

# OPERATING GUIDE

## SYSTEM PROCESSORS



*loudspeaker controller*

*matrix mixer*

*signal router*

**FBX 240** (2 x 4 System Processor)

**FBX 4802** (4 x 8 System Processor, 24-bit 96KHz)

**FBX 360** (3 x 6 System Processor)

**FBX 8802** (8 x 8 System Processor, 24-bit 96KHz)

**FBX 480** (4 x 8 System Processor)

**FBX 880** (8 x 8 System Processor, 24-bit 96KHz)

**FBX-100** (Wall-mounted remote control panel [requires -RC Series FBX])

**XConsole for Windows™** Software included with every unit; runs up to 16 FBX

- Full front panel control
- 24-bit A/D and D/A conversion, 40-bit extended processing
- 20 to 20 KHz Frequency Response
- +18 dBu Maximum Signal Input & Output
- Floating Point SHARC Processor
- 115 dB dynamic range

#### **Each Input/Output channel provides**

- Precise control of Level and Polarity
- Parametric Filters: up to 8 filters, numeric or graphic control
- Crossover: Bessel, Butterworth, and Linkwitz Riley filters; slopes to 48 dB/octave
- High Shelf Filter (3KHz to 20KHz) and Low Shelf Filter (20 Hz to 1KHz)
- FBX Feedback Exterminator: 8 Filters, with Setup Mode
- Compressor/Limiter, with controls for ratio, threshold, attack, release, and gain
- Digital Delay, up to 650/2s (80 on 240, 360, & 480) msec delay, adjustable in 21 microsecond increments
- Bypass: dedicated switches for all functions
- Channel Select buttons that toggle between Mute and Edit, with easy linking
- LED Indicators: Edit, Mute, Level
- LCD Display: All parameters and status displays
- Store up to 30 programs
- Multiple levels of password security
- Front panel RS232 and USB connections for computer control

#### **Back Panel:**

- XLR inputs & outputs; Phoenix on 4802/8802/880 units
- Ethernet connection (4802 and 8802/880 units only)

#### **XConsole Software Features:**

All front panel controls, plus more, including:

- Graphic filter adjustments
- Password protection
- View & edit frequency response curves
- Store and recall files, setups, programs
- Control and link up to 16 FBX (480 and 880 units only)
- Future-proof FREE Flash RAM upgrade capability: upgrade your firmware and software using xilica's FBX Upgrade Wizard

#### **FBX Optional Hardware and Software Features**

- Wall-Mounted Remote Control Panel
- FBX System Processors: Digital Input/Output Option

#### **Operating Guide Version 1.0 for 2007 xilica FBX with:**

FBX Firmware Version 6.0 and up • XConsole Software Version V10.and up



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## Section One: Introduction

Congratulations on your purchase of the xilica FBX. These products are our latest versions of the popular FBX System Processors.

The new FBX come in four basic input/output configurations. The FBX240 is a 2 by 4, the FBX360 is a 3 by 6, the FBX480 are 4 by 8, and the FBX880 is an 8 by 8. These System Processors are equally at home in both touring and installation applications, where they provide loudspeaker management, matrix mixing, and signal routing. State-of-the-art hardware and firmware guarantee superior sound quality and reliability.

All firmware and software can be upgraded using xilica's Upgrade Wizard software, included on your FBX U-DISK.

Aside from the powerful array of features packed into a single unit (multiple crossovers, complete signal routing and mixing, FBX filters, parametric filters, high and low shelf filters, delay, compression, and limiting), the FBX also offers a choice of user interfaces.

**Computer control:** When you install the included XConsole Control Software you will see a very powerful yet simple user interface. All parameters and system status monitors are available without burying you in cryptic menus. From here you control all audio, security, linking, and file saving functions, and you can manage your entire network of FBX.

**Front Panel Control:** The FBX combines the best of both worlds. The front panel provides access to every audio and system function for each device. Gain control for each input and output is one touch away. LED signal meters for each input and output provide a clear picture of signal status, and editing is fast with the datawheel and cursor keys. Quickly control multiple channels simultaneously by pressing several channel buttons at the same time, which is very handy for those global changes.

**NAVRC-100 Wall-Mount Remote Panel:** The attractive NAVRC-100 wall-mounted remote control panel allows for control of presets, gain, muting, and other basic functions. One NAVRC-100 can control up to 8 FBX, and one FBX can be controlled by up to 8 NAVRD-100 panels.

**Serial Remote Control Devices:** FBX are compatible with all the major serial controllers, including Crestron, AMX, and Cue.

### How to Use this Operating Guide

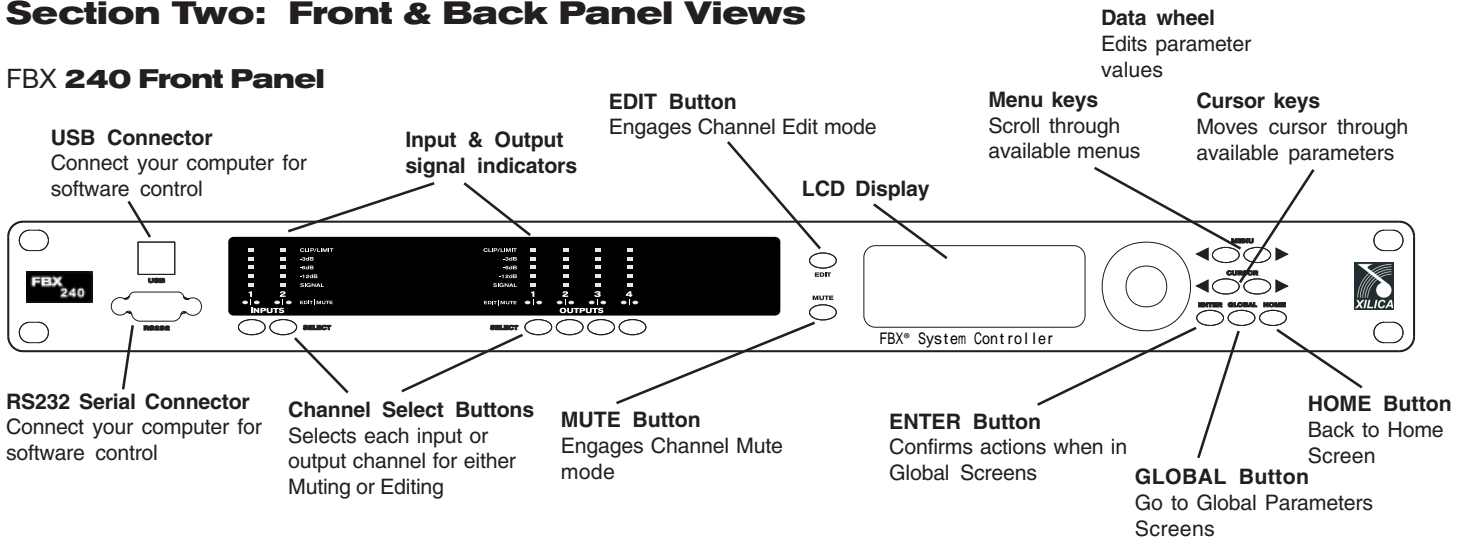
Detailed instructions are provided for all front panel controls, but you will probably be able to get going after taking a look at the Quick Start page. The instructions apply to all FBX except where noted.

Later in this guide is an overview of installing and using the XConsole Control Software. For more detailed information please see the Help section of the software.

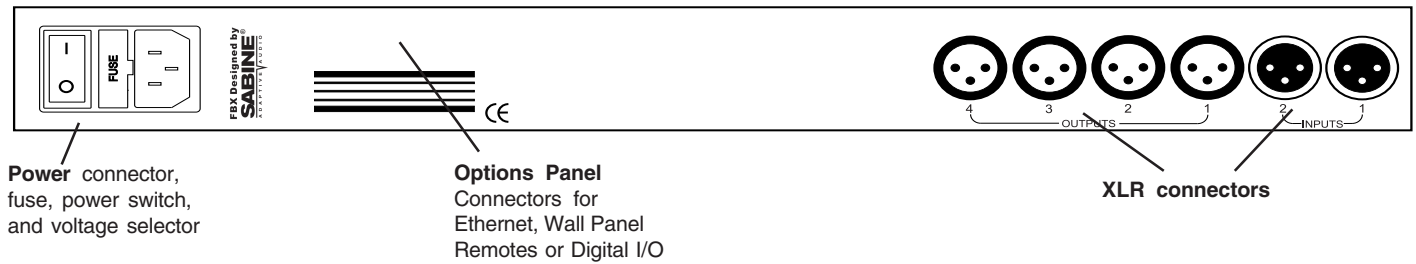
If you have any questions you may call xilica and xilica Customer Service Department at 386-418-2000 from 9:30 am to 6:00 pm EST.

Section Two: Front & Back Panel Views

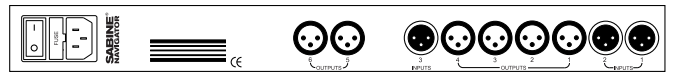
FBX 240 Front Panel



FBX 240 Back Panel

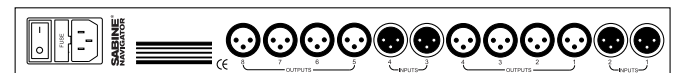
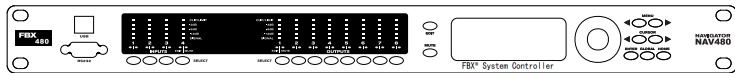


