AutoTrickler V4

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User Manual
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Contents

- AutoTrickler V4 housing assembly
- Powder hopper
- Glass cup (packed inside hopper)
- Acrylic mounting panel
- Power adapter
- Accessories
  - 2 acrylic windows
  - Serial port connector
  - 1/16” hex key
  - Centering tray
  - Hopper cover
  - 4 rubber bumpers
  - Jumper wire
  - Brush
  - Contact card
  - Funnel

Centering Tray

- Attach the centering tray to the scale platen.
  - Position the tray so that the front edge is close to the inside of the raised border of the scale platen, as shown in the photo.
  - The glass cup will rest slightly in front of center of the funnel.
  - Being off center will help prevent the first few kernels from bouncing on the bottom of the cup.
  - The platen can be rotated with the tray in place.

- Optional position:
  - You may position the tray further back so the cup will be offset slightly behind the funnel instead of in front. This will locate the cup closer to the center of the scale.
  - The scale will weigh powder accurately in any position, as long as the scale is zeroed with the empty cup in place.
  - It is recommended to use the standard forward position because it's easier to avoid accidentally bumping into the funnel.

Platform Bumpers

- Attach the four bumpers to the platform base.
  - Position a bumper in the center of each corner circle on the underside of the plastic windscreen platform base.
  - These bumpers keep the platform stable and level, which is absolutely critical to performance.

  - Without these bumpers, the platform will slide, the tilt angle will change, and the AutoTrickler will not work consistently.
  - **Do not skip this step.**

Panels

- Configure the scale windscreen panels.
  - Install all four vertical arms into the platform base.
  - Install the left, right, and rear panels, leaving the front open.

- Place the top panel on the platform.
  - If you have AutoTrickler V3 panel clips, remove them.
  - The groove on the bottom of the panel fits directly on top of the vertical arms.
  - The three bumpers already attached to the panel will face up, and the extended tab faces to the rear.

Only the front panel is open

Housing Placement

- Install the funnel into the bottom of the housing.
  - An o-ring is captive within the housing.
  - Push and twist the funnel groove into the o-ring.
- Position the housing on the top panel.
  - Center the left and right contact points on the bumpers.

  - Center the rear of the housing on the panel.

  - Verify the housing rests on all three bumpers properly and has a slight upward angle relative to the panel.
- Install the front and back windows.
  - Each window has rounded corners on the top.
- Place the cup on the scale.
  - Verify it is located under the funnel, slightly offset from center.

Electronics

- Install the serial port connector.
  - Unplug the scale power cord.
  - If you have V3 electronics installed, you can remove them.
  - Plug the connector into the scale serial port.
  - Use the included hex key to evenly snug the two screws to secure the connector to the scale.

- Connect the cable.
  - Plug in the two ends of the cable.
  - This cable provides both power and data to the control electronics which are integrated into the housing.
  - Remember to disconnect the cable before emptying powder.
  - The wire colors may be different on your cable. Verify the locking tab alignment.

Power Supply

- Identify the correct power adapter.
  - Use the power adapter provided with the AutoTrickler, not the original one that came with the A&D scale.
  - The model number of the correct power adapter (as of 2025) is Triad WSU120-1000-R. It will have a “reverse polarity” sticker.
  - The scale may come with its own A&D labeled power adapter which might not reliably power the motors.
    - If the scale resets when the motors run, it won’t work.
    - If it works, it can be used as a backup.
  - The power adapter supports both 120 and 240 V. If you are outside North America you may need a separate accessory to fit the plug into your socket (not included).

- Connect the scale to power.
  - A bright green light on the bottom of the AutoTrickler housing will illuminate for 1 second when power is connected.
  - The scale may drift after being plugged in until it warms up. There’s no need to wait, you just might have to press Re-Zero a bit more than usual for the first few minutes of loading.

Powder Hopper

- Close the hopper valve.
  - The bottom part of the hopper rotates to open and close the valve which restricts powder flow.
  - The valve must be closed to place the hopper on the housing.
  - If the rotation becomes too loose, the center screw can be tightened with a 1/8” hex.
- Install the hopper on the housing.
  - **Ensure the rear window is in place.**
  - Slide the hopper down onto the rear of the housing.

- Open the valve.
  - Observe the metal screw slides into the slot.
  - Once locked, the hopper and the window cannot be lifted, so powder cannot fall out by accident.
- Pour powder into the hopper.
  - Observe that powder fills the area in the back of the housing.

