

# The XTC Mode

## Using Modules With Your Sequencer

### Cubase VST

- Instruments
- Effects
- Channel Inserts
- Master Inserts

### Send Effects

### Logic Audio

- Instruments
- Effects
- Channel Inserts
- Master Inserts
- Aux Effects

## Processing Instruments and Effects to a File (Bounce/Export)

### Logic

### Cubase/Nuendo

## Software Settings\*

### Choosing the ASIO driver

- Cubase
- Logic

### Selecting Inputs and Outputs\*

- IO Settings Dialog: Options

## ULLI Settings\*

## ASIO Settings\*

- Cubase

### Selecting a Word Clock\*

- Logic
- External Word Clock

### Monitoring DSP Usage

### Settings

### Synthesizer Global Control Bar

## Latency Compensation

### General Information

### Using the Delay Module with Cubase or Nuendo

# The XTC Mode

Your DSP system software can operate in two distinct modes:

A) In standard mode modules are loaded into the routing window and connected together as described in the Live Bar section. If you are working concurrently with a sequencer, the SFP software is merged with the sequencer downstream.

B) XTC Mode, in which you load the modules directly into a VST-compatible sequencer (Cubase VST, Nuendo, Logic Audio) just like the native VST plug-ins you are familiar with. However, don't overlook the unique capabilities of the Project Window - in particular the free routing of signals from one program to another, to modules, or to external hardware, and the integration of sophisticated DSP mixing consoles.

XTC mode is enabled automatically if ***Enable XTC Mode*** is selected in the SCOPE Settings and you start the sequencer from the Live Bar. Otherwise ***Standard Mode*** is active.

**Note that normal VST plug ins must, by their design, use additional host CPU resources. Only our DSP software modules are able to make use of the power of the DSP processors. However, you can release valuable host CPU computing resources for other uses by replacing native plug ins with CreamWare DSP modules whenever possible.**

**When in XTC mode, the SFP software operates almost identically to our Pulsar XTC product. For this reason, we will use the term „Pulsar XTC“ in place of „SFP software in XTC mode“ in the manual.**

## Using Modules With Your Sequencer

If you are already familiar with using VST plug-ins you can skip the following section as XTC modules behave no differently than native VST plug-ins.

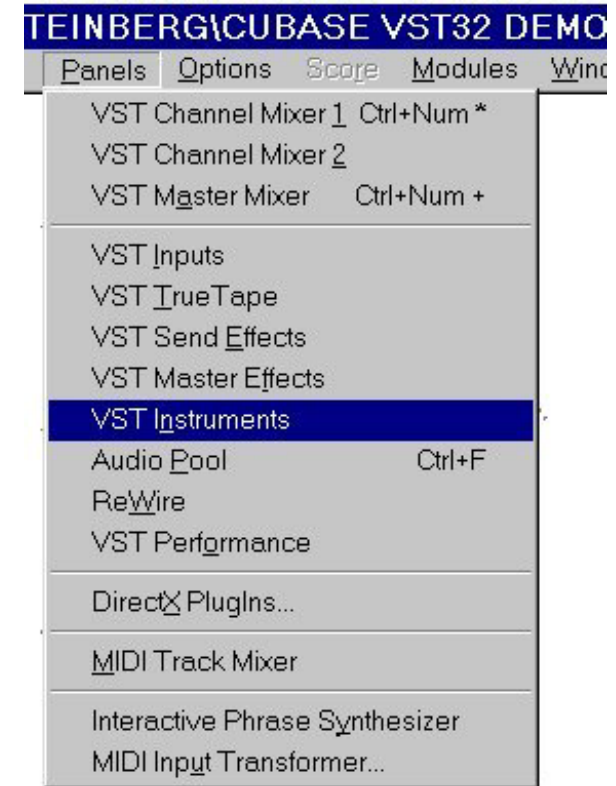
Pulsar XTC's instruments and effects are processed by the DSPs on the XTC card, and not by the computer's CPU. Notwithstanding this difference, the modules appear and behave just like other plug-ins that use the VST interface. Therefore you can use these virtual instruments and effects directly in any sequencer that supports the VST 2.0 specification (for example, the current versions of Cubase VST, Nuendo, Logic Audio). We'll use two popular sequencers, Cubase VST from Steinberg, and Logic Audio from Emagic, to provide concrete examples.

## Cubase VST

### Instruments

Click VST Instruments in the Devices menu to open the virtual VST instrument rack. To view the list of available instruments, click on the arrow next to No VST Instr. in the panel. From this list, click Pulsar XTC and then select the desired instrument – for this example, the U KNOW 007.

The synthesizer loads, and its name appears in the panel.



For information on other elements in this panel, consult the Cubase documentation.

You can add other instruments, or additional instances of the same instrument, by loading them into the empty instrument slot.

To access an instrument's control panel, click the **EDIT** button on the respective rack slot.

In the border at the top of the window that appears you will find, in addition to the usual VST options, some additional options common to all XTC instruments. These options are described in chapter 'Synthesizer Global Control Bar'.



