Mutec iClock

In any discussion of infrastructure, there is the risk of tedium. In general we are all happy to ignore the rather boring but vital underpinnings until something goes wrong whereupon they suddenly assume the centre stage spot. ROB JAMES assumes centre stage with a clock for all applications.

IN THIS DIGITAL AGE clocks are everywhere. Usually unseen and disregarded, clocks are the bedrock on which all else is built. From a talking Christmas card to a big broadcast facility, there is a clock at the heart of the machine. It is not simply catastrophic failure that causes problems. Incorrect rate matching, incorrect phase relationships and just plain lack of accuracy are responsible for a host of more or less egregious problems in audio and video. Even when clocks are accurate and jitter free, the sheer variety of different rates in common use is a daily nightmare for many, especially people dealing with transatlantic projects involving NTSC video and 24Frame film. Anything that could help to make life easier by dealing with at least some of this intelligently, and without operator intervention, would be very welcome. Enter the UK£1100 (+ VAT) Mutec iClock.

The iClock premise is this: unlike conventional clock synthesisers and video sync generators, the operator can define a number of required output clock rates and formats. These can include simultaneous pull-up, pull-down and varispeed. Once set, these output rates are then maintained regardless of changes to incoming reference signals. For example, if you begin with a 44.1kHz input that then changes to 48kHz, the defined output rates will remain the same.

The rear of this 1U box is populated by a prodigious number of connectors. Two BNCs and an XLR for the three external inputs, two pairs of BNCs for video out, four pairs of BNCs for Word clock out, two pairs of XLRs for AES-EBU out and two phonos for SPDIF out. Each pair of Word clock and AES-EBU outputs can be independently set, as can each SPDIF output. The RJ45 socket is for an RS485 connection to a PC.

A bright, back-lit, LCD is the operator's window into the world of iClock. All settings are made with four cursor keys. Three blue LEDs show the lock status of the currently active clock source and five red LEDs indicate the status of various iClock system parameters.

For such a versatile device the menu system is commendably simple and logical starting with reference sources followed by the various outputs and concluding with global options. Apart from the comprehensive range of standard input and output rates, the iClock can apply pull-ups and pull-downs to the Word clock outputs at the commonly used

REFERENCE SOURCES: PAL/SECAM + NTSC video; Word clock; Word clock x 256 (Super Clock); DSD64, DSD128 + DXD (384); AES-EBU3+11; AES-EBUid3+11; SPDIF; GPS; Telecom; DCF77 (German atomic clock); MSF (UK atomic clock — on request); internal oscillator; further formats via option cards.
OUTPUT CLOCK SIGNALS: PAL + NTSC Black+Burst or composite video sync; Word clock; Word clock x 256 (Super Clock); DSD64, DSD128 + DXD (384); film and video frame and field rates; AES-EBU11; SPDIF; further formats through option cards.

factors, +0.1%, -0.1%, +4.16% and –4.0%. Less common pulls can be accommodated by the varispeed function within a +/-20% range in 0.0001% steps. All this regardless of whether the reference is internal or external.

Mutec has included a number of features aimed at maintaining stable output in the face of loss or change of the reference. iClock enables tolerance ranges to be set for external references and the time interval before it will attempt to lock to the next reference and the time it will spend updating its clock source to the new rate. iClock can be set to Hold i.e. flywheel at the rate last received from the chosen input, or attempt to lock to the three external inputs and the internal generator in turn. This can either be done once (Sequence Synchronisation) or recursively (Cycle Synchronisation). When Cycle Synchronisation is active, if an external source is lost from, say, Input 1 then iClock will (after the relevant time intervals) lock to the next available source. However, once this has taken place it will then periodically interrogate Input 1 until it finds a good signal. When and if it does, it will

re-lock to it. SoftReLock comes into play whenever a reference changes or resynchronisation is required, to ensure a gradual and interruption free transition of the iClock's output signals to the new base reference.

iClock covers all the bases for audio with input and output Word clock rates from 8kHz to 24.576MHz including all the standard sampling rates and the DSD and DXD frequencies. The standard film and video frame and field rates are also provided to accommodate Pilotone resolvers, film projectors, etc. Stability and jitter performance is first class and Mutec has included niceties such as different output levels to suit a variety of interfaces and conditions. You can even add a DC offset to the SPDIF outputs for devices that don't like 'blank frame' on their inputs. The only omission is tri-level sync as used by some high definition video equipment. Mutec tells me it is working on it and something will arrive in 2006.

Currently available options include: a second power supply module for redundancy in mission critical applications; an extra video sync generator module for simultaneous PAL and NTSC outputs and conversion from PAL reference to NTSC output or vice-versa; and iC-Alarm which adds relay-coupled alarm signalling outputs. For the option slot, Word clock or AES-EBU modules are available. Each adds a further four outputs in the relevant format.

iClock is the most comprehensive solution I've seen to the clocking needs of an entire installation. If you need even more outputs, you can always add distribution amplifiers, much to be preferred over daisy chaining. In the real world we operate in, the multiple simultaneous output formats and versatile rates are the clincher. Even in a complex installation this may well be the only clocking device you will need. The redundant PSU and alarm options make it equally suitable for broadcast use. At this price, the iClock is a steal. ■

PROS Versatile; accurate; convenient.

CONS With this number of adjustable parameters preset memories would be useful; nothing I can think of.

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