

AutoTrickler V3

By Adam MacDonald

for Sartorius balances

User Manual
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AutoTrickler assembly

- 1. Install the tilt adjustment screw.**
This is used to adjust the flow rate.
- 2. Insert the tube.**
Ensure it spins freely with no friction.
- 3. Install the pulley belt with a twist.**
It can be twisted either direction, but having a twist is important!



AutoThrow assembly

1. Attach the AutoThrow to the top panel.

Screw the funnel and extension tube assembly onto the bottom (not too tight!).

2. Install the hopper.

Slide the hopper into the top of the AutoThrow. Look inside the hopper and notice the valve which can be opened and closed by rotating the hopper.



Unless otherwise specified, the panel and extension tube assembly are designed for the **Sartorius Entris** with a weighing chamber height of 9.06”.

If this does not fit your scale, you may need to build a custom panel, raise the cup higher, cut the extension tube to a shorter length, or we can send you a custom length tube. Please contact us for advice.

Electronics assembly

- 1. Connect the AutoTrickler motor cable to port 1.**
The orientation of the cable does not matter.
- 2. Connect the AutoThrow motor cable to port 2.**
Ensure the motors are plugged into the correct ports.
- 3. Connect the serial cable to your scale.**
Unless otherwise specified, the connector included is designed for Sartorius Entris.
Practum, Quintix, and Secura balances require a different electronics unit and the Sartorius YCC03-D09 adapter cable.
- 4. Connect the power adapter.**
- 5. Switch the black switch ON.**
The black switch controls power to the electronics.
You should see lights inside the box when powered on.



Connect your mobile device

The AutoTrickler can be controlled using your mobile device via Bluetooth.

The app supports any modern Android or iOS mobile device with Bluetooth 4.0 Low Energy support.



1. Download the AutoTrickler app.

It is available on Google Play and Apple App Store.

2. Start the app.

Tap the large red button to start scanning.

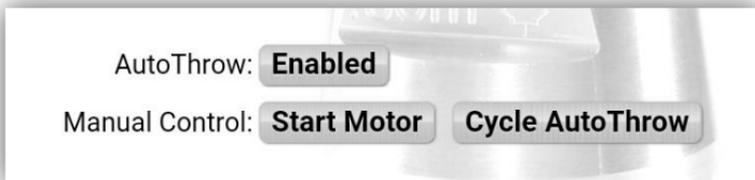
Multiple AutoTricklers will be selectable by a unique ID. Refer to Troubleshooting steps if the electronics are not detected.

3. Press Start Motor.

Ensure that the tube spins smoothly.

4. Press Cycle AutoThrow.

Ensure that the AutoThrow cycles smoothly.



Placement

- 1. Use at least one side and rear wind screen.**
This will ensure easy access while preventing airflow in any direction.
- 2. Attach the centering tray to the scale pan.**
To minimize splashing, position the tray slightly offset from center so the powder will drop along the side of cup. Rotate the pan to fine-tune the position.
- 3. Slide the cup into place.**
Tilt the cup forward slightly so that the edge does not hit the funnel.

