SuperTrickler®

When True Precision Matters

ST101 Generation 1, 2 & 3

Owners Manual – Profile

Powder & Preset

V3.3.2

This Document

This document was specifically written for the SuperTrickler® ST101 and forms part of a three-part manual set.
The **Owner's Manual – General** provides an overview of the SuperTrickler®.
The **Owner's Manual – Installation** explains scale setup and basic configuration.
The **Owner's Manual – Profile** focuses on powder and preset profile settings, including detailed dispensing operations.

Please read and understand this manual before operating the SuperTrickler. If you have questions or need help understanding any part of this documentation, contact our support team at: support@supertrickler.com.au

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You can also join our community via the following Facebook groups:
SuperTrickler FB Group: https://www.facebook.com/groups/174920460551694
SuperTrickler FB Owners Group: https://www.facebook.com/groups/1226539671258233 (you will need your order number to join this group) The Owners Group offers the most focused support, with verified owners sharing insights and asking questions freely.

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Profiles

Read this if nothing else

The SuperTrickler isn't difficult to use. It's **deeply configurable**. That distinction matters.

- For the **novice**, it offers an AI-driven, self-learning mode that works brilliantly out of the box for most situations.
- For **experienced** users, it provides unmatched control to optimize performance across virtually any powder type.

Criticism often stems from misunderstanding its dual nature. The SuperTrickler is not a one-button kitchen appliance—it's a precision instrument. Its perceived complexity is a trade-off for the flexibility and precision it offers across powder types. Careful study of this manual leads to excellent results. Adjusting controls without understanding them may cause inconsistent performance. Please take the time to read this manual.

Powder Profiles Overview

A profile is a structured set of parameters that defines how the SuperTrickler dispenses powder for a specific powder selection or preset. These seGeneration 3 units use a standard 12V/2A (30W) USB-C Power Delivery (PD) protocol power supply unit.ttings guide the system to control and optimize the dispensing process.

Although Powder Profiles include many settings that may seem complex at first, most users find the core parameters intuitive after minimal use. Sensible defaults and the built-in AI self-learning feature simplify initial setup. This depth of configurability enables exceptional speed and adaptability across a wide range of powders.

Unlike other machines that simplify their interface but sacrifice performance—often struggling with specific powder types—the SuperTrickler prioritizes precision and configurability without compromise.

To improve usability, the SuperTrickler maintains a persistent database of all powder and preset profiles. This eliminates the need to repeat learning or setup when switching powders.

Each powder or preset starts with a default configuration optimized for AI self-learning, allowing quick and easy dispensing. From there, you can fine-tune settings to meet your goals for speed, consistency, or precision.

Do not expect every charge to be perfect unless you are willing to reduce dispensing speed.

Terminology

- ***AI***: Artificial Intelligence – a system that uses weighted factors in relation to the information at hand to create an outcome.
- ***Tubes / Trickler***: The physical trickler tubes, the rotating bulk tube and the vibrating fine tube.
- ***Instrument***: How the system uses a given tube to deliver powder. Bulk, Fine & Pulse.
- ***Speed***: How fast an instrument is rotating or vibrating.
- ***Ramp***: To change the speed smoothly up or down.
- ***Inflight***: is the powder that has left the tube but not yet landed in the receiving powder cup.
- ***Target***: Is the instruments aiming point.
- ***Setpoint Offset***: Changes the instrument target to the charge setpoint less the offset (creates a new instrument setpoint).

At the heart of the SuperTrickler lies a GOFAI (Good Old-Fashioned AI) engine designed to learn and deliver precise results. Its functionality is divided into two distinct components:

1. **AI Orchestrator** – Oversees the charging operation, ensuring smooth execution and monitoring performance.
2. **AI Self-Learning** – Continuously analyzes errors flagged by the AI Orchestrator. Even when automatic profile adjustments are disabled, the self-learning process remains active in the background. It gathers data and generates insights to support operators in manually fine-tuning the profile

Sequencing and AI Orchestration

Unlike traditional systems that follow a fixed dispensing sequence, the SuperTrickler uses dynamic sequencing. The AI Orchestrator continuously monitors each charge and can switch instruments or methods mid-process to maintain both accuracy and efficiency.

Each instrument is calibrated to deliver precise amounts of powder, but higher dispensing speeds can introduce variability. To manage this, the AI monitors instrument performance in real time. If one instrument underperforms, the AI seamlessly transitions to another to ensure the final charge meets the target.

The AI operates without visual or tactile feedback—it relies entirely on data inputs, making it effectively “blind” to physical nuances. This is where your observations and manual adjustments become essential. By fine-tuning profile settings, you help guide the AI toward optimal performance for your specific needs.

Operators have different priorities. Some value consistency and are willing to trade speed for precision. Others prioritize speed and accept a higher rate of overthrows. Preferences range from extreme accuracy to more relaxed tolerances. The AI cannot infer these preferences—it relies on your input to shape its behavior for each powder.

Powder dispensing presents unique challenges. Some powders clump or bridge, while others flow freely. Most commercial dispensers use a “one-size-fits-all” approach, simplifying control systems to handle a broad range of powders. The SuperTrickler® takes a different path—allowing you to fine-tune settings for each powder type. These settings are saved, so you won't need to recalibrate when switching powders, giving you consistent control across a wide spectrum.

Of course, not every user wants to dive into detailed configuration. This is where the AI self-learning feature shines. It analyzes powder behavior and adapts over time, learning from its own performance. While it may not achieve perfect optimization, it finds a practical middle ground—delivering consistently accurate charges with minimal overthrows.

Ultimately, you are the best fine-tuner. Only you know your specific priorities and tolerances. For many users, selecting a powder and letting the AI self-learning system take over is more than sufficient. For others, the ability to guide and refine the process provides a powerful advantage.

Control System Philosophy

To get the best results from the SuperTrickler, it helps to understand its control system philosophy. While most dispensers rely on either a Proportional Integral Derivative (PID) controller or a basic Proportional Sequenced Controller, the SuperTrickler takes a different approach—integrating artificial intelligence (AI) into multiple aspects of its operation.

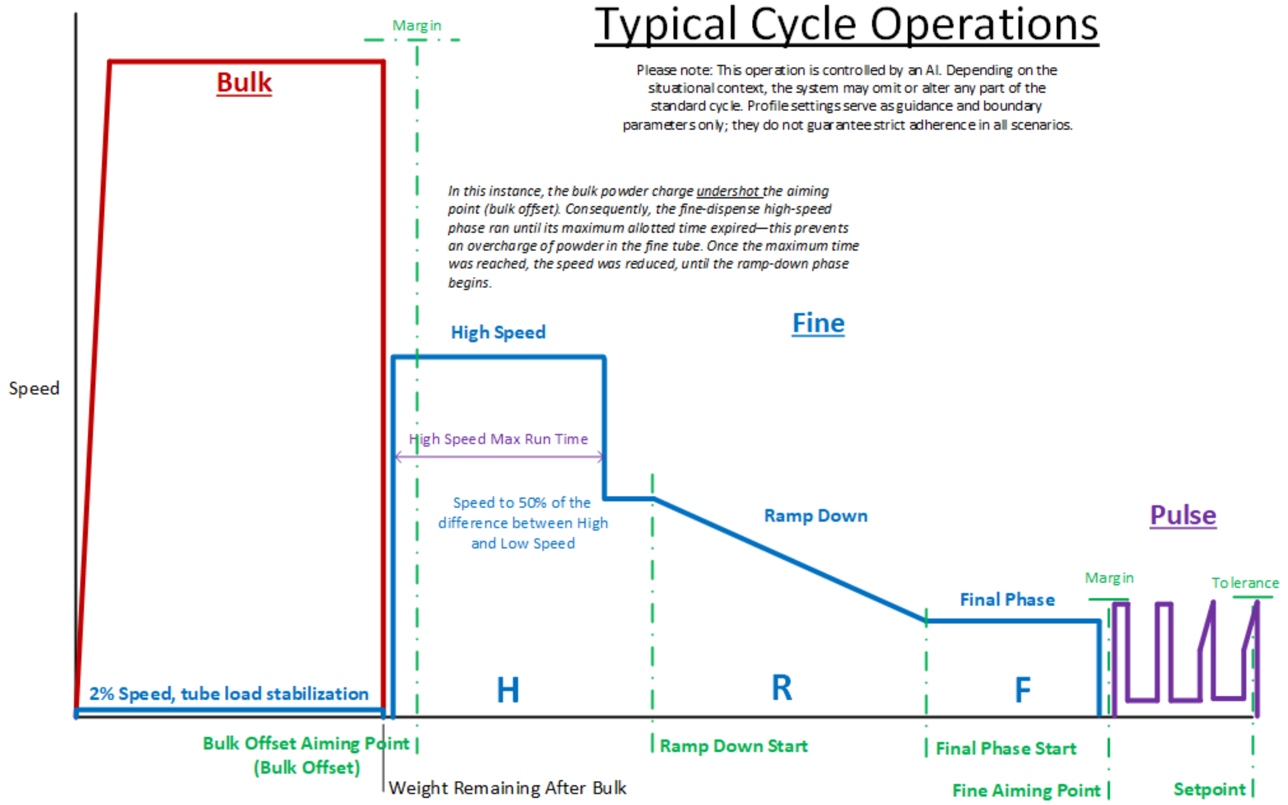
Proportional controllers have a key limitation: they adjust reaction speed based on the remaining error—how much more powder is needed. As the system nears the target, the error shrinks, and so does the reaction. In theory, a proportional controller alone may never reach the target, since its response slows to nearly zero. To compensate, most systems use techniques like setting a minimum speed or aiming slightly above the target setpoint. These methods are effective, but proportional controllers still require time to reach accurate results.