Opens the control panel

Presets selection

The controls and other options for a particular instrument are described in the in the chapter for that instrument in the Pulsar XTC manual.

Choose **VST Channel Mixer 2** from the Audio menu to open a mixer containing

channels corresponding to the individual instrument outputs (and both the mix outputs and the individual outs in the case of the Volkszämpler). Using the mixer you can add effects, mix the output signals, and distribute the signals to logical VST outputs.

Channel for instrument



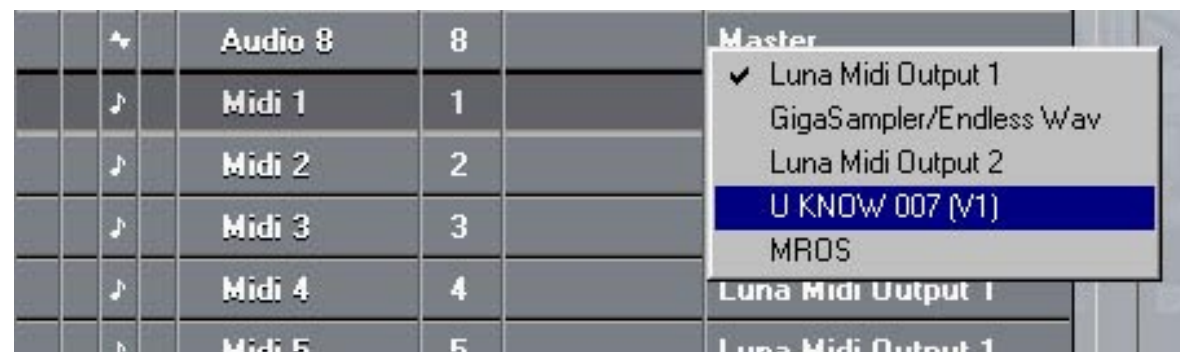
The MKII and Blue synths are monophonic. Because in Cubase all instruments are treated as stereo devices, the stereo channels carry only a mono signal.

For complete information on using the mixer consult the Cubase documentation.

In order to use MIDI information recorded on a Cubase track to play an XTC instrument, first click the **Output** column for the track, and then choose the respective instrument from the list that appears.

Ensure that the MIDI channel set for the track is the same as the MIDI channel as adjusted for the respective XTC instrument.

To play an XTC instrument from your MIDI keyboard, select its associated MIDI track in the Cubase track list by clicking on it.





## Effects

In general effects are loaded as channel insert effects, master insert effects, or send effects (Aux effects). Cubase allows any effect to be used in any of these ways, but in practice not all combinations are appropriate.

**Regarding this, note the following rules:**

Effects to be shared by several channels with different amounts of effect per channel must be installed as Aux effects. Examples of common Aux effects include reverb, chorus, and echo.

Effects to be used only by a single channel must be installed as channel insert effects.

Effects that alter the original signal but are not mixed back into it by proportion (for example, filters, EQ, and dynamics processors such as compressor, limiter, gate etc.) must be installed as insert effects (master or channel).

Effects to process the overall mix (for example, mix compression, dithering) must be installed as master insert effects.

## Channel Inserts

In the Cubase mixer, clicking the INS button opens a window containing 4 slots for insert effects. Click a black Insert field to call up the insert selection menu. In the menu, open the *PulsarXTC* directory and select the desired effect.

**Mono effects are designated with an "M", and stereo effects with either an "S", or nothing. Load only mono effects into mono channels. Although stereo effects will work in mono channels, they require double the amount of DSP power. Likewise, load only stereo effects into stereo channels. Mono effects will process only the left side of a stereo channel.**

To enable the effect, click the *On* button. Click the *Edit* button to call up the effect's control panel.



Insert button

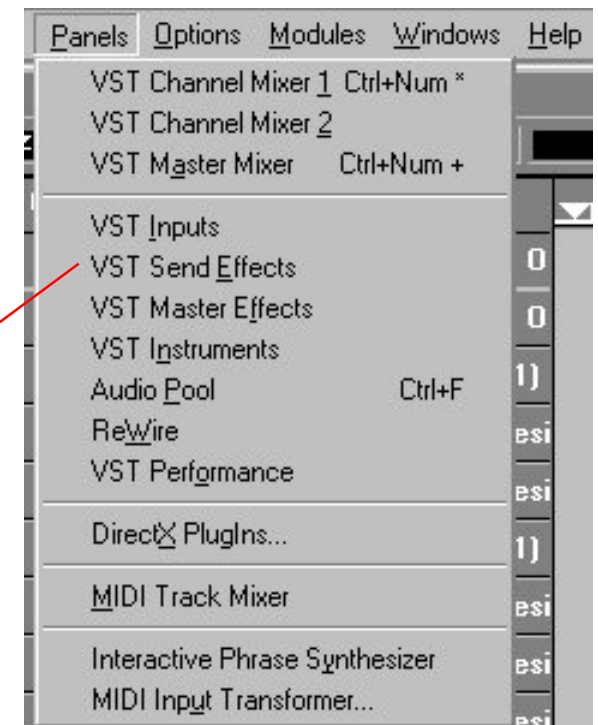


Insert field

## Master Inserts

From the *Devices* menu select *Master Effects* to call VST's master insert rack into which you can load up to 4 master inserts. Click a black Insert field to call up the insert selection menu. In the menu, open the *PulsarXTC* directory and select the desired effect.

