

USER GUIDE  
UGE068-0823

# TrueWeigh

## Extrusion Control System



Please record your equipment's model and serial number(s) and the date you received it in the spaces provided.

It's a good idea to record the model and serial number(s) of your equipment and the date you received it in the User Guide. Our service department uses this information, along with the manual number, to provide help for the specific equipment you installed.

Please keep this User Guide and all manuals, engineering prints, and parts lists together for documentation of your equipment.

Date:

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Manual Number: UGE068-0823

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Serial Number(s):

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Model Number(s):

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# Purpose of the User Guide

This user guide describes the TrueWeigh Gravimetric Extrusion Control system and explains step-by-step how to install, operate, maintain and repair this equipment.

Before installing this product, please take a few moments to read the user guide and review the diagrams and safety information in the instruction packet. You should also review manuals covering associated equipment in your system. This review won't take long, and it could save you valuable installation and operating time later.

# How the Guide is Organized

Symbols have been used to help organize the User Guide and call your attention to important information regarding safe installation and operation.



Symbols within triangles warn of conditions that could be hazardous to users or could damage equipment. Read and take precautions before proceeding.



Numbers indicate tasks or steps to be performed by the user.



A diamond indicates the equipment's response to an action performed by the user or a situation.



An open box marks items in a checklist.



A circle marks items in a list.



Indicates a tip. A tip is used to provide you with a suggestion that will help you with the maintenance and the operation of this equipment.



Indicates a note. A note is used to provide additional information about the steps you are following throughout the manual.

# Your Responsibility as a User

You must be familiar with all safety procedures concerning installation, operation, and maintenance of this equipment. Responsible safety procedures include:

- Thorough view of this User Guide, paying particular attention to hazard warnings, appendices, and related diagrams.
- Thorough review of the equipment itself, with careful attention to voltage sources, intended use, and warning labels.
- Thorough review of instruction manuals for associated equipment.
- Step-by-step adherence to instructions outlined in this User Guide.

# ATTENTION:

## Read This So No One Gets Hurt

We design equipment with the user's safety in mind. You can avoid the potential hazards identified on this machine by following the procedures outlined below and elsewhere in the User Guide.



### **WARNING: Improper installation, operation, or servicing may result in equipment damage or personal injury.**



This equipment should be installed, adjusted, and serviced by qualified technical personnel who are familiar with the construction, operation, and potential hazards of this type of machine.

All wiring, disconnects, and fuses should be installed by qualified electrical technicians in accordance with electrical codes in your region. Always maintain a safe ground. Do not operate the equipment at power levels other than what is specified on the machine serial tag and data plate.



### **WARNING: Voltage hazard**



This equipment is powered by 120 VAC as specified on the machine serial tag and data plate.

A properly sized conductive ground wire from the incoming power supply must be connected to the chassis ground terminal inside the electrical enclosure. Improper grounding can result in severe personal injury and erratic machine operation.

Always disconnect and lock out the incoming main power source before opening the electrical enclosure or performing non-standard operating procedures, such as routine maintenance. Only qualified personnel should perform troubleshooting procedures that require access to the electrical enclosure while power is on.



### **CAUTION: Mix blade hazard**

There are two hazards associated with the mix blades. First, the blades are driven with substantial torque. Never place your hand in the mix chamber unless power is completely disconnected. Second, the mix blades may become razor sharp. Always be careful when touching or cleaning these blades. Check for sharp edges frequently. Replace blade if a hazard exists.



### **CAUTION: Vertical valve hazard**

Vertical valves in hoppers slam closed without warning. They will injure your fingers. Always keep fingers clear of valve openings. Never use your fingers to clear an obstruction. Never use your fingers to move a sticking valve.

# ATTENTION: Read This So No One Gets Hurt (continued)



## **CAUTION: Slide gate hazard**

Never use your fingers to move a sticking slide gate under the mix chamber.



## **CAUTION: Misuse hazard**

This blender must be exclusively used for metering and mixing free-flowing (as per DIN ISO 3435) plastic granulate and additives. A total of four to twelve different materials can be metered and mixed in the blender, depending on the model.

The following must not be metered and mixed:

- Foods of all types (unit does not meet hygienic standards).
- Highly abrasive materials, such as stones, sand (increased wear of unit components).
- Poorly free flowing, sticky materials (airtight seal by the pneumatic cylinder is adversely affected).
- Liquids and powders (airtight seal by the pneumatic cylinder is not possible).

## Included Safety Features



### **Hopper finger guards**

Finger guards are fitted into each hopper compartment. Do NOT reach through these guards. Do NOT use your fingers to clear an obstruction below these guards. Do NOT remove these guards.

# How to Use the Lockout Device

 **CAUTION:**

Before performing maintenance or repairs on this product, you should disconnect and lockout electrical power sources to prevent injury from unexpected energization or start-up. A lockable device has been provided to isolate this product from potentially hazardous electricity.

Lockout is the preferred method of isolating machines or equipment from energy sources. Your Conair product is equipped with the lockout device pictured below. To use the lockout device:


- 1** Stop or turn off the equipment.
- 2 Isolate the equipment from the electric power.** Turn the rotary disconnect switch to the OFF, or “O” position.
- 3 Secure the device with an assigned lock or tag.** Insert a lock or tag in the holes to prevent movement.
- 4 The equipment is now locked out.**

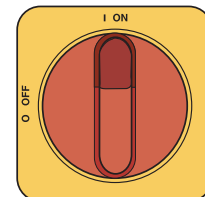
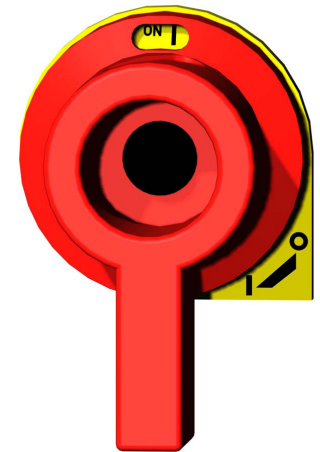
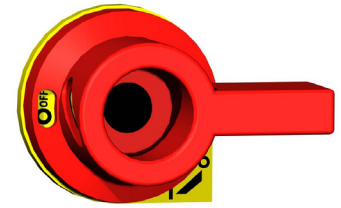
 **WARNING:**

Before removing lockout devices and returning switches to the ON position, make sure that all personnel are clear of the machine, tools have been removed, and all safety guards reinstalled.

To restore power to the dryer, turn the rotary disconnect back to the ON position:

- 5 Remove the lock or tag.**
- 6 Turn the rotary disconnect switch to the ON or “I” position.**

 **NOTE:** Depending on your blender model, it may have either of the shown disconnects.



# Zero Energy State (ZES)



**CAUTION:** Before performing maintenance or repairs on this product, you should disconnect and lockout electrical power sources to prevent injury from unexpected energizing or start-up.

During maintenance, it is essential that the system be put into a state which eliminates the possibility of components making an unexpected and dangerous movement. This procedure is typically referred to as lockout. After all energy sources have been neutralized, the system is in the zero mechanical state (ZMS). This provides maximum protection against unexpected mechanical movement.

The lockout procedure must include all energy sources:

- Electrical power supply
- Compressed air supply
- Hydraulic fluids under pressure
- Potential energy from suspended parts
- Energy in springs
- Any other source that might cause unexpected mechanical movement

The following is a recommended Zero Energy State procedure which must be followed prior to any inspection, or maintenance of the TrueWeigh.

- 1 Press the ‘STOP’ key on the remote operator’s control** if there is a remote control device.
- 2 Press the ‘STOP’ key at the local TrueWeigh control panel.**
- 3 Disconnect and lock out the primary electrical supply feeding all attached components.**
- 4 Disconnect and lock out the primary electrical supply** feeding the material handling system that is feeding the TrueWeigh material hoppers with process material.
- 5 Shut-off and lock out the primary compressed air supply** that is feeding the material handling devices. Vent the compressed air supply lines.
- 6 Disconnect all of the cables leading to the motor of the metering device** on each TrueWeigh. (This is done where applicable).
- 7 Drain any process material from the loading devices** feeding the TrueWeigh material hoppers.
- 8 Lock out all energy sources which might cause unexpected movement of equipment** which is accessible through the discharge at the base of the TrueWeigh extruder hopper.
- 9 Test to verify that all energy sources have actually been disconnected and/or deenergized.**



**WARNING:** Before removing lockout devices and returning switches to the ON position, make sure that all personnel are clear of the machine, tools have been removed and all safety guards reinstalled.

# Description

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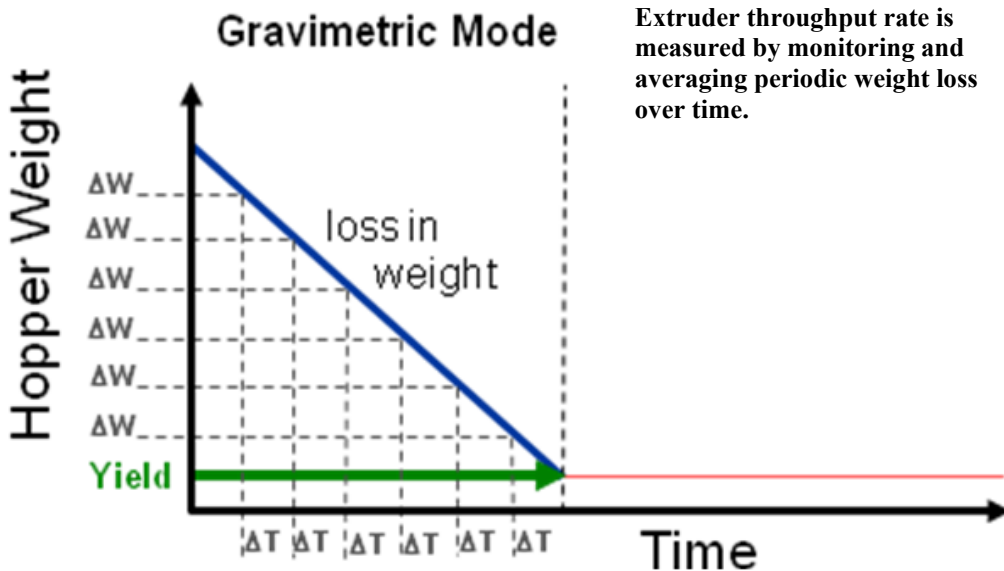
# What is the TrueWeigh Extrusion Control System?

The TrueWeigh extrusion control system applies weight loss control technology to any type of mono or co-extrusion process. The system is most often used on single screw, flood-fed extruders. The most common extrusion processes to use the TrueWeigh system are cast film or sheet, blown film, wire and cable, profile, pipe, tubing, and extrusion coating. The TrueWeigh system reduces material cost by producing consistently “on spec” product closer to minimum dimensional tolerances. The ability to precisely control layer ratios of co-extruded product improves overall quality and reduces material cost. Faster, automated start-up due to consistent ramping achieves production rates quicker, thus, creating more quality product and generates less scrap.

The TrueWeigh system can be used to control or monitor the following aspects of an extrusion line:

- Extruder or additive feeder rate by weight throughput.
- Haul-off rate by length throughput.
- Layer percentages by weight for co-extrusion processes.
- Weight of product per running length.
- Weight of product by area.
- Average thickness of film, sheet, pipe, tube, and wire & cable (requires width/diameter and material density inputs.)
- Up to twelve extruders and a haul-off, on a single co-extrusion line, can be monitored or controlled.

## How It Works



The TrueWeigh system determines the extruder rate by monitoring the weight loss in the TrueWeigh hopper mounted on the extruder throat. Periodically, the extruder rate is calculated by dividing the amount of weight lost by the amount of time since the last calculation. If the system is configured to control the extruder rate, the actual measured rate is compared to the set rate and if different, the extruder screw speed is changed. When loading of the TrueWeigh hopper occurs, the

system sees a gain in weight and switches from weight loss mode to a volumetric mode. The system relies on history during this volumetric mode to determine how much material is fed during the loading disturbance. This helps to maintain accurate inventory totals over time.

## Weight Loss Measurement Chart

Whenever, the TrueWeigh system is set-up to control the extruder screw speed, it must first calculate the rate-speed factor. The rate-speed factor is the relationship between the material mass flow rate through the TrueWeigh hopper and the extruder screw RPM. The rate-speed factor must be calculated before the system can be run in automatic (or gravimetric) mode.

The rate-speed factor is dependent on a number of process parameters:

- Extruder size. A smaller extruder will produce a smaller rate than a larger extruder running at the same screw speed.
- Material bulk density. A higher the material bulk density will produce a higher mass flow rate at a given extruder size and screw speed.
- Other process variables, such as: head pressure, screen pack and temperature profiles.

For this reason, the TrueWeigh system should be run in manual mode whenever materials or process conditions change abruptly. The system may take longer to respond than normal if not first run in manual after drastic process changes.

## TrueWeigh System Components

The TrueWeigh extrusion control system is comprised of a number of separate components, each having a specific function, as described below:

- TrueWeigh Controller – (TWC) – This is the overall “brain” of the system. An easy-to-use intuitive LCD touch screen controller with full color graphics allows quick and easy set-up. User friendly screens are configurable to match each specific extrusion process. Simple menu driven touch screens ask all appropriate questions to ease of individual application set-up. The operator can monitor the extrusion control set points, the haul-off control data, current and past alarm status and complete management of material inventory data.
- Extruder Drive Control Module – This module provides the interface between the central TrueWeigh controller and the extruder drive electronics. Various drive control outputs are available: An isolated 0–10 VDC signal, an Up/Down interface signal and a motorized potentiometer signal. If the motorized potentiometer option is selected, the system has “bumpless transfer” of extruder screw speed back and forth. Bumpless transfer is also available with an additional 0-10VDC signal isolator board or with a pulse encoder to provide the feedback from the extruder drive.
- Haul-off Drive Control Module - This module provides the interface between the central TrueWeigh controller and the haul-off drive electronics for length throughput monitoring and control. Various drive control outputs are available: An isolated 0–10 VDC signal, an Up/Down interface signal and a motorized potentiometer signal. An optical pulse encoder is also supplied to measure the actual haul-off speed. This information is used to maintain proper weight per running length of finished product and to provide accurate inventory reports.

# TrueWeigh Various Control Modes

The TrueWeigh system is capable of the following:

- Monitor extruder weight throughput of Mono or Co-extrusion process.
- Control extruder weight throughput & layer ratios of Mono or Co-extrusion process.
- Control haul-off (length) throughput of Mono or Co-extrusion process.
- Control extruder weight throughput, layer ratios and haul-off throughput of Mono or Co-extrusion process.

## TrueWeigh Control Modes


Control Mode	Description	Hardware Requirements
Weight Throughput Monitor Only	This is the simplest mode and does not control but merely monitors the weight throughput of each extruder. Loading and alarms are controlled by TrueWeigh hopper weights.	One central TrueWeigh Controller – (TWC) per extrusion line One TrueWeigh Hopper –(TWH) per extruder
Weight and Length Throughput Monitor	This mode merely monitors the weight throughput of each extruder and the weight per running length throughput. Loading and alarms are controlled by TrueWeigh hopper weights.	One central TrueWeigh Controller – (TWC) per extrusion line One TrueWeigh Hopper –(TWH) per extruder One haul-off drive module per extrusion line.
Weight Throughput Control	This mode controls the extruder speed(s) to maintain a constant set weight throughput. If more than one extruder is on the line, the individual layer ratios are set and controlled. Loading and alarms are controlled by TrueWeigh hopper weights.	One central TrueWeigh Controller – (TWC) per extrusion line One TrueWeigh Hopper –(TWH) per extruder One extruder drive interface module per extruder.
Weight Throughput Control and Length Throughput Monitor	This mode is similar to the Weight Throughput Control Mode, but it can also monitor the haul-off throughput and adjust the extruder speeds to maintain a constant weight per running length.	One central TrueWeigh Controller – (TWC) per extrusion line One TrueWeigh Hopper –(TWH) per extruder One extruder drive interface module per extruder. One haul-off drive module per extrusion line.
Length Throughput Control and Weight Throughput Monitor	This mode controls the finished product weight per running length by monitoring the weight throughput of each extruder and controlling the haul-off device. Each extruder's weight throughput is measured and the primary haul-off speed is adjusted to maintain the set weight per running length. Note, however, that while individual layer ratios are displayed, they are not being controlled.	One central TrueWeigh One Controller – (TWC) per extrusion line One TrueWeigh Hopper –(TWH) per extruder One haul-off drive module per extrusion line.
Weight Throughput Control and Length Throughput Control	This mode combines the benefits of both weight throughput control and length throughput control to provide complete control of weight per running length of finished product. Individual layer ratios for co-extruded products are controlled and the line output can be change while still making good product by simultaneously ramping both the extruder's speeds and the haul-off speed.	One central TrueWeigh Controller – (TWC) per extrusion line One TrueWeigh Hopper –(TWH) per extruder One extruder drive interface module per extruder. One haul-off drive module per extrusion line.

# Recipe Entry Modes

Depending upon the control mode selected, there are several recipes entry options (modes). The available recipe entry options determine how an operator would enter that data needed to control the extrusion line. Simple menu driven touch screens ask all appropriate questions for ease of product recipe set-up.

Several of the recipe entry options (for example, the thickness entry mode) exist for ease of operator entry and do not control the main entry. Since the TrueWeigh system does not monitor the ID (inside diameter) or OD (outside diameter) of the finished product, it cannot control the thickness. The ID and OD are assumed to be constant for ease of operator entry. (Note: Width is also be taken as a constant as there is no width controller)

The Recipe entry options available are accessed from the ‘Setup’ screen.

 **NOTE:** the control mode for the production line must FIRST be configured under 'Setup', in order to view the available Recipe entry options, which correspond to the selected control mode. The control mode is always set when the line is installed. Once the control mode has been set, the user may select available or alternate recipe entry modes at any time.

Recipe entry mode tables are listed below:

## Weight Throughput Monitor Mode

Monitor Mode	Operator Interface	TrueWeigh Controller
Weight Throughput- Mono	No recipe data entered	Displays weight throughput of extruder in Monitor
Weight Throughput - Coex	No recipe data entered	Displays weight throughput of each extruder and the layer ratios in Monitor
Weight per Length - Mono	Length throughput is entered - (Constant)	Calculates and displays the weight per length of the finished product based upon the measured weight throughput
Weight per Length - Coex	Length throughput is entered - (Constant)	Calculates and displays the weight per length of the finished product and the individual layer ratios based upon the measured weight throughputs
Thickness - Mono	Material solid density, width/ID/OD (constant if not monitored) and length throughput (constant) is entered	Calculates and displays the thickness of the finished product based upon the measured weight throughput
Thickness - Coex	Material solid density for each extruder, width/ID/OD (constant if not monitored) and length throughput (constant) is entered	Calculates and displays the total thickness of the finished product and the individual layer ratios based upon the measured weight throughputs
Weight per Area - Mono	Length throughput (constant) and Width (constant if not monitored) is entered.	Calculates and displays the actual weight per area of the finished product based upon the measured weight throughput
Weight per Area - Coex	Length throughput (constant) and Width (constant if not monitored) is entered.	Calculates and displays the actual weight per area of the finished product and the individual layer ratios based upon the measured weight throughputs

# Recipe Entry Modes (continued)

## Weight & Length Throughput Monitor Mode

Monitor Mode	Operator Interface	TrueWeigh Controller
Weight per Length – Mono	No recipe data is entered	Calculates and displays the weight per length of the finished product based upon the measured weight and length throughput
Weight per Length - Coex	No recipe data is entered	Calculates and displays the weight per length of the finished product and the individual layer ratios based upon the measured weight and length throughputs
Thickness – Mono	Material solid density and product width/ID/OD (constant if not monitored)	Calculates and displays the thickness of the finished product based upon the measured weight and length throughput
Thickness – Coex	Material solid density for each extruder and product width/ID/OD (constant if not monitored)	Calculates and displays the total thickness of the finished product and the individual layer ratios based upon the measured weight and length throughputs
Weight per Area – Mono	Width (constant if not monitored) is entered.	Calculates and displays the actual weight per area of the finished product based upon the measured weight and length throughput
Weight per Area – Coex	Width (constant if not monitored) is entered.	Calculates and displays the actual weight per area of the finished product and the individual layer ratios based upon the measured weight and length throughputs

## Weight Throughput Control Mode

Control Mode	Operator Interface	TrueWeigh Controller
Weight Throughput– Mono	Desired weight throughput is entered	Calculates, maintains and displays weight throughput of the extruder.
Weight Throughput – Coex	Total weigh throughput as a total for all extruders plus the individual layer ratios are entered	Calculates, maintains and displays weight throughput of each extruder plus the proper layer ratios.
Weight per Length – Mono	The desired weight per running length and a constant length throughput is entered	Calculates and displays the weight throughput and the weight per length of the finished product.
Weight per Length - Coex	The desired weight per running length, a constant length throughput and the individual layer ratios by weight for each extruder is entered	Calculates and displays the weight throughputs for each extruder and the weight per length of the finished product.
Thickness – Mono	The desired thickness, the material solid density, width/ID/OD (constant if not monitored) and length throughput (constant) is entered	Calculates and displays the weight throughput and the thickness of the finished product.
Thickness – Coex	The desired total thickness, the layer ratios by thickness for each extruder, the material solid densities for each extruder, width/ID/OD (constant if not monitored) and length throughput (constant) is entered	Calculates and displays the weight throughputs for each extruder, the individual layer thicknesses and the total thickness of the finished product.
Weight per Area – Mono	The desired weight per area, a constant length throughput and Width (constant if not monitored) is entered.	Calculates and displays the weight throughput and actual weight per area of the finished product.
Weight per Area – Coex	The desired weight per area, the layer ratios by weight for each extruder, a constant length throughput and width (constant if not monitored) is entered	Calculates and displays the weight throughput of each extruder, the actual weight per area of the finished product and the individual layer ratios.

# Recipe Entry Modes (continued)

## Weight Throughput Control / Length Monitor Mode

Control Mode	Operator Interface	TrueWeigh Controller
Weight per Length - Mono	The desired weight per running length is entered	Calculates and displays the weight throughput and the weight per length of the finished product, based upon the measured length throughput.
Weight per Length - Coex	The desired weight per running length and the individual layer ratios for each extruder are entered	Calculates and displays the weight throughputs for each extruder and the weight per length of the finished product, based upon the measured length throughput.
Thickness - Mono	The desired thickness, the material solid density, and the width/ID/OD (constant if not monitored) is entered	Calculates and displays the weight throughput and the thickness of the finished product, based upon the measured length throughput
Thickness - Coex	The desired total thickness, the layer ratios by thickness for each extruder, the material solid densities for each extruder, and the width/ID/OD (constant if not monitored) is entered	Calculates and displays the weight throughputs for each extruder, the individual layer thicknesses and the total thickness of the finished product, based upon the measured length throughput.
Weight per Area - Mono	The desired weight per area and width (constant if not monitored) is entered.	Calculates and displays the weight throughput and actual weight per area of the finished product, based upon the measured length throughput.
Weight per Area - Coex	The desired weight per area, the layer ratios by weight for each extruder and width (constant if not monitored) is entered	Calculates and displays the weight throughput of each extruder, the actual weight per area of the finished product and the individual layer ratios, based upon the measured length throughput.

# Recipe Entry Modes (continued)

## Length Throughput Control / Weight Monitor Mode

Control Mode	Operator Interface	TrueWeigh Controller
Weight per Length (Mono and Coex)	The desired weight per running length is entered	Calculates and displays the weight throughput and the weight per length of the finished product, based upon the measured weight throughput.
Thickness – Mono	The desired thickness, the material solid density, and the width/ID/OD (constant if not monitored) is entered	Calculates and displays the weight throughput, the thickness and the weight per length of the finished product, based upon the measured weight throughput
Thickness – Coex	The desired total thickness, the material solid densities for each extruder, and the width/ID/OD (constant if not monitored) is entered	Calculates and displays the weight throughputs for each extruder, the total thickness and the weight per length of the finished product, based upon the measured weight throughput.
Weight per Area (Mono and Coex)	The desired weight per area and the width (constant if not monitored) is entered	Calculates and displays the weight throughput of each extruder, the actual weight per area and the weight per length of the finished product, based upon the measured weight throughput
Weight per Length and length – Mono	The desired weight per running length and the length throughput are entered	Calculates and displays the weight throughput and the weight per length of the finished product.
Weight per Length and length - Coex	The desired weight per running length, the length throughput and the individual layer ratios by weight for each extruder are entered	Calculates and displays the weight throughputs for each extruder, the layer ratios and the weight per length of the finished product.
Weight per Length and weight – Mono	The desired weight per running length and the weight throughput are entered	Calculates and displays the weight throughput, the length throughput and the weight per length of the finished product.
Weight per Length and weight - Coex	The desired weight per running length, the total weight throughput and the individual layer ratios by weight for each extruder are entered	Calculates and displays the weight throughputs for each extruder, the layer ratios, the length throughput and the weight per length of the finished product.
Thickness and Length – Mono	The desired thickness, the material solid density, the width/ID/OD (constant if not monitored) and the length throughput are entered	Calculates and displays the weight throughput, the thickness, the length throughput and the weight per length of the finished product.
Thickness and Length – Coex	The desired total thickness, the individual layer ratios by thickness, the material solid densities for each extruder, the width/ID/OD (constant if not monitored) and the length throughput are entered	Calculates and displays the weight throughputs for each extruder, the individual layer thickness ratios, the total thickness, the length throughput and the weight per length of the finished product.
Thickness and Weight – Mono	The desired thickness, the material solid density, the width/ID/OD (constant if not monitored) and the total weight throughput are entered	Calculates and displays the length throughput, the thickness, the weight throughput and the weight per length of the finished product.
Thickness and Weight – Coex	The desired total thickness, the individual layer ratios by thickness, the material solid densities for each extruder, the width/ID/OD (constant if not monitored) and the total weight throughput are entered	Calculates and displays the length throughput, the weight throughputs for each extruder, the individual layer thickness ratios, the total thickness and the weight per length of the finished product.
Weight per Area and weight – Mono	The desired weight per area, the width (constant if not monitored) and the weight throughput are entered.	Calculates and displays the length throughput, the weight throughput and the actual weight per area of the finished product.
Weight per Area and weight – Coex	The desired weight per area, the total weight throughput, the layer ratios by weight for each extruder and width (constant if not monitored) is entered	Calculates and displays the length throughput, the weight throughput of each extruder, the actual weight per area of the finished product and the individual layer ratios.
Weight per Area and length – Mono	The desired weight per area, the width (constant if not monitored) and the length throughput are entered.	Calculates and displays the length throughput, the weight throughput and the actual weight per area of the finished product.
Weight per Area and length – Coex	The desired weight per area, the total length throughput, the layer ratios by weight for each extruder and width (constant if not monitored) is entered	Calculates and displays the length throughput, the weight throughput of each extruder, the actual weight per area of the finished product and the individual layer ratios.

## Resin and Product Codes

Resin codes are used to identify the various resins included in the products. There can be up to 250 different resin codes entered and each code can be comprised of a 10 character alphanumeric name and a solid density. The TrueWeigh controller will keep inventory totals for each resin code defined.

Product codes are used to identify the various production recipes to the products to be made. There can be up to 500 different product code recipes and each code can be comprised of a 12 character alphanumeric name. The TrueWeigh controller will keep a complete inventory for each of the product codes.

The use of the resin and product codes is optional and must be enabled or disabled from the recipe set-up menu screen. If they are enabled, codes must be in the recipes.



# Installation

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## Unpacking the Boxes

Upon receiving the shipment, always perform a thorough inspection of the contents and compare it to the enclosed packing list. Make sure all parts listed are present and that no visible damage exists.

Inspect all of the equipment in the presence of the freight carrier's representative for damage during shipment. Note any damage on the delivery receipt before signing it. If damage is evident, file a claim immediately against the carrier as it is their responsibility to pay for any damage incurred during shipping. Make sure to include a detailed report of the damage along with photos.

The TrueWeigh hopper is attached to the pallet to prevent damage during shipment. Each hopper is mounted on a load cell, which can be easily damaged if not handled properly. Care must be taken when removing the hoppers from the pallet, in order to avoid damage to the load cells. Installation personnel should only remove the hoppers from the pallet, when ready to be immediately placed upon the extruder throat. It is imperative that no external forces be applied to the load cells or the hoppers during installation.

Additional parts to be installed may include: the TrueWeigh operator control panel and any loading equipment that may be associated with the system.

## Preparing for Mechanical Installation

The TrueWeigh system is shipped as separate TrueWeigh hoppers, extruder and haul-off interface components, haul-off encoder and the central TrueWeigh control panel.

- 1** First, check the inside of all the TrueWeigh hoppers for any foreign material. Remove any material and wipe clean prior to mounting.
- 2** Next, mount the TrueWeigh hoppers to the extruder throats with either a custom made mounting adaptor or by drilling the blank flange supplied to match the extruder throat bolt hole pattern.
- 3** Mount the hopper loading equipment on the integral loading platform, making sure that the flapper valve or any other dispensing valves do not come in contact with the TrueWeigh hopper itself. etc.) with more than 100 lb capacity requires additional external support by customer.
- 4** After mounting the TrueWeigh hopper, the load cell overload protection screws need to be adjusted. Each hopper is shipped with four screws which are used to secure the weighed portion of the hopper during shipping. These screws serve to protect the load cell from being over-stressed and damaged during shipping and installation.
  - There are three screws located around the top of the hopper to keep it in place. Adjust these screws to be about 0.25" clearance from the hopper wall. This allows the hopper to now "float" on the load cell and prevent any interference with the framework of the hopper.
  - There are two screws located under the load cell. One has a green tag and is used to protect the load cell from overload during shipping and installation. This screw needs to be adjusted to provide a clearance of about 0.25" from the load cell. The other screw has a red tag is used for overload protection during operation. This screw has been factory preset and should not be adjusted in the field.

## Preparing for Installation

- 1** The operator control panel for the TrueWeigh system should be conveniently located for easy operator access. Additionally, the control panel will require field wiring by a qualified electrical contractor so, the distance between the operator panel, the extruder and haul-off drives and the TrueWeigh hoppers should be minimized as much as possible.
- 2** Each component has been prewired at the factory, so only the wiring required to interconnect all of the components must be performed in the field. This external wiring includes: network cable, power and loading interface wires from the central TrueWeigh controller to each of the TrueWeigh hoppers and interface wires to the extruder drives, haul-off drives and loading interface controller.
- 3** See the electrical drawings supplied with the system for exact connections required.

## Connecting All Field Wiring

The field wiring completes the electrical installation of the TrueWeigh system. The customer extrusion equipment is interconnected with the TrueWeigh system, to allow for automatic control of the production line, through the TrueWeigh touch screen. The following connections are required to complete the electrical installation:

- 1** The standard TrueWeigh system has the touch screen mounted in the main electrical controller. As an option, the touch screen can be remotely mounted. If the system has a remote touch screen, the 24VDC power and X2X network for the touch screen must be interconnected by the customer. The TrueWeigh electrical diagram shows these required connections.
- 2** The Drive Start buttons for the extruder(s) and haul-off device must be connected to the TrueWeigh electrical control panel. The voltage of these start buttons was specified at the time the system was ordered, and may be 24VDC, 120VAC or 230VAC. The start button electrical connections are shown on the TrueWeigh electrical control diagram. Use caution to ensure the voltage of your start button matches the input relay voltage shipped with the TrueWeigh electrical control panel. Some systems do not control the haul-off device. In this case, the haul-off device start button is not connected to the TrueWeigh electrical control panel.
- 3** To control the extruder(s) and haul-off device speeds, the TrueWeigh electrical control panel is connected to the drive speed control input. There are three options for this connection, one of which was specified at the time your system was ordered. The options include: speed control using the customer 0-10VDC speed potentiometer, speed control using a motorized potentiometer, and lastly speed control using an UP/DOWN input. The TrueWeigh electrical control panel diagram shows the connection required for your specific system.
- 4** The TrueWeigh X2X network must be connected to the TrueWeigh hoppers mounted on each extruder throat. This connection allows the TrueWeigh control panel to communicate with each extruder mounted TrueWeigh hopper. The TrueWeigh electrical control diagram and the TrueWeigh hopper electrical diagram show these required connections.
- 5** The TrueWeigh AC Power must be connected to the TrueWeigh hoppers mounted on each extruder throat. This connection allows the TrueWeigh control panel power to be common with each extruder mounted TrueWeigh hopper. The TrueWeigh electrical control diagram and the TrueWeigh hopper electrical diagram show these required connections.

## Connecting All Field Wiring (continued)

- 6 The Haul-Off device encoder, supplied by Conair, is an optional device and is connected only if the haul-off speed is controlled or monitored by the TrueWeigh system. Some systems do not control or monitor the haul-off device. In this case, the haul-off device encoder is not connected to the TrueWeigh electrical control panel. For systems that do control or monitor the haul-off encoder, the TrueWeigh electrical control panel diagram shows the connection required for the haul-off encoder.
- 7 The extruder speed encoder or 0-10VDC feedback card, as an option supplied by Conair, is an optional device and is connected only if the extruder speed is monitored by the TrueWeigh system. Some systems do not monitor the extruder speed(s). In this case, the extruder encoder or 0-10VDC feedback card is not connected to the TrueWeigh electrical control panel. For systems that do monitor the extruder speed encoder or 0-10VDC feedback card, the TrueWeigh electrical control panel diagram shows the connection required for each extruder speed.

