

Mutec REF10 SE120 one clock to sync them all

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Mutec REF10 SE120 master clock

The REF10 SE120 is just one product, not two, and quite a compact one at that. It is a 10MHz master clock, the £5,200 flagship design Berlin-based Mutec. Not so long ago such a device would be regarded by most audiophiles as professional exotica to be found only in the exclusive setting of the recording studio. Indeed, professional users remain Mutec's primary customer constituency. Now though, as non-professional music-lovers seek the highest digital sound quality, Mutec devices are increasingly turning up in audiophile systems around the world.

In this review I'll try to show what those buyers know, and why we might want to pay attention to clocking in general and Mutec's REF10 SE120 in particular. Today, virtually all contemporary recordings are digital. Played back digitally, they should sound more faithful to the master than if we add a third stage involving a vinyl disk and a stylus. And yet, for a painfully long time, reality has defied theory. Always there was the thousand-dollar question; when will digital in the home come good on its promise and finally achieve sonics that surpass the best that can be had from vinyl?

It's nothing if not a contentious subject, but I've recently heard DACs from Ideon, Master Fidelity and Wadax that in my view turn the theory of digital supremacy into sonic actuality. File playback sounded shockingly alive, vital and natural, with a transparency akin to that of a master tape or studio master file.

The companies I've mentioned – and it's not a definitive or complete list – all use different approaches to the actual digital to analogue conversion process. What they do have in common is an understanding, clearly demonstrated in the construction of their products, that top-drawer digital requires great attention to detail when it comes to the quality of power supplies, interfaces and, here's where we get to the nub of things... to clocking, where specifically the

achievement of the lowest possible jitter and phase noise is critical for how the human brain perceives digitally recorded music.

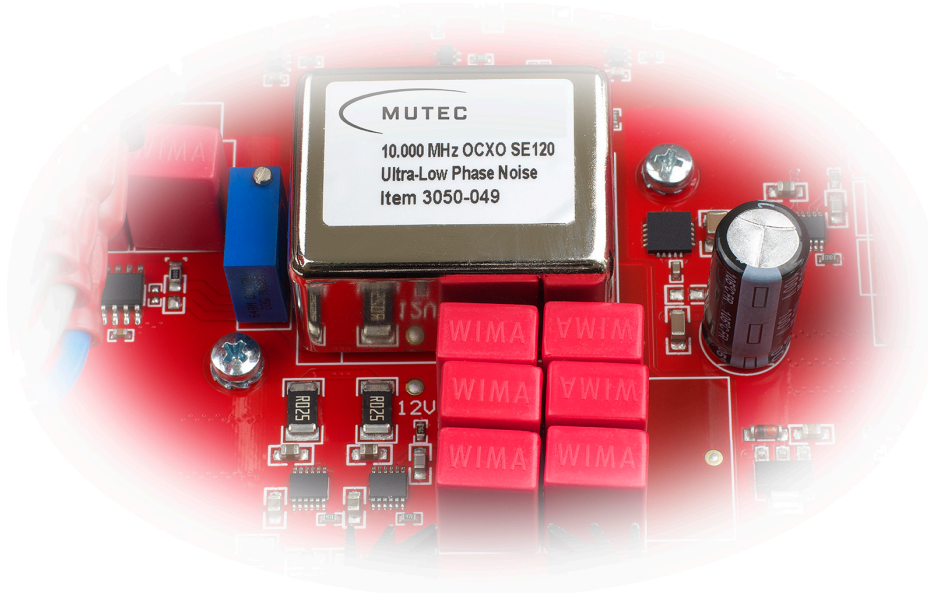
There's accurate and there's accurate

As Mutec's Christian Peters notes, so-called atomic clocks using rubidium and caesium in the oscillator are thought by the wider world as being the ultimate in time accuracy. But, while they don't drift much over the long-term and are therefore suitable for use in telecommunications and allied fields, measured over the short intervals appropriate to audio they exhibit gross sample-to-sample differences – jitter or phase noise – which have a disastrous impact on sonic quality.



Oscillators built around lab-grown crystals of quartz have proved to be much more accurate for audio applications, with considerably lower jitter and phase noise. Their stability is commonly enhanced by housing them in temperature-controlled mini-ovens, giving us the Oven Controlled Crystal Oscillator or OCXO. Lift the lid of most contemporary DACs, network players or CD transports and we'll likely find an OCXO. But quality, and thereby accuracy, varies over an enormous range. As a rule – and Master Fidelity, Wadax and Ideon are among the exceptions – manufacturers don't want to pay for the highest-spec OCXO units. That means the clock inside our digital device can almost certainly be improved upon.