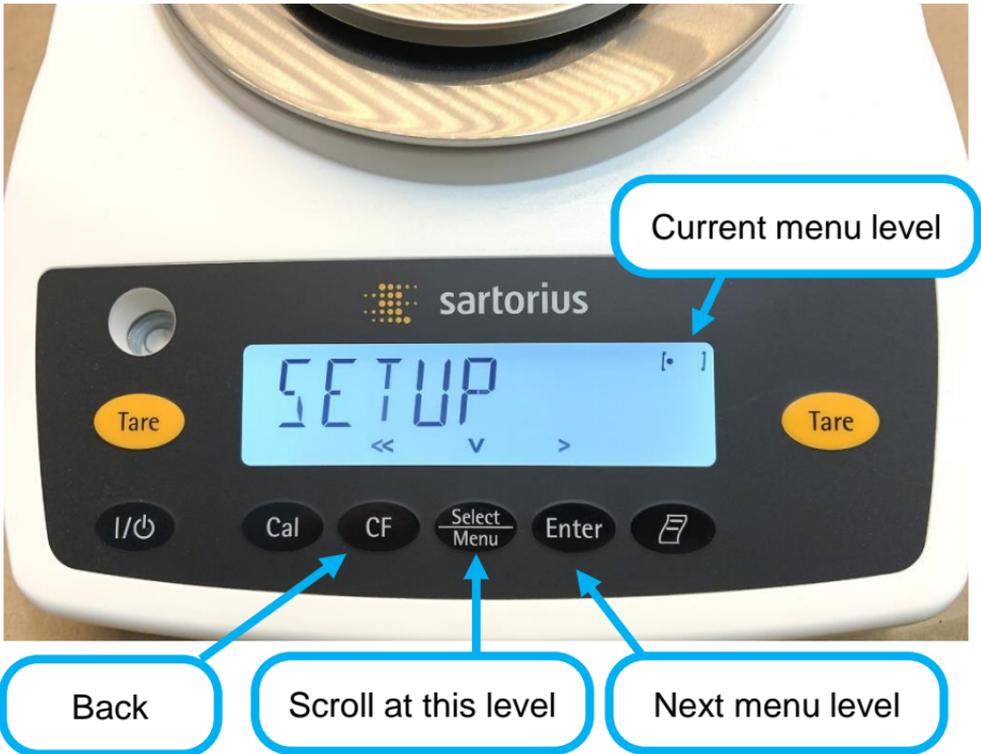


Serial port configuration

The scale serial port needs to be configured so that it will communicate with the AutoTrickler electronics.

This only needs to be done once. The settings are permanently stored within the scale, and will not affect normal weighing operation of the scale.

Following are instructions for Sartorius Entris. For Practum, Secura, Quintix, or GD503, refer to the separate configuration sheet.



- Hold MENU to enter the menu.
- The current menu level is displayed in the upper right.
- Press SELECT repeatedly to cycle options at this level.
- Press ENTER to move to the next level.
- Press ENTER to confirm a setting.
- A circle in the upper right confirms the current setting.
- Press CF to go back.

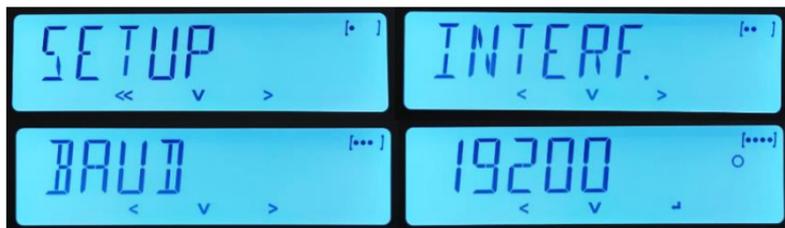
SETUP – BALSCAL – AMBIENT – VERY STABLE

Set the dynamic weight response to be very stable.



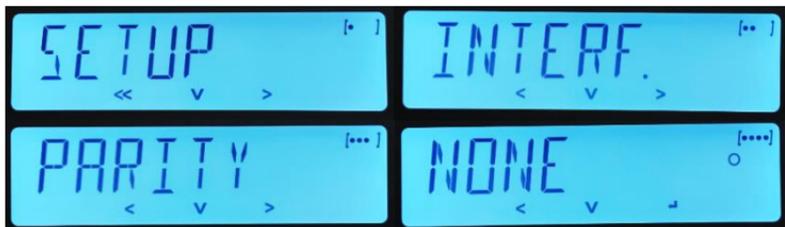
SETUP – INTERF – BAUD – 19200

Set the serial port baud rate to 19200.



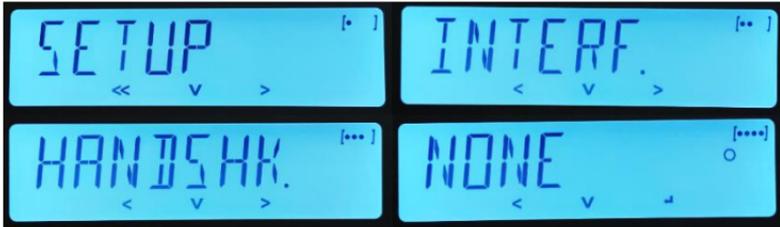
SETUP – INTERF – PARITY – NONE

Set the serial port to use no parity bit.



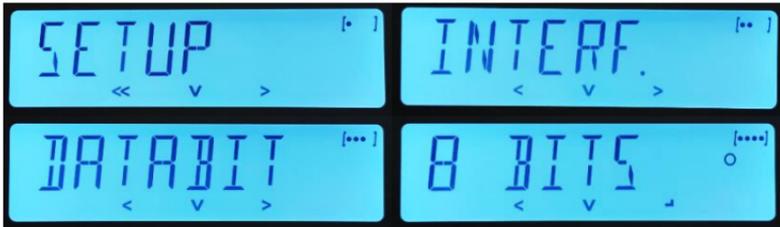
SETUP – INTERF – HANDSHK – NONE

Set the serial port to use no handshaking.



SETUP – INTERF – DATABIT – 8 BITS

Set the serial port to use 8 bit communication.



SETUP – PRNTOUT – PRINT – AUTO W/O

Set the serial port to output data continuously.



SETUP – PRNTOUT – FORMAT – 16 CHAR

Set the serial port to use 16 character output format.