## Connecting the Main Power

- 1 The TrueWeigh main power connection is made to the TrueWeigh electrical control panel. The TrueWeigh electrical diagram shows this required connection and amperage rating.

## System Configuration

The TrueWeigh system is a highly flexible and user configurable system. As such, it has the ability to store a significant amount of data to completely describe your particular process application and set-up. This system configuration data only needs to be entered once as it is stored in battery backed memory. In addition, some of the configuration variables have default values which in most cases do not need to be changed. A configuration worksheet has been provided in this manual (Appendix A) that can be filled-out so a written log of the system configuration can be saved. Section 4 of this manual describes in detail all of the parameters which can be configured. See SETUP, under the Menus section of this manual.

## TrueWeigh Hopper Calibration

The TrueWeigh hopper weighing system is only as accurate as its calibration. Therefore, whenever a component in the weigh system (hopper, load cell, electrical components, etc.) is changed or replaced, the TrueWeigh hopper should be calibrated with precise calibration test weights. *See Calibration, under the Menus section* of this manual.

Model Part Number	Weight
26702901	1 kg
26702902	5 kg
26702903	10 kg

## TrueWeigh Hopper Calibration (continued)

Once each hopper has been calibrated, they should be checked and verified about once a month or so by adding a test weight to the hopper and confirming the hopper weight.

A hopper calibration off by 0.01 lbs can cause a very large error in the hopper accumulated totals.

For accurate TrueWeigh hopper calibration, please use the following procedure:

- 1** The TrueWeigh hopper must be completely empty. Remove all materials from the inside of hopper and clean hopper walls.
- 2** Make sure that nothing is touching the hopper assembly and it is floating properly on the load cell.
- 3** Eliminate or minimize any vibration that may be affecting the hopper to ensure a proper zero weight reading and hopper calibration.
- 4** Access the CALIBRATION function from the touchscreen through the SETUP function. The user presses SETUP, then EXTRUDER, then CALIBRATION.
- 5** The user will be prompted by the display to remove all materials from the hopper, obtain a tare weight reading, and place a test weight on the hopper for a weight reading, all to complete the hopper calibration.
- 6** Repeat this procedure for each extruder hopper in the system.

## TrueWeigh Haul-Off Calibration

For accurate haul-off calibration, use the following procedure:

- 1** The TrueWeigh controller may be either monitoring or controlling the speed of the haul-off device. Examples of “Haul-Off Devices” include: Nip, Roller, Puller etc. Such a device is equipped with an encoder, to provide line speed pulse feedback to the TrueWeigh controller. The controller uses these pulses to accurately calculate the actual speed of the production line haul-off device.
- 2** Access the CALIBRATION function from the touchscreen through the SETUP function. The user presses SETUP, then “Haul-Off Device”, then CALIBRATION.
- 3** The user will be prompted by the display to enter the encoder wheel circumference and the encoder number of pulses per wheel rotation. Enter these values to complete the calibration.

## **Linearization of the TrueWeigh Controller to the Extruder Speed**

Since the TrueWeigh controller may be used to control the RPM of each extruder screw, the maximum rpm of each extruder must be configured into the TrueWeigh controller SETUP screen. To do this, enter the SETUP screen on the TrueWeigh controller, select the appropriate extruder, select the drive parameter button, and type in the maximum RPM for that extruder. Repeat this for each extruder in the system.

## **Linearization of the TrueWeigh Controller to the Haul-Off Speed**

Since the TrueWeigh controller may be used to control the speed of the haul-off device, the maximum feet per minute of the haul-off device must be configured into the TrueWeigh controller SETUP screen. To do this, enter the SETUP screen on the TrueWeigh controller, select the haul-off device, select the drive parameter button, and type in the maximum feet per minute of the haul-off device.


# Operation

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# Loading Material into the TrueWeigh Hoppers


Before the extruders can be operated, material must be loaded into the TrueWeigh hoppers. Each TrueWeigh hopper has a specific loading on weight, loading off weight or loading time. These settings are made by the user and are accessed under the 'Setup' section of the TrueWeigh control panel. See the 'Menus' section of this manual to complete these settings, and ensure material has been properly loaded into each extruder TrueWeigh hopper.

 **NOTE:** it is imperative the hoppers are not over-filled. An over-filled condition will prevent the TrueWeigh control panel from properly calculating the extruder rate.


## Starting the Extrusion Process

The drive start buttons for the extruder, and the haul-off device, must be in the 'On' position. This is done on the extruder operator panel, and not the TrueWeigh control panel. The extruder's material hopper must also be filled with material.

**1** From the <Home> screen press the 'Manual' button.

 **NOTE:** If an extruder weigh hopper is not calibrated, a popup will be presented asking if the system should proceed to Manual mode without a valid hopper calibration.

**2** Enter the manual speeds for the extruder and the hauloff devices. To begin extruding product, the user sets the speed of the extruder and the haul-off device by entering these values into the <Manual> screen, accessed from the home screen on the TrueWeigh control panel. These entered values serve to manually ramp each extruder, and the haul-off device to a desired operating speed.

 **NOTE:** If the HAND CONTROL feature on the <Manual> screen is set to 'Enabled', turn hand control 'Disabled', so the TrueWeigh control panel can take over the speed setting operation of the extruder and haul-off device.

**3** Press the 'Recipe' button. After ramping up the extruder and haul-off, the user must enter a valid extrusion 'Recipe', accessed from the <Home> or <Manual> screen. The entered 'Recipe', allows the system too automatically (gravimetrically) operate the production line.

**4** After entering a valid 'Recipe', press the 'Commit/Automatic' button.

The TrueWeigh system is now in automatic. Proceed to the 'Monitor' screens to examine the gravimetric performance of the production line

## Stopping the Extrusion Process


- 1 Press the button ‘Stop’ to stop the metering and mixing process.

When ‘Stop’ is pressed, the extruder and haul-off devices will ramp slowly downward to a stopped condition.

## Working with Extrusion Recipes

Depending upon the control mode selected, there are several recipe entry options available. The recipe entry options determine how an operator enters the recipe data needed to control the extrusion line.

The recipe entry options available are accessed from the <Setup>, <System>, <Recipe> screen.

 **NOTE:** The control mode for the production line must FIRST be configured under <Setup>, <System>, <Control>, in order to view the available recipe entry options, which correspond to the selected control mode. The control mode is always set when the line is installed. Once the control mode has been set, the user may select available or alternate recipe entry modes at any time.

## Security Settings

Security levels dictate what data is accessible by the user. On each screen page in the status area at the bottom of each screen, a security box indicates the current level of security.

The security level, color, and default pass-codes are as follows:

- 0 – Green - Guest – minimum security level
- 1 – Yellow - Operator – Passcode ‘3333’
- 2 – Orange - Setup – Passcode ‘2222’
- 3 – Red - Service – maximum security level - Passcode ‘1111’

The pass-codes for each level can be changed in the ‘Setup’ – ‘Panel’ – ‘Security’ screen. [Refer to the Operation section entitled, Menus-Security](#) for more information regarding user-defined pass-codes and setting up the security system.

# Touch Panel Interface

## Licensing

The software installed into the touch-panel requires a license in order to boot the system to the 'Home' page. Certain TrueWeigh features will also require a license to be entered before the feature will be enabled and available for use. The licenses are generated from the 'Station Identifier' of the touch screen unit. Installing new software into touch-panel may trigger the licenses to be invalid. An invalid software license will prevent the system from completing the boot sequence. If the license is invalid, the user is presented with an invalid license popup window. Contact Conair support to obtain a new license.

## USB

There are two USB ports on the back side of the main touch screen unit. Remove the access panel door on the side of the control to gain access to the USB ports. Either of these USB ports accepts a formatted USB thumb drive (FAT16, FAT32). Both USB ports can be populated with a thumb drive. When a thumb drive is inserted into the unit, it will be listed for selection in the drive availability box. Removing the drive will also remove the drive reference from the drive availability box.

The USB thumb drives are useful for saving a variety of system parameters as well as report generation. Files that can be saved are system configuration, recipes, and resins. All reports can be formatted as text files and placed on a USB thumb drive as well.

## User Interface

The user interface, presented on the touch screen, is a collection of pages or screens which can be used to monitor and control the system. The TrueWeigh system is designed to work with a variety of configurations and applications. As a result, screen pages will vary, depending upon the configuration of the system. It is impossible to show all possible screen variations.

## General Concepts

Presented here are useful concepts for operating the TrueWeigh system.

- All user interaction is through the touch screen display. Navigation is processed via pressing raised 3D-shaped buttons. Pressing a 'button' will appear to indent the button indicating a button press.
- Numeric and character entry is performed by touching an 'input' box, which reveals an alpha/numeric keypad. An input repeat feature occurs, if a character is pressed and held on the keypad.
- The Numeric only keypad will display the minimum/maximum values allowed for the particular data field to be edited. If data is entered outside the listed range, the data will reset to the range limit nearest the entered data value. The minimum number is on the bottom with the maximum number on the top.
- Parameters for display only will be presented within a box with a light blue background.
- Boxes that allow user input have a white background with a simple 'box frame' border.
- The currently selected input box will have a 'box frame' border around a blue box with black text.
- Buttons and input boxes that are currently 'locked' will have a dark brown box with white text.



0.00 %



40.00 %



6.00 lb



0.00 ft/min

# Touch Panel Interface (continued)

- In the lower left corner of the display, the 'Alarms' button is presented. This button face will change in color to represent worse case active alarm severity. Pressing this button on any screen of the system will immediately display the active alarms screen. Pressing the 'Back' button on the alarms screen will return to the screen displayed, before going to the alarms screen.
- The 'Alarm' button will change color to reflect the severity of the most severe active alarm in the system. If no alarms are present, the button face will be gray.
- Recipes are numbered from 1 to 1000.
- Resins are numbered 1 to 250
- Screen layout:
  - The 'Title Area' of each screen appears across the top of each page. In the top left corner is the name of the production line with the name of the blending system, on the right side is the current system time and the 'Help' button. The 'Help' button presents context sensitive help information for each screen. In the center of the title bar the screen name is displayed.
  - The 'Status Area' of each screen appears across the bottom of each page. This area contains a variety of information displaying the operational status of the system. On the bottom left of the screen is the 'Alarm' button which navigates to the 'Active Alarms' screen. The alarm button face color indicates the severity of the most active alarm.




On the bottom right a 'Back' or 'Home' button will typically be displayed. The 'Back' button will return to the previously displayed screen. The 'Home' button returns to the initial <Home> screen.

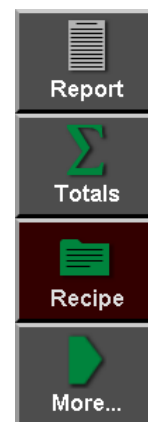
Located on the lower right of the status area the current running Recipe Name and Order Name (if enabled) are displayed. Next to the Recipe Name field is a field indicating the current security level. Touching the security text status also provides the security popup for a shortcut method to change security levels. Next to these fields the current Recipe Name is shown and above the Recipe Name, the Order Name (if enabled) is displayed. In the middle is a text box indicating the current state of the blender; and if implementing a TrueWeigh, the state of the extrusion process is also shown with the blender state. If self-loading is enabled, the state of the self-loading system is shown above the blender state.

- The 'Navigation Area' of the operation screens appears across the right side of each page.

## Screen Navigation

Screen navigation is accomplished by pressing buttons visible on the command bars shown at the right hand side of the screen. Each button appears as a raised area and is represented with a name, an icon, or both an icon and name. When the button is pressed it will change color and appear to be depressed.

 **NOTE:** on some screens it may not be possible to show all navigation buttons at the same time. In these cases, the lower right hand side of the screen will show a 'More...' button which will scroll through additional navigation buttons.




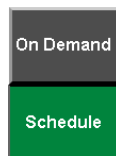
An example of a command bar:

(Continued)

## Touch Panel Interface (continued)

The buttons present on the command bars will change based on which page is currently being shown. Navigation buttons with identical function will be located in the same area on numerous pages. For example, 'Back' and 'Home' buttons will be in the lower right corner when applicable.

 **NOTE:** If the button face appears as dark brown, then that button is 'locked' and will not function. This is due to the current operating security level or the current operating state of the system. Pressing a button in the locked condition will present the security popup window to allow the user to enter a pass-code which will raise the operating security level to a higher level. This will allow the button to become 'unlocked'.



Selection buttons are buttons that represent a selected / not selected state. When NOT selected these buttons appear raised with a gray face. When selected, this button will appear sunken and have a dark green face. This button type is commonly found in 'Reports', 'Setup', and 'Help' areas of the system. They are used to select a type of Report, an area of the Setup system, or a specific Help document.

### Basic Navigation Buttons

There are several navigation buttons that are not specific to any page. The following section outlines these buttons.



**More** – This button is used to scroll through the various navigation / command buttons on the screen.



**Alarm** – This button is used to change the current screen to the 'Active Alarms' screen. This button will also change color to reflect the level of the alarm highest active alarm. Refer to the Operation section entitled, Menus-Alarms for detailed descriptions and alarms processing.



**Back** – This button is used to return to the screen previously shown to the current screen.



**Home** – This button is used to return to the main screen of the system.



**Yes** – Affirmative response to question, perform the action.



**No** – Negative response to question, cancel the action.



**Page Up** – Move up a full page of text in the text box.

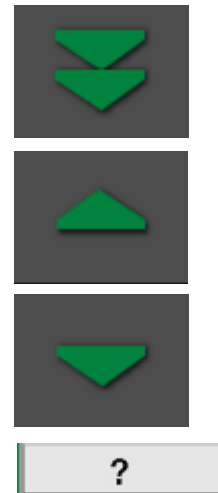
# Touch Panel Interface (continued)

**Page Down** – Move down a full page of text in the text box.

**Line Up** – Move up a line of text within the text box.

**Line Down** – Move down a line of text within the text box.

**Help** – Launch the context sensitive help system.



## Keypads



**Keypad** – Number Pad



**Keypad** – Alphanumeric Pad

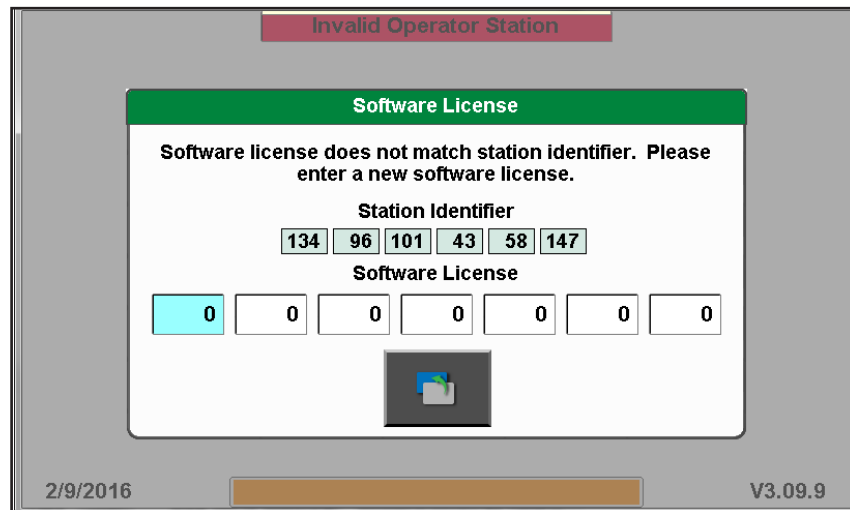
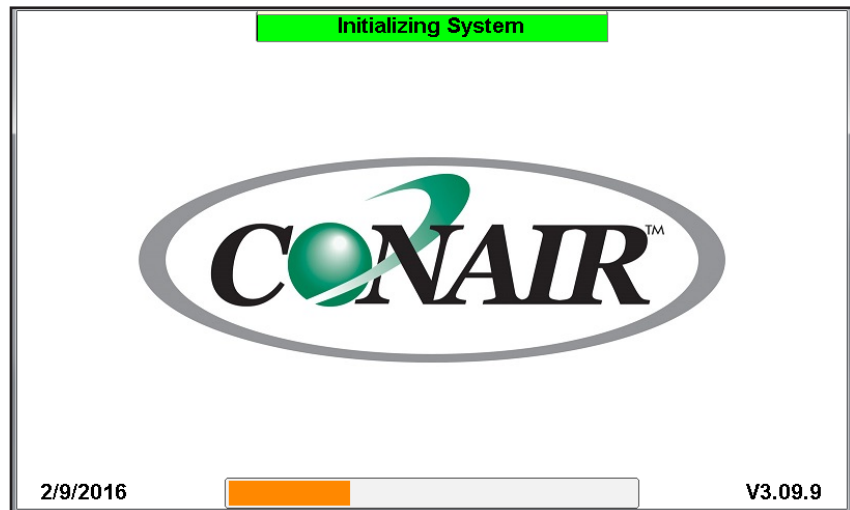
# Operating Screens

## Initial Page

When the system is first powered on, the touch screen will go through the manufacturer's boot up process. Upon completion, the TrueWeigh code will display the <Initializing System> screen, indicating the software is loading the configuration of the system setting the initial operating parameters. Do not turn off power during the time this page is shown. In the lower right hand corner of the screen, the current Software Version is displayed. There is firmware protection built into the system. Powering the system on for the first time with new software requires a 'software licensing' code to be entered in order to continue the boot process. For new installations, this will have been completed by Conair before shipment. The software license codes can be viewed on the <Setup> – <Maintenance> – <License> screen.

Contact Conair Parts at  
1.800.458.1960  
from outside the United  
States, call 814.437.6861

Contact Conair technical support if the system does not boot. The system 'Station Identifier' code must be presented to obtain a new license code. The 'Station Identifier' code can be found on the license entry pop up window.



# Operating Screens (Continued)

## Home Page

The <Home> screen is always displayed after the initial boot screen. For a TrueWeigh system the <Home> screen displays the current status of the blending process. For a TrueWeigh system the <Home> screen will represent the current status of the extrusion process. The display will return to the <Home> screen whenever the 'Home' button is pressed.

The appearance of the <Home> screen will vary based on the application, control modes, and recipe entry method selected. For this reason, not all representations of this screen will be discussed here, but the functionality of all these screen variations will be discussed. The focus of this page is to monitor, start, and stop the operation of the blender.

**Extrusion Monitor, <Home> Screen:** The <Home> screen shows the current state of the extrusion process. Displayed will be the material throughput values of the extruder and the haul-off device. Also shown will be the speed of the extruder, and the amount of material available in the extrusion weigh hopper. The extruder shown is selectable in a co-extrusion system. If an extruder has sub-layer components, a 'sub-layer' button will be presented. The button will present a popup window which will show the set versus actual values and status for the sub-layer components.

If the extruder hopper is experiencing an alarm condition, an alarm indicator will appear above the extruder hopper graphic.



If the extruder hopper is actively requesting a material load sequence, a load request indicator is displayed above the hopper image.



If the extruder hopper is loading material, a loading indicator is displayed above the hopper image.



If the extruder has a non-zero actual speed value, a running indicator will be displayed.



Additionally there are mode buttons which can be used to place the stop the extrusion process, place it into automatic, or manual.

### Command Bar:

Along the right side of the screen is a command bar that provides navigation to further operational and configuration screens. Pressing the 'More...' button at the bottom will display additional less often used command bar buttons. For this case a simplified command bar is shown with buttons pertinent only to the extrusion process. The remaining buttons will be found on the <Home> screen.

**Automatic** – Places the Extrusion system into automatic operation. This action requires a valid recipe be entered from the Recipe screen. The button will show a green indicator if in automatic. If the recipe has been changed, the button appearance will change to the 'Commit' button.



**Manual** – Places the extrusion system in manual operation. This will navigate to the <Manual> screen where the extruder and haul-off speeds can be manually set.



(Continued)

## Operating Screens (Continued)



Stop

**Stop** – This button is used to put ‘only’ the blender into a stopped state. The button will show a red indicator if stopped.



Commit

**Commit** – The ‘Automatic’ button will change to a ‘Commit’ button whenever the recipe has been modified and is not yet the running recipe. Pressing the ‘Commit’ button will implement the changes to the recipe.



Recipe

**Recipe** – Navigate to the recipe entry screen.



Security

**Security** – Navigate to the security passcode entry screen.



Setup

**Setup** – Navigate to the setup screens.



Report

**Report** – Navigate to the report generation screen.



Language

**Language** – Navigate to the language screen to change display languages.



Totals

**Totals** – Navigate to the material throughput totals (inventory) screen.



Recipe

**Recipe Alarm** – When ‘Commit’ has been pressed and the new recipe contains an error that prevents it from being processed, the ‘Recipe Alarm’ button will be shown. This button will navigate to a screen where errors with the recipe can be viewed.

Weight / Time	
Actual	0.00 lbs/hr
Set	0.00 lbs/hr

Weight / Time	
Actual	0.00 rpm
Set	0.00 rpm

Extruder	
Max. Rate	0.00 lbs/hr
Min. Rate	0.00 lbs/hr


## Operating Screens (Continued)

### Sub-Layer:

If the extruder shown on the <Home> screen contains sub-layer devices like additive devices or a scrap-saver recycling system, the [sub-layer] button will be shown. Pressing the [sub-layer] button a popup will be shown where the status and the set versus actual values of the sub-layer devices will be shown. Status values include the hopper weight, alarm, and loading state.

If a scrap saver device is on the extruder, the scrap and virgin percentages will be shown along with the actual material usage rate.

Extruder 1		Sub-Layer	
		Main	Additive 2
Hopper Weight		10.00 lb	0.00 lb
Weight / Time	Actual	0.00 lbs/hr	0.00 lbs/hr
	Set	0.00 lbs/hr	0.00 lbs/hr
RPM	Actual	0.00 rpm	0.00 rpm
	Set	0.00 rpm	0.00 rpm
Resin Name			
		Scrap	Virgin
Set		0.00 %	0.00 %
Weight / Time		0.00 lbs/hr	0.00 lbs/hr



### Starting the Extrusion Process:

The drive start buttons for the extruder, and the haul-off device, must be in the 'On' position. This is done on the extruder operator panel, and not the TrueWeigh control panel.

To begin extruding product, the user sets the speed of each extruder and the haul-off device by entering these values into the <Manual> screen, accessed from the <Home> screen on the TrueWeigh control panel. These entered values serve to manually ramp the extruder, and the haul-off device to a desired operating speed.

After ramping up the extruders and haul-off, the user must enter a valid extrusion 'Recipe', accessed from the home screen. The entered 'Recipe', allows the system too automatically (gravimetrically) operate the production line.

After entering a valid 'Recipe', press the 'Automatic' button.

The TrueWeigh system is now in automatic. Proceed to the 'Monitor' screens to examine the gravimetric performance of the production line.

### Stopping the Extrusion Process:

Pressing the 'Stop' button a popup is presented requesting which device should be stopped, (Extruder Only, Blender Only, Extruder and Blender). If the blender is included in the Stop action, a second popup will be displayed. The second popup asks whether the blender should finish the current batch before stopping or should the blender stop immediately. It is recommended to stop at the end of the batch if possible.

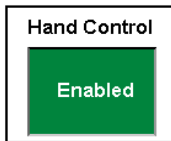
(Continued)

# Operating Screens (Continued)

## Manual

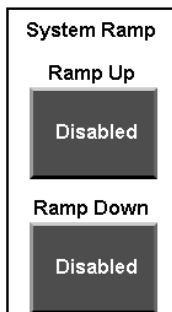
This Manual screen allows the user to manually set the motor speeds for all devices in the system (extruder, sub-layer, and haul-off). This screen will change based on the number of motor drives configured during the ‘Setup’ of the system. When the ‘Manual’ button is pressed to navigate to the <Manual> page, the system is placed into the ‘Manual’ state (removed from Automatic, or Stopped). Exiting from this page will not remove the system from ‘Manual’ operation. Only pressing the ‘Stop’ or ‘Automatic’ buttons will remove the system from ‘Manual’ control.

The input boxes here allow for each drive to have a set speed. The actual speed of the drive is shown above the input box. Each set of boxes is labeled with the name of the device it controls. For example, the extruder or haul off device. The haul off device, if present, will always be listed first, followed by the extruder. If additives are present, a ‘SubLayer’ button will be shown which when pressed, will present a popup where the additive motor speeds can be set.



If the system is in ‘Hand Control’ and the drives have a feedback control, then it is not possible to enter set speeds into the input fields. In ‘Hand Control’, the set speeds are being obtained from the drive directly and cannot be edited. When ‘Hand Control’ is enabled, the Hand Control button will be depressed, colored green, and state enabled.

When ‘Hand Control’ is disabled the TrueWeigh system will assume control of the drives used in the extrusion system. The drives speeds set on the <Manual> screen will be the new set values. A popup will be presented requesting verification.



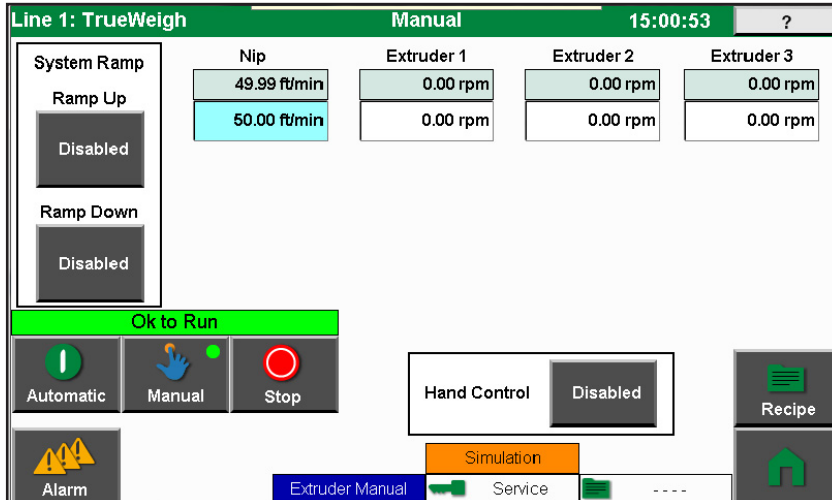
With the extruder and haul-off speeds set, it is possible to ramp up / down all devices simultaneously by pressing the ‘Extruder Ramp Up/Down’ buttons. If the ramp operation is to also include the haul-off device, press the ‘System Ramp Up/Down’ buttons. To change the speed of any one device, touch the speed field and enter a new value, or use the up/down buttons to incrementally change the device speed.

Above the Automatic, Manual, and Stop buttons is an indicator box that indicates the system has run long enough to obtain rate information for all of the drives in the system. This box must be ‘Green’ and display the message ‘Ok to Run’ before the system can be put into ‘Automatic’ control. A ‘Red’ box with the message ‘Not Ok to Run’ means the system is still obtaining extruder rate information.

Also located on this page the current actual recipe throughput rates and the extrusion hopper material weight data values are shown.

(Continued)

## Operating Screens (Continued)



**Automatic** – Places the Extrusion system into automatic operation. This action requires a valid recipe be entered from the Recipe screen. The button will show a green indicator if in automatic. If the recipe has been changed, the button appearance will change to the ‘Commit’ button.

**Manual** – Places the extrusion system in manual operation. This will navigate to the <Manual> screen where the extruder and haul-off speeds can be manually set.

**Stop** – This button is used to put ‘only’ the blender into a stopped state. The button will show a red indicator if stopped.

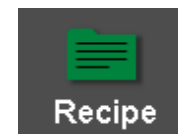
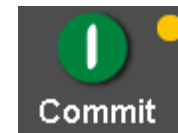
**Commit** – The ‘Automatic’ button will change to a ‘Commit’ button whenever the recipe has been modified and is not yet the running recipe. Pressing the ‘Commit’ button will implement the changes to the recipe.

**Recipe** – Navigate to the recipe entry screen.

**Recipe Alarm** – When ‘Commit’ has been pressed and the new recipe contains an error that prevents it from being processed, the ‘Recipe Alarm’ button will be shown. This button will navigate to a screen where errors with the recipe can be viewed.

### Recipe

The recipe screens are provided to enter the (Production Recipe) or target set values which the blender will attain. The method of recipe entry will change based on the setup of the system. It is impossible to have all variations available on a single screen. Therefore the recipe entry could involve more than a single screen. To present the recipe entry screen in order to enter a ‘New Recipe’, press the ‘Recipe’ button on the <Home> screen.



## Operating Screens (Continued)

Whenever the user edits a 'New' recipe, a temporary recipe is being edited. It is not being used to control the system. When a recipe parameter is changed, the 'Automatic' button shows a 'Yellow' indicator and the button text displays 'Commit'. This is an indication that the recipe has changed and the system is NOT processing the changed recipe. The system will control the production line according to the 'New' recipe values, only after the 'Commit' button is pressed. When the 'Commit' button is pressed the 'New Recipe' is validated for any errors that would prevent the system from being able to process it.

- If there is an error with the 'New Recipe', the 'Recipe Alarm' button will become visible. The 'New Recipe' will NOT become the current/processing recipe. The recipe errors must first be corrected.
- If there are no errors with the recipe, the system will go into (Automatic) and processing will begin. The New Recipe is copied to the Set/Current Recipe and the system will control the process accordingly. The 'Commit' button will change to the 'Automatic' button. The new recipe name will be shown in the status section at the bottom of each screen.

### Recipe Entry Screens

The recipe entry screen is provided to enter the target set values for the systems automatic operating state. These screens are highly dynamic and depend upon the configuration chosen in <Setup>. The recipe entered here is a temporary recipe called the 'New Recipe' or 'Next Recipe'.

The 'Recipe Book' contains any stored recipes. In the 'Recipe Book', recipes can be edited or viewed without affecting the current running recipe. The proper security level must be met in order to store recipes/resins, or edit recipes/resins in the recipe book.

From the <Home> screen, when the 'Recipe' button is pressed, the extrusion recipe entry screen will be presented.

### System Recipe

With extrusion systems the primary recipe screen is for entry of recipe values specific to the overall extrusion process. These set values specify the overall throughput requirements of the system, the recipe name, and job name if applicable.

Navigate to the system recipe entry screen by pressing the 'Recipe' button on the <Home> screen. The recipe entry parameters for extrusion systems vary by application, control mode, and recipe entry mode and are configured in the <Setup> <System> sections.

### Recipe Name/Number

In the top center of the recipe entry screen is shown the next recipes name and number. This is by default named (Recipe 1) and (1) respectively. If a recipe has been selected from the recipe book, then the selected recipe's name and number will be shown in these fields.

### Order Names

If (Order Names) have been enabled, then a data entry field to enter the next order name will be shown. If this field (max. 15 char) has been changed, then a popup will be presented asking the operator if the current (Order Totals) should be cleared. This is to assure the proper material usage for the new order (Order Totals) will be accurate. Selecting the 'YES' button will immediately clear the inventory totals. The current Order Name is visible in the status section at the bottom of each screen.

(Continued)

## Operating Screens (Continued)

### Commit/Automatic/Stop

Once a recipe has been entered, the 'Automatic' button will become a 'Commit' button. This is done in order to reflect that the (Next Recipe) has changed and is not yet being processed by the blender. Pressing the 'Commit' button will validate the (Next Recipe) and if there are no errors, the (Next Recipe) will be copied to the (Set/Production Recipe) and the blender will begin processing the recipe. If an error is found, the 'Recipe Error' button will be shown. The recipe must not contain any errors in order for the system to operate.

**Automatic** - Places the Blender into automatic operation. This action requires a valid recipe be entered from the Recipe screen. The button will show a green indicator if in automatic. If the recipe has been changed, the button appearance will change to the 'Commit' button.

**Manual** - Places the extrusion system in manual operation. This will navigate to the <Manual> screen where the extruder and haul-off speeds can be manually set.

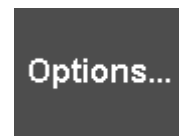
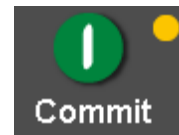
**Stop** - This button is used to put 'only' the blender into a stopped state. The button will show a red indicator if stopped.

**Commit** - The 'Automatic' button will change to a 'Commit' button whenever the recipe has been modified and is not yet the running recipe. Pressing the 'Commit' button will implement the changes to the recipe.

**Recipe Book** - Navigate to the <Recipe Book> screen. This is where stored recipes can be edited and selected for use.

**Material Calibration** - Launch the material calibration popup. This will provide a means to clear the feed rate tables for the selected component hoppers, the extruder, and the haul-off devices.

**Options** - If additional recipe entry options are available (Motor drive start speeds) this button will navigate to a new screen where this data can be entered.



## Operating Screens (Continued)

Line 1: TrueWeigh		Recipe		21:01:13		?	
New Recipe	1	Recipe 1		Order Name			
Length / Time		Weight / Length					
Actual	0.00 ft/min	Actual	0.00 lb/Kft				
Set	50.00 ft/min	Set	220.00 lb/Kft				
				Material Calibration			
				Book			
				Extruder			
				Automatic		Manual	
				Stop			
				Hand Control		Simulation	
Alarm				Extruder Stopped		Service	
						Home	

### Extruder Recipe

A separate screen from the system recipe entry screen, the extruder recipe screen is for entry of extruder set values. Each extruder may also have target set values. These set values can include the percentage of each extruder in a co-extrusion production line, the material density, or the target sub-layer values.

