



**Review: Sample Modeling Mr. Sax T.
Created by Stefano Lucato
by Rick Paul - 2nd March 2009 -**



Sample Modeling, the virtual instrument and music technology company formed as a collaboration between Dr. Giorgio Tommasini and Peter Siedlaczek, got off to a strong start with [The Trumpet](#), a virtual instrument that raised the bar for emulation of its namesake and several related instruments. In fact, The Trumpet advanced the state of the art for wind instrument emulation in general with new techniques for real-time modulation, making more accurate emulation not only possible, but also playable.

Well, Sample Modeling is back, and this time Messrs. Siedlaczek and Tommasini have teamed up with Dr. Tommasini's longtime music technology collaborator, Stefano Lucato, to tackle one of the most difficult wind instruments to emulate believably, the saxophone. Specifically, Sample Modeling's new Mr. Sax T. virtual instrument tackles the tenor saxophone. Will Mr. Sax T. live up to the high standards set by the Trumpet and Messrs. Tommasini's and Lucato's earlier collaborations (with Gary Garritan on the [Garritan Stradivari Solo Violin](#) and [Garritan Gofriller Solo Cello](#))? Let's look and see.

Background



At the high level, Mr. Sax T. provides a single virtual tenor saxophone instrument, with variations for the Native Instruments Kontakt 2 and Kontakt 3 samplers. Mr. Sax T. includes a copy of the NI Kontakt 2 Player, so there is no need for users to own either of the full Kontakt samplers.

Mr. Sax T. is the brainchild of musician, producer, and music technologist Stefano Lucato, who has brought a new patent-pending technique, Synchronous Wave Triggering, to the table for this project. This technique allows real-time multi-vector morphing across time, timbre, and pitch. If that description reminds you of the time you fell asleep in Physics or Calculus class (been there, done that), here's a simpler way to think of it. The saxophone is a complex instrument that has many aspects to its expressiveness that can be controlled, independently in many cases, by the player in real time. The technology behind Mr. Sax T. allows morphing between the multiple dimensions of the sax's sound in a manner that minimizes the size of the sample library needed while maximizing the playability and expressiveness of the virtual instrument. Characteristics such as sub-harmonics, growl, pitch bend, and vibrato can all be manipulated in parallel while the technology behind Mr. Sax T. figures out what that means in terms of the sound of the sax at any given time.

Of course, Mr. Sax T. also employs techniques previously used in The Trumpet, as well as other collaborations between Messrs. Lucato, Tommasini, and/or Siedlaczek. Instead of rehashing those techniques here, though, I will refer those who are interested to my May 2008 [review of The Trumpet](#). I will mention one key difference, though. Whereas The Trumpet provides multiple keyswitches to invoke different types of attacks and releases, call out specific modes of portamento, and invoke various real-time playing techniques, Mr. Sax T. uses absolutely no keyswitches. Most techniques used within Mr. Sax T. are playable through either the keyboard (or other MIDI controller) or various MIDI continuous controllers. A few additional techniques are called out as options within the Kontakt 2 Player (or Kontakt 3) interface.

Mr. Sax T. is supported across multiple plug-in formats, as determined by the formats supported by the relevant Kontakt engines. Those formats include VST (Windows/Mac), RTAS (Windows Mac), and AU (Mac only). A standalone version of the Kontakt 2 Player is also provided. The standalone version supports ASIO, DirectSound, and MME on Windows, though, in practice ASIO will be highly preferable due to low latency (less than 7 ms) considerations. The standalone player supports Core Audio on the Mac. Sample Modeling recommends running Mr. Sax T. on a relatively modern system. Their primary validation system included an Intel Core 2 Duo E6600 CPU, 2 GB of RAM, Windows XP, 2 SATA hard drives, and a 24-bit, low latency audio card. On that system, Mr. Sax T. consumed approximately 5-7 percent of the CPU.