FBX 360 Front Panel



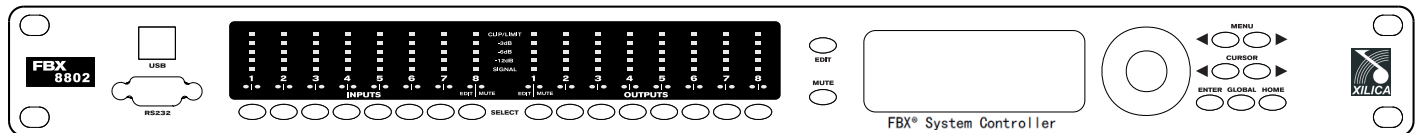
FBX360 Back Panel

FBX 480 Front Panel

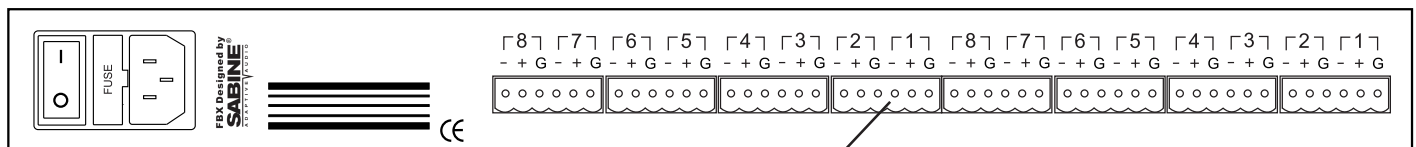


FBX480 Back Panel

FBX 4802/8802 Front Panel



FBX 4802/8802 Back Panel

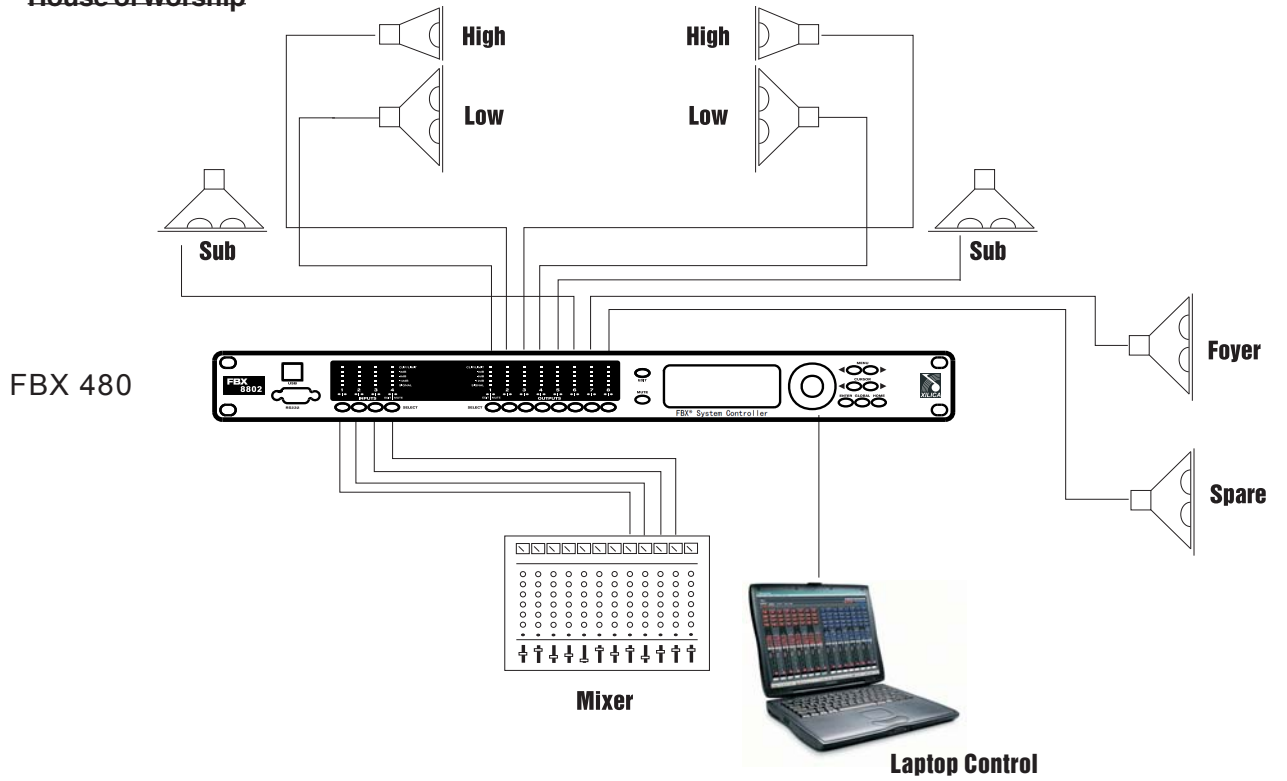


Phoenix 3-pin Connectors

### Section Three: FBX Applications

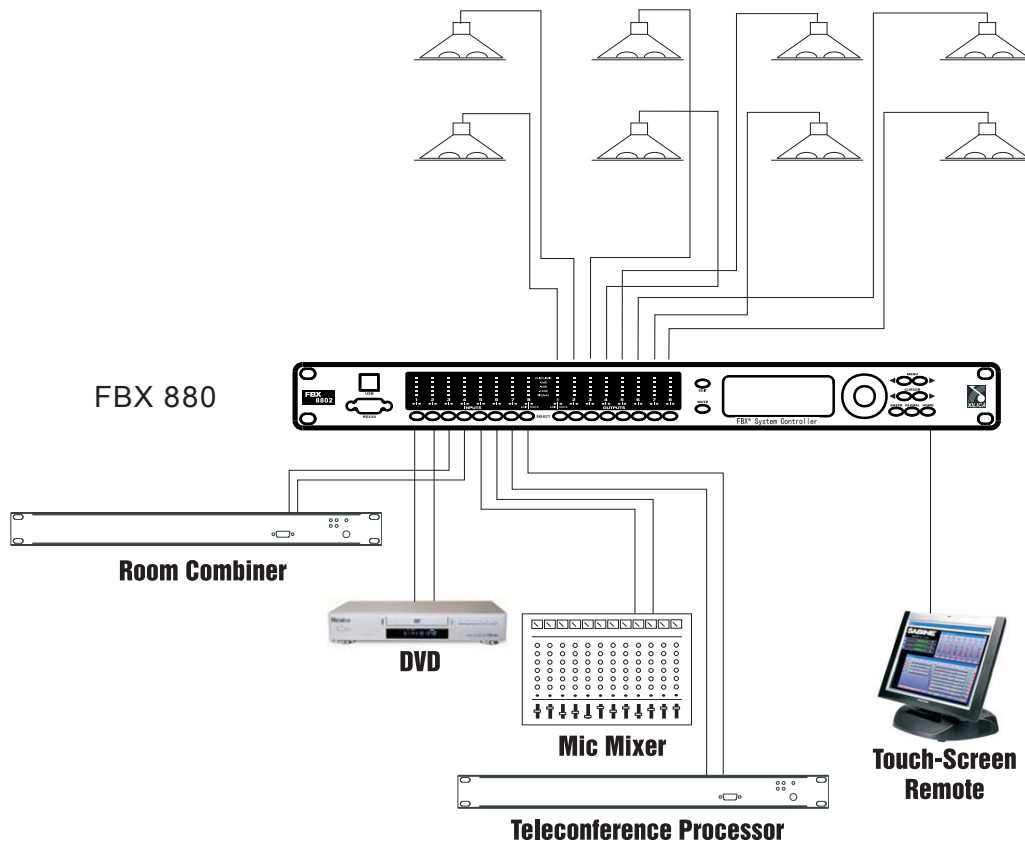
#### 3.1 INSTALLED AUDIO

House of Worship

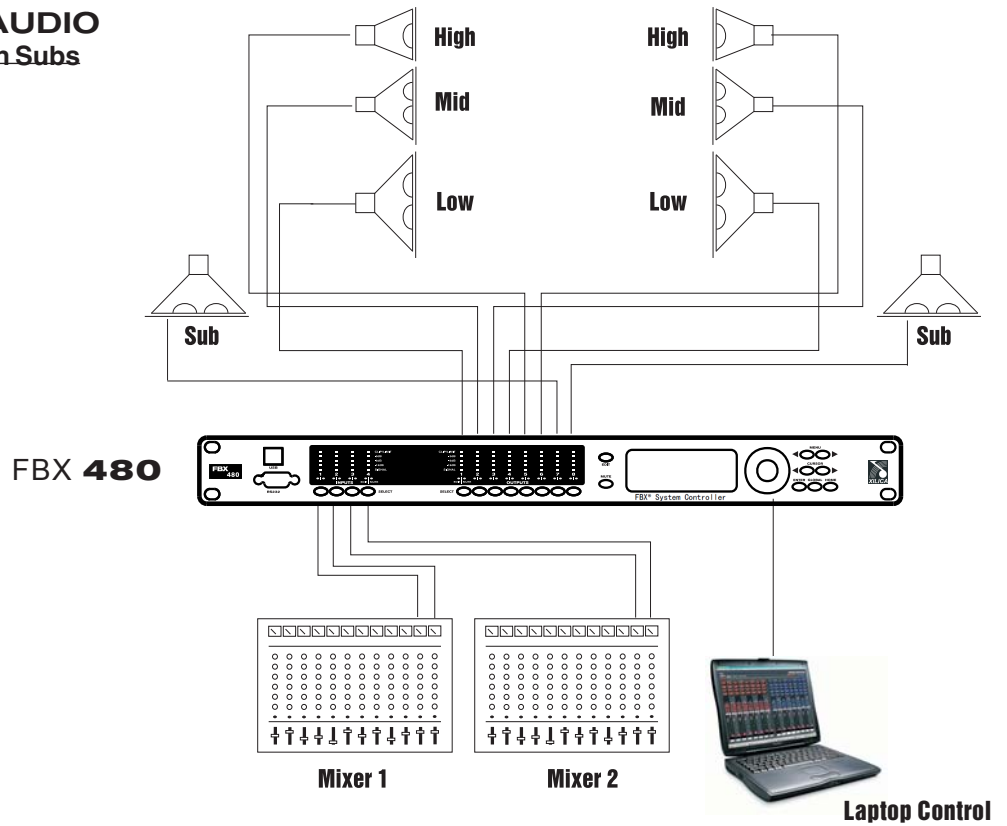


Conference Room - Distributed Audio

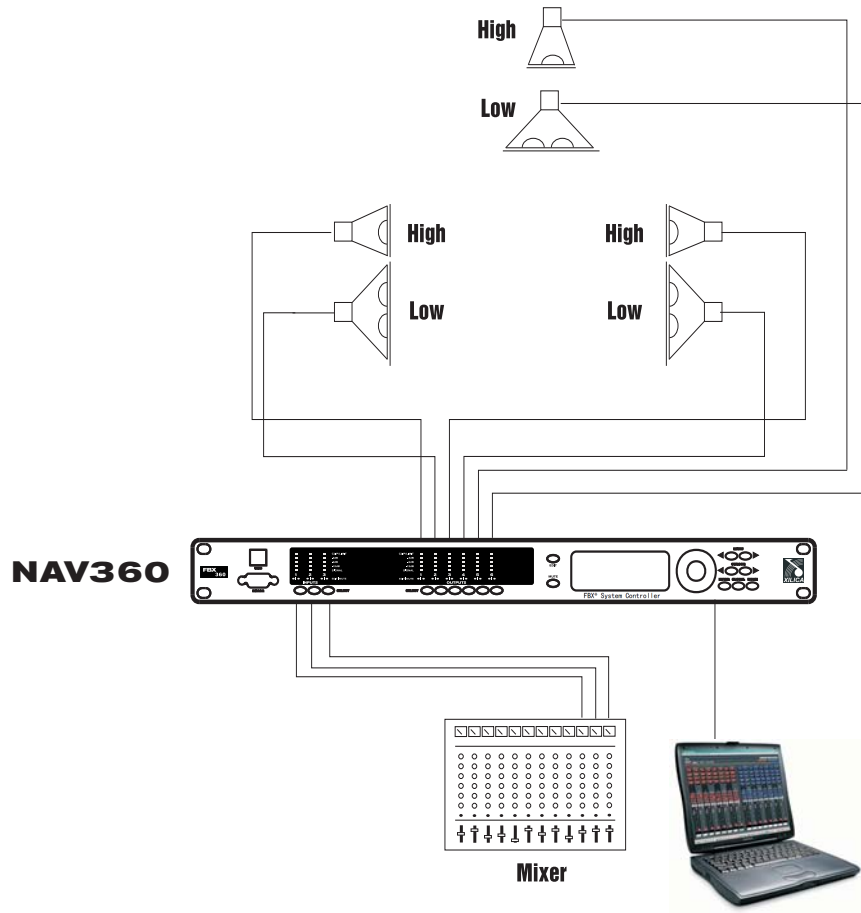
Ceiling Speaker Zones



**3.2 PRODUCTION AUDIO**  
Stereo 3-way, with Subs

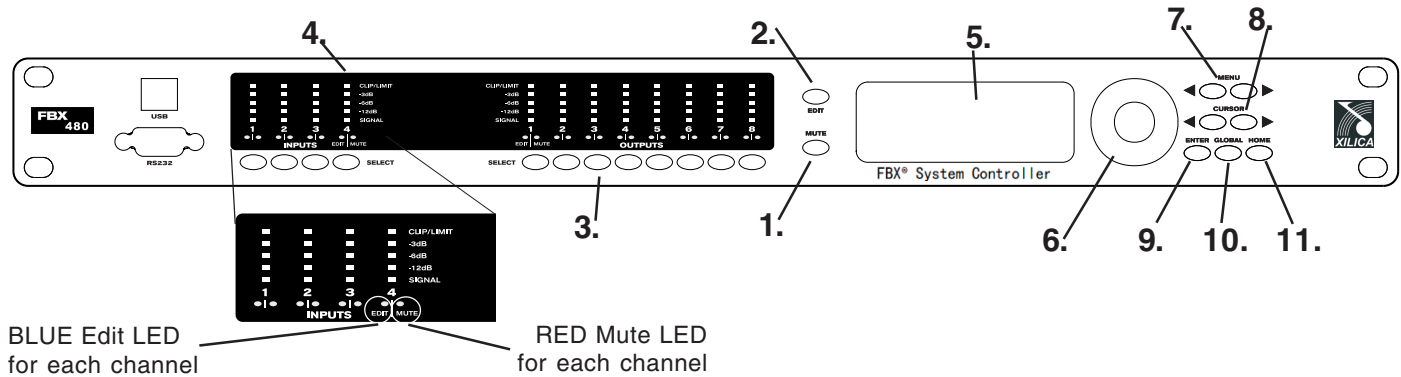


Left, Center, Right





## Section Four: Using FBX Front Panel Controls



**1. MUTE Button:** Select this to turn the Channel Select Buttons into MUTE buttons. Each press of a Channel Select button toggles that channel's Mute Status, and the RED Mute LED will light indicating the channel is muted.

**2. EDIT Button:** Select this to turn the Channel Select Buttons into EDIT buttons. Each press of a Channel Select toggles that channel's Edit Status, and the BLUE Edit LED will light indicating the channel is in Edit Mode.

**3. Channel Select Buttons:** Selects the corresponding channel for either Editing or Muting as described above. Press again to toggle off either Edit or Mute modes. When in Edit mode the LCD menu display pertains to the channel(s) that are selected. The last modified menu will be displayed on the LCD.

**CHANNEL LINKING:** Linking (think of this as applying your edits to multiple channels simultaneously) multiple channels is accomplished by simply selecting multiple input or output channels. Linking is very powerful - it simplifies programming for common parameter values across multiple channels. Multiple inputs can be linked together and multiple outputs can be linked together. You cannot link inputs to outputs.

**4. Peak Level LEDs:** Indicates the current peak level of the Input or Output Signal. Ranges are Signal (anything below -12 dB), -12dB, -6dB, -3dB, Clip/Limit. The Input **Clip** LED references to the device's maximum headroom. The Output **Limit** LED references to the threshold of the limiter.

**5. LCD:** Shows all the necessary information for editing all parameters.

**6. Rotary Data Wheel:** Changes parameter data values. The wheel has travel velocity sensing which allow for large or small incremental data changes. For extra coarse modification of delay and frequency (1 Hz resolution) values, pressing the **Enter** key simultaneously will increment/decrement the data value by 100 X.

**7. MENU Buttons:** The two Menu buttons move through the menus in a linear format.

<< **Menu:** Previous menu screen;      **Menu>>:** Next menu screen

**8. CURSOR Buttons:** After choosing a menu to work with, use these keys to move through each of the editable parameters within the Menu in a linear format. These also move the cursor in certain screens.

<<**Cursor:** Previous parameter or cursor position;      **Cursor>>:** Next parameter or cursor position

**9. ENTER Button:** Press this key to execute changes in the Global Parameters Screens and in the FBX Setup Screen to initiate Setup Mode. **Fast scrolling with the Enter key:** Press this key while turning the data wheel to modify delay and frequency (1 Hz resolution mode) data values by 100X.

**10. GLOBAL Button:** Choose this button to enter the special Global Parameters menu.

**11. HOME Button:** Choose this button to return to the FBX Home screen, which displays the model number and the last loaded preset. This also exits both Edit and Mute modes.

**TECH TIP**

For fast scrolling of frequency or delay values, hold the Enter Key while turning the datawheel

#### 4.1. QUICK START GUIDE TO THE FBX FRONT PANEL

- After powering up the unit, the following initialization screen is displayed on the LCD:

* XILICA	FBX480*
FBX	v1.0

- The initialization process takes about 8 seconds and during that period the unit boots and displays the FBX firmware version.
- After the initialization process is finished the FBX displays its main screen:

* XILICA	FBX 480*
P01 MAIN	_____

- The screen shows the current program number and program name assigned to the unit. The program assigned is always the last program the user recalled or stored before powering down the unit.

The FBX is now ready to go.

##### 4.1.1 Configuring The FBX

Working with your FBX is easy. Follow these basic steps to get started. For details on working within each menu, please read Section Five on operating the FBX.

1. **Signal Routing:** You first need to get your inputs routed to the appropriate outputs. You can do this in two ways.
  - A. Press Enter to enter the Global Parameters Menu, press the >>Menu key until you get to the Configuration Menu, and choose one of the preset configurations. This is the fast way to get all your routing done.
  - B. Or you can press the Select key on one of the outputs, press the >>Menu until you get to the Source Menu, and choose which of the inputs you want to patch to this particular output.
2. **Set Input/Output Gain:** The first menu you see when pressing the Select key on each input or output is the Signal Menu. The cursor is already in the Level field, and you can immediately turn the datawheel to adjust the input and output gain of each channel. This fast access to gain is very handy for quick adjustments during your program.
3. **Mixing:** Mixing for each output is done in the Source Menu of each output (see 1.B. above). In this menu each input has a gain control so you can set the levels to create just the right mix in this particular output.
4. **Crossover Filters:** At this point you may want to set the crossover filters for each of the outputs. You are essentially controlling which band of frequencies you will send to each of your speakers or speaker systems. Press the Select key for the output you want to set, and press the Menu key until you get to the XOVER Menu. You will set filters for the lower and upper rolloff points, the slopes of the filters, and type of each filter.
5. **Equalization:** You may want to adjust the frequency response of your system. The FBX Processor gives you a powerful set of EQ tools. For each input and output you can use up to eight filters, and these can be either Parametric, High Shelving, or Low Shelving filters. Press the Select button on any input or output channel to access the EQ Menu.
6. **FBX Feedback Exterminator:** Each input channel includes 8 patented FBX feedback control filters. Use the FBX Mode menu to begin Setup Mode for maximum gain before feedback. See the results of the process in the FBX Menu, and change the default FBX parameters on the FBX Global Menu.
7. **Save your work:** You know how important this one is. If you are editing in the input/output menus, press Home to get to the Main Menu. Then press Global to get to the Global Parameters Menus, and scroll to the Store Menu. Save and name your program here. Do it early and often!

## Section Five: Operating the FBX

### 5.1 INPUT MENUS

Each of the FBX input channels has a separate **Menu** key. There are 7 function menus for each input channel, and you cycle through these by pressing the Menu keys. The first line in the LCD indicates which input channel you are editing, and shows the name of that channel if you have added one (for example, IN\_1: \_\_\_\_\_), The menus are arranged in a linear fashion. Scroll to the right to reach the end, then scroll back to the left until you reach the beginning. Use the Cursor keys to select a parameter to edit, and use the Data Wheel to make your edits.

#### Signal

*FBX 480 & FBX880*

IN_1: _____	MENU: Signal
LEVEL: 0.00dB	
POL : +	
DELAY: 0 (000.000 ms)	

*FBX240, 360, 480*

I1: _____	Signal
LEVEL: 0.00 dB	

I1: _____	Signal
POL: +	

I1: _____	Signal
DELAY: 000.000 ms	

- LEVEL: Gain, -40.00 dB to +15.00 dB in 0.25 dB steps.
- POL: Polarity, can be normal (+) or inverted (-).
- DELAY: Delay in 21 microsecond steps. Can be displayed in ms, ft or m. The time unit of the delay can be changed in the **Global Parameters** menu. The maximum delay is 80 ms in the FBX240, 360, and 480.

**FBX240, 360, 480**

LCD Display has only 2 lines. Use Cursor key to access all parameters in each window

#### EQ

*FBX 480 & FBX880*

IN_1: _____	MENU: EQ
EQ#: 1	BW :0.33oct
LEVEL: + 0.00dB	Q=0.436
FREQ : 1000Hz	TYPE: PEQ

*FBX240, 360, 480*

I1: _____	EQ1
EQ#: 1	

I1: _____	EQ1
LEVEL: 0.00 dB	

I1: _____	EQ1
FREQ: 1000 Hz	

I1: _____	EQ1
FRE 0.02 Q=72.13	

I1: _____	EQ1
TYPE: PEQ	

- EQ#: Selects one of the 8 available equalizer filters.
- LEVEL: Adjusts EQ level. Ranges from -30.00dB to +15.00dB in 0.25dB steps.
- FREQ: EQ center frequency. Ranges from 20 to 20,000 Hz in either 1 Hz steps or 1/36 octave steps. The frequency steps can be selected in the **Global Parameters Menu**.
- BW: EQ Bandwidth. Ranges from 0.02 to 2.50 octaves in steps of 0.01 octave steps for PEQ. The Q value is automatically shown beneath the octave value. For Lo-Shf or Hi-Shf, it is either 6 or 12dB/Oct.
- Type: Type of EQ. The types can be PEQ (parametric), Lo-Shf (Low shelving), and Hi-Shf (High shelving).