Line 1: TrueWeigh		Recipe		21:02:42		?	
New Recipe	1	Recipe 1					
Extruder 1		Extruder 2		Extruder 3			
Sub-Layer							
Actual	0.00	0.00	0.00				
Set	35.00	32.00	33.00				
Resin Name		Resin 2		Resin 3			
				Automatic		Manual	
				Stop			
				Enter layer values in:		Parts	
Alarm				Hand Control		Simulation	
				Extruder Stopped		Service	
						Home	
						Material Calibration	
						Book	

### Sub-Layer

If the extrusion layer includes additive devices, a 'Sub-Layer' button will be presented. This button when pressed will present a popup window where the operator can enter recipe values pertinent to the additive devices and the main extruder hopper.

## Operating Screens (Continued)

Line 1: TrueWeigh		Sub-Layer		21:03:37		?	
				<b>Extruder 1</b>			
		Main		Additive 2			
Actual		0.00 %		0.00 %		0.00 %	
Set		100.00 %		0.00 %		0.00 %	
Resin Name		Resin 1		---			
				Total %			
				100.00 %			
-----							
		Scrap	12.00 %	Virgin	88.00 %		
Alarm		Hand Control		Extruder Stopped		Simulation	
Service		Private		----		----	

### Options

The <Options> screen is an additional recipe entry screen where less commonly entered data values can be entered. This screen provides data entry for the motor start speeds when they are included in the recipe.

- Motor Start Speeds: If (Motor Starts Speeds) is enabled, the start speed for the motor drive is automatically loaded into the 'Manual' drives speeds data entry boxes when the system enters 'Manual' mode from the stopped state. The start speeds are entered into the recipe from the options popup window.

Line 1: TrueWeigh		Options...		10:31:00		?	
Nip							
		0.00 ft/min	Manual Speeds Part of Recipe				
Extruder 1							
Sub-Layer		Extruder 2		Extruder 3			
0.00 rpm		0.00 rpm		0.00 rpm			
Alarm		Hand Control		Extruder Stopped		Simulation	
Private		Private		----		----	

### Material Calibrate

This button will present a popup which will allow the operator to clear the extruder feed rate tables. The system must be stopped in order for the feed tables to be cleared. For each hopper, the system maintains a feed rate table. If new material is entered into a hopper, this feed table may not properly reflect the proper feed rate for the new material. On the popup press 'All' or select an individual extruder hopper. Press 'Yes' to clear the feed rate tables of the selected extruder hoppers. When the system begins to process the next set recipe or manual mode of operation, it will enter the relearn mode where the feed table is re-populated.

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## Operating Screens (Continued)

### Recipe Book

The (Recipe Book) is the name given to the list of permanently stored recipes. A maximum of 1000 recipes can be maintained. If a production recipe is commonly used, it can be saved to the recipe book. Once in the recipe book, it can be selected at any time. This can provide a more efficient recipe entry process and reduce the likelihood of incorrect recipe entry. Another benefit of stored recipes is the maintaining of material usage totals on a recipe by recipe basis. A <Totals> screen displays the material usage for each of the recipes in the recipe book. The proper security level must be met in order to store recipes/resins, or edit recipes/resins in the recipe book.

Recipes in the recipe book can be viewed and edited without affecting the current production recipe or the operating state of the extrusion system. The recipe entry process for the book matches that used for the production or new recipe. The significant difference being that after a recipe has been entered in the recipe book; it is not validated for correctness. The validation process only takes place when 'Commit' is pressed. Therefore caution should be taken when entering a recipe into the book. In order to insure a valid recipe entry, it is possible to 'Upload' the current production recipe into the recipe book.

### Command Bar

**Search** - Present a popup window where the list of recipes in the Recipe Book can be viewed and selected.

Clear

**Clear** - This button will present a popup window where the currently selected stored recipe or the entire Recipe Book can be reset to default values. Once an action is selected, a verification popup will be presented before any stored recipe is cleared.

Upload

**Upload** - While in (Automatic) this button will present a popup where the current production recipe can be uploaded to the Recipe Book. The operator will be allowed to name the recipe and select the recipe number of the uploaded recipe.

Edit

**Edit** - Change the locked condition of the data entry fields to allow the selected recipe from the book to be edited.

Select

**Select** - Select the current recipe shown in the book to be used as the New Recipe.

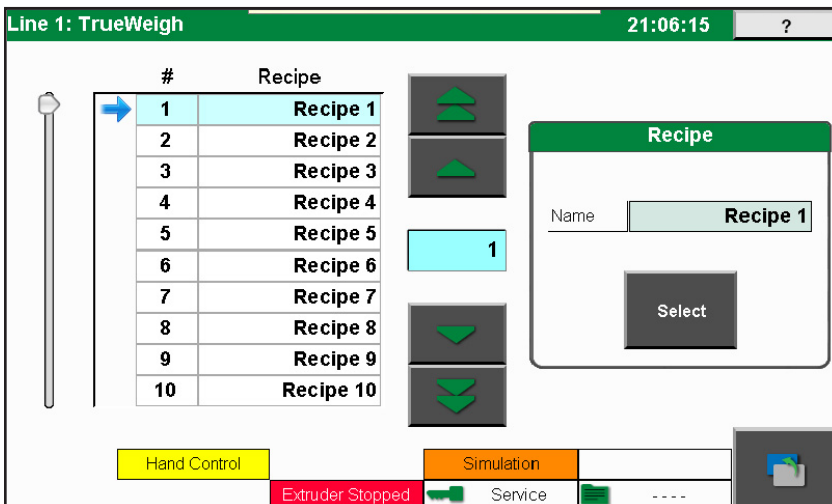
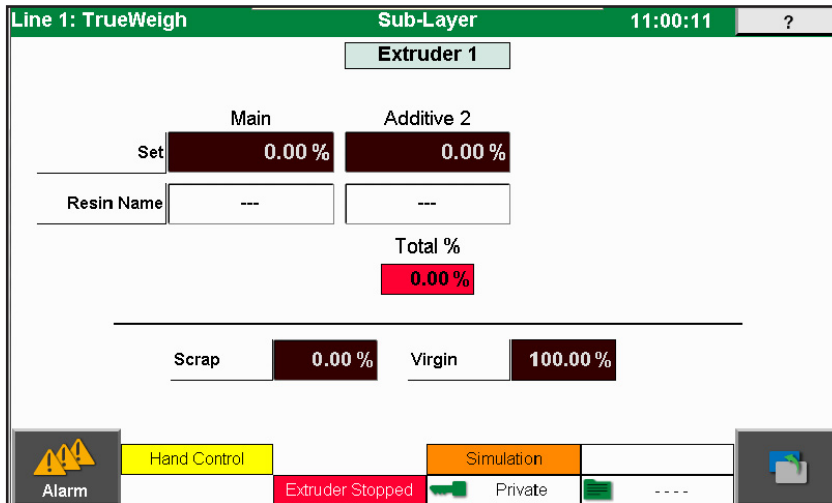
Save

**Save** - Save the recipe being edited into the Recipe Book and restore the locks on the data entry fields.

Cancel

**Cancel** - Cancel the current recipe edit and lock the data entry fields. Do NOT save the recipe into the Recipe Book.

# Operating Screens (Continued)



## Select Recipe

Press the [Select] button to copy the current recipe in the book to the (New Recipe). A confirmation popup will be presented to confirm the selection. If confirmed the popup will be closed, and control will return to the <Recipe> screen. The 'Commit' button will also be shown.

## Upload Recipe

If the system is currently operating in (Automatic) mode, it is possible to 'Upload' the current production recipe to the recipe book. If the operator has the correct security level which is configurable in <Setup>, they can press the 'Upload' button to copy the production recipe into the book. A popup will be presented where the operator selects the recipe number and name for the new recipe in the book.

**NOTE:** Any recipe at that recipe number location will be overwritten with the new recipe values. The recipe inventory total is however not cleared.




If the recipe number has changed, the user will be asked if the newly stored recipe should become the current production recipe. This is important for tacking recipe totals. If the recipe name changes then the current production recipe name will change to match that of the newly entered name.


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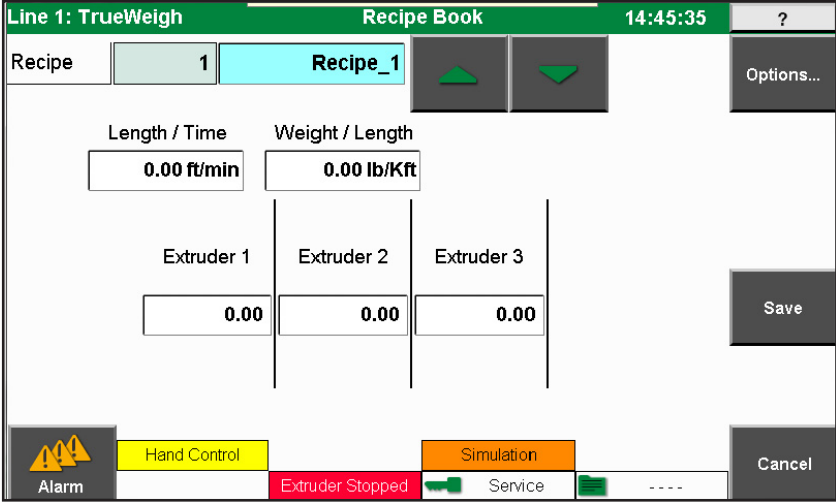
## Operating Screens (Continued)

### Edit Stored Recipe

To edit a stored recipe the operator must have the proper security rights. This is configurable in the <Setup>, <Panel>, <Security> screen. Select the entry in the Recipe Book that needs to be modified. Press the 'Edit' button to unlock the recipe entry fields. Enter the new recipe values. If necessary use the 'Options' button to enter data not shown on the initial screen. Enter the name of the recipe (15 characters maximum). Save the changes by pressing the 'Save' button.

 **NOTE:** Recipe validation does not take place until the 'Commit' button is pressed. Entering an invalid recipe into the book will cause recipe errors when it is used for production.

 **NOTE:** If the saved recipe number matches the current production recipe, a popup will be presented indicating that the recipe book recipe does not match the production recipe. The operator is then presented the option of updating the (Next Recipe) with the modified recipe in the book. If confirmed the recipe is copied to the (Next Recipe) and the 'Commit' button is shown.



The screenshot shows the 'Recipe Book' interface for 'Line 1: TrueWeigh'. The top bar displays 'Recipe Book' and the time '14:45:35'. Below this, there are fields for 'Recipe' (value 1) and 'Recipe\_1'. There are up and down arrow buttons next to the recipe name. An 'Options...' button is on the right. The main area contains two columns: 'Length / Time' with a value of '0.00 ft/min' and 'Weight / Length' with a value of '0.00 lb/Kft'. Below these are three extruder settings: 'Extruder 1' (0.00), 'Extruder 2' (0.00), and 'Extruder 3' (0.00). A 'Save' button is on the right. At the bottom, there is an 'Alarm' indicator (three exclamation marks), a 'Hand Control' button, a 'Simulation' button, and a 'Service' button. A status bar at the very bottom shows 'Extruder Stopped' in red.

### Resin Selection / Names

If resins codes are enabled, then for each hopper in the system, a resin data entry field will be presented for the component on the <Recipe> - <Options> screen. The text of the field will show the name of the selected resin for that hopper. To select a new resin, press the data entry field.

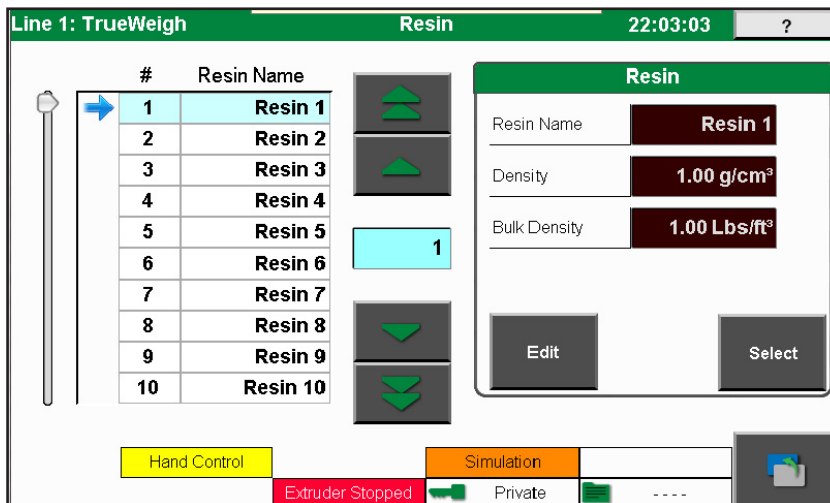
A resin selector popup will be shown where the list of available resins can be viewed and chosen. Select resins to be viewed in the list by using the scrollbar, the 'up/down' buttons, or simply typing the resin number into the selection field. It is also possible to touch the resin name in the table itself to select a specific resin. The selected resin will be highlighted in the table with an arrow pointing to it. It will also appear to the right of the table in the selected resin box. There are a total of 255 resin locations available.

After verifying the resin and its density, press the select button to use the selected resin. The density value is critical for extrusion control when it is necessary to control thickness, ID, or OD. The density value will be entered into the 'New Recipe' and the resin name will be shown on the <Options> screen.

- **Select:** Press 'Select' to choose the displayed resin for the material component hopper selected. The resin popup window will close automatically.

## Operating Screens (Continued)

- Edit:** The desired resin may not be available in the list. To edit a resin, press the 'Edit' button. This will unlock the fields defining the resin so that they may be edited. Each resin has a name, a solid density, and a bulk density value. The solid density value will be used by the system if (Density in Recipe) is enabled. The 'Save' button is pressed when complete to save the changes into the list. To edit a resin the operator must have the necessary rights (Security level to save recipes and resins).




### Security

Security levels dictate what data is accessible by the user. On each screen in the lower right, a text box indicates the current level of security. If the current security level prevents the user from changing a data field, the background of the field will be brown in color with grey text. The same applies to a button; the button face will turn a brown color.

Pressing a locked field will present a popup window where a new security level passcode may be entered. Touching the status area of the screen around the security indication will launch the security entry popup. It is also possible to display the security screen popup from the <Home> screen command bar by pressing 'More...' – 'Security'.

With the security popup window displayed, a new passcode can be entered. If the passcode is valid, the new security level will be set and the popup will close automatically after a short timeout. If the new security level is high enough, data entry may resume. The popup window can be dismissed by pressing the 'Back' button. Pressing the 'Lock' button will automatically set the Guest security level and close the popup, without entering a passcode.

 **NOTE:** If the passcode entered is invalid, the security level will be set to the minimum level.

 **NOTE:** Some user interactions are also not possible if the blending system is operating or a set IO condition exists. In these cases the fields will again be locked, however when touched, a popup will be presented indicating the system must be Paused in order to perform the necessary action. Pressing the 'Back' button will dismiss the popup.

The security level, color, and default pass-codes are as follows:

- 0 – Green - **Guest** – minimum security level - This is the minimum security level. At Guest level all screens are navigable; however data entry or system operational control is locked. This allows a Guest to traverse the system but not make any changes.

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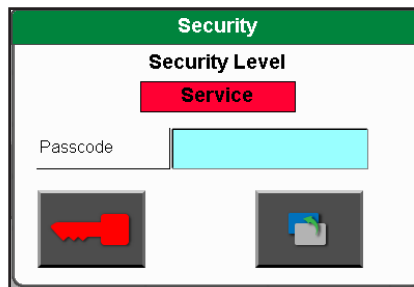
## Operating Screens (Continued)

- 1 – Yellow - **Operator** – Passcode ‘3333’ - With this level all blender operational fields may be accessed.
- 2 – Orange - **Setup** – Passcode ‘2222’ - This level of security allows for various blender setup parameters to be adjusted. Upon returning to the <Home> screen the new setup parameters will be saved.
- 3 – Red - **Service** – maximum security level - Passcode ‘1111’ - The highest level of security, this level is intended for Conair service personnel or those users who have special training of the blender operation.

The pass-codes for each level can be changed in the ‘Setup’ – ‘Panel’ – ‘Security’ screen. [Refer to the Operation section entitled, Menus-Security](#) for more information regarding user-defined pass-codes and setting up the security system.

Also available with the security system is an ‘Auto Logout’ feature. If the ‘Auto Logout Timeout’ value is set to a value other than 0, then after the set timeout value has elapsed, the current security level number will be set to the minimum level (Guest).

**Lock** – Set the security level to the minimum value without entering a passcode. Close the security popup window.



### Help

The Help system provides support documentation for each screen in the user interface. In order to more easily navigate the various help documents, they are organized by Chapter, Section, and Page. When the Help system is accessed, the support document for the relevant screen is presented.

The Help screen is shown by pressing the ‘Help’ button located in the top right corner of the screen. Across the top of the <Help> screen are selection buttons that will allow selection of the available Chapters. Along the left side of the screen are selection buttons that select a Section of documents that pertain to the chosen chapter. Across the bottom of the screen are selection buttons that will display the desired Page within the Chapter and Section. The support document is presented within a scrollable text window. Buttons along the right side of the screen will scroll the document displayed in the text window.

The Chapter, Section, and Page buttons which are pressed indicate which support document is presented. Additional support information can be shown by selecting a different combination of buttons. Pressing the ‘Back’ button will return control to the previous screen.

# Operating Screens (Continued)

## Monitor

The <Monitor> screens show a detailed status of the extruders operation. This screen will show the state of (3) extruders simultaneously. For systems with more than (3) extruders, 'Next' / 'Previous' buttons will be presented for navigation to additional extruders.

Status data shown on this screen includes: Hopper Weight, Loading state, and Alarm State. The systems set target values as dictated by the current recipe are shown along with the actual values as determined by the systems feedback. Set versus Actual data includes: Material usage rate, Motor Speed and Recipe target values.

Line 1: TrueWeigh 09:36:13 ?

Extruder Running    Extruder 1  
 Load Request    Sub-Layer    Extruder 2    Extruder 3  
 Loading  
 Alarm

Hopper Weight		6.97 lb	6.35 lb	6.64 lb
Weight / Time	Actual	230.67 lbs/hr	210.79 lbs/hr	217.32 lbs/hr
	Set	231.00 lbs/hr	211.20 lbs/hr	217.80 lbs/hr
RPM	Actual	25.81 rpm	26.86 rpm	27.74 rpm
	Set	25.81 rpm	26.87 rpm	27.76 rpm
Parts	Actual	35.02	32.00	32.99
	Set	35.00		33.00
Resin Name			Resin 2	Resin 3

Alarm     Extruder Automatic     Simulation     Private     Recipe 1

More...

Line 1: TrueWeigh 09:37:50 ?

System


Recipe	Max. Rate	2134.20 lbs/hr		
	Min. Rate			
Recipe	Max. Rate	746.97 lbs/hr	682.94 lbs/hr	704.28 lbs/hr
	Min. Rate	85.83 lbs/hr	78.47 lbs/hr	80.92 lbs/hr
Extruder	Max. Rate	746.97 lbs/hr	745.47 lbs/hr	744.23 lbs/hr
	Min. Rate	78.63 lbs/hr	78.47 lbs/hr	78.34 lbs/hr

Alarm     Extruder Automatic     Simulation     Private     Recipe 1

A 'Sub-Layer' button will be presented for an extruder if it has sub-layer components. This button will launch a popup window for the sub-layer components.

## Operating Screens (Continued)

Extruder 1		Sub-Layer	
		Main	Additive 2
Hopper Weight		10.00 lb	0.00 lb
Weight / Time	Actual	0.00 lbs/hr	0.00 lbs/hr
	Set	0.00 lbs/hr	0.00 lbs/hr
RPM	Actual	0.00 rpm	0.00 rpm
	Set	0.00 rpm	0.00 rpm
Resin Name			
		Scrap	Virgin
Set		0.00 %	0.00 %
Weight / Time		0.00 lbs/hr	0.00 lbs/hr



### Alarms

The TrueWeigh system contains alarms for each device in the system. There are three levels of alarm severity, Information, General, and Shutdown. A single alarm may have a different severity level based on which operating state the system is in. For example an empty hopper alarm may be a General alarm when the system is stopped but it is a Shutdown alarm if the system is running. Each alarm type and the severity assigned can be viewed and edited in setup. To navigate to the Alarms Setup section from the <Home> screen, press 'More...' – 'Setup' – 'System' – 'Alarm'.

The last 100 alarms are logged to the system memory and even after a reboot sequence, are available for viewing. This historical log can be cleared by the user. The logged alarm list has additional entries, indicating when the alarm became active, when it went inactive, as well as when an alarm was acknowledged.

On the <Report> screen it is possible to generate reports that list either the active or logged historical alarms. These reports can then be viewed away from the device.

To view the active or logged alarm lists, an operator can press the 'Alarm' button located on the lower left hand corner of the touch-screen. The color of the alarm button reflects the level of the most severe active alarm. Touching this button will navigate the operator to the active alarms screen. The logged alarm list can then be viewed by pressing the 'Alarm Log' button located on the <Active Alarm> screen.

Alarm Severity	Color	Description
Information Alarm	Green	This alarm severity indicates a non-critical condition which should soon be resolved.
General Alarm	Yellow	This alarm severity indicates a serious condition that needs immediate attention.
Shutdown Alarm	Red	This alarm severity indicates a critical condition & caused the line to shut-down. This requires immediate attention.

### Active Alarms

The <Active Alarms> screen is divided into two main sections. The (Alarms) section contains the list of active alarms. The (Help) section contains context sensitive help information for the currently highlighted alarm. Active alarms are alarms whose trigger condition is actively occurring or that had occurred but have not yet been acknowledged. Active alarms can be acknowledged, but as long as the trigger condition occurs, they will continue to appear in the list. When the alarm condition is no longer occurring, and has been acknowledged, it will be removed from the list.

(Continued)

## Operating Screens (Continued)

The (Alarms) section appears along the left hand side of the screen. The alarms in the list will appear color coded based on the severity of the alarm at the time it was triggered. If the alarm condition is white, the alarm condition is no longer occurring.

### Alarm List

For each alarm in the alarm list, information fully describes the alarm state and time of occurrence.

- Severity- (1:Info, 2:General, 3:Shutdown)
- Time- The time the alarm occurred or changed state.
- Alarm State- (Active, Inactive)
- Acknowledge State- (A, nA, RA, AR) An indication of the acknowledge state (Acknowledged, not Acknowledged, Reset then Acknowledged, Acknowledged then Reset).
- Description- Descriptive text indicating the alarm, and the device where the alarm occurred.

Alarm Indication:

- Information- Green: Non critical alarm.
- General- Yellow: Needs immediate attention.
- Shutdown- Red: Needs Immediate attention, the system has stopped.
- White- The alarm trigger is no longer occurring, and the alarm has not yet been acknowledged.

Alarm Control:

- Active alarms may be acknowledged by pressing the [Acknowledge] button.
- Press the 'Alarm Log' button to view the <Logged Alarms> screen.
- Press the 'Reports' button to navigate to the <Report> screen to output the alarm list CTRL-R.

### Content Sensitive Help

Using the navigation buttons in the (Alarms) section it is possible to highlight/select any alarm in the list. Once selected the (Help) section will update with descriptive text for the selected alarm. The text will include a definition of the alarm, possible causes, and resolutions for clearing the alarm. As the highlighted alarm changes, the help document will automatically update with the appropriate text.

Security:

In order to acknowledge the active alarms the operator must have at least (Operator) level of security.

**Acknowledge** – Acknowledges alarms in the active alarms list. If the alarm is 'inactive' then it will be cleared from the list.

**Alarm Log** – Navigate to the logged alarm page.

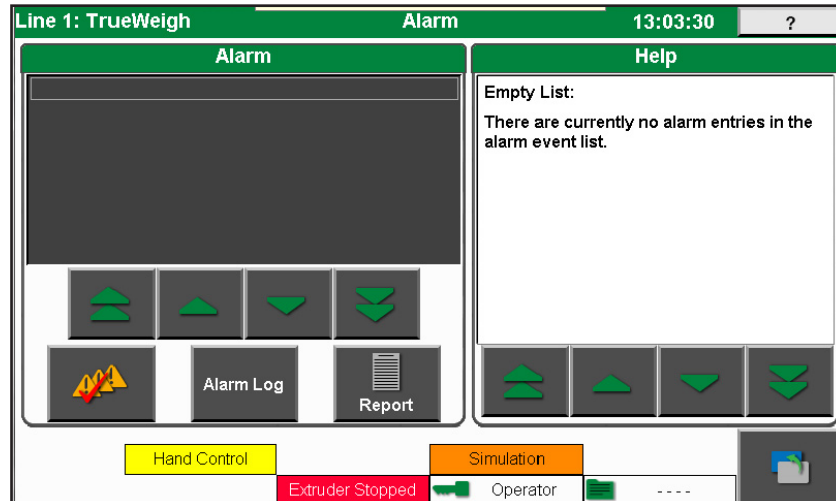
(Continued)



## Operating Screens (Continued)



**Report** – Send the logged alarm list to an output device such as a printer or USB thumb drive.



### Logged Alarms

The <Logged Alarms> screen is divided into two main sections. The (Alarm Log) section contains the list of logged or historical alarms. The (Help) section contains context sensitive help information for the currently highlighted alarm. Whenever an alarm is triggered or changes state (active, inactive, acknowledged) an entry will be made into the alarm log list. The alarm status column of the alarm list will reflect the state of the alarm when it was added to the list. The 100 most recent alarm events will appear in the logged alarm list. As new alarms occur, the oldest alarm entries will be removed from the list.

The (Alarm Log) section appears along the left hand side of the screen. The alarms in the list will appear color coded based on the severity of the alarm at the time it was triggered. If the alarm condition is white, the alarm condition is no longer occurring. A 'Clear All' button is presented which allow the alarm list to be cleared.

### Alarm List

For each alarm in the alarm list, information fully describes the alarm state and time of occurrence.

- Severity- (1:Info, 2:General, 3:Shutdown)
- Time- The time the alarm occurred or changed state.
- Alarm State- (Active, Inactive)
- Acknowledge State- (A, nA, RA, AR) An indication of the acknowledge state (Acknowledged, not Acknowledged, Reset then Acknowledged, Acknowledged then Reset).
- Description- Descriptive text indicating the alarm, and the device where the alarm occurred.

# Operating Screens (Continued)

## Alarm Indication:

- Information - Green; Non critical alarm.
- General - Yellow; immediate attention.
- Shutdown - Red; Needs immediate attention, the system has stopped.
- White - The alarm trigger is no longer occurring, and the alarm has not yet been acknowledged.

## Alarm Control:

- Press the Alarm button to view the active alarms screen F1
- Press the Clear button to delete all entries from the logged alarm list CTRL-CLEAR.
- Press the Reports button to navigate to the Reporting screen to output the alarm list CTRL-R.

## Content Sensitive Help

Using the navigation buttons in the (Alarms) section it is possible to highlight/select any alarm in the list. Once selected the (Help) section will update with descriptive text for the selected alarm. The text will include a definition of the alarm, possible causes, and resolutions for clearing the alarm. As the highlighted alarm changes, the help document will automatically updated with the appropriate text.

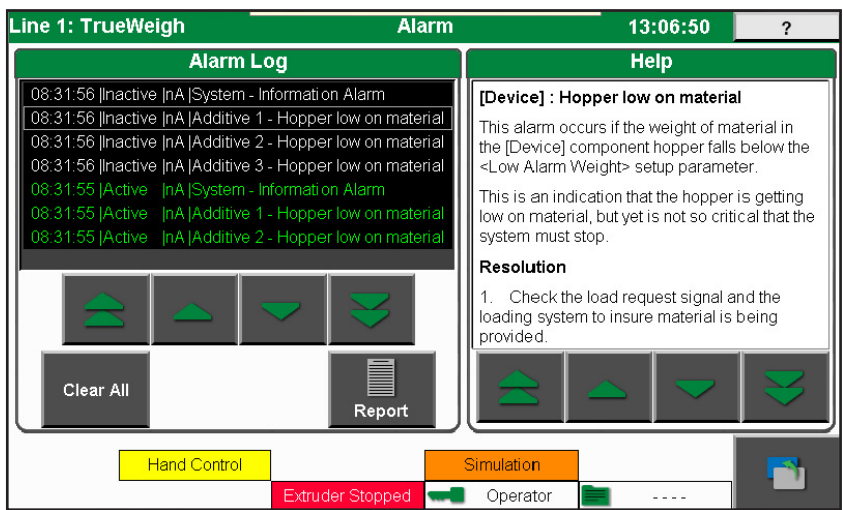
## Security:

In order to clear the Alarm Log the operator must have at least (Setup) level of security.

**Clear All** – Clear the logged alarm list of all entries.



**Report** – Send the logged alarm list to an output device such as a printer or USB thumb drive.



(Continued)

## Operating Screens (Continued)

### Recipe Errors

Recipe errors reflect a problem with the new or next recipe. When the 'Commit' button is pressed, the new recipe is validated. If there are issues with recipe that will prevent the system from running, a recipe error is generated. These errors prevent the system from operating in Automatic. If there is an error with the recipe, the 'Recipe Alarm' button will appear. Pressing this button will present the <Recipe Alarm> screen. Correct the recipe to clear the errors and press the 'Commit' button again.

The <Recipe Error> screen is divided into two main sections. The (Recipe Error) section contains the list of recipe errors. The (Help) section contains context sensitive help information for the currently highlighted recipe error.

When the error condition is no longer occurring, it will be removed from the list.

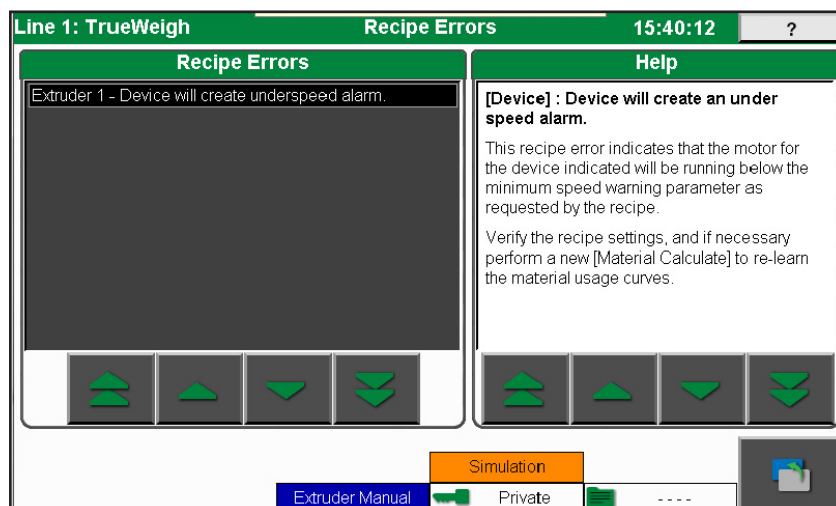
### Recipe Error List

For each error in the recipe error list, information fully describes the error state.

- Device- An indication of which portion of the recipe entry that is creating the error.
- Description- Descriptive text indicating the alarm, and the device where the alarm occurred.

### Content Sensitive Help

Using the navigation buttons in the (Recipe Errors) section it is possible to highlight/select any error in the list. Once an error is selected the (Help) section will update with descriptive text for the selected error. The text will include a definition of the error, possible causes, and resolutions for clearing the error. As the highlighted error changes, the help document will automatically updated with the appropriate text.



### Reports

The TrueWeigh system has a variety of reporting features. It has the capability of generating text based report outputs, continuous logged data output, or remotely connected PC based output. Each featured output is executed and configured from the <Reports> screens. Along the left side of the <Reports> screen, selection buttons are present for selecting which featured reports is to be addressed.

## Operating Screens (Continued)

### On Demand Reports

For text based output, the system has the capability to generate a variety of pre-defined reports. All reports are formatted as plain text and can be saved to either a USB thumb-drive, to the onboard memory drive, or via an Ethernet connection and implementing the Telnet protocol. If using a physical drive and the drive is at capacity, an alarm will occur indicating the problem. Each report includes a header which identifies the production line, report time, report name, and the name of the system. All reports can be formatted as either a comma separated file (.csv), or as a formatted text file (.txt).

Parameter	Options	Description
Select Report	Alarm Log Report Active Alarms Report Current Status Report Shift Inventory Report Total Inventory Report Resin Report	Select the type of report you wish to generate.
Report Style	Formatted Report Comma Separated Data File	Select the output format or style you wish to generate
Select Destination	Compact Flash USB Port 1 USB Port 2 Telnet	Select the destination where the report output should be sent.
Report Name	Reports\<<Report Name>.txt Reports\<<Report Name>.csv	The name of the report as it will appear at the destination drive.

It is also possible to generate reports on a scheduled basis. When outputting to a physical drive the output filename will include a date and time coding this identifies when the report was generated.

On demand reports are generated the moment the 'Run Report' button is pressed. A progress bar will be presented showing the progress of the report generation. Once the progress bar vanishes, the report is complete. The report results will be immediately shown in result popup window. If an error occurs during the process, a pop-up will be presented indicating the error condition. The report output will be available at the destination location. Available reports can include:

- **Alarm Log Report:** A report that lists the last 200 logged or historical alarm events. This report may take some time to generate depending on the length of the historical alarm list. The following data is included:
  - Event Time
  - Alarm State
  - Acknowledge Status
  - Device Name
  - Alarm Message
- **Active Alarm Report:** This report will output the entire list of current active alarms. For active alarms, only the current state is listed. For non-current alarms, each is updated with the new status. Each alarm will remain on the list until the alarm is cleared and acknowledged. The following data is included:

(Continued)

## Operating Screens (Continued)

- Event Time
- Alarm State
- Acknowledge Status
- Device Name
- Alarm Message
- **Current Status Report:** This report prints out the current status of the system. First, the job name, if available is shown. This is followed by the current recipe. The recipe values printed, match those entered at the recipe screen page. In addition to the set values, the actual values are printed. This is followed by the inventory and shift totals. For the shift totals, the percentage of the material consumed over the shift is also calculated.

