SCALE-TRON

Automation, sensors and weighing systems

BatchTron II
User's Manual

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Customer Responsibility:
The customer in applying the product described in this document accepts that the product is a programmable electronic system which is inherently complex. In doing so, the customer therefore undertakes the responsibility to ensure that the product is properly installed, commissioned, operated, and maintained by competent and qualified personnel, trained in accordance with any instructions or safety precautions made available, or through proper engineering practices, and to thoroughly verify the use of the product in each particular application.

Errors in documentation:
The product described in this documentation is subject to continuous development and improvement. All information of a technical nature and particulars of the product and its use including the information and particulars contained in this documentation are given in good faith by Scale-Tron Inc.

This manual is intended only to assist the user in the installation, use, and operation of the product, and therefore Scale-Tron Inc. shall not be liable for any loss or damage whatsoever from the use of the information in, or any error in, or omission from this manual.

Should you have any difficulty in installation, operation or maintenance of your BatchTron-II batching system, our staff are available to help you during normal business hours and at any other time by special arrangement.

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1 INTRODUCTION

The BatchTron series of batch control systems are full-featured, World Class batch automation systems that run your plant at the highest possible speed while giving the rock-solid reliability that you need; freedom from worries that the control system will quit at a critical time. The use of industrial PLCs and touch screens for batching, rather than domestic PC computers, gives all versions of BatchTron this legendary freedom from service calls and costly downtime.

BatchTron control systems are versatile and adaptable to all types of batch based or continuous processes where solid and liquid ingredients need to be batched and mixed in a timed sequence. Concrete is the main application, but they are also used in bulk terminal controls, food, animal feed and any product that is made in batches. You can program interruptions for hand-added or micro-ingredients. You can also include automation of associated delivery belts, flying buckets, hoppers and delivery stations at any stage.

Throughout this manual, warnings, cautions, and special notes are added to indicate a potentially hazardous condition, or to identify a potentially hazardous situation if not corrected.

Describes a condition that may prove to be harmful or fatal to either personnel, equipment or both.

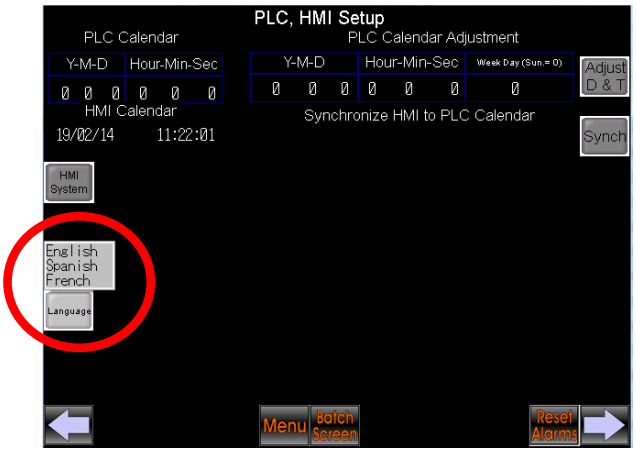
NOTE: Describes a condition which requires special attention

The Batchtron II has touch screen capability for 250 different screens, although only a few of these are used. Some screens control plant functions while some allow data entry. The **MENU** button provides access to the setup screens, which require a password before they can be altered. The formula entry screen also requires a password.

Screens 1 to 19 do not require a password and are intended for production personnel. Screens 20 to 39 require a security level 1 password. Screens 40 to 45 require a security level 2 password, intended for supervisory personnel. Screens 46 to 50 require a security level 3 password, for installation personnel only.

In the following descriptions bold text denotes screen titles, parameters and buttons.

For language selection go to **PLC, HMI Setup** page from **MENU**.



Using the **Language** buttton to the left of the screen select English, Spanish or French from the drop down list as required.

2 SYSTEM OPERATION

2.1 Before you start

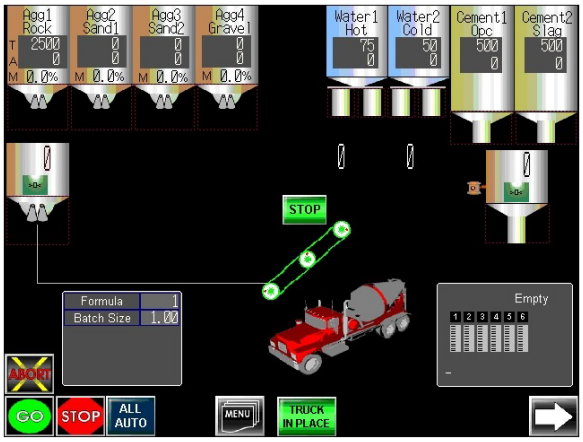
The Batchtron II has touch screen capability for 250 different screens, although only a few of these are used. Some screens control plant functions while some allow data entry. Scrolling through the screens is done with the arrow buttons in the bottom corners. The MENU button provides access to the setup screens, (20 – 39) which require a password before they can be altered. The formula entry screens (40 – 45) also require a password.

Shortcuts are provided from the main screen to other areas; touching anywhere in the top "bin" area will access the **MENU** screen. Touching the water or admix areas will access the water or admix screens. Other shortcuts will be provided when appropriate.

The screen arrangement is customized to your plant. Thus, some screens will differ from the description, or may not appear. Some custom screens will not be described here, but their features and operation conform to the standards of this manual.

Before turning on any equipment, ensure that no-one is working on or around the plant machinery. Ensure that all personnel are aware that equipment will start automatically and warn them before you start. Post warning notices on conveyors and mixers. Check the mixer in particular and ensure that the main power switch is open before allowing access. Keep the large red mushroom head emergency STOP button in the depressed state until you are ready to start. At any time during operation when you want to stop the equipment or if you think that someone is in danger, press the STOP button. All plant equipment controlled by the BatchTron will stop, but when you restart, it will continue from where it left off.

HOME or batching screen



When you are sure that it is safe, turn on the **POWER** circuit breaker. The Home batching graphic screen will appear, note that the truck may not be on the initial screen, depending on whether there is a **TRUCK IN PLACE** signal. If a mixer is part of the plant, this will be shown on the Home screen. Touching this will take you to the mixer screen.

The Home screen shows a diagram of the batch plant. Along the top of the screen are aggregate bins, water tanks and cement silos. Below the aggregate bins are the aggregate hopper and aggregates transfer belt. Below the cement silos are the mixer and admix bottles. Batch formula details are displayed. On the bottom row are process control buttons.

All symbols will either change color or shape to show the status of its represented equipment. All equipment running or stop status are displayed by the symbol's color. A light green symbol will be displayed when the equipment is running or energized. A dark green symbol will be displayed when the equipment is stopped or de-energized.

This batching screen can be recalled from any secondary screen by touching the "**HOME**" button.

For the aggregate bins, the top two rows display the aggregate name and type. The next two rows display target (T) and actual (A) weights used in the current running batch or previous finished batch. The target weight, will only change when a

new batch is started. The actual weight will only change during batching and will revert back to zero when a new batch begins. Finally the material SSD moisture (M) is displayed as a %. The system supports 16 aggregate bins but only the first four are displayed. Other bins will show when they are in use (feeding). Once the current batch is complete the screen will display the first four bins.

