

Akai S1100 Stereo Digital Sampler

A User Report by Mike Collins:

S1100 RRP: £3499 inc. VAT
(cf. S1000 RRP £2799 inc. VAT)

Specs:

- 16-note polyphonic, rack-mounted, stereo digital sampler.
- 44.1kHz, 22.05 kHz sampling rates, 16-bit resolution.
- 20Hz - 20kHz, 20Hz - 10kHz bandwidths.
- 2 Megabytes of memory as standard, expandable to 32 Megabytes.
- Sampling Time (2 MByte RAM): 23.76 secs - mono @ 44.1kHz; 11.88 secs - stereo @ 44.1kHz; 47.52 secs - mono @ 22.05kHz; 23.76 secs - stereo @ 22.05kHz.
- Features time-stretch, SMPTE read/write, and cue lists for A/V work. Has 8 individual + stereo analogue jack outputs, plus XLR AES/EBU digital outputs.
- Optional IB-04 digital interface board provides digital in/out and DAT backup.
- Will read S900, S950, and S1000 disks.
- Further info: Akai UK

Preamble:

Most recording engineers are probably familiar with the ubiquitous Akai S1000 sampler, which has taken up its position as the "industry-standard" model here in the UK. This model built on the success of its forerunners, the S900 and S950 models, by adding stereo capabilities, and 16-bit/44.1kHz specifications. It has been judged by many to be the best in its price-bracket for overall performance and reasonable ease-of-use.

Studios appreciate longevity in the equipment they use, especially if the specifications can be upgraded to keep up with the latest developments in the technology. Yamaha recognized this factor when they used the user-interface from their popular REV 7 digital reverb unit on their more-recent REV 5, for instance. If the operational aspects of a piece of fairly-complex equipment such as this remain essentially the same, engineers who have found the time to familiarize themselves with the original model can continue to work with new models which retain a familiar user-interface.

In keeping with this aim, Akai have recently made available the S1100 sampler, which has better general specifications, and several new or improved features, compared with the S1000. Yet the basic operation of the two models remains the same, so, if you know the S1000, you more or less know the S1100!

First Impressions:

The S1100 comes supplied with just four 3.5" floppy disks containing factory samples: Grand Piano #2 contains a very useful program of piano samples which have been very professionally trimmed and looped. Orchestral #1 has

a selection of strings, orchestral brass, oboe, and flute. The strings are excellent, but I have heard better brass, oboe, and flute. Workstation #5 has a selection of instruments suitable for a modern dance track, including piano, guitar, clavinet, bass and drum sounds. Sample Wave Mixing #8 contains a very good selection of pads, lead sounds, Xylophone and Marimba, and synthesizer sounds, which could be very useful for film scores, for instance.

After checking out the factory disks, I tried out some S900, S950, and S1000 disks which I had to hand. All the disks loaded perfectly, and the programs loaded as well - this latter feature saving you from having to recreate your keygroup mappings when transferring sounds from older libraries. The S1100 effects will obviously not be allocated when you load other formats - however, it is quite easy to set suitable effects up yourself, once the programs are loaded.

Multi-Effects:

The S1000 is actually the first sampler to feature internal multi-effects, as the manual proudly announces, and there are 50 preset effects to choose from. These include several types of Reverb, including various halls, rooms, and plate reverb simulations. The next category is Chorus/Flange, which use a complex algorithm with four delay lines modulated by a low frequency oscillator to produce "rich, swirling stereo effects". A separate delay lets you add echo effects to these. A stereo Pitch Shifter lets you transpose sounds up or down by as little as 0.01 of a semitone for subtle detune effects, and up to 50 semitones for a more 'outrageous' result. The last category is Echo, and a three-tap delay line is used here, with feedback and pan independently-adjustable for each delay line. Using this, you can set up effects similar to those of the old Roland Space-Echo and similar tape-delay units with multiple heads. In all, there are 20 preset reverbs, 10 chorus/flange/delay FX, and 10 multitap delays - all editable.

Each effect has its own level, EQ, Pan, and width controls, and every program on the S1100 can have its own unique effects. This is in contrast to some synthesizer units with built-in effects, where these effects are linked to particular sound programs, such that it can be difficult to re-program these for use with other programs. On the S1100 there is an Effects File containing 50 effects, and these can be freely assigned to any program number. If there is a reverb you like on one disk, you can easily select this for use with any other program. You can even apply the same effect to several programs if you want to, with different amounts of effect applied to each of these using the effects send in the Mix Page of the Select Program mode. And the 'icing on the cake' is that you can use the S1100 effects as a stand-alone unit, where you route, say, a Prophet 5 synth into the S1100 and out to your mixer after adding effects. This feature can even be used in combination with the internal sounds - so you could play the S1100's sounds and route an external synth through the S1100's effects. This is a pretty flexible scheme, and the S1100 definitely scores a few extra points for this feature.

