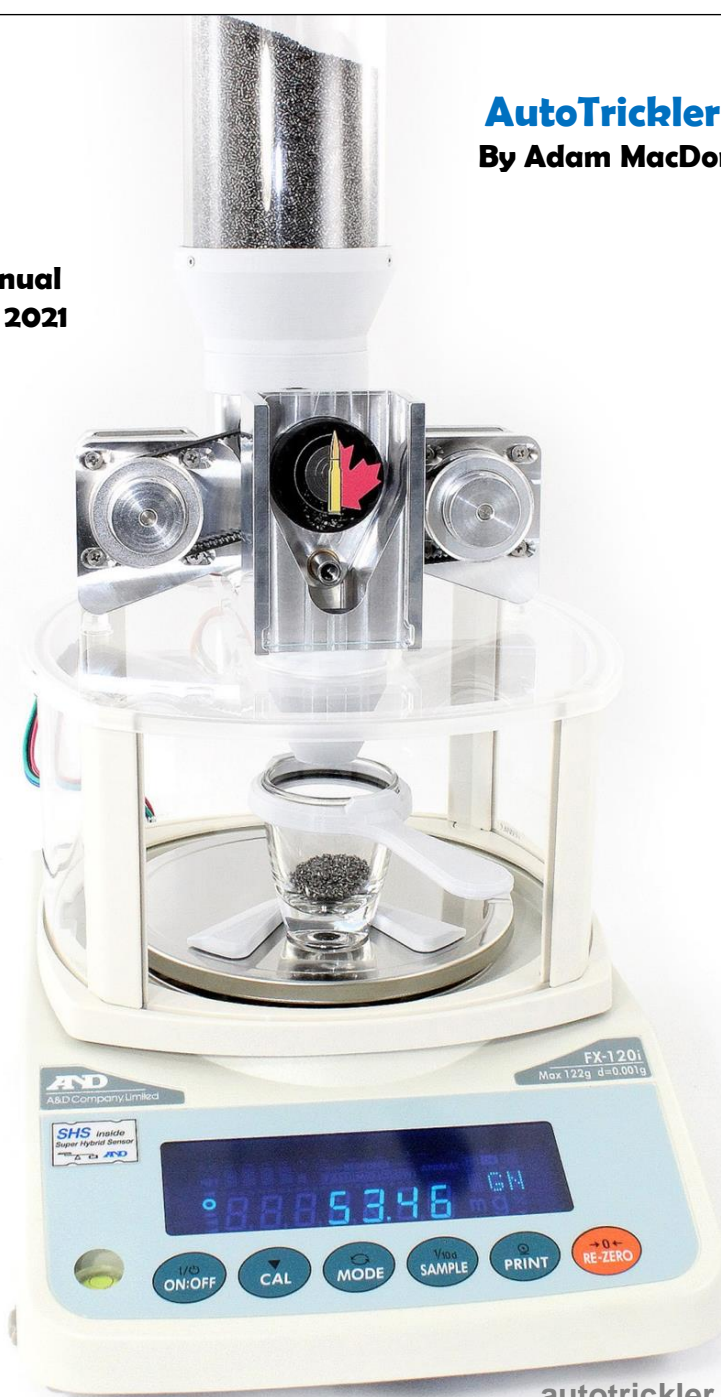


AutoTrickler V4

By Adam MacDonald

User Manual
October 2021



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
 - Rubber bumpers
 - Jumper wire
 - Brush
 - Contact card



Centering Tray

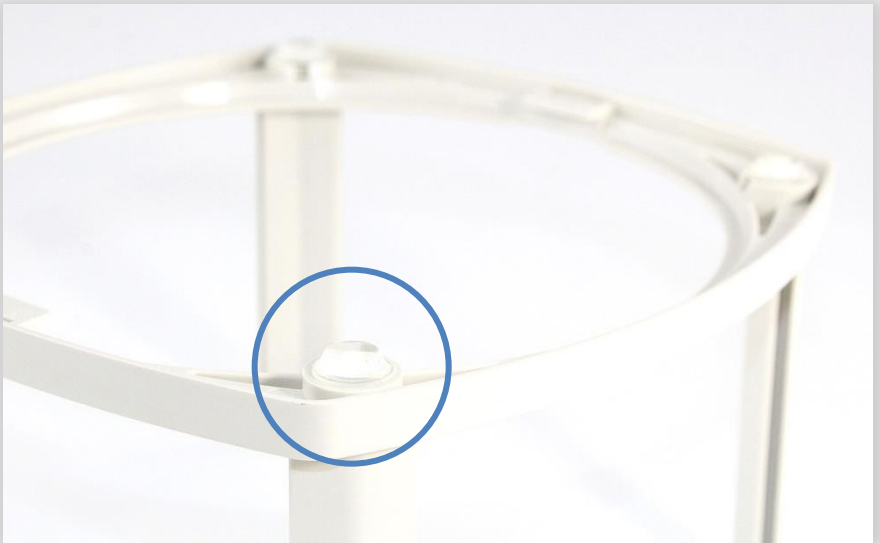
- Attach the centering tray to the scale platen.
 - Position the tray so that the front edge is close to the inside of the raised border of the scale platen, as shown in the photo.
 - The glass cup will rest slightly in front of center of the funnel.
 - This will help prevent the first few kernels from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



