



Technical Note: 10000303

Dynamically Adjusted Measurement Update Rate

Summary

What does "Dynamically Adjusted" mean in the Measurement Update Rate specification for the MDC-360?

Note: Frequency Resolution of the MDC-360 is "0.03 Hz @ 6 MHz", which means that when the crystal's frequency is 6 MHz, the smallest frequency change the MDC-360 can detect is 0.03 Hz.

First, the MDC-360 takes a measurement from the sensor crystal and stores this as an update. 100 milliseconds later it takes another measurement. If the frequency change is greater than 0.6 Hz (when the crystal's original frequency is 6 MHz) then it will update otherwise it keeps the last update. In another 100 ms it will measure crystal's frequency and it will again compare it to the last update looking for a frequency change greater than 0.3 Hz, half of what it was last time because of the extended measurement time. This process is repeated every 100 ms until either a frequency change larger than the resolution for that particular measurement is detected or the 2 second limit is met. If the 2 second limit is met then an update is forced with a final resolution of 0.03 Hz. This measurement algorithm gives you the benefit of high speed updates when the frequency is changing fast and high resolution when it's changing slowly.

If the MDC-360 updates itself on the first attempt then the update rate is 10 Hz, if it updates on the last attempt then it's 0.5 Hz.

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Related Products:	MDC-260 , MDC-360C , MDC-361C , RQCM , TM-400
Product Line:	Thin Film / Vacuum
Notes:	NOTE: While the numbers may not be the same, this concept also applies to other Maxtek products that specify a "Dynamically Adjusted" Measurement Update Rate.