

# Reducing Turntable Vibrations

## Problem

I have a Platinum or Silver series turntable and my table sometimes shakes, or stutters, or turns really slow. What are the steps I can take to minimize stutter or vibrations?



### Keep Iconasys Software in Foreground

Whether using Shutter Stream or the Turntable Controller Software, make sure the software controlling the table is always in the foreground.



### Reset the Turntable

1. Turn off the table.
2. Exit the software.
3. Unplug the USB cable from the computer and leave out for 2 seconds.
4. Plug the USB cable back in.
5. Power the table back up.
6. Restart the Iconasys software



### Use a Powered USB-2 Hub

For the best (fastest and smoothest) rotations, we recommend the use of a Powered USB-2 Hub and the original turntable USB cables. The USB-2 hub should have a separate DC power supply, which plugs into the wall and then into the USB hub. **Do not use a USB hub without an external DC power supply!**

## Explanation



### Stepper and Continuous Motors

Stepper motors update their position in steps, whereas continuous motors rotate continuously, without control over the motor's position. Stepper motors are inherently less smooth than a continuous motors, but their advantage is that their position can be controlled more precisely.

In order to explain the steps, you can take to minimize perceived turntable vibration, it is important to first understand the different turntable and motor mechanics:

1. First, the motor types. There are two types of Iconasys turntables:
  - a. The first design uses a **DC or AC motor**, together with an encoder that tells where the turntable is located. This design, which Iconasys called the "USB Turntable," was used in the original Iconasys turntable and it's no longer being produced. The advantage of the DC motor design is that the motor tends to have a smoother rotation, but the design becomes more complex in determining the turntable position. Further, it gets a little trickier with trying to stop the table at the exact position.
  - b. The second design is based on **stepper motors**. All existing Iconasys tables, including the Silver and Platinum series use a **stepper motor**. The advantage of stepper motors is that they can be made very precise, without much circuitry. On every controlling pulse, the motor makes a small update in position. In order to rotate a stepper motor, multiple square pulses are sent to it. At each pulse the motor updates one step. The motor speed is controlled by the frequency of the pulses sent to it. Because the stepper motor updates its position in steps, stepper motors are inherently less smooth than a continuous DC motor design. A good way to visualize the movement between the continuous motor and the stepper motor is to think about the *seconds hand* on a smoothly rotating clock versus a digital clock. In a digital clock, the seconds hand has discreet movements, with the hand jumping from position to position.
2. Second, the stepper controller logic. When designing the stepper controller logic, there are two possible approaches.
  - a. The first approach is to use an **off-the-host controller**. In this case, a second "mini-computer" is used to offload the step-pulsing responsibility. Commands are sent from the main computer to the mini-computer and the mini-computer handles the pulsing of the stepper table. The advantage of this approach is that pulsing the turntable is independent of the host computer and the main capturing program can be placed in the background, without affecting the turntable rotation. The disadvantage of this approach is that if there is any upgrade that needs to be done to the "mini-computer" the upgrade, often referred to as a "firmware upgrade" is more complex and the mini-computer can easily end up in a vegetable state if the computer loses power or connection during the upgrade.
  - b. The second approach is to use an **on-the-host controller**. This eliminates the need for a second "mini-computer" and significantly simplifies the upgrade logic. A new update requires a new software install on the main computer and everything works. The disadvantage of this approach, however, is that if the main turntable controller software is put in the background and the OS no longer prioritizes the pulses to the table, then the table can shake or stutter.

## Reducing Vibrations in Shutter Stream

As explained above, stepper motor turntables are inherently built on steps. If you hold your hand on a stepper turntable you will be able to sense, with your hand, the small pulses in the table. The vibration of these pulses is minimized by using gearboxes and torque multipliers, such as belts. Must Iconasys stepper tables will have a smooth rotation, but when they don't there are a few potential causes:

1. First, make sure the controlling software is in the foreground. If you control the table via Shutter Stream, make sure the Shutter Stream software is in the foreground. Do not place Shutter Stream in the background and start doing work with another software while capturing your 360 images. If you control the turntable via the Turntable Controller software, then make sure the turntable controlling software is in the foreground. Do not place the Turntable Controller software in the background.



#### **Keep Iconasys Software in Foreground**

Whether using Shutter Stream or the Turntable Controller Software, make sure the software controlling the table is always in the foreground.

2. Iconasys' software allows the table to be locked or unlocked when idle. Best practices is to keep the table locked when using it. Hence, select the "Lock when idle" option. This will provide the most precise turntable position, but it will also provide a continuous-controlling-magnetic field for the motor's rotor. This tends to have a slightly more stabilizing effect on the overall smoothness of the rotation.
3. Experimentally, we have noticed that if you turn off the turntable, before you close the Shutter Stream software, the next time you control the turntable, the turntable tends to have more vibration. This has to do with the initialization of the communication between the software and the hardware. In this case, follow these steps:
  - a. First, never turn off the turntable, without exiting the software first.
  - b. Second, reset the turntable-communication:
    - i. Turn off the table.
    - ii. Exit the software.
    - iii. Unplug the USB cable from the computer and leave out for 2 seconds.
    - iv. Plug the USB cable back in.
    - v. Power the table back up.
    - vi. Restart the Iconasys software



#### **Don't Turn off Turntable Before Exiting Software**

Avoid turning off the turntable before closing the Iconasys software. During software exit, the Iconasys software closes all the communication handles properly when the hardware is still on. Turning off the hardware before exiting the software seems to create communication issues between the host computer and the turntable. If this happens, the hardware needs to be reset by disconnecting and reconnecting the USB cable, as described above.

## Related articles

- [Installing the Turntable Driver](#)
- [Turntable Status LEDs and Error Codes](#)
- [Turntable Fails To Rotate](#)
- [How to Run the Turntable Controller](#)
- [3D PDF of Silver Mid](#)
- [3D PDF of Silver XL](#)
- [Reducing Turntable Vibrations](#)
- [Silver Medium and Large Hanging Kit](#)
- [Connecting the Platinum Large Turntable](#)
- [USB Turntable SDK Source Code](#)
- [Turntable Rotation Issues](#)
- [USB Extension](#)
- [Setting Up the Platinum XL Turntable](#)
- [AC or DC Motor Turntable Stutters](#)
- [Download Turntable SDK Source Code](#)