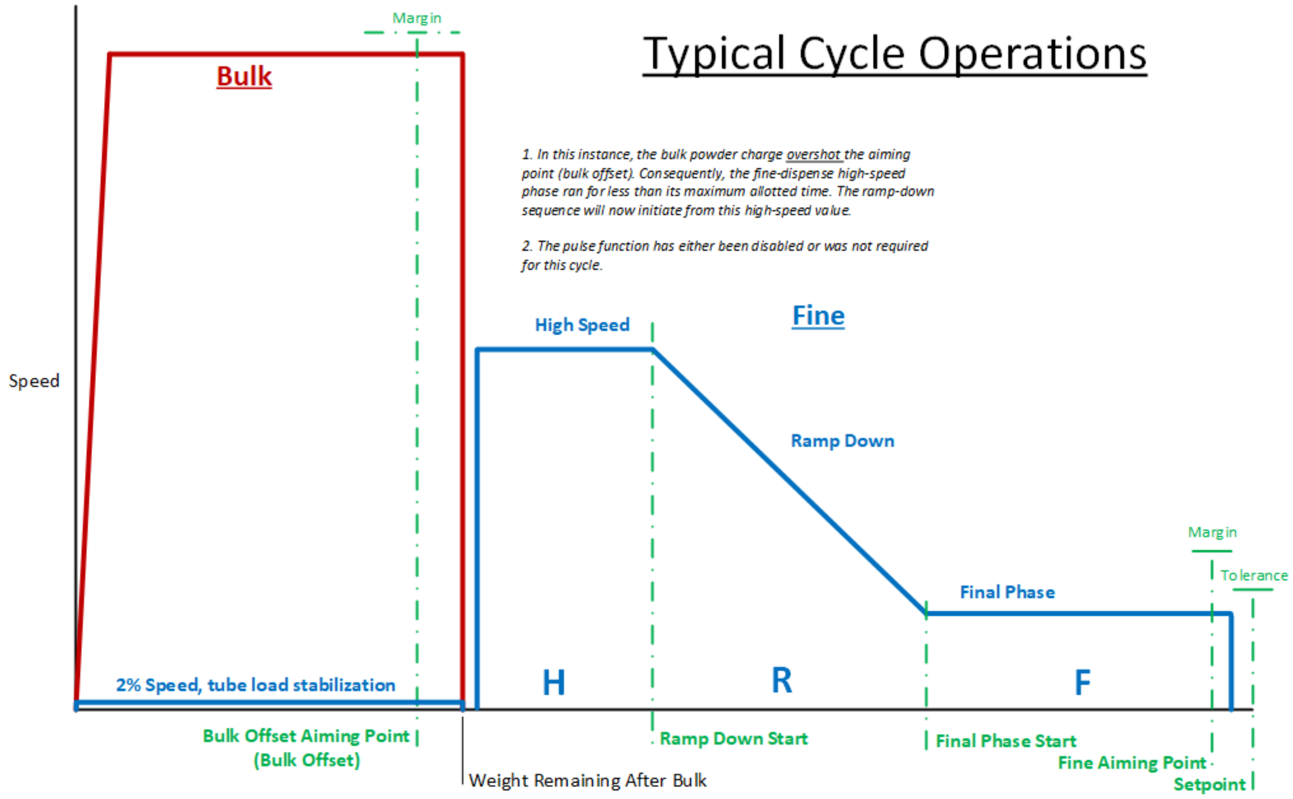
In contrast, the SuperTrickler uses AI to evaluate and adjust each dispensing attempt in real time. Rather than following a fixed sequence, the AI Orchestrator dynamically assesses each instrument's performance and responds accordingly. While this approach may increase the risk of overthrows, it offers major advantages in speed and flexibility. Operators can choose faster dispensing with a higher reject rate, or slower, more conservative operation with minimal or no rejects. The balance between speed and accuracy is entirely up to the operator, allowing precise control over the process.

Basic & Advanced Setting.

The profile offers two viewing and control modes: Basic and Advanced. Basic mode displays only the most commonly used controls, while Advanced mode unlocks a broader range of settings for power users who wish to fine-tune performance for greater speed or consistency. Advanced mode may also be necessary when troubleshooting unusual issues. This setting can be found in the profile more settings screen.

Advanced settings are shown in this document following this depiction ***Advanced*** and ending with a page line.


Typical Cycle Operations
Please note: This operation is controlled by an AI. Depending on the situational context, the system may omit or alter any part of the standard cycle. Profile settings serve as guidance and boundary parameters only; they do not guarantee strict adherence in all scenarios.
In this instance, the bulk powder charge undershot the aiming point (bulk offset). Consequently, the fine-dispense high-speed phase ran until its maximum allotted time expired—this prevents an overcharge of powder in the fine tube. Once the maximum time was reached, the speed was reduced, until the ramp-down phase begins.
Margin
Bulk
Speed
High Speed
Fine
High Speed Max Run Time
Speed to 50% of the difference between High and Low Speed
Ramp Down
Pulse
Margin
Tolerance
Final Phase
2% Speed, tube load stabilization
H
R
F
Bulk Offset Aiming Point
(Bulk Offset)
Weight Remaining After Bulk
Ramp Down Start
Final Phase Start
Fine Aiming Point
Setpoint


Typical Cycle Operations
Margin
Bulk
1. In this instance, the bulk powder charge overshot the aiming point (bulk offset). Consequently, the fine-dispense high-speed phase ran for less than its maximum allotted time. The ramp-down sequence will now initiate from this high-speed value.
2. The pulse function has either been disabled or was not required for this cycle.
Speed
High Speed
Fine
Ramp Down
Margin
Tolerance
Final Phase
2% Speed, tube load stabilization
H
R
F
Bulk Offset Aiming Point
(Bulk Offset)
Weight Remaining After Bulk
Ramp Down Start
Final Phase Start
Fine Aiming Point
Setpoint

Target Weight Calculation

Traditional control systems treat the setpoint as the final target and stop dispensing once the measured weight falls within the specified tolerance. However, because powder flow is often uneven, this method can be unreliable. The challenge is compounded by the scale's 50-millisecond update rate—during which a significant amount of powder may still be in motion.

The SuperTrickler's AI control system uses predictive methods to calculate powder weight and process status. To account for inconsistent powder flow, it targets an internal "aiming point" rather than the final setpoint. This aiming point is calculated to compensate for system lag and powder behavior. As a result, each instrument run finishes on target—but that target is based on a predictive calculation, not the setpoint itself.

The Bulk instrument uses a fixed target, typically set to the lower tolerance weight less the **offset**. For the Fine and Pulse, the target is user-selectable between three options:

- **Low:** Lower Tolerance weight.
- **Middle:** The mid-point between the Upper and Lower Tolerance.
- **High:** Upper Tolerance weight.

By default, the Fine target is set to **Low** and the Pulse target to **Middle**. This configuration generally performs well. However, some issues may still occur—for example, the Pulse may overshoot at the last moment, or the Fine phase may take longer than expected or be reactivated for a small correction.

Adjusting the target settings can help reduce these issues. For instance, if the Pulse frequently causes overthrows, consider setting its target to **Low**.

💡 **Important Note:** Adjusting these targets does not change the final charge weight or tolerance range. It only modifies the internal aiming point used by the predictive algorithm to determine when to stop each trickling phase—helping improve shutdown accuracy.

Inflight Concept and Inflight Tracking

Inflight refers to the powder that remains airborne between the end of the tube and the powder cup after the trickler stops. This value plays a critical role in the dispensing process.

The inflight tracking system monitors the airborne powder to refine the inflight value. It also compensates for changes in powder behavior as the hopper level decreases.

Inflight Tracking Filtering

The Bulk and Fine instruments each have their own inflight tracking filter. This filter uses the most recent inflight measurement and applies median exponential smoothing. The system significantly enhances the stability of inflight tracking adjustments. Without filtering, inflight values would vary unpredictably—no two drops are exactly the same. Smoothing allows the system to aim more consistently, targeting just inside the desired point.

The amount of smoothing can be adjusted from 0% (no smoothing) to 100% (maximum smoothing, which prevents change). A value around 80% to 95% is generally effective as an all-round setting. However, if the instrument seems unresponsive or slow to adapt, try reducing the filter to 75% - 80%. If the inflight behavior appears erratic or overcompensating, increase the filter to 95% or higher. The filter can also be turned off manually, and under certain conditions, the system may disable filtering automatically.

Vibrator Speed Settings

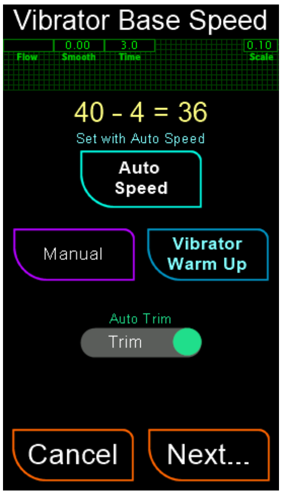
Stage one - the vibrator base speed.

Important

This setting must be configured when using an unprofiled powder or preset. It should also be checked at the start of each session and periodically during extended loading.

By default, (optional)the system will issue a warning at the start of each session. It will also alert you if the unit has been idle for a set period (default: 30 minutes).

VERY IMPORTANT: **Correctly setting the vibrator base speed is critical. If this step is skipped or done incorrectly, the AI self-learning system may not achieve stable results.**



The top of the screen displays the flow information (see Powder Flow Graph section below for details).

In most cases, it's best to use the **Auto Speed** function and allow the system to automatically determine the optimal base speed.

The setup involves two steps:

1. Set the vibrator base speed using the automatic system (**preferred**) or adjust it manually.
2. Set the **High Speed Limit**, which defines the maximum speed any instrument can reach.

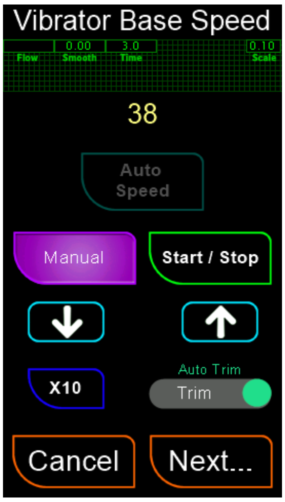
You can adjust the starting point in the **System Deep Settings**. As a general guideline, set the starting value about 15–20 units above the typical final result. This gives the powder tube time to fully charge and helps establish a consistent flow before trickling begins.

✷ **Auto Trim**

Auto Trim is a system that operates after self-learning. It monitors each powder drop, detecting increases in overthrows on the Fine or Pulse instruments and checking for low flow during Fine operation. If either of these extremes begins to trend, Auto Trim will intervene and make a small adjustment to the vibrator base speed to compensate for the change.

⚠ **This is a critical stage in the process**. It is imperative, especially near the end, that there are **no drafts** (such as open doors or windows, movement by people or animals, or breathing near the scale) **and no movement** (including vibrations or shifting items on the same table). Any disturbance can dramatically affect the accuracy of this critical setting.

Advanced

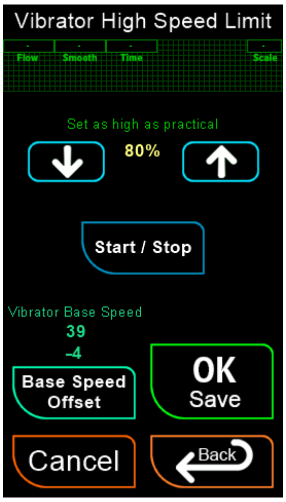


Alternatively, you can use the **Manual** setting to adjust the speed until the scale increments roughly once per second. Once this rate is achieved, stop the motor and reduce the speed by 4 units to optimize the control system's range.

Press the **Start/Stop** button to operate the motor. To adjust the speed, use the **Light Blue down and up arrows** to change the speed's minimum value. Always allow time for the flow to stabilize before finalizing the settings. This range can be any value between 1 and 255, with the current value displayed in yellow.

The **blue** unit button will toggle the value of the arrows between increments of **x1** and **x10**.

Stage two – the vibrator high speed limit



The vibrator high-speed limit defines the maximum speed for any instrument that utilizes the vibrator. This is not a critical setting and, once initially configured for a given profile, should generally remain unchanged

To operate the vibrator, press the Start/Stop button and adjust the speed as needed. Aim for a setting that achieves effective vibration without causing powder to bounce out of the cup. The speed range spans from 1% to 100% is steps of 5%. While a limit value of 100% is not unusual, a typical operating setting is around 75%. Again I remind you this is not a critical setting and you can just leave it 75% if no powder jumps out of the cup at that speed.

When completed, press the OK/Save button to lock in the values.

How to set the Vibrator Speed Settings step by step.

STEP 1. Make sure the hopper contains enough powder and that the powder cup is correctly positioned under the trickler tubes..

STEP 2. Press the **Auto Speed** button. The system will start the vibrator tube, gradually increasing speed, then slowing down until the flow rate reaches about one kernel every 3 seconds. Wait for the system to complete this process automatically.

STEP 3. After Step 2, the system will automatically advance to the screen for setting the **Vibrator High Speed Limit**.

STEP 4. Press the **Start / Stop** button and allow time for powder to build up in the tube—don't rush this step. While the vibrator is running, use the green arrow keys to adjust the speed up or down to prevent powder from bouncing out of the cup. Use the **blue range key** to toggle the adjustment step size between ×1 and ×10. This setting doesn't require precision—"close enough" is fine

STEP 5. When you're satisfied with the speed, stop the motor and press **OK Save** to confirm and store the settings.