**Use only stereo effects as master insert effects.**

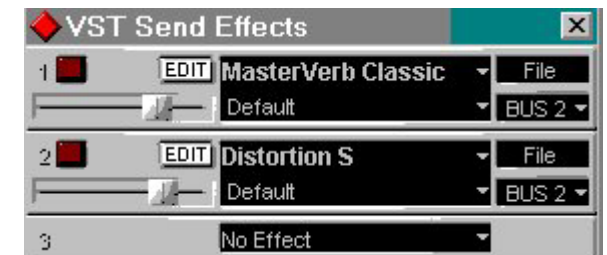


## Send Effects

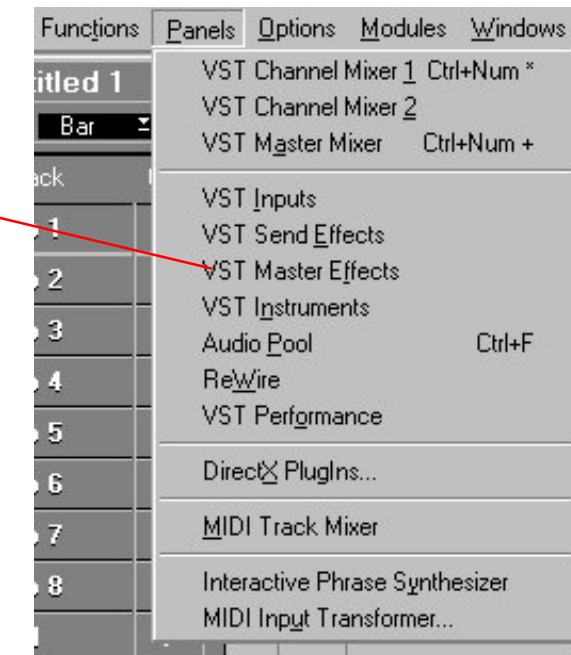
From the *Devices* menu select **VST Send Effects** to open VST's Aux insert rack into which you can load up to 8 send effects. Click a black Insert field to open the insert selection menu. In the menu, select the *PulsarXTC* directory and then the desired effect.

**Use only stereo effects as send effects.**

To enable the effect, click the **On** button. Click the **Edit** button to open the effect's control panel. The fader controls the volume of the signal sent to the bus selected in the field in the lower right.



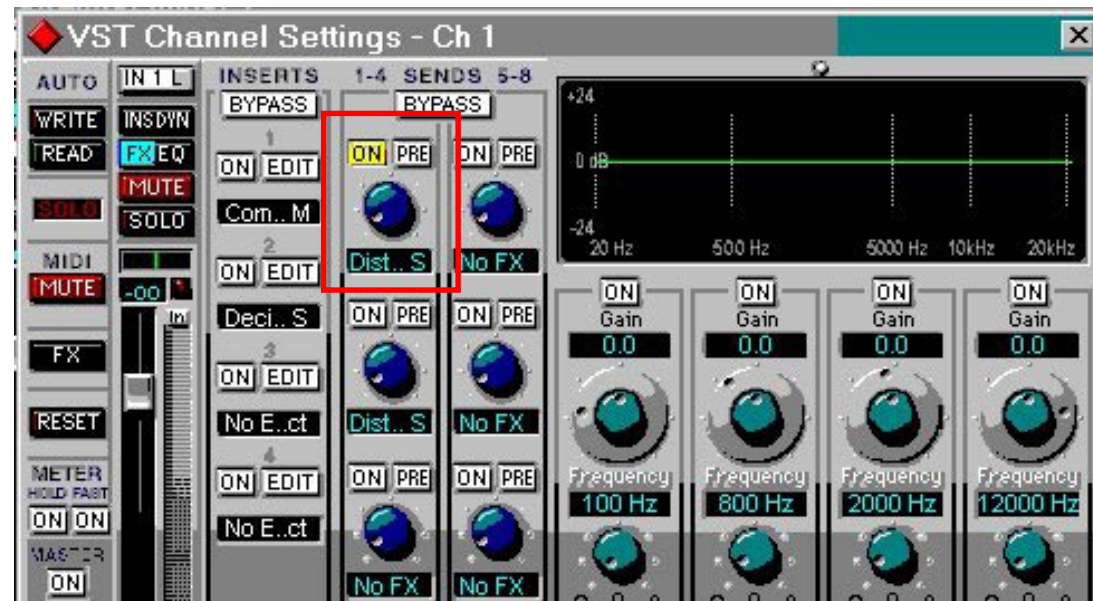
See the **Cubase** documentation for descriptions of other elements of this panel.