**FBX**

See Section 5.6 for a complete description of how to operate the FBX Feedback Exterminator

**FBX Feedback Exterminator***FBX 480 & FBX880*

IN_1: _____	MENU: FBX
FBX#: 1	FREQ: 9020 Hz
TYPE: FIXED (L)	BW : 0.10 Oct
LVL : -9dB	

- EQ#: Selects one of the 8 available FBX filters.
- TYPE: Choose Fixed for more gain before feedback, Dynamic for control of new feedback during the show. See section 5.5 for a complete guide to using the FBX function.
- LVL: Shows level in dB of the FBX filter (not editable).
- FREQ: Shows center frequency of the FBX filter (not editable).
- BW: Shows the width of the FBX filter (not editable).

*FBX240, 360, 480*

I1: _____	FBX1
FBX#: 1	

I1: _____	FBX1
TYPE: Fixed (L)	

I1: _____	FBX1
LEVEL: -3 dB	

I1: _____	FBX1
FREQ: OFF	

I1: _____	FBX1
BW: 0.01 oct	

**FBX-Global Parameters***FBX 480 & FBX880*

IN_1: _____	MENU: FBX-Glob
LOCK : On	DEPTH: 24dB
BYPASS: On	WIDTH : 0.10
RSTDYN: Off	SENS: 3 PERS:3

- LOCK: This refers to Fixed filters only, which by definition already are fixed in their centerpoint position. Locking prevents the filter from getting deeper. Locked is the recommended setting. Ready Mode automatically locks fixed filters.
- BYPASS: Bypasses all FBX filters on this Input channel. On indicates bypass; Off indicates FBX is active.
- RSTDYN: Reset Dynamic FBX filters. Turning to on toggles the reset function.
- DEPTH: Sets maximum depth of all FBX filters on this input channel. Range is 0 to -84dB.
- WIDTH: Sets default width of all FBX filters on this input channel. Range is 0.01 to 1.00 octave.
- SENS: Sets the Sensitivity of the FBX algorithm to the difference between music and feedback. Range is 1-5.
- PERS: Sets persistence - how long feedback can persist before a filter is set. Range is 1-5.
- Factory Defaults are recommended for Sensitivity, and Persistence settings.

*FBX240, 360, 480*

I1: _____	FBXGbl
LOCK: On	

I1: _____	FBXGbl
BYPASS: Off	

I1: _____	FBXGbl
RSTDYN: Off	

I1: _____	FBXGbl
DEPTH: 4 dB	

I1: _____	FBXGbl
WIDTH: 0.10 oct	

I1: _____	FBXGbl
SENSE: 2	

I1: _____	FBXGbl
PERSIST: 2	

**FBX-Mode**

*FBX 480 & FBX880*

IN_1: _____	MENU: FBX-Mode
SETUP MODE	: Ready

*FBX240, 360, 480*

I1: _____	FBXMod
SETUP MODE:	Ready

I1: _____	FBXMod
Setup?:	<Enter>

FBX SETUP MODE	
Abort:	<Home>

· SETUP MODE: This screen is used to engage FBX Setup mode. Use this for setup only - not for use during the show. This step provides maximum gain before feedback. Follow on-screen instructions and raise gain slowly. **For a step-by-step guide to using the FBX see section 5.6.**

**Compressor**

*FBX 480 & FBX880*

IN_1: _____	MENU: Compress
THRESH : 0.0dBu	
ATTACK : 10ms	RATIO: 2:1
RELEASE: 8x (80ms)	

*FBX240, 360, 480*

I1: _____	Comp
THRESH:	0.0 dBu

I1: _____	Comp
ATTACK:	0.3

I1: _____	Comp
RELEASE:	2x Atck

I1: _____	Comp
RATIO:	1:1

· THRESH: Compressor Threshold. Ranges from -20 to +20dBu in 0.5dB steps.  
 · ATTACK: Attack time. Ranges from 0.3 to 1ms in 0.1ms steps; from 1 to 100ms in 1ms steps.  
 · RELEASE: Release time. Can be set at 2X, 4X, 8X, 16X or 32X the attack time.  
 · RATIO: Set compression ratio, 1:1 to 40:1 (Limit).

**FBX240, 360, 480**

**LCD Display has only 2 lines. Use Cursor key to access all parameters in each window**

**Bypass**

*FBX 480 & FBX880*

IN_1: _____	MENU: Bypass
DELAY: 0	
EQ 1 - 8:	0X000000

*FBX240, 360, 480*

I1: _____	Bypass
DELAY:	0

I1: _____	Bypass
EQ1-8:	0X000000

· DELAY: Select X using the datawheel to bypass the delay  
 · EQ: Select X to bypass one of 8 EQ filters on this input

**Channel Name**

*FBX 480 & FBX880*

IN_1: _____	MENU: Name
NAME: _____	

*FBX240, 360, 480*

I1: _____	Name
NAME:	_____

· Name: Channel name. The maximum length is 6 characters. Use the datawheel to scroll through all the possible characters, and use the cursor keys to move to the next space. Once the name is created it will appear in the upper field of this window.

## 5.2 OUTPUT MENUS

Each output channel of the FBX has a separate menu key. There are 6 menus for each output channel. The menus cycle in a linear fashion, just like the input menus. Use the Cursor keys to select a parameter to edit, and use the Data Wheel to make your edits.

### Signal

*FBX 480 & FBX880*

OUT_1: _____	MENU: Signal
LEVEL: 0.00dB	
POL : +	
DELAY: 0 (000.000 ms)	

- LEVEL: Gain, -40.00dB to +15.00dB in 0.25dB steps.
- POL: Polarity, can be normal (+) or inverted (-).
- DELAY: Delay is adjustable in 21 microsecond steps and displayed in ms, ft or m. The time unit of the delay can be changed in the **Global Parameters** menu. The maximum available delay is 650ms (80 for the FBX240, 260, and 480).

*FBX240, 360, 480*

O1: _____	Signal
LEVEL: 0.00 dB	

O1: _____	Signal
POL: +	

O1: _____	Signal
DELAY: 000.000 ms	

### EQ

*FBX 480 & FBX880*

OUT_1: _____	MENU: EQ
EQ#: 1	BW :0.33oct
LEVEL: + 0.00dB	Q=0.436
FREQ : 1000Hz	TYPE: PEQ

- EQ#: Selects one of the 8 available Equalizer filters.
- LEVEL: EQ level. Ranges from -30.00dB to +15.00dB in 0.25dB steps.
- FREQ: EQ center frequency. Ranges from 20 to 20,000 Hz in either 1Hz steps or 1/36 octave steps. The frequency steps can be selected in the **Global Parameters** menu.
- BW: EQ Bandwidth. Ranges from 0.02 to 2.50 octaves in steps of 0.01 octave steps for PEQ. The Q value is automatically shown beneath the octave value. For Lo-Shf or Hi-Shf, it is either 6 or 12dB/Oct.
- Type: Type of EQ. The types can be parametric (PEQ), Lo-Shf (Low shelving), and Hi-Shf (High shelving).

*FBX240, 360, 480*

O1: _____	EQ1
EQ#: 1	

O1: _____	EQ1
LEVEL: 0.00 dB	

O1: _____	EQ1
FREQ: 1000 Hz	

O1: _____	EQ1
FRE 0.02 Q=72.13	

O1: _____	EQ1
TYPE: PEQ	

**Crossover**

*FBX 480 & FBX880*

OUT_1: _____	MENU: XOver
FTRL: Off	FTRH: Off
FRQL: 1000Hz	FRQH:1000Hz
SLPL : 24dB	SLPH:24dB

- FTRL: Choose the type of low frequency filter (high pass). Types can be Butterworth (Butterworth), Link-Ri (Linkwitz-Riley) or Bessel.
- FRQL: Filter cut-off frequency of low frequency crossover point (high pass). Ranges from 20 to 20,000Hz in either 1Hz steps or 1/36 octave steps. Select frequency resolution in the **Global Parameters** menu.
- SLPL: Filter Slope of low frequency crossover point (high pass). Ranges from 6 to 48dB/octave in 6dB/octave steps. If the selected Filter Type is Linkwitz Riley, the available slopes are 12 / 24 / 36 / 48 dB/octave.
- FTRH: Choose the type of high frequency filter (low pass). Types can be Butterworth (Butterworth), Link-Ri (Linkwitz-Riley) or Bessel..
- FRQH: Filter cut-off frequency of high frequency crossover point (low pass). Ranges from 20 to 20,000Hz in either 1Hz steps or 1/36 octave steps. Select frequency resolution in the **Global Parameters** menu.
- SLPH: Filter Slope of high frequency crossover point (low pass). Ranges from 6 to 48dB/octave in 6dB/octave steps. If the selected Filter Type is Linkwitz Riley, the available slopes are 12 / 24 / 36 / 48 dB/octave.

*FBX240, 360, 480*

O1: _____ XOver
FTRL: Off

O1: _____ XOver
FRQL: 1000 Hz

O1: _____ XOver
SLPL: 24 dB

O1: _____ XOver
FTRH: Off

O1: _____ XOver
FRQH: 20 Hz

O1: _____ XOver
SLPH: 6 dB

**FBX240, 360, 480**

LCD Display has only 2 lines. Use Cursor key to access all parameters in each window

**Compressor**

*FBX 480 & FBX880*

OUT_1: _____	MENU: Compress
THRESH : 0.0dBu	
ATTACK : 10ms	RATIO: 2:1
RELEASE: 8x (80ms)	

- THRESH: Compressor Threshold. Ranges from -20 to +20dBu in 0.5dB steps.
- ATTACK: Attack time. Ranges from 0.3 to 1ms in 0.1ms steps; from 1 to 100ms in 1ms steps.
- RELEASE: Release time. Can be set at 2X, 4X, 8X, 16X or 32X the attack time.
- RATIO: Set compression ratio, 1:1 to 40:1 (Limit).

*FBX240, 360, 480*

O1: _____ Comp
THRESH: 0.0 dBu

O1: _____ Comp
ATTACK: 0.3

O1: _____ Comp
RELEASE: 2x Atck

O1: _____ Comp
RATIO: 1:1



**Input Source**

*FBX 480 & FBX880*

OUT_1: _____	MENU: Source
In1: On _____	In4: Off
In2: Off	
In3: Off	

*FBX240, 360, 480*

O1: _____	Source
In1: Off	

- 1, 2, 3, 4 – Input channel source for the current output channel. This is your sub-mixer for each output of the FBX. Values range from 0.00 (Maximum level) to -40, then OFF, which mutes that input for the output you are editing.

**Channel Name**

*FBX 480 & FBX880*

OUT_1: _____	MENU: Name
NAME: _____	

*FBX240, 360, 480*

O1: _____	Name
NAME: _____	

- Refer to the Input Menus for details on naming your output channels.

**Bypass**

*FBX 480 & FBX880*

OUT_1: _____	MENU: Bypass
DELAY: 0	
EQ 1 - 8: 0X000000	

*FBX240, 360, 480*

O1: _____	Bypass
DELAY: 0	

O1: _____	Bypass
EQ1-8: 0X000000	

- DELAY: Select X using the datawheel to bypass the delay
- EQ: Select X to bypass one of 8 EQ filters on this output

**5.3 GLOBAL PARAMETERS MENUS**

The **Global Parameters Menus** allow you to control and change global parameters that are related to the general operation of the FBX. Press HOME to access the Main Menu, then GLOBAL to enter the Global Parameters Menus. All Global Menus require you to press the ENTER key to confirm the selected edit.

**Program Recall**

The FBX has a built in non-volatile memory that can store up to 30 different program setups. A program can be recalled using this menu.

*FBX 480 & FBX880*

GLOBAL _____	MENU: Recall
PROG: 1	
NAME: _____	

*FBX240, 360, 480*

GLOBAL _____	Recall
P: 1 MAIN _____	

- PROG: Program Number to be recalled..
- NAME: Program Name of the program. This is read only; names can be changed in the Store menu.



**Program Store**

The FBX has a built in non-volatile memory that can store up to 30 different program setups. A program can be stored using this menu. The old program with the same program number will be replaced. Once the program is stored in the flash memory, it can be recalled at a later time, even after power down.

*FBX 480 & FBX880*

GLOBAL PROG: 1 NAME: _____	MENU: Store
----------------------------------	-------------

*FBX240, 360, 480*

GLOBAL P: 1	Store
----------------	-------

GLOBAL NAM: _____	Store
----------------------	-------

- PROG: Program Number for the current data to be stored.
- NAME: Program Name, allows a maximum length of 12 characters.

**Configuration**

*FBX 480 & FBX880*

GLOBAL MODE: None	MENU: Config
----------------------	--------------

*FBX240, 360, 480*

GLOBAL MODE: None	Config
----------------------	--------

- MODE - configures the mode of operation.

<u>Mode:</u>	<u>Out 1</u>	<u>Out 2</u>	<u>Out 3</u>	<u>Out 4</u>	<u>Out 5</u>	<u>Out 6</u>	<u>Out 7</u>	<u>Out 8</u>
None	Any	Any	Any	Any	Any	Any	Any	Any
Stereo 2-Way	In1	In1	In2	In2	Any	Any	Any	Any
Stereo 3-Way	In1	In1	In1	In2	In2	In2	Any	Any
Stereo 4-Way	In1	In1	In1	In1	In2	In2	In2	In2

The unit assigns the Input source for the corresponding outputs when the Mode of Configuration is selected. The crossover point parameters like the filter type, cut-off frequency and slope have to be configured manually in the **Xover** Menu in each Output menu.

\*Note: The configuration mode configures the input sources when selected. The user can change the source afterwards if desired. It does not keep the configuration in memory.

**Copy Parameters**

*FBX 480 & FBX880*

GLOBAL SOURCE: In1 TARGET : In1	MENU: Copy
---------------------------------------	------------

*FBX240, 360, 480*

GLOBAL SOURCE: In1	Copy
-----------------------	------

GLOBAL TARGET: In2	Copy
-----------------------	------

Copy channel parameters from the source to the target. When the Source and Targets are both Inputs or Outputs, all audio parameters will be copied. When one of the Source or the Target is an input while the other is an output, only the Level, Polarity, Delay and EQ are copied.

- SOURCE: Channel to be copied from.
- TARGET: Channel to be copied to.

**General System Parameters**

*FBX 480 & FBX880*

GLOBAL	MENU: General
FREQ MODE : 36	Steps/Oct
DELAY UNIT : ms	
DEVICE# : 1	PORT:CAT-5

*FBX240, 360, 480*

GLOBAL	General
FREQ MODE: 36/Oct	

GLOBAL	General
DELAY UNIT: ms	

- FREQ MODE: Selects the frequency control mode for EQ and crossover filters. The coarse adjustment is 36 steps/octave; choose All Frequencies (1 Hz resolution) for fine adjustments.
- DELAY UNIT: ms (milliseconds), ft (feet), or m (meters).

**Communications**

*FBX 480 & FBX880*

GLOBAL	MENU: Comm
PORT : RS232/USB	
BAUD RATE: 115200	
DEVICE #: 1	

*FBX240, 360, 480*

GLOBAL	Comm
PORT: RS232/USB	

GLOBAL	Comm
BAUD RATE: 115200	

GLOBAL	Comm
DEVICE #: 1	

- PORT: Choose control port. RS232/USB for direct connection to a computer, or CAT-5 for Ethernet.
- BAUD: Choose the baud rate to match your serial port when connecting via RS232 or USB. The values are 1200, 2400, 4800, 9600, 19200, 38400, 57600, or 115200.
- DEVICE#: Assigns the device ID from 1 to 16. Assigning ID numbers is required when you are creating a network of more than one FBX.

**Security**

The FBX enables the user to secure the unit and prevent undesired changes in the setup. In order to make changes to the security levels the user must enter the correct password.