- **Optional:**
 - You can 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 are using AutoTrickler V3 clips, remove them.
 - The groove on the bottom of the panel fits directly over the top of the vertical arms.
 - The three bumpers already attached to the panel will face up, and the extended tab faces to the back.



Only the front panel is missing

Housing Placement

- 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.



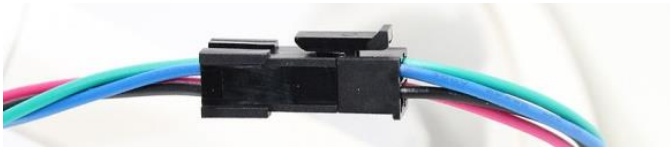
- The funnel fits through the large hole without touching the panel.
- Verify the housing rests on all three bumpers properly and has a slight upward angle relative to the panel.
- Install the front and back windows.
 - Each window has rounded corners on the top.
 - Ensure the logo is oriented correctly.
 - The two windows are the same size.
- Place the cup on the scale.
 - Verify it is located under the funnel, but 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 AutoTrickler cable.
 - Plug in the two ends of the cable.
 - This cable provides both power and data to the AutoTrickler control electronics which are integrated into the housing.



- Optional:
 - A locking tab must be squeezed to disconnect the cable.
 - If you wish, the locking tab can be cut off to allow faster disconnection when switching powders.
 - If necessary, you can order a replacement serial port cable.

Power Supply

- Identify the correct power adapter.
 - If you purchased the scale separately, it may have come with its own A&D-labeled power adapter which might not reliably power the AutoTrickler.
 - **Always use the power adapter that we provide as a replacement.**
 - This power adapter supports both 120 and 240 V. If you are outside North America you may need a separate standard accessory to fit the plug into your socket (not included).
 - The model number of the correct power adapter (as of the time of writing) is SAW30A.



- Connect the scale to power.
 - The bottom of the AutoTrickler housing includes a bright green light that will illuminate for 1 second when power is connected.
 - The scale may drift slightly after being plugged in. There's no need for it to warm up; you just might have to press Re-Zero once or twice within the first few minutes.

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 install the hopper on the housing.
 - The center screw provides tension and can be adjusted if necessary 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.



- Rotate the hopper to open the valve.
 - Observe the metal screw slide into the slot.
 - Once locked, the hopper and the window cannot be lifted, so powder cannot fall out.
- Pour powder into the hopper.
 - Powder will fill 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 affect normal weighing 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.



App

- Install the AutoTrickler app.
 - Download the free AutoTrickler app from the Google Play Store or Apple App Store.
 - You will need a smartphone or tablet running Android or iOS with Bluetooth 4.0 Low Energy support.
 - If your device is too old it may not be supported. Contact us for help if you are not able to find or install the app.

- 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. This may take a few seconds and then the appropriate controls will appear.

- Test run the motors.
 - Ensure the cup is in place.
 - Press **Fast** and **Slow** to verify each tube spins.
 - Set the **Speed** slider to 5 (the default position).

Scan, or start / stop automatic dispensing

45.2

Tap to set target

Increment target weight on the fly

+1

+0.1

+0.01

-1

-0.1

-0.01

7

8

9

4

5

6

1

2

3

←

0

.

Enter new target weight

Control:

Calibrate

Fast

Slow

Speed:



Disconnect

Settings

- **Calibrate:** start powder calibration process
- **Fast:** run large tube continuously (for testing)
- **Slow:** run small tube continuously (for testing)
- **Speed:** adjust speed / accuracy tradeoff
- **Settings:** detailed performance tuning
- **Disconnect:** will keep running, if target is set

Preparing the Scale

- Level the scale.
 - 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, which is very important.