Touching the aggregate bin area of the screen will display the **Agg Control Panel** screen for a more detailed view of the aggregates.

The bin gates are touch actuator buttons to feed material into the scales. These buttons are active any time that this screen is displayed.

Pressing these GATE buttons will open the gates and release material. To prevent accidental feeding when the system is not in use, press the red emergency stop button on the console.

For the cement silos the top two rows display the cement name and type. The following two rows display target and actual weights. The lower row displays the actual value during and after each material feed. If the silo is equipped with a 'SILOWEIGH' its reading is provided on the bottom of the silo. The system supports 8 cement silos but only the first two are displayed. Others will show when they are in use feeding into the scale. Once the current batch is complete the screen will display the first four.

Touching the cement silo area of the screen will display the **Cement Control Panel** screen for a more detailed view of the cements.

The silo bottoms are touch actuator buttons to feed material into the scales. These buttons are active any time that this screen is displayed.

Pressing these FEED buttons will open the gates and release material. To prevent accidental feeding when the system is not in use, press the red emergency stop button on the console.

The water tanks show the title in the first two lines. This is followed by target and actual volume. As before, touching the bottom of the tank will discharge water. Touching the body of the tank will display the **Water Control Panel** for a detailed view of water type.

Each of the scale hoppers has a weight display, a **ZERO** button (in the box) and a discharge button (hopper bottom). The **ZERO** button will zero the scale reading to compensate for drift, material buildup and equipment maintenance. Similar to the **FEED** buttons, the **DISCHARGE** button will open the scale discharge gate or butterfly valve for cement scale - use caution as above.

Below the aggregate scale hopper is a conveyor belt. When the BatchTron receives the belt running signal the display rollers will rotate. A **STOP** button is above the belt.

Up to eight admix bottles can be displayed. They show the actual contents level. When all bottles have discharged, the **EMPTY** light will be displayed. Touching the bottle area will display the **Admix Control Panel** for a detailed view of the admixes.

In the bottom center there is dark green button **TRUCK IN PLACE**, when pressed it becomes light green and the truck symbol appears below the scales as shown. Alternatively, a mixer symbol is seen, which indicates the mixing action.

Three keys in the bottom left corner control the batching action:

GO initiates a new batch or restarts a stopped operation.

STOP halts material feed or scale discharge.

ABORT allows the batching process to be cleared when a fault has occurred. The batch must already have been stopped before it can be aborted. To abort a batch press and hold the stop and abort buttons for 2 seconds.

The scales, bottles, and mixer must be manually emptied and checked before starting a new batch.

PAUSE button will put production on hold. This button will flash during hold mode. Return to normal mode by pressing it again.

ALL AUTO button sets all the **AUTO** buttons throughout the system to green with one operation. Most **AUTO** buttons revert to **OFF** when power is turned off or lost. If any equipment is not in auto mode this button will change color.

MENU button will show the Menu Page, to select any screen page

Previous Screen is selected with the looped arrow button.

Help info for the current screen is selected with the **?** button.

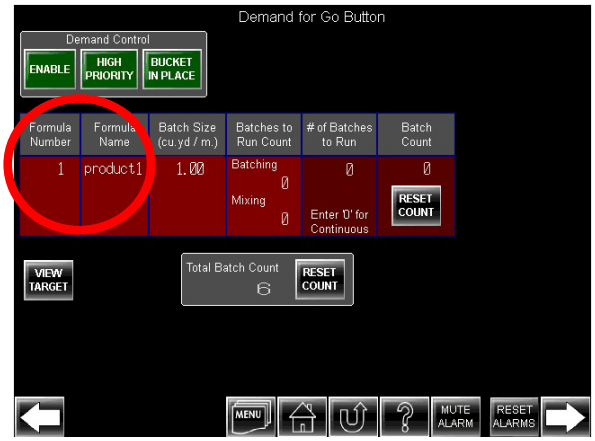
Scroll though screens with the corner arrows.

The design principle of BatchTron is to allow single manual control for any plant equipment, without the need to stop automatic operation and force the operator to run everything manually. This allows the operator to carry out operations such as mechanical maintainance or adjustment. However there is the potenttial for unwanted results. In the event that a problem is detected, pop-up warning windows will ask for confirmation or cancelation.

2.2 Run a Batch From the GO Button

Before starting a load, you must select the formula to be produced. To run from the **GO** button first retrieve the desired formula by pressing the ➔ button until **Demand for Go Button** screen appears. Alternatively double click on screen 9 in **MENU**.

Touch the **Formula Number** box and a numeric keypad pops-up. Enter the required formula number. The formula name is shown in the next box. Confirm by pressing **ENTER.** Select **Batch Size** box and enter the desired batch size. Confirm by pressing **ENTER**.



NOTE: ***Concrete formulas are normally stored as one cubic yard or cubic metre, which is equal to 100% or 1.00. To batch a 2 cu. yd. or cu. m. mix, enter 2.00. To batch a 3/4 cu. yd. (cu. m.) mix, enter .75.***

In the **No. of Batches to Run** box, enter the number of batches desired for a production run. For repeated batching, when using “bin low” or “bucket in place” signal, enter 0. Confirm by pressing **ENTER**.

Batch Count records the number of batches completed in the current cycle.

RESET COUNT allows a new sequence to be entered while the production is running. Touch **O.K. TO RUN** in order to effect these changes on the next batch.

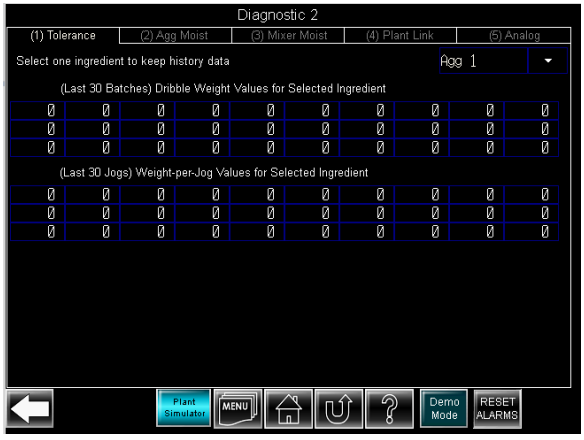
VIEW TARGET button will display the All ingredients' target weights with water compensation based on the SSD moisture (aggregates and water only) and batch size. This gives the operator a quick way to verify the upcoming concrete before starting production. Return to the **Demand** screen by touching **EXIT**.

SIMULATE MODE

The **PLANT SIMULATION** button allows the production cycle to run in the **SIMULATE** mode. This mode is useful for training or fault-finding purposes.

The red mushroom **EMERGENCY STOP** button on the console must be depressed to prevent actual plant equipment such as aggregate feeds and conveyors from running.

This function can be reached by pressing the corner arrow ➔ until **Diagnostic 2** screen appears. Alternatively double click on screen 19 in **MENU**



SIMULATE mode is activated and cancelled by touching the **Plant Simulation** button and entering the appropriate password in the pop-up keypad, then **ENTER**.

The system will run through batch and mixing sequences, just as if real batches were being made. Operators can be taught the different functions in this way. Since PLC outputs are live these can be checked for correct sequencing in the case of an equipment failure.