You can control the signal level to be sent to an aux effect from each channel in the Logic mixer. Click and hold on one of the send slots and select the return bus for the effect. The rotary control determines the proportion of the signal to be sent on the bus to the effect. In the selection list you can also choose whether the signal will be Pre or Post fader (taken before or after the signal volume has been adjusted by the channel fader).

**For detailed information on these elements, consult the Logic documentation.**

With send effects it is usual to adjust the effect's Dry control to zero. Otherwise, a portion of the original signal is mixed back into the effect, limiting the control of the effect, and possibly introducing problems due to phase cancellation.





# Logic Audio

## Instruments

In Logic Audio, VST instruments are loaded by merging them into the mixer. The Logic mixer contains channel strips for audio instruments in an area to the right of the strips for the audio tracks. Click and hold on the upper slot button (above the Inserts) until a list appears. In the list, select the **Pulsar XTC** submenu and then the desired instrument.

The instrument loads, and its name appears on the button.



For more information on the instrument channel strips consult the Logic documentation.

Logic does not recognize the Volkszampler's independent outputs, only the stereo mix outputs.

To open an instrument's control panel, double-click the respective slot button.

In the border at the top of the window that appears you will find, in addition to the usual VST options, some additional options common to all XTC instruments. These options are described in chapter 'Syntheseizer Global Control Bar'.

To use MIDI data recorded on a track to play an instrument, you must assign the audio instrument to be associated with it in the Logic Arrange window. Click and hold on the Output field for the track until a list appears. From the list, choose the desired instrument.

**Ensure that the MIDI channel set for the track is the same as the MIDI channel as adjusted for the respective instrument.**

To play the instrument from your MIDI keyboard, select the associated MIDI track in the track list by clicking on it.



## Effects

**Please read the notes about using effects as channel inserts, master inserts, or aux effects in the preceding Cubase example.**

### Channel Inserts

Effects can be loaded into the insert slots of each channel of the Logic mixer. To load an effect, click and hold on an insert slot to display a list of all installed effects. From the list, choose the Pulsar XTC directory and then the desired effect.

**Mono effects are designated with an "M", and stereo effects with either an "S", or nothing. Load only mono effects into mono channels. Although stereo effects will work in mono channels, they require double the amount of DSP power. Likewise, load only stereo effects into stereo channels. Mono effects will process only the left side of a stereo channel.**

To open a loaded effect's control panel, double-click on the respective insert slot.



## Master Inserts

Master channel strip is located at the far right of the Logic mixer. You can load stereo effects into the insert slots of the Master channel.



To load an effect, click and hold on an insert slot to display a list of all installed effects. From the list, choose the Pulsar XTC directory and then the desired effect.

**Load only stereo effects into the Master insert slots.**

To open a loaded effect's control panel, double-click on the respective master insert slot.

## Aux Effects

Return channel strips are located on the right side of the Logic mixer. You can load effects into the insert slots of each of the return channels. To load an effect, click and hold on an insert slot to display a list of all installed effects. From the list, choose Pulsar XTC and then the desired effect.

**If the return channel strip is switched to stereo, the effects list displays only stereo effects. Otherwise, it shows only mono effects.**



To open a loaded effect's control panel, double-click on the respective master insert slot.

For each channel in the VST mixer you can open a window containing controls for all 8 effects in the send rack. Click the FX button to open the window. The rotary controls adjust the proportion of the signal to be sent to each effect. You can also switch the sends on or off, and select whether the signals will be Pre or Post fader (taken before or after the signal volume has been adjusted by the channel fader).

**For detailed information, consult the Cubase documentation.**

With send effects it is usual to adjust the effect's Dry control to zero. Otherwise, a portion of the original signal is mixed back into the effect, limiting the control of the effect, and possibly introducing problems due to phase cancellation.



## Processing Instruments and Effects to a File (Bounce/Export)

Cubase and Logic both allow you to process all tracks, including effects and virtual instruments, and save the result in a single file. XTC modules can also be included in this processing.

### Logic

The function to use in Logic is *Bounce*, located in the mixer's Master channel strip. Bounce processing proceeds no more quickly than playing the tracks in real-time. Any loaded XTC modules will also be processed - no special treatment or change to the procedure is required to include them.

## Cubase/Nuendo

Steinberg's Cubase and Nuendo programs process the tracks offline, and the processing can be faster than real-time playback. If you have not installed an I/O extension board on the XTC card you can proceed with the *Export Audio* function in the VST Master mixer as usual. However, the DSP processors on the XTC card calculate the audio data according to the sample rate in use. Therefore, the file will not be processed faster than real-time.

If you have installed an I/O extension board, a conflict arises between the word clock of the audio card used for audio output and the XTC card. In this case, another procedure is necessary in which you record the mixer output to a new track.