Wikipedia is as good as anywhere for readers to take a crash course if they are unfamiliar with the degree of granularity involved here, but in the case of clocks for digital audio purposes,





only a few years ago single-figure picosecond performance was held to be absolute state of the art. Today, pioneers in the field are talking about accuracy measured in tens of femtoseconds. Any discussion about what sonic gains can be liberated by using a master clock such as the Mutec REF10 SE120 has to be prefaced by a caveat that will be readily understood. What we hear is going to depend on the degree to which jitter and phase noise are reduced. If our audio system has high quality OCXOs built in then the gains are going to be rather more modest than if the standard OCXOs are of average or poor quality.

Why Mutec?

I wanted to try Mutec's REF10 SE120 because it is not just the company's flagship clock but, as far as I have been able to ascertain, may well be the most accurate available for audio use from any vendor. Mutec claims – and we can have no reason to doubt it - jitter of circa 15 femtoseconds and phase noise of $< -120\text{dB/c}$ measured at 100Hz. The review sample, that Christian Peters reassured me was simply taken from production, in other words not specially selected, came with its own test card showing actual jitter of 11.57 femtoseconds.

In requesting the review sample my aim was to discover whether if we can't afford a Wadax, a Master Fidelity or an Ideon, but key units in our digital chain can accept a 10MHz clock input, can we get some of the way there sonically by using a clock like the Mutec?

The REF10 SE120 was connected via 50 Ohm clock cables to a Jay's Audio CDT3MK3 CD transport and a Master Fidelity NADAC DAC. The Mutec can be hot-swapped in and out of a system ad-lib without any likelihood of causing damage, so it's easy to do an A/B test as a track plays. For the hard of hearing, or the those lacking confidence in what their ears are telling them, the back and forth can be done as many times as necessary for a confident appraisal.

Sound quality

The review sample REF10 SE120 demonstrated that clocking at this level could deliver worthwhile sonic gains on system where only a few components accept a 10MHz input (in my case just the CD transport and DAC). The results gave 100% confidence that the relative value to be gained would rise further if additional digital components in the system could be similarly clocked.

As an example of how that might look in practice, we could hypothesise a system configured around a network player like the excellent value Hifi Rose RS 130 (£4,300). HiFi Rose is honest enough to admit that in building its network player to a price, it isn't using the most accurate internal clock. We know that because on the rear panel HiFi Rose has provided a BNC input that allows connection to... an external 10MHz clock.

If we use a Mutec REF10 SE120 with its eight galvanically isolated outputs, we can make our RS 130 network player subject to master clock signals, but also our CD transport, our switch, our USB converter and our DAC as well, as long as they have the necessary 10MHz inputs. Mutec's Christian Peters likes to characterise a clock in such a setting as akin to the conductor of an orchestra. We can all see where he's going with that.

During my time with it the Mutec made an unarguable case for itself, despite the fact that I was able to connect just two digital components to it. A good number of invited guests sat in the listening chair and I came to observe that clocking is one of those functions that some listeners initially struggle to pin down. They have a sense that 'something' has changed when the clock is slotted in and only over the course of several tracks begin to notice what that 'something' is.

Mutec REF10 SE120

Put it baaack

That's not to say that the impact is minor; more that while the improvement in dynamic energy, tonal quality and soundstaging are easily identified, the major gain, in some ways more subtle, is in musical flow and realism or naturalism. It's a quality that some people seemed slow to catch on to and give a name to. More often than not they 'got it' when the clock was removed, rather than added. "Put it baaack" was a common cry.



While many upgrades we can make to our system have instant appeal the first time they are heard, I've found that the love-affair sometimes cools almost as quickly. The really sticky changes we can make are sometimes those that take time to absorb and understand. They are what we might regard as the 'can't go back' changes.

Conclusion

So it is with the Mutec REF10 SE120. For not a lot of money in high-end audio terms it is a masterfully engineered product from a designer and his company that are pushing the boundaries of time management. Even in the modest two-box setting of the review system the Mutec clock made a strong sonic and economic case for permanent residence. It is a given that in a larger system that sonic value case would be even more open and shut.

Specifications

Type: 10MHz word clock

Outputs: 2x 10MHz 50 Ohm BNC, 6x 10MHz 75 Ohm BNC

Jitter 1-100 Hz: ≈ 15 fs

Size HxWxD: 84 x 196 x 300mm

Weight: 4.35kg

Finish: black or silver front plate

Warranty: 2 years



The ear is all about great music and great sound. It is written by hard bitten audio enthusiasts who strive to find the most engaging, entertaining and great value components and music of the highest calibre. This really is what living is all about.