While Mr. Sax T. can be programmed, maximum enjoyment will come from actually playing it. To do this in real time, you will need a controller keyboard with at least an expression pedal or breath controller, pitch wheel, and modulation wheel. Additional configurable controllers would also be helpful. Alternately, almost any type of wind controller will work well for playing the instrument. Sample Modeling provides specialized configuration controls to tailor Mr. Sax T.'s performance with a wind controller. (Side note: I didn't have a wind controller to try with Mr. Sax T. for this review. However, having watched a couple of videos of users playing Mr. Sax T. with wind controllers has put a wind controller high on my wish list for possible future acquisitions. To see what I mean, check out www.youtube.com/watch?gl=IT&hl=it&v=rWf_1ajq32E and www.youtube.com/watch?v=gtvmcRKsHto.)

At present, Sample Modeling sells Mr. Sax T. via direct download via Digital River's Share*It! service only. List price is 119 euros, with the current US Dollar price at \$159. Sample Modeling also offers a bundle of Mr. Sax T. and The Trumpet at a discount of 20% off both instruments. An optional backup CD is available at extra cost. The packed size of the Mr. Sax T. download is approximately 280 MB. Other purchase and download considerations are as for The Trumpet (see the [product review](#) for more details).

In addition to the downloadable software for Windows and Macintosh, the product includes three Adobe Acrobat format documents, which need to be manually copied from the downloaded ZIP file to the product's documentation directory. These include the *Kontakt Player 2 User Guide*, a 6-page *Short User Guide to Mr. Sax T.*, and a *ReadMe*. The *ReadMe* document includes both a Quick Reference guide and the legalese governing the license terms for the product.

Other than having to extract installation files from a ZIP file and manually copy the documentation, the installation process is a straightforward Windows (or Mac) installation, and also installs the Kontakt 2 Player. Software protection is via the NI Service Center facility. The product will run for up to 14 days without authorization. After that, authorization is required to continue using the product. If your system is connected to the internet, authorization via the NI Service Center is a relatively quick and painless matter.

I tested Mr. Sax T. under Cakewalk's [SONAR 8 Producer Edition](#), version 8.0.3. The test system has an Intel Core 2 Duo E6600 CPU with 4 GB of RAM and Windows XP SP3 (fully patched to latest Windows Update levels). The audio interface was the [E-MU 1820M](#), running v2.0 DAS drivers and PatchMix software.

The Instrument

At the user interface level, Mr. Sax T. is a standard Kontakt instrument, albeit one that makes heavy use of scripting to respond to the user's playing. Versions are provided for Kontakt 2 and Kontakt 3, and it is important to load the appropriate one for the sample player you are using.

It is also important to be cognizant of the sample rate you're using. Most software instruments transparently match the sample rate of the plug-in host, which is generally also matched to the sample rate of your audio interface (a requirement in SONAR, though other DAWs may differ). However, Mr. Sax T. features a manual internal sample rate (ISR) setting which is not directly tied to any host or audio card settings. If you do not set that to match the host and audio card settings, playback will be affected, for example with missing notes. It is also worth noting that Sample Modeling strongly recommends rendering Mr. Sax T. at 88.2 kHz for best audio quality, independent of the sample rate to be used in the end result. This consideration relates to the optimal operation of the Mr. Sax T. engine, which works better at the 88.2 kHz, not just a matter of any slight improvement in sound that might come from using higher sample rates. It has an effect on the quality of the instrument's sound, especially on higher notes, though how noticeable the difference is will depend on how exposed your sax part is in the context of your recording, not to mention how well your ears notice subtle differences. I'll discuss some further considerations of this recommendation below in the "Playing Around" section.



Beyond the internal sample rate setting, Mr. Sax T. features a number of static, preference-oriented settings. Some basic ones include the type of controller you are using (keyboard, breath, and two types of wind controllers), what feature the sustain pedal (CC#64) maps to (growl, sub-harmonic, or reduced velocity), what governs portamento time (velocity, CC5, or the inverse of CC5 values), and attack preferences (combinations of soft/hard and smooth/enhanced). The attack preferences are particularly useful for affecting the character of the "player". For example, the difference between a smooth/soft attack and an enhanced/hard attack is significantly more pronounced tonguing in the latter.

