



## REF 10

### The Audiophile 10 MHz Reference Master Clock

The MUTEC REF 10 is an audiophile reference master clock generating 10 MHz signals with industry-leading low phase noise (i.e. jitter) to significantly improve digital playback systems. As the conductor of your digital audio orchestra at home, the REF10 will inspire you with unheard-of clarity, graceful dynamics, and pure music.

It is the most flexible, most compatible 10 MHz clock on the market allowing you to spend less time worrying about integration and leaving you with more hours to enjoy blissful playback.

#### Features

- Audiophile 10 MHz reference generator with industry's lowest phase noise
- Improves and enhances compatible DACs, audio re-clockers, music servers, and master clocks
- Engineered around a handcrafted, ultra-low phase noise OCXO made in Germany
- Generates a very high slew-rate square wave signal for superior lock precision compared to the sine wave signals used by competing brands
- Provides simultaneous reference outputs with 50 and 75  $\Omega$  impedance for maximum compatibility with clocks and DACs by other manufacturers
- Eight galvanically isolated, individually switchable BNC clock outputs
- Revolutionary, sub-Hz optimized, lowest noise power supply for every circuit section
- Integrated, highest-quality international linear power supply
- Highly efficient power line filtering
- Intuitive user interface with noble aesthetics

Currently available digital converters, master clocks, and audio re-clockers perform acceptably when reproducing or processing digital audio. Even so, we at MUTEC felt that the existing solutions fall short of delivering the full potential of audio productions. In our commitment to advancing the state of the art and science we set out to investigate the possibilities to further enhance the performance of digital audio systems. The result of our extensive research is the REF 10, our first Empyrean Class product combining uncompromising engineering with the beauty of simplicity and the utmost clock precision.



Our research has shown that the high clock stability of so-called "atomic clocks" is limited to the long-term time domain and is therefore not suited for digital audio. In contrast to these Rubidium clocks, the REF 10 is engineered around MUTEC's hand-crafted, oven-controlled oscillator (OCXO) made in Germany, featuring highest clock stability in the time domain relevant for audiophile digital audio performance. Newly developed ultra-low noise clock distribution and amplification circuits based on sub-1 Hz optimized, lowest noise voltage sources transfer the reference signal to the REF 10's eight outputs with virtually no losses.

As a result the REF 10 fulfills both of the critical requirements for an extraordinary audiophile reference master clock: Lowest possible phase noise for unmatched audio quality and highest clock precision for most accurate synchronization.

Due to its revolutionary clock reference and its unrivaled flexibility the REF 10 can enhance the audio quality of compatible D/A converters (DACs) and re-clockers to the highest possible level. It is the perfect match and ideal upgrade for MUTEC's 10 MHz ready products like the MC-3+ and MC-3+USB Smart Clocks, as well as the iClock.

Unlock a more dynamic, more transparent sound stage with exceptional spatiality and level of detail, free from any digital blur. For all music enthusiasts reaching for the pinnacle of signal purity, audio quality, and clock precision, the REF10 is the must-have expansion to conduct your digital playback chain.

**"The REF 10 makes everything sound both louder and more dynamic, which for a mastering engineer is the holy grail. It lends a noticeable tightness to the bass and an increase in presence, but all in a very musical way. Compared to other 10 MHz reference clocks we tried it was definitely smoother and more elegant sounding."**

Matt Colton, Alchemy Mastering London

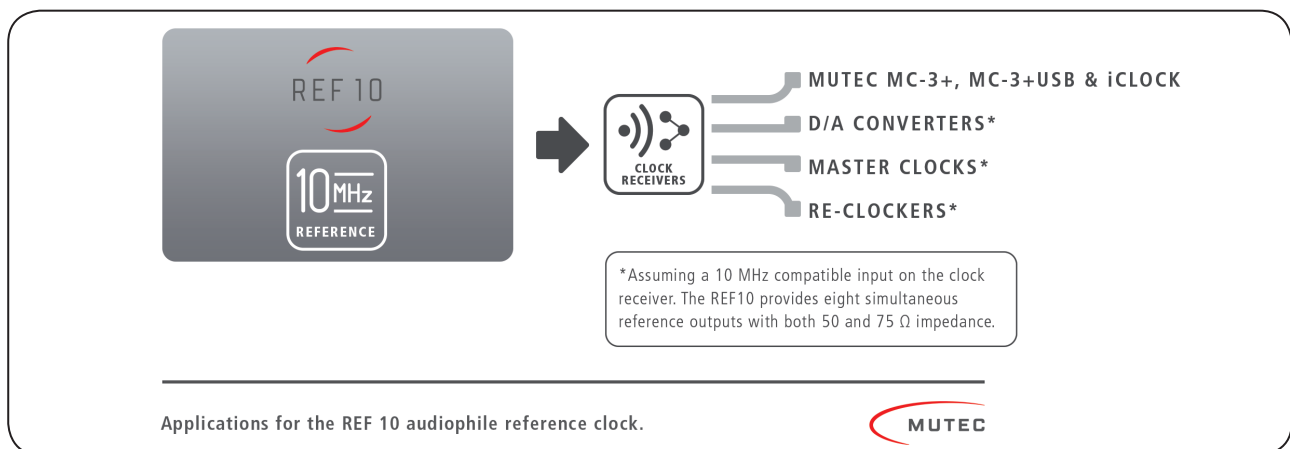
### Applications

- As an ultra-low noise, high stability clock reference for the entire digital audio chain at home or in the studio
- As an ideal high-end upgrade for MUTEC's own MC-3+, MC-3+USB and iClock master clocks
- As an audiophile performance enhancement for compatible DACs, master clocks and re-clockers by any brand

### Phase noise: dBc/Hz

1 Hz:	≤ -116
10 Hz:	≤ -145
100 Hz:	≤ -160
1000 Hz:	≤ -166
Noise floor:	≤ -170

All measurements were taken at the device's outputs and figures represent average values. Minor production related deviations will be expected.



Learn more about the REF 10 now at [www.mutec-net.com](http://www.mutec-net.com)