The output selection list at the bottom of the Cubase Master Channel strip contains the option *L Merge* for this purpose. Select this option for now. The merge options represent virtual outputs that can be routed back to inputs. The

VST Input dialog contains corresponding inputs labeled *L Merge* and *R Merge*. Select these inputs, then choose a free stereo track to record to. Switch this track to a free channel in the Cubase mixer and turn Merge Input on (click on the In button in the channel strip while holding the Ctrl key). This is always the last option in the list. You must also enable the *Mute* option for this channel so that the output does not reappear at the master inputs resulting in feedback.

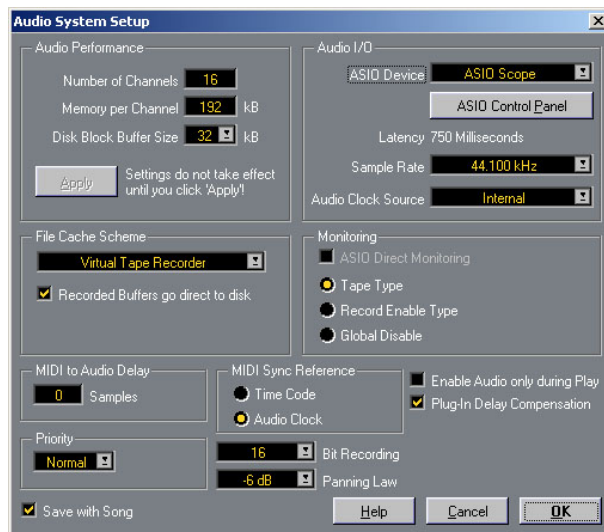
Begin recording as usual. When recording is complete, switch the master channel output back to the I/O extension output you use for monitoring.



## Software Settings\*

\*Available only with I/Os

The following setting descriptions assume you are using the I/Os of the DSP card with your sequencer. You can also use the I/Os of another sound card and employ the DSP card in XTC mode only as a pure DSP processing board.



## Choosing the ASIO driver

### Cubase

To select the appropriate ASIO driver in Cubase, first call the **Audio System Setup** dialog by choosing **Options->Audio Setup->System...**

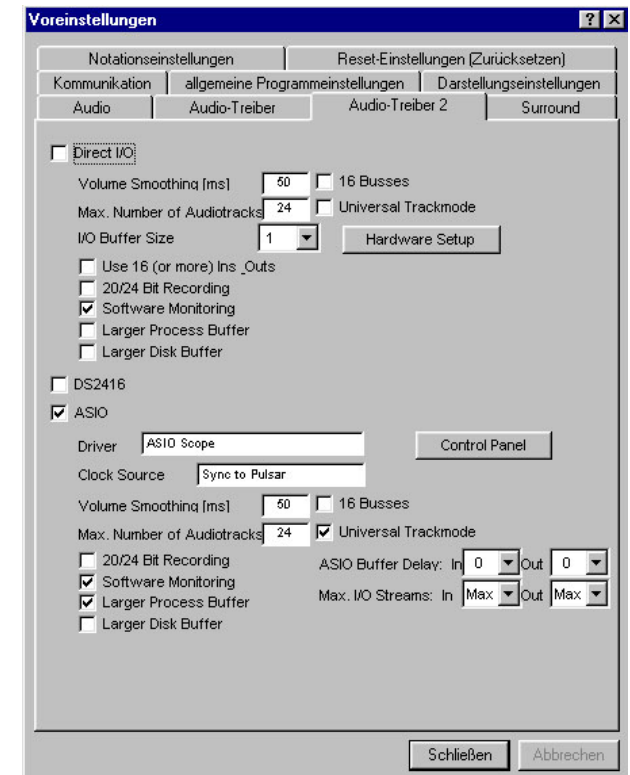
Under **ASIO Device**, choose **ASIO Scope** from the drop-down list. This is the correct driver for Pulsar XTC.

### Logic

To select the appropriate ASIO driver in Logic, first call the **Defaults** dialog by choosing **Audio->Audio Hardware and Drivers**. Click the **Audio Driver 2** tab.

Under **ASIO/Driver**, select **ASIO Scope**. This is the correct driver for Pulsar XTC.

Pulsar XTC's ASIO driver conforms to the ASIO 2.0 specification. It is therefore possible to enable direct monitoring during record in the sequencer. In Cubase, enable **Direct Monitoring** in the Monitoring section of the Audio System Setup dialog. In Logic, enable **Software Monitoring**.



## Selecting Inputs and Outputs\*

\*Available only with I/Os

In Cubase call the ASIO Multimedia Set-up dialog by clicking the Control Panel button in the Audio System Setup dialog. In Logic, open the New Project Settings dialog. The audio I/Os of Pulsar XTC (and any other installed DSP cards) are displayed for you to enable or disable as you wish. I/Os that you enable then appear in the routing dialogs of the sequencer as available inputs and outputs. Consult your sequencer's documentation for further information.