NOTE: Temperature and other environmental factors can affect vibration behavior. You can recalibrate these settings as needed, but we recommend adjusting only the Stage One base speed. The High Speed Limit should generally remain unchanged once set.

Vibrator Base Speed Offset

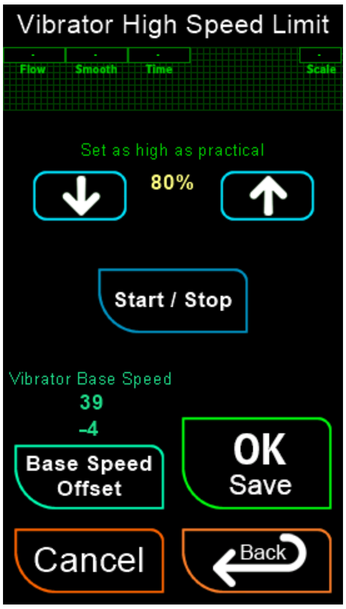
This feature applies only when using the **Automatic Base Speed Setting** and is disabled during manual speed configuration. The offset adjusts the base speed to ensure the system can slow down enough for the vibrating tube to run without dispensing powder.

Note: When setting the Vibrator Base Speed manually, the offset does not apply, and it is assumed that the operator has already accounted for the offset amount.

⚠ **Important**: The default offset of -4 is suitable for most powders. However, the optimal offset value depends on the powder and must be determined through trial and error. If the system—especially the Pulse instrument—struggles with a particular powder, try adjusting the offset by 3 or 5 units up or down and observe the results. If performance improves, fine-tune further. If it worsens, reverse the adjustment. A reliable guide for the correct offset is that the **Fine Low Speed.**

When the Offset Applies and How It Works

After the Automatic Base Speed detection, the offset is automatically applied to the base speed value. The system then proceeds to the High-Speed Limit screen, where you can adjust the offset if needed.



On the **Vibrator High Speed screen**, the base speed is shown along with the applied offset. To change the offset, press the **Base Speed Offset** button and enter a value between –20 and 0. If a positive number is entered, the system will automatically convert it to negative. If the value is out of range, the default offset will be used.

⚠ **Important**: You can change the offset at any time without redoing the base speed setup. The change affects the actual recorded value, not just the displayed one. For example, if the displayed value is 43 with an offset of -4, and you change the value to -3, the resultant base value will be 40.

The default offset value is –4.

Instruments

Instruments define how each tube operates based on its configured parameters.

Bulk: A rotating tube designed for fast delivery of large powder quantities.
💡 **Note**: During Bulk operation, the vibrating tube runs at low power to maintain tube loading consistency.

Fine: Uses the vibrating tube to fill any shortfall left by the Bulk instrument. It operates at both high and low speeds, ramping down as the target weight approaches. This ramp-down is not for proportional control—it's designed to de-load the tube (i.e., reduce powder buildup) in preparation for the Pulse instruments or the final few kernels of powder.

Pulse (Pulsating): Uses the vibrating tube, running a complex cycle of a pulsed On/Off cycle to complete any remaining shortfall. If disabled, the system will rely on the Fine instrument to finish the powder drop.

Each instrument's profile page includes a test-run tool that lets you observe powder flow and manually set speeds. If the Fine instrument's speed is set manually, the AI self-learning system will not adjust it. In that case, the profile screen will display the message: **"Self-learning speed locked."**

Profile Variables

A profile is a collection of settings that define how the system behaves for a specific powder or preset. These settings are stored in a persistent database and automatically recalled whenever that powder or preset is selected.

Each profile includes a set of variables that control system behavior—such as instrument speeds, inflight values, target weights, and other parameters that affect dispensing performance.

These variables are grouped into logical sections to reduce overall complexity:

- **Basic** – Tolerance, final stabilisation.
- **Delivery Instruments** – Bulk, Fine and Pulse.
- **Self-Learning**.

Initially, these settings may seem overwhelming. Be patient, and expect to revisit the relevant sections several times as you adjust the instrument. To help reduce complexity, you can set the system to "Simple" mode, which limits the number of active controls to just the essentials.
The key to successful fine-tuning is to observe trends rather than react to individual powder drops. Make sure you understand the settings you're adjusting—don't assume their function without review. Take the time to read and reflect on each setting's purpose. With practice, you'll become confident in troubleshooting and fine-tuning your SuperTrickler to meet your needs.

Let's now move on to the profile screens, where each variable and its functionality is described. The opening screen presents a menu that allows you to select the section you need.
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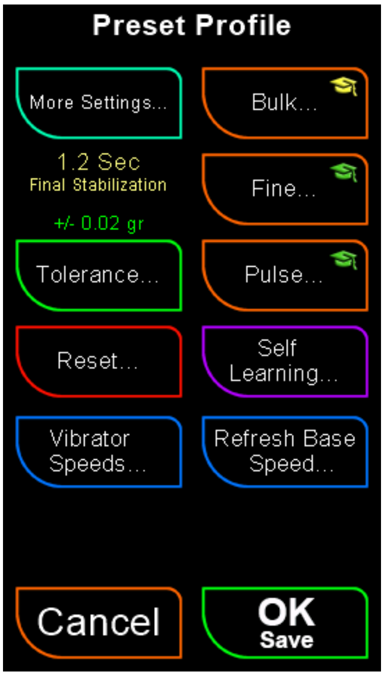

※ **More Settings**: More Settings – Includes options for final stabilization time, Settings mode, powder level alerts, vibrator off mode, dispensing timeout, and the special instrument stop mode.

※ **Tolerance**: Defines the acceptable range for a charge. Use this option to set both the tolerance level and type.

Note: A small green flashing dot, top left of the tolerance button indicates that the profile tolerance is something other than the standard ± 0.02 (± 0.020 for 3-digit resolution scale)

※ **Reset**: Opens the reset selection menu, allowing you to restore profile or instrument settings.

※ **Bulk, Fine & Pulse**: Access the settings for instrument.

※ **Self Learning**: Configure AI self-learning parameters.

※ **Vibrator Speeds**: Configure vibrator speed settings (a critical parameter). See also *Refresh Base Speed.*

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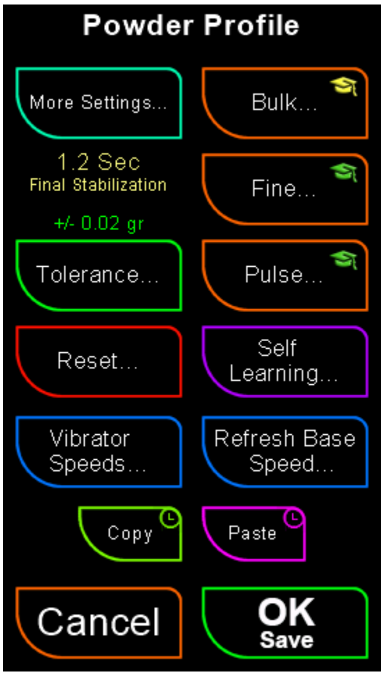
※ **Refresh Base Speed**: Updates the base speed only. It functions like the Vibrator Speed button, but does not navigate to the High Speed Limit page, which should remain unchanged once configured.

※ **Cancel**: Discards any changes (except vibrator settings) and returns you to the dispensing screen.

※ **OK Save**: Saves all changes and returns you to the dispensing screen/

Advanced



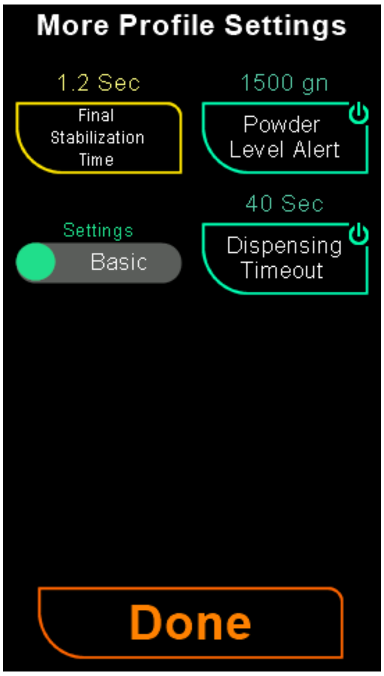
※ Copy: Copies the entire profile to the clipboard (only one clipboard is available).

※ *Paste*: Pastes the clipboard contents into the current profile.

Note: The Copy/Paste function is useful in several ways, for example:

- **Saving the current profile** – Save your existing profile before experimenting. If needed, you can restore it later.
- **Creating a new preset** – Save a profile and use it as the basis for a new preset (for example, the same powder but a different charge weight). Then, recall the saved profile into the new preset.

More Settings



❋ **Final Stabilization Time**: Final Stabilization Time – This parameter, measured in seconds, defines the delay after a charge completes. It gives the scale time to stabilize before determining whether the charge needs more powder, is within tolerance, or should be rejected due to overshoot.

If set too low, undershoots may occur; if too high, excessive time may be wasted. Typically, a delay of one to two seconds is sufficient, longer for high resolution scales. For fine grain powders, a shorter delay may be appropriate. For large grain powders, a longer delay may be necessary to account for vibrations caused by heavier granules in the delivery cup and scale.

💡 **Note**: A&D recommends a minimum stabilization time of one second, however the new high precision FX/FZ 104 & FX/FZ 254, scales will need approximately double the normal times, and a final stabilising time of 2 seconds or more is recommended.

❋ **Powder Level Alert**: Sets the threshold amount of powder that triggers a hopper alert. The default is OFF or 1500 grains, but you can adjust it to any value. Press and hold to disable the feature.

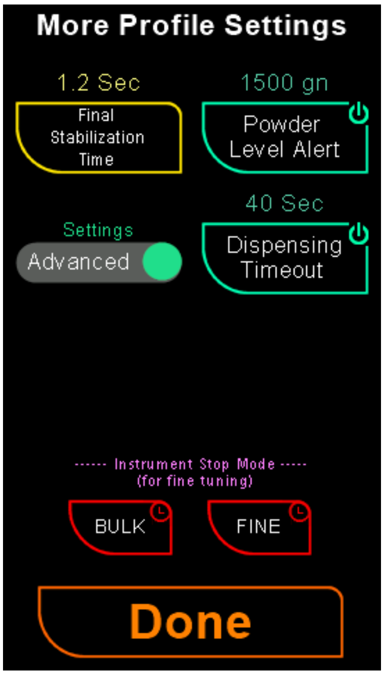
Guide to Hopper Volumes:

- It takes approximately 700 grains to cover the powder baffle at the bottom of the hopper.
- If the powder is 75mm (3") below the top, there are approximately 2000 grains in the machine.
- If the powder is 50mm (2") below the top, there are approximately 4000 grains in the machine.
- If the powder is 25mm (1") from the top, there are approximately 7000 grains in the machine.

❋ **Settings**: Selects between displaying the **Basic** profile settings or the **Advanced** profile settings, which may be required by power users or for troubleshooting unusual issues. Changing this setting does not affect the operation of the control system; it only modifies access to additional controls.

❋ **Dispensing Timeout**: Sets the maximum time allowed for a powder throw. If the limit is exceeded, the throw is automatically aborted. Press and hold to disable.

Advanced



Instrument Stop Mode: Instrument Stop Mode – A specialized fine-tuning option. When enabled for a specific instrument, it halts the charge once that instrument completes its operation. This allows detailed examination of the instrument's characteristics and metadata to optimize performance for speed or consistency. When any instrument stop mode is active, a notification will flash on the dispensing screen. If the system undershoots the target, the discard message will display as "DISCARD (ISM)."

