

Trimming the PicoPak Signal Frequency Measurement

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The PicoPak Clock Measurement Module makes a coarse measurement of the applied RF signal frequency at the start of its phase lock acquisition process. That measurement is made using a 1 second frequency count, and is then used to establish an approximate 100 Hz beat note to make a more precise period measurement. The coarse frequency measurement is not critical, but must be within ± 20 Hz or so to allow the acquisition process to succeed.

Provisions are included in the PicoPak firmware and its Windows® graphical user interface application to apply a frequency calibration correction to the coarse frequency measurement should that be necessary. The PicoPak firmware has undocumented “*↵”, “*?” and “*=” commands to display, get and save that calibration value in EEPROM. It is a signed 8-bit integer equal to the required correction in Hz for adjusting the coarse 10 MHz RF signal frequency measurement, with a default value of 00 hex. This calibration value can be displayed along with a text label and prompts with the “*↵” command, read as two hex characters with the “*?” command, and entered into EEPROM with the command “*=XX” where XX are the two hex characters representing its value (80=-128 to 7F=+127 Hz range).

The PicoPak Windows® graphical user interface application adds this calibration value to the measured coarse signal frequency measurement when performing a lock acquisition. With the bVerbose flag set in the PicoPak.ini configuration file, the results of the coarse frequency measurement are displayed. The calibration value can be determined by setting it to zero, applying a 10 MHz signal, and observing the average correction required in Hz at 10 MHz to obtain the correct reading. Reselect the COM port to force a course frequency measurement. This should be done after trimming the PicoPak’s PIC clock frequency.

It is unclear whether or not individual coarse PicoPak signal frequency measurement calibration is necessary, but these provisions are available if they are.

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