- 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. It's 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 one scale division. Your scale will probably remain within this tolerance over its lifetime.

Powder Calibration

- Start the calibration process.
 - Place the empty cup and re-zero the scale.
 - Press **Calibrate** in the app to start the process.
 - After the tubes are primed, the flow rate stabilizes, and the natural flow rates of both tubes at a constant speed will be measured. This takes about 1 minute.
 - The calibrated flow rates are saved in the AutoTrickler electronics even if you disconnect power to the scale.
- Verify the measured flow rate is within range.
 - Press **Settings** and observe the **small tube** calibrated flow rate.
 - The value should be within 0.10 to 0.20 GN/s.
- If the value is too high or low:
 - See page 17.
- Recalibrate after:
 - Changing powders
 - Adjusting the level of the scale
 - Adjusting the tilt angle of the housing
 - Changing anything which could affect the natural flow rate.

Operation

- **Setting the target weight**
 - Enter your desired target weight using the numbered buttons in the app.
 - Set the **Speed** slider to 5 (default) or your desired setting.
 - Press the large button at the top of the screen to set the target weight and start the dispensing process.
- **Dispensing will start:**
 - Within +/- 0.02 GN of zero.
 - Between 0.10 GN and the target weight.
- **Dispensing will stop:**
 - Within +/- 0.02 GN of the target weight (green light ON).
 - Over the target weight (green light OFF).
 - Any negative weight (cup is lifted).
- **Notes:**
 - Do not lift the cup to accept a charge while the motors are still turning to dispense the last few kernels.
 - Lifting the cup during dispensing could cause the motors to spin quickly for a moment, dropping extra powder.
 - Only accept a charge when you see the green light and verify the amount is correct.
 - If you replace the empty cup and the weight is not close to zero, the previous charge could be incorrect.

Speed Settings

- Adjust the speed slider.
 - The **Speed** slider provides an adjustable tradeoff between speed and accuracy which can vary between powder types.
 - The default setting of 5 is a good starting point.
 - Large kernel powders usually require lower speed settings to avoid overshooting.
 - Fine kernel powders flow more smoothly and can handle higher speed settings.
- Optional:
 - In the **Settings** screen, there are separate sliders for the large tube, small tube, and transition weight.
 - The transition weight determines the weight remaining when the small tube takes over.
 - The **Speed** slider on the main screen controls all three at the same time, and displays **custom** if there are any changes.
 - Changes will take effect instantly. To reset any custom changes, move the main **Speed** slider.
- Note about accuracy:
 - An occasional overshoot takes a few seconds to fix. It might be worth having an overall faster time on every cycle. Experiment and decide what you prefer.
 - Finishing every single charge exactly on the right number is not necessary for long range shooting.
 - If you accept +/- 0.02 GN and reject +0.04 GN, then your velocity and elevation at long range will be the same as if they were all perfect.
 - **One kernel does not matter**, but two or three might.

Understanding Flow

The powder should flow through the small tube in a shallow, consistent stream, so that the last few kernels can fall predictably at low speed.

The amount of powder in the tube is affected by the tilt angle.

- Not enough flow:
 - The calibrated flow rate will be under 0.10 GN/s, or the powder may not flow at all.
 - The motor will run at maximum speed for a long time.
 - Inconsistent space between clumps of powder in the tube will cause periods of time where no powder is flowing.
 - The motor will run faster to compensate, and clumps of powder will fall out unpredictably, causing overshoots.
 - The housing may need to be tilted down.
- Too much flow:
 - The calibrated flow rate will be above 0.20 GN/s.
 - A large amount of powder will be visible at the end of the tube.
 - Many kernels will often fall at once, causing overshoots even at conservative settings.
 - The housing may need to be tilted up.

Small kernel powders tend to flow quickly, smoothly and consistently. Expect to see calibrated rates between 0.15 and 0.20.

Large kernel powders tend to flow less consistently, or not at all if the tilt angle is too far upwards. These powders are sensitive to tilt angle. You may need lower speed settings to avoid overshooting by more than two kernels. Expect calibrated rates between 0.10 and 0.15.

Adjusting Flow Rate

The housing has been designed to have a fixed tilt angle that works across a wide range of powders we have tested. However, you can adjust the tilt angle if you need to.