 **NOTE:** This report only prints out the recipe data at the time of the report.

- **Shift Inventory Report:** This report shows the current shift totals and the percentage of each ingredient as consumed over the shift. Note that if the shift totals are not cleared at the beginning of the shift then these initial values will be added to the prior shift totals.
- **Total Inventory Report:** This report shows the current inventory totals and the percentage of each ingredient as consumed since the last time the inventory totals were cleared.
- **Resin Report:** If resin codes are enabled this report will be available. This report outputs a list of all resins maintained by the system including the total amount of material processed by each resin.

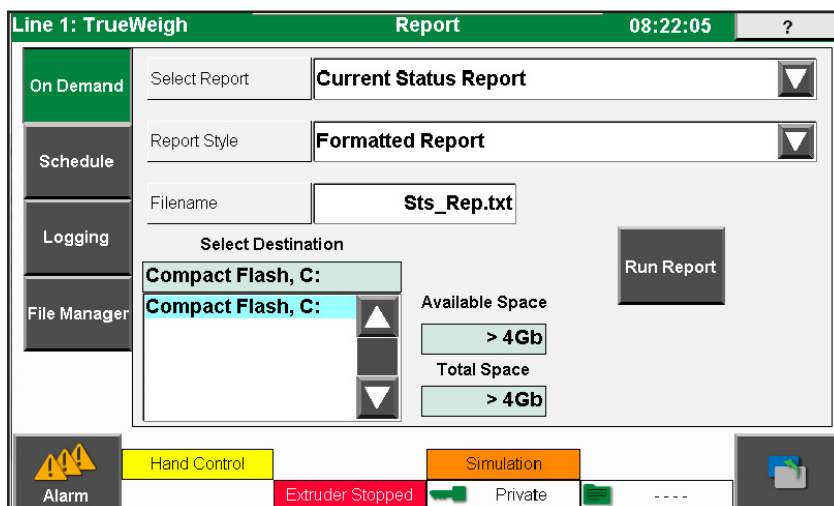
To generate an on demand report:

- 1** In the (On Demand) section, select the type of report to be generated from the pull-down menu.
- 2** Select the format of the report output from the pull-down menu. Either a formatted report output with data properly column aligned, or a comma separated file format where each data value is separated by a comma.
- 3** Select the report destination. The report destination pull-down will update with the output options based on what hardware is currently available. The system will show the available drive space for the destination selected. If the space exceeds 4 Gigabytes, the value shown will be '>4Gb'.
- 4** A default report name is populated into the (Report Name) field. This report name (15 characters) can be changed. Take care when specifying the file extension.
- 5** Press the [Run Report] button to generate the report. When complete the report will be shown in a Report View popup window.

### Run Report

**Run Report:** Execute or Run the report as specified by the selected data filters. The progress bar will show the progress of the report. Upon completion of the report, the output will be presented in a 'Report Viewer' popup window.

## Operating Screens (Continued)



### Scheduled Reports

Each On Demand text report has the capability of being generated automatically on a periodic basis. The date and time of the report execution is appended to the filename. This allows multiple reports to be generated without user interaction. This method will continue to consume drive space until the reports are retrieved and removed from the drive. It is recommended to use a thumb-drive for scheduled reports due to the larger capacities available.

Parameter	Options	Description
Select Report	Alarm Log Report Active Alarms Report Current Status Report Shift Inventory Report Total Inventory Report Resin Report	Select the type of report you wish to generate.
Report Style	Formatted Report Comma Separated Data File	Select the output format or style you wish to generate
Select Destination	Compact Flash USB Port 1 USB Port 2	Select the destination where the report output should be sent.
Report Name	Reports<Report Name> Reports<Report Name>	The name of the report as it will appear at the destination drive. The file extension will be added after the date and time concatenation.
Schedule Report	YES / NO	Choice of whether the selected report output will be scheduled. (Enabled/Disabled)
Report Start Time [HH:MM]	HH = 7, MM = 30 (7:30 am)	The first time of the day that the report will be generated. This is a 24 hour clock representation.
Report Interval Time [HH:MM]	HH = 1, MM = 0 (Report output hourly)	The interval from the last time the report was generated before generating another report.

To generate a scheduled report:

- 1** In the (Scheduled) section, select the type of report to be generated from the pull-down menu.
- 2** Select the format of the report output from the pull-down menu. Either a formatted report output with data properly column aligned, or a comma separated file format where each data value is separated by a comma.

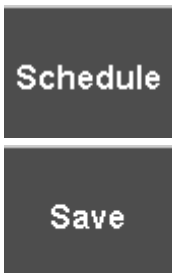
(Continued)

## Operating Screens (Continued)

- 3 Enable or Disable the schedule report using the Schedule Report pull-down.
- 4 Select the report destination. The report destination pull-down will update with the output options based on what hardware is currently available. The system will show the available drive space for the destination selected. If the space exceeds 4 Giga-bytes, the value shown will be '>4Gb'.
- 5 A default report name is populated into the (Report Name) field. This report name (15 characters) can be changed.

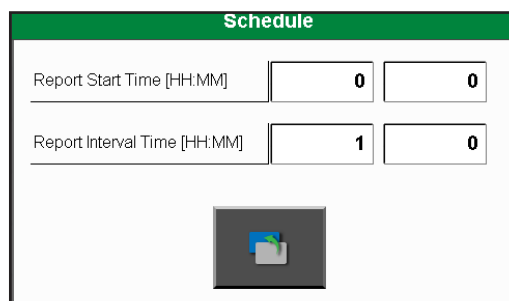
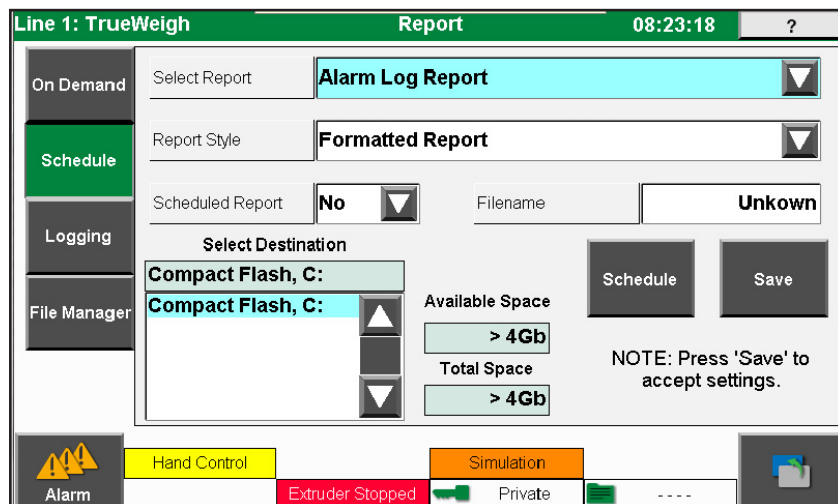
 **NOTE:** Do not specify the file extension! The file extension will be added when the report is generated.

- 6 Pressing the (Schedule) button will present a popup window, to enter the report schedule.
- 7 Enter the Report Start time. This value is the time (24 hour clock) that the report should first be generated.
- 8 Enter the Report Interval time. This value is the amount of time (24 hour clock) between the last generated report and the next.
- 9 Press the back button to close the schedule popup.
- 10 Press the 'Save' button to save the schedule report settings.



**Schedule:** Present a popup window where the report times are scheduled.

**Save:** Save the selected report parameters as shown.



## Operating Screens (Continued)

### Logging Data

Process data can be logged to files either on the internal drive or a USB thumb drive. Each data record consists of a single line of data that is comma separated. The first line of each file is a header line which contains the column headings for the data lines to follow. Each day a new file is created, and a date code is concatenated with the filename. Once the data drive is full, data logging will stop and an alarm will be shown in the alarm list. For data files located on the internal drive, a simple FTP client can be used to manage the files.

- **Batch Data:** For every batch of material the blender makes, the amount of material, the type of material, and other component statistics are saved.


 **NOTE:** Each data line will be contain approximately 70 bytes + (50 bytes \* Number of Components).

- **Inventory Data:** Current inventory totals of the system and components. The inventory totals for all devices will be saved whenever the system powers up, every set interval, and when the <Auto> or <Stop> button is pressed. The interval period can also be set.
- **Recipe Data:** The current recipe is saved whenever the <Auto> or <Stop> button is pressed.
- **Thickness:** With TrueWeigh if thickness mode is enabled, the calculated product thickness is output according to the set interval.

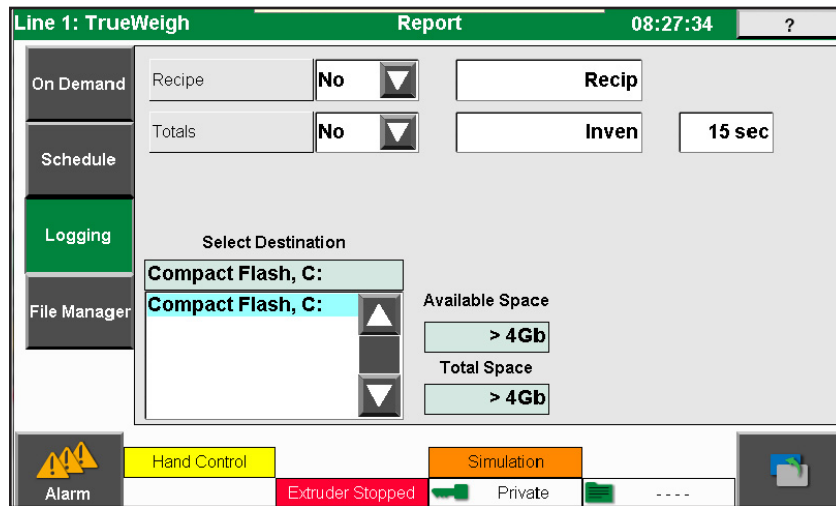
Parameter	Options	Description
Enable logging output	Yes / No	Enable / Disable the various data logging output reports.
Report / Data File Name	LogData<Report Name>	The file name prefix for the resulting data file. The date and extension will be concatenated.
Report Interval	60 (seconds)	Available for some report outputs, the frequency of which data is output to the destination.
Select Destination	USB Port 1 USB Port 2 Compact Flash	The destination where the file output will be placed.

To enable data logging

- 1** In the (Logging) section, enable or disable the various logging options.
- 2** If Inventory logging is enabled, set the desired logging interval.
- 3** Enter a filename prefix for the data file. The date and extension will be concatenated to the prefix to create the final file name.
- 4** Select the destination for ALL data logging output. The system will show the available drive space for the destination selected. If the space exceeds 4 Gigabytes, the value shown will be '>4Gb'.

 **NOTE:** For the destination of logged data, a single destination is set for all data logging outputs.

## Operating Screens (Continued)



### File Manager

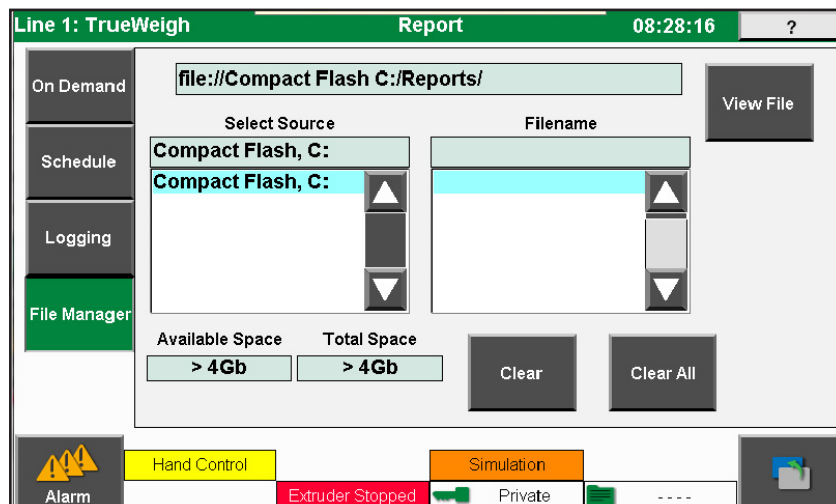
The 'File Manager' button presents a screen where the operator can view On Demand and Scheduled text reports that have been created. The reports reside in the (Drive:)\Reports\ directory of the selected drive.

To view a report

The operator screen presents a drive selection list where available drives are shown. Once a drive is selected, the file list will populate with all files residing in the (Reports) directory of the chosen drive.

- 1 Select the source drive
- 2 Select a file from the file list. The selected drive path and file will be shown in the (Path) field.
- 3 Press the 'View File' button to display the selected report.
- 4 Press the 'Back' button to close the report viewer.

With the correct permissions {Setup} the operator has the option to delete either the selected file, or all files in the reports directory. Press the 'Clear' button to delete a single report file, or the 'Clear All' button to delete all files.



(Continued)

## Operating Screens (Continued)

file://Compact Flash C:/Reports/Sts_Rep.txt				
Status Report				
Production Line: Line 1				
System: TrueWeigh				
Thu Sep 8 08:19:12 2016				
-----				
Recipe: 0 - - - -				
Total Weight/Length	Set	Actual	Resin	
	0.00	0.00		
Total Weight/Length	0.00	0.00		
Total Length Rate	0.00	0.00		
Total Weight Rate	0.00	0.00		
Extruder 1	Parts	0.00	0.00	----
--->	Virgin	Percent	0.00	100.00
--->	Scrap	Percent	0.00	0.00
Extruder 2	Parts	0.00	0.00	----
Extruder 3	Parts	0.00	0.00	----

### Totals

#### General Information

The TrueWeigh system maintains the total material processed by each loss-in-weight hopper and the overall material length-throughput if a haul-off device is available. The extruder totals summed together for a system total. The number of batches processed is also accumulated. The <Totals> screens display the recipe, system, device, and if enabled resin and order material consumption totals. For the system and extruder totals, three types of totals are maintained: inventory, shift, and order totals. Separate buttons are provided to clear each of the totals in the system. The current security level can determine which set of totals can be cleared by the user.

#### System Totals

Like other screens in the system, the totals screens can vary based on the system configuration. For large extrusion systems it is not possible to show all extruder totals on a single screen. For these systems a 'Next' button is presented which when pressed will show the totals for the additional loss-in-weight hoppers.

The totals screen displays the recipe, resin, system and device inventories. To access the <Totals> screen from the <Home> screen, press the 'Totals' button. Selection buttons on the left side of the screen will allow selection of different material usage totals. Like other screens in the system, the totals screens can vary based on the system configuration. If resin names have been enabled then a selection button for viewing resin totals will be available.

- **System:** The extrusion system maintains the total weight of material processed by each loss-in-weight hopper. Each of the extruder material usage totals are summed together for a system total. Three types of material consumption totals are accumulated in the system. The first is the running total, labeled (Total Inventory). The second is called (Shift Totals) which allows users to track material usage during a shift period. The third total if enabled through setup is called (Order Totals). Separate buttons are provided to clear each of the totals maintained by the system. The current security level can determine which set of totals can be cleared by the user.
- **Inventory Totals:** Inventory totals are intended on being a continuous running total of material usage. The security level for clearing the inventory totals is configurable in the security section of <Setup>, <Panel>, and <Security>. The default security level setting is (SETUP). When clearing the totals, a confirmation popup is presented which also shows the last 5 accumulated values before being reset. Pressing 'YES' to clear the totals will clear the totals for all components and the number of batches processed. The system total will be added to the list of previous totals, and the oldest item in the list will be removed. Pressing 'NO' will exit the popup without clearing the totals.

(Continued)

## Operating Screens (Continued)

- Shift Totals:** Shift totals are intended on being cleared by the user or automatically at the change of shift. The security level for clearing the shift totals is configurable in the security section of <Setup>, <Panel>, and <Security>. The default security setting is <Operator>. When clearing the totals, a popup is presented which shows the last 5 of cleared instances values. Pressing 'YES' to clear the totals will clear the accumulated shift totals for all components and the number of batches processed. The system total will be added to the list of previous totals, and the oldest item in the list will be removed. Pressing 'NO' will exit the popup without clearing the totals.
- Order Totals:** If Order Names is enabled, there is an additional set of totals available. This set of totals is intended to track material usage on a per order basis. This set of totals can be cleared at the beginning of an order, and again at the end. There is a separate report output just for order totals. A button is provided to clear the order totals, or the operator will be asked when changing the order name if the totals should be cleared when the 'Commit' key is pressed. The default security setting is <Operator>. A confirmation popup is provided to verify the operation.



**Clear:** There are separate 'Clear' buttons for Inventory, Shift, and Order totals. The 'Clear' buttons will each delete the material usage totals for the respective type requested.

Line 1: TrueWeigh		Totals			09:00:20	?
		Inventory	Shift	Order		
System	System	141.66 lb	141.66 lb	100.60 lb		
	Nip	2342.50 ft	2342.50 ft	459.08 ft		
Recipe	Extruder 1	55.68 lb	55.68 lb	34.89 lb		
	Extruder 2	42.39 lb	42.39 lb	32.36 lb		
	Extruder 3	43.59 lb	43.59 lb	33.36 lb		
Resin						
Sub-Layer						
		Clear	Clear	Clear		
Alarm	Extruder Automatic	Simulation	Private	Recipe 1		

### Recipe Totals

The TrueWeigh system maintains the total material processed by each loss-in-weight hopper. These totals are accumulated together to create a Recipe Total. The blending system maintains a (Recipe Book) of 1000 stored recipes. When running a recipe from the Recipe Book the material processed with the selected recipe will be accumulated as a Recipe Total.

The Recipe Totals screen shows the recipe totals for all recipes in the Recipe Book. The screen shows a table of 10 recipe totals. Each entry in the list consists of the recipe number, name, and accumulated total. The list can be navigated by using the scrollbar, the page up/down buttons, the selected item up/down buttons, or by directly entering the desired recipe number. The selected recipe is shown with a light blue background, and arrow icon pointing to the entry.

## Operating Screens (Continued)

The accumulated total for the selected recipe item can be cleared by pressing the [Clear] button, or all recipe totals can be cleared by pressing the [Clear All] button. In either case a confirmation popup is presented to verify the operation.

The security level to clear the recipe totals is the same as that to store a recipe in the Recipe Book. This is configurable in setup on the <Security> screen. The default setting requires a security level of (SETUP).

**Clear:** The 'Clear' button will delete the material usage total for the selected recipe. A confirmation popup will be presented before the totals are removed.

**Clear All:** The 'Clear All' button will delete the material usage total for all stored recipes. A confirmation popup will be presented before the totals are removed.

#	Name	Totals
1	Recipe 1	3908.17 lb
2	Recipe 2	0.00 lb
3	Recipe 3	0.00 lb
4	Recipe 4	0.00 lb
5	Recipe 5	0.00 lb
6	Recipe 6	0.00 lb
7	Recipe 7	0.00 lb
8	Recipe 8	0.00 lb
9	Recipe 9	0.00 lb
10	Recipe 10	0.00 lb

Clear

Clear All

Operation  
4

### Resin Totals

The TrueWeigh system maintains the total material processed by each loss-in-weight hopper. If Resin Names are enabled via setup, then a Resin can be assigned to each loss-in-weight hopper in the Recipe. For each of these resins, an accumulated material processed is maintained. A total of 255 resins are possible with the system.

The Resin Totals screen shows the resin totals for all resins. The screen shows a list of 10 resins totals. Each entry in the list consists of the resin number, name, and accumulated total. The list can be navigated by using the scrollbar, the page up/down buttons, the selected item up/down buttons, or by directly entering the desired resin number. The selected resin is shown with a light blue background, and arrow icon pointing to the entry.

The accumulated total for the selected resin item can be cleared by pressing the 'Clear' button, or all resin totals can be cleared by pressing the 'Clear All' button. In either case a confirmation popup is presented to verify the operation.

The security level to clear the resin totals is the same as that to store a recipe in the Recipe Book. This is configurable in setup on the <Security> screen. The default setting requires a security level of (SETUP).

(Continued)

## Operating Screens (Continued)

Clear

**Clear:** The 'Clear' button will delete the material usage total for the selected resin. A confirmation popup will be presented before the totals are removed.

Clear All

**Clear All:** The 'Clear All' button will delete the material usage total for all stored resins. A confirmation popup will be presented before the totals are removed.

Line 1: TrueWeigh		Totals		14:29:26	?
	#	Name	Totals		
System	1	Resin 1	0.00 lb	▲	Clear Clear All
Recipe	2	Resin 2	0.00 lb	▲	
Resin	3	Resin 3	0.00 lb	1	
Sub-Layer	4	Resin 4	0.00 lb	▼	
	5	Resin 5	0.00 lb	▼	
	6	Resin 6	0.00 lb		
	7	Resin 7	0.00 lb		
	8	Resin 8	0.00 lb		
	9	Resin 9	0.00 lb		
	10	Resin 10	0.00 lb		

### Sub-Layer Totals

The TrueWeigh system maintains the total material processed by additional material throughput devices located on each extruder. The material totals for the additive feeder and Scrap-Saver devices can be shown by pressing the 'Sub-Layer' button. If Sub-Layer devices are enabled via setup, then the Sub-Layer section of totals will become available.

The Sub-Layer screen shows the totals for each device located on the extruder. A pull-down selection box at the top of the screen allows the operator to select the extruder containing the sub-layer devices. The screen will then show the material usage totals for each attached device as well as the overall extruder total.

Line 1: TrueWeigh		Totals			09:07:17	?
		Extruder 1				
		Inventory	Shift	Order		
System	Extruder 1	82.05 lb	82.05 lb	61.25 lb		
Recipe	Main	74.33 lb	74.33 lb	54.69 lb		
Resin						
Sub-Layer	Scrap	7.72 lb	7.72 lb	6.56 lb		

# Operating Screens (Continued)

## Recipe Entry Screens

The recipe entry screen is provided to enter the target set values for the systems automatic operating state. These screens are highly dynamic and depend upon the configuration chosen in <Setup>. The recipe entered here is a temporary recipe called the ‘New Recipe’ or ‘Next Recipe’.

The ‘Recipe Book’ contains any stored recipes. In the ‘Recipe Book’, recipes can be edited or viewed without affecting the current running recipe. The proper security level must be met in order to store recipes/resins, or edit recipes/resins in the recipe book.

With the TrueWeigh there are separate recipe entry screens for the extrusion process and the blender process. This separation helps to distinguish the different control areas of the system (blending and extrusion). From the <Home> screen, when the ‘Recipe’ button is pressed, the extrusion recipe entry screen will be presented. Likewise from the main blender monitor screen, when the ‘Recipe’ button is pressed, the blender recipe entry screen will be presented. With a recipe screen presented, it is also possible to navigate between the extrusion and blending recipe screens.

### Extrusion

Navigate to the extrusion recipe entry screen by pressing the ‘Recipe’ button on the <Home> screen. Alternatively from the blender recipe entry screen press the ‘Extruder’ button. The recipe entry parameters for extrusion systems vary by application, control mode, and recipe entry mode and are configured in the <Setup> <System> sections.

### Recipe Name/Number

In the top center of the recipe entry screen is shown the next recipes name and number. This is by default named (Recipe 1) and (1) respectively. If a recipe has been selected from the recipe book, then the selected recipe’s name and number will be shown in these fields.

### Order Names

If (Order Names) have been enabled, then a data entry field to enter the next order name will be shown. If this field (max. 15 char) has been changed, then a popup will be presented asking the operator if the current (Order Totals) should be cleared. This is to assure the proper material usage for the new order (Order Totals) will be accurate. Selecting the ‘YES’ button will immediately clear the inventory totals. The current Order Name is visible in the status section at the bottom of each screen.

### Commit/Automatic/Stop

Once a recipe has been entered, the ‘Automatic’ button will become a ‘Commit’ button. This is done in order to reflect that the (Next Recipe) has changed and is not yet being processed by the blender. Pressing the ‘Commit’ button will validate the (Next Recipe) and if there are no errors, the (Next Recipe) will be copied to the (Set/Production Recipe) and the blender will begin processing the recipe. If an error is found, the ‘Recipe Error’ button will be shown. The recipe must not contain any errors in order for the system to operate.

## Operating Screens (Continued)



Automatic

**Automatic** - Places the Blender into automatic operation. This action requires a valid recipe be entered from the Recipe screen. The button will show a green indicator if in automatic. If the recipe has been changed, the button appearance will change to the 'Commit' button.



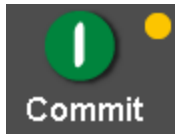
Manual

**Manual** - Places the extrusion system in manual operation. This will navigate to the <Manual> screen where the extruder and haul-off speeds can be manually set.



Stop

**Stop** - This button is used to put 'only' the blender into a stopped state. The button will show a red indicator if stopped.



Commit

**Commit** - The 'Automatic' button will change to a 'Commit' button whenever the recipe has been modified and is not yet the running recipe. Pressing the 'Commit' button will implement the changes to the recipe.



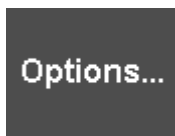
Book

**Recipe Book** - Navigate to the <Recipe Book> screen. This is where stored recipes can be edited and selected for use.



Material Calibration

**Material Calibration** - Launch the material calibration popup. This will provide a means to clear the feed rate tables for the selected component hoppers, the extruder, and the haul-off devices.



Options...

**Options** - If additional recipe entry options are available (Motor drive start speeds) this button will navigate to a new screen where this data can be entered.

Line 1: TrueWeigh		Recipe		21:02:42	?
New Recipe	1	Recipe 1			
	Extruder 1	Extruder 2	Extruder 3		
	Sub-Layer				
Actual	0.00	0.00	0.00		
Set	35.00	32.00	33.00		
Resin Name		Resin 2	Resin 3		
	Automatic	Manual	Stop		
	Enter layer values in:		Parts		
Alarm	Hand Control	Simulation	Service	----	
	Extruder Stopped				

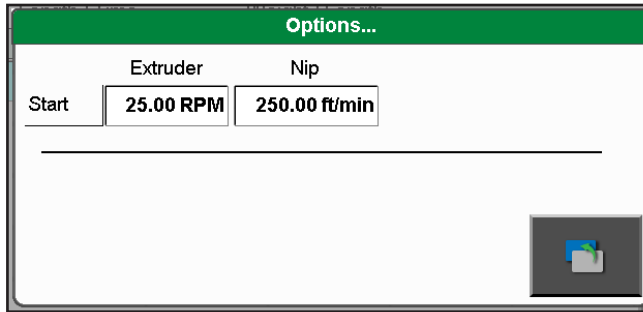
### Recipe Options

The <Options> screen is an additional recipe entry screen where less commonly entered data values can be entered. This screen provides data entry for material density, Resin Selection, Feed Order, and Dosing Rate (Volumetric Mode). A total of six component hoppers can be shown on a single screen.

(Continued)

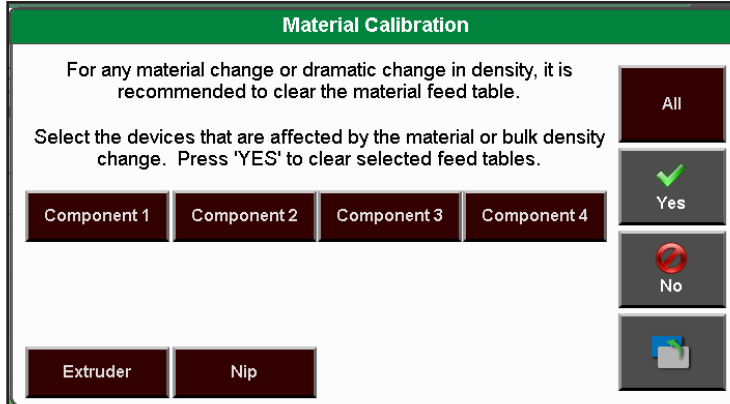
## Operating Screens (Continued)

- **Motor Start Speeds Density:** If (Motor Starts Speeds) is enabled, the start speed for the motor drive is automatically loaded into the 'Manual' drives speeds data entry boxes when the system enters 'Manual' mode from the stopped state. The start speeds are entered into the recipe from the options popup window.



### Material Calibrate

This button will present a popup which will allow the operator to clear component feed rate tables. The system must be stopped in order for the feed tables to be cleared. For each hopper, the system maintains a feed rate table. If new material is entered into a hopper, this feed table may not properly reflect the proper feed rate for the new material. On the popup press 'All' or select an individual component hopper. Press 'Yes' to clear the feed rate tables of the selected component hoppers. When the blender begins to process the next batch, it will enter the relearn mode where the feed table is re-populated.




# Setup and Configuration


Setup is used to configure the TrueWeigh systems operating parameters – the calibration, the number of extruders, haul-off, and other parameters. It also contains the configuration menus for remote communication protocols and all TrueWeigh Maintenance and Diagnostic functions. Each Setup parameter is configured and then stored in permanent memory.

To navigate to the <Setup> screen, first navigate to the <Home> page. At the <Home> screen press the ‘More...’ button. Press the button labeled ‘Setup’ and the screen will change to the main <Setup> screen.

The setup screens are organized to group the configuration parameters by the type of device (System, Panel, Extruder, Haul-off, Network, and Maintenance). The various device types are chosen by ‘Selection’ buttons shown across the TOP of the screen. For each device, relevant parameters are further grouped into sections. Each section is chosen using ‘Selection’ buttons along the Left side of the screen. With this method it is very easy to navigate through-out the setup system with a minimal amount of screen navigation and user interaction.

All setup parameters can be viewed by the user; however the current security level and operating state will dictate whether or not the parameters can be adjusted. If while in setup, a parameter needs to be changed, touch the desired input field. If the user does not have proper security a security popup screen will appear, where the user can input a new security passcode. If the system operating state does not allow a parameter field to be edited, a security popup screen will appear informing the user the system state must be changed before editing the selected field. If the user enters the correct passcode, the field will become editable. Locked parameters will have a darkened background.

 **NOTE:** After changing any setup parameter, DO NOT power down without first returning to the <HOME> screen and waiting for at least a minute. The system requires this time to store any parameter changes to the Compact Flash CF card installed in the touch screen.

 **NOTE:** If the system requires a reboot sequence, a ‘Reboot Requested’ popup will be displayed. After the configuration has been saved, the system will automatically perform a reboot sequence.

In case it is necessary to reset the system to a default state, there is a ‘Factory Default’ button provided which will erase all memory and reset the entire configuration back to an initial default state. This button can be found in the <Maintenance> section of setup.

## Setup Devices

System

**System:** This device contains setup parameters that define the physical configuration of the blender, the methods by which production recipes are entered, and the severity and processing of alarm states.

Panel

**Panel:** This device contains parameters which define the appearance of the touchscreen and the security requirements for user actions

Extruder

**Extruder:** This device represents the component material hoppers. All control parameters for the feed gates and alarm tolerances can be configured.

# Setup and Configuration (continued)

**Haul-Off:** This device represents the haul-off or take-away device. All control parameters for the take-away, drive interface, and alarm tolerances can be configured.

**Network:** This device provides for configuration and setup of remote communications and networking support.

**Maintenance:** This area provides various support functions for file IO, licensing, and Manual Control of the blender.

**More...:** Simple button to provide access to more devices and areas of setup.

**Diagnostics:** {Service} This button provides access into the blender diagnostics support sections. The user must have service level security in order to enter the system diagnostics.

## System Device

This group of screens is used to set system wide operational parameters. This includes sections for the parameters that define the physical configuration of the blender, the methods by which production recipes are entered, and the severity and processing of alarm states.

**Info:** Shows a screen displaying the systems software version and date information, the current time and date, and the licensing station identifier.

**Control:** This section contains parameters that define the physical configuration of the system, and how the overall system is being controlled.

**Recipe:** Setup parameters that select the method with which target throughput data is entered into the system by the user.

**Relays:** This section contains parameters that configure and define several programmable relay functions.

**Alarm:** This section contains parameters that configure the severity and action of all alarms in the system with respect to operating state (Stop, Manual, and Automatic).

### Info

This screen provides basic system information about the version of firmware and the touch-screen identification. It is the first screen presented when 'Setup' is pressed on the <Home> screen.

Mixer

Network

Maintenance

More...

Diagnostic

Info

Control

Recipe

Relays

Alarm

## Setup and Configuration (continued)

- **Date:** The current date and time reported by the system. This can be changed in the setup of the <Panel> <Time> screen.
- **Station Identifier:** The station identifier is a six digit number unique to each touch-screen system. It is used for obtaining license codes for system features that require an unlock code in order to enable. The <Maintenance> <License> screen lists the Station Identifier and the License Codes for all unlocked features.
- **Firmware Version:** The version of firmware currently installed.
- **Firmware Date:** The date the currently installed firmware was released.

Line 1: TrueWeigh		Setup					10:38:45	?
	System	Panel	Extruder	Nip	Network	Maintenance		
Info	Date	08-09-2016 10:38:45						
Control								
Recipe	Station Identifier	105	69	189	101	39	147	
	Firmware Version	V3.06.8						
Relays	Firmware Date	9/7/2016						
Alarm								
Alarm	Hand Control	Extruder Stopped		Simulation	Private	Diagnostic	Home	

### Control

This screen sets parameters that dictate what a system consists of and how the overall system is being controlled. Any changes on this screen will greatly change the operation and screen appearance of the system. Changes made on this screen will force a system restart when returning to the <Home> screen.