Other static parameters include master tuning (in semi-tones from A=440 Hz), the amount of expression randomness (for keyboard mode only since this is to simulate some of the inherent randomness of breath control, which will come from the player using a breath-based controller), pipe resonance intensity (labeled as "ModalRes"), randomness of sub-harmonic intensity on transitions (labeled as "T.SH"), and pitch bend sensitivity. It is also possible to set parameters that would normally be controlled by MIDI continuous controllers with static values. However, the most realistic results will be obtained by manipulating these controls in real time.

Speaking of real-time control, Mr. Sax T. provides a number of parameters. One of the most critical for expressive real-time performance is CC#11 (expression pedal), CC#2 (breath controller), or CC#7 (volume) for incoming expression, which is equivalent to airflow and relates to volume in this context. Other critical ones for basic real-time playing include note on velocity (controls attack dynamics and can also be used to control portamento time) and CC#1 (mod wheel -- controls vibrato intensity). Pitch bend is also essential, and behaves asymmetrically, with a much larger bend down than up to match the related characteristics of a real saxophone. Close behind these, but less likely to be available for real-time use to the non-octopuses among us, is CC#19 for vibrato rate. The values of all of these parameters except pitch bend, plus overall dynamics level (*pp* to *ff*), are represented in real-time on a set of five columnar bar graphs near the center of the Mr. Sax T. interface.

While you'll no doubt have run out of hands and feet by this point, there are several additional controls that can enhance the expressiveness of Mr. Sax T. CC#8 (called DynPitch) controls the amount of pitch modulation on variations of dynamics. CC#9 controls the amount of key noise from the instrument. CC#20 controls sub-harmonic intensity. CC#21 controls growl, and CC#23 controls flutter tongue. Note that growl and sub-harmonic intensity are best controlled via continuous controllers, but there is also an option, via one of the static settings, to control one of these via the sustain pedal (CC#64). This can be helpful for real-time playing once you've run out of hands for controlling parameters in real-time. My general thought would be to use the sustain pedal for one of these for live playing, but overdub or program the continuous controllers when using Mr. Sax T. within a sequencer.

Keep in mind that all these continuous controllers can be working independently in real-time, and the transitions in the sound are seamless. This makes for an extremely expressive instrument, just like a real saxophone. Note, though, that it is indeed an instrument, complete with the notion that achieving best results will require practice. The good news is a remarkable level of believability can be obtained fairly easily, with relatively intuitive playing techniques, especially if you're already used to playing The Trumpet or the Garritan Stradivari or Gofriller solo string instruments. If there is any bad news, it is simply that you'll run out of limbs before you can get to all of the expressive possibilities of the instrument in real time.

Playing Around

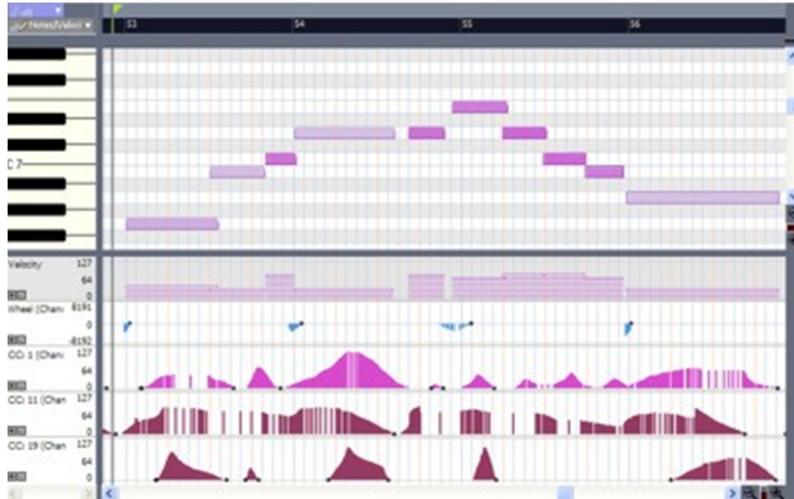
I started out working with version 1.01 of Mr. Sax T. I was up and running shortly after skimming through the brief documentation to get a handle on controller use. While I have some hardware limitations, namely an expression pedal whose granularity is far too coarse for optimal expression with an instrument like this, Mr. Sax T. still played wonderfully under the circumstances. It was immediately clear that it stood head and shoulders above any saxophone emulations I had tried prior to that point. It also sounded better to me than any I'd heard in web-based demos of products I had not personally tried. The saxophone is a very tough instrument to get right because of all the dimensions of its expressiveness. Most sounds I've used before are good in some areas and not so good in other areas. There is a very real danger of sounding "synthy" in areas where they're not so good. By contrast, a real saxophone can go from smooth to honky in a heartbeat if that's what the player desires (and the player is capable enough). Mr. Sax T. delivers that same potential.