Note: If both Bulk and Fine stop modes are selected, only the Bulk mode will take effect, and the system will stop after the Bulk cycle.

How to Use Instrument Stop Mode Buttons

To **turn ON** a Stop Mode button:

- **Press and hold** the button for **1 second**
- You'll hear a **long beep** confirming activation

To **turn OFF** a Stop Mode button:

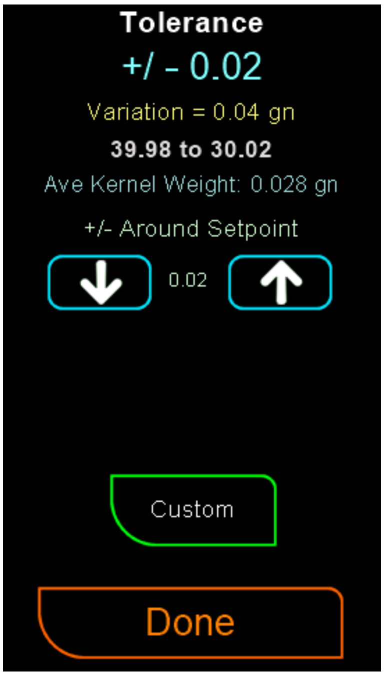
- **Tap and release** the button quickly
- No beep is heard on deactivation
-

Note: Switching from **Advanced** to **Basic** settings will automatically **disable all active Stop Mode buttons**

Tolerance

Tolerance defines the acceptable range for a charge. This adjustment lets you set how wide the range is and how it is applied. If tolerance is too tight, success rates may drop; if too loose, load stability may suffer. Two modes are available:

- Standard – applies tolerance equally above and below the setpoint.
- Custom – allows independent adjustment above and below the setpoint.



Line 1: Selected tolerance configuration. Blue indicates ± tolerance around the setpoint; Green indicates custom settings.

Line 2: Tolerance range or variation. For example, ±0.02 grains yields a total variation of 0.04 grains (0.02 below and 0.02 above).

Line 3: Charge range with the current setpoint.

Line 4: Average kernel weight of the selected powder (if available in the powder.dbl file).

✳ **Down & Up arrows**: Adjust the tolerance bandwidth.

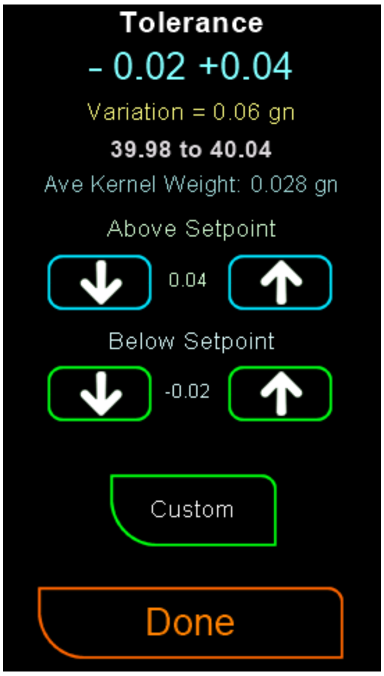
Three Decimal Place Mode Behaviour

In three-decimal-place mode, an additional button (X1/X10) appears:

- X1 – Fine adjustment.
- X10 – Accelerated adjustment.

Note: Use these modifiers to fine-tune or expedite changes depending on your precision needs.

Custom Settings



Custom Settings – Allow separate tolerance values below and above the setpoint.

- Setting tolerance to 0.00 may seem ideal, but it often results in many rejected charges.
- Some powders have individual grains weighing 0.06 grains or more. Despite this, testing shows that average kernel weights allow tolerances below grain weight to remain achievable, especially for larger charges.
- Rule of thumb: Weigh 10–20 kernels to find the average kernel weight. Multiply by 2 and set this as your ± tolerance (rounded to the nearest 0.02 grains, the scale's resolution).
- Example: Vihtavuori N555 average kernel weight = 0.024 grains. ×2 = 0.048 → tolerance ±0.04 grains (range 0.08).
- For tighter tolerances, customize above and below values, but always allow at least one kernel weight.
- The Powder Database file includes many preset tolerance values. For large-kernel powders, verify that the preset suits your needs.

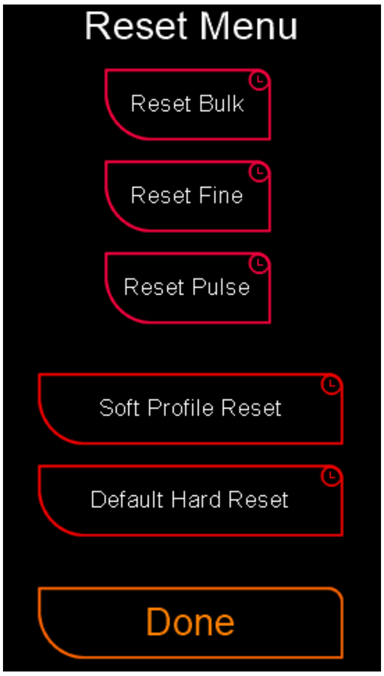
Reset Menu Function Overview

There are many valid reasons to reset a profile and start fresh. Like any system, the AI can make decisions based on flawed assumptions or incomplete data, which may lead to unintended results.

For example, if a clump of kernels falls during a critical measurement, the AI may misinterpret this as normal powder behavior. Similarly, if powder flow is restricted while the AI is assessing flow rate, it may reach incorrect conclusions, producing a poor profile that leads to overthrows or slow performance.

In these situations, it is often best to reset the profile and allow the AI to relearn under improved conditions. Alternatively, you can reset only the instrument that is underperforming.

The reset menu allows you to restore the current profile—either fully or partially—to a state optimized for self-learning.



The reset menu includes:
⚛ Three smaller red buttons to reset individual instruments independently.

⚛ Two larger buttons to perform full profile resets, each with different scopes and retained settings.

Soft Profile Reset
Resets the profile using the default profile, while preserving the following settings:

- Charge Setpoint
- Cartridge Volume
- Kernel Weight
- Tolerance
- Final stabilization Time
- Powder Level Alert
- Vibrator Off Mode
- Idle Offset Units
- Dispensing Timeout
- Fine and Pulse Target Settings
- Pulse Ramp
- Pulse Dither
- Self-Learn Bias

Default Hard Reset
💡 Note: Use this as a **last resort** to reset nearly all operational parameters.
Resets the profile using the default profile, preserving the following settings:

- Charge Setpoint
- Cartridge Volume
- Powder Level Alert
- Idle Offset Units
- Dispensing Timeout

Bulk Instrument

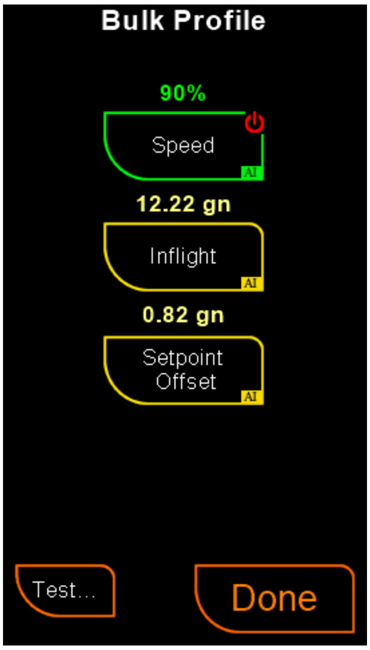
The Bulk Instrument screen contains all parameters for the bulk trickler tube. This tube is driven by a rotating stepper motor and is designed to dispense the majority of the powder quickly.

Process of the Bulk Instrument.

The Bulk Instrument process operates as follows:

- The system evaluates whether the bulk instrument is suitable for the current charge.
- If suitable, the rotating trickler ramps up from zero to the operating speed.
- At the same time, the vibrating motor runs at low speed to even-out the loading in the tube.
- When the weight reaches the aim point, the rotating trickler stops. A prediction algorithm is used to increase accuracy due to the high throughput of powder, faster than the scale handle.
- The system then evaluates the results of the instrument's operation

Bulk Instrument Parameters



☀ **Speed**: Defines the rotation speed from 1% to 100%. The default is 90%, but this may not suit all powders. Powders that flow poorly may clump or tumble inside the tube; reducing speed often improves consistency. A stable output allows the system to predict inflight powder more accurately, helping the bulk instrument stop closer to the target weight. See Bulk Test for more details. To disable the Bulk instrument, press and hold the Speed button.

NOTE: At times the AI may also choose an alternative speed.

☀ **Inflight:** Defines the amount of powder still airborne after the bulk motor stops. This value is usually set by AI self-learning, or the Inflight Tracking system and can also be adjusted manually using the metadata shown on the dispensing screen. See the inflight section for more details.

☀ ***Setpoint Offset***: The Setpoint Offset is initially configured by the AI self-learning system to provide a margin that allows the Fine or Pulse instrument to operate correctly. This parameter is part of the **HRF** system (see below) and determines how long the Fine instrument will operate at High Speed.

Under normal conditions, the Fine instrument is enabled and governed by two parameters: **Ramp-Down** and **Final-Phase**. The Bulk instrument's aim point is calculated as:

Setpoint – (Setpoint Offset + Ramp-Down + Final-Phase)

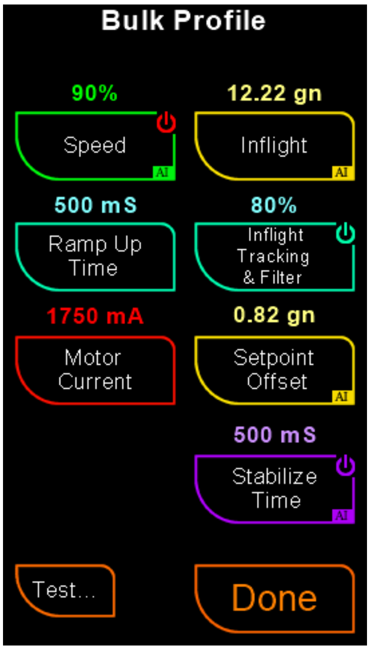
If the Fine instrument is disabled, the Setpoint Offset simply acts as a fixed offset from the charge setpoint.

While this may initially appear to be a Fine instrument control, it is fundamentally an operational control for the Bulk instrument. Its purpose is to create space for the Fine instrument to function effectively by shifting the Bulk aim point below the setpoint by a defined margin.

⚠ Although the concept may seem complex at first, it's best understood as a **margin or tolerance control** for the Bulk instrument—helping it accommodate the inherent variability (or inaccuracy) of bulk delivery.

✵ **Test**: Opens a page where you can run the bulk motor and adjust speed while observing powder flow. For more details see below.

Advanced



✵ ***Ramp Up Time***: Defines the time taken for the bulk motor to accelerate from zero to the set speed. A soft start reduces strain on components. For heavy powders, use a longer ramp-up; for lighter powders, a shorter ramp-up may be suitable. Although a setting of 0 ms is possible, it is not recommended for heavy powders.

✵ **Motor Current**: Adjusts the current supplied to the bulk motor, from 500 mA to 2000 mA (0.5–2 A). The default is 1200 mA for Gen 1 machines and 1750 for Gen 2 machines.

- Increase the value if the motor stalls or struggles with heavier powders.
- Use lower values for lighter powders to reduce strain and noise.