### IO Settings Dialog: Options

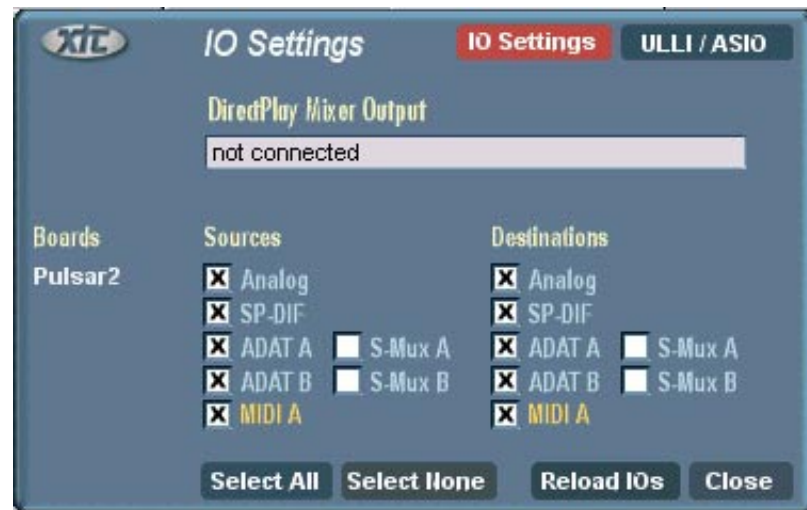
**ULLI/ASIO:** Calls the dialog for changing the ULLI driver latency settings (described in the following pages).

**DirectPlay Mixer Output:** Click this field with the right mouse button (PC, Ctrl + click on the Mac) to select an output on the XTC card for the loaded XTC instrument's signal to be sent to, latency free, when *Direct* mode is enabled for the instrument. For more information, see the chapter **Synthesizer Global Control Bar**.

**Sources:** lists all available physical outputs.

**Destinations:** lists all available physical inputs.

**SMUX:** The original ADAT interface specifies a maximum sampling frequency of 48 kHz. If this option is enabled, then devices with ADAT ports conforming to the SMUX specification (developed by Sonorus) can utilize a 96 kHz sampling frequency by using ADAT channel pairs when transmitting the signal.



Output selection for Direct mode

**Select All:** Enables all inputs and outputs.

**Select None:** Disables all inputs and outputs.

**Reload IOs:** Closes the dialog and confirms the changes to the settings.

**Close:** Closes the dialog. Changes made to the settings take effect only after restarting the sequencer.



## ULLI Settings\*

\*Available only with I/Os

Use this dialog to adjust the size of the ASIO driver buffers (reserved memory areas) and the resulting delay (latency). The delay depends on this setting, and the sample rate in use as represented in the table. Smaller latency values require greater host computer performance. Find the best compromise for your system by experimentation.

Changes made here require a restart of the software.

## ASIO Settings\*

\*Available only with I/Os

**ASIO1:** When this option is selected an ASIO driver prior to the ASIO2 specification is loaded.

The Direct Monitoring option is available only with the ASIO2 driver.

The ASIO1 driver is somewhat less demanding of system resources

**ASIO2:** Selects the ASIO2 driver as the ASIO driver to be loaded (default).

**Sync:** When this option is selected the sequencer synchronizes to the ADAT sync signal connected to the corresponding input on the optional Sync Plate.

**16 Bit / 24 Bit:** Selects the resolution for the ASIO driver.

16 bit resolution consumes less overhead than 24 bit resolution and should therefore be used when your audio was originally recorded with only 16 bits.

The communication between the sequencer and the XTC modules is not affected by this option.

## Selecting a Word Clock\*

\*Available only with I/Os

In your sequencer's audio settings dialog (described previously) you will also find a setting for specifying the word clock source for audio synchronization. (See the discussion following for pertinent information).

### Cubase

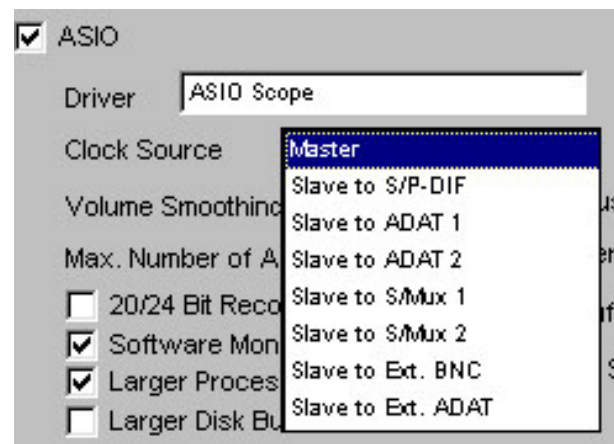
From the list under **Audio Clock Source** select either **Master** (whereby the sampling frequency is generated by the XTC card according to the sampling frequency of the current song) or the digital input connected to the word clock you want to use.



XTC Mode

### Logic

From the list under **Clock Source** select either **Master** (whereby the sampling frequency is generated by the XTC card according to the sampling frequency of the current song) or the digital input connected to the word clock you want to use.