Press **HOME** button to return to the batching screen. When all is ready and you have ensured that no personnel are working on the equipment, turn the large red mushroom head **EMERGENCY STOP** button to the right to energize the external equipment. Touch the **GO** button or energize the external **START** input to initiate the batch. The **GO** button should turn light green and the target weights should appear on the screen.

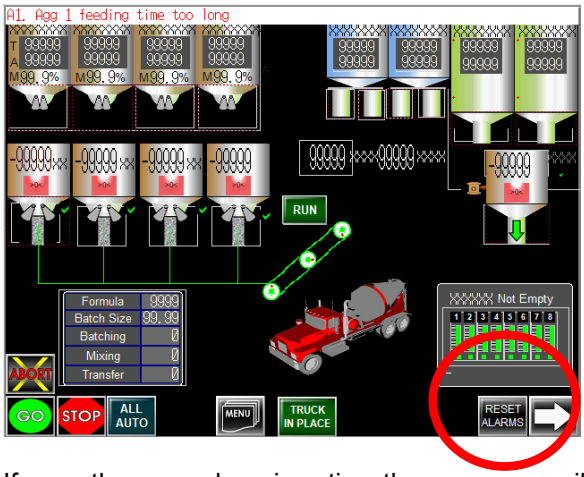
If the **STOP** button is not shown, the pre-start conditions have not been met. These differ from one system to another but check that the scale discharge gates are closed and any other input enabling conditions are met. An alarm should occur if at least one of the conditions for a batch start is not met.

If after a few seconds the alarm message **OVER ZERO BAND** appears on the top, one of the scales is off zero. Press the **RESET** button and note the scale readings. If one is over the zero-check band, check to ensure that no material is sticking in the scale hopper and press the **ZERO** button for the appropriate scale. When the scale indicates zero, press the **GO** button again.

Other alarm messages will appear if:

- The feed time exceeds the timeout value.
- The weight tolerance for an ingredient is exceeded.
- The admixes do not fill properly.
- The scales do not discharge within the allotted time.

Note the message on top of the screen and touch the RESET ALARMS button to disable alarms.

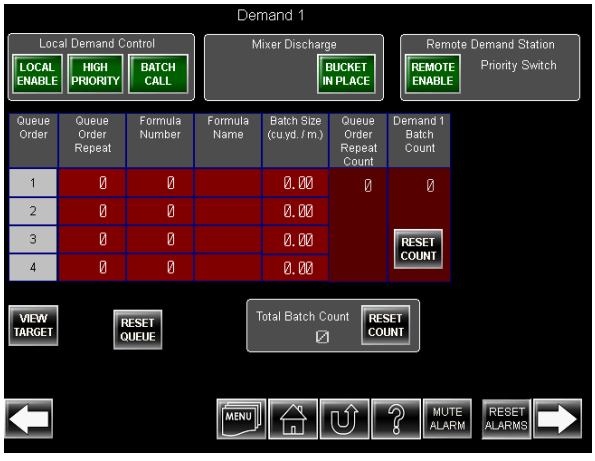


If more than one alarm is active, the messages will alternate.

The scales will automatically discharge into the mixer truck provided that the **TRUCK IN PLACE** condition is enabled. The scale discharge sequence is defined from the delay times in the **SETUP** menu.

2.3 Run batches using Demands

This screen can be reached by pressing the corner arrow ➔ until **Demand 1** screen appears, or by touching the **Formula Number** area on the home screen. Alternatively double click on screen 10 in **MENU**



Before starting a production run, you must select the mix design (formula) to be produced, batch size and number of batches to produce.
On the **Demand 1** screen, press the **Formula Number** box. A numeric keypad will display. Enter the desired formula number and touch **ENTER**. Note, the valid range of formulas is displayed at the top of the key pad. Once the formula number is entered, the formula name will then be refreshed under the formula name.

Touch on the **Batch Size** box and enter the desired batch size. Note that batch sizes are typically stored as cubic yards (or cubic meters). Touch the **ENTER** key to confirm.

Next, press the **Queue Order Repeat** box to select the number of batches to run. Again, a numeric keypad will display. Enter the desired number of batches and press the **ENTER** key. If this value is left as zero, then the system will run batch after batch as the “mud hopper low” or “bucket in place” signal is received.

Four different formulae can run in a queue. The **Queue Order Repeat** number defines how many batches each formula number repeats. A zero entered under **Queue Order Repeat** on a multiple **Queue Order** row will stop the queue.

On the **HOME** screen in the **Formula** box **Batching** sequence number and **Mixing** sequence number can be left as zero or else enter a number to select a sequence. Sequence 1 will be used if any sequence entered is left as zero.

VIEW TARGET will display all the ingredient targets, with water compensation effect and batch size. This gives the operator a quick way to verify the upcoming mix before starting the production. Touch **EXIT** to return to the Demand 1 screen.

Touch the **LOCAL ENABLE** button, to change the button color from dark green (disabled) to light green (enabled). This is a safety feature to ensure the formula, batch size & batch to run setup are correct for the expected production. Batching will only start with this button enabled. The button will maintain its status after a batch is complete. This button will be on disabled status (dark green color)

after system power up and after confirming the abort action.
The system will normally wait for the external “bucket in place” or “mud hopper low” input signal before starting a batch, if such an external push button or probe exists, and **HIGH PRIORITY** is disabled (dark green color).

Enabling the **HIGH PRIORITY** button will batch the ingredients into the scales as soon as the scales are empty. It will not wait for the external “mud hopper low” or “bucket in place” input signal. This gives the fastest production rate.

The system will wait for the external “bucket in place” or “mud hopper low” input to open the mixer door if such an external push button or probe exists; otherwise, the system will open the mixer door as soon as the mixing time counts down to zero.

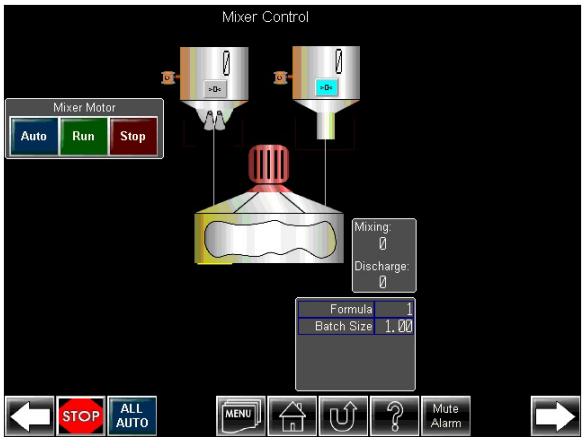
The **MUTE ALARM** button will mute the audible alarm of the alarm feature. The alarm will still display and be recorded by the system.

To return to the Home screen, touch the Home button. Alternatively press **MENU** button on the bottom of the screen, then double click on screen 1 in **MENU**.

When all is ready and you have ensured that no personnel are working on the equipment, release the large red mushroom head EMERGENCY STOP button to energize the external equipment. Press the **BUCKET in PLACE** button for the batching to begin. If the **Bucket In Place** button is energized, the mixer will discharge into the bucket automatically.