Operation with switches

The AutoTrickler can be controlled with either the switches on the electronics unit or the AutoTrickler app.



- **To set an active target weight:**
 - Set the red switch to the OFF position.
 - Place your desired charge weight on the scale by hand.
 - Set the red switch on the ON position.
 - Ensure the scale display is stable and wait 2 seconds.
 - The AutoTrickler will now dispense to that target weight repeatedly.
- **To cancel an active target weight:**
 - Set the red switch to the OFF position.
- **To enable/disable the AutoThrow:**
 - Set the red switch to either the ON or OFF position.
ON – AutoThrow enabled
OFF – AutoThrow disable
 - Set the black switch OFF, then ON, and wait 5 seconds.

Operation with mobile device

When using your mobile device, switches on the electronics units will still function. The controls are synchronized.

Set / cancel target

42.5
grains

Modify target on the fly

Enter a new target

Enable/disable AutoThrow

Run AutoTrickler motor at full speed

Cycle AutoThrow once

AutoThrow: Enabled

Manual Control: Start Motor Cycle AutoThrow

Bluetooth: Disconnect

Performance

1. From within 0.02 grains of zero:

The scale will slowly auto-correct for drift.
The AutoThrow will drop the contents of its chamber.
The volume is adjusted by the adjustment arm.

2. For target weights over 100 grains:

The AutoThrow cycles multiple times.
100 – 200 grains: 2 cycles
200 – 300 grains: 3 cycles
300 – 400 grains: 4 cycles
Over 400 grains: 5 cycles

Example:

Target weight 250 gr
Cycles 3 times
Set to approx. 80 gr

3. From 0.1 to 1.5 grains below the target weight:

The AutoTrickler will run at full speed.
The flow rate is adjusted by tilt of the tube.

4. Within 1.5 grains of the target weight:

The AutoTrickler will slowly ramp down to the target.
The ramp down is adjusted by the slider.

Consistency, speed, and accuracy are achieved through three adjustments covered in the next few pages.

Each should be tuned carefully through trial and error to suit your preference and the powder you are using.

The recommended objective is to reach the desired target **within +/- 0.02 grains in 10 seconds**, 19 out of 20 times.

Adjusting the AutoThrow

- The AutoThrow adjustment arm controls the volume of powder dispensed when the AutoThrow cycles.
 - The marks that roughly correspond to 10 grains, depending on the density of the powder you are using.
 - Start roughly 2-3 grains below your target weight.
 - You can use the **Cycle AutoThrow** button or set a target and disconnect the AutoTrickler in order to repeatedly cycle.



- Adjust the arm through trial and error as you load to optimize overall speed.
 - Ideally, all of the powder should reach the cup just before the AutoTrickler starts to ramp down.
 - This ensures the ramp down process is consistent each time.
- To clear the AutoThrow of powder:
 - Rotate the hopper clockwise to close the valve.
 - Cycle the AutoThrow a few times.
 - Remove the empty the hopper.
 - Shake and dislodge any loose kernels from inside the top of the AutoThrow, and cycle until nothing comes out.

Adjusting the flow rate

- The flow rate is controlled by tilting the AutoTrickler tube slightly upwards or downwards.
- This is the **most important adjustment** to prevent overshooting and ensure consistent results.



- Set the flow rate to **0.5 grains per second**.
 - Use the **Start Motor** button, or set an arbitrary target and allow the AutoTrickler to run at full speed for a long time.
 - Observe how quickly the displayed weight on the scale is increasing as powder falls into the cup.
 - Turn the tilt adjustment screw in small increments until the flow rate is roughly 0.5 grains per second (2 seconds per grain).
- Optimize the flow rate through trial and error.
 - Small changes will have a noticeable effect!

Adjusting the ramp down

- The slider fine-tunes how the motor slows down.
 - This setting **only affects the final 1.5 grains** when approaching the target weight. It does not affect flow rate at max speed.
 - A faster setting will maintain a higher speed until closer to the target weight, and then slow down quickly.
 - A slower setting will slow down in advance and ramp more conservatively to avoid overshooting.



- Start with the slider near the middle.
 - Use the tilt adjustment screw for major adjustments.
 - As you are loading, if you notice overshoots more often than desired, move the slider slightly to the slower side.
 - If you feel you can speed up and still avoid overshooting, move the slider slightly to the faster side.
- To optimize this adjustment on its own:
 - Disable or disconnect the AutoThrow.
 - Set a target of 3 grains and place an empty pan on the scale.
 - Observe the ramp down performance as the AutoTrickler attempts to dispense 3 grains into your pan.
 - Make small adjustments as needed.
 - Press RE-ZERO to restart without needing to empty the pan.