*FBX 480 & FBX880*

GLOBAL	MENU: Security
MENU : In-Signal	
LOCK : No	
PASSWORD: _____	

*FBX240, 360, 480*

GLOBAL	Secure
PASSWORD: _____	

- MENU - Selects the menu to be locked/unlocked. The options are:
  - In-Signal: Input Signal Menu (Level, Polarity, Delay).
  - In-EQ: Input EQ Menu.
  - In-Name: Input Channel Name Menu
  - Out-Signal: Output Signal Menu (Level, Polarity, Delay).
  - Out-EQ: Output EQ Menu.
  - Out-Xover: Output Crossover Menu.
  - Out-Limit: Output Limit Menu.
  - Out-Source: Output Source Menu.
  - Out-Name: Output Channel Name Menu.
  - Global Parameters: Global Parameters Menu

**Security** (continued)

- **LOCK:** Engages lock (Yes) or unlock (No) for the corresponding menu.
- **PASSWORD:** Enter your 4-character password here. Initial password creation must be done within XConsole Software. Entering the same password here initiates the lockout function. Press Enter and your FBX front panel controls will be locked according to the menu selections you made. You can alter those selections via the front panel or through the software. FBX240, 360, and 480 models do not allow for selective menu locking. With these all front panel functions are either locked or unlocked.

**5.4 INPUT/OUTPUT REFERENCE GUIDE**

This chart shows all the parameters and edit values for each control on each menu. Use this as your reference for ranges of all parameters in each menu.

Parameters	<<Menu>>	<<Cursor>>	Min	Max	Steps	Units
Level	Signal	LEVEL	-40	15	0.25	dB
Polarity	Signal	POL	+ / -			
Delay	Signal	DELAY	0	21,600	1	21us steps
EQ Number	EQ	EQ#	1	6	1	
EQ Level	EQ	LEVEL	-30	15	0.25	dB
EQ Frequency	EQ	FREQ	20	20,000	1	Hz
EQ Bandwidth	EQ	BW	0.02	2.5	0.01	Octave
Crossover Low	XOver	FTRL	Off / Butterworth / Linkwitz-Riley / Bessel			
Crossover Low	XOver	FRQL	20	20,000	1	Hz
Crossover Low	XOver	SLPL	6	48	6	dB/octave
Crossover High	XOver	FTRH	Off / Butterworth / Linkwitz-Riley / Bessel			
Crossover High	XOver	FRQH	20	20,000	1	Hz
Crossover High	XOver	SLPH	6	48	6	dB/octave
Limiter Threshold	Limit	THRESH	-20	20	0.5	dBu
Limiter Attack	Limit	ATTACK	0.3	100	0.1/1	ms
Limiter Release	Limit	RELEASE	2 / 4 / 8 / 16 / 32X Attack time			
Source Select	Source	1, 2, 3, 4	Off / On			
Channel Name	Ch-Name	NAME	6 characters			

## 5.5. FEEDBACK CONTROL AND PARAMETRIC EQUALIZATION

Operation of the FBX Feedback Exterminator section of the front panel of your FBX is simple, but may require a brief explanation for those of you unfamiliar with xilica FBX products and/or terminology. Let's begin by defining a few key terms.

### 5.4.1. Glossary of Terms

- **FEEDBACK** describes what happens when a loudspeaker disperses sound back into an amplified microphone, at a level sufficient to allow one or more frequencies to ring out of control. Feedback can occur at any frequency, but is especially painful at mid to high frequencies. The specific frequencies that feedback in a particular situation depend on the acoustics of the environment, the placement of the microphone(s) and speaker(s), the response characteristics of the sound system components, and the volume of amplification. Anyone who has operated a sound system or attended a conference or a concert is familiar with feedback and its unpleasant consequences!
- A **PARAMETRIC EQUALIZER** allows the user to precisely specify three critical values that determine an equalizer's characteristics: the center frequency of the EQ band that is boosted or cut (measured in Hertz), the amount of boost or cut imposed at the center point (measured in dB), and the width of the bell-curve shaped frequency band that is affected (typically measured in octaves).
- An **FBX FILTER** is essentially an automatically placed, narrowly attenuated parametric filter, with the center point of its narrow cut tuned to a precise frequency that feeds back when a sound system amplifies one or more microphones to a sufficient volume. The FBX will automatically place up to 8 FBX filters in the signal path, corresponding to 8 distinct frequencies of feedback.
- A **FIXED FBX FILTER** will not move from the original set frequency of the filter. Once it sets itself, it remains at the same frequency. The system's gain before feedback is limited primarily by the number of fixed filters; i.e., increasing the number of fixed filters increases the system's gain before feedback. However, unless it is **LOCKED**, a **FIXED FILTER** may move its notch deeper without changing frequency. Fixed filters are typically set by turning up system gain to the point of feedback prior to sound check or performance, and they represent the "first layer" of feedback protection.
- A **DYNAMIC FBX FILTER** acts like a Fixed filter, until all available FBX filters (Fixed or Dynamic) are in use and a new frequency begins to feedback. When this happens, whichever Dynamic filter was set earliest in the performance will drop its original frequency and move to the new one. Dynamic filters are especially useful with mobile or wireless microphones (where feedback frequencies may change due to microphone repositioning) and represent the "second layer" of feedback protection. Note that both Fixed and Dynamic filters can be set while music is playing (except when in Setup Mode). One of the distinguishing properties of the xilica FBX algorithm is its ability to distinguish music (or speech, or other sounds) from feedback.
- A **LOCKED FBX FILTER** is a Fixed filter locked in place; i.e., it cannot get any deeper or change its frequency. Locked fixed filters are no longer adaptive. Locking Fixed filters ensures your first layer of feedback protection is always in place -- highly recommended.
- **FILTER WIDTH** generally refers to the width (measured in octaves, or fractions thereof) of a filter, including graphic EQ filters, parametric filters, and FBX filters. More specifically, width is defined by determining the outer frequencies (surrounding the filter center point) that are altered  $\pm 3$  dB when the filter is imposed.
- **CONSTANT Q** filters are filters whose widths remain constant regardless of the amount of boost or attenuation imposed by the filters. Constant Q feedback control filters are defined several different ways in our industry. Some companies claim their filters are Constant Q because they do not widen when measured at the deepest part of the filter. Under this meaningless definition, every feedback filter ever made is Constant Q. However, the top end of these filters get wider and wider as the filter gets deeper. In other words, they take out more of the program as the filter gets deeper. xilica Constant Q filters uses the most stringent and meaningful definition. Our filters never get wider than the specified width when measured at the top of the filter (-3 dB point). Our filters never remove more of the program as the filter gets deeper.
- **FBX Setup Mode** refers to xilica's exceptionally fast method of placing FBX filters during sound system setup. Think of Setup mode as your key to achieving one of the main benefits of the FBX: getting more gain before feedback. In Setup the FBX is very sensitive so **do not talk into the mics during setup**, and try to keep room noise to a minimum. Setup is designed to allow feedback to occur at lower input levels, and it imposes a strong limiter on the feedback output as it occurs. The net result is that you are able to ring out feedback more quickly, and at a much quieter level!

**NOTE: MAKE SURE Setup Mode IS OFF and Ready Mode IS ENGAGED WHEN YOU USE THE FBX OR YOUR AUDIO SIGNAL QUALITY MAY SUFFER!**

## 5.6. FBX OPERATING INSTRUCTIONS

Follow these steps to obtain the maximum gain before feedback, with minimal or no loss in the tonal quality of your program. You should always setup one channel at a time by turning down the other channels of the mixer or power amplifiers.

### STEP ONE: EQUIPMENT SETUP

Set up your sound system and position all the speakers and microphones you anticipate using. When possible, avoid placing microphones directly in front of speakers. Patch the FBX into the system (refer to section Three for installation configurations). Set your levels for nominal performance but avoid raising the gain enough to induce feedback. If you are using a graphic EQ, adjust only for the desired tonal qualities, but **DO NOT NOTCH FOR FEEDBACK**. If there is any equipment in the signal path that incorporates a noise gate function, you **MUST DISENGAGE** these noise gates prior to the setup procedure. You may reengage them upon setup conclusion. For best results setup your FBX on one input channel at a time. You can mute the audio in the other input channels.

### STEP TWO: CHOOSE YOUR FILTER TYPES and REMOVE BYPASS

The default filter setting for your FBX are 6 FBX Fixed Filters and 2 FBX Dynamic Filters per input channel. You may change that mix of filters, and this should be done before you enter Setup Mode. You can always alter the mix of FBX filters and repeat the Setup procedure. To change filter types, choose the FBX Menu in the Input Channel you are working on.

The factory default for the FBX is BYPASS: On, which means the FBX section is Bypassed. Before you start FBX Setup, select the input channel you are working on, then go to the FBX Global Menu. Set the BYPASS to Off, meaning the FBX section is now active.

#### FBX Bypass

Be sure and take the FBX section out of Bypass before setup! Do this in the FBX Global Menu.

### STEP THREE: ENGAGE SETUP MODE - RESET FILTERS

Choose an input channel and select the FBX-Mode Menu. Using the datawheel select "Setup" in the SETUP MODE field, then press ENTER. Press ENTER again to confirm Setup Mode. **Setup mode clears all Fixed & Dynamic filters. Do not use Setup mode during your performance.**

```
IN 1: _____ MENU: FBX-Mode
SETUP MODE : Setup
```

Press <Enter> to Proceed

*Press enter to begin Setup -  
FBX 480, 880 (above), FBX240,360,480 (below)*

```
I1: _____ FBXMod
Setup?: <Enter>
```

```
*****SETTING UP FBX*****
      Quiet Please
      Raise Gain Slowly
      Press <Exit> to End
```

*Raise gain slowly; Setup automatically ends  
or got to Ready mode any time by pressing  
Exit - FBX4802, 8802 (above),  
FBX 240,360,480 (below)*

```
FBX SETUP MODE
Abort: <Exit>
```

### STEP FOUR: RAISE MASTER GAIN

Make sure your power amplifier is turned up and your microphones are turned on. Slowly raise the master gain of your mixer (or the submix for this input channel of the FBX) until the first feedback begins. The FBX will quickly remove the feedback by setting the first filter. Continue to raise the gain slowly. Try to avoid making two or more frequencies feed back at the same time, which sometimes happens if the gain is raised too quickly. As new frequencies feed back, new filters will be placed. (Note: sometimes the same frequency will feed back a second time, and an earlier filter will notch more deeply.)

Continue raising the gain. Setup mode will end and Ready mode will be engaged in one of two ways:

1. All of the Fixed filters and at least the first Dynamic filter are set. This will automatically turn **Setup Mode** off and the FBX Menu window will be displayed. At this point **STOP RAISING THE GAIN!**

- You've set as many filters as you need or want, even though you haven't used them all. Press EXIT to prevent any more Fixed filters from setting, or any of the set Fixed filters from notching more deeply. Pressing EXIT exits **Setup Mode** and the FBX Menu window will be displayed.

You are now ready to begin your program!

*FBX 480 & FBX880*

IN_1: _____	MENU: FBX
EQ#: 1	FREQ: 9020 Hz
TYPE: FIXED (L) BW : 0.10 Oct	
LVL : -9dB	

*FBX240, 360, 480*

I1: _____	FBX1
FREQ: 9020	

**See the results:** In the FBX Menu you can view the parameters of all your FBX Filters. Scroll through all the filters in the FBX# field. You may edit the type of filter, but not the level (LVL), width (BW), or frequency (FREQ). You may want to create parametric filters based on the results of your FBX Setup, then repeat the Setup procedure to maximize system gain.

### 5.6.1. FBX Setup Mode Cautions & Alternate Setup Procedure

Setup Mode is designed to allow fast and quiet feedback elimination during setup. Setup Mode should ONLY be used for pre-performance setup. **DO NOT USE Setup Mode DURING A PERFORMANCE!** This will produce distorted audio and set filters on music or audio program. Setup Mode also may not work well during setup in a very noisy environment. To speed up feedback elimination, Setup relaxes the FBX criteria for distinguishing "good" audio from feedback and places filters more readily. If the environment is noisy, there is a greater likelihood of placing a filter on audio that is not feedback.

If you are working in a noisy environment you can still get the benefit of the Setup procedure, which is more gain before feedback. Instead of starting in the FBX Mode Menu, begin in the FBX Global Menu. This procedure will still eliminate feedback very quickly, though not as quickly as Setup Mode, and without reducing the volume of the feedback before it is filtered out.

- Change the LOCK setting to Off. Now the Fixed filters are available to react to feedback.
- Follow Step Four of the Setup procedure outlined above -- raise the gain for this input channel.
- Continue raising the gain until you achieve the gain before feedback you require, or you set all the fixed filters. You can see the results of this procedure in the FBX Menu (shown above).
- VERY IMPORTANT:** Go back to the FBX Global Menu and set LOCK to On. This will lock the fixed filters and prevent them from going any deeper. If you use the factory default settings you will still have two dynamic filters available for automatic feedback control during the program.

Whether or not Setup Mode is used, the end result of setting up FBX filters should be identical. Your sound system will have clearer, louder, feedback-free sound.

### 5.6.2. FBX Feedback Exterminator - Global Parameters

A unique feature of the FBX Feedback Exterminator is the ability to adjust the way the algorithm reacts to feedback. Unlike other feedback controllers, you can create and save your own customized versions of the FBX.

See section **5.1 Input Menus** for instructions on using the Global parameters of the FBX.

**Sensitivity** and **Persistence** are controls that allow the speed and analysis of the FBX algorithm to match the type of audio program. Some audio programs, notably certain types of classical music, produce occasional waveforms that are difficult to distinguish from acoustic feedback. The factory default Sensitivity and Persistence values should work in almost all conditions; however, you may change them if necessary to prevent the possibility of triggering a false filter, or to more quickly set the FBX filters. There is a trade-off between speed of filter placement and how carefully the filter is placed. More demanding audio sources (that is, program material with musical content that is similar to feedback, like flutes and organs) may require higher Sensitivity & Persistence settings, which will slightly slow down the speed of filter placement, but decrease any possibility of mistaking program audio for feedback. Lower settings are recommended when you need faster reaction during speech-only programs.



## Section Six: Using XConsole Software

The FBX are designed with easy-to-use front panel controls. You can experience the full capability of the FBX by using the FBX Remote Software, which opens up a whole new level of programmability. With the software you get increased storage capacity -- save an unlimited number of programs as files, transfer files from one unit to another, and download and upload an entire set of programs to your FBX. You can also view and edit every function very quickly and arrange various functions on screen to suit your needs. These setups or screensets can be saved and recalled.

All FBX models come equipped with the hardware and software necessary to run the units via remote control from a Windows-equipped computer. Your unit should include one CD ROM that includes the FBX Software and the FBX Upgrade Wizard for future upgrades of your firmware.

### 6.1. SYSTEM REQUIREMENTS AND RECOMMENDATIONS

1. PC computer equipped with Pentium processor 400 MHz or faster and hard disc with at least 20 MB of available space for program files.
2. Windows 2000 or higher and SVGA or greater resolution graphic card and monitor.
3. One COM port for RS232 or USB serial connection, with a 16550 or faster UART chip.

### 6.2. CONNECTIONS

**Connection via RS232 serial port** if your computer has a 9-pin COM port. Use a standard 9-pin male to standard 9-pin female RS-232 connector, available from most computer stores. For connecting multiple FBX you will need to have the FBX480 or 880 versions which include the built-in Ethernet interface for use with a network switch/hub, or use a separate COM port for each FBX. Connect the computer's COM port to the front panel FBX RS-232 jack. **Do not use any connectors that are wired for a null modem.**

**Connection via USB port** is easy. Using a standard USB cable (Type A to Type B connector as shown below) connect the FBX front panel USB port to your computer's USB port. USB drivers are automatically installed when you install the FBX software.



### TECH TIPS

Try these tips if you are having difficulty connecting your FBX unit(s) to a Windows PC.