The basic control parameters are:

Parameter	Default	Range	Security	Description
Application	Blown Film	various	Service / Stopped	Menu of options for the type of end product being produced. This setting can affect the recipe entry.
Extruder Control Mode	Control	Unused / Monitor / Control	Service / Stopped	Menu of options for selecting the level of control for the extruder. This affects the recipe entry.
Haul-off Control Mode	Unused	Unused / Monitor / Control	Service / Stopped	Menu of options for selecting the level of control for the haul-off. This affects the recipe entry.
Use regrind / scrap in extruder	No	Yes / No	Service / Stopped	Select yes if the extruder has a scrap reclaim system. This affects the recipe entry.
Thickness Control Mode	Unused	Unused / Monitor / Control	Service / Stopped	Menu of options for selecting the level of control for the thickness gauge interface.
Number of Extruders	1	[1 : 12]	Service / Stopped	Number of extruders in the system.
Number of Additives	0	[0 : 5]	Service / Stopped	The number of additive devices that are controlled by the system. This affects the recipe entry.

(Continued)

# Setup and Configuration (continued)

## Recipe

The Recipe setup parameters select the method by which target throughput values are entered into the system.

The basic recipe parameters are:

Parameter	Default	Range	Security	Description
Recipe Entry Options		various	Service / Stopped	The target values used to control the extruder and haul-off can be selected. The application and control mode settings will affect the available target values.
Layer Entry Options	Parts	Parts / Layer % / WPL	Service / Stopped	The correlation of extruder entry values and whether the ratio must add to 100%.
Stretch Factor in recipe	No	Yes / No	Service / Stopped	Include in the recipe a factor which indicates the amount of shrinkage or expansion of the material after it leaves the primary haul-off device.
Manual Start speeds part of Recipe	No	Yes / No	Service / Stopped	Should the 'Manual' mode start speeds be included in the recipe.
Enable Automatic Start	No	Yes / No	Service / Stopped	Once all devices have a learned rate while in manual, switch to automatic mode.

(Continued)

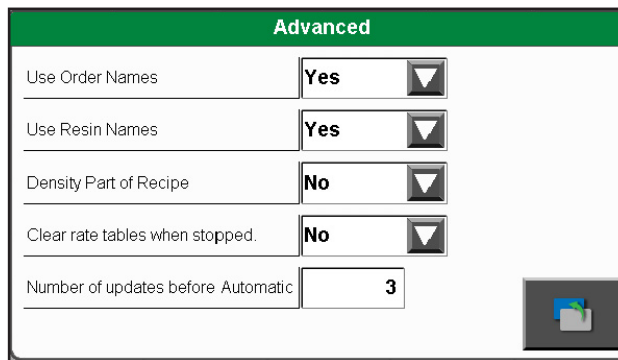
## Setup and Configuration (continued)



The 'Advanced' button shown on this page is to launch a popup window for configuration of the additional extrusion recipe entry features.

The extruder recipe parameters are:

Parameter	Default	Range	Security	Description
Use Order Names	No	Yes / No	Service / Stopped	The system can show an order name on the monitor screens or for reporting purposes.
Use Resin Names	No	Yes / No	Service / Stopped	The system can keep track of overall resin usage for each resin. This will require recipe entry to include a resin selection for each component.
Density Part of Recipe	No	Yes / No	Service / Stopped	Select if the material density for each component be included in the recipe.
Clear rate tables when extrusion stopped	No	Yes / No	Service / Stopped	When the extrusion process is stopped, the extruder rate table can be cleared automatically.
Number of updates before automatic	3	[1 : 10]	Service / Stopped	When the extrusion process is in manual, how many rate updates are performed before the system enters automatic operation.



### Relays

This page is used to set up the system configurable relays. Not all relays are user configurable.

Procedure to configure a relay:

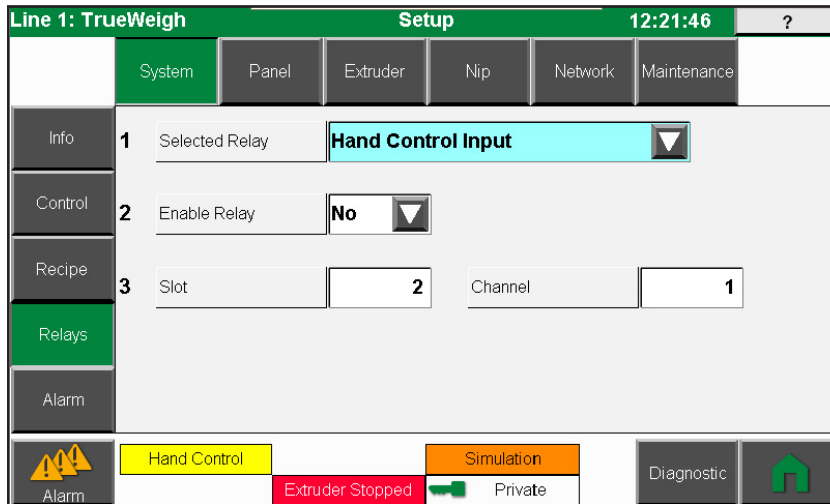
- 1** Select a relay type to configure 'Selected Relay'.
- 2** Enable / Disable the selected relay.
- 3** Select the IO Slot and Channel where the relay and the IO point reside.

The basic relay parameters are:

Parameter	Default	Range	Security	Description
Selected Relay		None / Hand Control Input / System Running Output / Job Start Input		Select a relay to configure.
Enable Relay	-- / No / Yes / No	Yes / No	Service / Stopped	Hand Control Input, Manual relay in control System Running Output Relay, on when running Job Start Input, Automatic Job restart not enabled
Slot		[1 : 15]	Service / Stopped	The PLC slot address for the X20 slice where the relay function is connected.
Channel		[1 : 12]	Service / Stopped	The IO or channel number for where the relay resides on the slice.

(Continued)

# Setup and Configuration (continued)



## Alarm

This page of the setup is concerned with setup and configuration of the alarm system. Each device in the system has the capability of generating a number of alarms. The alarm can represent three different levels of severity based on the operating state of the system. The default alarm database configures each alarms severity with corresponding operating state. Changes to the default alarm definitions are fully user programmable. This page will facilitate the modifications to the alarm database.

The severity levels are:

- Information – <Green> Lowest severity level, an alarm has occurred and the operators must be informed.
- General – <Yellow> An alarm has occurred that needs immediate attention, before it elevates to a shutdown alarm.
- Shutdown – <Red> A severe alarm that requires the system be stopped.


The basic alarm parameters are:

Parameter	Default	Range	Security	Description
Level to Trigger Output	Shutdown	Info / General / Shutdown	Service	The external alarm claxon and light indicator will turn on should any alarm of the indicated severity occur or more sever occur. (For example: A value of General means the claxon will sound for all General and Shutdown alarms.

**Defaults:** This button provides a means by which the entire alarm database can be reset back to factory defaults. A verification popup will be presented before the actual reset takes place. Pressing ‘Yes’ on the popup will reset the alarm database. Pressing ‘No’ will exit the popup and NOT clear the alarm database. This action requires a security mode of {Service / Stopped}.



## Alarm Database Configuration

 **NOTE:** Changes to the alarm database should only be handled by a trained technician. Improper alarm configuration could result in poor system performance, or improper system operation.

Each alarm in the system is assigned to a specific device (components, mixer, batch weight hopper...). Each alarm can be assigned an alarm severity for each operating state of the blender. In order to modify the settings for an alarm, the service personnel must follow the proper procedure in sequence: (Continued)

## Setup and Configuration (continued)

- 1 Device: {Operator}** Select a device. Alarms are assigned to the devices present in the system. A pull-down menu is provided with a list of devices available in the system. For the alarm that needs to be assigned or viewed, select the device where the alarm is assigned.
- 2 Alarm: {Operator}** Select the alarm that needs to be changed or viewed. A pull-down menu is provided that lists all of the alarms that are assigned to the selected device.
- 3 Stop / Manual / Automatic <various> [Info / General / Shutdown] {Service}** For each operating state of the system, the severity of the selected device and alarm combination is shown with a pull-down menu. Using the pull-down menu it is possible to change the severity action for a given operating state.

 **NOTE:** Changes in alarm severity only apply to the selected device and alarm. A similar alarm assigned to a different device will not be affected.

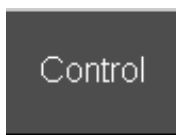
### Extruder Setup

The Extruder setup screens are used to set parameters that are relevant to an individual extruder. Settings are further grouped into categories: Drive Interface, Control Parameters, Loading, Alarms, and Calibration.

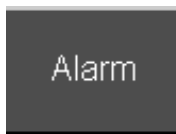


Extruder Device Sections

**Drive:** This screen is used to set the device interface type and where on the X20 PLC rack the interface is located.



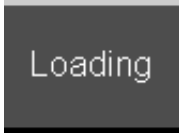
**Control:** This page is for setting up control settings for the extruder.



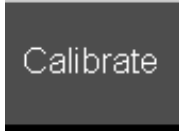
**Alarm:** This screen sets parameters which control when an extruder alarm might occur.

# Setup and Configuration (continued)

**Loading:** This screen sets the loading parameters for the TrueWeigh hopper.



**Calibrate:** This screen will allow the weight calibration settings to be edited; or the weight calibration procedure can be followed to determine the appropriate settings.

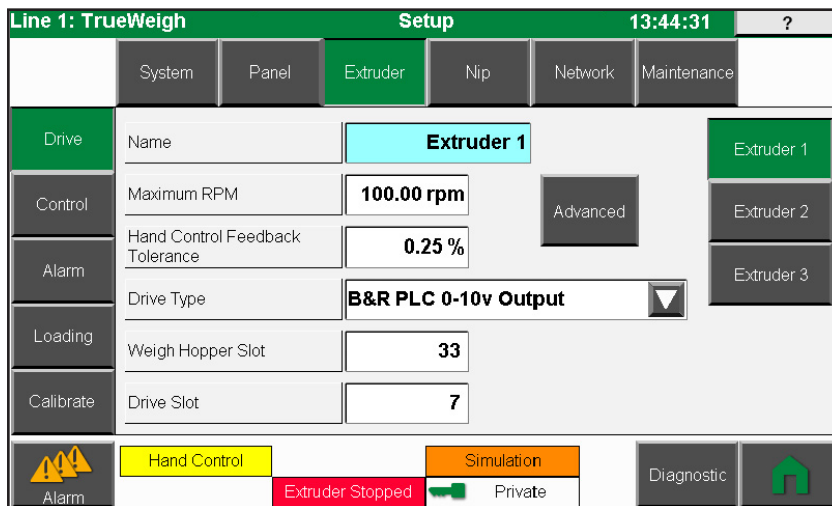


## Drive

This page is for setting up the physical configuration of each extruder drive and the weigh hopper interface. A system may have multiple extruders and each extruder will have its own parameters. When first entering the extruder setup screens the extruder 1 is always presented first. Along the right side of the screen are (4) 'Selection' buttons with the extruder names. The selected extruder is represented as the depressed button. If there are additional extruders there are additional previous and next buttons to navigate through all extruders. Some of the settings will require a system reboot after making changes. Some settings cannot be changed unless the system is stopped.

The basic extruder drive settings are:

Parameter	Default	Range	Security	Description
Name	Extruder	15 char string	Service / Stopped	Name of the extruder device, used by the system to refer to the extruder.
Maximum RPM	100	[0 : 9999]	Service / Stopped	The maximum RPM of the extruder auger/screw.
Hand Control Feedback Tolerance (%)	0.05	[0 : 100]	Service	When in 'Hand Control' mode, should the feedback speed differ from the set speed by this tolerance, the set speed will be updated.
Drive Feedback	None	None, Tach, Analog	Service / Stopped	Select the type of feedback available for the drive interface.
Drive Type	B&R PLC 0-10v	B&R PLC 0-10v	Service / Stopped	The type of interface the system has with the motor drive controlling the take-away device.
Weigh Hopper Slot	Various	32 / 131	Service / Stopped	The slot in the plc rack where the loss-in-weight hopper load cell is connected.
Drive Slot	Various	7 / 31	Service / Stopped	The slot in the plc rack where the extruder drives reference is connected.



**Advanced:** This button will present a popup window where additional less frequently used parameters can be set.




(Continued)

## Setup and Configuration (continued)

The advanced extruder control settings are:

Parameter	Default	Range	Security	Description
Pulses / Wheel Rotation	2	[0 : 2000]	Service / Stopped	Optional settings if drive feedback is present, what is the pulse resolution of the tachometer.
Tachometer Zero Speed Offset	0	[0 : 100]	Service / Stopped	The percent of full scale voltage offset before the motor begins to turn.
Gearbox Ratio	1.0	[0 : 100]	Service / Stopped	If the tachometer is attached to the motor shaft, and there is a gearbox between the motor and extruder, this gearbox ratio must be set.
Screw Synchronization	No	Yes / No	Service / Stopped	Screw synchronization enables consistent weight readings with the rotation of the screw. Each weight reading occurs at the same point of screw rotation.
Maximum Voltage (v)	10	[0 : 10]	Service / Stopped	The maximum voltage used by the extruder devices motor drive..
Drive Feedback	None	None / Tach. / Analog	Service / Stopped	The type of feedback signal used for determination of extruder speed for bumpless transfer.
Hopper Type	Standard	Standard / TBE / TBRremote/ TWB	Service / Stopped	The type of physical device used to represent the loss-in-weight hopper for the extruder.
Remote Blender ID	1	1 / 15	Service / Stopped	If implementing a blender for the hopper type, this value is the NodeID
TWLink Network Timeout (msec)	10	1 / 10	Service	If the loss-in-weight hopper is a blender, this value represents the network timeout where a lack of data response will trigger an alarm.

**Advanced**

Maximum Voltage	<input type="text" value="10"/>	
Drive Feedback	<input type="text" value="None"/>	▼
Screw Synchronization	<input type="text" value="No"/>	▼
Gearbox Ratio	<input type="text" value="1"/>	
Pulses/Wheel Rotation	<input type="text" value="20"/>	
Tachometer zero speed offset	<input type="text" value="0.00 %"/>	
Hopper Type	<input type="text" value="Standard"/>	▼
Remote Blender ID	<input type="text" value="1"/>	
TWLink Network Timeout	<input type="text" value="10000 sec"/>	

### Control

Control parameters that are used to control the algorithm for monitoring the weight in the extruder loss-in-weight hoppers and setting the extruder speed.

The basic extruder control settings are:

Parameter	Default	Range	Security	Description
Acceleration Rate (%)	5	[0 : 100]	Setup	The extruder will ramp/speed up at this percentage rate per second.
Deceleration Rate (%)	5	[0 : 100]	Setup	The extruder will ramp/slow down at this percentage rate per second.
Rate Calculation Time (sec)	10	[0 : 999]	Setup	Extruder speed is calculated at this interval in seconds.
Maximum Speed Change (%)	2	[0 : 99]	Setup	The maximum allowed percentage speed change allowed per the set Rate Calculation Time.
Non-Gravimetric Error (%)	2	[0 : 500]	Service	The weight throughput variation between the actual and expected cannot exceed this percentage, otherwise an unstable state occurs.
Non-Gravimetric Tolerance	300	[0 : 10000]	Service	The variation of the raw weights A/D value cannot exceed this value otherwise unstable state occurs.

# Setup and Configuration (continued)

**Advanced:** This button will present a popup window where additional less frequently used parameters can be set.



The advanced extruder control settings are:

Parameter	Default	Range	Security	Description
No Weight Loss Tolerance (lb)	0.1	[0 : 99]	Service	The change in weight between updates must exceed this value otherwise after the Weight Loss Error count is exceeded, an alarm will occur.
Maximum No Weight Loss Errors	50	[0 : 255]	Service	The number of no weight loss errors before an alarm occurs.
Minimum Rate (lbs/hr)	0.5	[0 : -]	Service	In Monitor Mode only, this is the minimum rate required before the system starts processing the material loss calculations.
Rate Deviation Allowed (%)	15	[0 : 100]	Service	Rate deviation percentage allowed where no auto speed changes occur
Max Rate Error (%)	25	[0 : 100]	Service	Exceeding this error percentage causes the extruders speed average to be reset.
Motorized Pot Tolerance	30	[0 : 255]	Service	The bit deadband around which the motorized pot is controlled.
Maximum Non-Gravimetric Time	30	[0 : 10000]		In Automatic, an alarm occurs if the weigh system is unstable for this amount of time in seconds.
Initial Non-Gravimetric Count	5	[0 : 100]	Service	A counter that decrements when the weigh system is unstable. If it should it reach a value of 0, an update error will occur.
Max Non-Gravimetric Count	10	[0 : 100]	Service	Maximum value of coast counter.
Max Error Count Before Reset	3	[0 : 100]	Service	In Automatic, the number of update errors before the rate speed table is reset.

(Continued)

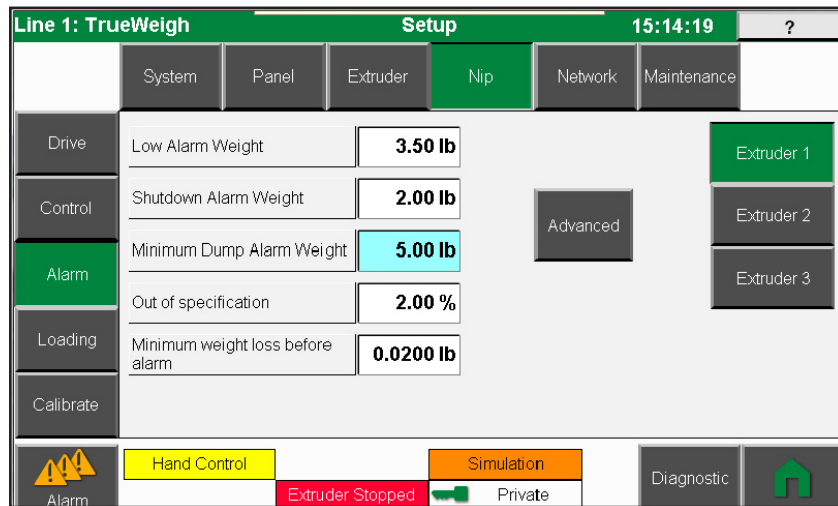
# Setup and Configuration (continued)

## Alarm

Extruder devices have several alarms that have a programmable trigger. The settings on this page allow for changing the default trigger points.

The basic extruder alarm settings are:

Parameter	Default	Range	Security	Description
Low Alarm Weight (lb)	3.5 / 21 / 35	[0 : 200]	Operator	Alarm if weight falls below this value.
Shutdown Alarm Weight (lb)	2 / 21 / 35	[0 : 200]	Operator	Shuts down the line if weight falls below this value.
Minimum Dump Alarm Weight (lb)	5	[0 : 200]	Operator	Alarm if weight refills less than this value.
Out of Specification (%)	2	[0 : 100]	Operator	Alarm if rate deviates more than this percentage value
Minimum Weight Loss Before Alarm (lb)	2	[0 : 10]	Service	The minimum weight loss over 10 second period before alarm occurs.
Drive Low Speed Alarm (%)	5	[0 : 100]	Setup	Minimum speed setting for proper control.
Drive Low Speed Warning (%)	10	[0 : 100]	Setup	Minimum speed setting before a warning alarm is presented.
Drive High Speed Alarm (%)	99	[0 : 100]	Setup	A counter that decrements when the weigh system is unstable. If it should it reach a value of 0, an update error will occur.
Drive High Speed Warning (%)	99	[0 : 100]	Setup	Maximum speed setting for proper control.
Motor Speed Out of Specification	20	[0 : 500]	Setup	The tolerance of the motor feedback in RPM before an alarm is triggered. After 10 consecutive tolerance violations the alarm is triggered.



The advanced extruder alarm settings are:

Parameter	Default	Range	Security	Description
Drive Low Speed Alarm (%)	5	[0 : 100]	Setup	Minimum speed setting for proper control.
Drive Low Speed Warning (%)	10	[0 : 100]	Setup	Minimum speed setting before a warning alarm is presented.
Drive High Speed Alarm (%)	99	[0 : 100]	Setup	A counter that decrements when the weigh system is unstable. If it should it reach a value of 0, an update error will occur.
Drive High Speed Warning (%)	99	[0 : 100]	Setup	Maximum speed setting for proper control.
Motor Speed Out of Specification	20	[0 : 500]	Setup	The tolerance of the motor feedback in RPM before an alarm is triggered. After 10 consecutive tolerance violations the alarm is triggered.

(Continued)

# Setup and Configuration (continued)

Advanced	
Drive Low Speed Alarm	5.00 %
Drive Low Speed Warning	10.00 %
Drive High Speed Alarm	98.00 %
Drive High Speed Warning	95.00 %
Motor speed out of specification (RPM)	20.00 rpm

## Loading

Loading parameters are used to control the loading of the weigh hopper.

The basic extruder loading settings are:


Parameter	Default	Range	Security	Description
Loading On Weight (lb)	5 / 30 / 50	[0 : 180]	Operator	Weight to begin filling the hopper.
Loading Off Weight (lb)	5	[0 : 100]	Operator	Weight to end refill of the hopper.
Loading Time (sec)	10	[0 : 999]	Operator	Time to refill hopper: will override loading off weight.
Loading Enabled	Yes	Yes / No	Operator	Enable or disable the loading feature for this hopper.
Load by Time	No	Yes / No	Service	Enable or disable the loading cycle to be controlled by time.

Line 1: TrueWeigh		Setup				15:19:17	?
	System	Panel	Extruder	Nip	Network	Maintenance	
Drive	Loading On Weight		5.00 lb				Extruder 1
Control	Loading Off Weight		10.00 lb				Extruder 2
Alarm	Loading Time		10 sec				Extruder 3
Loading	Loading Enabled		Yes				
Calibrate	Load by Time		No				

Alarm
Hand Control
Extruder Stopped
Simulation
Private
Diagnostic

## Calibration

This page is for calibration of the extruder weigh hopper mounted above the extruder throat. Calibration is the process by which the tare weight of the hopper is determined. In order to determine the weight of material in the hopper, two weight readings are required, an empty hopper weight, and a hopper weight with some known weight present. This linear relationship can now be used to calculate the amount of material present in the hopper.

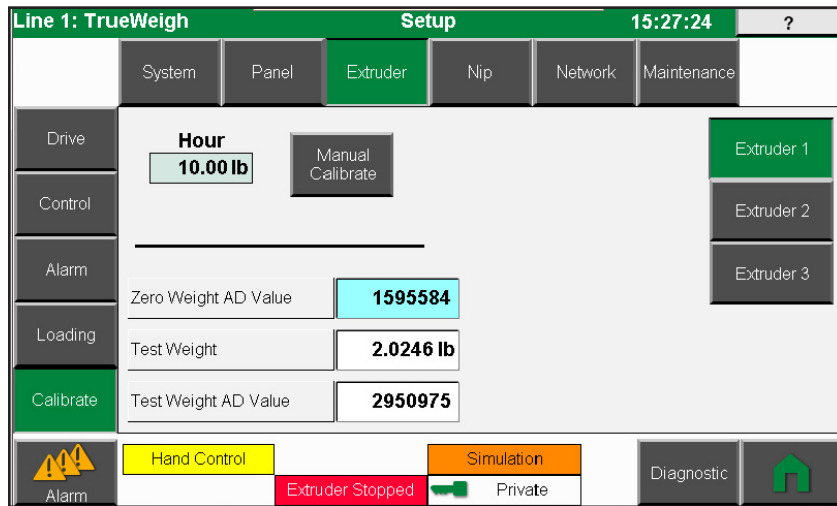
 **NOTE:** The system must be stopped before the calibration process can begin. The level of security required for calibration is configurable on the <Security> screen.

# Setup and Configuration (continued)

First the tare weight of the empty hopper is determined. Then the exact value of a test weight is entered into the system. Place the known test weight inside/on the hopper. Now allow the system to get a reference of a known weight. Remove the test weight. From these reference points it is now possible to accurately determine the weight of material in the hopper.

The basic extruder calibration settings are:

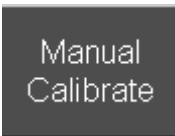
Parameter	Default	Range	Security	Description
Zero Weight AD Value	0	[0 : -]	Operator / Stop	The calibration factor for an empty weigh extruder hopper bin.
Test Weight (lb)	5	[0 : 100]	Operator / Stop	The value of the precision test weight used to determine the second calibration factor (Test Weight AD Value).
Test Weight AD Value	1	[0 : -]	Operator / Stop	The calibration factor for an extruder hopper bin containing a known weight.



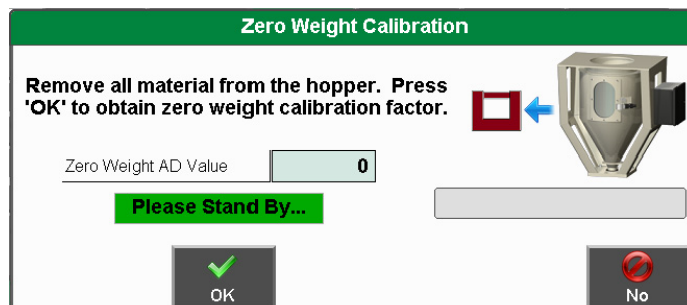
### Calibration Procedure {Operator / Stop}

- 1 Press the 'Manual Calibrate' button. It is a good idea to re-calibrate the unit after it has been transported and mounted. Re-calibrating the unit assures that the start weight on the scale inside the blender is zero.

**NOTE:** The weigh bin must be in place, and empty, when you perform this task. If the bin is not in place, the calibration will be inaccurate and will need to be redone. Once the (Zero Weight Calibration) process has started, the procedure must be completed.

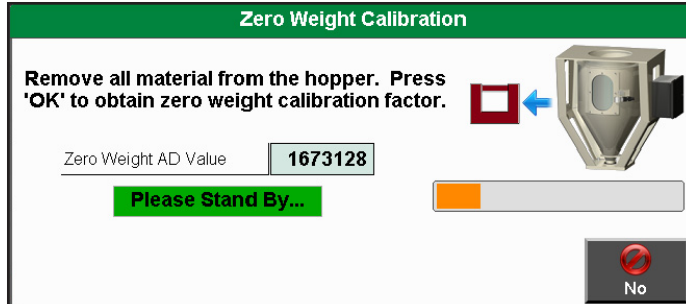


**Manual Calibrate:** This button will start the procedure to manually calibrate the calibration factors for the extruder hopper weigh scale.

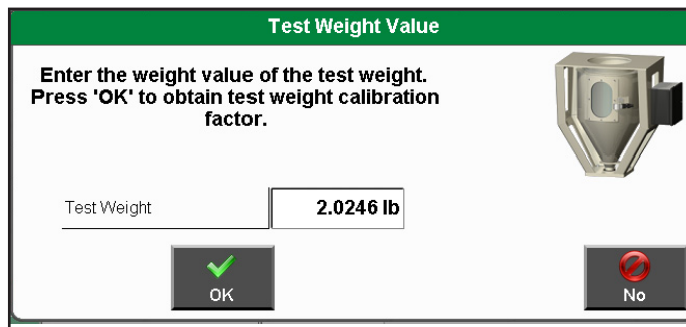


# Setup and Configuration (continued)

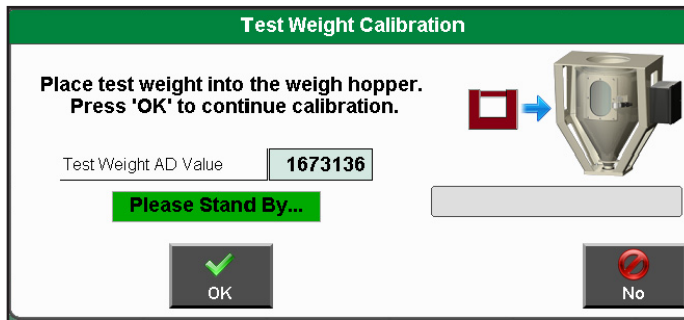
- 2 Press the 'OK' button to obtain the Zero Weight Calibration Factor. Please stand by, while the system obtains the Zero Weight Calibration Factor.



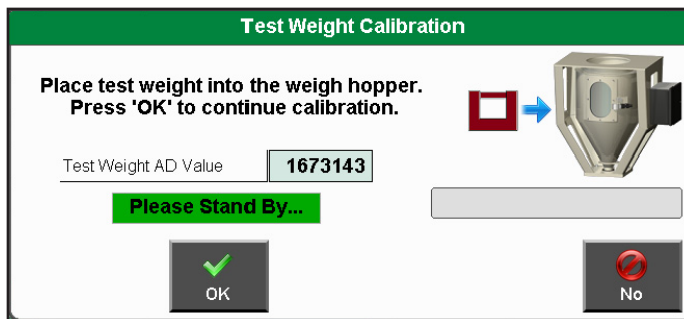
- 3 Enter the Test Weight Value, and then press 'OK'. The test weight should not exceed the capacity of the hopper else damage could result to the weighing system.



- 4 Place the test weight into the hopper and press 'OK' to continue with the calibration.



- 5 Stand by while the system obtains the Test Weight AD Value. Remove the test weight from the hopper. The displayed hopper weight should return to 0.



# Setup and Configuration (continued)

## Haul-off Setup

This section of the setup is concerned with the configuration and setup of the material haul-off or material take-away device. This device has many names based on the production line application. Throughout this guide the term haul-off will be used. In conformance to the application, the system will automatically change the name of this device to match the application. The name of the device is also configurable if the default values are not acceptable. Settings are further grouped into categories: Drive, Control, Alarms, and Calibration.

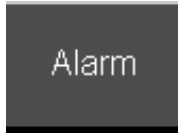


### Haul-off Device Sections

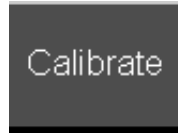
**Drive:** This screen is used to set the device interface type and where on the X20 PLC rack the interface is located.



**Control:** This page is for setting up control settings for the haul-off.



**Alarm:** This screen sets parameters which control when an haul-off alarm might occur.



**Calibrate:** This screen will allow the length throughput calibration settings to be edited.

### Drive

This page is for setting up the physical configuration of the haul-off drive. Some of the settings will require a system reboot after making changes. Some settings cannot be changed unless the system is stopped.

The basic haul-off drive settings are:

Parameter	Default	Range	Security	Description
Name	<various>	15 char string	Service / Stopped	Name of the device, used by the system to refer to the take-away device. The system setting for 'Application' will change the default value of this setting
Hand Control Feedback Tolerance (%)	0.05	[0 : 100]	Service / Stopped	When in hand control mode, the system will not adjust the manual speed unless the feedback value changes by more than the feedback tolerance.
Drive Type	B&R PLC 0-10v		Service	The type of interface the system has with the motor drive controlling the take-away device.
Maximum Voltage	10	[0 : 10]	Service / Stopped	The maximum voltage used by the take-away devices motor drive.
Number of Gears	1	[0 : 16]	Service / Stopped	The number of physical gears connected to the take-away device providing different maximum RPM's.
Select Gear	1	[0 : 100]	Service / Stopped	Select a gear so that the maximum RPM for that gear can be input. If the take-away device does not have separate gears, enter 1.
Maximum Rate (ft/min)	100	[0 : 9999]	Service / Stopped	The maximum RPM of the take-away device with the selected gear setting.

(Continued)

# Setup and Configuration (continued)

## Gear ... Rate setting:

If the haul-off device can be controlled using multiple gearings, the maximum rate for each gear settings must be configured. The TrueWeigh system supports a maximum of 16 gears. Select a gear and enter the corresponding maximum rate for the gear.

## Control

Haul-off devices have several parameters that adjust the algorithm that is used to control and monitor the device. This page is for setting up the control settings for the haul-off.

The basic haul-off control settings are:

Parameter	Default	Range	Security	Description
Acceleration Rate (%)	5	[0 : 100]	Setup	The haul-off will ramp/speed up at this percentage rate per second.
Deceleration Rate (%)	5	[0 : 100]	Setup	The haul-off will ramp/slow down at this percentage rate per second.
Rate Calculation Time (sec)	10	[0 : 999]	Setup	Take-away speed calculated at this interval in seconds.
Maximum Speed Change (%)	2	[0 : 99]	Setup	The maximum allowed percentage speed change allowed per the set Rate Calculation Time.
Max Rate Error (%)	25	[0 : 100]	Setup	Exceeding this error percentage causes the take-away devices speed average to be reset.
Rate Deviation Allowed (%)	15	[0 : 100]	Service	Rate deviation percentage allowed where no auto speed changes occur
Minimum Rate:	0.5	[0 : 99]		In Automatic, an alarm occurs if the weigh system is unstable for this amount of time in seconds.
Unstable Pulse Err	2	[0 : 500]	Service	The pulse variation between the actual and expected cannot exceed this percentage, otherwise an unstable state occurs.
Max Error Count Before Reset	3	[0 : 100]	Service	In Automatic, the number of update errors before the rate speed table is reset.

(Continued)

# Setup and Configuration (continued)

Advanced

**Advanced:** This button will present a popup window where additional less frequently used parameters can be set.

The advanced haul-off control settings are:

Parameter	Default	Range	Security	Description
Maximum Unstable Pulse Time (sec)	30	[0 : 10000]	Setup	In Automatic, an alarm occurs if the unstable state occurs for this amount of time in seconds.
Initial Unstable Pulse Count	5	[0 : 100]	Setup	A counter that should it reach a value of 0, an update error will occur.
Maximum No Pulse Errors	5	[0 : 255]	Setup	Number of scans of no pulses before an alarm occurs.
Motorized Pot Tolerance	30	[0 : 255]	Setup	The bit dead-band around which the motorized pot is controlled.