Values below 1400 mA are displayed in white (low current). Values at or above 1400 mA are displayed in red (high current). High current increases noise, stress on components, and the risk of thermal shutdown. For best results, use the lowest stable setting.

💡 **NOTE**: Motor current only affects torque. It does not change speed or other performance characteristics.

✵ **Inflight Tracking & Filter**: Adjusts the level of filter smoothing applied to the inflight tracking system. See the section above on *Inflight Tracking* for more details.

✵ **Inflight Tracking & Filter OFF**: Press and hold this button to disable the inflight tracking system.

✵ **Stabilize Time**: Stabilize Time – Defines the delay (in milliseconds) for the scale to settle before results are evaluated.

- The initial value is measured and set by the AI.
- Practical range: 500–1000 ms and 1000–1500 for high precision scale.
- Too short: risk of premature instrument engagement
- Too long: wasted time

💡 **Note**: When the time is set below 500 (1000 for a high precision scale) milliseconds, the inflight tracking will be disabled, as there will still be powder in flight when the next instrument starts.

✵ **Stabilize Time OFF:**

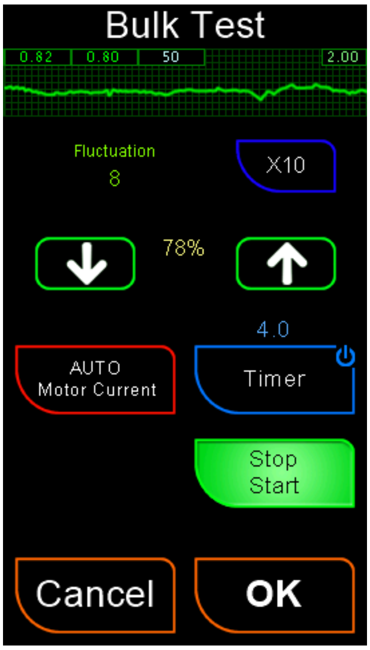
A specialized mode to reduce cycle time. Press and hold the Stabilize Time button to disable the stabilization.

- Disables stabilization delay and inflight tracking.
- AI compensates for residual inflight powder as the Fine or Pulse instruments begin dispensing.
- If inflight is set too high, Fine may pause prematurely.

- If inflight is set too low, Fine may overshoot

⚠ **Important**: Do not disable *Stabilize Time* while the system is in *Self-Learning* mode. The AI requires stabilization to accurately assess powder behaviour during its learning phase.

Bulk Test



⚛ **Motor Current:** The test page includes an option to automatically set the motor current by pressing the Auto Motor Current button. When this button is pressed, the speed will be set to 100%, and the motor will start at the lowest current setting. If the motor stalls, it will be turned off, the motor current readjusted to a higher value, then restarted. This process will repeat until a stable current is found or the maximum is reached.

⚠ **Bulk speed** is often overlooked, yet it can be a critical factor in achieving optimal performance. If set too high, the powder may tumble rather than flow, resulting in unstable output. Conversely, if set too low, the powder fails to flow smoothly. Depending on kernel weight, the AI may adjust this speed automatically, but manually setting it from the test screen before initiating self-learning is usually the best approach.

Bulk Test Speed: Run the bulk at various speeds to identify the setting that produces the **least fluctuation** within the first two to three seconds. Use the X10/X1 button to adjust the step size and fine-tune the speed for optimal stability.

Timer: The timer limits the maximum run time of the bulk tube to prevent the cup from being overfilled.

⚠ **Important**: The Bulk motor is a stepper motor, which can be quite noisy at certain speeds—typically between 40% and 85% of its maximum speed. At lower speeds, the motor requires less current, and reducing the current can help minimize noise.

Fine Instrument

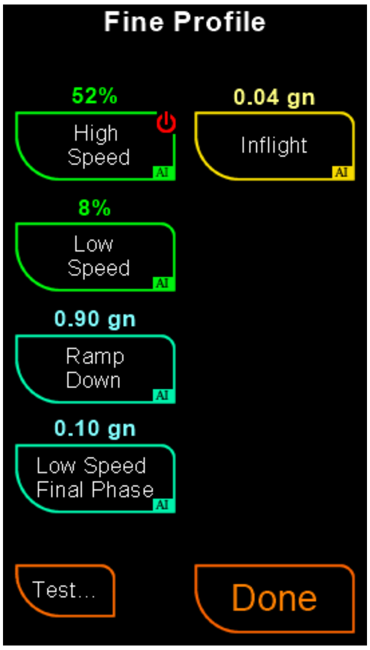
The Fine instrument compensates for any shortfall left by the Bulk instrument or, when Bulk is not used, it quickly fills smaller charges.
A vibratory system differs from a rotating trickler tube. In a rotating tube, speed changes produce immediate changes in powder flow. In a vibrating tube, powder flow depends on the previous vibration speed, so changes are not instantaneous. The advantage is precision—the vibrating tube can dispense very small, controlled amounts of powder.

Process of the Fine Instrument.

The Fine Instrument process operates as follows:

- The system evaluates whether the Fine instrument is suitable for the charge.
- The remaining weight is assessed, and a start speed is chosen between the high-speed and low-speed settings.
- The vibrating trickler accelerates from off or idle to the high-speed setting. High speed will only operate for a short time before reducing itself to a mid-speed to avoid overloading the tube.
- As the aim point approaches (minus ramp-down and final-phase weights), the speed reduces toward the low-speed setting.
- At low speed, the tube continues running for the final phase.
- When the aim point is reached, the trickler returns to off or idle.
- The system evaluates the results.

Fine Instrument Parameters



High Speed: Defines the maximum operating speed of the vibrating trickler, expressed as a percentage of full speed. If the Fine instrument is not required, press and hold the **High Speed** button to disable the Fine instrument.

Although this setting defines the high-speed value, the system will only run at this speed for a short duration (see Advanced HRF details below). After that period, the speed is automatically reduced to a mid-speed level to prevent overloading the tube with powder.

Warning, setting the high speed too high will cause overthrows.

Low Speed: Defines the minimum operating speed (as a percentage) used during the final phase after ramp-down. This value is automatically adjusted by the self-learning system unless it is manually locked.

Ramp Down: Defines the weight before the aim point at which the vibrating trickler begins slowing down.

- Too small: risk of overshoot.
- Too large: wasted time.

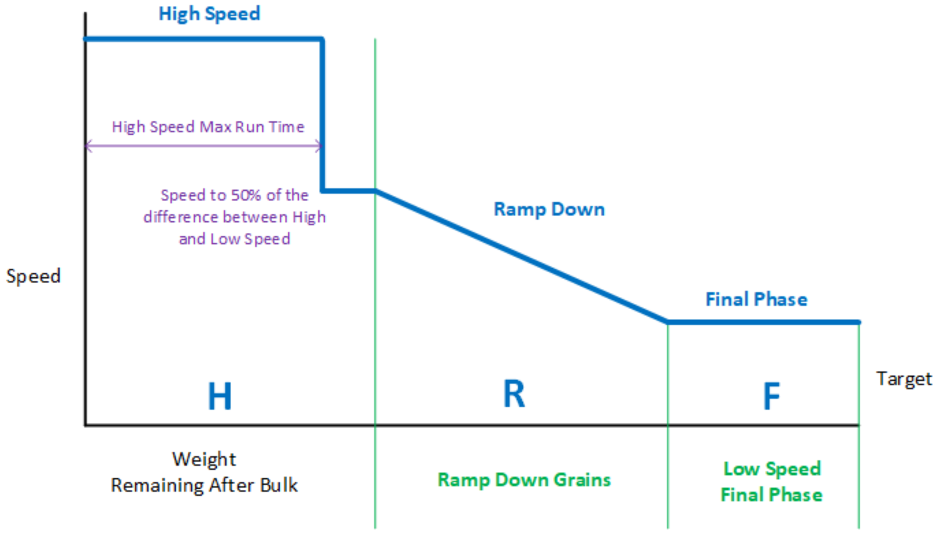
Low Speed Final Phase: Defines the number of grains remaining after ramp-down, during which the tube runs at low speed. This helps stabilize inflight values and ensures consistent de-loading of powder before Pulse operation.

Key points:

- Ramp-down and final phase work together to stabilize inflight powder.
- If ramp-down is too fast, excess powder may trigger premature shutdowns.
- Larger or free-flowing powders may require higher values; fine powders may need less.

Tip: Mastering the High-Speed, Ramp-Down, and Final-Phase (HRF) relationship is essential for fine-tuning. Also see the Fine HRF system below.

Fine Control HRF Operation



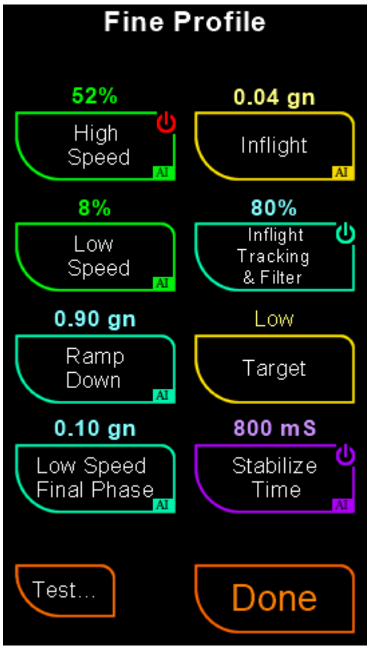
⚙ **Test**: Opens a page where you can run the Fine motor and adjust speeds while observing powder flow. The test screen also includes a speed lock option to prevent AI self-learning from changing motor speed.

⚙ **Inflight:** Defines the amount of powder still airborne after the Fine motor stops.

- Usually set by AI self-learning, but can be adjusted manually using metadata on the dispensing screen.
- Recommended inflight levels: 0.02–0.15 grains.

💡 **NOTE (Pulse disabled):** If the Pulse instrument is turned OFF, the Low-Speed will be set to the minimum flow value and the Inflight value will be set to 0.00. The system will rely on the Fine instruments it to dribble the powder up to the target setpoint.

Advanced



Inflight Tracking & Filter: Adjusts the level of filter smoothing applied to the inflight tracking system. See the section above on *Inflight Tracking* for more details.

Inflight Tracking & Filter OFF: Press and hold this button to disable the inflight tracking system.

NOTE: When the time is set below 700 milliseconds or 1400 for high precision scales, the inflight tracking will be disabled, as there will still be powder in flight when the next instrument starts.

Target: Defines the internal aiming point for the Fine instrument. Options: Low, Medium, or High.
- Default: Low.
- Use Medium or High to increase speed if accuracy is consistent.
- Use Low or Medium to reduce overthrows if precision is a priority.

Stabilize Time: Stabilize Time – Defines the delay (in milliseconds) for the scale to settle before results are evaluated.
- The initial value is measured and set by the AI.
- Practical range: 700–1000 ms and 1400–2000 for high precision scale.
- Too short: risk of premature instrument engagement.
- Too long: wasted time.

Stabilize Time OFF: To disable the stabilisation time feature, press and hold the Stabilise button. When disabled, special AI-based pre-emptive algorithms are used to compensate, allowing for quicker loading. However, this may increase the risk of overthrows.

Self-Learning Fine Tuning
Although the Bulk or Fine adjustments may have stopped their core settings learning, the system - while still in self-learning or monitoring mode - will continue fine-tuning the Bulk **Setpoint Offset**, Fine **Ramp Down**, and Fine **Low Speed Final Phase** to optimize the balance between consistency and speed.