1. **Software Version.** Make sure the software version installed in your computer is compatible with the firmware version of your FBX. Read the release notes at [xilica.com](http://xilica.com).
2. **Check cable.** For RS232 you need a serial 9-pin, not a null modem.
3. **COM Port.** Make sure the COM Port selected is correct. If not you may get an "Invalid Port" message when running the software. Click OK and then correct the port setting. You may have to restart the software. Also make sure no other serial devices are using that COM port.
4. **Find the COM when using USB.** The driver for the FBX USB port is installed when you install the FBX software. USB COM ports are assigned dynamically by your computer, so you will need to find out which COM port is being used by your USB-connected FBX.
  - a. With the power on connect the FBX to your computer using a USB cable. You will see a message in your System Tray indicating the new USB device has been found.
  - b. In Windows, click **Start** and select **Settings, Control Panel**, then double click **System**.
  - c. Click on **Hardware, Device Manager** and open up **Ports (COM & LPT)**.
  - d. You will see the USB driver assigned to one of the COM ports. Use this COM port number when setting up the connection in the FBX software (Step 4 on the next page).
5. **Refresh your COM Ports.** This is a good choice if you are having trouble connecting. In Windows, click **Start** and select **Settings, Control Panel**, then double click **System**. Click on **Hardware, Device Manager** and open up **Ports (COM & LPT)**. Right click the **COM Port** for your FBX and select **Remove** (or **Uninstall**). Your computer will verify your intent and then reboot. As it reboots, it will rebuild your COM Port file. This will clean out previous settings for devices no longer attached to your computer and may allow the FBX software to locate your unit(s).

**NOTE:** **COM Port Properties & Settings** (Bits per second, Data bits, Parity, Stop bits & Flow control) are controlled by the FBX Software and need not be adjusted.

### 6.3. INSTALLING AND USING THE SOFTWARE

Follow the on screen instructions for installing the xilica Remote Control Software for the FBX. If you are using the FBX in a network see Section 6.7 for details.

After the installation you should have a FBX software icon on your desktop. We also suggest you install the FBX Upgrade Wizard software. This will come in handy when you want to upgrade the firmware in your FBX.

#### Connecting to your FBX:

1. First you need to setup the FBX front panel settings.

**For connecting via RS232 or USB:** Press the Global button and then the >Menu key to get to the Comm Menu. The port should be RS232/USB; the baud rate should be 115200; the device number should be #1.

**For connecting via Ethernet:** Press the Global button and then the >Menu key to get to the Comm Menu. The port should be CAT-5; the baud rate should be 115200; the device number should be unique in each FBX within your FBX network. Start with #1 and number them sequentially.

2. Patch the serial connection to your computer using a standard 9-pin RS232 serial cable or USB cable and run the FBX Software. If you are using an Ethernet connection patch your Ethernet cable from your network switch to the connector on the back of the FBX. For more information on Ethernet connections, see section 6.7.
3. The opening screen allows you to choose the Live Mode for connecting to the FBX or Design Mode for offline editing while not connected to a FBX. Choose Live Mode to connect.
4. In the Connection Setup screen choose your comm port (RS232/USB) or IP numbers (network) for the device number you are using (device numbers can be changed in the FBX unit in the **Global Parameters: General** menu on the front panel). For connecting to one FBX select Device 1, and select RS232/USB. For more about connecting to a FBX Network, see section 6.7.

**NOTE: If you are using USB as your connection please read the Tech Tip on the preceding page for important information on finding the correct COM port for your USB connection.**

5. With the proper COM port (or IP numbers) selected to which you patched your FBX (usually com 1 or 2) click the "Connect!" button. **Your unit is connected when the System Status display on the upper left of the main screen shows "Up Sync OK" or "Link OK."** Refer to the illustrations on the following page for a look at the connection status screens.
6. If you have any trouble connecting, see the Tech Tip on this and the previous page.

Once you are connected you can proceed to use all the powerful features of the FBX. For a basic explanation of all controls on the main screen, please see the following page.

### 6.4 UPGRADING FBX FIRMWARE AND SOFTWARE

The firmware is the internal operating system of your FBX unit. Software is the program you install on your computer to control the FBX. Your FBX CD includes the **FBX Upgrade Wizard** program. You will use this program to upgrade the firmware in your unit. You can do this any time in order to get any recent improvements or added features.

Here is the procedure for upgrading your firmware.

1. Use your browser and visit xilica.com and choose Professional Audio Products. Click to the FBX page, choose Firmware Upgrades, and download the latest firmware. You can save the file anywhere on your computer, but make a note of it!
2. Run the FBX Upgrade Wizard and follow the on-screen instructions. You will be asked to choose the firmware file, and here you will point to the file you downloaded from xilica.com.
3. Continue with the on-screen instructions and you will complete the firmware upgrade.



## 6.5. FBX REMOTE CONTROL SCREENS

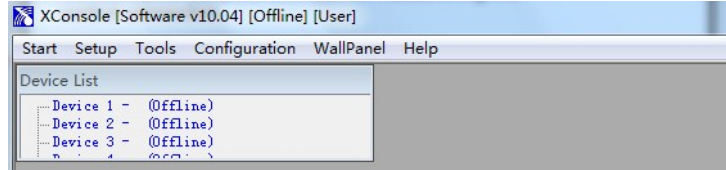
### Connection Screens

These screens are used for making the software connection to your FBX in Live Mode. See section 6.3 for more information on connecting your FBX.

#### Connection Setup Screen



#### Connection Status Displays



1. The green area on this screen says “Connecting,” which indicates your computer and the FBX establishing the control connection.

2. When the connection is successful you will see the message “Up Sync OK” (shown below) and then “Link OK.”



### Main Screens

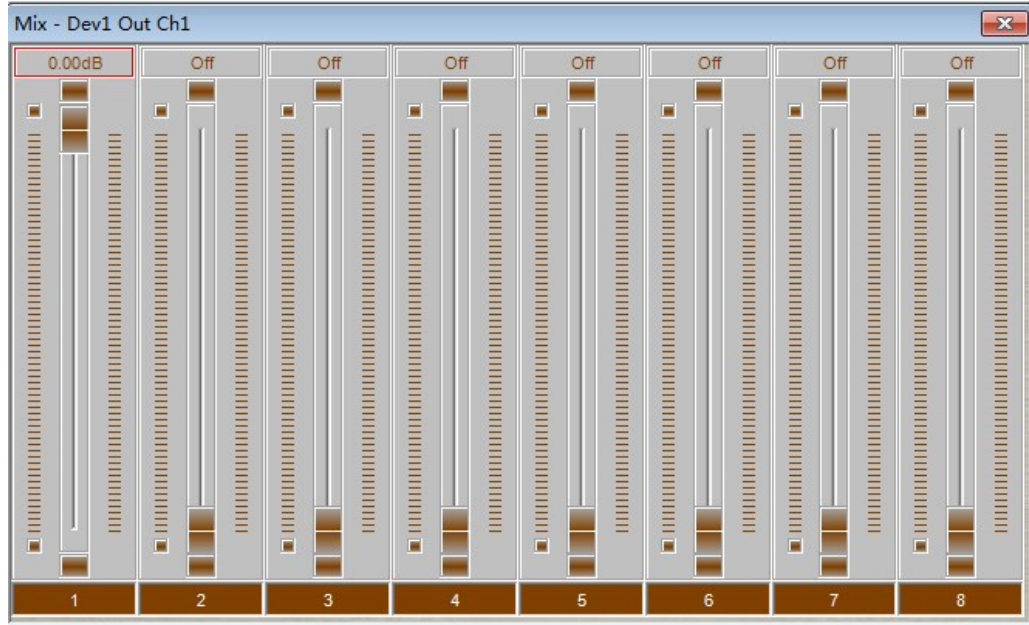
There are two ways to view the main screen: Mixer or Matrix, as shown on the following page.

#### Guide to Main Screen Menus:

- **File** (Open, Save, Open Setup, Save Setup, New Setup, Exit): Open and Save refer to the .NDAT files which are used to store and recall parameters of the FBX on your computer. These are equivalent to Programs, which are stored in the FBX. Setup files are used to save other parameters. Think of Setups as your screen sets and network settings. Custom desktop arrangements can be saved and recalled. Links between units are also saved in Setups (.XST files). See section 6.6 Saving Your Work for a complete explanation.
- **View**: Displays the values for every parameter in the FBX. You can print these from here, too.
- **Device**: Choose which FBX to control when connected to a FBX Network.
- **Function**: (Link, Copy, Reset All, Security, Device Name, Preferences) Link opens the screen where you can establish multiple link groups and link any parameter across any number of FBX. Copy opens a screen that allows for flexible copying of any parameter to any FBX. The Security screen provides for password creation and selection of which front-panel menus will be locked when using a password. Device Name is just that, and Preferences allows for default units for delay, EQ bandwidth, and temperature.
- **Program**: From here you can recall or save a Program into the memory of the FBX (rather than as a file on your computer). All programs stored within your FBX can be transferred to your PC using Upload All to PC. You can also transfer the files stored on your computer to the FBX as programs using Download All to Device. See section 6.6 Saving Your Work for a complete explanation.
- **Connection**: Setup allows you to choose how to connect to one or multiple FBX. This window is also displayed when you choose Live Mode from the welcome screen. Connect to the FBX via RS232 or USB as well as Ethernet (FBX480 or 880 only).

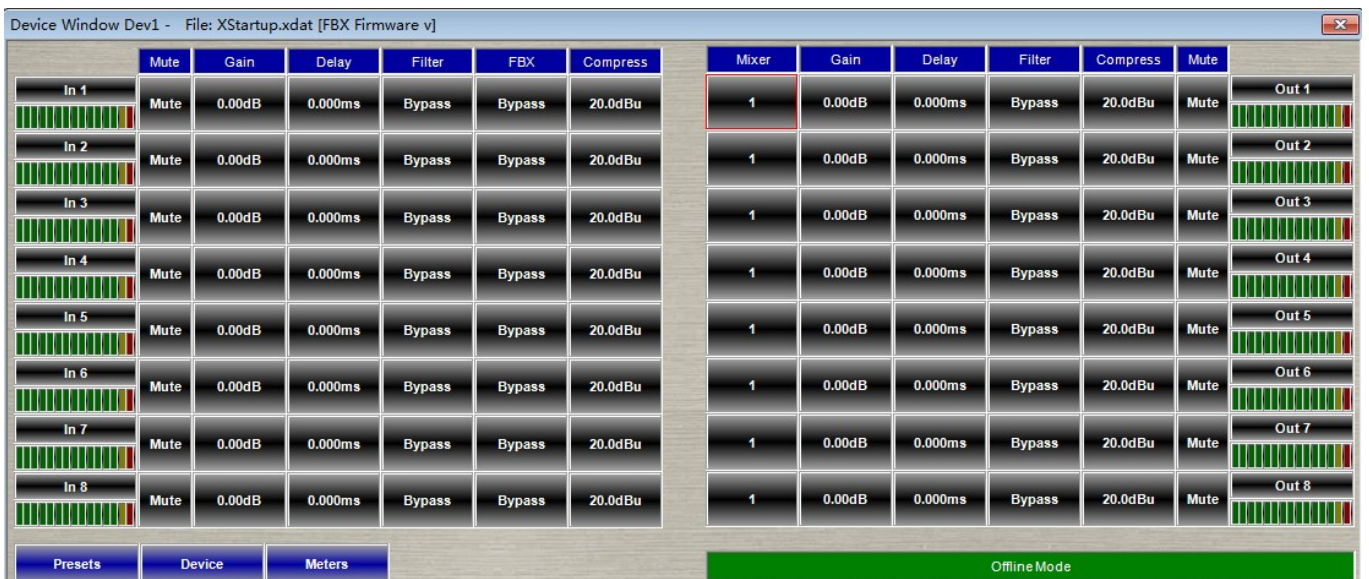
### Main Screen - Mixer View

This view allows you to work with the FBX processing in a traditional mixer view. Each input and output has its own set of processing. Your inputs and outputs also have select buttons for routing - just like a mixer. Set up your groups using the buttons at upper right - each group can be named and can have its own set of linked functions.

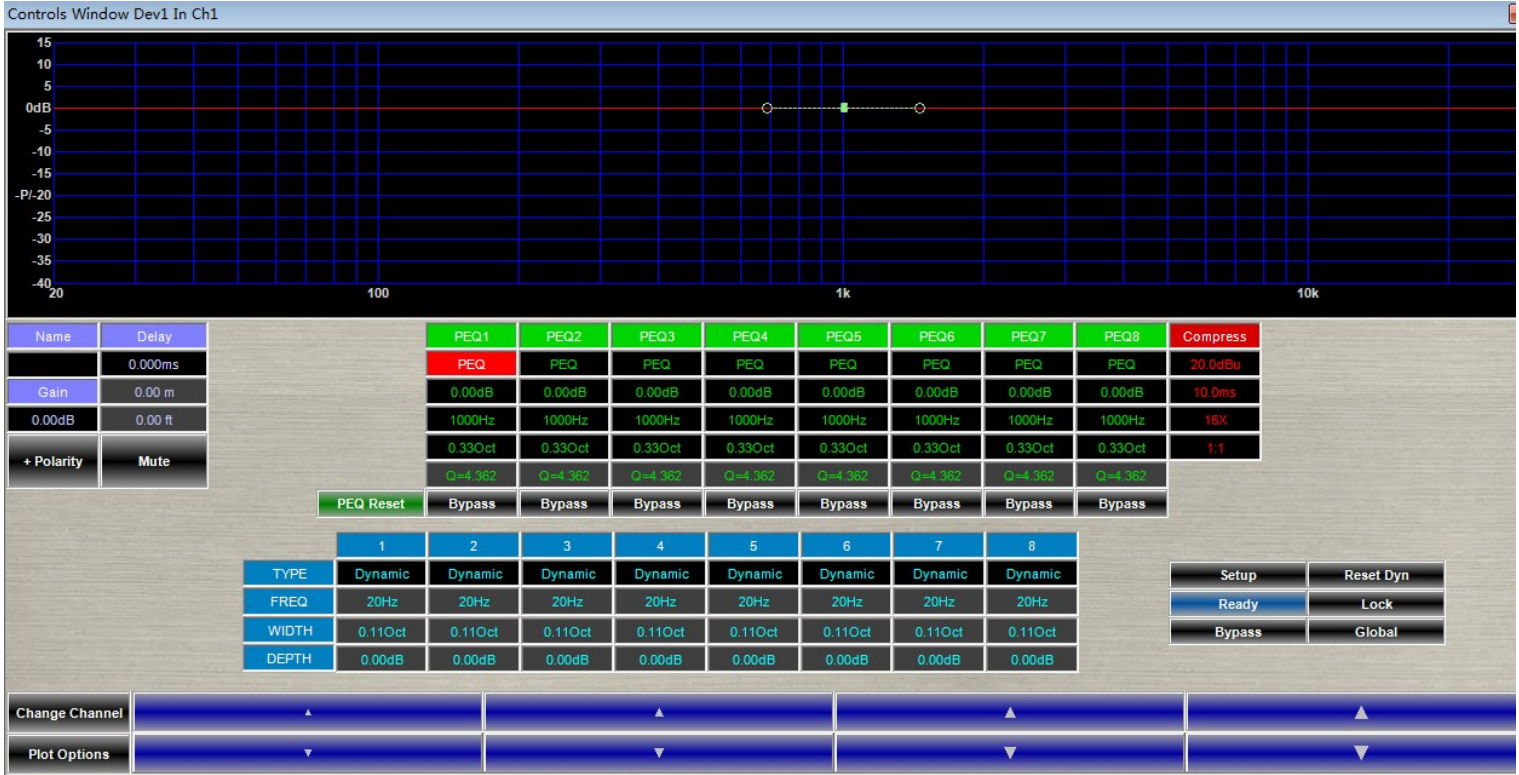


### Main Screen - Matrix View

This view gives you a “processor block” format for working with your FBX. The features are the same as in Mixer View. With this screen you can get a sense of the routing and signal flow of your FBX.



## SECTION SIX: USING XConsole CONTROL SOFTWARE



This is one of the most commonly used screens. Controls for all other screens work in a similar way.