Within an hour or so of starting to play with Mr. Sax T., I felt pretty comfortable playing it. I got right down to business trying to use it in a recording, experimenting with an original jazzy arrangement of a classic song. The instrument literally inspired the arrangement as I just kept "wailing" with it, going through the piece over and over, enjoying playing Mr. Sax T. in real time while trying to come up with a more solid, repeatable part. When I finally started recording a part of my arrangement, I noted that Mr. Sax T. got stuck notes anytime SONAR's transport was stopped in the middle of a note. This was true even when the Kontakt setting to respond to a MIDI "all notes off" command (which is what SONAR sends, rather than individual note off messages, when its transport is stopped) was engaged. I had to work around that issue for the time being, but that turned out to be a bug in V1.01 that was resolved in V1.02, which is now available through the NI Service Center's automatic update facility.

Once I got the part down, I made a few additional passes overdubbing additional controllers to add to the expressiveness. Within a few hours of having started using the product, I had a performance down, and most who heard that agreed with my perception that this product represents a new level of realism for saxophone emulation. Most also agreed that my own playing techniques with it were lacking in a few important areas, such as remembering to give the "player" time to breathe. (Hey, it's been a few decades since I've played a real clarinet or sax, and we keyboard players can breathe and play at the same time!) That was a point well taken, though, in that believability of an emulation is affected not only by the capabilities of the product, but how that product is used.

After this initial experiment, I updated to V1.02 of Mr. Sax T. for my further uses. My main such use was as part of a brass section arrangement (alongside The Trumpet and a trombone from the Garritan Jazz & Big Band library) I added to a recording that is currently still in progress. The context here was more of a pop/rock thing, and Mr. Sax T. fit the bill nicely. In this case, because I am trying to make this part of a polished recording, I decided up front that I would put in the effort to automate the continuous controllers for maximum believability and expression. My first cut of the brass part of the arrangement was a big step up in believability from anything I've been able to do

before on the sax front. However, my experimentation since then has also helped me identify some areas where I can improve things through further work with continuous controllers, which is where I'm sitting with this project as I write this review. I might add that some of those areas would "come for free" with a wind controller, such as synchronizing the ramp up and down of the expression curve to the notes and phrasing at beginnings and ends of phrases.



Speaking of additional experimentation, further consideration of how wind controllers work, along with looking at some example MIDI files Sample Modeling provides on their web site to show Mr. Sax T. in use, inspired me to mess around some more with what could be done through intelligent editing of MIDI continuous controllers. While those experiments have mostly convinced me I'd really like to have a wind controller, I also found that even editing the MIDI information manually can fairly quickly obtain significantly more realistic results. Mind you, the difference between what can be done with Mr. Sax T. just by playing it, even with an expression pedal whose granularity is too coarse, and what I've been able to do with any other sax emulation to date is significant, and Mr. Sax T. might well fool many listeners. I'm a bit masochistic in this, though, in that I'd also like to be able to fool sax players. I think it just might be possible!