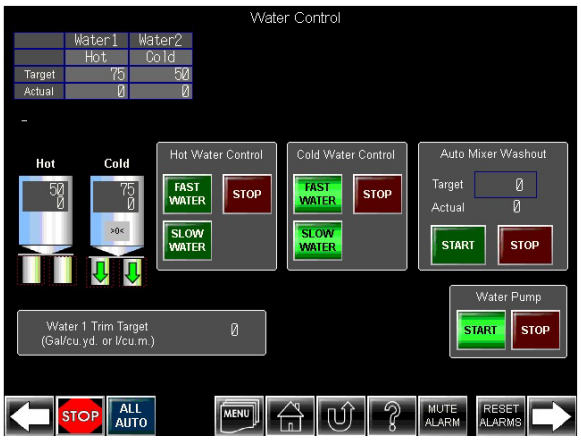
2.4 Mixer 1 & 2 operator screens

This screen can be reached by pressing the corner arrow ➔ until **Mixer Control** screen appears. Alternatively double click on screen 2 or 3 in **MENU**



2.5 Water control operator screen

This screen can be reached by pressing the corner arrow ➔ until **Water Control** screen appears. Alternatively double click on screen 4 in **MENU**

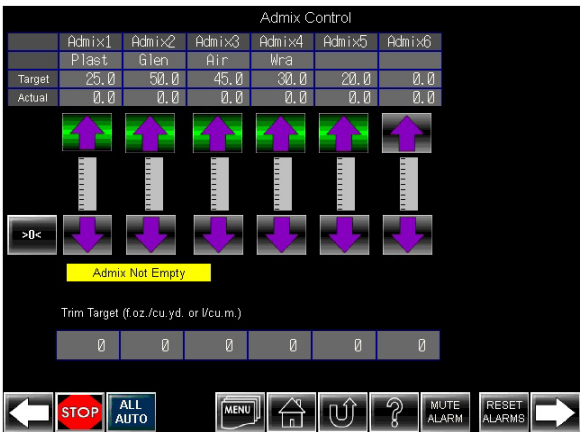


For water the top two rows display the Water name and type. (these have been entered in “Units, Names and labels” in screen 49 in **MENU)**. The following two rows display target and actual value amounts.

The **FAST WATER** or **SLOW WATER** buttons will start the water pump and feed water and indicate feeding in auto mode. The tank for water is intended to be used as a scale also, depending on the settings in the Formula entry screen.

2.6 Admix Control operator screen

This screen can be reached by pressing the corner arrow ➔ until **Admix Control** screen appears. Alternatively double click on screen 5 in **MENU**

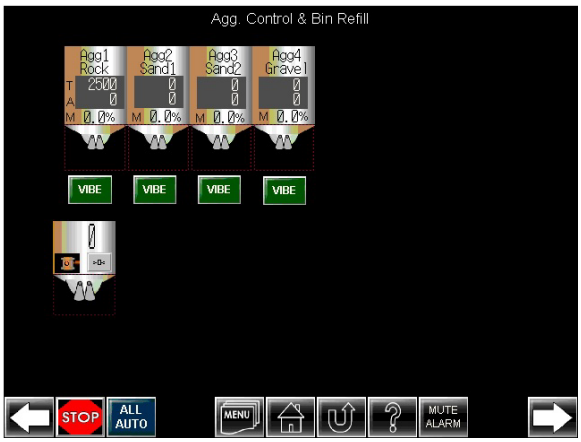


For Admix the top two rows display the Admix name and type. The following two rows display target and actual value amounts.

The **FILL** and **DISC** arrows above and below the admix symbols fill and discharge the sight glasses when touched. If admixes are fed directly, only the **FILL** buttons are active.

2.7 Aggregate Control Screen

This screen can be reached by pressing the corner arrow ➔ until **Agg Control & Bin Refill** screen appears. Alternatively double click on screen 6 in **MENU**

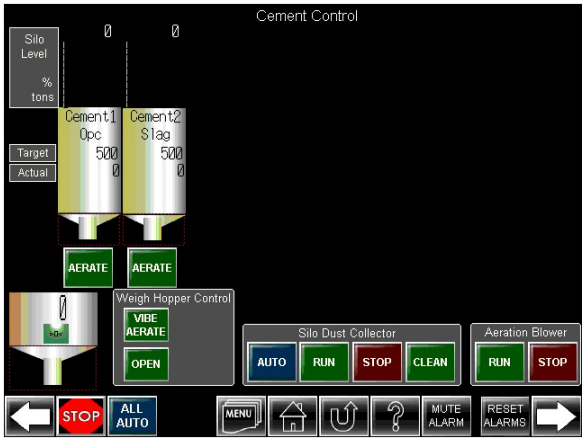


All equipment has **AUTO, STOP** and **RUN** buttons, except for the vibrator, which only has a **VIBE** button. **VIBE** buttons will be in dark green if the equipment is not turned on. If the PLC control system has sent running signal to the corresponded equipment these buttons will be light green. If the button is in light green and the corresponded equipment is not running, the fuse, magnetic contactor coil or circuit breaker need to be checked.

All equipment can be manually turned on by the touching the **RUN** button. A warning message will be displayed if the equipment's starting sequence is not followed (for example, open agg scale gate while agg transfer belt is not running. All equipment can be stopped by pressing the **STOP** button. The **AUTO** button can toggle the equipment between auto and manual modes. In manual mode, the equipment will not start automatically. The **AUTO** button will be light blue if it is in auto mode, it will be in dark blue if it is in manual mode.

2.8 Cement control operator screen

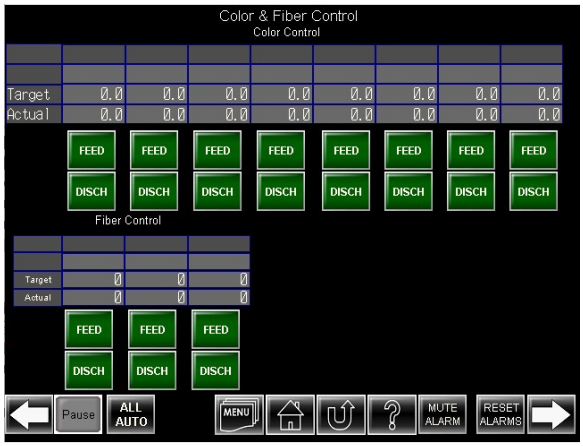
This screen can be reached by pressing the corner arrow ➔ until **Cement Control** screen appears. Alternatively double click on screen 7 in **MENU**



In the **Cement Control** screen there are cement silos and the cement scale. The silos have names and types on their tops following by actual and target values on the bottoms.

2.9 Color / fiber operator screen

This screen can be reached by pressing the corner arrow ➔ until **Color & Fiber Control** screen appears. Alternatively double click on screen 8 in **MENU**

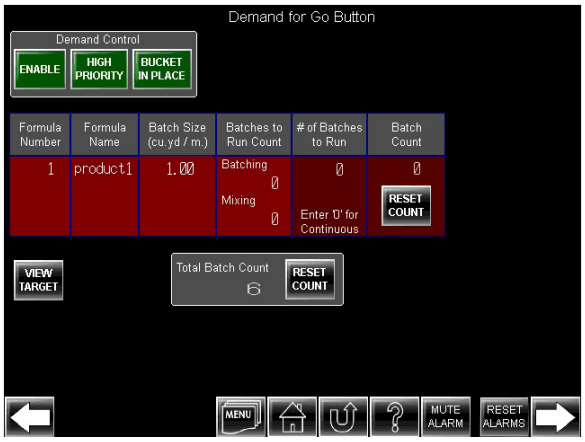


For Colors and fibers the top two rows display the colors and fibers name and type (this is entered in screen 49 “Units, Names and labels” in **MENU**), the following two rows display target and actual value amounts.