Setup Tips
High Speed: In general, maintain a reasonably fast High Speed, considering how close the bulk is to the target and the amount of work required during the Fine phase. If the speed is too fast, the ramp-down might be ineffective (or require a longer ramp-down) and stability will be compromised, while too slow a speed will waste time. As a guide, 2/3 (66.6%) of the **Vibrator High Speed Limit** is a good starting point. If Fine overshooting is a problem reduce this value.
Allow time and settings for the Low Speed, Ramp Down and Low Speed Final Phase to give you stable result, with rare use of the pulse instrument. If using the controls you find its difficult to obtain fine stability then reduce the Hight Speed. See fine tuning below.

Set the **Low Speed** as slow as you can while maintaining a very slow, consistent flow. The goal here is to achieve a very low and consistent inflight value. Running at this slow speed is preferable to using the pulse mode, if possible.

Set the **Ramp Down** as described above, but make observations to ensure the **Final Phase** operates clearly. Keep the ramp as short as possible to avoid wasting time; however, if the ramp is too short, it will interfere with the final phase, leading to inconsistent inflight values and potential overthrows.

Set the **Low Speed Final Phase** (default is 0.15 grains) to ensure it runs long enough to achieve a fairly consistent inflight value. However, setting it too long will result in wasted time.

Fine tuning the **High Speed**: Once everything is stable and the pulse is rarely or not being used, begin gradually increasing the High Speed. Remember to look for trends rather than focusing on the results of a single throw. Continue to incrementally increase the speed until you either reach the High Speed Limit or start encountering unstable results, overthrows, and higher usage of the pulse.

Ultimately, the amount and consistency of the Fine inflight powder is a combination of the **Bulk Offset**, **High & Low Speed**, **Ramp Down**, and the **Low Speed Final Phase**. The more consistent the inflight, the faster your powder drop will be, as it will allow you to adjust the inflight down to the point where the pulse is hardly required.

Fine HRF

Fine HRF (High-Speed, Ramp-Down, and Final-Phase) – These parameters determine the balance between consistency and speed. Key influencing factors include:

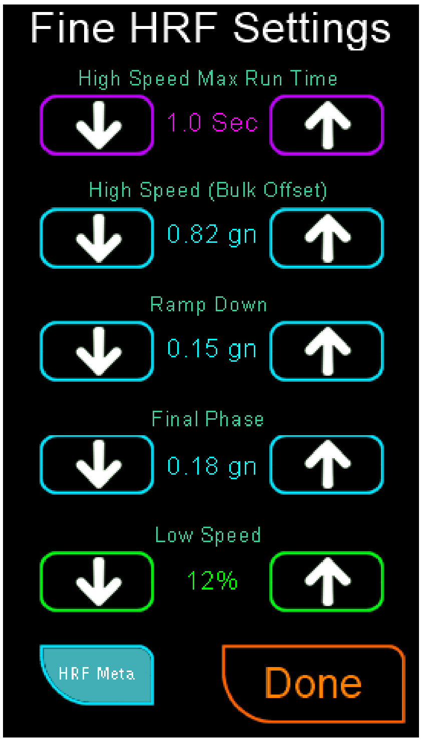
- Bulk stability
- High Speed run time
- High Speed starting point (Bulk Setpoint Offset)
- Ramp-Down duration (Fine Ramp-Down)
- Final Phase duration (Fine Low Speed Final Phase)

Correctly setting these parameters establishes the foundation for reliable charges. Combined with options such as disabling Bulk and Fine stabilization times—and optionally disabling Pulse to let the Fine Final Phase complete the charge—you can achieve both speed and consistency.

Quick Access and HRF Meta-Data Display:

Hold the Profile button on the dispensing screen to access HRF shortcuts. A dedicated HRF meta-data display is also available via the F-key, showing HRF timing data.

For fast throws, aiming for an average of approximately 1 second for each stage of the HRF process is a good starting point. If the Fine Instrument begins to overshoot, extending these durations can often resolve the issue quickly.



✵ **Arrow Button**:
Provide quick adjustments to profile settings in single-unit steps. Hold the button to apply rapid changes.

Example Usage:
If HRF metadata indicates the Ramp-Down phase is too short and causing overthrows, hold the Profile button and tap the Ramp Down Up arrow to increase the ramp-down grains.

✵ **HRF Meta Button:**
This button provides a convenient way to toggle the metadata between the option selected via the F-key (default: Inflight) and the HRF metadata

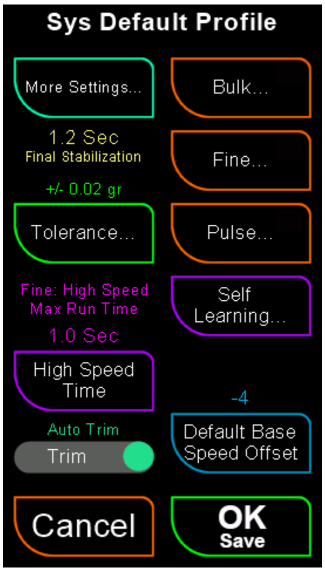
✵ **High Speed Max Run Time:**
Limits the maximum duration of the Fine High-Speed phase to prevent overloading the tube.

Tube Overloading: If Bulk stops early, Fine High Speed may run too long, causing an overloading of powder (too much powder) in the tube resulting in overthrows.

- To prevent the overloading, we can limit the High Speed with a maximum run time.
- Typical value: ~1 second.
- If overthrows persist, reduce to ~0.6 seconds or less.
- Heavy powders will require only a small amount of High-Speed of around 0.3-0.5 of a second.

💡 **Note 1**: This setting is separate from the measured overall High Speed operational duration, which usually averages 1 second or more, found in the HRF metadata.

💡 **Note 2**: As there is no room on the Fine screen for this control, the ability to change its default value is the Default Profile settings screen.



Pulse Instrument

Designed to make up any shortfall left by previous instruments. When configured correctly, it can dispense powder down to a single grain.

- Advantage: Provides precise final finishing of the charge.
- Disadvantage: Slower, as each pulse requires time for powder to fall and be measured.

The settings of the pulse system are the most complex. This complexity is necessary to manage the wide variety of powder characteristics in this delicate operation. Often, fine-tuning the pulsing system is a matter of trial and error, as there are no fixed rules for what will work best for the powder you are using in your specific environment.

What Happens if you turn the pulse instrument off (important)

Turning Pulse Off – The Fine instrument takes over finalizing the charge.

- Fine inflight is set to 0.00.
- Fine low speed is set below continuous flow to purge excess powder.
- Fine may need adjustment to deliver a gentle dribble and longer final phase.
- System automatically switches to minimum flow values when Pulse is off, and restores normal values when re-enabled.

Recommendation: Allow the system to self-learn with Pulse enabled so all parameters are optimized.

Dithering.

Prevents standing waves in the vibrating tube, which can stop powder flow. The system continually varies speed and pulse durations to disrupt standing waves.

- Based on pulse parameters and remaining weight.
- Ensures consistent powder movement during pulsing.

Ramping.

Softens the start of each pulse to prevent powder bursts.

- Motor ramps from ~50% speed to nominal speed during the pulse period.
- May require longer pulse-on times.
- System may enable or ignore ramping automatically.

💡 **Note**: Ramped pulses are displayed with a "/" before the speed (e.g., Pulse /32%).

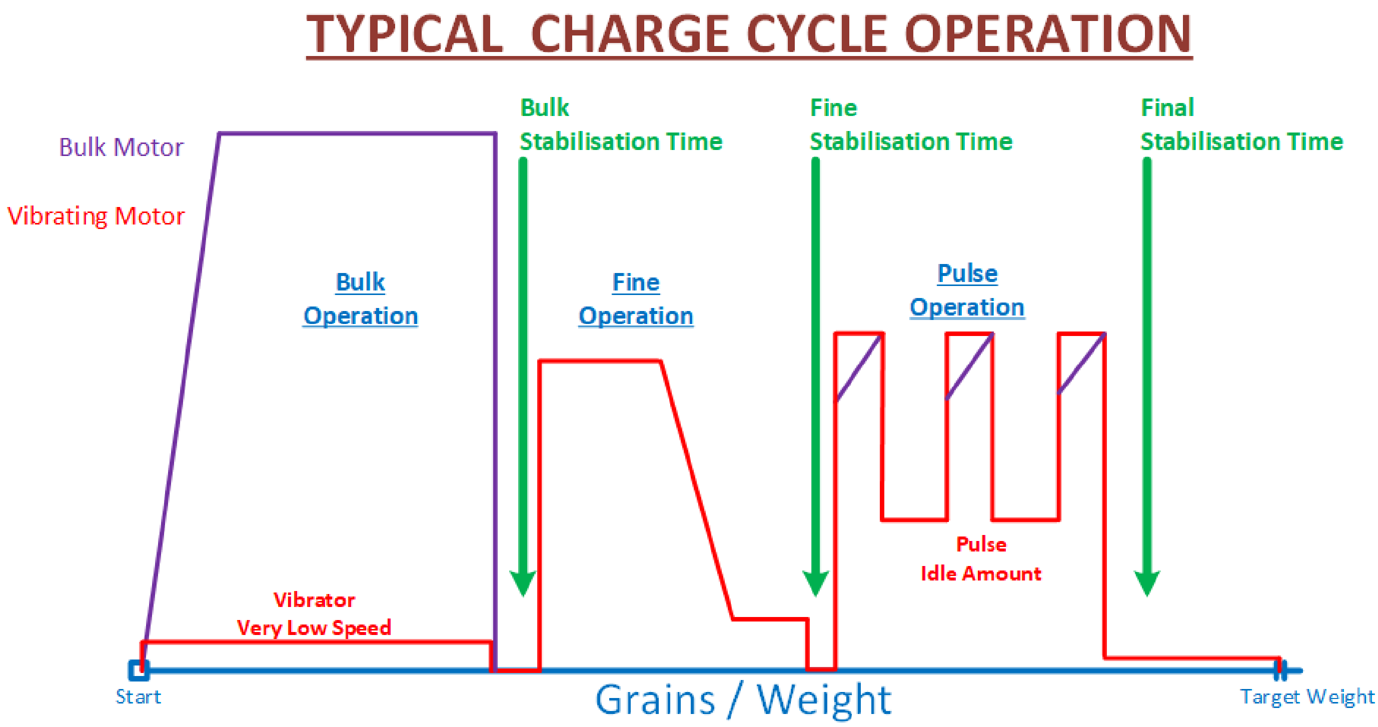
Process of the pulse Instrument.

Pulse Instrument process:

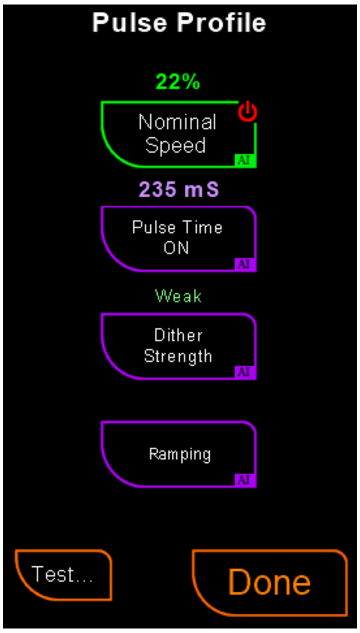
- System evaluates whether Pulse is suitable for the remaining charge.
- Vibrating trickler starts from off or idle to pulse idle speed (if enabled).
- Motor runs at nominal speed for a short time (milliseconds).
- Motor returns to idle; wait time allows powder to fall and be measured.
- If charge is still short, the process repeats until the aim point is reached.

💡 **Note**: This is an extraordinarily simplified description of the pulse operation. The full complexities and operational details are beyond the scope of this manual.

