

Firmware Version 1.5 Addendum

A new version of firmware is now shipping on all of our impulse drivers. This new firmware allows the user to modify the software correction value used for adjusting the quartz crystal. This allows the user to adjust for the natural aging, or drift, which occurs in all quartz crystals, and is also useful in cases where the device is subject to an average temperature well above or below that of standard room temperature. Impulse drivers are adjusted at time of assembly to perform accurately at standard room temperature (approx. 20 to 25°C or 68 to 77°F).

NOTE: The TCXO (Temperature Compensated Crystal Oscillator) version of the impulse driver has a very accurate timebase. Its frequency is highly stable even during large temperature swings. Adjustment should only be needed after several years of operation to compensate for crystal aging.

Taking an accurate time correction reading

Before adjusting the software correction value you should first set the clock to a accurate source and take a reading of its drift at a later time. The more time you allow to pass, the greater the accuracy of a drift reading will be. It is recommended that you allow at least 1 week to pass before a manual reading is relied upon for correction purposes. You should also make sure the batteries in your impulse driver are fresh, a weak battery can effect the accuracy of the device. When taking readings for software correction, be sure to use an accurate source. Accurate sources include an atomic clock that has recently synced, a PC that is synced to a time server, or a GPS receiver.

Adjusting the software correction value

The software time correction value entered by the user refers to the number of seconds per week of correction. For example, if the clock is slow 14 seconds per week, a value of +14 entered into the software correction option will compensate for this drift. NOTE: If the existing correction was set to a value other than 0 when a correction reading was taken, you will need to add or subtract this from your readings. The initial factory correction value will be noted on the inside battery cover, and can be checked by stepping through the options list.

- Disconnect your clock from the impulse driver.
- Connect the supplied light bulb to the “COIL” and “Vbatt” terminals.
- Press both stop and advance buttons while pressing and releasing the reset button.
- The light bulb will flash 5 times indicating you have entered the user options menu, the 5th flash will be longer.
- The first option will now be “blinked” back, along with its value. The option number blink is longer in duration, and the value of the option is a shorter blink. For example, option # 1 being set to 2 will be: 1 long flash followed by 2 shorter flashes* (*See important note below).
- After the value is displayed, you can enter the new option number by pressing the advance button the same number of times as the new value*.
- After you have entered the new value you must press the STOP button. This both saves the value entered and proceeds to display the next option #. NOTE: You do not need to enter a value if it does not need to be changed.
- To make sure the values were entered correctly, it is recommended that you step through the options for verification. Once you have verified your new values, press the reset button. The impulse driver will return to normal operation. You can now disconnect the light bulb and wire your clock back to the impulse driver.

Option numbers and their value range:

- ◆ Option #1: Sign of the time correction value. 1=negative, 2=positive.
- ◆ Option #2: Tens of the time correction value. 0-9*
- ◆ Option #3: Ones of the time correction value. 0-9*
- ◆ Option #4: Tenths... 0-9*
- ◆ Option #5: Hundredths... 0-9* (This can be safely ignored or set to 0 for non-TCXO units).

* **IMPORTANT NOTE:** An option value of 0 is **BOTH** displayed and entered as 10.