### Guide to Crossover Screen Controls:

- **View:** Use these buttons to choose which Output graph you will view. You can view multiple output response curves. In this example Outputs 1, 2, and 3 are shown.
- **Control:** Use these buttons to choose which Output you will edit using the controls below the graph area. You can only control one output at a time. In this example we are controlling Output 2.
- **EQ Type:** Choose between Parametric, Low Shelf, and High Shelf using the pull-down menu. You must choose a filter type before any editing.
- **EQ Freq.:** Set the frequency of the filter center points by typing in a number or using the Slider tool. Note that the scale for the Slider tool is dynamic - when you choose Frequency the scale displays Hz.
- **EQ Width:** Set the bandwidth of each filter by typing a number into the field or using the Slider tool. Remember to select the field before using the Slider, which shows fractions of an octave in the scale.
- **EQ Depth:** Set the EQ filter depth (or level) by typing a number into the field or using the Slider tool, which shows level setting in dB.
- **Crossover Type:** Sets the type of filter you will use for each of the crossover filters (low or high) in the selected output. Use the pull-down menu to choose the type -- your first step before any other editing of the crossover.
- **Crossover Freq.:** Set the frequency at which the filter roll-off begins typing in a value or using the Slider tool. Choose the Freq field first and you will see the Slider's scale display the range of values at either end of the Slider. You can also edit the filter frequency by grabbing the Filter Handle with your mouse and dragging it along the bottom of the graph display.
- **Crossover Slope:** Set the slope of the filter by typing in a number or using the Slider tool. You can also edit the slope dragging the circles that flank the Filter Handle. You will see the slope change as you adjust these handles.



## 6.6. SAVING YOUR WORK: FBX FILES AND PROGRAMS

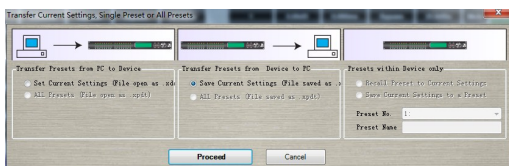
Your FBX provides several ways of saving and recalling parameters, and these are useful for preserving your work. We use the terms Program and File to distinguish where the information is stored. Using the FBX Software gives you access to both the Programs and the Files. If you are operating the FBX from the front panel you only have access to the programs.

1. **Programs:** These are saved and recalled from the front-panel of the FBX. These are stored in the FBX internal memory, and there are 30 possible programs, or presets. Please see section 5.3 for the instructions on how to Save, Name, and Recall these internal programs from the front panel of the FBX. You may also recall and save these FBX-based programs from within the FBX software by choosing the Program menu. Remember, these programs are stored in the FBX. It is possible to transfer these programs as a group from the FBX to your computer, or from the computer to the FBX. See the **NLT Files** section below.
2. **Files:** These saved and recalled on your computer, just like any other file stored on your hard drive. Using your computer as a platform gives you unlimited memory storage of FBX files. There are **three types of files** associated with the Navigator:

**NDAT files:** These files are the equivalent of one of the 30 programs that can be stored within the FBX, except in this case they are stored on your computer. All parameters for one FBX are stored in an .NDAT file. You can store as many of these as you need on your PC. These are accessed using **Open File** or **Save File** from the File menu in the FBX software. If you are working in the FBX software and you would like to save your work directly into the FBX as a program (you must be connected in Live Mode to do this) choose **Recall** or **Save** from the Program menu in the software.

**NLT files:** These files store a listing of 30 FBX programs. Store and recall these using the Download and Upload functions in Program menu of the FBX software. Think of these files as a way to store all 30 programs of a FBX in one place. This can be handy if you need to make a backup of everything stored within the FBX. Or you may want to categorize your programs according to applications. These can be downloaded to the FBX all at once using NLT files. Use the upload function to transfer the 30 programs from the FBX to your PC. Think of it this way: uploading copies Programs and saves them as Files on your computer. The default location for these files is the **C:\Program Files\I J\WJ\FBX** directory on your PC. Here are the step by step procedures for uploading and downloading.

**Upload All To PC:** Choose this from the Program Menu. This action overwrites previous uploads - you will get a warning asking you to confirm. If you want keep previously uploaded programs you should rename the files in the xilica FBX directory. The upload process creates 30 files, with default names Program 1.ndat, Program 2.ndat, etc.



**Download All to Device:** Choose this from the Program menu. You will see a screen that lists all the programs, from 1 to 30. Next to each Program is a button that allows you to load a FBX file (NDAT) into that program number. Go ahead and load up to 30 files. This is a good way to get your programs in the order you need them in the FBX. Once you have loaded these files into as many programs as you need, its time to save this list as an **NLT file**. Choose Save List. When you want to recall an NLT file you already made, choose Load List. If you want to start a fresh list, choose Clear List.

If you like the current list of files and you want to transfer them to the FBX, choose **To Device**. This will take up to 30 minutes, and it will load these NDAT files as programs into the FBX. This overwrites the FBX programs, so be sure you are ready to do this.

Download All to Device Screen

**XST files:** These Connection Setup files are for storing and recalling computer connection information. This file stores all your IP addresses and comm port selections. You can create and save these files with various connection schemes, for connecting to a single FBX or a group of networked FBX. Access these by choosing Setup from the Connection menu.

## 6.7. CREATING A FBX NETWORK (FBX480 AND FBX880 ONLY)

**Ethernet connection instructions FBX**

Your FBX480 and FBX880 FBX can be controlled through a standard Ethernet connection. This option allows for control of up to 16 FBX in one session of XConsole Software.

There are three main procedures for creating your FBX network. The first is patching your hardware, the second is assigning IP addresses to the FBX, and the third is connecting your network using the FBX software. You only have to do this once. From then on you will simply choose Connect and you will be controlling your network.

**Hardware and Connections**

1. **Network Switch:** In order to create your FBX network you will need a network switch. This device comes in a variety of configurations. Choose one that has enough ports to accommodate all your FBX plus the computer you will use for control. The maximum number of ports you will need is 17. Many companies offer switches, including NetGear, D-Link, 3Comm, Belkin, and Cisco.

2. **FBX:** Press the System key on the front panel and scroll through the menus to the General Menu. Choose the Port parameter and change it to CAT-5.

SYSTEM-SETUP	MENU: General
FREQ MODE : 36	Steps/Oct
DELAY UNIT : ms	
DEVICE# : 1	PORT:CAT-5

*Front panel LCD showing correct port setting*

3. **Ethernet cables:** Connect your computer's network card to a port on the switch with a standard Ethernet cable (RJ45 connectors). Connect each FBX network connection to a port on the switch using standard Ethernet cables.

**Assign FBX IP addresses using DeviceInstaller**

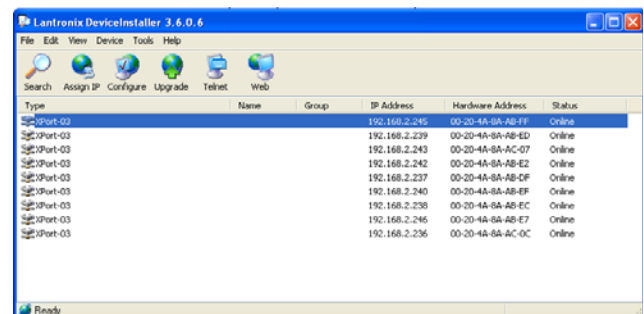
1. **Install the Lantronix DeviceInstaller software.** This software requires that your computer has .NET Framework 1.1 or higher. The DeviceInstaller utility comes on your FBX CD Rom, or you can download it from [xilica.com](http://xilica.com). It does not make an icon on your desktop, so you must run it from Start - Programs.

2. **Make sure your connections are made** as described in the Hardware & Connections section above.

3. **Run DeviceInstaller.**

4. **Click on the 'Search' button** in DeviceInstaller. The connected FBX(s) will be listed in the window.

The Hardware Address shown is also displayed on the back panel of the FBX.



*DeviceInstaller main screen showing 9 FBX with IP addresses successfully assigned*

5. **Select the first FBX** and click the 'Assign IP' button.

6. **Select 'Assign a Specific IP address'** in the dialog and click 'Next'

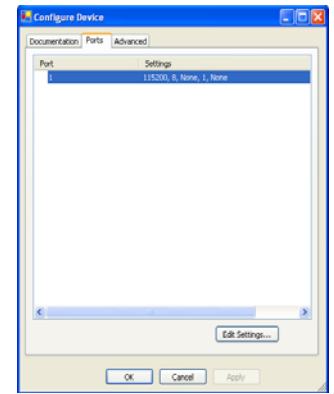
7. **Enter the desired IP address**, subnet mask (255.255.255.0 in all cases), and default gateway (0.0.0.0 in all cases) and click 'Next.'

- We recommend you follow this format for your IP addresses: **198.168.2.xxx**

- Choose any set of numbers in place of xxx. The network order of your FBX depends on the sequence of these numbers, so plan accordingly. Device 1 in your FBX network will be the lowest numbered IP address. Make a note of the complete address of each device - you will need this later.

- If you are incorporating this Navigator network into an existing network, please consult your system administrator before assigning IP addresses. Assigning an already existing address can cause your network to crash!

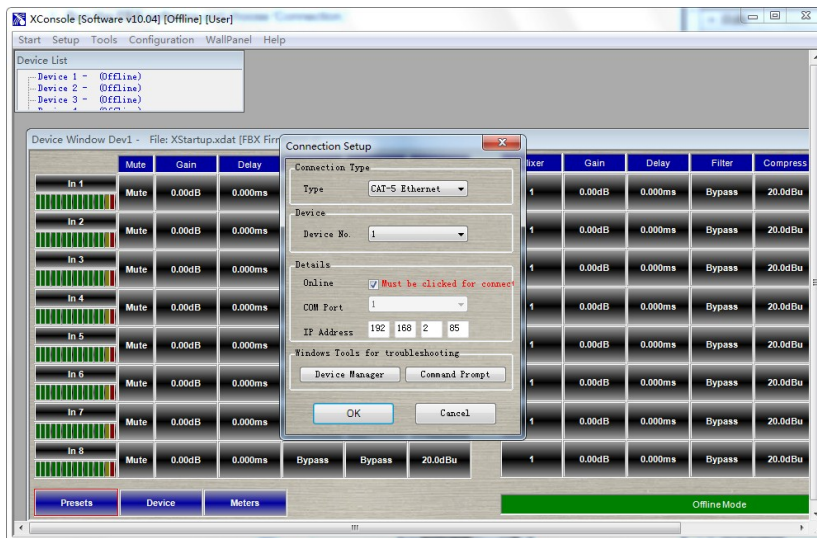
8. Click the 'Assign' button
9. Select the same FBX in the main window again and click the 'Configure' menu button
10. Select the 'Ports' tab and click 'Edit Settings'
11. Change the Baud Rate to 115200, Data bits to 8, Parity to None, Stop bits to 1, and Flow Control to None. Click 'OK'
12. Repeat both procedures for all connected FBX, making sure that each has a unique IP address.
13. Close DeviceInstaller. The FBX(s) should now be ready for Ethernet connection.



Configuration screen in DeviceInstaller

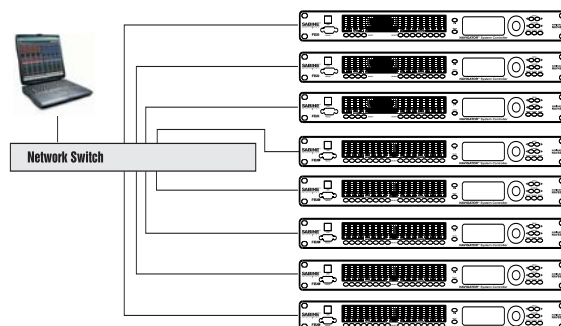
### Run FBX Software and Connect to your Network

1. Run the FBX software and choose 'Connection.'
2. Select 'Live Mode,' then select 'Network.'
3. Enter the IP addresses for all your FBX. Make sure you use the same ones you assigned in the previous section. The order of your FBX follows the numerical order of the IP addresses, so you can set the order in which you would like them to appear at this point. Choose 'OK.'
4. FBX in your network will begin to connect, indicated by the bright green window in each device in the device display at the top of the screen. Choose the device you wish to control by clicking on one of the device pictures, or use the Device menu.
5. Save your setup! In the connection window choose 'Save File' and create a file (.xlt). This will save all those IP addresses. You can load this file on another computer if you need to control the same FBX network. See page 29 for more information about xlt files.
6. While in network mode the Link function is very useful. You can link all the main functions across devices and channels.



Main screen in FBX Software, showing Connection window with IP addresses assigned and 10 devices present. Note System Status at upper left shows the units are already connected.

Hardware connections for a FBX Network

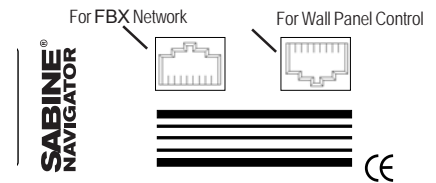


## Section Seven: Using FBX Optional Hardware and Software Features

### 7.1. Wall-Mounted Remote Control Panel

#### Connecting the FBX

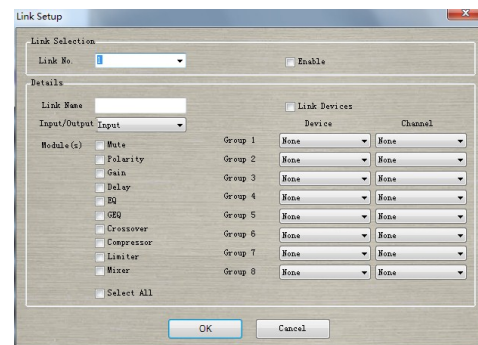
Your FBX is equipped with two RJ-45 connectors on the back panel. The one on the left (facing the back of the unit) is the Ethernet connector and the one on the right is the wall panel connector. Standard CAT-5 Ethernet cable with RJ-45 connectors is used to connect the wall panel controller to this jack. The FBX supplies power to the wall panel controller via the Ethernet cable. Run cable from the FBX location to the wall panel location using industry-standard practices. The maximum cable length from one wall panel to a FBX is 200 feet. Do not install the wall panel yet - you have to program it first.



#### Programming the Wall Panel - Software Setup

Using the Wall Panel Setup Software you can build custom menus that will appear on the controller. In this way you can send specific control commands to the connected FBX. For example, you can set up a menu that allows you to mute or unmute all of the output channels, or allows you to change the gain on one or more channels. A total of 32 menus can be programmed into the wall controller. Before installing the NAVRC-100 wall panel controller you will need to program it for use in your application.

1. **Install the Navigator Wall Panel Setup Software:** There is a program on the CD-ROM that came with your FBX or with the NAVRC-100 that must be installed on your computer in order to setup the wall panel controller. Find and run the installation program here: CD root\Navigator\Wallpanel Setup\Setup.exe. After running the installer, there will be an icon on your desktop labeled “xilica Wall panel Setup”.
2. To get started, double-click the “xilica Wall Panel Setup” icon on your desktop.
3. Begin by clicking the **“Add Menu”** button. This creates a blank menu which you will edit to contain the commands you need. In the “LCD Line 1” box type in a name (up to 16 characters) for the menu. This is the text that will be displayed on the wall panel LCD when you are scrolling through the menus.
4. In the **Command** drop-down list select a command function that will be associated with your new menu. Next, click the **“Range”** button next to the Command drop-down list to select the control range for this command. For example, if the menu is for controlling gain you could limit the range of gain values available for control with the wall panel.
5. Now click on the **“Link”** button to select which device (FBX) and which channels on the FBX will be affected with this new command. This is very important - if you forget to do this the wall panel will not work. One exception to this rule is the command for Program Recall. In this case you only need to choose the device (#1).
6. When you are done setting up your new menu, click Add Menu again to add new menus, setting each one up as required by your application. When you are done, click the **OK** button to apply the new menus. Then, click the File->Save menu to save your work! You can recall this file later to setup another wall panel.