## Alarm

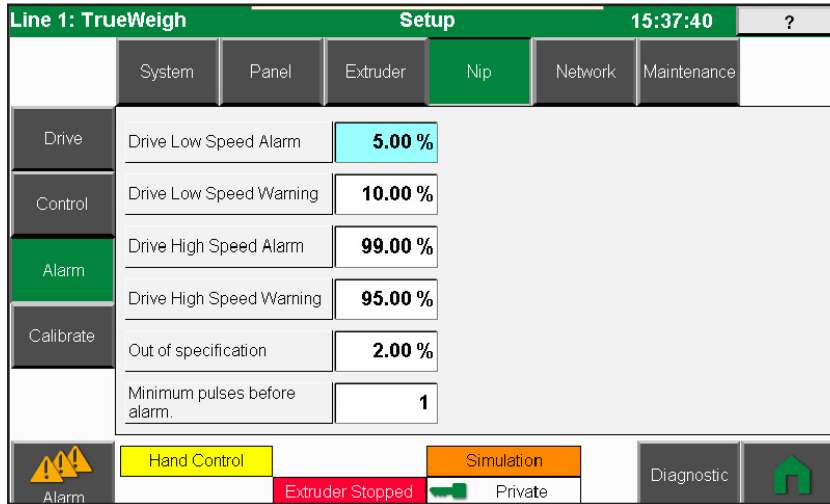
Haul-off devices have several alarms that have a programmable trigger. The settings on this page allow for changing the default trigger points.

The basic haul-off alarm settings are:

(Continued)


# Setup and Configuration (continued)

Parameter	Default	Range	Security	Description
Drive Low Speed Alarm (%)	5	[0 : 100]	Setup	Minimum speed setting for proper control.
Drive Low Speed Warning (%)	10	[0 : 100]	Setup	Minimum speed setting before a warning alarm is presented.
Drive High Speed Alarm (%)	99	[0 : 100]	Setup	Maximum speed setting for proper control.
Drive High Speed Warning (%)	95	[0 : 100]	Setup	Maximum speed setting before a warning alarm is presented.
Out of Specification (%)	2	[0 : 100]	Service	Alarm if the actual length throughput varies from the set value by more than this percentage.
Minimum Pulses Before Alarm	1	[0 : 50]	Service	Alarm if the pulse change per scan is less than this value.



## Calibration

This page is for the calibration of the haul-off device. The haul-off has an attached tachometer which is used to accurately determine its speed. The system determines the length per time the material is being processed by counting the pulses from the encoder and knowing the diameter of the haul-off wheel. In order to perform this calculation the circumference of the encoder wheel and the number of pulse per revolution of the tachometer are needed. This page is provided to enter these values.

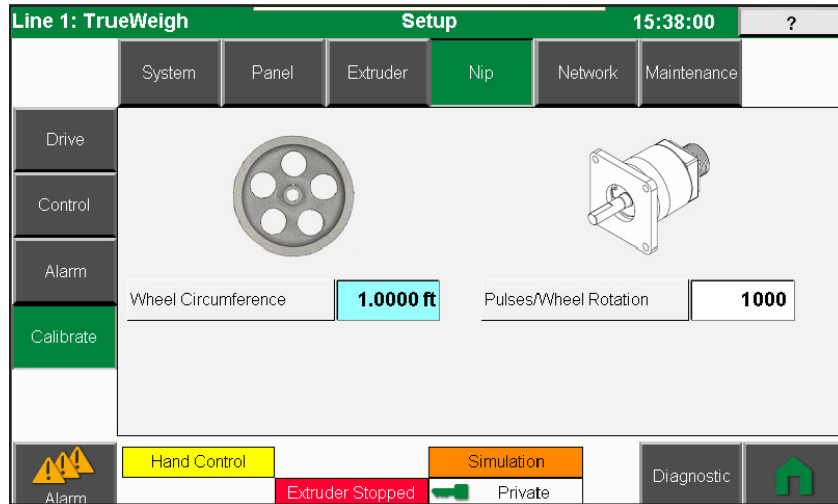
 **NOTE:** The system must be stopped before the calibration process can begin. The level of security required for calibration is configurable on the <Security> screen.

The basic haul-off calibration settings are:

Parameter	Default	Range	Security	Description
Wheel Circumference (ft)	1	[0 : 100]	Service / Stop	Enter the circumference of the pulse encoder wheel.
Pulses/Wheel Rotation	1000	[0 : 5000]	Service / Stop	Enter the number of pulses per revolution of the encoder wheel.

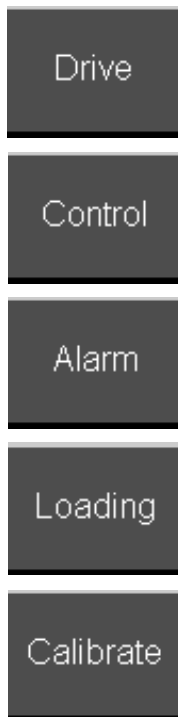
(Continued)

## Setup and Configuration (continued)



### Additive Setup

The Additive setup screens are used to set parameters that are relevant to an individual additive. The additive feeder is part of the extrusion process and is mounted below the extruder hopper. A maximum of 5 additive devices are possible with 2 additives per extruder in this configuration. Selection toggle buttons along the right side of the setup screens provide the settings for the each possible additive. Settings are further grouped into categories: Drive Interface, Control Parameters, Loading, Alarms, and Calibration.



#### Additive Device Sections

**Drive:** This screen is used to set the device interface type and where on the X20 PLC rack the interface is located.

**Control:** This page is for setting up control settings for the additive.

**Alarm:** This screen sets parameters which control when an additive alarm might occur.

**Loading:** This screen sets the loading parameters for the additive hopper.

**Calibrate:** This screen will allow the weight calibration settings to be edited; or the weight calibration procedure can be followed to determine the appropriate settings.

#### Drive

This page is for setting up the physical configuration of each additive device. Some of the settings will require a system reboot after making changes. Some settings cannot be changed unless the system is stopped.

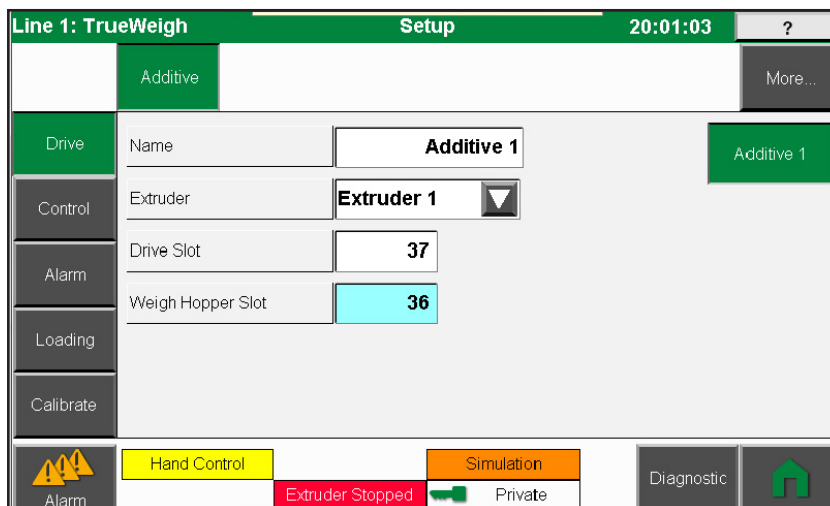
(Continued)

# Setup and Configuration (continued)

Select the additive by name using the selection buttons along the right side of the screen. The setup parameters for the newly selected additive will immediately appear. Any previous changes will be saved with the associated additive.

The basic additive drive settings are:

Parameter	Default	Range	Security	Description
Name	Additive x	15 char string	Service / Stopped	Name of the additive device, used by the system to refer to the additive.
Extruder	Various	Extruder 1..12	Service/Stopped	Each extruder can have 2 additives. This field will present a pull-down menu with extruders that are available for an additive.
Drive Slot	3 / 5	[1 : 10]	Service / Stopped	The location of the stepper drive control slice in the additive PLC Panel.
Weigh Hopper Slot	2 / 4	[1 : 10]	Service / Stopped	The location of the stepper drive control slice in the additive PLC Panel.



## Control

Control parameters that are used to control the algorithm for monitoring the weight in the additive loss in weight hoppers.

The basic additive control settings are:

Parameter	Default	Range	Security	Description
Acceleration Rate (%)	5	[0 : 100]	Setup	The additive will ramp/speed up at this percentage rate per second.
Deceleration Rate (%)	5	[0 : 100]	Setup	The additive will ramp/slow down at this percentage rate per second.
Rate Calculation Time (sec)	10	[0 : 999]	Setup	Additive speed is calculated at this interval in seconds.
Maximum Speed Change (%)	2	[0 : 99]	Setup	The maximum allowed percentage speed change allowed per the set Rate Calculation Time.
Non-Gravimetric Error (%)	2	[0 : 500]	Service	The weight throughput variation between the actual and expected cannot exceed this percentage, otherwise an unstable state occurs.
Non-Gravimetric Tolerance	300	[0 : 10000]	Service	The variation of the raw weights A/D value cannot exceed this value otherwise unstable state occurs.

(Continued)

## Setup and Configuration (continued)

Advanced

**Advanced:** This button will present a popup window where additional less frequently used parameters can be set.

The advanced additive control settings are:

Parameter	Default	Range	Security	Description
No Weight Loss Tolerance (lb)	0.1	[0 : 99]	Service	The change in weight between updates must exceed this value otherwise after the Weight Loss Error count is exceeded, an alarm will occur.
Maximum No Weight Loss Errors	50	[0 : 255]	Service	The number of no weight loss errors before an alarm occurs.
Minimum Rate (lbs/hr)	0.5	[0 : -]	Service	In Monitor Mode only, this is the minimum rate required before the system starts processing the material loss calculations.
Rate Deviation Allowed (%)	15	[0 : 100]	Service	Rate deviation percentage allowed where no auto speed changes occur
Max Rate Error (%)	25	[0 : 100]	Service	Exceeding this error percentage causes the extruders speed average to be reset.
Rate Calculation Factor	10	[0 : 300]	Service	How many times the additive task is processed before the weight reading is sampled.
Maximum Non-Gravimetric Time	30	[0 : 10000]	Service	In Automatic, an alarm occurs if the weigh system is unstable for this amount of time in seconds.
Initial Non-Gravimetric Count	5	[0 : 100]	Service	A counter that decrements when the weigh system is unstable. If it should it reach a value of 0, an update error will occur.
Max Non-Gravimetric Count	10	[0 : 100]	Service	Maximum value of coast counter.
Max Error Count Before Reset	3	[0 : 100]	Service	In Automatic, the number of update errors before the rate speed table is reset.

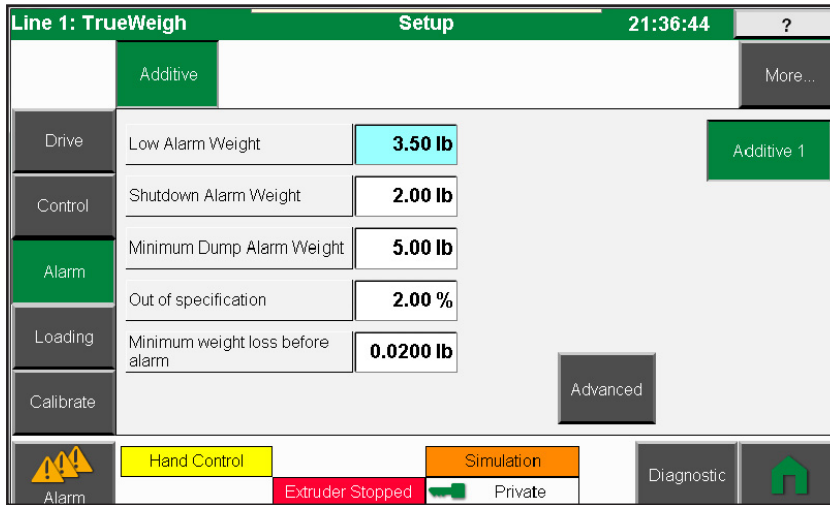
# Setup and Configuration (continued)

## Alarm

Additive devices have several alarms that have a programmable trigger. The settings on this page allow for changing the default trigger points.

The basic additive alarm settings are:

Parameter	Default	Range	Security	Description
Low Alarm Weight (lb)	3.5 / 21 / 35	[0 : 200]	Operator	Alarm if weight falls below this value.
Shutdown Alarm Weight (lb)	2 / 21 / 35	[0 : 200]	Operator	Shuts down the line if weight falls below this value.
Minimum Dump Alarm Weight (lb)	5	[0 : 200]	Operator	Alarm if weight refills less than this value.
Out of Specification (%)	2	[0 : 100]	Operator	Alarm if rate deviates more than this percentage value
Minimum Weight Loss Before Alarm (lb)	2	[0 : 10]	Service	The minimum weight loss over 10 second period before alarm occurs.

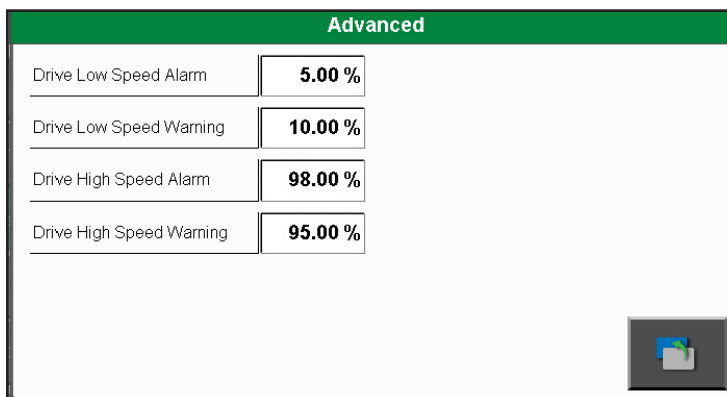


**Advanced:** This button will present a pop up window where additional less frequently used parameters can be set.



The advanced additive control settings are:

Parameter	Default	Range	Security	Description
Drive Low Speed Alarm (%)	5	[0 : 100]	Setup	Minimum speed setting for proper control.
Drive Low Speed Warning (%)	10	[0 : 100]	Setup	Minimum speed setting before a warning alarm is presented.
Drive High Speed Alarm (%)	99	[0 : 100]	Setup	A counter that decrements when the weigh system is unstable. If it should it reach a value of 0, an update error will occur.
Drive High Speed Warning (%)	99	[0 : 100]	Setup	Maximum speed setting for proper control.



(Continued)

## Setup and Configuration (continued)

### Loading


Additive devices have several alarms that have a programmable trigger. The settings on this page allow for changing the default trigger points.

The basic additive loading settings are:

Parameter	Default	Range	Security	Description
Loading Enabled	Yes	Yes / No	Operator	Loading for this hopper is enabled.
Load by Time	No	Yes / No	Operator	The loading output is controlled by time or by weight.
Loading On Weight (lb)	5 / 30 / 50	[0 : 180]	Operator	Weight to begin filling the hopper.
Loading Off Weight (lb)	5	[0 : 100]	Operator	Weight to end refill of the hopper.
Loading Time (sec)	10	[0 : 999]	Operator	Time to refill hopper: will override loading off weight.

### Calibration

This page is for calibration of the additive weigh hopper. Calibration is the process by which the tare weight of the hopper is determined. In order to determine the weight of material in the hopper, two weight readings are required, an empty hopper weight, and a hopper weight with some known weight present. This linear relationship can now be used to calculate the amount of material present in the hopper.

 **NOTE:** The system must be stopped before the calibration process can begin. The level of security required for calibration is configurable on the <Security> screen.

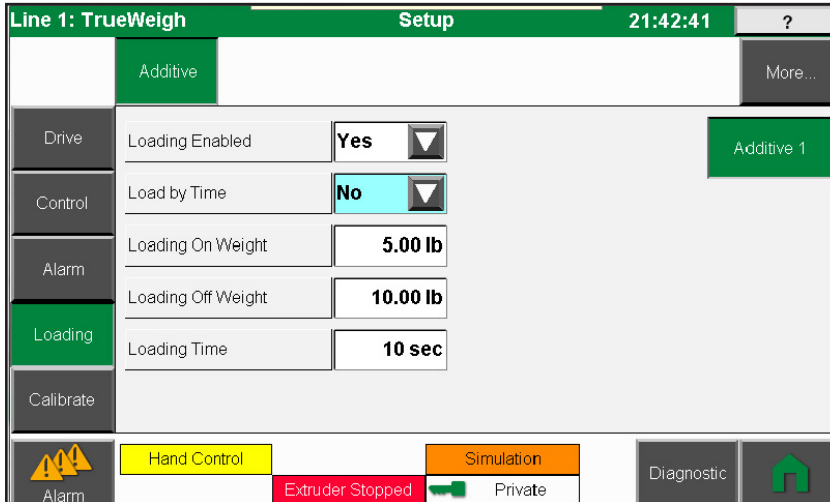
First the tare weight of the empty hopper is determined. Then the exact value of a test weight is entered into the system. Place the known test weight inside/on the hopper. Now allow the system to get a reference of a known weight. Remove the test weight. From these reference points it is now possible to accurately determine the weight of material in the hopper.

The basic additive calibration settings are:

(Continued)

# Setup and Configuration (continued)

Parameter	Default	Range	Security	Description
Zero Weight AD Value	0	[0 : -]	Operator / Stop	The calibration factor for an empty weigh hopper bin.
Test Weight (lb)	5	[0 : 100]	Operator / Stop	The value of the precision test weight used to determine the second calibration factor (Test Weight AD Value).
Test Weight AD Value	1	[0 : -]	Operator / Stop	The calibration factor for an additive hopper bin containing a known weight.



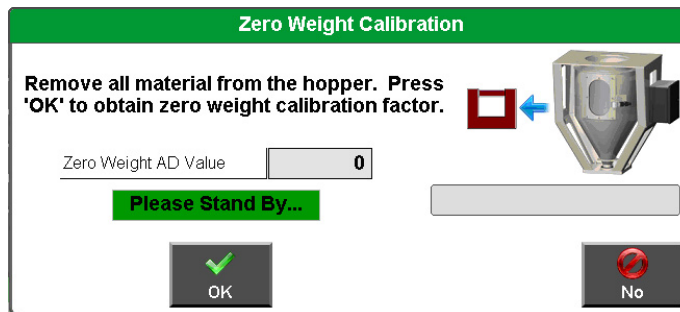
## Calibration Procedure {Operator / Stop}

- 1 Press the 'Manual Calibrate' button. It is a good idea to re-calibrate the unit after it has been transported and mounted. Re-calibrating the unit assures that the start weight on the scale inside the blender is zero.

**NOTE:** The weigh bin must be in place, and empty, when you perform this task. If the bin is not in place, the calibration will be inaccurate and will need to be redone. Once the (Zero Weight Calibration) process has started, the procedure must be completed.

**Manual Calibrate:** This button will start the procedure to manually calibrate the calibration factors for the extruder hopper weigh scale.

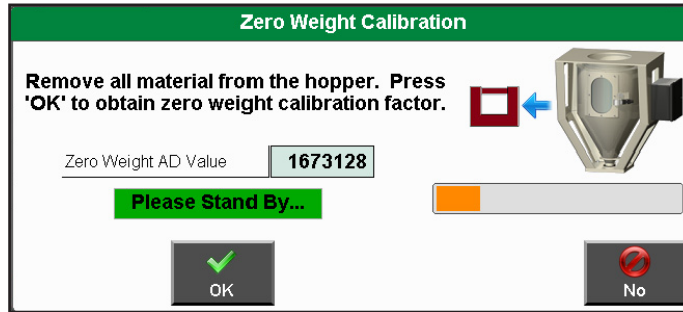
Manual Calibrate



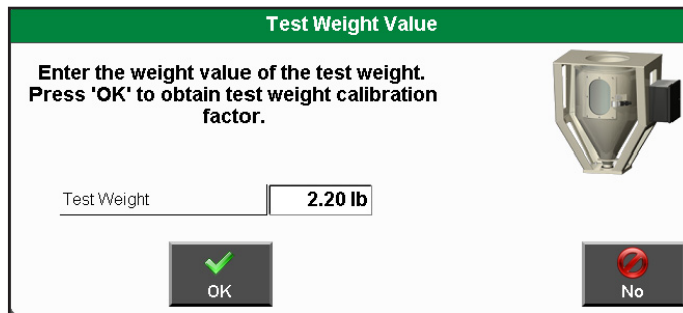
- 2 Press the 'OK' button to obtain the Zero Weight Calibration Factor. Please stand by, while the system obtains the Zero Weight Calibration Factor.

(Continued)

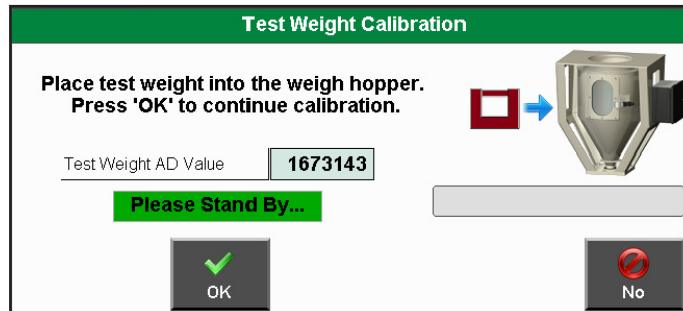
## Setup and Configuration (continued)



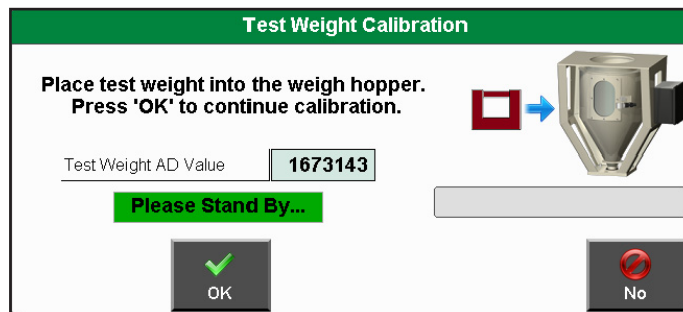
- 3 Enter the Test Weight Value, and then press 'OK'. The test weight should not exceed the capacity of the hopper else damage could result to the weighing system.



- 4 Place the test weight into the hopper and press 'OK' to continue with the calibration.



- 5 Stand by while the system obtains the Test Weight AD Value. Remove the test weight from the hopper. The displayed hopper weight should return to 0.



(Continued)

# Setup and Configuration (continued)

## Panel Device

This group of screens is used to configure the CPU, the touch screen, units, security level, and system date and time.

### Panel Device Sections

**Panel:** Parameters for setting the display language, system naming, and screen saver.

**Units:** Parameters for selection of English or Metric units and display precision.

**Security:** Parameters for granting security access to various system functions and entry of security level passwords.

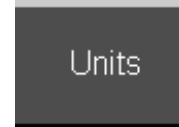
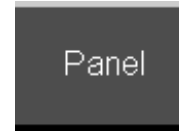
**Time:** Parameters for setting the system time and defining operator shift times.

### Panel

This page of the setup is concerned with the setup of the systems default language and touch-screen appearance. This page also provides for adjusting the screen brightness, contrast and screensaver.

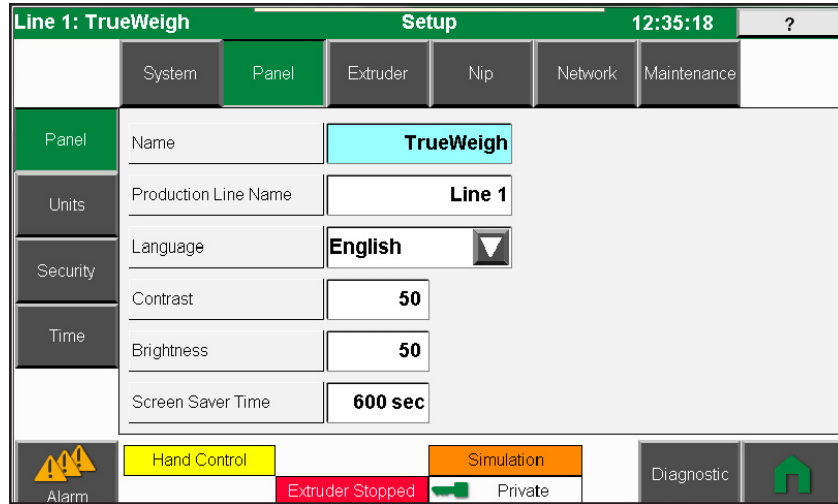
The basic Panel settings are:

Parameter	Default	Range	Security	Description
Name	TrueWeigh	[various]	Service	The name of the system as it will appear throughout the touch-screen pages and on reports.
Production Line Name	Line 1	[various]	Service	This defines a name used for naming a full production line. This is included in the various data and report outputs. If multiple systems comprise a full production line, this name provides a means by which all devices can be grouped under a single name for reporting purposes.
Language	English	[various]	Operator	The default display language. This is the language that will be used when the system is booted. Any change made will immediately take effect.
Contrast	50	[10 : 100]	Operator	Contrast of the display.
Brightness	50	[10 : 100]	Operator	Brightness of the display.
Screen Saver Time	600	[0 : 7200]	Operator	The time in seconds after which the screen will black out. To re-activate the screen simply touch the display and the last page viewed will be shown. A value of 0 will disable the screen saver.



(Continued)

# Setup and Configuration (continued)



## Units

All units are represented internally the same regardless of what unit types are shown on the display. The touch-panel automatically converts the internal units to that selected to be shown on the display. This page is provided to change the displayed units to either English or Metric values based on user preferences. The default precision for displayed units is typically 2 decimal places. In the Precision frame, the default settings can be changed for individual unit types. This change affects all devices controlled through the touch-panel.

The basic Units settings are:

### General Frame:

Parameter	Default	Range	Security	Description
Units	English	English / Metric	Setup	The base number system shown by the touch-panel. If extrusion control is enabled, additional settings are provided for key unit types.
Weight / Length	lbs/100ft; kg/m	lbs/1000ft / lbs/ft; kg/m / g/m	Setup	The unit measure for weight of material per a given length of produced material.
Weight / Area	lbs/sq.ft. kg/ sq.m	lbs/sqft / lb/ream; kgs/ sqm / g/sqm	Setup	The unit measure of weight of material per a given area of produced material.
Thickness	µm mm cm	µm / mm / cm	Setup	Available for metric only, the unit measure for a given thickness of material.
Width	mm cm	Mm / cm	Setup	Available for metric only, the unit measure for a given width of material.

### Precision Frame:

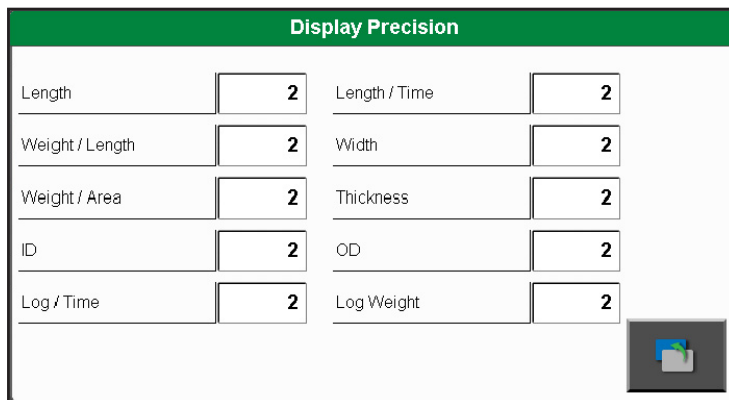
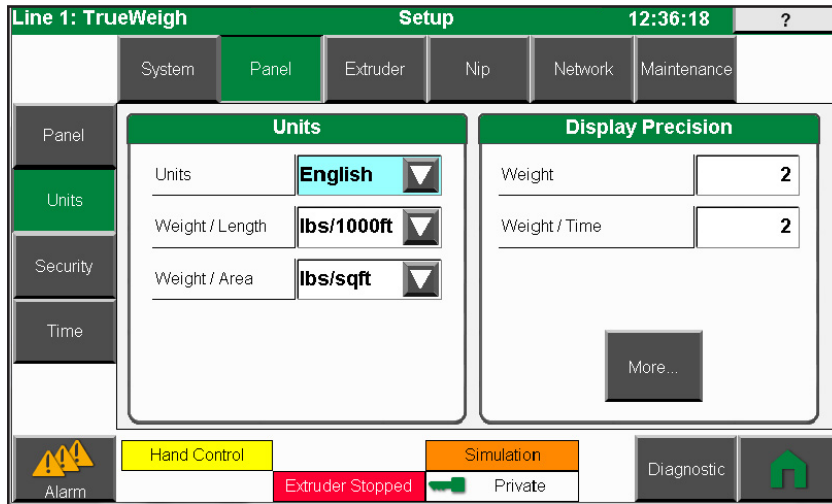
Parameter	Default	Range	Security	Description
Precision	2	[0 : 3]	Setup	Typically 2 decimal places of resolution are presented. It is possible to increase or decrease this value as necessary for several unit types. Fields are provided to change the displayed resolution for various unit types.



**More...:** This button is provided to show a popup where the precision of additional unit types can be set.


(Continued)

# Setup and Configuration (continued)



## Security

This screen sets parameters relevant to the security system. There are 4 levels of security 3 of which each have a passcode. The passcodes allow the user to raise the level of security to unlock various features. Some user actions may have programmable security level locking. This page is for setting these programmable lock levels and for changing the default security pass-codes.

 **NOTE:** Take care when changing passcodes; should the new passcode be lost, the system must be set back to factory defaults to reset the passcode values.

Press the 'Advanced' button to enter additional parameters. The basic Security settings are:

(Continued)

## Setup and Configuration (continued)

Parameter	Default	Range	Security	Description
Level For Automatic/Stop	Setup	Guest / Operator / Setup / Service	Service	The security level required put the blender into automatic or stop.
Level For Recipe Entry	Operator	Guest / Operator / Setup / Service	Service	The security level required to enter a new recipe.
Level to Clear Inventory Totals	Setup	Guest / Operator / Setup / Service	Service	The security level required to delete the inventory totals on the totals page.
Level to Clear Shift Totals	Operator	Guest / Operator / Setup / Service	Service	The security level required to delete the shift totals on the totals page.
Level to Save Recipes/Resins	Setup	Guest / Operator / Setup / Service	Service	The security level required to modify recipes and resins in the Recipe Book.
Level to Calibrate	Operator	Guest / Operator / Setup / Service	Service	The security level required to calibrate the weighed hoppers.
Operator Password	3333	[various 6 char]	Service	The password required for changing to the 'Operator' security level. Refer to the manual for default values.
Setup Password	2222	[various 6 char]	Service	The password required for changing to the 'Setup' security level. Refer to the manual for default values.
Service Password	1111	[various 6 char]	Service	The password required for changing to the 'Service' security level. Refer to the manual for default values.
Auto Logout Timeout	0; Disables	[300 : 7200]	Service	Time in seconds after which the security level will automatically revert to the maximum (most secure) level of security.

Advanced

**Advanced:** This button will present a popup where the security level passcodes and auto logout timeout values are set.

The screenshot shows the 'Line 1: TrueWeigh Setup' interface. At the top, it displays 'Setup' and the time '12:36:39'. Below this are tabs for 'System', 'Panel', 'Extruder', 'Nip', 'Network', and 'Maintenance'. The 'Panel' tab is active. On the left, there are categories: 'Panel', 'Units', 'Security', and 'Time'. The 'Security' category is highlighted. The main area shows several dropdown menus for security levels: 'Level to Run' (Operator), 'Level for Recipe Entry' (Guest), 'Level to Clear Shift Totals' (Operator), 'Level to Save Recipes / Resins' (Setup), 'Level to Calibrate' (Operator), and 'Level to Clear Inventory Totals' (Setup). An 'Advanced' button is visible on the right side of the screen. At the bottom, there are status indicators: 'Alarm' (with a warning icon), 'Hand Control' (yellow), 'Extruder Stopped' (red), 'Simulation' (orange), and 'Private' (green). A 'Diagnostic' button and a home icon are also present.

The screenshot shows the 'Advanced' security configuration popup. It has a green header with the word 'Advanced'. Below the header, there are four input fields: 'Operator Password' (masked with \*\*\*\*), 'Setup Password' (masked with \*\*\*\*), 'Service Password' (masked with \*\*\*\*), and 'Auto Logout Timeout' (set to 0 mins). A home icon is located in the bottom right corner of the popup.

# Setup and Configuration (continued)

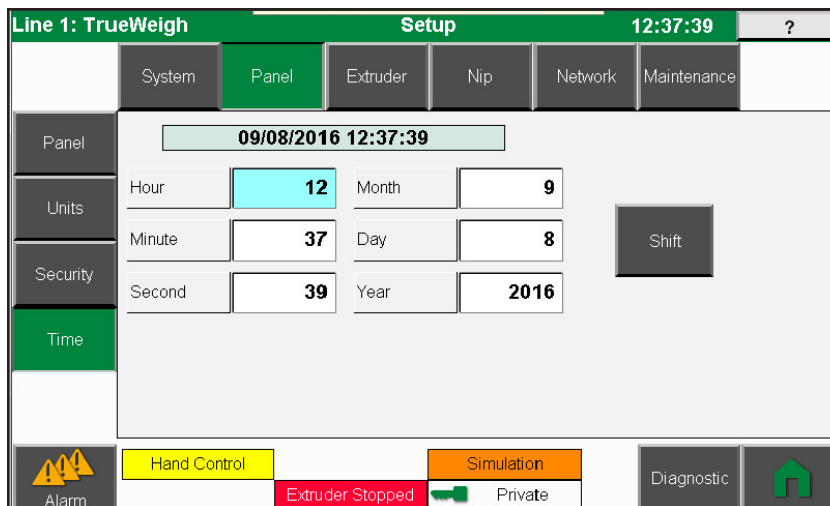
## Time

This screen is used for setting the systems time and date. Pressing the [Shift] button, a popup is presented where time parameters are available for setting up (3) work shifts.