Looking at the image below you can see a typical powder drop, showing the pulse operation. The purple line indicates the ramping is enabled.



Pulse Instrument Parameters



⁕ **Nominal Speed**: Main operating speed (%). Slower, longer pulses are usually more effective than high speed fast pulses. Press and hold to disable Pulse.

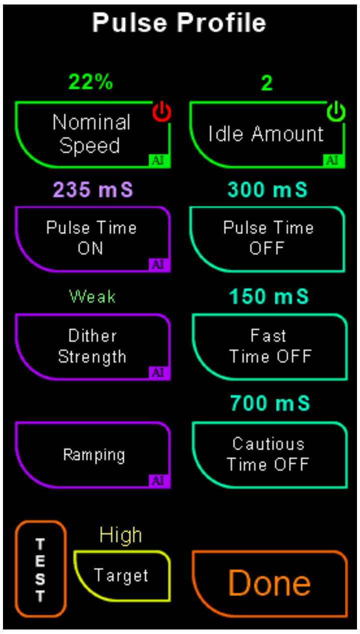
⁕ **Pulse Time ON**: Motor run time (ms). If ramping is enabled, ramp occurs during this period..

⁕ **Dither Strength**: Adjusts the intensity of dithering to enhance kernel movement. This process modulates the speed around the Nominal Speed and Pulse Time ON to help prevent the formation of standing waves within the tube.

⁕ **Enable Ramping**: Turns on ramping to soften pulse impact.

⁕ **Test**: Opens test screen to run motor and adjust speeds. Includes speed lock option..

🛠 *Advanced*



⚙ **Idle Amount**: When the tube starts there is considerable inertia involved before the kernels respond to the vibration and begin moving. The pulse idle amount is set in units, which can be a value between Off or 1 to 100, generally a value of 5 is considered high.
Trial and error is the best way to deal with the setting. If the pulse time is taking a long time and flowing well, increase this value. If the powder seems to flow too much and you are getting many pulse overthrows, then reduce this value. Generally, reducing it in steps of 2 or 5 is common.

⚙ **Pulse Time OFF**: Wait time (ms) for powder to fall and be measured.

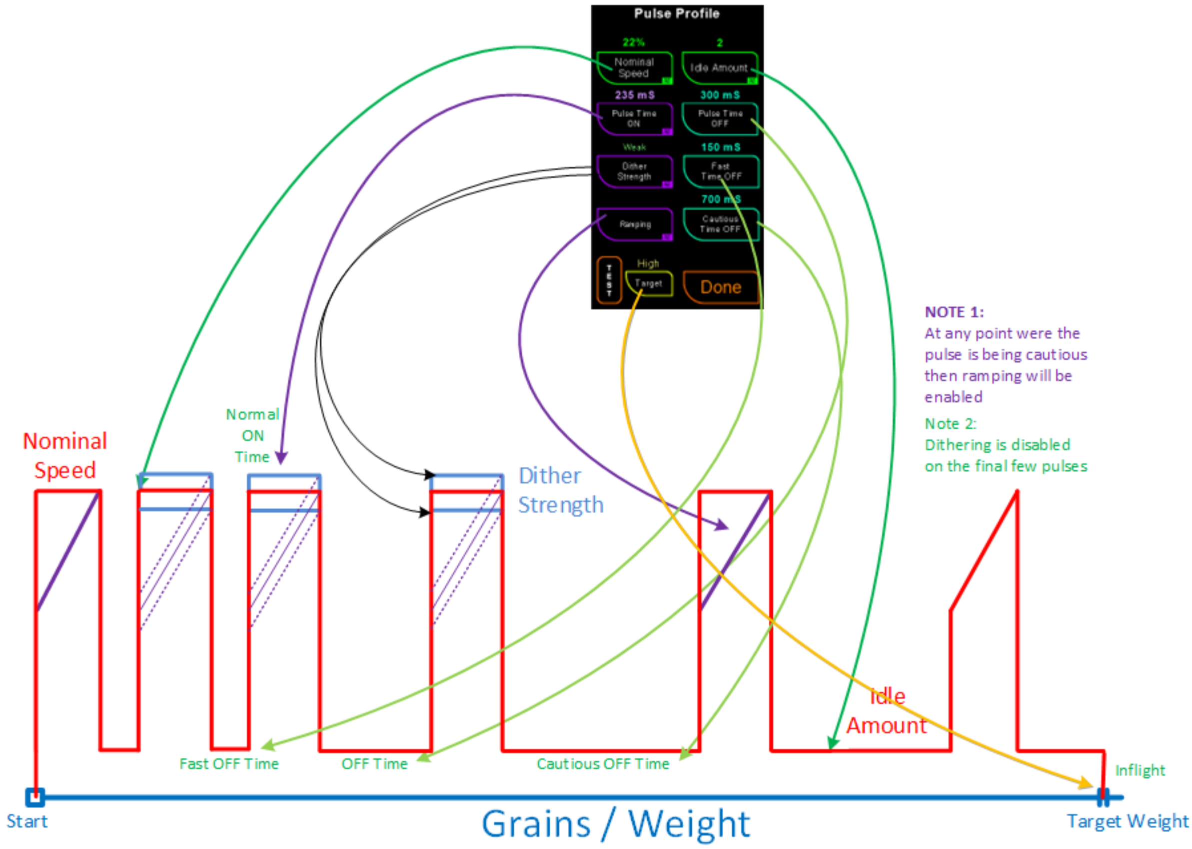
⚙ **Fast Time OFF**: Short delays used when remaining powder has a significant amount of powder remaining. Adjust to balance speed vs overthrows.

⚙ **Cautious Time OFF**: Longer delays used when only a few kernels remain or the system is unsure of the weight changed value. Typical value ~700 ms, although a longer time may be required with high precision scales.

⚙ **Target**: Internal aim point (Low, Medium, High). Default: Medium.

Tips:
- If powder is not moving, increase dithering or reduce OFF time.
- Prefer longer ON times at slower speeds over short, powerful pulses.
- If overthrows occur, increase OFF time (e.g., 400–500 ms) or set Target to Low/Medium.
- For larger kernels, increase idle speed to maintain energy in the powder.
- Light powders may allow very short ON times with rapid pulses, provided kernel weight and inflight values remain within tolerance.

PULSE SETTINGS



Note: It is feasible to have the pulse ON times very short with lighter powders. The vibrating trickler can operate with very quick consecutive pulses. The caveat for this type of operation is that the powder granule weight and inflight granules fall within the charge tolerance.

AI Self-Learning Settings

AI Self-Learning – Designed to quickly establish profile settings. While operator judgment remains essential for fine-tuning, self-learning provides a strong baseline, reducing the amount of manual adjustment required

The AI self-learning system monitors overshoots and performance, making adjustments where beneficial. It evaluates errors, state, and expectations to decide whether to react.

- It may adjust settings even after a successful charge if improvements are possible.
- It avoids reacting to every error, preventing unnecessary slowdowns.
- Its goal is to balance speed with accuracy, despite the natural variability of powder flow.

Explaining the complexities of AI self-learning or the terminology is beyond the scope of this manual. It's easier to accept the parameters as a guide to self-learning, aiming to provide results close to what you seek. However, understanding the functionality of the instrument's heuristics is still essential.

AI Self-Learning Limitations.

The AI self-learning system runs on a small microcontroller with limited memory and processing power.

- It cannot see or hear powder flow; decisions are based only on scale data and profile settings.
- Its training covers a broad range of powders, but unusual or difficult powders may fall outside its capabilities.
- It balances speed and consistency within its programmed and profile limits.
- Most powders work well with minimal intervention, but some may require manual adjustment.

Working Environmental - Stability

⚠ It is **critically important** that during the learning stage the working environment remains **stable, consistent, and free from disturbances** such as movement on the bench. Electrical interference, drafts, or even breathing near the scales can cause **erroneous measurements**, which may create **havoc for the self-learning system**.

Gestalt's (down the rabbit hole)

Gestalt Effect – Like humans, the AI can build on early assumptions, even if they are flawed. If poor conditions occur during initial learning, the system may reinforce incorrect behavior, leading to suboptimal results.
Solution: Reset the profile or a selected instruments and restart learning under better conditions.

AI Scholar Hat Icon

Scholar Hat Icon – Indicates the current state of AI learning:

- Yellow – Profile reset or instrument reset.
- Green – Full learning mode active.
- Blue – Some instruments have stopped learning. The instruments that are still learning will be shown under the Hat.
- Purple – Monitoring mode only (not adjusting).
- Orange – Extended leaning has been initiated. The instruments that are still learning will be shown under the Hat.

Instrument text colors:

- Green – Instrument learning.
- Bright Blue – Core learning stopped (minor tweaks possible).
- Orange – Self-learning disabled.

Self-Learning Fine Tuning Operation

The process has two stages:

- **Core settings** – Establishes the basic operating parameters.
- **Fine-tuning** – Begins once core settings are set and continues even after instruments stop core learning, provided self-learning remains active.

Fine-tuning uses trial-and-error adjustments to optimize:

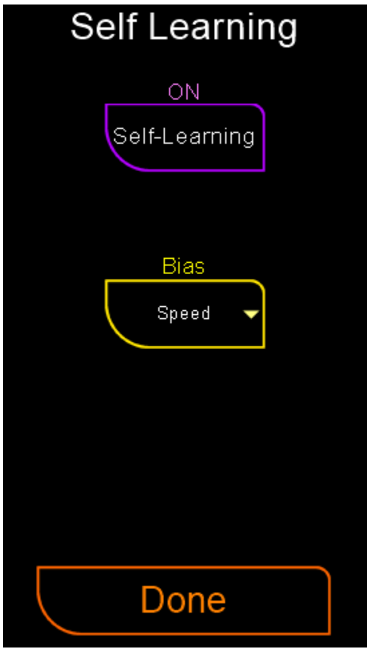
- Bulk Setpoint Offset
- Fine High Speed
- Fine Ramp Down
- Fine Low Speed Final Phase (HRF)

The goal is to achieve a low Fine inflight value and ensure the vibrating tube is de-loaded before Pulse operation.

💡 **Note:** The Fine instrument includes an additional control called **Fine HRF Target Time**. See the Fine HRF section for details.

Self-Learning Parameters

The system uses several parameters to control how learning occurs. The screen displays each setting value, along with (in gray) the current successive count and the total key heuristic receptor count (if applicable).



✵ **Self-Learning**: Enables or disables the self-learning function manually..

✵ **Self-Learning Bias Selection:**

Self-Learning Bias – Allows you to choose a preferred outcome before starting learning:

➢ Moderate (default) – Balanced compromise between speed and consistency.

➢ Consistency – More conservative, prioritizes stability and reducing overthrows.

➢ Speed – Less conservative, prioritizes faster operation. Disables Bulk and Fine stabilization times, saving ~1 second or more.

Notes:

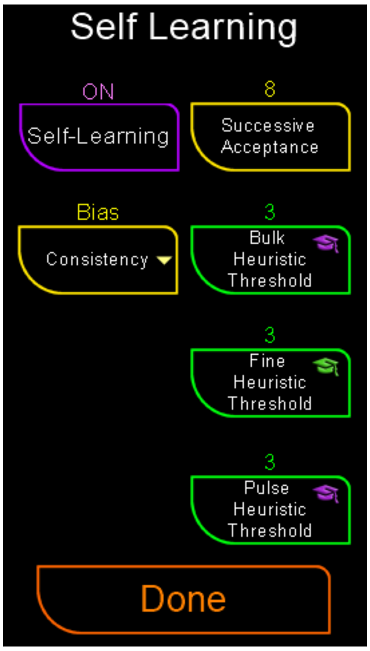
- If Speed produces poor results, try Moderate or Consistency.
- During self-learning, failed charges are not recorded while the instrument remains in learning mode.
- Remember this is learning bias and not an operational optimisation setting.

