



Notes on Programming Cardinal CPP Products

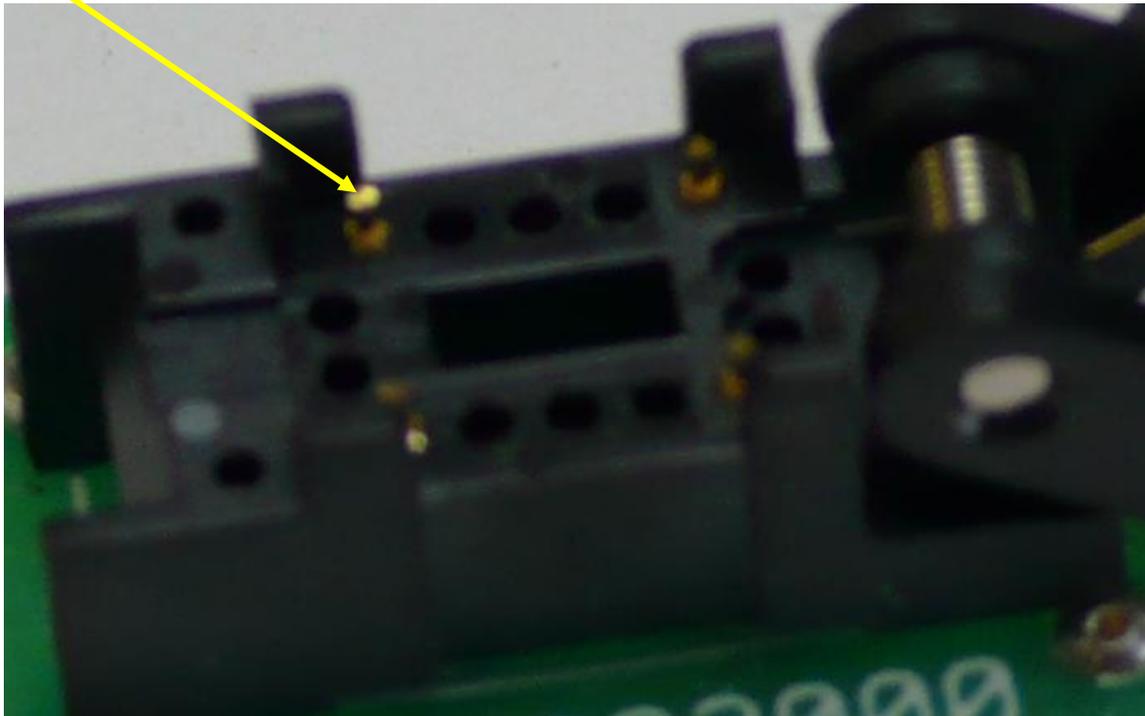
Some background on the programming process will give a framework to help understand how certain issues can possibly arise.

The blank CPP device is placed in the programmer adapter socket. The first action in programming is for the blank frequency to be read. The programmer interacting with the synthesizer IC makes additional frequency measurements to determine how much fine tuning can be performed. These frequency measurements and the final target output frequency are used to calculating parameters for the synthesizer IC to bring the output frequency within the available fine tune range. The calculated parameters are then programmed into the IC. The programmer then performs a fine tune of the device to bring the output frequency within the target PPM. A final frequency read is performed and the output frequency and PPM are displayed by the software.

As can be understood from the process above the ability to accurately measure frequency is critical. An error in the measurement of the base frequency will cause incorrect parameters to be calculated and programmed into the device. The output frequency can now easily be beyond the fine tuning range of the device and so cause a failure. An error message of "Frequency not in tolerance" or "Unable to Tune" will be reported.