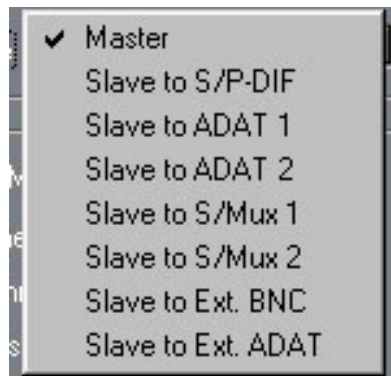


If you have several DSP boards installed, their digital inputs will appear in this list, as well as the inputs of the optional Sync Plate (if available).

To guarantee XTC's operation as a slave, make sure the master device is connected to the appropriate digital input, and that it is switched on so that it transmits a data stream.

## External Word Clock

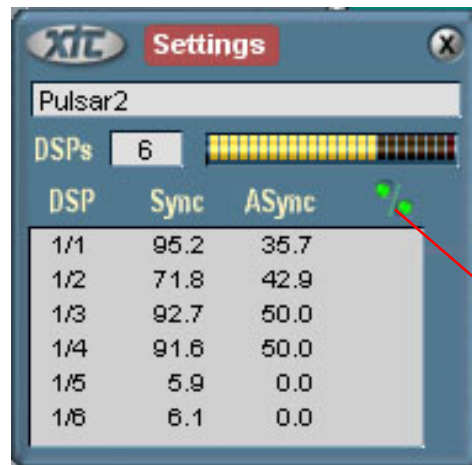
In some situations, especially when using several devices, the word clock in the data stream can degrade, and it is advisable to supply a word clock from a central source. For this to work, your external devices must support external word clock, and provide the appropriate BNC connectors. Further, you will require the optional SyncPlate, which contains the BNC and also ADAT sync connectors.



If the optional Sync Plate is installed two additional entries for word clock sources appear in the list.

## Monitoring DSP Usage

Open the DSP Meter module by clicking the round XTC Logo on the surface of a module. The dialog that appears displays the number and type of installed boards as well as the total number of DSPs available. The bar graph indicates the current utilization of the DSPs.



percentual display  
(on/off)



## Settings

Click on the Settings button in the XTC window to open a dialog in which you can make various general adjustments.

### Controller Behavior

Here you can adjust how mouse movement influences the rotary controls. The following options are available:

**Default:** This is the default behavior for rotary controls. In this mode, the selected controller is adjusted by dragging the mouse around it in a circle. By increasing the distance of the mouse from the control, the control parameter can be adjusted more finely. The indicator on the control always points towards the mouse pointer. If you drag the mouse pointer under the control, the control value flips between minimum and maximum.

**Vertical:** Only the vertical component of the mouse movement controls the potentiometer. Finer control resolution results from increasing the distance of the mouse pointer from the control.



**Round:** The difference between Default and Round is that with Round the control's indicator does not necessarily point towards the mouse pointer. Therefore, you can click the mouse at any arbitrary position without the control's indicator jumping to point to it. You can still „turn“ the control, however. Another difference is that the control does not flip from minimum to maximum or vice versa when the mouse pointer passes underneath.

**Buffer Preload:** If you are outputting audio through a sound card from another manufacturer use this parameter to avoid problems that might arise, such as audio clicks in the output. Increase the value until the problem disappears.

It is sometimes necessary to adjust this parameter when using the Multimedia drivers (Wave) rather than the ASIO driver.

**Preset Author:** The name or 'handle' entered here appears in the *Author* column of the preset list for any presets you have created and saved.

## Synthesizer Global Control Bar

For each synthesizer there is a global control bar at the top of the control panel to adjust some parameters that apply to the synthesizer overall.

Compensation is not possible, however, when playing the instrument in real time. Therefore, in this mode the synthesizer's output signal is sent directly to a physical



**Direct:** Enables *Direct Mode*.

Direct mode allows you to play a virtual XTC instrument 'live' with a MIDI keyboard without introducing any perceptible delay (latency). In this mode, audio signals from the synthesizers bypass the sequencer altogether where the signal would normally be delayed by data buffering of the operating system. During MIDI sequencer playback this delay can be compensated for internally.

output on the I/O Plate. Select the particular output in the I/O Settings dialog (see the chapter **Selecting Inputs and Outputs**).

The *Direct* button has three states:

**Off** (black)

**Direct Out** (blue)

The signal is sent to the selected output.

**Direct Out** and **Master Out** (green)

The signal is sent to the selected output and also, with a some added delay, over the sequencer's Master Out.