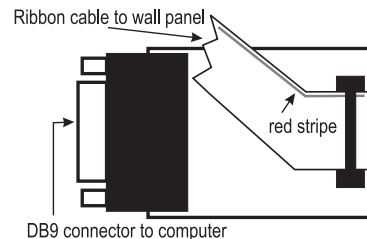




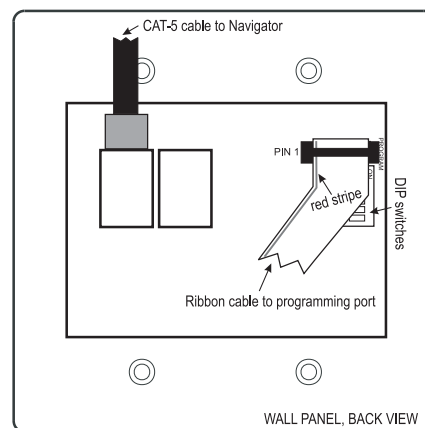
**Programming the Wall Panel - Transferring the settings to the wall panel**

The next step is to transfer these new menus into your wall panel controller. This is done using the programming port board and cable that comes with your wall panel. You will also need a standard DB9 serial cable for this step. We suggest you do this close to the FBX rather than at the wall panel's remote location. In this way you will be able to easily transfer and test the programming.

1. Using a standard RS232 cable, connect your computer's RS232 serial port to the DB9 connector on the programming port. Connect the 10 pin ribbon connector coming from the programming port board to the wall panel at the jack labeled "Program Port", making sure that the red stripe on the ribbon cable is on the end of the connector labeled PIN 1. Next, connect the wall panel to your FBX using a standard CAT-5 Ethernet cable (either of the RJ-45 jacks on the wall panel will work). You are now ready to program the wall panel.



2. Make sure the FBX is turned off and then click the **Program->Update menu** on the wall panel setup program. Select the COM port on your PC that is connected to the wall panel, and then click the "Program" button. Next, turn on your FBX. The progress bar on the screen should immediately begin scrolling. It takes about 20 seconds to program the wall panel. After its done (100%), press the **Close** button. *Very important:* you must now turn off your FBX and then turn it back on. The wall panel should now be programmed.



**Setup the FBX**

To set up your FBX for use with the wall panel, you will need to confirm the settings in the **Global** menu. On your FBX, click the Global button, and then click the right menu arrow until the "Comm" menu appears. Using the cursor button, make sure the **Dev #** is set to 1, the **WP Mode** is set to Master and the **WP Num** is set to 1. The dip switches on the wall panel should all be set to the down or off position, which sets the address to #1.

GLOBAL	MENU: Comm
PORT : RS232/USB	WP MODE: Master
BAUD RATE: 115200	WP NUM: 1
DEVICE #: 1	

Follow the steps in the next section to verify that the menus on your wall panel are working correctly - you should be able to control your FBX using the **Menu** and **Value** up/down buttons on the wall panel. Changes made on the wall panel should show on the front panel of the FBX. If it doesn't seem to be working, verify that you have assigned the link correctly in the setup program.

**Using the Wall Panel**

The controls on the wall panel behave just like the controls on the front panel of the FBX. The one difference is the use of the ENTER and EXIT buttons.

1. Press ENTER to begin using the wall panel. This takes you out of the Main Menu, shown at right.
2. Press the MENU up/down buttons to scroll to the menu you would like to use. In the example at right we named the first menu "Presets," and the current setting is "2." Pressing the MENU down button takes us to the next menu, which we called "Volume."
3. Press the VALUE up/down buttons to edit the values of the menu functions. In this case we can raise or lower the gain on whatever channel we linked to this menu.
4. When you are done editing values press EXIT to return to the main menu.

\* XILICA PANEL \*

Presets  
1: 2 1

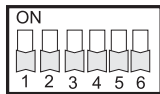
Volume  
LEVEL: -18.50 dB



**Using Multiple Wall Panels and Multiple FBX**

Your application may require the ability to control one or more FBX from one or more Wall Panels. Because there is only one Wall Panel connector on each FBX, you must connect either multiple FBX or Wall Panels by daisy-chaining the Wall Panels. The Wall Panel has two RJ45 jacks, so you can connect up to two FBX to one Wall Panel. Or you can connect up to 32 Wall Panels to one FBX. You can combine these scenarios, too. For example, you might have two Wall Panels, each with the ability to control two FBX. Here are the procedures for all the possible scenarios. In each case you still must program both the Wall Panel and the FBX as described on the preceding page.

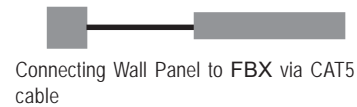
**1. One Wall Panel connected to one FBX.** In this situation, set all the dipswitches on the Wall Panel to 'off' (down). Set the FBX WP MODE to Master, and the WP NUM to 1. This is the scenario described in the setup procedure on the previous page of this guide – see that diagram for the location of the Dip Switch controls.



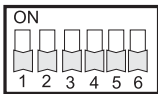
Dip Switches on back of Wall Panel

GLOBAL	MENU: Comm
PORT : RS232/USB	WP MODE: Master
BAUD RATE: 115200	WP NUM: 1
DEVICE #: 1	

Front Panel FBX LCD



**2. One Wall Panel connected to multiple FBX.** Here, set all the dipswitches down as above. Set ONE of the FBX WP MODE to Master and the rest of them to Slave. All connected FBX must have unique Device Numbers – the example below shows a Slave set to Device #2. Set WP NUM to 1 – you are still using just one Wall Panel.

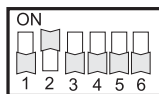
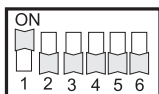
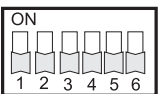


GLOBAL	MENU: Comm
PORT : RS232/USB	WP MODE: Master
BAUD RATE: 115200	WP NUM: 1
DEVICE #: 1	

GLOBAL	MENU: Comm
PORT : RS232/USB	WP MODE: Slave
BAUD RATE: 115200	WP NUM: 1
DEVICE #: 2	



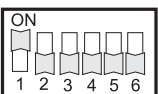
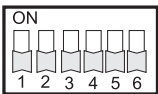
**3. Multiple Wall Panels connected to a single FBX.** Here, each Wall Panel needs a unique address, set by the dipswitches. For the first Wall Panel, set all dipswitches down as in the above scenarios. For the next, turn dipswitch 1 on. For the next Wall Panel, turn dipswitch 1 off and dipswitch 2 on. Increment these as needed for each additional Wall Panel. The dipswitch settings for each Wall Panel are binary. See the **chart on page 37** for the dip switch settings to use when you have multiple Wall Panels. On the FBX, set WP MODE to Master and set WP NUM to the number of Wall Panels connected. For example, if there are three Wall Panels, set WP NUM to 3, as shown below.



GLOBAL	MENU: Comm
PORT : RS232/USB	WP MODE: Master
BAUD RATE: 115200	WP NUM: 3
DEVICE #: 1	



**4. Multiple Wall Panels connected to multiple FBX.** In this case set the Wall Panel dipswitches as shown above, giving each a unique address. Set ONE of the FBX WP MODE to Master and the rest to SLAVE. On each FBX, set WP NUM to the number of wall panels connected.



GLOBAL	MENU: Comm
PORT : RS232/USB	WP MODE: Master
BAUD RATE: 115200	WP NUM: 2
DEVICE #: 1	

GLOBAL	MENU: Comm
PORT : RS232/USB	WP MODE: Slave
BAUD RATE: 115200	WP NUM: 2
DEVICE #: 2	

### Complete the installation

Once you have verified the wall panel is working properly it is time to mount it into the 2-gang wall box. This wall box should be installed in the wall using industry-standard practices, and CAT-5 cable should be running from the FBX to the box (maximum distance is 200 feet of CAT-5 cable).

1. Remove the ribbon cable from the wall panel and store the cable and the Programming Port board in a safe place. You will need this if you choose to re-program the wall panel.
2. Plug the CAT-5 cable into either one of the RJ-45 connectors on the back of the wall panel.
3. Mount the wall panel on the front of the box using the mounting screws that came with the box.
4. Test the wall panel again and confirm that it is controlling the FBX. You are ready!

### Tips and Troubleshooting

#### Cables

If the wall panel is not functioning properly cables are the most likely cause. Verify that your CAT-5 cables are properly terminated with RJ-45 connectors. Check the cable with another device to be sure.

#### Version number is flashing

If the second line of the wall panel LCD flashes on and off with the version number, this indicates a problem in the programming of the Navigator Wall Panel Remote software. The most likely problem is the LINK settings. Verify that each of your menus are linked to a device, inputs or outputs, and a channel number. Follow the steps in the Programming the Wall Panel and Transferring the Settings sections of this operating guide and test the wall panel again. The version number should no longer be flashing.

\* XILICA PANEL \*  
WALLPANEL V1.01

#### Controlling multiple channels

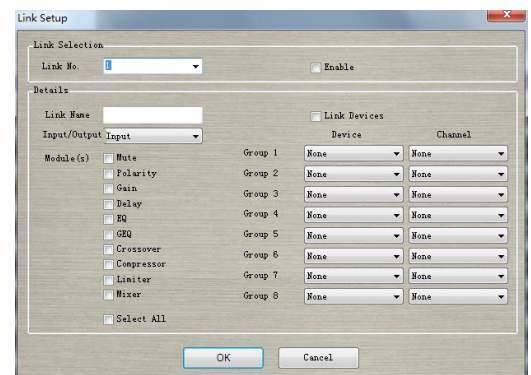
If you would like your menus to control multiple channels, you can choose multiple links using the LINK command in the Navigator Wall Panel Remote software. For example, you may want to mute all output channels. The example at right shows the Link Setup for linking all 8 outputs of a FBX480 or FBX880. In this case we chose "Mute" in the **Command** menu.

#### Error Updating

You may see this message in the Navigator Wall Panel Remote software. When you start to program the wall panel the power must be off on your FBX (remember, the wall panel gets its power from the FBX). If the power is on you will see the "Error Updating" message. Turn off your FBX and chose **Program->Update** again. You should see the screen that asks you to choose your comm port - proceed as shown in the Transferring the Settings section of this operating guide.

#### Customer Service

If you have any other questions regarding the NAVRC-100 Wall Panel please contact us at [xilica.com](http://xilica.com) or call 800-626-7394.



## 7.2 FBX System Processors: Digital Input/Output Option (96 KHz, 24-bit)

For Models FBX480, FBX880, FBX480, FBX880

FBX with the Digital Input/Output option include a DB25 connector on the back panel. You will need a DB25 to XLR male/female snake in order to patch the digital inputs and outputs. xilica uses the Yamaha standard for wiring the DB25 connector for AES/EBU connections. Your FBX may come with a DB25 to DB25 adaptor that maintains the Yamaha standard for the pin wiring (see the wiring diagram for this adaptor on the next page). You must use this in order to keep the standard Yamaha wiring scheme.

### Instructions for using the Digital I/O

1. Choose analog or digital inputs and outputs. In the Global menu, the inputs and outputs can be selected as digital or analog in pairs. For example, Input 1 and 2 can be set to either analog or digital. as shown in the LCD screen shot below.

GLOBAL SETUP	MENU: I/O MODE
I 1-2: Analog	I 3-4: Digital
O1-2: Digital	O3-4: Digital
O5-6: Analog	O7-8: Digital

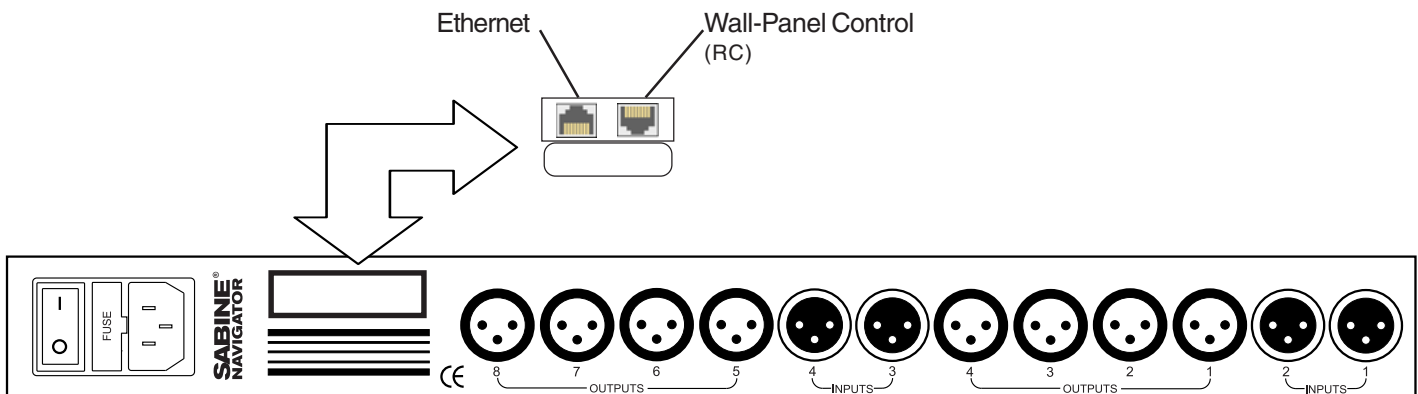
Press the Global button on the front panel, then press the Menu>> button several times to get to the I/O Mode Menu. Use the Cursor buttons to move through each selection, and use the data wheel to toggle Analog or Digital for each input or output pair. "I" indicates Input and "O" indicates Output.

NOTE: For the FBX880, the digital option is limited to only inputs 1 through 4. Inputs 5 through 8 are analog only. All outputs can be digital.

2. The sample rate and bit depth are fixed and there is no conversion available, nor is there an external sync option. Your input and output devices will need to be 96 KHz and 24-bit in order to work with the FBX.

3. You can mix analog and digital inputs and outputs, but each input or output pair can only be either digital or analog - never both. For example, choosing digital for Inputs 1 and 2 disables the analog inputs.

4. Once you have made these settings you are ready to go!



FBX 480 back panel, and RC option (RJ45 connector)

Digital I/O Option: Wiring diagram for Yamaha AES/EBU Adaptor (for reference only)

Signal	FBX Side	Output
	MALE	(Yamaha) Side FEMALE
GND	1	10
IN1-	2	14
IN2+	3	2
GND	4	12
NC	5	
NC	6	
GND	7	13
OUT1-	8	18
OUT2+	9	6
GND	10	
OUT3-	11	20
OUT4+	12	8
GND	13	22
IN1+	14	1
GND	15	
IN2-	16	15
NC	17	
GND	18	23
NC	19	
OUT1+	20	5
GND	21	24
OUT2-	22	19
OUT3+	23	7
GND	24	25
OUT4-	25	21

Wall Panel Control Option: Dipswitch Settings for setting the unique address of up to 32 Wall Panels. Below are the sequenced settings for multiple panels, and these must be used and set in this order.