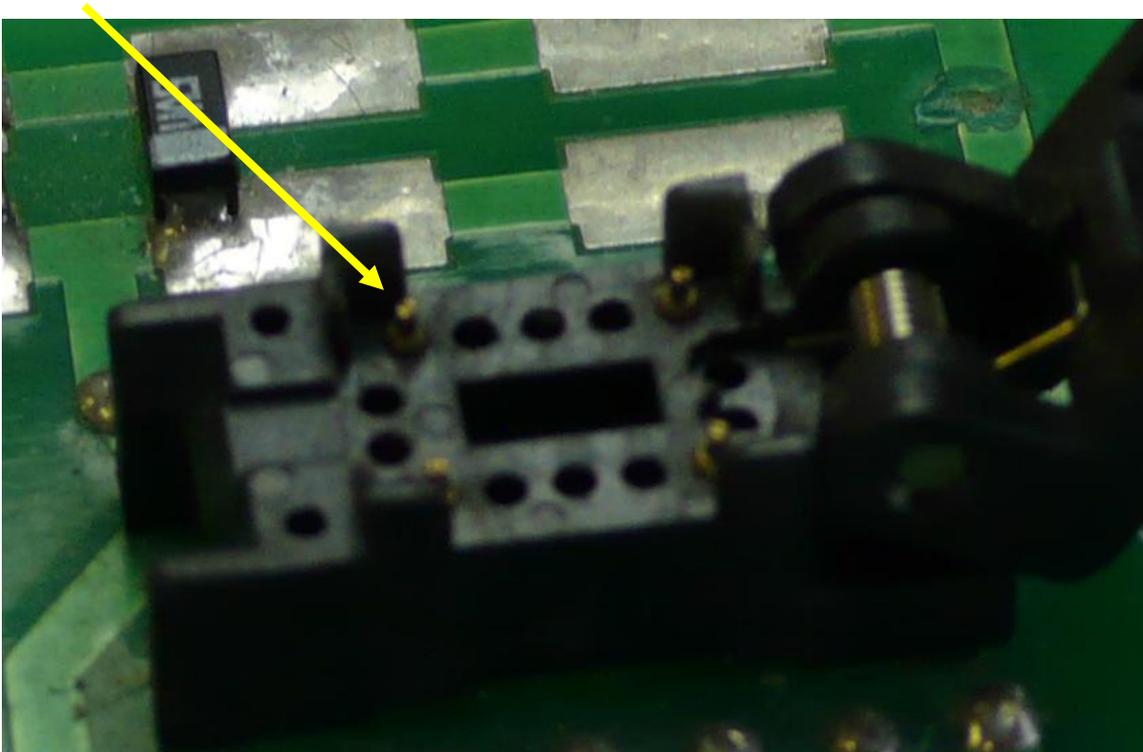
The adapter socket may look simple but is a critical component in making an accurate frequency measurement. Any marginal electrical contact between the programmer and the CPP device generates the possibility of an incorrect frequency measurement. Each pad of the CPP device is contacted through a spring loaded pogo pin.

A Good pogo pin is spring loaded and has easy movement up and down but little side to side movement. Note the top of pin is clean and shows no sign of wear.



Through rough use these pogo pins can become bent and lose their mobility and so their ability to cleanly contact the CPP. The head of each pogo pin has a castellation, which over continued use will wear down and eventually prevent reliable connection to the CPP. The barrel holding the movable pogo pin can also wear with heavy use, leaving an opening where debris can build and prevent smooth action of the pogo pin. Contacting problems during programming of the synthesizer may report the error message "Failed to verify programming". The adapter should be regularly inspected for signs of wear and replaced as necessary. With a worn adapter socket the rate of occurrence of programming issues will continue to increase until it is replaced.

Worn pogo pins have a few potential issues. The head can be worn down or filled with debris. Also the pin may not move freely vertical and can have significant horizontal play.



Another factor in accurate frequency measurement is calibration. The programmer contains a frequency reference. A calibration procedure should be performed every year to ensure accurate frequency measurements. Depending on the programmer usage, this may also be a good time to replace the adapter sockets.

A final case during programming results in the message "No PLL values found". This message is displayed when no solution for the PLL synthesizer parameters can be found to generate the required target output frequency from the measured blank frequency and fine tune range. The CPP has not been programmed and should be set aside and used for an application requiring a different target frequency.

When handling the CPP product normal ESD precautions should be observed to ensure that static damage does not occur to the device.