The **FEED** and **DISCH** buttons under the Colors and Fibers symbols feed and discharge the sight glasses when touched. If Colors and Fibers are fed directly, only the **FEED** buttons are active.

2.10 Demand for GO button screen

This screen can be reached by pressing the corner arrow ➔ until **Demand for Go Button** screen appears. Alternatively double click on screen 9 in **MENU**



The required formula number is entered with a pop-up keypad into the **Formula Number** box. The formula name is shown in the next box. The desired batch size is entered into the **Batch Size** box. The required batches to run in **No. Batches to Run** box, enter 0 for continuous production.

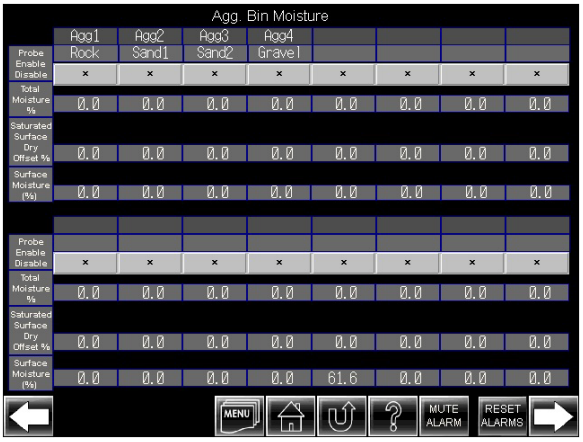
Batch Count records the number of batches completed in the current cycle.

RESET COUNT allows a new sequence to be entered while the production is running.

VIEW TARGET button will display the all ingredients target with water compensation effect and batch size. This gives the operator a quick way to verify the upcoming concrete before starting the production. Return to the **Demand** screen by touching **EXIT**.

2.11 Aggregate Bin Moisture

This screen can be reached by pressing the corner arrow ➔ until **Agg Bin Moisture** screen appears. Alternatively double click on screen 14 in **MENU**



The surface (free or SSD) moisture in aggregates will cause an error in the batched weights unless compensated. **Batchtron II** allows both manual and automatic entry of free moisture values plus compensation for Absorption if the entered values or moisture sensor used Total Moisture. Once entered, the weight of aggregate is automatically corrected and the water value is reduced as a result. You will notice that the aggregate target weights on the batch screen will be higher than they were before compensation.

To enter manual values, select the field for aggregate 1 to 6 by touching on the desired field. Enter the moisture value, with decimal point, followed by **ENTER** key.

3 SYSTEM SETUP

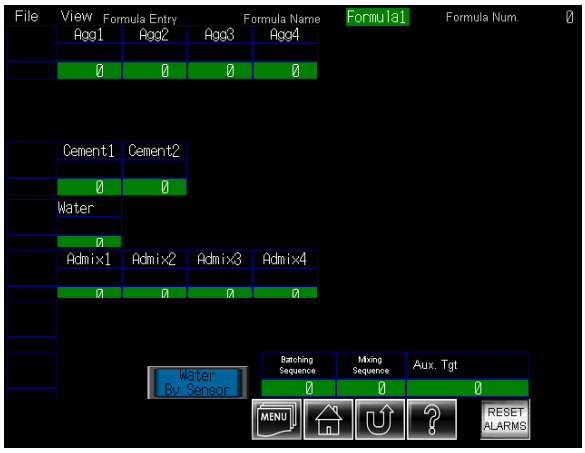
3.1 Passwords

Refer to **Appendix** section 5:

Screens 1 to 19 are for plant operators and require no password.
Screens 20 to 39 are protected by the setup password.
Screens 40 to 42 are protected by the formula password.

3.2 Formula Entry

This screen can be reached by double clicking on screen 40 in **MENU** and entering the formula password.



You can enter formulas (mix designs) on this screen.
It provides you with two tab functions, **FILE** and **VIEW.**

FILE tab – allows you to execute the following functions:

Save button - allows you to enter and save formulas.

Open button - allows you to retrieve formulas for viewing.

Save As button - allows you to modify a formula from one formula number and save as another formula number.

Clear All button - allows you to clear all formulas. Caution – this will remove all formulas.

Print button – allows you to print current formula.

To enter a formula: From the **File tab** menu, choose **OPEN** and with the pop-up keyboard enter desired formula number (formula 1 to 300) in Formula/ Recipe number. The formula name will be retrieved as verification. If you are unsure whether there is already a formula at a particular formula number, enter the formula number and check whether the formula name appears. Press **OPEN** to retrieve the saved formula, or choose another formula number if it is already occupied.

On **Formula Entry** screen, touch each entry area to open a keypad. Enter the desired values on the keypad, followed by **ENTER**. The **CLR** button clears a wrong entry. The **Formula Name** field can hold maximum 8 characters. The **Formula Num**. field is just for reference. Note that Aggregate weights must be entered as SSD moisture values, i.e. the weight of the aggregate including absorbed water but zero free water.

Once all ingredients are entered and correct, save the formula from file menu, choose **Save** or **Save As**. If **Save As** was selected, you will have an opportunity to choose a new formula number and name.

To modify a formula, follow the above procedure. Retrieve it from the File menu, selecting **OPEN.** - Enter formula number and press **OPEN**. This formula can be saved by the File menu, choosing **Save**. It can also be saved with another number and name by the File menu, choosing **Save As ->** and entering a new formula number / name and press **Save**. This is a convenient way to copy and paste a formula with minor changes.

VIEW tab– allows you to view batching targets by batch size, batch targets in different units, water/cement ratio and admix/cement ratios.

Show Target by Batch Size menu views batching target for different batch sizes and water compensation.

To enter the mixing design by one cubic unit (cu. yd. or cu. m.) is strongly recommended. To view different batch size, sand or water targets compensation by sand moisture, from the **View** menu, choose **Target by Batch Size** enter desired batch size in percent, to view the result.

To view the mixing design, in alternative units from the **View** menu, choose **Switch Units**

To view water/cement ratio, from the **View** menu, choose **Water Cement Ratio**. W/C ratios will pop up.

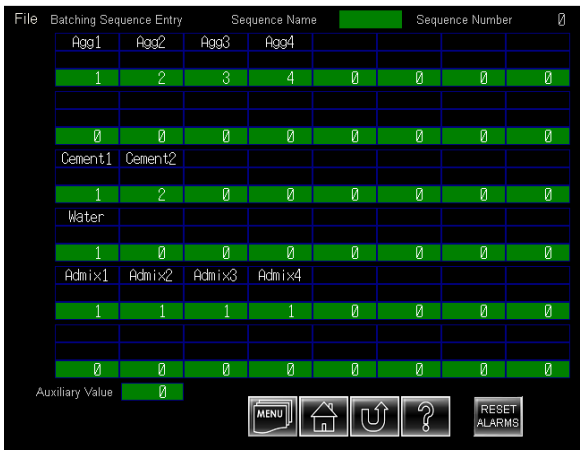
To view admixes volume to cement weight ratios, from the **View** menu, choose **Admix Cement Ratios**. Ratios of admix volumes to 100 weight units of cement will pop up.