In my first experiment with Mr. Sax T., I used it at 44.1 kHz, which is the sample rate I most frequently use for multi-track recording projects. For my second project, though, I decided to try working at 88.2 kHz. This was partly because I wanted to try out Mr. Sax T. at its optimal rate as recommended by Sample Modeling. However, I was also curious about what considerations might arise from working on a multi-track project at a higher sample rate, and, especially, about what sort of aural differences, if any, working at such a rate might make in my end results. Because SONAR only permits one sample rate within a project, I had to do a fair amount of setup work to convert the project, which I'd initially started at 44.1 kHz, to 88.2 kHz. Luckily, it was, to that point anyway, a 100% softsynth project, with the exception of one count-off track, which was an audio loop. Thus, this just meant getting rid of the count-off track and unfreezing the softsynth tracks so I could save the project without audio then load it again later at the new sample rate.

In this case, I wanted to try working at 88.2 kHz, so decided to convert my existing project to that sample rate. However, if you do not need or want to work at 88.2 kHz for your entire project, there are other ways to render Mr. Sax T. at 88.2 kHz that aren't quite as obtrusive to workflow as the method I used here. In particular, another key possibility would be to just go ahead and work at 44.1 kHz while arranging and tracking your parts. Once you had the sax part ready to render, you could save a copy of your project without any audio or other softsynths, then load that project at 88.2 kHz, and render your Mr. Sax T. part. Finally, you would go back to the original 44.1 kHz project and import the audio file you'd rendered in the 88.2 kHz copy into the 44.1 kHz project for mixing. You'll also then need to archive your Mr. Sax T. tracks and disconnect the instance of the Kontakt Player Mr. Sax T. is using from the Synth Rack to free up its memory.

Once I was working at 88.2 kHz, I ran into a few issues, some predictable and at least one unexpected. The main predictable one was that working at the higher sample rate consumes more CPU power all around. This is natural since twice as much audio data has to be processed. This also means any rendered tracks will have twice as much data, which further means that disk bandwidth usage for rendered tracks will double. The key unexpected issue I ran into was running out of application memory. 32-bit Windows XP Home provides a maximum of 2 GB of application memory to SONAR. My recording project had been running close to its threshold at 44.1 kHz, but went over the edge at 88.2 kHz. Further investigation showed this was due to Toontrack EZ Drummer's using a couple of hundred megabytes more memory at 88.2 kHz than at 44.1 kHz on the kit I was using. Other softsynths I was using in the same project did not use significantly more memory at 88.2 kHz than at 44.1 kHz. Thus, I am writing this issue off as likely being specific to use of EZ Drummer and that my project had already been near its limit on memory usage.

Beyond those considerations, Mr. Sax T. worked equally well at 88.2 kHz as it had at 44.1 kHz. Of course, I also got the benefit of more optimal rendering due to the way the Mr. Sax T. engine works, which was the key point of working at the higher sample rate.

Closing Notes

My verdict? Mr. Sax T. does for the tenor saxophone what The Trumpet did for the trumpet, cornet, and a few other trumpet-like instruments. That is all the more impressive to me because of how difficult a sax is to emulate, and perhaps because I did at one time actually play saxophone (though let's not talk about my tone on the instrument, please). Mr. Sax T. is another entry in the fine line of instruments that bear the marks of Messrs. Lucato, Tommasini, and Siedlaczek.

If there is anything on my wish list, it would simply be to have additional saxophones of the same caliber, especially alto, soprano, and baritone saxes. I understand, through comments made by the Sample Modeling guys on their forum, that alto and baritone models are likely to be coming in the not-too-distant future.

Value for money here is not quite as strong as in The Trumpet. That package is only about 50% more expensive than Mr. Sax T., but delivers seven times the number of instruments (including the three trumpets plus additional trumpet-like instruments). I would have preferred to see the entire sax family come in around the same price tag as The Trumpet. Perhaps, though, Sample Modeling will have some pleasant surprises (i.e. discounts) for uses who choose to purchase more than one instrument in the sax family with the additional instruments are introduced?

The bottom line, though, and pardon me if I sound like a broken record, is that Sample Modeling has once again raised the bar in instrument emulations. I'm pretty sure I will not be the only one eagerly looking forward to the rest of their saxophone series and whatever else they may have on the table (I've also heard a trombone may be coming).

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