- If the flow rate is not between 0.10 and 0.20 GN/s:
 - Check that the scale is level.
 - Check that the platform is level.
 - Check that the housing is resting on the platform correctly.
 - Press **Slow** to run the small tube until the flow rate stabilizes.
 - If no powder is flowing, push the front of the housing down to prime the tube until powder starts flowing, then release and let it run normally for about 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. If this happens repeatedly, clear it by pushing something into the tube that can fit through.
 - Press **Calibrate** and verify the calibrated small tube flow rate is still out of range.
 - You may need to adjust the housing tilt angle when using this powder.
- To increase flow rate:
 - Add a spacer on the **rear bumper** to raise the back of the housing by 10 to 20 thou (1/4 to 1/2 mm).
- To decrease flow rate:
 - Add a spacer on the **front bumpers** to raise the front of the housing by 10 to 20 thou (1/4 to 1/2 mm).

Recalibrate and check that the new measured flow rate is within range. Remember what spacer you need for a specific powder, and what calibrated flow rate you expect.

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. Try turning the large tube by hand (or press **Fast** in the app) to release pressure.
- Remove the hopper.
 - Be careful not to spill powder that remains in the housing.
- Remove all the powder.
 - Place the hopper under the rear window and lift the window, pouring powder into the hopper. Then close the window.
 - Disconnect the cable.
 - Lift the housing, tilt it backwards, and shake. Powder in the tubes will fall to the back. Then lift the window and pour 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.
- Empty the cup.
 - Some powder may have fallen into the cup. Don't forget to empty it also.
- Pour powder into your container.
 - Place the hopper over your container and open the valve.
 - Shake out any stray kernels.
 - Close the valve.

Note: powder may tend to stick to the windows or the hopper when it is new. Over time this will improve. It may help to rub these parts with your powder to coat them with some dust.





Optional Jumper Wire

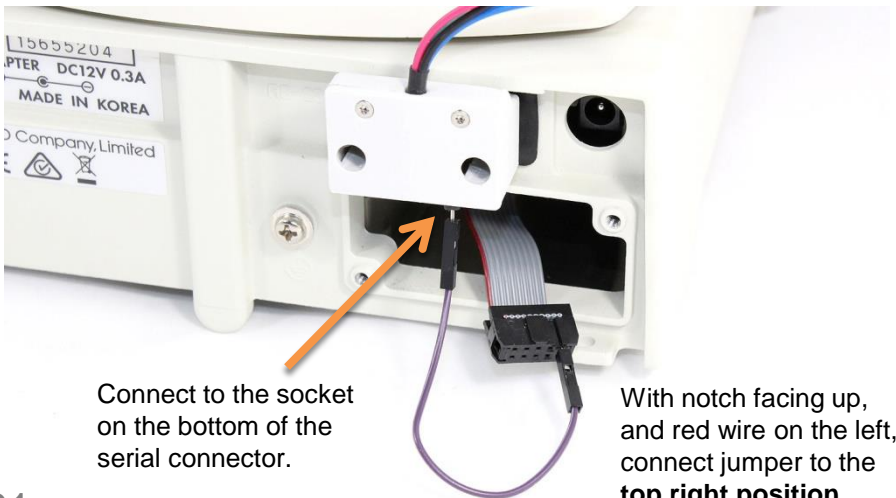
Roughly 1% of new A&D FX scales have a serial connector that does not provide power to the AutoTrickler electronics. In rare circumstances this may also happen after some time.

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

- If the app is unable to connect:
 - Ensure Bluetooth and Location Services are enabled.
 - Ensure the Location Services permission is enabled for this app.
 - Ensure your device supports Bluetooth 4.0 Low Energy.
 - Try connecting with a different device if you have one.
 - Unplug the AutoTrickler cable and plug it back in again 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.
 - If the light is solid, it is probably connected. Unplug and plug in the cable.
- If the app is connected, but unable to set a target weight:
 - Ensure the scale is turned on and displaying a weight in grains (GN) or grams (g).
 - Verify the scale configuration settings on page 9 and 10.
 - If you have changed any scale settings recently, factory reset the scale according to the A&D scale manual and then repeat the configuration steps 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 about 10 times per second.
- If the scale displays “Lb” or resets while motors are running:
 - Ensure you are using the correct power adapter we supplied, not the original A&D power adapter. See page 7.
- If a motor shakes in place, does not turn, or vibrates excessively:
 - Check the cable to the motor is connected properly.
 - Ensure the four screws holding the motor are tight.
- 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. Try inserting a thin rod through 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 within 0.10 to 0.20 GN/s.
 - See page 15-18 for details on flow rate and adjustments.
- Email adamjmac@autotricker.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 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 two years 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.