**University of Illinois Observatory self-winding clock synchronizer**

**Quick Reference Guide**

**Version: 1.0 Date: 3/7/2024 Author: Matthew Vogel**

**Summary:**

The self-winding clock synchronizer is intended to be used with the self-winding clock in the Observatory. The synchronizer outputs a one second long pulse to the synchronizing coil of the self-winding clock once an hour, starting at 59 minutes, 59 seconds past the hour. This synchronizes the clock and ensures that the clock maintains the correct time. The synchronizer gets its time base from the GPS satellites.

**Connecting the synchronizer:**

The synchronizer has a connector for sending the sync pulse signal to the clock. The connector is a two conductor 5.5 x 2.1mm jack mounted on the side of the synchronizer. Wire a two-conductor cable to a matching 5.5 x 2.1mm plug, then connect the other end of the two wires to the two terminals of the synchronizer coil inside the clock. The synchronizer output pulse is powered by the internal lithium-ion battery of the synchronizer, so the output voltage will be between 3.7V and 4.2V, depending on the state of charge of the battery.

**Powering the synchronizer:**

The synchronizer has an internal battery that will run the synchronizer for about 10 hours. To keep this battery charged, plug the USB cable from the synchronizer into a suitable USB power supply (anything that can output 5V and at least 0.5A). To power off the synchronizer, unplug the USB cable from the power supply and turn off the power switch on the side of the synchronizer. During normal use, ensure that the power switch is “on” in order to keep the battery charged.

**Using the synchronizer:**

Once the synchronizer is powered and connected to the clock, it should automatically start sending the sync pulse to the clock once an hour, as long as the synchronizer can get a signal from the GPS satellites to maintain its internal time base.

There are three buttons to the left of the display on the synchronizer:

**Button 1 (top):**  This button can be used to enable/disable the synchronizer output pulse. Each press of the button toggles the enable/disable state of the sync output. Note that the sync output cannot be enabled if the synchronizer is unable to get a GPS signal to maintain its internal time base.

**Button 2 (middle):**  This button can be used to manually trigger the synchronizer output pulse (e.g., for testing the clock’s synchronizer coil). The sync output will be active for as long as this button is pressed.

**Button 3 (bottom):** This button is not used.

**Location of documentation:**

https://github.com/mvogel932/UofIObservatoryClockSync