Serial Port Configuration

- Configure the scale settings.
  - The scale must be configured to send data correctly over the serial port.
  - This only needs to be done once. The settings are permanently stored within the scale.
  - This will not prevent normal operation of the scale.

bASFnc → SPd = 2

Set the refresh rate to 20 times per second

- Press and hold SAMPLE to enter the menu.
- Press SAMPLE repeatedly until **bASFnc** is displayed.
- Press PRINT to select the setting.
- Press SAMPLE repeatedly until **SPd** is displayed.
- Press RE-ZERO repeatedly until **2** is displayed.
- Press PRINT to set the value.
- Press CAL to exit the menu.

dout → Prt = 5

Set the Print key to wait for a stable reading

- Press and hold SAMPLE to enter the menu.
- Press SAMPLE repeatedly until **dout** is displayed.
- Press PRINT to select the setting.
- Press SAMPLE repeatedly until **Prt** is displayed.
- Press RE-ZERO repeatedly until **5** is displayed.
- Press PRINT to set the value.
- Press CAL to exit the menu.

Sif → bps = 5

Set the serial port baud rate to 19200

- Press and hold SAMPLE to enter the menu.
- Press SAMPLE repeatedly until **Sif** is displayed.
- Press PRINT to select the setting.
- Press SAMPLE repeatedly until **bps** is displayed.
- Press RE-ZERO repeatedly until **5** is displayed.
- Press PRINT to set the value.
- Press CAL to exit the menu.

Sif → btPr = 2

Set the serial port mode to 8N1

- Press and hold SAMPLE to enter the menu.
- Press SAMPLE repeatedly until **Sif** is displayed.
- Press PRINT to select the setting.
- Press SAMPLE repeatedly until **btPr** is displayed.
- Press RE-ZERO repeatedly until **2** is displayed.
- Press PRINT to set the value.
- Press CAL to exit the menu.

RESPONSE = FAST

Set the weight response rate to Fast

- Press and hold MODE until RESPONSE is displayed.
- Press MODE repeatedly until FAST is displayed.
- Press PRINT to confirm the setting.
- Press CAL to exit the menu.

Preparing the Scale

- Level the scale as a starting point.
  - The scale includes a bubble level next to the display.
  - Use the two front adjustment feet to center the bubble.
  - The platform will be level and the housing rests at a slight upward angle.
  - The leveling may be changed later as part of calibration.

- Select your unit of measure.
  - Press the Mode button on the scale to select either **GN** (grains) or **g** (grams).
  - The AutoTrickler supports only grains or grams.