Advanced

Heuristics

Heuristics prevent the AI from overreacting to every error.

- Receptors strengthen with success and weaken with failure.
- This creates a tolerance for occasional errors, avoiding constant adjustments.
- Without heuristics, the system would slow down by reacting to every small glitch.



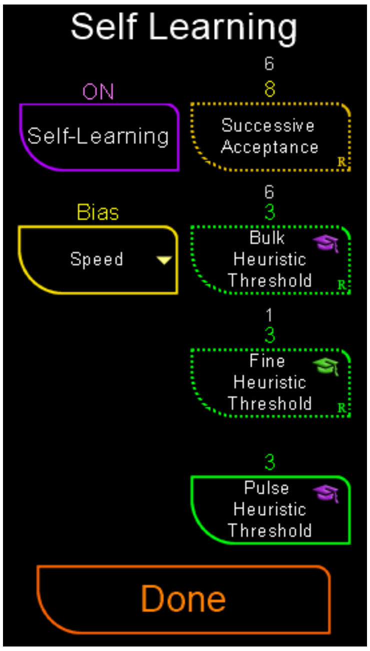
Successive Acceptance: Automatically disables self-learning once a set number of successful charges occur in a row.

- Low value: stops learning after only a few successes.
- High value: requires many successes before stopping, useful if aiming for near 100% success rate.
- Works in combination with instrument heuristic thresholds.

Instrument Heuristics Threshold: Defines how many consecutive successes are required before self-learning stops for a specific instrument.

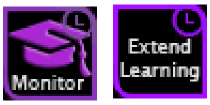
- Example: A value of 3 means learning stops after three successes in a row. If a failure occurs, learning resumes.
- Low values (2–3): faster operation, but may allow occasional overshoots.
- High values: greater consistency, but slower operation.
- Tip: Set higher thresholds only for instruments that are struggling, while keeping others lower for speed.

Resetting the Heuristics Receptors



Once the instrument has been used, the actual Heuristics Receptor value is displayed (no value is shown if the instrument has not yet run), and the buttons appear with a dashed outline. To reset the Heuristics Receptor and extend the instrument's learning, press the button once; the Heuristics Receptor will be cleared. Pressing the button a second time allows you to edit the Heuristics Threshold value if desired.

Note: Resetting any instrument's Heuristics Receptor will automatically reset the Successive Acceptance Heuristics Receptor.



From the dispensing screen, once Self-Learning has entered Monitor Mode or is no longer active, the purple scholar's hat icon can be pressed and held to re-enable Self-Learning and clear all Heuristics Receptors, thereby extending the learning process.

Note: Doing so does not reset the profile; it only allows the system to continue learning from the point at which each instrument's learning was completed. To clarify the extended learning, the scholar's hat will be depicted in orange.

Starting a new session with an existing Powder Profile

When reusing an existing powder profile, consistency with previous sessions is essential. To achieve this, consider the following factors::

Calibration:

Calibrate the base speed at the start of each session. Repeat the calibration periodically during long sessions if the system begins to perform poorly.
Tip: Re-run calibration 10–15 minutes into a session, as the mounting rubber stabilizes over time, improving performance.
Optional: You may wish to warm up the vibrator's mounting rubber before calibration.

Environments Factors

Temperature and humidity can significantly affect powder flow and SuperTrickler performance. For best consistency, operate in a climate-controlled environment whenever possible.

⚠ ***Important information about Humidity:***

A&D specify an operating humidity range of 40%–60% RH, and never below 30%. Once you drop into the low-20% range, you're in the danger zone. At that point, electrostatic charge becomes a dominant error source, overwhelming the balance's ability to stabilise.

Static doesn't just disrupt the scale's readings—it also interferes with powder flowability, particle separation, and dosing dynamics, causing inconsistent trickle behaviour and unpredictable settling.

Powder Profile Summery

At first, the profile system may seem complex, but with experience it becomes straightforward. The AI self-learning feature manages most of the process, and many users simply allow it to run without manual intervention.

Advanced users may choose to modify or optimize settings to suit their preferences. If results become inconsistent, reset the profile and start again. You can also reset inflight amounts to zero and allow AI self-learning to recalibrate. This is especially recommended after changing instrument speeds..

The powder profile is a powerful tool, offering detailed control for those who want it, while remaining optional for users who prefer to let the AI manage the process. Future training resources will provide additional guidance to help you refine settings to meet your specific needs..

Overwhelm

The SuperTrickler can feel overwhelming at first, with many controls that may not be immediately clear in purpose or use. With practice, however, the system becomes much easier to understand. To start with stick with the basic controls and then move on the advanced control as required.

Why so many controls?

The SuperTrickler® has been criticized for its complexity, but this design allows it to handle a wide range of powders without mechanical changes, shims, or part swaps. It is not hard to use - it is deeply configurable, and that distinction is important.

Let's break it down into simple blocks and focus on the controls that are frequently used.

Getting Started

Choose Basic Mode from the More Settings screen to begin with (default).

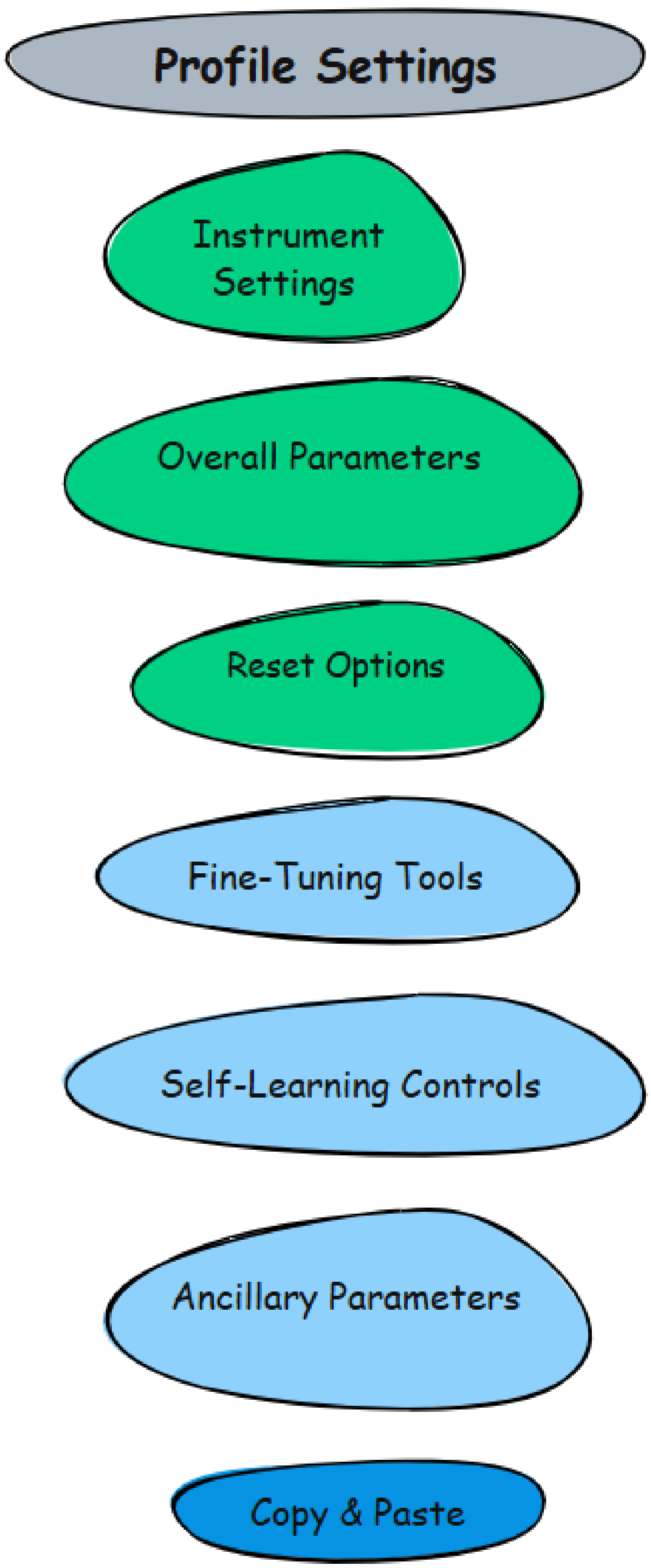
💡 Note: The settings Mode (basic/Advanced) does not change how the SuperTrickler operates; it only changes what settings are displayed on the screens.

Types of Controls

There are seven main types of controls in the profile:

1. **Instrument Settings** – mainly Fine controls and this is available from the HRF on the dispensing screen.
2. **Overall Control Parameters –** Vibrator speed setting and the tolerance is the most common.
3. **Reset Options** – occasional.
4. **Fine-Tuning Tools** – rarely used
5. **Self-Learning Controls** – rarely used
6. **Ancillary Parameters** – rarely used
7. **Copy & Paste** – rarely used

Out of these, **Tolerance** is most commonly adjusted based on your requirements and powder weight.



Instrument Settings: these are the most used controls and represent the majority of available controls…

- **Bulk**
- **Fine** *(most used)*
- **Pulse**

Overall Parameters: These represent the controls that oversee the dispensing parameters. Key ones include…

- **Vibrator Speed Setting** *(most used)*
- **Tolerance**
- **Final Stabilization Time**
- **Vibrator OFF Mode**

Reset Options (occasional use)
These allow you to start fresh by…

- Resetting an individual instrument
- Performing a soft or hard reset

Generally, you'll use either the instrument reset or a soft reset to relearn.

Fine-Tuning Tools: These include…

- **HRF Quick Setting Tools** *(most used)*
- **Bulk and Fine Stop Modes** *(rarely used)*

Self-Learning Controls: These govern how the AI learns to dispense powder and include…

- Setting the bias for **Speed**, **Moderate or Consistency** *(most used)*
- Turning **Self-Learning OFF**
- Heuristics settings.

Ancillary Parameters: These include…

- **Power Alerts**
- **Dispensing Timeout**

Copy & Paste:

- **Copy** the profile to a clipboard
- **Paste** the clipboard to the profile

Final Thoughts

Start with the basic controls, then gradually explore advanced settings as needed. In most cases, Tolerance and Fine instrument settings are the most frequently used. Key Fine settings are also accessible from the HRF screen on the Dispensing screen.

Tips for Speed

For those seeking speed: be aware that increased speed may lead to occasional overthrows. If this trade-off is acceptable, the following tips can help you achieve significantly faster operation—especially with the slower 104 & 254 scale.

⚠ From the Self-learning menu, select the bias for 'Speed'. This must be done **before self-learning** has started (or after a reset).

⚠ Use the Bulk Test to find the optimal speed with minimal fluctuation. This improves system stability. Again, do this **before self-learning** has started (or after a reset).

These following adjustments should be made after self-learning has completed, or after you've disabled it when monitoring begins.

1. Disable Bulk Stabilize Time by pressing and holding the Stabilize button.
2. Disable Fine Stabilize Time by pressing and holding the Stabilize button.
3. Disable Pulse (if possible) by pressing and holding the Nominal Speed button.

Next, use the HRF controls (press and hold the Profile button) to fine-tune the Fine control for stable results. This typically involves adjusting the Final Phase and Low Speed settings.

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