Press **CANCEL** to close popup windows at any time.

The last three fields on the last row usually are used for special functions. They can hold mixer moisture probe value; mixer moisture %; or slump meter value. This value can be used or ignored by the system depending on the selection of **Water Control Method Selection** on the demand screen. These three aux targets are often renamed to reflect their usage in the system. The values can be set differently in different formulas to allow control of these parameters directly from the formula.

3.3 Batching Sequence Entry

This screen can be reached by double clicking on screen 41 in **MENU** and entering the formula password.



Batching Sequence Screen provides functions to define the sequence of ingredient to the weigh hopper. It provides you with the following functions:

FILE tab allows you to execute the following functions:

Save button - allows you to enter and save batching sequences.

Open button - allows you to retrieve batching sequences for viewing.

Save As button - allows you to modify a batching sequence from one sequence number and save as another sequence number.

Clear All button - allows you to clear all batching sequences.
Print button – allows you to print current batching sequence.

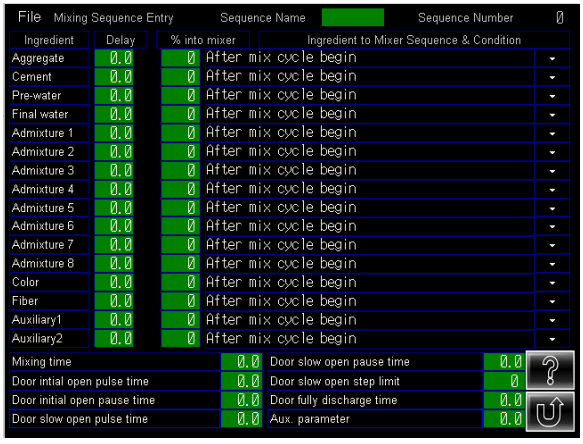
On the top of the page you can enter the **Sequence Name,** a maximum of 8 characters can be entered. If **Sequence Name** is already 8 characters long, use **CLR** or **BS** keys to move the cursor back, otherwise no new character can be entered.

This screen will be refreshed to show the sequence to be used for the running mixing cycle. This refreshing will happen whenever a new batching cycle started. Be aware of this and do not edit the sequence during this interval.

You can open a popup menu by pressing the down arrow buttons on each step (row) to setup ingredient the sequence. You can select the sequence for each ingredient to be fed into the weigh hopper. For example 1, 2, 3 means the ingredient from bin 1 to weigh hopper first followed by bin 2 and 3. Another example, 2, 1, 3 means the ingredient from bin 2 to weigh hopper first followed by bin 1 and 3.

3.4 Mixing Sequence Entry

This screen can be reached by double clicking on screen 42 in **MENU** and entering the formula password.



The **Mixing Sequence** screen controls ingredients to mixer sequence and mixing cycle timing.You can enter mixing designs on the screen.

FILE tab: allows you to execute the following functions:

Save button: allows you to enter and save mixing sequences.

Open button: allows you to retrieve mixing sequences for viewing.

Save as button: allows you to modify a mixing sequence from one mixing number and save as another mixing number.

Clear All button - allows you to clear all mixing sequences.

Print button – allows you to print current mixing sequence.

On top of the page you can enter the sequence name, (maximum 8 characters). If sequence name is already 8 characters long, after opening the keyboard, use **CLR** or **BS** keys to move the cursor back, to make room for new charactors.

On the middle of the screen are **Delay for each ingredient**; % **of into mixer** and **Ingredient to Mixer Sequence & Condition** entry area.

On the bottom of the page are eight time parameters entry areas; **Mixing time; Door initial open pulse time; Door initial open pause time**; **Door slow open pulse time; Door slow open pause time**; **Door slow open step limit; Door fully discharge time** and **Aux parameter**.

This screen will be refreshed to show the sequence to be used for the running mixing cycle. This refreshing will happen whenever a new mixing cycle started. Do not edit the sequence during this interval.

A popup menu can be opened by pressing the down arrow buttons on each step (row) in order to setup the **Ingredient to Mixer Sequence & Condition**. Conditions can be selected for each ingredient to be fed into the mixer, touch **ENTER** to confirm.

If the popup menus are closed by accidently touching any area on the screen the previous selected item will be still in effect.

There are 16 different ingredients which can be fed into the mixer in 16 different steps (sequences). Each step can take place one after another or overlapped with each other.

For example, your mixing design requires that:-

-Aggregate materials to be fed to mixer first.

-Cementitious materials to be fed to the mixer 15 seconds after aggregate material in the mixer.

-Pre-water to be fed into the mixer 2 seconds after all cementitious materials in the mixer,

-Final water to be fed into the mixer 2 seconds after all admix 2 inthe mixer.

-Admix 1 to be fed into the mixer 5 seconds after pre-water in the mixer.

-Admix 2 to be fed into the mixer 7 seconds after admix 1 in the mixer.

You can enter: **Ingredients**; **Delay**; **% into Mixer**; **Ingredient to Mixer Sequence & Condition** as follows for this example.

Aggregate; 0.0; 0; After mixing cycle starts
Cement; 15.0; 0; After aggregate starts feeding to mixer
Pre-water; 2.0; 0; After all cement is in mixer
Final water; 2.0; 0; After admix 2 starts feeding to mixer
Admix 1; 5.0; 0; After pre-water starts feeding to mixer
Admix 2; 7.0; 0; After admix 1 starts feeding to mixer

For any ingredients which your plant does not have, **After mixing cycle starts** should be selected as the condition. The times on the bottom are mixing and aux parameters.

The parameter meanings are as the following:
Mixing time: Net mixing time after all ingredients are fed into the mixer.

For mixer discharging, BatchTron can open the mixer right away or slowly open the door step by step. The following five parameters are for mixer door opening control.

Door initial open pulse time: A short time will yield a small door opening, to help regulate the discharge rate.

Door initial open pause time: This is the delay time after an initial small opening is achieved.

Door slow open pulse time: After the initial opening. The mixer door is opened further, to allow for a larger discharge flow.

Door slow open pause time: After the initial opening. this is the delay before the next opening on time (pulse).

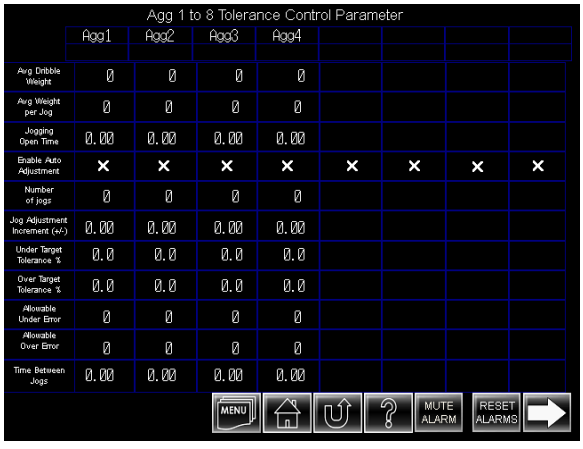
Door slow open step limit: Total steps (including initial opening and slow opening) limit. This is the number of cycles for which the door will be pulsed based on the above mixer door slow open on & off times. After this, the mixer door will go to fully open.