## Section Eight: FBX Engineering Specifications

### Audio Performance

Freq Response: +/-0.1dB (20 to 20kHz)  
 Dynamic Range: 115dB typ (unweighted)  
 CMMR: >60dB (50 to 10kHz)  
 Crosstalk: <-80dB  
 Distortion: 0.002% (1kHz @ +4dBu)

### Digital Audio Performance

Processor: 32-bit floating point  
 Sampling Rate: 96kHz (4802, 8802) 48kHz (240, 360, 480)  
 Analog Converters: High Performance 24-bit  
 Propagation Delay: 1.5 ms (4802, 8802); 1.8 ms (240, 360, 480)

### Front Panel Controls

Display: 4 x 26 Character Backlit LCD (4802, 8802)  
 2 x 26 Character Backlit LCD (240, 360, 480)  
 Level Meters: 5 Segment LED  
 Buttons: Mute and Edit Function Controls  
 Select Controls, Menu Controls  
 Data-wheel Encoder

### Inputs and Outputs

Input Impedance: >10k Ohms  
 Output Impedance: 50 Ohms  
 Maximum Level: +18dBu  
 Type: Electronically balanced

### Connectors

Audio: 3-pin XLR, Multi-pin Phoenix (FBX880)  
 RS-232: Female DB-9  
 USB: Type B  
 Power: Standard IEC Socket

### General

Power: 115 / 230 VAC (50 / 60Hz); 20 watts  
 Dimensions: 19 "x 1.75 "x 8 " (483 x 44 x 203mm)  
 Weight: 6.4 lbs / 2.9 kg

### Audio Control Parameters

Gain: -40 to +15dB in 0.25dB steps  
 Polarity: +/-  
 Delay: Up to 650ms per I/O (4802, 8802)  
 80 ms per I/O (240, 360, 480)  
 Equalizers (8 per I/O)  
 Type: Parametric, Hi-shelf, Lo-shelf  
 EQ Gain: -30 to +15 dB in 0.25 steps  
 Crossover Filters (2 Filters per Output)  
 Filter Types: Butterworth, Bessel, Linkwitz Riley  
 Slopes: 6 to 48dB/oct

### FBX Feedback Exterminator®

8 independent digital FBX filters per input channel,  
 controlled automatically from 20 Hz to 20 KHz  
 Filter depth: 3 dB steps from 0 dB to -84 dB  
 Maximum depth adjustable from -4 to -84 dB  
 Filter width: user-controllable from 1.00 to .01 octave  
 Resolution: 1 Hz from 20 Hz to 20 KHz  
 Time required to find and eliminate feedback: typically 0.3  
 seconds @ 1 KHz

### Compressor/Limiter

Threshold: +20 dBu to -20 dBu  
 Ratio: 1:1 through infinity  
 Attack: 0.3 to 100ms  
 Release: 2 to 32X the attack time

### Global Parameters

Number of Programs: 30  
 Preset Configurations: Generic, 2, 3, 4-Way, plus other  
 variations  
 Front Panel & Software Security Locks: Any individual  
 menu, password protected

### Upgrades

Operating system firmware stored in Flash RAM. All  
 future upgrades for firmware and software downloadable  
 from xilica website using Upgrade Wizard.

### Notes:

-Below approximately 200 Hz the feedback filters become  
 slightly wider to increase the feedback and rumble  
 capture speed at these low frequencies.

-Tests performed using an Audio Precision System One  
 model 322 or equal.

(SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE)

One-year limited warranty  
 Patented

## Section Nine: Cautions & Warranty

Warning! This equipment must be earthed.

Caution! Risk of electric shock. Do not open.

Caution! Shock hazard. Do not remove covers. No user serviceable parts inside. Refer servicing to qualified service personnel.

Warning! To reduce the risk of fire or electric shock, do not expose this product to rain or moisture.

Attention! Cet appareil doit être relié à la terre.

Attention! Risque de choc électrique; ne pas ouvrir.

Attention! Risque de choc; ne pas ôter les capots. Aucune pièce accessible à l'intérieur. S'adresser à un technicien qualifié.

Attention! Pour réduire le risque d'incendie ou de choc électrique, ne pas laisser l'appareil sous la pluie ou à l'humidité.

Achtung! Dieses Gerät muss schutzgeerdet sein.

Achtung! Gefahr eines elektrischen Stromschlags. Gehäuse nicht öffnen.

Achtung! Gefahr eines elektrischen Stromschlags. Gehäuse nicht öffnen. Keine von Benutzer zu bedienenden Teile im Geräteinneren.

Überlassen Sie das Gerät zu Servicezwecken nur geschultem Fachpersonal.

Um Brandgefahr oder das Risiko eines elektrischen Schlags auszuschließen, das Gerät vor Nässe und Feuchtigkeit schützen.

Advertencia! Este equipo debe estar conectado a tierra.

Precaución! Riesgo de descarga eléctrica. No abrir.

Precaución! Riesgo de descarga eléctrica. No desmontar las tapas. Piezas interiores no reparables por el usuario. Reparable sólo por personal cualificado.

Advertencia! Para reducir el riesgo de incendio o de descarga eléctrica no exponga este producto a la lluvia o humedad.

### FCC Statement:

This device complies with Part 15 of the FCC Rules. Operation is subject to the following conditions: (1) This device may not cause harmful interference; and (2) This device must accept any interference received, including interference that may cause undesired operation. *Warning:* Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio TV technician for help.

### Canadian Compliance Statement

This digital apparatus does not exceed the Class B limits for radio noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de la class B prescrites dans le Règlement sur le brouillage radioélectrique édicté par le ministère des Communications du Canada.

### Japanese EMI Compliance Statement

この装置は、第二種情報装置

(住宅地域又はその隣接した地域において使用されるべき情報装置)で住宅地域での電波障害防止を目的とした情報処理装置等電波障害自主規制協議会 (VCCI) 基準に適合しております。

しかし、本装置をラジオ、テレビジョン受信機に近接してご使用になると、受信障害の原因となることがあります。

取扱説明書に従って正しい取り扱いをして下さい。



## Warning!



The Navigator is designed to operate from standard AC power. Please be sure the power in your area is compatible with the power requirements marked on the rear of the unit. Using the wrong input voltage may cause permanent damage to the unit and will void the warranty.

The Navigator is supplied with one of the following AC power cords:

Japan	100 VAC
U.S./North America	120 VAC
Continental Europe	230 VAC
United Kingdom	240 VAC
Australia	240 VAC



## Caution!



Replace the fuse with a fuse of exactly the same rating specified on the rear of the product.

1. Read all safety and operating instructions before using this product.
2. All safety and operating instructions should be retained for future reference.
3. Obey all cautions in the operating instructions and on the unit.
4. All operating instructions should be followed.
5. Use only shielded audio and data cables.
6. This product should not be used in the presence of moisture or rain, or near any water, i.e., a bathtub, sink, swimming pool, wet basement, etc.
7. This product should be located so that its position does not interfere with proper ventilation. Do not use in direct sunlight. Do not place flat against a wall or in a built-in enclosure that will impede the flow of cooling air.
8. This product should not be placed near a source of heat such as a stove or radiator.
9. Connect only to a power supply of the type marked on the unit adjacent to the power entry module.
10. Never break off the ground pin on the power supply cord.
11. Power supply cords should always be handled carefully. Never walk or place equipment on power supply cords. Periodically check cords for cuts or signs of stress, especially at the plug and the point where the cord exits the unit.
12. The power supply cord should be unplugged when the unit is to be unused for long periods of time.
13. Care should be taken so that objects do not fall and liquids are not spilled into the unit through the ventilation holes or any other openings.
14. This unit should be checked by a qualified service technician if:
  - A. The power supply cord or plug has been damaged.
  - B. Anything has fallen or been spilled into the unit.
  - C. The unit does not operate correctly.
  - D. The unit has been dropped or the enclosure damaged.
15. The user should not attempt to service this equipment. All service work should be done by a qualified service technician.

OSHA 2201; 1995 revised.



**CAUTION** 

EXPOSURE TO EXTREMELY HIGH NOISE LEVELS MAY CAUSE A PERMANENT HEARING LOSS. INDIVIDUALS VARY CONSIDERABLY IN SUSCEPTIBILITY TO NOISE INDUCED HEARING LOSS, BUT NEARLY EVERYONE WILL LOSE SOME HEARING IF EXPOSED TO SUFFICIENTLY INTENSE NOISE FOR A SUFFICIENT TIME. THE U.S. GOVERNMENT'S OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA) HAS SPECIFIED THE FOLLOWING PERMISSIBLE NOISE LEVEL EXPOSURES:

DURATION/DAY IN HOURS	SOUND LEVEL IN dBA, SLOW RESPONSE
8	90
6	92
4	95
3	97
2	100
1-1/2	102
1	105
1/2	110
1/4 or less	115

ACCORDING TO OSHA, ANY EXPOSURE IN EXCESS OF THE ABOVE PERMISSIBLE LIMITS COULD RESULT IN HEARING LOSS. EAR PLUGS OR PROTECTORS IN THE EAR CANALS OR OVER THE EARS MUST BE WORN WHEN OPERATING THIS DEVICE IN ORDER TO PREVENT A PERMANENT HEARING LOSS, IF EXPOSURE IS IN EXCESS OF THE LIMITS AS SET FORTH ABOVE. TO ENSURE AGAINST POTENTIALLY DANGEROUS EXPOSURE TO HIGH SOUND PRESSURE LEVELS, IT IS RECOMMENDED THAT ALL PERSONS EXPOSED TO EQUIPMENT CAPABLE OF PRODUCING HIGH SOUND PRESSURE LEVELS SUCH AS THIS DEVICE BE PROTECTED BY HEARING PROTECTORS WHILE THIS UNIT IS IN OPERATION.

**CAUTION** 

This apparatus contains a lithium battery. Replacement shall be made by qualified service personnel only.  
Call xilica at (386) 418-2000 or consult an authorized xilica agent.

FBX and FBX Feedback Exterminator are registered trademarks of xilica, Inc., and are the brand names of its line of automatic feedback controllers. Covered by U.S. Patent No. 5,245,665, Australian Patent No. 653,736, Canadian Patent No. 2,066,624-2, German Patent No. 69118486.0, and U.K. Patent No. 0486679. Other patents pending.

FBX, Graphi-Q, POWER-Q, REAL-Q, and REAL-Q2 are trademarks of xilica, Inc.  
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**Limited Warranty**

THIS LIMITED WARRANTY VALID ONLY WHEN PURCHASED AND REGISTERED IN THE UNITED STATES OR CANADA. ALL EXPORTED PRODUCTS ARE SUBJECT TO WARRANTY AND SERVICES TO BE SPECIFIED AND PROVIDED BY THE AUTHORIZED DISTRIBUTOR FOR EACH COUNTRY.

Ces clauses de garantie ne sont valables qu'aux Etats-Unis et au Canada. Dans tous les autres pays, les clauses de garantie et de maintenance sont fixées par le distributeur national et assurées par lui selon la législation en vigueur.

Diese Garantie ist nur in den USA und Kanada gültig. Alle Export-Produkte sind der Garantie und dem Service des Importeurs des jeweiligen Landes unterworfen.

Esta garantía es válida solamente cuando el producto es comprado en E.U. continentales o en Canada. Todos los productos que sean comprados en el extranjero, están sujetos a las garantías y servicio que cada distribuidor autorizado determine y otorgue en los diferentes países.

**ONE-YEAR LIMITED WARRANTY/REMEDY**

XILICA, INC. ("XILICA") warrants this product to be free from defects in material and workmanship for a period of one (1) year from date of purchase PROVIDED, however, that this limited warranty is extended only to the original retail purchaser and is subject to the conditions, exclusions and limitations hereinafter set forth:

**CONDITIONS, EXCLUSIONS AND LIMITATIONS OF LIMITED WARRANTIES**

These limited warranties shall be void and of no effect if:

- The first purchase of the product is for the purpose of resale; or
- The original retail purchase is not made from an AUTHORIZED XILICA DEALER; or
- The product has been damaged by accident or unreasonable use, neglect, improper service or maintenance, or other causes not arising out of defects in material or workmanship; or
- The serial number affixed to the product is altered, defaced or removed; or
- The power supply grounding pin is removed or otherwise defeated. In the event of a defect in material and/or workmanship covered by this limited warranty, xilica will repair the defect in material or workmanship or replace the product, at XILICA's option; and provided, however, that, in any case, all costs of shipping, if necessary, are paid by you, the purchaser.

THE WARRANTY REGISTRATION CARD SHOULD BE ACCURATELY COMPLETED, MAILED TO AND RECEIVED BY XILICA WITHIN FOURTEEN (14) DAYS FROM THE DATE OF YOUR PURCHASE.

In order to obtain service under these warranties, you must:

- Bring the defective item to any Authorized XILICA DEALER and present therewith the ORIGINAL PROOF OF PURCHASE supplied to you by the AUTHORIZED XILICA DEALER in connection with your purchase from him of this product. If the DEALER is unable to provide the necessary warranty service, you will be directed to the nearest other XILICA AUTHORIZED DEALER which can provide such service.

OR

- Ship the defective item, prepaid, to:

XILICA, INC.  
13301 HIGHWAY 441  
ALACHUA, FL 32615-8544

including therewith a complete, detailed description of the problem, together with a legible copy of the original PROOF OF PURCHASE and a complete return address. Upon xilica's receipt of these items:

If the defect is remedial under the limited warranties and the other terms and conditions expressed have been complied with, xilica will provide the necessary warranty service to repair or replace the product and will return it, FREIGHT COLLECT, to you, the purchaser.

xilica's liability to the purchaser for damages from any cause whatsoever and regardless of the form of action, including negligence, is limited to the actual damages up to the greater of \$500.00 or an amount equal to the purchase price of the product that caused the damage or that is the subject of or is directly related to the cause of action. Such purchase price will be that in effect for the specific product when the cause of action arose. This limitation of liability will not apply to claims for personal injury or damage to real property or tangible personal property allegedly caused by xilica's

negligence. xilica does not assume liability for personal injury or property damage arising out of or caused by a non-xilica alteration or attachment, nor does xilica assume any responsibility for damage to interconnected non-xilica equipment that may result from the normal functioning and maintenance of the xilica equipment.

UNDER NO CIRCUMSTANCES WILL XILICA BE LIABLE FOR ANY LOST PROFITS, LOST SAVINGS, ANY INCIDENTAL DAMAGES OR ANY CONSEQUENTIAL DAMAGES ARISING OUT OF THE USE OR INABILITY TO USE THE PRODUCT, EVEN IF XILICA HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

THESE LIMITED WARRANTIES ARE IN LIEU OF ANY AND ALL WARRANTIES, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR USE; PROVIDED, HOWEVER, THAT IF THE OTHER TERMS AND CONDITIONS NECESSARY TO THE EXISTENCE OF THE EXPRESS LIMITED WARRANTIES, AS HEREIN ABOVE STATED, HAVE BEEN COMPLIED WITH, IMPLIED WARRANTIES ARE NOT DISCLAIMED DURING THE APPLICABLE ONE-YEAR PERIOD FROM DATE OF PURCHASE OF THIS PRODUCT.

SOME STATES DO NOT ALLOW LIMITATION ON HOW LONG AN IMPLIED WARRANTY LASTS, OR THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE LIMITATIONS OR EXCLUSIONS MAY NOT APPLY TO YOU. THESE LIMITED WARRANTIES GIVE YOU SPECIFIC LEGAL RIGHTS, AND YOU MAY ALSO HAVE OTHER RIGHTS WHICH MAY VARY FROM STATE TO STATE.

THESE LIMITED WARRANTIES ARE THE ONLY EXPRESS WARRANTIES ON THIS PRODUCT, AND NO OTHER STATEMENT, REPRESENTATION, WARRANTY OR AGREEMENT BY ANY PERSON SHALL BE VALID OR BINDING UPON XILICA.

In the event of any modification or disclaimer of express or implied warranties, or any limitation of remedies, contained herein conflicts with applicable law, then such modification, disclaimer or limitation, as the case may be, shall be deemed to be modified to the extent necessary to comply with such law.

Your remedies for breach of these warranties are limited to those remedies provided herein, and xilica gives this limited warranty only with respect to equipment purchased in the United States of America.

**INSTRUCTIONS-WARRANTY REGISTRATION CARD**

1. Mail the completed WARRANTY REGISTRATION CARD to:

XILICA, INC.  
13301 HIGHWAY 441  
ALACHUA, FL 32615-8544

- a. Keep the PROOF OF PURCHASE. In the event warranty service is required during the warranty period, you will need this document. There will be no identification card issued by xilica, Inc.

2. IMPORTANCE OF WARRANTY REGISTRATION CARDS AND NOTIFICATION OF CHANGES OF ADDRESS:

- a. Completion and mailing of WARRANTY REGISTRATION CARDS - Should notification become necessary for any condition that may require correction, the REGISTRATION CARD will help ensure that you are contacted and properly notified.

- b. Notice of address changes - If you move from the address shown on the WARRANTY REGISTRATION CARD, you should notify xilica of the change of address so as to facilitate your receipt of any bulletins or other forms of notification which may become necessary in connection with any condition that may require dissemination of information or correction.

3. You may contact xilica directly by telephoning (386) 418-2000.

4. Please have the xilica product name and serial number available when communicating with xilica Customer Service.