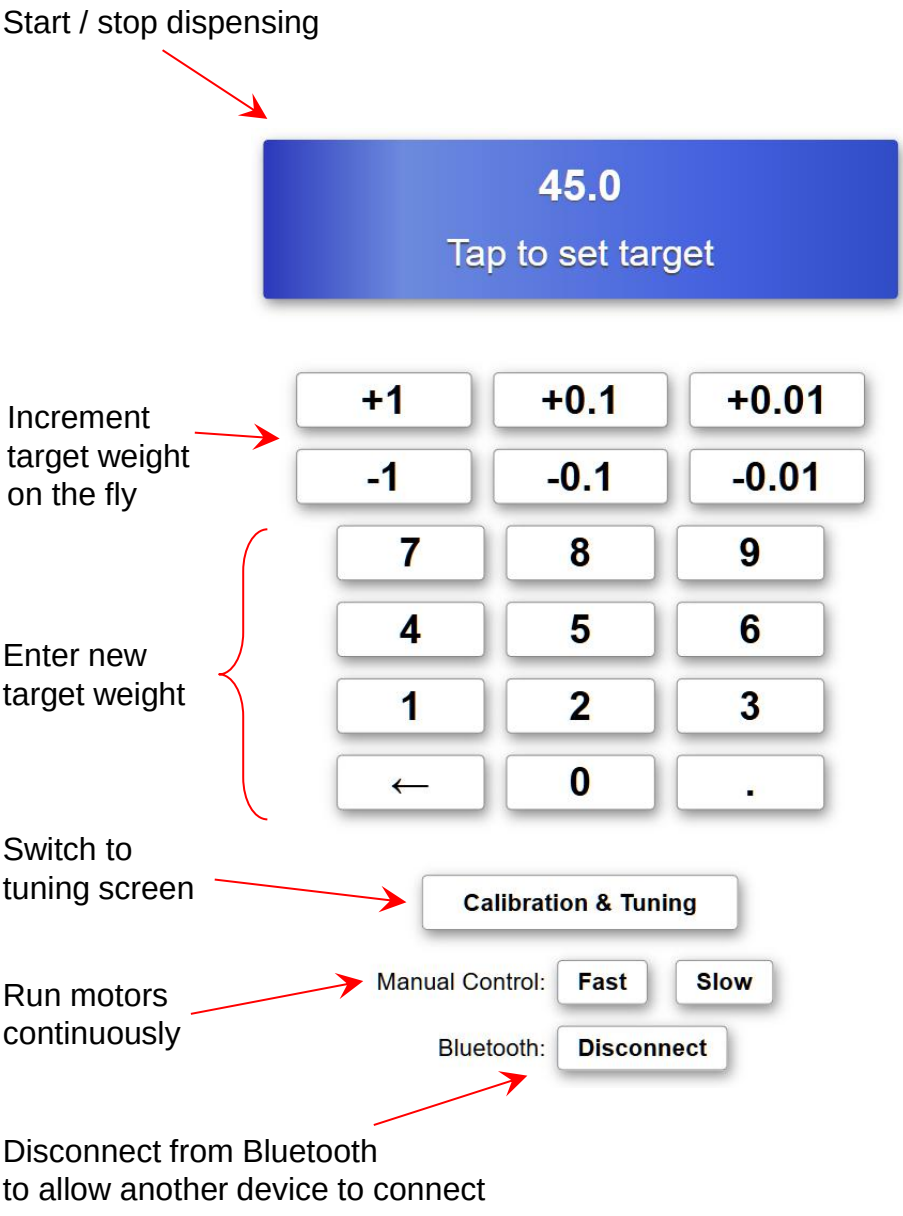
- Optional:
  - Calibrate the scale according to the instructions in the A&D scale manual.
  - This is not required. The scale does not need to be recalibrated every session.
  - Calibration does not affect repeatability, drift, or random fluctuations. Its only purpose is to scale all of the measurements relative to a known reference weight.
  - If a 100 gram test weight measures within +/- 0.020 g, powder charges under 100 GN will be accurate within 0.02 GN. Your scale will probably remain within this tolerance over its lifetime.

App

- Install the AutoTrickler app.
  - Download the free AutoTrickler app from the Google Play Store or Apple App Store.
  - The app is free, does not require an account, does not connect to the internet, and we do not collect, store, sell, or care about your personal data. It is simply a remote control for the hardware and does not do anything else.
  - You will need a smartphone or tablet running Android or iOS with Bluetooth 4.0 Low Energy support.
  - If your device is very old it may not be supported. Contact us for help if you are not able to find or install the app. We also offer a basic tablet for sale on our website.

- Connect to the AutoTrickler.
  - Press “**tap to scan**”.
  - Press **Connect** when the button appears, or wait.
  - If you see “AutoTrickler not found”, see troubleshooting steps on page 22.
  - The app will automatically detect whether the connected AutoTrickler is V3 or V4 and show the appropriate controls. This may take a few seconds.

- Test run the motors.
  - Ensure the cup is in place.
  - Press **Fast** and **Slow** to verify each tube spins freely.