The operator can set Mixer **Door initial open pulse time** to very long (999.9), to open the mixer door at once after after the mixer discharge cycle starts

Mixer discharge time is set by **Door initial open pause time.** Mixer door will be held in fully open position for this time, then the mixer door will close. Door is held fully open for this time before completing the mixer discharge cycle, when a new mix cycle can be started.

3.5 Aggregate Tolerance

This screen controls the aggregate tolerance and can be reached by double clicking on screen 20 in **MENU** and entering the setup password.



Agg Dribble Weight - Aggregate free fall weight during feeding. Gate will close from fully open (when aggregate is feeding by gate); or feeder will stop from full speed (when aggregate is feeding by belt).

Agg Weight per Jog - The value should be less than 1.5 the tolerance weight. If target is 2200 lb; under and over tolerance is 2%; the tolerance weight is 44 lb.

Jogging Open Time - Gate Jogging open time or motor jogging run time. Adjust this time to make the parameter 02 less than 1.5 tolerance weight; in previous example; it is 66 lb.

Enable Auto Adjustment – Disabling will hold parameter 01 to 03 unchanged. Operator can manually edit the parameter 01 to 03. Enabling this will allow the control system to calculate the actual free fall average as parameter 01; actual weight per jog average as parameter 02; increase or decrease parameter 03 to get weight per jog average in the range of 1.5 tolerance weight or less. For a large aggregate bin, this should be enabled; for a small aggregate bin, this should be disabled. For small aggregate bin, the material level inside the bin changes a lot from batch to batch; the material flow rate is never stable and parameter 01 and 02 average result will change too much if this parameter is enabled.

Number of jogs -(for motor driven feeder, select zero). This value x Parameter 03 should be larger than the variation on parameter 01. For example; if the actual free fall weight from batch to batch has a variation of 110 lb compared with parameter 01 value, then parameter 02 x Parameter 03 must be larger than 110 lb. Increase this value if the variation on the actual free fall is very high. Increasing this value will increase the total batching time. Increasing this value can avoid tolerance error.

Jog Adjustment Increment (+/-)
Aggregate gate jogging open or motor jogging run time adjustment increment (+/-); this value will be used to adjust jogging time to make sure weight per jog is not too small and not too large. Zero will disable parameter 03 auto adjustment.

This parameter should be small or zero if material flow rate is not stable.

Under Target Tolerance % -
Aggregate under target tolerance as % of target. If target is 2200 lb, this parameter is 2%; the feeding will stop after weight is higher than 2156 lb. Reduce this value if concrete yield is important.

Over Target Tolerance % -
Aggregate over target tolerance as % of target. If target is 2200 lb, this parameter is 2%; the tolerance alarm will be triggered if weight is higher than 2244 lb

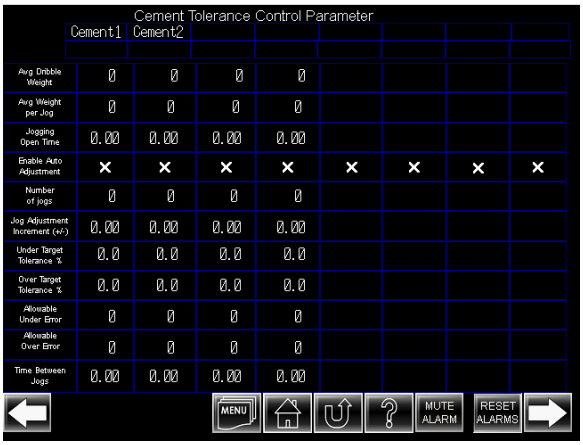
Allowable Under Error -
Aggregate allowable under target weight. When target is very small, parameter 07 result will be too low; in this case; this value will be used to stop feeding. For example; if this value is 10 lb and the target is only 450 lb, 1% is under tolerance; the feeding will stop after weight is higher than 440 lb.

Allowable Over Error -
Aggregate allowable over target weight; when target is very small; parameter 08 result will be too low. In this case, this value will be used to trigger alarm.

Time Between Jogs -
Aggregate time between jogs. 3 seconds is typical; increase this value if scale is not stable. Increasing this value will increase the total batching time. Increasing this value may improve the tolerance performance

3.6 Cement Tolerance Control

This screen controls the cement tolerance and can be reached by double clicking on screen 22 in **MENU** and entering the setup password.



Average Dribble Weight
Cement average free fall weight during feeding, with gate closing from fully open (if cement is feeding by gravity); or feeder stopping from full speed (when cement is fed by screw feeder).

Average Weight per Jog
Cement average weight per jog. The value should be less than 1.5 times the tolerance weight. If target is 910 lb, under and over tolerance is 1%; the tolerance weight is 14 lb.

Jogging Open Time
Cement gate Jogging open time or motor jogging run time. Adjust this time to make the parameter 02 value less than 1.5 times tolerance weight or less; in previous example; it is 14 lb.

Enable Auto Adjustment
Cement tolerance control auto adjustment. Disable will keep parameter 01 to 03 never changed. Operator can manually edit the parameter 01 to 03. Enabling this will allow the control system to calculate the actual free fall average as parameter 01; actual weight per jog average as parameter 02. Increase or decrease parameter 03 to get weight per jog average in the range of 1.5 tolerance weight or less. For a plant

which has a large cement silo; and using screw feeder, this should be enabled.

Number of jogs
Cement preferable jogging number (for motor driven feeder; please select zero). This value x Parameter 03 should be larger than the variation on parameter 01. For example; if the actual free fall weight from batch to batch has a variation of 50 lb compare with parameter 01 value, then parameter 02 x Parameter 03 must be larger than 50 lb. Increase this value if the variation on the actual free fall is very high. Increasing this value will increase the total batching time. Increasing this value can avoid tolerance error

Jog Adjustment Increment (+/-).
Cement 1 gate jogging open or motor jogging run time adjustment increment (+/-); this value will be used to adjust jogging time to make sure that the weight per jog is not too small and not too large. **Zero** will disable parameter 03 auto adjustment. Set this parameter to zero if cement feeding by screw feeder.

Under Target Tolerance %
Cement under target tolerance as % of target. If target is 910 lb and this parameter is 1%, the feeding will stop after weight is higher than 901 lb. Reduce this value if concrete yield is important; Reduce this value if regulation does not allow cement below target.

Over target tolerance %
Cement 1 over target tolerance as % of target. If target is 910 lb and this parameter is 1%, the tolerance alarm will be triggered if weight is higher than 919 lb.

Allowable Under Error -
Cement allowable under target weight; when target is very small; parameter 07 result will be too low; in this case; this value will be used to stop feeding.