Main Features:

The review model had Software version 1.0 operating system in ROM, and the manual stated that there was provision for future upgrades to be loaded from disk into RAM. The excellent manual was written by Steve Howell - a freelance Midi specialist working for Akai (Japan) here in the UK. Steve Howell explained: "the S1100 has 16-bit quantisation, with oversampling on input - the same as the S1000. However, it has a 20-bit Digital-to-Analogue Converter (DAC) with 64 times oversampling on output - as opposed to a 16-bit DAC with no oversampling on the S1000. This means

less noise and greater dynamic range from the S1100. The 20-bit DAC's allow you to boost the levels of individual outputs in Edit Program mode by up to 12 dB, and you can boost the main stereo level by up to 6dB." This last feature is Akai's response to feedback from users about the S1000 - which shows that they do listen!

I asked Steve about using computer-based editors for the S1100 control functions, and he told me that many of these functions will be accessible via SysEx in a future upgrade. This will enable editor software to be written for the S1100 on personal computers sometime next year - maybe. Personally, I think Akai should put a higher priority on this, as many people like to control their Midi gear from one central location via computer.

One of the best features in the S1100 is 'Time-Stretch'. This lets you lengthen or shorten a sample from 25% of its original length to 2000% (twenty times) its length. Here you can alter the length of a drum rhythm sample to fit in with the rest of the track without altering the pitch, or fit sound effects or vocal phrases to video soundtracks to get the timing exactly right. I tried this on a four-bar drum rhythm sample, and it took 7 minutes to create a sample stretched to twice the length. This worked perfectly - the tempo dropped to half the original, but the pitches of the drum sounds stayed the same! There are actually two 'modes' of operation available: 'Intell', which is for speech and music (which I used on the drum rhythm sample), and 'Cyclic', which is suitable for individual instrument samples. I tried 'Cyclic' on some voice samples, and can report that this also worked perfectly well in practice: I sampled an 'Ah' voice sound, and wanted to create a C Major triad chord (C3, E3, & G3) from the original C3 sample. I used Time-Stretch to create new samples at E3 and G3, and then played and held the chord on my Midi keyboard. When the samples reached the end of their length, they all finished at the same instant - in contrast to what normally would have happened if I had just mapped the original C3 sample to play on the E3 and G3 keys, where the highest note would have finished first, followed by the middle, then the lowest note.

Another major new feature is the Q-Play mode, where you can create, edit, and play cue lists. This is aimed at audio/visual post-production suites which do not use Midi equipment (are there still such places in existence?). The idea here is that you enter a Midi note to trigger a specific sound effect at a specific SMPTE location, and build a 'cue list' of these that will play back at specific frame locations on your video. You can even create your cue lists 'on the fly' while the video is playing. The S1100 now has its own built-in SMPTE code reader/generator to facilitate this, and the beauty of this system is that you don't need a Midi keyboard to trigger your samples to SMPTE any more. It is a shame that the code reader won't handle Midi Time Code (MTC) though, because quite a number of A/V studios do actually have Midi equipment, and MTC would be the ideal code to integrate the S1100 into a Midi setup.

The S1100 also has a built-in 'virtual' mixer with FX sends, pans, and level controls for the individual and stereo outputs. Talking about stereo outputs, there is an extra pair of these, via XLR's, which provide 'real-time' digital

output in AES/EBU and S/PDIF formats. Using these, you can output audio to most professional digital tape recorders or DAT machines.

Backup and Sound Libraries:

You can still use the optional IB 04 AES/EBU digital interface board (as with the S1000) which lets you sample in from DAT or CD digitally, and transfer data out to DAT. Using this you can backup the memory, or a hard disk, onto DAT, including all your samples, program information, looping information, and so on. So this is a worthy addition to the system, even though there are direct digital outputs built-in - because these don't allow program data backup.

There is also a built-in SCSI (Small Computer Systems Interface) interface, which lets you connect any Apple Macintosh-compatible hard disk drive to the S1100 to hold your sound libraries. Various third-party manufacturers can supply rack-mounted CD-ROM drives, 45 meg removable hard disk drives, and up to 1.2 gigabyte hard disk storage devices which use SCSI. A popular combination is a CD-ROM drive and a 45-meg removable drive in one convenient 19" rack.