Start / stop dispensing
45.0
Tap to set target
Increment target weight on the fly
+1
+0.1
+0.01
-1
-0.1
-0.01
Enter new target weight
7
8
9
4
5
6
1
2
3
←
0
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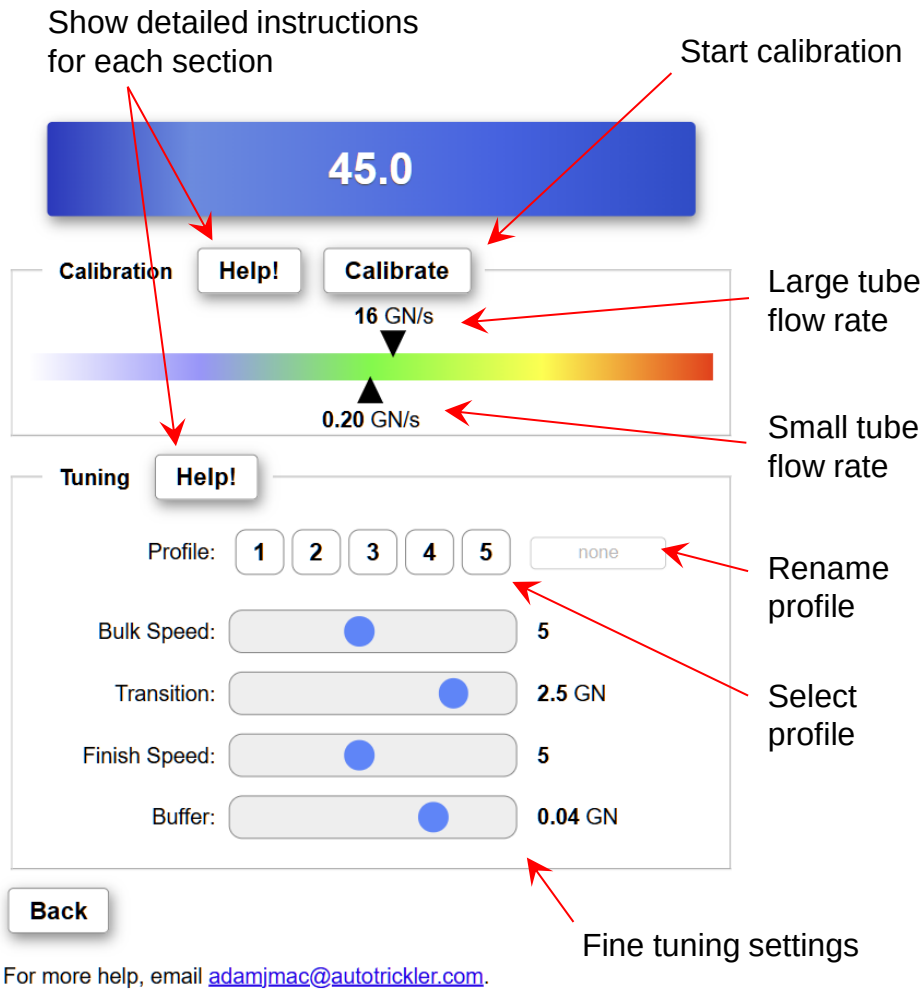
Switch to tuning screen
Calibration & Tuning
Run motors continuously
Manual Control:
Fast
Slow
Bluetooth:
Disconnect
Disconnect from Bluetooth to allow another device to connect



- Profiles:
  - Profiles are optional. The most recent settings are always saved in the electronics and persist through a power cycle.
  - While a profile is active, changes to the four tuning settings are applied to that profile, which is saved on your phone or tablet.
  - Profiles and tuning settings do not apply to calibration. Calibration is an independent concept.

Calibration

Calibration measures the natural flow rates of both tubes, which must fall within an optimal range for good performance. Motor speeds will also be adjusted based on these flow rates.

Always recalibrate after changing powders or adjusting the leveling angle of the scale or housing.

- Start the calibration process.
  - Place an empty cup, re-zero the scale, and press **Calibrate.**
  - At least 50 grains must flow within 10 seconds or the process will abort. Ensure powder can flow from the hopper.
  - Both tubes will be primed and the flow will be measured with a constant motor speed. This takes about 1 minute.
  - Roughly 180 - 250 GN should dispense. If the cup seems like it will overflow, cancel and check that the housing is not tilted downward excessively.
  - The most recently measured flow rates are saved in the electronics even if power is disconnected.
- If there is no flow:
  - Check that the scale and platform are level, and the housing is resting on the platform correctly.
  - Press **Slow** to run the small tube until the flow rate stabilizes.
  - Push the front of the housing down to encourage powder to flow, then release and let it run normally for 10 more seconds.
  - If there is still no flow, then empty the powder and check for a blockage in the tube. Some large kernel powders may get stuck.
- Verify the flow rate is in the ideal range.
  - The **small tube** flow rate is critical for accuracy. See the next page for details.
  - The **large tube** flow rate is not important, as long as the value is not at either extreme.

Adjusting Flow Rate

To avoid overshooting and finish accurately, the powder in the small tube must flow in a consistent stream, without gaps or large clumps.

This is controlled by adjusting the level angle of the tube, which can be most easily done by rotating the front scale feet.

For most powders, **the ideal flow rate is 0.20 GN/s**, however it can be adjusted to maximize consistency.

The flow rate must be set correctly.