Troubleshooting: Operation

If the AutoTrickler seems to not be working at all:

- Turn the black switch OFF, then ON.
- Ensure the scale is powered on and displaying a stable, positive weight.
- Look inside the electronics from the rear. You should see a rapidly flashing red light. This confirms the scale configuration settings are correct and serial port communication is working.

If you do not see a flashing red light:

- Check for a broken wire near the serial connector.
- Check that scale configuration settings are still correct. They should never change on their own.

If the AutoTrickler mobile app fails to scan or detect the device:

- Ensure Bluetooth is enabled and your device supports Bluetooth 4.0 Low Energy.
- For Android devices, enable Location Services, and enable the Location Services permission for the AutoTrickler app.
- Ensure you are using the **AutoTrickler** app by OneZero Innovations Inc., not another app with a similar name.

If the motor shakes in place and will not turn:

- Check that the motor cable is fully connected.
- Rotate the motor by hand to ensure nothing is jammed.
- Check for a broken motor cable. Swap cables between the AutoThrow and AutoTrickler to identify if the cable is the problem.

If the AutoTrickler motor vibrates excessively loudly:

- Remove the large pulley with a 5/64" hex key and evenly tighten the four screws holding the motor to the base. If the motor is slightly misaligned and these screws work loose over time, they will vibrate very loudly.

If the tube spins extremely fast and sprays powder:

- The tube is not spinning freely in the bushings. When it catches, the belt stretches, releases, and the tube spins. Remove the belt and the tube should turn smoothly in all positions. Polish the tube with fine sandpaper if necessary.

If the AutoTrickler runs but the AutoThrow does not:

- The AutoThrow is disabled. Enable it using the app or the switches on the electronics unit (see earlier in this manual).

If the AutoThrow runs in one direction continuously:

- Plug the AutoTrickler into port 1 and the AutoThrow into port 2.

If powder splashes out of the cup from the AutoThrow:

- Adjust the cup so that the powder falls more to the side instead of the center of the cup. Raise the cup so it is only slightly below the funnel. If the problem persists, contact us for help.

If the AutoThrow repeatedly jams while cycling:

- Contact us for help!

If you need any spare parts:

- Accessories are available at autotrickler.com.

If you have any other problems, questions, or feedback, please contact **Adam MacDonald** at adamjmac@autotrickler.com.

Entris 64-1s Maximum Weight

The Entris 64-1s balance has a 64 gram (987 GN) weight capacity, which does not allow much room for a heavy powder charge when using the glass cup.

However, this limit is relative to the weight of the empty pan. By adding a small weight to the pan at power-on, powder charges up to 200 GN can be measured.

1. Obtain any object which weighs approx. 180 – 190 GN.
2. Unplug the scale power cord.
3. Place the plastic centering tray and the 185 GN weight on the scale.



4. Plug in the scale power cord and turn on the scale. The display will read 0.
5. Remove the 185 GN weight. The display will read LOW.
6. Place the glass cup next to the centering tray on the scale. The display will read approximately 700 GN.
7. Press Tare.
8. Add powder into the cup and ensure the scale is able to measure your desired range of powder charges.

ALWAYS VERIFY EACH CHARGE WEIGHT ON THE SCALE BEFORE LOADING POWDER INTO A CASE.

This product is a tool for dispensing powder, not measuring. It does not change the weight displayed on the scale or affect the accuracy or performance of the scale in any way. It does not prevent you from setting an unsafe target weight. It does not inform you that your charge is over the target or unsafe to fire. It does not ensure that you have properly zeroed the scale before weighing a charge.

You are fully responsible for operation of your scale and this product and determining how much powder to put into your cases and into your firearm.

Use this product at your own risk. The designer, manufacturer, and distributor of this product accept no liability for anything you do with this product. Reloading is dangerous and you are fully responsible for any damaged incurred to yourself, others, or property whether directly or indirectly related to use of this product.

Proper reloading practices must be used at all times.

Do not use black powder or black powder substitutes with this product. Black powder can be ignited by static discharge. This product includes electronics, motors, and moving metal parts and is not safe for use with black powder or any explosive materials.

The AutoTrickler is warranted to be free from any defects in material or workmanship under normal use for the period of one year from the date of manufacture. During the warranty period, any product or parts of the product that are determined to be defective due to improper material or workmanship under normal use and maintenance will be repaired or replaced at no charge. This warranty is extended only to the original purchaser and is non-transferrable. This product is intended for non-commercial use. Any other use of this product will void this warranty.

This warranty applies only to an original AutoTrickler product that has not been modified in any way. This warranty applies only to an AutoTrickler product that was purchased either directly from OneZero Innovations Inc. or one of its authorized distributors, with proof of purchase.

If you have any questions, comments, or concerns, please contact **Adam MacDonald** at adamjmac@autotricker.com.