There are no specific sound libraries available for the S1100 yet, apart from the four 3.5" factory disks that come with the machine. However, you can buy at least half a dozen CD-ROM disks containing different S1000 or S900 formatted samples. Also, many dealers have large libraries of samples for the S1000/S900 which they will let you copy onto 45-meg removable drives for a nominal fee.

RAM:

The standard S1100 has 2 Meg of RAM, and this is expandable to 8 Meg using 2 Meg units, or to 32 Meg using 8-Meg units (as is the S1000). This gives you from 11.88 seconds for a stereo 44.1 kHz sample using 2 Meg, up to about 3 minutes and 10 seconds in 32 Meg - just about the length of an average-length 7" single, for instance! On a warning note, Akai say that third party memory boards are not recommended, as inferior Korean-manufactured units may not work properly.

Version 2.0:

Akai have already announced that Version 2.0 software (available early next year) will allow direct-to-disk recording with basic editing facilities. For instance, you will be able to have sequenced sounds playing from RAM in the S1100, and, say, a sax solo playing back from a hard disk. This will make the S1100 very much an 'all-round' recording tool - for studio use particularly. For instance, if you use the S1100 to record material for your master in the studio, you could then take this to a Sound Tools-equipped editing suite, and make careful edits to your vocal tracks, or whatever, with no loss of quality, and only paying for the editing equipment, rather than for a full-blown recording studio. You could then transfer the edited sounds back to the S1100 and use these on your final mix.

Use with Digidesign Sound Tools:

You can transfer S1100 samples to and from Sound Tools' Sound Designer II (SDII) sample editing and hard disk recording software on the Macintosh via SCSI - using the S1000 sampler setting in SDII! I transferred the 35 Piano samples from the factory disk into SDII, and found that I was able to improve some of the loops using SDII's superior facilities. Then I sampled a Wurlitzer Electric Piano into Sound Tools, trimmed and looped the samples, and then transferred these into the S1100. Here I found that trimming and looping were much easier to carry out using the SDII software. Unfortunately, I discovered that you cannot play the S1100 via Midi while it is connected to the Mac via SCSI - and if you turn the SCSI off without quitting Sound Designer first, the Mac crashes! Once set up properly, the transfer of short individual samples is very quick, however.

Unfortunately, there is no way to ask the S1100 to send all its samples, one after another. You have to select them in turn, and then transfer them individually. The selection is done via a scrolling numerical field in a dialog box on the Mac, and if you want to select the 20th or 30th sample, for instance, this can be a tedious process. Also, I encountered several mysterious Macintosh "crashes" while transferring sounds via SCSI. The watch cursor would appear onscreen and refuse to go away until I turned the Mac off! And another mysterious problem occurred as well - while the SCSI cable was connected to the S1100, unpleasant noises found their way into my monitor amplifier every time any of the disk drives on the Mac were active, or the S1100 SCSI transfers were taking place. I disconnected the mixing desk from the monitor amplifier, and it still happened - but only with the S1100 SCSI linked to the Mac!

Despite these problems, I do recommend Sound Designer (or Alchemy software) to professional users - as the onscreen editing and looping features are far superior. Using sample editing programs such as these will save you precious studio time and allow for much more accurate work.

Conclusions:

The previous top-of-the-range samplers from Akai, the S900, S950, and S1000 all became "industry-standard" models here in the UK. Akai have worked hard to provide useful new features for the S1100 to help it to maintain this position.

There is still room for improvements to the design - for example, setting loop startpoints can be difficult, especially as the waveform is not displayed sufficiently well for you to see its envelope properly. It can also be awkward to move between some of the parameters which you need to edit on different 'pages'. I believe that front-panel editing software for personal computers (as well as the existing sample-editing software) would be very advantageous for studio use.

It is good to see the continuity of the S1000 instrument 'family' in the 'wet-fish' market of hi-tech Midi equipment - where each year brings a 'shoal' of new models, often with radically-different user-interfaces which the poor

musician or engineer has to struggle to learn 'on the job' at his next gig or session.

I wish Akai every success with this revamped S1000, and it is a welcome addition to their range of professional samplers. The S1000 model is still available, as are the playback only and keyboard versions, but studio users may well opt for this higher-spec S1100 rackmount unit.

Mike Collins © November 1990