- Not enough flow:
  - The measured flow rate is under 0.15 GN/s.
  - The motor will run faster to compensate.
  - Gaps in the flow will lead to longer dispensing times.
  - While finishing, clumps of powder combined with a faster motor speed will lead to unpredictable flow, causing overshoots.
  - The housing needs to be tilted down.
- Too much flow:
  - The calibrated flow rate is over 0.25 GN/s.
  - The motor will run slower to compensate.
  - While finishing, too many kernels will fall at once, even with a slow motor speed, causing overshoots.
  - The housing needs to be tilted up.
- To change the flow rate:
  - Rotate the front scale feet by 1-2 turns, recalibrate, and observe how the measured flow rate has changed. Repeat as necessary.

If you use different powders that require different leveling angles, you can switch between two specific angles by adding or removing a thin spacer under the central rear foot of the scale.

Operation

- Set the target weight.
  - Enter your desired weight using the numbered buttons and press the large button at the top to start dispensing.
  - Dispensing will automatically start within 0.02 GN of zero.
  - Dispensing will automatically stop within 0.02 GN of the target, or when the cup is lifted.
- Accept or reject the result.
  - Only accept a charge when you see the green light and verify the amount is correct.
  - If the result is over your threshold by 1 kernel, remove 1 kernel by hand and then accept the charge.
  - Do not lift the cup until the motors have stopped. A momentary lower weight cup could cause a few extra kernels to drop.
  - If the scale is not zero after a cycle, check the previous charge weight. This can prevent some common mistakes.
- If kernels are sticking to the cup:
  - Do not wash off the graphite lube which has already been applied to the surface.
  - Do not apply a dryer sheet which leaves a sticky residue.
  - Apply graphite lube or rub powder all over the glass surfaces.
  - Once the cup has formed a layer of powder residue, fine kernels will no longer stick. This may require some time with a new cup.
- Regarding accuracy:
  - Fixing the occasional overshoot may be faster overall than tuning for a slow cycle time. Experiment to find efficiency.
  - Set reasonable expectations. For long range competition, one kernel **does not** significantly affect results on target.
  - For F-Class and ELR, it is perfectly fine to accept +/- 0.04 GN.

Fine Tuning

Fine tuning settings allow adjustment of each stage of the process to optimize performance for each type of powder.

Fine tuning does not fix an incorrect flow rate. If performance is way off with default settings, the flow rate needs be adjusted first.

Running the motors too slowly for too long will lead to more powder building up inside the tube, increasing overshoots. Fast, smooth, and efficient settings give the best results.

- Bulk Speed
  - Adjusts how the large tube ramps down towards the transition weight. Select the highest value which still results in a consistent transition. Typical value is 4-6.
- Transition
  - Set the transition weight below the target where the small tube takes over. Tyically, 2.5 is safe, and 2.0 may be faster for fine powders which have consistent transitions.
- Finish Speed
  - Controls how the small tube ramps down towards the target. Select the highest value which results in a smooth and steady ramp down through the final 1 grain.
  - Typical values are 4-7. If overshoots are occurring even with a value of 2 or 3, it likely due to inconsistent flow. Try adjusting the flow rate to improve consistency.
- Buffer
  - Sets an extra weight below the target which the motor speed curve ramps towards. Once reaching this point, the motor will run at a very slow constant speed until reaching the target.
  - This should be set to the weight of a single kernel. Increasing this will not help avoid overshoots with small kernel powders.

Removing Powder

- Close the hopper valve.
  - If it will not fully close, there is a kernel stuck in the opening. Don't force it; just wiggle back and forth.
- Lift the hopper.
  - Be careful not to spill powder that remains in the housing.
- Remove all the powder.
  - Disconnect the cable.
  - Place the hopper under the rear window and lift the window, releasing most of the powder into the hopper.
  - Lift the housing, tilt it backwards, and shake. Powder in the tubes will fall to the back. Then lift the window and pour the rest into the hopper.
  - Repeat as necessary.
  - Look through both tubes from the front to verify they are empty.
  - If necessary, use the brush to clear any stray kernels.
- Pour powder into your container.
  - Place the hopper upright over your container and open the valve.
  - Shake out any stray kernels.
  - Close the valve.
- Do not store powder in the hopper.
  - Long term, some powders can discolor the hopper materials, and exposure to humidity may affect the burn rate.
  - Always store powder in the manufacturer container which is designed to be airtight.