**Port:** This option selects which MIDI input to use to control the synthesizer in Direct Mode.

**Channel:** Sets the synthesizer's MIDI channel.

**Voices:** Sets the maximum number of voices to be simultaneously in play for this synthesizer.

**Be aware that each additional voice you make available consumes DSP resources. It is good practice to reduce the number of voices to only what is required for the synthesizer's current function in the arrangement.**

# Latency Compensation

## General Information

- No DSP card - even when completely integrated into a native audio sequencer - cannot solve the latency problems of a native system. Delays are system dependent, and are somewhat greater for XTC plug-ins than for standard VST plug-ins, because the host software must also communicate with the DSP card. This is true not only for Pulsar XTC, but for any other comparable product currently available (such as the TC Powercore.)
- Although a DSP card adds more processors and tremendous processing power to your system, it cannot improve the native latency of your system.
- The degree of latency depends on several things: your audio sequencer, the I/O implementation (DSP board or another sound card), and the ASIO driver supplied with your sound card.
- Perfect latency-free operation of DSP effects and instruments is only possible

when a DSP card runs on its own operating system in parallel to the host-based sequencer as is the case with products such as Luna II, Pulsar II, SCOPE /SP, or Pro Tools.

- The latency of XTC instruments and effects is roughly double that of normal VST instruments and plug-ins. If you are using an XTC instrument with an XTC effect on it, the latency increases again. However, this is only of concern when playing live.
- Current I/O cards with low latency can be used effectively, without large delays, for live performance.
- By using one of the XTC I/O daughterboards you can reduce latency by about 25% over a fast “foreign” sound card. In addition, you can use the “Direct Mode” with the I/O daughterboards for full latency-free performance.

- During playback, XTC effects latencies for each channel are automatically compensated for in the mix. If your sequencer supports automatic compensation for Master/Group channels, but the XTC instruments exhibit latency problems anyway, a workaround (see below) is available.

**Steinberg has already announced that a solution to the XTC instruments latency problem will be available as a patch to Cubase/Nuendo in the very near future (within weeks).**

## Using the Delay Module with Cubase or Nuendo

This version includes a module called *XTC Delay* which is available as mono (M) or stereo (S) version in the menu of XTC insert effects. The module automatically compensates latency that is caused by the communication between Pulsar XTC and the sequencer. The module does not have a surface, since no user adjustments are necessary.

**You must use this module with the current versions of Cubase VST and Nuendo. Future sequencer updates should provide automatic compensation so you will not have to use this module.**

The module must be used ...

- if XTC synths are used. Load the module into the insert slots of all mixer channels of audio tracks or native VST instruments.

- if XTC effects are loaded as inserts into Group Channels (which include the channels for VST instruments!). Load the module into the insert slots of all other mixer channels.

**As a final comment regarding the above, two delay modules must be loaded into each channel if an XTC insert effect is applied to an XTC synth. However, if an XTC effect is applied to a native VST instrument, you don't need to load a delay module for this instrument.**

**Note:** If XTC effects are loaded as inserts into audio channels, the sequencer will automatically compensate latency (make sure the respective option is enabled, e.g. 'Plug-In Delay Compensation' in the Audio System Setup of Cubase). In this case you do not have to use the module.

**Note:** The Volkszähler is a native VST instrument. The usage of the delay is the same as with any other native VST instrument.

**Important:** To avoid loading another instance of the delay module for each XTC insert effect in a Group Channel, you should use the XTC module *MultiFX M/S* which is a container for up to 6 inserts (see manual). This way latency does not increase with each insert. We recommend to use this module also for multiple insert effect in audio channels, because then the sequencer has only to compensate for a much smaller latency.

# Index

## Symbols

16 Bit / 24 Bit 16

## A

ASIO 16  
ASIO Settings 16  
ASIO1 16  
Aux Effects 11  
Aux insert rack 7

## B

BNC connectors 18  
Bounce 13  
Buffer Preload 19

## C

Channel 20  
channel 12  
Channel Inserts 6, 10  
Controller Behavior 19  
controls 4  
Cubase 13  
Cubase VST 3

## D

Default 19  
Devices 7  
Direct 20  
Dry control 8  
DSP Usage 18

## E

EDIT 4  
Effects 6, 10  
Export 13  
Export Audio 13  
External Word Clock 18

## G

Global Control Bar 20

## I

insert rack 7  
Inserts 10  
Instruments 3, 9

## L

Latency 16  
Latency Compensation 21  
Logic 13

## M

Master Effects 7  
Master Inserts 7, 11  
Merge 13  
MIDI channel set 10  
MIDI keyboard 5, 10  
MIDI track 5, 10  
mixer 4  
Monitoring DSP Usage 18  
mono 6  
Mono effects 10

## N

Nuendo 13

## O

options 4  
Output 5

## P

panel 3, 7  
phase cancellation 8  
Post 8, 12  
Pre 8, 12  
Processing Instruments and Effects to a File 13

## R

rack slot 4  
Reload IOs 16

## S

Select All 16  
Send Effects 7  
send rack 12  
Settings 19  
Sources 15  
stereo 6  
stereo effects 10, 11  
Sync 16  
Sync Plate 18  
synthesizer 3  
Synthesizer Global Control Bar 20

## T

track list 5

## U

U KNOW 007 3  
ULLI Settings 15, 16  
Using Modules With Your Sequencer 3

## V

Vertical 19  
Voices 20  
VST Channel Mixer 2 4  
VST interface 3  
VST outputs 4  
VST Send Effects 7