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Microchip Gives Its Most Precise Atomic Clock a Performance Upgrade

MHM-2020 introduces security and a modern touch panel display to the world's most deployed fleet of active hydrogen maser atomic clocks

CHANDLER, Ariz., June 18, 2019 /PRNewswire/ -- The world depends on commercially available maser atomic clock technology to deliver precise frequency and timing for applications including metrology, deep space research and global navigation. Microchip Technology Inc. (Nasdaq: MCHP), via its Microsemi subsidiary, is meeting the needs of these demanding applications with the MHM-2020, its hydrogen maser atomic clock that improves typical long-term stability performance by nearly 10 times over the previous generation MHM-2010. Building on the MHM-2010's long service life and cost of ownership legacy, the MHM-2020 offers an upgraded user experience with a color touch panel display and secure network management port.



Hydrogen masers deliver stability by operating on the principle that hydrogen atoms, in the proper environment, emit microwaves at a precise 1420405751 Hertz (Hz) frequency. Phase-locking this extremely small-power and high-purity signal to a very high-performance quartz oscillator delivers a clock output signal with the necessary long-term stability and phase noise to enable precise time keeping. Active hydrogen masers are the most advanced commercially available atomic clocks produced by Microchip, quadrupling the stability of passive hydrogen masers while providing superior short-term stability compared to cesium beam tube atomic clocks.

Designed and manufactured in the U.S., the MHM-2020 maser uses a novel drift-compensation feature to significantly improve long-term clock-drift and aging performance, which is critical for metrology and timekeeping applications. This builds on the legacy of the

MHM-2010, which set the industry's expectations for long service life and low cost of ownership. Its improved performance makes the MHM-2020 the preferred choice of national labs that work with Bureau International des Poids et Mesures (BIPM) standards for maintaining Coordinated Universal Time (UTC) worldwide, enabling users to attain <3E-16/day long-term aging along with improved temperature stability (tempco) and lower magnetic field sensitivity. The maser's short-term clock stability performance between 1-100 seconds range meets the stringent requirements of Very Long Baseline Interferometry (VLBI) for radio astronomy research such as studying black holes and other applications that require a low noise, precise frequency and timing reference.

"As the leading supplier of commercial atomic clock solutions, Microchip continues to invest, develop and deliver new capabilities to our customers," said Randy Brudzinski, vice president and general manager of Microchip's frequency and time business unit. "The MHM-2020 maser builds upon the widely valued heritage of the current MHM-2010 product and we are offering an upgrade option to customers who purchased the MHM-2010 maser during the past five years so they can benefit from Microchip's technology advancements without having to purchase a new system."

Pricing and Availability

The MHM-2020 76001-20X active hydrogen maser and upgrade package for users of applicable legacy MHM-2010 masers are both available. The maser can be specified with an optional low phase noise packaging option. Microchip supports the maser with clock maintenance, on-site repair and consulting services, as well as an extended warranty.

For additional information, contact a Microchip sales representative, authorized worldwide distributor or visit Microchip's website. To purchase products mentioned here contact a Microchip authorized distributor.

Resources

High-res images available through Flickr or editorial contact (feel free to publish):

- Application image: **https://www.flickr.com/photos/microchiptechnology/48001740312**
- MHM-2020 image: **https://www.flickr.com/photos/microchiptechnology/48001505356**

About Microchip Technology

Microchip Technology Inc. is a leading semiconductor supplier of smart, connected and secure embedded control solutions**.** Its easy-to-use development tools and comprehensive product portfolio enable customers to create optimal designs which reduce risk while lowering total system cost and time to market. The company's solutions serve more than 125,000 customers across the industrial, automotive, consumer, aerospace and defense, communications and computing markets. Headquartered in Chandler, Arizona, Microchip offers outstanding technical support along with dependable delivery and quality. For more information, visit the Microchip website at **www.microchip.com**.

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