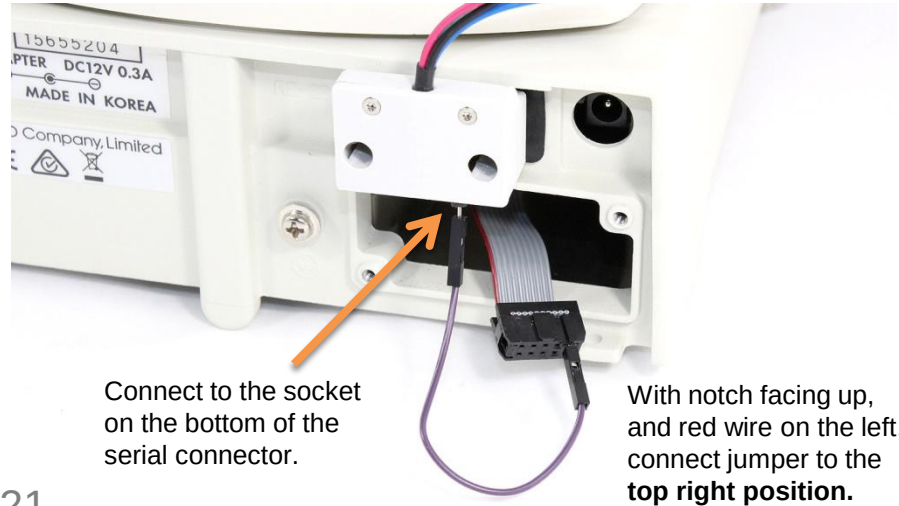
Optional Jumper Wire

Roughly 1% of new A&D FX scales have a serial connector that does not provide power to the AutoTrickler electronics. In rare circumstances this may also happen after some time.

Only install the jumper wire after you have **confirmed there are no lights on the electronics** while plugged into scale.

Once you are sure there are no lights, unplug the scale power cord and install the jumper wire as shown.

Afterwards, connect the scale power cord and immediately look to see if the lights have turned on. If the lights do not turn on, unplug the scale power cord, disconnect the jumper wire and contact us for help.



Connect to the socket on the bottom of the serial connector.

With notch facing up, and red wire on the left, connect jumper to the **top right position.**

Troubleshooting

- See our official setup, troubleshooting, and tuning videos:
  - **youtube.com/autotrickler**

- If the app is unable to connect:
  - Ensure Bluetooth and Location Services permissions are enabled.
  - Try connecting with a different device if you have one.
  - Disconnect and reconnect the AutoTrickler cable to reset power.
  - After powering on, the red light should blink once per second. Once connected, it will remain solid.
  - If there is no light on the bottom of the housing, see page 21.
  - Install the LightBlue app, which scans for all Bluetooth Low Energy devices. The AutoTrickler will appear as “BT05”.

- If the app is connected, but unable to set a target weight:
  - Ensure the scale is turned on and displaying a weight in **GN** or **g**.
  - Verify the scale configuration settings on page 9 and 10.
  - Factory reset the scale according to the A&D scale manual and then repeat the configuration on page 9 and 10.
  - When the scale is properly configured, you will see a small red light inside the electronics in the bottom of the housing which blinks rapidly.

- If the scale displays “Lb” or resets while motors are running:
  - Ensure you are using the correct power adapter we supplied. See page 7.

- If a motor does not turn, shakes, or vibrates:
  - Check the cable to the motor is connected properly.
  - Reduce the belt tension by loosening and retightening the four screws. There is a demonstration in the “V4 Unboxing and Setup” video.

- If the calibration process does not complete:
  - The first 50 GN needs to pour through the large tube within 10 seconds. If the powder does not flow fast enough, the process will abort.
  - Verify the hopper valve is open and powder is able to flow.
  - Verify the housing is resting on the platform correctly and the scale is level.

- If powder is not flowing through the small tube:
  - Push the front of the housing downwards and see if powder flows while tilted.
  - Check for a blockage in the tube.
  - If the powder generally flows too quickly or too slowly, see page 17.

- If the weight consistently overshoots the target:
  - Calibrate and verify the small tube flow rate is 0.17 to 0.23 GN/s.
  - See page 15-18 for details on flow rate and adjustments.

- **Email adamjmac@autotrickler.com for more help.**

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 damages 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 guaranteed to be 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 two years from the date of receipt from an authorized distributor. 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 MacDonald Innovations or one of its authorized distributors, with proof of purchase.

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

Assembled from tested and certified components. FCC ID 2AB6YHM-1011V1