The system maintains its own time and date values. The time and date will be included on reports and data logging file output. The time and date are also used to schedule automatically generated reports, data logging output, and to determine the current working shift. If shift times are defined, it is possible to automatically clear the shift totals after a shift report is generated at the end of the shift. The name of the current shift is also output to SQL.

The basic time and date settings are:

Parameter	Default	Range	Security	Description
Hour		[0 : 24]	Setup	The current hour value implemented with a 24 hour clock.
Minute		[0 : 59]	Setup	The current minute value.
Second		[0 : 59]	Setup	The current second value.
Month		[1 : 12]	Setup	The current month value.
Day		[1 : 31]	Setup	The current day of the month value.
Year		[2008 : 2032]	Setup	The current 4 digit year representation.



**Shift:** This button will present a popup window where the work shift times and names can be configured.




### Shift Configuration: {Setup}

The system supports configuration of 3 shifts. To configure the shift periods, press the 'Shift' button to present a popup. To configure a shift, it must first be enabled. Enable the shift and enter the shift starting time using a 24 hour clock value [HH:MM]. Enter the duration of the shift in hours and minutes [HH:MM].

**NOTE:** The duration of the shifts cannot sum to a value greater than 24 hours. Also the duration of a shift should not overlap another shifts time. If two shifts are configured with overlapping times, the shift that started first will be given priority.

# Setup and Configuration (continued)

 **NOTE:** Shifts can span the midnight hour, but care should be taken as some reporting packages do not properly recognize spanning midnight. Data for a shift started on the previous day may be reported on the following days report. Care will have to be taken when selecting the report time filter.


The basic shift settings are:

Parameter	Default	Range	Security	Description
Name	Shift 1 Shift 2 Shift 3	[various 11 char]	Setup	The name of the shift.
Start Time [HH]	0 0 0	[0 : 24]	Setup	The 24-hour clock starting hour of the shift.
Start Time [MM]	0 0 0	[0 : 59]	Setup	The starting minute of the shift.
Duration [HH]	24 0 0	[0 : 24]	Setup	The 24-hour clock duration in hours of the shift
Duration [MM]	0 0 0	[0 : 59]	Setup	The duration in minutes of the shift beyond the duration hour.
Enable	Yes No No	Yes / No	Setup	Enable this shift as a valid work shift.
Clear Shift Totals After Report	No	Yes / No	Setup	Automatically clear the shift inventory totals at the end of a shift.

**Shift**

	Name	Start Time [HH:MM]		Duration [HH:MM]		Enable
1	Shift1	0	0	24	0	Yes <input type="button" value="v"/>
2	Shift2	0	0	0	15	No <input type="button" value="v"/>
3	Shift3	0	0	0	15	No <input type="button" value="v"/>

Clear Shift Totals After Report



## Network

The system supports remote communications using a variety of protocols. Some of these protocols use the built in TCP/IP port of the touch-panel, while others may require the addition of hardware. Multiple protocols can operate simultaneously over the touch-panels TCP port. Some remote protocols will require an unlock code to enable. This page will configure and setup the various protocols and required hardware.

When entering the unlock code, the station identifier will be presented. A Conair representative can use the station identifier code to generate the unlock code. The unlock code must be correctly applied in order to enable the protocol.

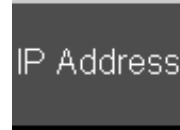
For more information on the capabilities of Conair's implementation of the protocol, refer to the available protocol manual.

# Setup and Configuration (continued)

All remote protocol parameters will require a security level of {Service} to modify. Once a protocol is enabled, or any protocol settings have been changed, the system will perform a reboot sequence upon returning to the <Home> screen. When the reboot sequence is completed, the protocol will become available.

## Network Device Sections

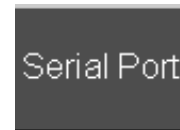
**IP Address:** This screen is for the setup and review of the systems remote network configuration.



**Protocol:** This screen is provided to enable and set configuration parameters for a number of remote communication protocols.



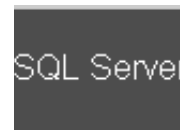
**Serial Port:** This screen is provided to enable and configure remote communications that rely on a physical serial port.



**Email:** This section will configure the transmission of an email whenever an alarm occurs.



**SQL Server:** This screen will provide configuration for connecting the blender to a remote SQL server.



## IP Address

This screen shows the touch-panels unique NodeID and Ethernet network addressing. Whenever changes are made to these parameters, a reboot of the system will be performed upon returning to the <Home> screen.

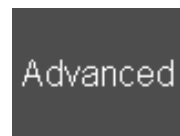
### TCP/IP Settings

For the following parameters the current set values are shown along with fields for data entry. Pressing the Set button next to each parameter will immediately change the system set value. Navigating away from this page will also set the values in the system. Once set, external devices will be able to 'PING' the touch-station, however a system reboot will be performed upon exit of setup to insure full functionality of the change taking place.

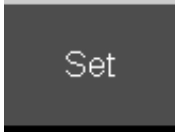
The basic IP Address settings are:

Parameter	Default	Range	Security	Description
IP Address	10.1.44.1	[0 : 255]	Service / Stop	The Ethernet TCP/IP network ip address.
SubNet Mask	255.255.0.0	[0 : 255]	Service / Stop	The Ethernet TCP/IP subnet mask.
Gateway Address	0.0.0.0	[0 : 255]	Service / Stop	The Ethernet TCP/IP gateway address if required.

**Advanced:** This button will present a popup window where additional less frequently used parameters can be set.



## Setup and Configuration (continued)



**Set:** The network settings can only be saved when all changes have been completed. This button will save the changes made to the configuration parameters.

The advanced IP Address settings are:

Parameter	Default	Range	Security	Description
NodeID	1	[1 : 15]	Service / Stop	The Node ID is a unique number assigned to the touch-screen. This is used with the self-loading option and TrueWeigh systems to identify the remote blenders.
HostName	trueweigh	15 character string	Service / Stop	The Ethernet hostname of the touch-panel.

### Protocol

The system supports remote communications using a variety of protocols. Some of these protocols use the built in TCP/IP port of the touch-panel, while others may require the addition of hardware. Multiple protocols can operate simultaneously over the touch-panels TCP port. Some remote protocols will require an unlock code to enable. This page will configure and setup the various protocols and required hardware.

All remote protocol parameters will require a security level of {Service} to modify. Once a protocol is enabled, or any protocol settings have been changed, the system will perform a reboot sequence upon returning to the <Home> screen. When the reboot sequence is completed, the protocol will become available.

The protocols that can work over the Ethernet port include: ModbusTCP, EtherNetIP, and OPC Server. The Ethernet port is always available on the touch panel for usage. The IP addressing of the touch-panel is configured on the <IP Address> setup page. The OPC Server and EtherNetIP protocols will require an unlock code to enable. The Modbus TCP does not require an unlock code.

The Profibus protocol requires the addition of special hardware in order to function. Contact a Conair representative if the protocol is to be implemented.

The protocols settings are:

## Setup and Configuration (continued)

Parameter	Default	Range	Security	Description
Modbus TCP/IP	No	Yes / No	Service / Stop	The Modbus protocol does not require an unlock code in order to enable. Please refer to the Modbus protocol manual for the available tag list. The IP Address of the touch panel configured on the <IP Address> screen is used by this protocol.
Profibus	No	Yes / No	Service / Stop	The Profibus protocol requires additional hardware that must be installed. This protocol also requires an unlock code to enable.
Profibus: Data Byte Order	Big Endian	Big Endian / Little Endian	Service / Stop	Select the data byte ordering for the profibus data stream.
EtherNet/IP Protocol	No	Yes / No	Service / Stop	The EtherNet/IP protocol requires an unlock code in order to enable. Please refer to the EtherNet/IP protocol manual. The IP Address of the touch panel configured on the <IP Address> screen is used by this protocol. This interface also requires the IP Address of the remote system be defined. This protocol will also require a double reboot of the touch-screen. The first reboot will enable the protocol, and the second reboot will acknowledge the remote systems IP address.
Opc Server	No	Yes / No	Service / Stop	The OPC Server protocol does requires an unlock code in order to enable. Please refer to the OPC Server protocol manual for the available tag list and connection requirements. The IP Address of the touch panel configured on the <IP Address> screen is used by this system.
EtherNetIP	No	Yes / No	Service / Stop	The EtherNet/IP protocol requires an unlock code in order to enable. Please refer to the EtherNet/IP protocol manual. The IP Address of the touch panel configured on the <IP Address> screen is used by this protocol. This interface also requires the IP Address of the remote system be defined. This protocol will also require a double reboot of the touch-screen. The first reboot will enable the protocol, and the second reboot will acknowledge the remote systems IP address.
EtherNetIP: IP Address	0.0.0.0	[0 : 255]	Service / Stop	The EtherNet/IP interface also requires the IP Address of the remote system be defined.

**Line 1: TrueWeigh** Setup 13:13:19 ?

System Panel Extruder Nip **Network** Maintenance

IP Address: Modbus TCP/IP **No** ▼

Protocol: Profibus **No** ▼ Data byte order: **Big Endian** ▼

Serial Protocol: OPC Server **No** ▼

Email: EtherNet/IP **No** ▼

SQL Server IP Address: 0 0 0 0

Alarm Hand Control Simulation Diagnostic Private Extruder Stopped

### Serial Protocol

The system has the capability of implementing the Modbus Serial and Allen Bradley DF1 protocols over a standard RS485 serial port. The serial port hardware is required for these protocols which is not standard equipment. Only one protocol at a time may use the available serial port. The Modbus serial protocol does not require an unlock code to enable. This section will allow for the configuration of the serial port and enabling of the protocol. Contact a Conair sales or service representative for further information.

## Setup and Configuration (continued)

In order to set up a serial protocol, the port where the protocol will reside must first be chosen. Once a serial port has been chosen, the remaining parameters will populate accordingly.

The basic serial port settings are:

Parameter	Default	Range	Security	Description
Protocol	None	Modbus / AB DF1	Service / Stop	Select the appropriate protocol for the port. The Modbus protocol does not require an unlock code, while the ABDF1 protocol will require an unlock code.
Baud Rate	19200	800 / 9600 / 19200 / 38400 / 57600 / 115200	Service / Stop	Baud rate for the serial port.
Parity	None	None / Even / Odd	Service / Stop	The Ethernet TCP/IP gateway address if required.
Stop Bits	1	1 / 2	Service / Stop	Number of stop bits defined for the port.
Bits per Character	8	7 / 8	Service / Stop	Number of data bits per character.

The screenshot shows the 'Setup' screen for 'Line 1: TrueWeigh'. The 'Serial Protocol' section is highlighted in green. The settings are as follows:

- Serial Port: Serial Port 1
- Protocol: None
- Baud Rate: 115,200
- Stop Bits: 1
- Parity: None
- Bits per Character: 7

The bottom status bar includes: Alarm (yellow triangle), Hand Control (yellow button), Extruder Stopped (red text), Simulation (orange button), Private (green button), and Diagnostic (green house icon).

### Email

The system has the capability of sending an email whenever an alarm of a set severity occurs. A maximum of 3 recipients can be configured to receive the emails. A local SMTP server can be used to send the messages, or if the touch-screen is connected with the Internet, it can connect directly with outside SMTP services like Gmail.

The system will use the public DNS servers implemented by Google for name resolution. The DNS server addressing can be found on the <IP Address> settings screen.



**Test SMTP:** This button when pressed will send a test email message to the enabled recipients configured in the recipient list.

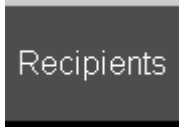
The basic email settings are:

# Setup and Configuration (continued)

Parameter	Default	Range	Security	Description
Enable Email	No	Yes / No	Service / Stop	The email feature must be enabled to operate. This will require a security unlock code.
SMTP Address	NA	34 character string	Service	The address of the remote SMTP Server (example smtp.mail.gmail.com).
Response Timeout (sec)	240	60 / ...	Service	The timeout value for a response from the remote SMTP server.
Authentication	Plain/Login	Plain/Login / SSL/TLS	Service	The authentication mechanism for the server connection.
Port Number	25	0 / ...	Service	The port number used for the server connection. (Typical: Port 465 or 587 for SSL/TLS, Port 25 for Plain/Login).
User Name	NA	34 character string	Service	The user name for the touch-screen login to the SMTP Server.
Passcode	NA	34 character string	Service	The user passcode for the touch-screen login to the SMTP Server.

Operation 4

**Recipients:** This button will present a popup window where the alarm trigger level, email recipients, and sender email address settings are configured.



The basic email settings are:

Parameter	Default	Range	Security	Description
Receive from Email Address	NA	34 character string	Service / Stop	The email address of the touch-screen (sender email address).
Recipient Enable	No	Yes / No	Service	Enable the recipient to receive email notifications.
Send to Email Address	NA	34 character string	Service / Stop	The recipients email addresses. A maximum of 3 recipients can be configured.
Level to trigger Output	Shutdown	Info / General / Shutdown	Service	The severity level of the alarm that will trigger a notification email be sent.


(Continued)


# Setup and Configuration (continued)

## SQL Server

The system has the capability of communicating directly with Microsoft SQL Server. This is accomplished with an Ethernet connection with the SQL Server's network. The touch-panel must have its IP Address settings configured to reside on this network (see <IP Address> screen). This section will configure the connection with the server and the type of data that will be output to the server. The SQL interface will require an unlock code to enable. This section will configure the parameters needed to implement the interface. If the touch-panel cannot communicate with the SQL Server an alarm will be generated.

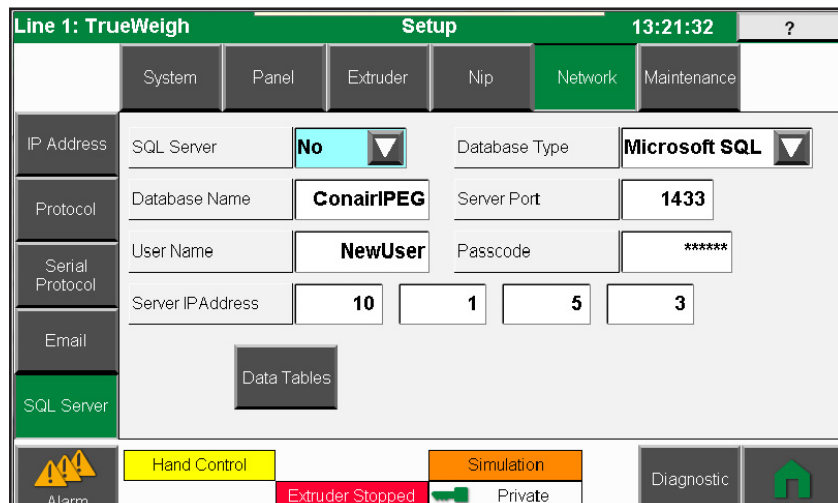
When the touch-panel first connects with the server it will verify that the Conair database and the proper tables and relationships have been established within the server. Conair can provide documentation that shows the contents of the tables and relationship mappings.

 **NOTE:** The setup of the Microsoft SQL server side is the responsibility of the customers IT department. Conair does have an SQL Server interface manual which can be used as a guide in this process.

 **NOTE:** Part of SQL Server setup process will be to set up a user within the SQL Server and for the Conair Database. This interface also requires that dynamic port addressing be disabled for this connection.

The basic SQL Server settings are:

Parameter	Default	Range	Security	Description
SQL Server	No	Yes / No	Service / Stop	This setting will enable or disable the connection with the server. The SQL Server interface requires an unlock code in order to enable.
Database Type	Microsoft SQL	Microsoft SQL	Service / Stop	The type of SQL database server.
Database Name	ConairPEG	11 character string	Service / Stop	The name of the database defined in the SQL Server.
Server Port	1433	Plain/Login / SSL/TLS	Service / Stop	The port used by the SQL Server.
Server IP Address	0.0.0.0	[0 : 255]	Service / Stop	The IP address of the SQL Server.
User Name	NA	11 character string	Service	The touch-panel user login to the SQL server.
Passcode	NA	11 character string	Service	The touch-panel user logins passcode to the SQL Server.



**Data Tables:** This button will present a popup window where the type of data to be saved to the SQL Database is configured.

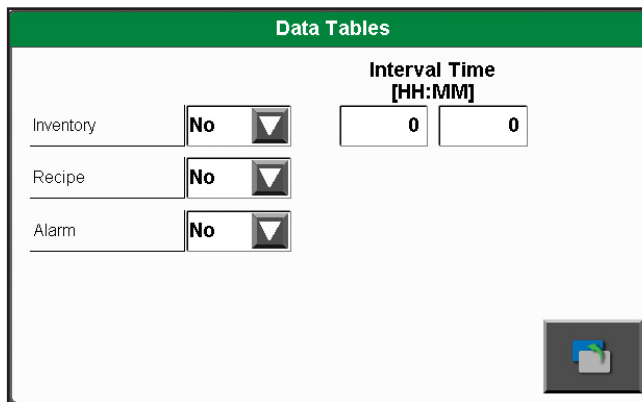
(Continued)

# Setup and Configuration (continued)

 **NOTE:** Conair can provide several pre-built report outputs which can be loaded into the Microsoft SQL Server. These reports provide a variety of means by which material usage data can be seen. These reports require the (BATCHES) data table be enabled.

The data table settings are:

Parameter	Default	Range	Security	Description
Inventory Data	No	Yes / No	Service	This setting will enable or disable the connection with the server. The SQL Server interface requires an unlock code in order to enable.
Inventory Data: [HH]	1	[0 : 23]	Service	24 hour clock hour interval value for when the inventory data is saved to database.
Inventory Data: [MM]	0	[0 : 59]	Service	24 hour clock minute interval value for when the inventory data is saved to database.
Recipe Data	No	Yes / No	Service	The type of SQL database server.
Alarm Data	No	Yes / No	Service	The name of the database defined in the SQL Server.
Batches	No	Yes / No	Service	The port used by the SQL Server.

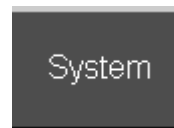


## Maintenance

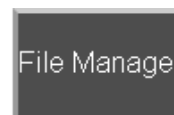
The maintenance area provides a set of screens which enable the operator to perform a series of maintenance features, including backing up the configuration, recipes, licensing, and defaulting the system to factory defaults. A screen is also provided to allow manual control of the component gates, the batch hopper gate, and the mixing system.

### Maintenance Device Sections

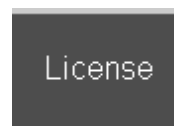
**System:** This section provides for basic system functions Factory Defaults, Touchscreen Calibration, and Safe Screen Cleaning.



**File Manager:** This section allows various file IO functions to take place including saving and retrieving configuration, recipe book, and resins. Report and log files can also be removed from the respective drives if necessary.



**License:** This section shows the current systems station identifier and the unlock codes for any locked features.



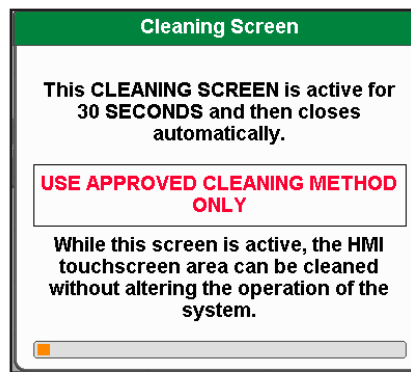
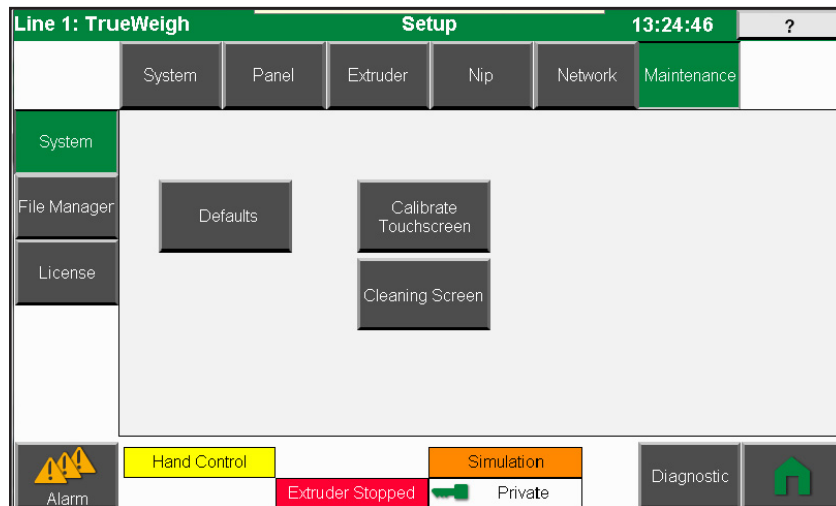
### System

This section provides for basic system functions Factory Defaults, Touch-screen Calibration, and Safe Screen Cleaning.

(Continued)

## Setup and Configuration (continued)

- **Defaults:** Security: {Service/Stop} The system can be reset back to a Factory Default setting. Pressing this button a confirmation popup will be presented before any action is taken. Once the system is reset, returning to the [Home] screen the system will perform a reboot sequence.
- **Calibrate Touchscreen:** Security: {Service/Stop} The touch-screen system is touch calibrated from the factory. In the event that the touch-actions do not align with pressing of the screen, the screen can be re-calibrated. When the button is selected, a target will be presented in each corner of the screen one at a time. Press the target to re-calibrate the touch-action.
- **Cleaning Screen:** Security: {Setup} Pres this button to present a popup screen for 30 seconds. During this time it is possible to clean the touch-screen without affecting the operation of the system. A progress bar is presented to indicate the time remaining before the popup screen will vanish.



### File Manager


This screen allows the operator to save and retrieve various data files to the onboard flash drive, or to an attached USB thumb-drive. When the drive is selected, the screen will display the available space and the total space available for the drive. If the selected drive is at capacity, then file IO will not be possible, and for the case of data logging, an alarm will be generated.


## Setup and Configuration (continued)

This system has a built in FTP Server, therefore it is possible to access the files using and FTP Client software package. The IP address of the touch-panel can be viewed or set within the <Setup-Network> screen. The touch-panel must be connected to the PC with the FTP client via standard Ethernet practices.

- **Internal Hard Drive:** (Compact Flash, F:) There is an internal flash drive available for storage of data files. The total space of this drive can vary. An FTP Client is required to access files on the internal drive. FTP client access to the internal hard drive is possible with a user login and password of (Username: conairftp, Password: conairftp).
- **USB Thumb-Drives:** (USB Port 1, USB Port 2, ...) The system has at least 1 USB thumb-drive. Multiple thumb-drive sockets may be available depending on the system. The maximum size of the USB stick is 32 GB. Once the USB stick has been plugged into the system, the system will recognize the drive and it will become available in the list of available drives.

Access to the USB thumb-drive with an FTP Client is possible with a user login and password of (USB Port 1: Username: conairusb1, Password: conairusb / USB Port 2: Username: conairuSB3, Password: conairusb). Of course the USB stick may also be removed. Do not remove the USB stick while data access is occurring.

 **NOTE:** The USB stick CANNOT be formatted with NTFS, this is not supported.

 **NOTE:** Take care when using multiple USB thumb-drives. The first USB thumb-drive inserted will be referred to as USB Port 1, the second as USB Port 2. If the first thumb-drive USB Port 1 is removed, the remaining USB thumb-drive will still be referenced as USB Port 2.

### Drive Explorer

From the pull-down menu, the 'Drive Explorer' is the first available selection. The Drive Explorer will allow for the various drives to be scanned for files and directories. Buttons are provided to allow for individual files or entire directories to be deleted.

To explore a drive:

- 1** Select the destination drive to explore. The sub-directory selection box will populate with all of the directories on the selected drive.
- 2** Select the sub-directory. The file selection box will populate with all of the files in the selected directory.
- 3** Select the desired file.

**Clear:** {Setup} This button will delete the selected file from the selected path.

**Clear All:** {Setup} This button will delete all of the selected files from the selected path.

**Reload:** This button will refresh the directory and file lists for the selected drive selection.



Clear



Clear All



Reload

(Continued)

## Setup and Configuration (continued)

### Data File Action

From the pull-down menu, various file IO operations can be performed. The list of operations available can change based on the configuration of the system.

For each action, the user will

- 1 Select a source or destination drive.
- 2 Depending on the file action selected, the user can then select a directory.
- 3 Select or enter a filename, depending on the action taken.
- 4 Press the 'OK' button to perform the selected action.



**OK/Run:** This button will execute the selected file action.

- **Save/Retrieve Configuration:** The full configuration of the system can be saved or retrieved. This is useful in the event that a firmware update is required; the existing system configuration can be saved then reloaded after the firmware update is completed. Also Conair service often will request the configuration files in order to diagnose issues with the system. After performing a retrieval of the configuration, the system will perform a reboot sequence upon returning to the <Home> screen.

Multiple files are used for the configuration so selecting an individual file for this task is not available. The default directory for the configuration files is (CfgFiles).

- **Save/Retrieve Recipe:** The recipe book can be saved or retrieved. In the event of a firmware update, the recipe book can be saved and reloaded after the firmware update is completed. With identical systems, it is also possible to copy the recipe book from one system to another.

The default path for the recipe book is (/DatFiles/RecipLst.csv).

- **Save/Retrieve Resin:** The list of resins can be saved or retrieved. In the event of a firmware update, the resin list can be saved and reloaded after the firmware update is completed. With identical systems, it is also possible to copy the resin list from one system to another.

The default path for the resin list is (/DatFiles/ResinLst.csv).

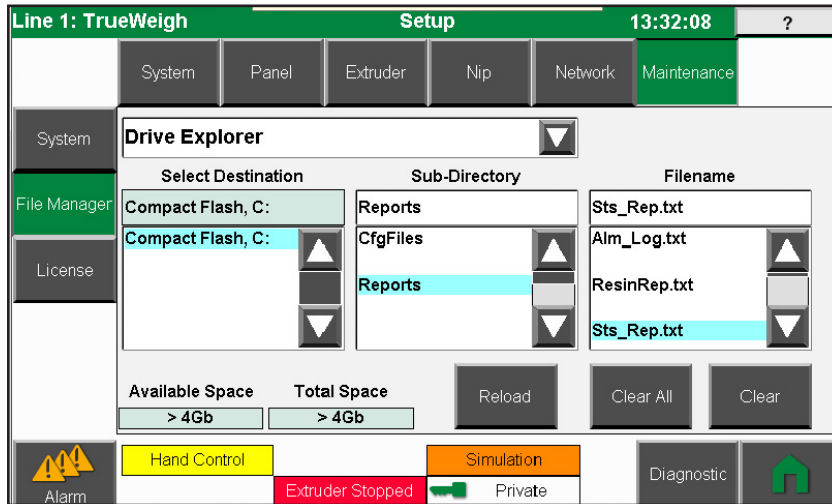
- **Save Diagnostics:** This option will save multiple diagnostic files to the hard-drive. Files included will be the system configuration, feed tables, batch data, mixer state, and the alarm log. These files are typically used by Conair service to diagnose issues with the system. This provides a simpler method of obtaining diagnostic files without having to individually select them.

The destination drive is the only selectable path option for this option. The various data files will be stored in the (Diagnostics) directory on the specified drive.

- **Save Feed Tables:** This option will save the feed / material calibration data for each of the component hoppers. If extrusion control is also available, the rate tables for the extruder and the haul-off devices will also be saved.

The default path for the feed tables is (/DatFiles/FeedTbl.csv).

# Setup and Configuration (continued)

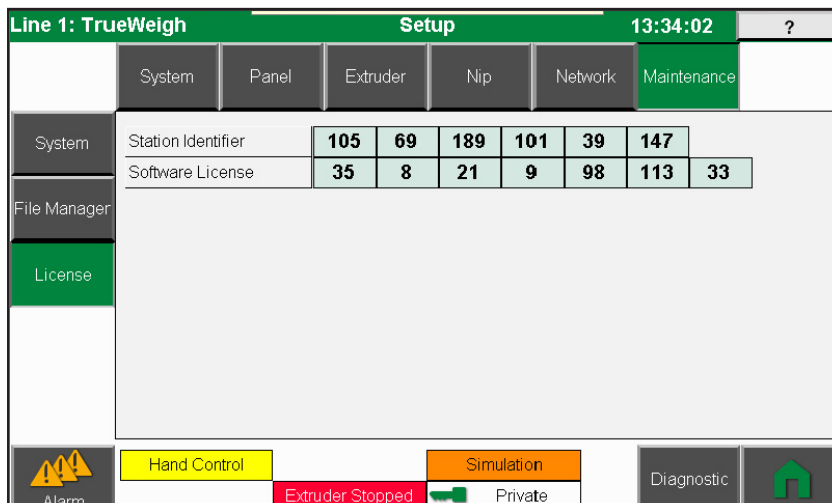


## License

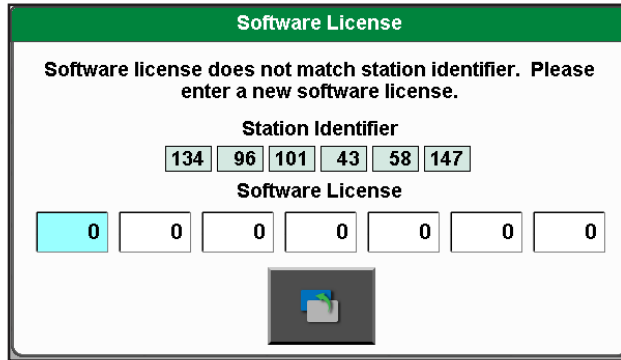
Each touch-system has a unique Station Identifier. This identifier is used to unlock features of the system that require an unlock code in order to enable. The primary required unlock code is for the station firmware itself. When a feature requires an unlock code, a security popup window will be presented when the user tries to enable the feature. At this time the unlock code must be entered. If the code is invalid or unavailable, the popup window will close and the feature will be disabled.

The Station Identifier must be provided to a Conair representative in order to generate the unlock code for the feature. Each unlock code is unique for the touch-panel and the feature. This screen displays the Station Identifier for the current system as well as all entered unlock codes for the respective features.

**NOTE:** During a system firmware upgrade, it may be necessary to re-enter the unlock codes. Write down the unlock codes before performing any firmware upgrades.




## Setup and Configuration (continued)



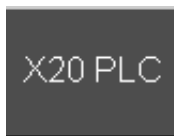
### Diagnostics

The diagnostics screens are used for diagnosing system control and hardware operations, and only trained service personnel should use this area. The user must have {Service} level security to enter diagnostics. To navigate to the <Diagnostic> screens, first navigate to the <Home> page. At the <Home> screen press the 'More...' button. Press the button labeled 'Setup' and the screen will change to the main <Setup> screen. Press the 'Diagnostic' button in the lower right corner of the screen to show the initial screen <X20 PLC> diagnostics.

 **NOTE:** Press the 'Setup' button in the lower right corner of the screen to return to <Setup>.

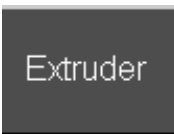
 **NOTE:** The 'Home' button will return to the main <Home> screen.

The diagnostic screens are organized similar in concept to the Setup area. This is to group the diagnostic functions by the type of device (X20 PLC, Extruder, and Haul-off). The various device types are chosen by 'Selection' buttons shown across the TOP of the screen. For each device, relevant parameters are further grouped into sections. Each section is chosen using 'Selection' buttons along the Left side of the screen. With this method it is very easy to navigate through-out the diagnostics area with a minimal amount of screen navigation and user interaction.

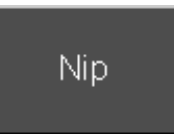


#### Diagnostics Devices

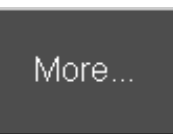
**X20PLC:** This device contains diagnostic information for the PLC and touchscreen hardware.



**Extruder:** This device represents the extruder drive and control system.



**Haul-off:** This device represents the hauloff drive and control system.



**More...:** Simple button to provide access to more devices and areas of diagnostics.

# Setup and Configuration (continued)

## X20 PLC

This page is used for reviewing the status of the touch-screen and the PLC within the main TrueWeigh panel.

The PLC rack consists of a number of addressable slots where each slot has a pre-defined X20 slice installed. The X20 PLC slices are composed of essentially three pieces, a backplane socket, an I/O module, and a 12 position connector. The slice, or Slot, addresses and parts can be seen on the electrical print for the specific model blender. All three pieces plug into each other to provide a 'slice' (slot). Each slice is assigned a 'slot/slice' number. Slices are then connected to each other to form a rack. Slice numbers are assigned consecutively from a 'start' point. Some backplane modules have Hex encoded rotary dipswitches in them. These modules are used as 'start' points to begin the slot numbering scheme. Slot/slice numbers are Hex dipswitch settings are shown on the electrical enclosure drawing supplied with the system.

The X20 slice provides the IO required by the system. The configuration of the system determines the required IO and also the required X20 slices. Therefore not all of the X20 slices may be installed, and gaps in the PLC rack slot addressing may appear. The PLC rack is powered by two sources of power. The main bus power provides power to the slice processing hardware. The IO bus power provides the power to drive the IO points. Power through the PLC rack may be isolated at certain points, refer to the system schematic drawings for proper power connections.

**System:** This section will present diagnostic information regarding the PLC IO rack connected with the touch-screen system.

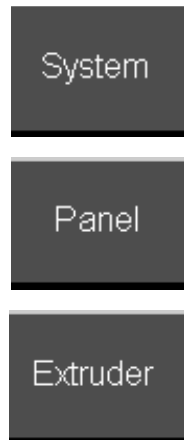
**Panel:** This section will present diagnostic information regarding the touch-screen system.

**Extruder:** This section will present diagnostic information regarding the extruder mounted loss-in-weight hopper panel.

### System

The System screen shows the physical PLC rack hardware status. For each slice in the PLC rack, a graphical image is shown. Each graphic shows the slot address, the type of slice installed, and its status. By touching the slice graphic, or the slices (Type) button, detailed information about the slice will be shown.

Information for only seven slots can be shown on a single screen. To see additional slots, a scroll bar is provided which can be adjusted to show additional slots. Gaps in the slot addressing may occur if the current system configuration does not require the pre-defined X20 slice.



## Setup and Configuration (continued)

### Text Status Indication

A text indicator for the slice relates whether the slice is OK (Green) or BAD (Red). If the slice is BAD then the system cannot determine the pre-defined slice at the specified slot address. This indicates either the slice is missing, or there is a problem with the main BUS power. If the surrounding slices also indicate BAD, it is most likely the main power is a problem. If a single slice is BAD, then it most likely a missing slice, a failed slice, or the wrong type of slice is installed in the slot.

### LED Status Indication

A graphic indicator located at the top of each slice provides power and availability status for each slice in the PLC rack.

- **Single Green LED** – The slice is OK. The correct slice is installed in the slot and not reporting any issues with either the primary or IO power busses.
- **Single Red LED** – The slice is BAD. There is most likely a missing slice, a failed slice, or the wrong type of slice is installed in the slot.
- **Green and Red LED** – The slice is OK, the primary power bus to the slice is indicating a problem. The slice is installed correctly however the power source for the primary power bus is indicating a problem.
- **Green and Yellow LED** – The slice is OK, the IO power bus to the slice is indicating a problem. The slice is installed correctly however power source for the IO power bus is indicating a problem.
- **Green, Red, and Yellow LED** – The slice is OK, the IO and Bus power to the slice indicate a problem. The slice is installed correctly however the power sources for both the IO and primary busses are indicating a problem.
- **No LED indicators** – The slice is RESERVED. The correct slice is installed in the slot however this slice is not required for the given system configuration.
- **'X' Indicator** – The slice is not applicable. The correct slice is installed in the slot however the system configuration does not require the slice. The slice has been installed to properly maintain the slot addressing.

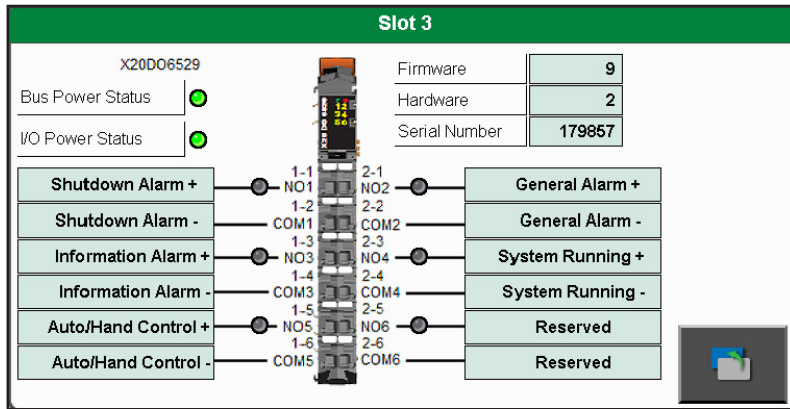
Line 1: TrueWeigh		Diagnostic				08:03:37		?
	X20 PLC	Extruder	Nip	Additive			More...	
System	Slot 1	Slot 2	Slot 3	Slot 4	Slot 5	Slot 7	Slot 8	
Panel	OK	OK	OK	OK	OK	OK	OK	
Extruder	BR9300	DI9371	DO6529	CS1030	CS1070	CM8281	CM8281	
		PLC Test		OFF				
Alarm	Hand Control	Extruder Stopped		PLC Automatic		Setup	Home	

# Setup and Configuration (continued)

## Slice Detail - Connections

If the PLC IS NOT in (Test Mode / Automatic) mode, touching the slice graphic, or the slice 'Type' button, a detail view of the slice is presented. This detail view shows a graphic image of the slice along with descriptive text for each connection point of the slice. The status of any Inputs/Outputs will also be shown.

**Manual PLC OFF:** This 'Selection' button can place the PLC into manual or automatic mode. In automatic/off mode the system software will be in control of the PLC rack. A status indication in the status bar at the bottom of the screen will indicate the PLC is in 'PLC Automatic'.



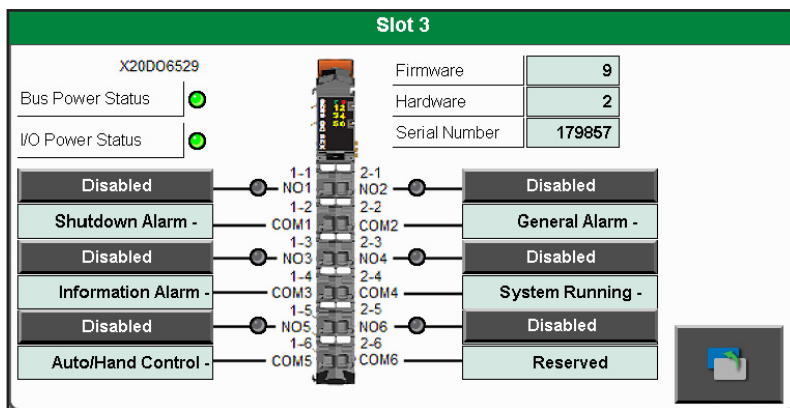
## Slice Detail – Manual Control

If the PLC is in (Test Mode / Manual) mode, touching the slice graphic, or the slice 'Type' button, a detail view of the slice is presented. The status of any Inputs/Outputs will also be shown. In this mode the descriptive text for the wire connections is not shown; instead manual control buttons and data input fields are presented where applicable.

**CAUTION:** This will allow for manual control of the PLC. TAKE CARE WHEN OPERATING IN TEST MODE! This mode should only be done by trained service personnel. Injury or damage could occur without proper caution.

Upon leaving the X20 diagnostic screens, the PLC will always be removed from Test Mode.

**Manual PLC ON:** This 'Selection' button can place the PLC into manual or automatic mode. In manual/on mode the user will be in control of the PLC rack. A status indication in the status bar at the bottom of the screen will indicate the PLC is in 'PLC Automatic'.



(Continued)

## Setup and Configuration (continued)

### Extruder

This section highlights the status of the extrusion system and the quality of the control algorithm. A system may have multiple extruders and each extruder will have its own parameters. When first entering the extruder diagnostic screens the extruder 1 is always presented first. Along the right side of the screen are (4) 'Selection' buttons with the extruder names. The selected extruder is represented as the depressed button. If there are additional extruders there are additional previous and next buttons to navigate through all extruders.

Status

**Status:** This page provides information regarding the stability of the extruder itself.

Feed Table

**Feed Table:** This page provides the extruders rate table.

Weight

**Weight:** This page provides weight information for the extruder's material hopper.

### Status

This page provides basic diagnostic information regarding the extruders current rate and control algorithm.

- **Actual Speed:** This is the actual RPM of the extruder.
- **Coast Counter:** This represents a counter which indicates if the current weigh system is currently in volumetric mode. When the counter reaches a value of 0 the weigh hopper is fully gravimetric.
- **Delta Grams:** The loss in weight of the extruder weigh hopper between weight scans.
- **Total Delta Grams:** The total weight loss of the extruder weigh hopper between rate calculation updates.
- **Minimum Weight Loss:**
- **Weight Loss Error:** The percent error between the expected weight loss for extruder weigh hopper versus the actual weight loss for the extruder hopper.
- **Rate:**
  - Instantaneous Rate –
  - Set Rate – The set rate of the extruder as determined by the current recipe. This is valid if the system is in automatic.
  - Actual Rate – The actual rate of the extruder as determined by the TrueWeigh control platform.
  - % Error – The percent error between the set versus actual extruder rate values.

# Setup and Configuration (continued)

Line 1: TrueWeigh Diagnostic 08:16:43 ?

X20 PLC Extruder Nip Additive More...

Status	Actual Speed	0.00 rpm	Instant	0.000 lbs/hr	Extruder 1
Feed Table				Set	0.000 lbs/hr
	Coast Counter	0	Actual	0.000 lbs/hr	Extruder 2
Weight	Delta Grams	0.0000 g	% Error	0.00 %	Extruder 3
	Total Delta Grams	0.00 g			
	Minimum Weight Loss	0.00 g			
	Weight Loss Error	0.00 %			

Alarm Hand Control Simulation Private Setup

Extruder Stopped

## Feed Table

This page shows the extruder material throughput rate table.

- **Valid Points:** The number of valid data points calculated for the position in the table.
- **Min. Rate:** The minimum feed rate of material possible for the position in the table.
- **Max. Rate:** The maximum feed rate of material possible for the position in the table.
- **Average:** The calculated moving point average for the position in the table.
- **Speed:** The average extruder drive speed for the position in the table.
- **Valid Segments:** The total number of valid segments in the rate table.
- **Current Segment:** The current segment the extruder is currently operating in.
- **Slope:** The current slope of the rate curve.
- **Max. Rate:** The maximum rate possible for the extruder.

Line 1: TrueWeigh Diagnostic 08:18:12 ?

X20 PLC Extruder Nip Additive More...

#	Valid Points	Min. Rate	Max. Rate	Average	Speed	
0	0	0.0000	0.0000	0.0000	0.00	Extruder 1
1	0	0.0000	0.0000	0.0000	0.00	Extruder 2
2	0	0.0000	0.0000	0.0000	0.00	Extruder 3
3	0	0.0000	0.0000	0.0000	0.00	
4	0	0.0000	0.0000	0.0000	0.00	

Valid Segments 0 Slope 0.0000

Current Segment 0 Max. Rate 0.00

Alarm Hand Control Simulation Private Setup

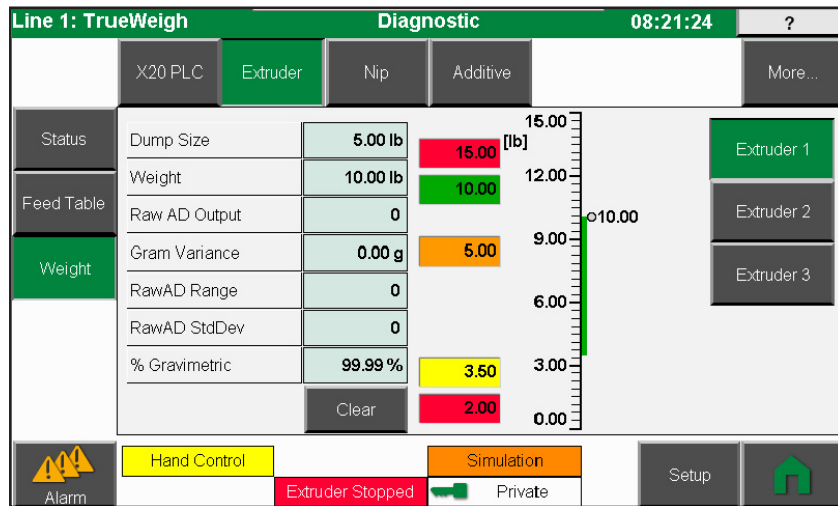
Extruder Stopped

## Weight

This page shows the extruder weigh bin status.

# Setup and Configuration (continued)

- **Dump Size:** The amount of material last dumped into the weigh hopper by the conveying system.
- **Weight:** The amount of material in the weigh hopper.
- **Raw AD Output:** The raw analog to digital converter output value reading for the extruder weigh bin.
- **Gram Variance:** The material weight variance experienced by the extruder weigh hopper.
- **Raw AD Range:** The statistical range of the Raw AD value.
- **Raw AD StdDev:** The statistical standard deviation of the Raw AD signal.
- **% Gravimetric:** The percentage of the time the extruder weigh hopper is experiencing full gravimetric operation. The [Clear] button will clear the percent gravimetric calculation.
- **Weigh Scale:** This is a graphical representation of the weight of material in the weigh hopper. Numerical values indicate the alarm and load on/off weights. Indicators will relate whether the weigh hopper is requesting material, or currently experiencing a load sequence

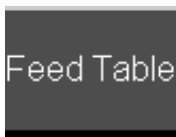


## Haul-off

This section highlights the status of the haul-off system and the quality of the control algorithm.



**Status:** This page provides information regarding the stability of the batch hopper itself.



**Feed Table:** This page provides the extruders rate table.

## Status

This page provides basic diagnostic information regarding the haul-off's current rate and control algorithm.



# Setup and Configuration (continued)

#	Valid Points	Max. Rate	Min. Rate	Average	Speed
0	0	10.005	0.000	0.000	0.00
1	0	20.009	10.005	0.000	0.00
2	0	30.014	20.009	0.000	0.00
3	0	40.018	30.014	0.000	0.00
4	5	50.023	40.018	1.000	49.96

## Additive

This section highlights the status of the additive system and the quality of the control algorithm. A system may have multiple additives and each additive will have its own parameters. When first entering the additive diagnostic screens the additive 1 is always presented first. Along the right side of the screen are (4) 'Selection' buttons with the additive names. The selected additive is represented as the depressed button. If there are additional additives there are additional previous and next buttons to navigate through all additives.

Status

Feed Table

Weight

**Status:** This page provides information regarding the stability of the additive itself.

**Feed Table:** This page provides the additive's rate table.

**Weight:** This page provides weight information for the additive's material hopper.

### Status

This page provides basic diagnostic information regarding the additives current rate and control algorithm.

- **Actual Speed:** This is the actual RPM of the additive.
- **Coast Counter:** This represents a counter which indicates if the current weigh system is currently in volumetric mode. When the counter reaches a value of 0 the weigh hopper is fully gravimetric.
- **Delta Grams:** The loss in weight of the additive weigh hopper between weight scans.
- **Total Delta Grams:** The total weight loss of the additive weigh hopper between rate calculation updates.
- **Minimum Weight Loss:**
- **Weight Loss Error:** The percent error between the expected weight losses for additive weigh hopper versus the actual weight loss for the additive hopper.

# Setup and Configuration (continued)

- **Rate:**
  - Instantaneous Rate –
  - Set Rate – The set rate of the additive as determined by the current recipe. This is valid if the system is in automatic.
  - Actual Rate – The actual rate of the additive as determined by the TrueWeigh control platform.
  - % Error – The percent error between the set versus actual additive rate values.

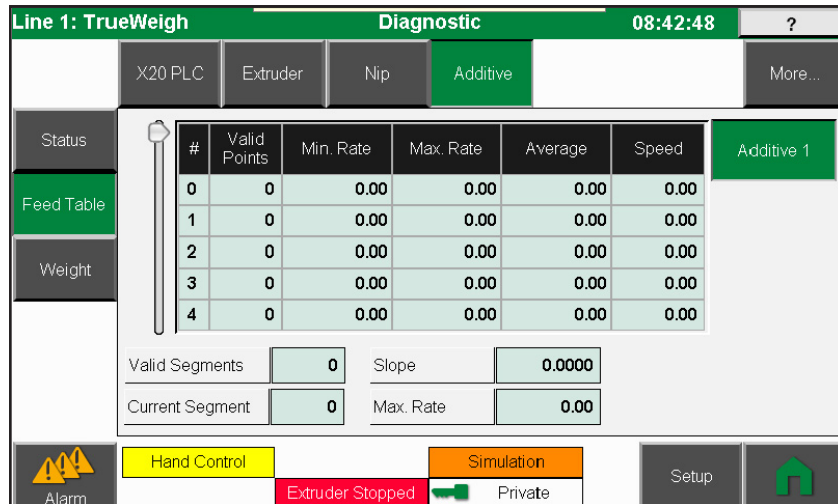
Line 1: TrueWeigh		Diagnostic		08:41:14		?	
	X20 PLC	Extruder	Nip	Additive			More...
Status	Actual Speed		0.00 rpm	Rate		Additive 1	
Feed Table	Instant		0.000 lbs/hr	Set		0.000 lbs/hr	
	Actual		0.000 lbs/hr	% Error		0.00 %	
Weight	Coast Counter		0	Total Delta Grams		0.00 g	
	Delta Grams		0.0000 g	Minimum Weight Loss		0.00 g	
	Total Delta Grams		0.00 g	Weight Loss Error		0.00 %	
	Minimum Weight Loss		0.00 g				
Weight Loss Error		0.00 %					
Alarm		Hand Control		Simulation		Setup	
		Extruder Stopped		Private			

## Feed Table

This page shows the additive material throughput rate table.

- **Valid Points:** The number of valid data points calculated for the position in the table.
- **Min. Rate:** The minimum feed rate of material possible for the position in the table.
- **Max. Rate:** The maximum feed rate of material possible for the position in the table.
- **Average:** The calculated moving point average for the position in the table.
- **Speed:** The average additive drive speed for the position in the table.
- **Valid Segments:** The total number of valid segments in the rate table.
- **Current Segment:** The current segment the additive is currently operating in.
- **Slope:** The current slope of the rate curve.
- **Max. Rate:** The maximum rate possible for the additive.

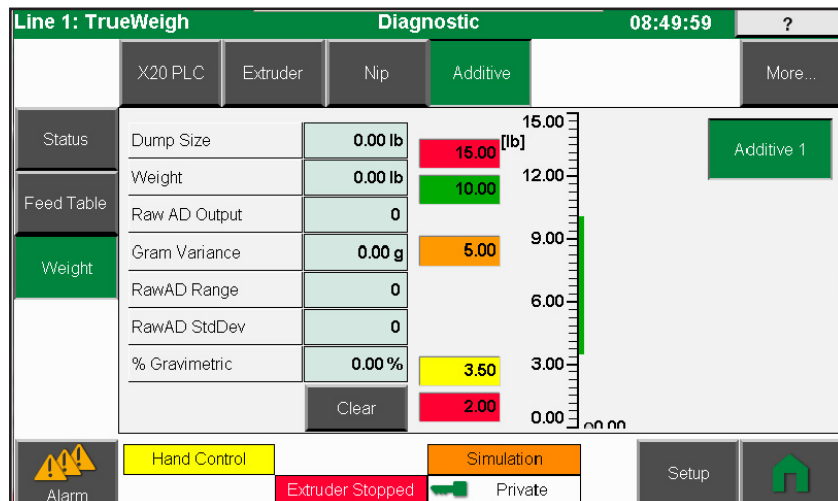
## Setup and Configuration (continued)



### Weight

This page shows the additive weigh bin status.

- **Dump Size:** The amount of material last dumped into the weigh hopper by the conveying system.
- **Weight:** The amount of material in the weigh hopper.
- **Raw AD Output:** The raw analog to digital converter output value reading for the additive weigh bin.
- **Gram Variance:** The material weight variance experienced by the additive weigh hopper.
- **Raw AD Range:** The statistical range of the Raw AD value.
- **Raw AD StdDev:** The statistical standard deviation of the Raw AD signal.
- **% Gravimetric:** The percentage of the time the additive weigh hopper is experiencing full gravimetric operation. The [Clear] button will clear the percent gravimetric calculation.
- **Weigh Scale:** This is a graphical representation of the weight of material in the weigh hopper. Numerical values indicate the alarm and load on/off weights. Indicators will relate whether the weigh hopper is requesting material, or currently experiencing a load sequence.



# Maintenance

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# Preventative Maintenance Schedule

The TrueWeigh system contains three components that should be verified for proper operation every six months. Being a loss-in-weight system, the proper operation of the loading equipment, the TrueWeigh hopper load cells, and the haul-off encoder is important for reliable and accurate control of the system.

Routine maintenance will ensure optimum operation and performance of the TrueWeigh system. We recommend the following maintenance schedule and tasks.

- **Whenever you change materials**
  - Check EMERGENCY STOP function
  - Test the safety interlock switch
  - Clean the extruder weigh hopper(s)
- **Monthly or as often as necessary**
  - Inspect hoses for damage or wear**  
Damaged compressed air hose can allow moisture or contamination to seep into the system. Replace any hose that is torn or cracked.
  - Inspect the installation**  
Check installed mounting hardware to make sure that the installation is secure.
  - Inspect the compressed air system**  
Check the compressed air system for leaks. Compressed air leaks could compromise the performance of the TrueWeigh system.
  - Drain the water separator in the compressed air system.**
- **Annually or as often as necessary**
  - Calibrate/adjust load cells on TrueWeigh hopper(s)

## Loading Equipment

The TrueWeigh hoppers are generally loaded with a positive shut-off slide gate or a vacuum receiver. In both cases, the proper operation of the loading component is necessary for accurate control of the loss-in-weight TrueWeigh hopper(s).

Inspect the slide gate above the TrueWeigh hopper. The gate should not leak material at all when closed. When open, it should open completely, to allow material to move through it. The slide gate contains an air cylinder and a solenoid valve. Inspect each of these devices to be sure no air leaks are present.

## TrueWeigh Hopper

The TrueWeigh hoppers are mounted directly to a load cell assembly. The connection to the load cell is the only mechanical connection for the TrueWeigh hopper. Inspect the hopper to ensure no mechanical interference is present. Any optional dust seals should be inspected for wear and replaced if necessary. Dust seals should be non-binding, and move freely about the hopper.

The load cell on the TrueWeigh hopper should be calibrated and checked. Calibrate the load cell and verify the weight reading from the load cell is correct, by placing a known test weight value on the TrueWeigh hopper. Observe the weight reading for the hopper on the 'Monitor' screen of the TrueWeigh controller touch screen.

## Haul-off Encoder

The haul-off for the system has an optionally supplied Conair encoder. This encoder supplies pulses to the TrueWeigh controller for calculating the line speed of the extruded product. Inspect the encoder shaft for wear of the shaft bearing. Inspect the calibrated wheel attached to the shaft to be sure the set screw is tight. Lastly, the wheel should be positioned to properly ride the haul-off mechanical system. This is usually done with a direct contact connection with the product, or by contacting a mechanical surface rotating the same speed as the extruded product.

Operate the haul-off device by setting it to a known speed. Observe the speed reading for the haul-off encoder on the 'Monitor' screen of the TrueWeigh touch screen controller.

## Software Upgrades

Upgrading the software on the TrueWeigh controller is accomplished by downloading the latest software version from Conair, copying the software to a USB stick, and rebooting the touch-screen controller.

To download the most up to date TrueWeigh software version, contact Conair service.

Contact Conair Parts at  
1.800.458.1960  
from outside the United States, call  
814.437.6861



# Troubleshooting

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## Before Beginning

You can avoid most problems by following the recommended installation, operation and maintenance procedures outlined in this User Guide. If you have a problem, this section will help you determine the cause and tell you how to fix it.

Before you begin troubleshooting:

- Find any wiring, parts, and assembly diagrams that were shipped with your equipment.** These are the best reference for correcting a problem. The diagrams will note any custom features or options not covered in this User Guide.
- Verify that you have all instructional materials related to the W Series Dryer.** Additional details about troubleshooting and repairing specific components are found in these materials.
- Check that you have manual for other equipment connected in the system.** Troubleshooting may require investigating other equipment attached to, or connected with the control.

## A Few Words of Caution



**WARNING: Improper installation, operation or servicing may result in equipment damage or personal injury.**

This equipment should only be installed, adjusted, and serviced by qualified technical personnel who are familiar with the construction, operation, and potential hazards of this type of machine.

All wiring, disconnects, and fuses should be installed and adjusted by qualified electrical technicians in accordance with electrical codes in your region. Always maintain a safe ground. Do not operate the equipment at power levels other than what is specified on the machine serial tag and data plate.



**WARNING: Voltage hazard**



Always disconnect and lock out the incoming main power source before opening the electrical enclosure or performing non-standard operating procedures, such as routine maintenance. Only qualified personnel should perform troubleshooting procedures that require access to the electrical enclosure while power is on.

# Identifying the Cause of a Problem

To find the cause of an alarm, on each screen in the system the 'Alarms' button appears in the lower left corner of the display. The color of this key will reflect the severity level of the most severe active alarm. Press the 'Alarms' button to navigate to a screen where the alarm list will be displayed. The list will display all unacknowledged alarms. Alarms whose state has cleared will also appear in the list if they have not been acknowledged. Once acknowledged, the cleared alarms will be removed from the list.

The cause of the alarm and the time that it occurred will be displayed on the screen. The user can navigate the alarm list using the 'Up' and 'Down' buttons. The 'ACK' button when pressed, acts to acknowledge all of the alarms in the list.

Next to the alarm list is text box which provides support information for the currently selected alarm. Scrolling through the alarm list, the text box will update with the appropriate support information.

# Signaling Alarm Message

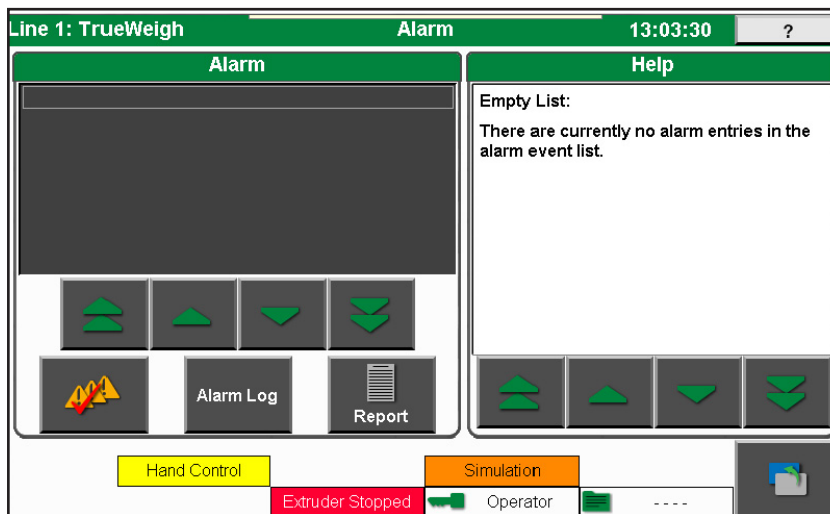
The operator knows when an alarm is occurring due a variety of means:

- The alarm beacon flashes.
- The <HOME> screen has an alarm indicator for each device which will turn on if that device is experiencing an alarm.
- The 'Alarm' button face will change from a 'gray' color to indicate the severity of the alarm.
- When the 'Alarm' button is pressed, the visualization will show a list of all alarms.



# Handling Alarm Messages

- 1 Press the 'Alarm' button to navigate to the 'Alarm List'.
- 2 Press the 'Ack' button to acknowledge and clear any old alarms.



(Continued)

# Alarms

The 'ALARM' button allows the operator to view, silence and acknowledge any alarm in the TrueWeigh system.

## TrueWeigh Alarms

The TrueWeigh alarm screen displays parameters used to generate alarms for the TrueWeigh extrusion control system.

Understanding alarm codes:

In front of some alarm messages you may see these designators:

- **Extruder 1, Extruder 2, Etc.** along with alarm text. Extruder number stands for the extruder that is causing the alarm. It is important to look at the alarm text and check to see if there is a problem with the extruder number listed. For example, the alarm code "Extruder 2: Out Of Material." indicates that this problem is occurring because of weigh hopper on extruder 2 is out of material.
- **Haul-Off** along with the alarm text. Haul-off alarms are alarms specifically generated by the haul-off / take-off device.
- **Additive 1, Additive 2, Etc.** along with alarm text. Additive number stands for the additive device that is causing the alarm. It is important to look at the alarm text and check to see if there is a problem with the additive number listed. For example, the alarm code "Additive 1: Low on Material." indicates that this problem is occurring because of weigh hopper used for additive 2 is low on material and is not being properly loaded.
- **System** along with the alarm text. System alarms are general alarms that are not related directly with a specific device or material.

# Replacing Fuses

This procedure covers the factory-installed fuses inside the TrueWeigh electrical control panel. If you have installed an electrical disconnect or emergency stop switch, additional fuses and/or breakers may have been used elsewhere in the main power circuit.

Located inside the TrueWeigh control panel are fuses for the AC line, FU1, and the power supply output side, FU2 and FU3.


To replace a blown fuse:

- 1 Disconnect and lockout the main power.**
- 2 Open the electrical enclosure door.** Turn the screws on the front panel counterclockwise to open.
- 3 Replace the fuse.** The fuses are located inside the control cabinet and are labeled and identified on the subpanel and the electrical print.
- 4 Close the electrical enclosure and restart the unit**

# Replacing Load Cells

- 1 Remove the material from the extruder's weigh hopper.**
- 2 Disconnect the load cell wiring that extends into the control box (see wiring diagram).**
- 3 Remove the two screws that are used to mount the weigh hopper to the load cell.**
- 4 Remove the weigh hopper.**
- 5 Remove the two screws that are used to mount the load cell to the hopper frame.**
- 6 Place a small amount of removable strength Loc-tite™ onto the two screws and re-install the load cell and extruder weigh hopper back onto the hopper frame.** Make sure that the load cell and hopper are mounted square with the hopper opening exit and tighten the screws to a value of 10 Nm.

Do NOT use excessive force. Forces that are exerted on the load cell from outside when attaching and removing the TrueWeigh extruder hopper load cell may damage the very sensitive load cell.

 **NOTE:** A set screw positioned below the load cell is used as a stop for the load cell to prevent damage if over weighting occurs. If this bolt was not loosened during removal or installation, it should not need adjusted. If it was loosened, the gap needs to be reset so the load cell contacts the bolt when the weigh bin is loaded full with material. A .020" feeler gage could be used to set the gap.



## **WARNING: Electric Shock**



High voltages can cause life-threatening currents in the body and injury from electric shock. Allow only trained and qualified electrical technicians to work on the electrical system. Before any electrical work, disconnect the unit from the power supply and lockout to prevent unauthorized persons switching it on.




## We're Here to Help

Conair has made the largest investment in customer support in the plastics industry. Our service experts are available to help with any problem you might have installing and operating your equipment. Your Conair sales representative also can help analyze the nature of your problem, assuring that it did not result from misapplication or improper use.

## How to Contact Customer Service

To contact Customer Service personnel, call:



 **NOTE:** Normal operating hours are 8:00 am - 5:00 pm EST. After hours emergency service is available at the same phone number.

**From outside the United States, call: 814-437-6861**

You can commission Conair service personnel to provide on-site service by contacting the Customer Service Department. Standard rates include an on-site hourly rate, with a one-day minimum plus expenses.

## Before You Call...

**If you do have a problem, please complete the following checklist before calling Conair:**

- Make sure you have all model, control type from the serial tag, and parts list numbers for your particular equipment. Service personnel will need this information to assist you.
- Make sure power is supplied to the equipment.
- Make sure that all connectors and wires within and between control systems and related components have been installed correctly.
- Check the troubleshooting guide of this manual for a solution.
- Thoroughly examine the instruction manual(s) for associated equipment, especially controls. Each manual may have its own troubleshooting guide to help you.

**Additional manuals and prints for your Conair equipment may be ordered through the Customer Service or Parts Department for a nominal fee.**

**Most manuals can be downloaded free of charge from the product section of the Conair website.**

**[www.conairgroup.com](http://www.conairgroup.com)**

## Equipment Guarantee

Conair guarantees the machinery and equipment on this order, for a period as defined in the quotation from date of shipment, against defects in material and workmanship under the normal use and service for which it was recommended (except for parts that are typically replaced after normal usage, such as filters, liner plates, etc.). Conair's guarantee is limited to replacing, at our option, the part or parts determined by us to be defective after examination. The customer assumes the cost of transportation of the part or parts to and from the factory.

## Performance Warranty

Conair warrants that this equipment will perform at or above the ratings stated in specific quotations covering the equipment or as detailed in engineering specifications, provided the equipment is applied, installed, operated, and maintained in the recommended manner as outlined in our quotation or specifications.

Should performance not meet warranted levels, Conair at its discretion will exercise one of the following options:

- Inspect the equipment and perform alterations or adjustments to satisfy performance claims. (Charges for such inspections and corrections will be waived unless failure to meet warranty is due to misapplication, improper installation, poor maintenance practices, or improper operation.)
- Replace the original equipment with other Conair equipment that will meet original performance claims at no extra cost to the customer.
- Refund the invoiced cost to the customer. Credit is subject to prior notice by the customer at which time a Return Goods Authorization Number (RGA) will be issued by Conair's Service Department. Returned equipment must be well crated and in proper operating condition, including all parts. Returns must be prepaid.

Purchaser must notify Conair in writing of any claim and provide a customer receipt and other evidence that a claim is being made.

## Warranty Limitations

**Except for the Equipment Guarantee and Performance Warranty stated above, Conair disclaims all other warranties with respect to the equipment, express or implied, arising by operation of law, course of dealing, usage of trade or otherwise, including but not limited to the implied warranties of merchantability and fitness for a particular purpose.**