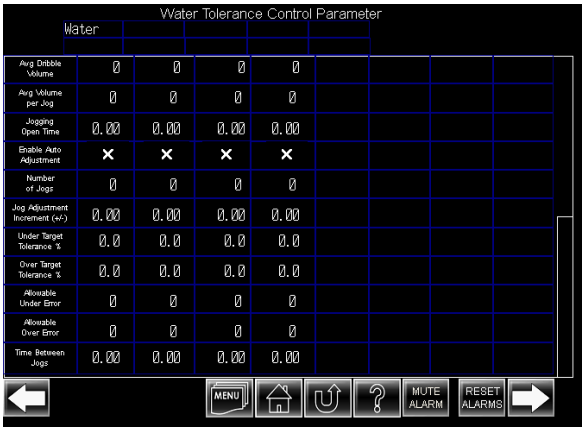
For example; if this parameter is 5lb; and target is only 430 lb, under tolerance is 1%; the feeding will stop at 475 lb.

Allowable Over Error
Cement allowable over target weight; when target is very small, parameter 08 result will be too low; in this case; this value will be used to trigger alarm.

Time Between Jogs
Cement time between jogs. 3 second is typical; increase this value if scale is not stable. Increasing this value will increase the total batching time. Increasing this value may improve the tolerance performance.

3.7 Water Tolerance Control

This screen provide control for water tolerance, and can be reached by double clicking on screen 23 in **MENU** and entering the setup password.



Average Dribble Volume
Water average free fall volume during feeding, gate closing from fully open (if water is feeding by gravity) or feeder stopping from full speed (when water is feeding by pump).

Average Volume per Jog
Water average volume per jog. The value should be less than 1.5 the tolerance weight. If target is 510 lb, under and over tolerance is 1%; the tolerance weight is 5 lb. This parameter is only used if water is measured by weigh hopper (scale).

Jogging Open Time
Water gate Jogging open time or motor jogging run time. Adjust this time to make the parameter 02 value less than 1.5 tolerance weight; in previous example; it is 8 lb. This parameter is only used if water is measured by weigh hopper (scale).

Enable Auto Adjustment
Water tolerance control auto adjustment. Disable will keep parameter 01 to 03 never changed. Operator can manually edit the parameter 01 to 03. Enabling this will allow control system to calculate the actual free fall average as parameter 01; actual weight per jog average as parameter 02; increase or decrease parameter 03 to get weight per jog average in the range of 1.5 tolerance weight or less. This should be enabled when water pressure is stable.

Number of Jogs
Water preferable jogging number (for motor driven feeder; please select zero). This value x Parameter 03 should be larger than the variation on parameter 01. For example; if the actual free fall weight from batch to batch has a variation of 50 lb compared with parameter 01 value, then parameter 02 x Parameter 03 must be larger than 50 lb. Increase this value if the variation on the actual free fall is very high. Increasing this value will increase the total batching time. Increasing this value can avoid tolerance error. This parameter can be set as zero when water pressure is stable. This parameter is only used if water is measured by weigh hopper (scale).

Jog Adjustment Increment (+/-)
Water gate jogging open or motor jogging run time adjustment increment (+/-); This value will be used to adjust jogging time to make sure weight per jog is not too small and not too large. Zero will disable parameter 03 auto adjustment. Set this parameter to zero when water is feeding by pump. This parameter is only used if water is measured by weigh hopper (scale)

Under Target Tolerance %
Water under target tolerance as % of target. If target is 510 lb, this parameter is 1%; feeding will stop after weight is higher than 505 lb.

Over Target Tolerance %
Water over target tolerance as % of target. If target is 510 lb and this parameter is 1%, the tolerance alarm will be triggered if weight is higher than 515 lb.

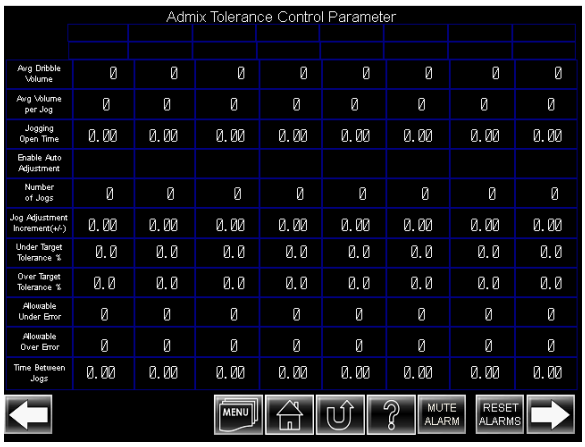
Allowable Under Error -
Water allowable under target weight; when target is very small, parameter 07 result will be too low. In this case, this value will be used to stop feeding. For example; if this parameter is 5 lb and target is only 430 lb, under tolerance is 1%; the feeding will stop at 475 lb.

Allowable Over Error
Water allowable over target weight; when target is very small, parameter 08 result will be too low. In this case, this value will be used to trigger alarm.

Time Between Jogs
Water time between jogs. 3 second is typical; increase this value if scale is not stable. Increasing this value will increase the total batching time. Increasing this value may improve the tolerance performance. This parameter is only used if water is measured by weigh hopper (scale).

3.8 Admix Tolerance

This screen provides control for Admix tolerance and can be reached by double clicking on screen 24 in **MENU** and entering the setup password.



Average Dribble Volume
Admix average free fall amount during feed valve closing from fully open (if admix is feeding by gravity); or feeder stopping from full speed (when admix is feeding by pump only).

Average Volume per Jog
Admix average amount per jog. This value should be less than 1.5 the tolerance weight. If target is 510 oz, under and over tolerance is 1%; the tolerance weight is 5 oz. This parameter is only used if admix is measured by weigh scale.

Jogging Open Time
Admix gate jogging open time or motor jogging run time. Adjust this time to make the parameter 02 value less than 1.5 times the tolerance weight; in previous example, it is 8 oz. This parameter is only used if admix is measured by weigh scale.

Enable Auto Adjustment
Admix tolerance control auto adjustment. Disabling will keep parameters 01 to 03 unchanged. Operator can manually edit the parameter 01 to 03. Enable this will allow the control system to calculate the actual free fall average as parameter 01; actual weight per jogging average as parameter 02. Increase or decrease parameter 03 to get weight per jog average in the range of 1.5 tolerance weight or less. This should be enabled when admix pressure is stable.

Number of Jogs
Admix preferable number of jogs (for motor driven feeder; please select zero). This value x Parameter 03 should be larger than the variation on parameter 01. For example; if the actual free fall weight from batch to batch has a variation of 50 oz compared with parameter 01 value, then parameter 02 x Parameter 03 must be larger than 50 oz. Increase this value if the variation on the actual free fall is very high. Increasing this value will increase the total batching time. Increasing this value can avoid tolerance error. This parameter can be set as zero when admix pressure is stable. This parameter is only used if admix is measured by weigh scale.

Jog Adjustment Increment (+/-)
Admix gate jogging open or motor jogging run time adjustment increment (+/-); this value will be used to adjust jogging time to make sure weight per jog is not too small and not too large. Zero will disable parameter 03 auto adjustment. Set this parameter to zero when admix is feeding by pump. This parameter is only used if admix is measured by weigh scale.

Under Target Tolerance %
Admix under target tolerance as % of target. If target is 510 oz and this parameter is 1%, the feeding will stop after actual is higher than 505 oz.

Over Target Tolerance %
Admix over target tolerance as % of target. If target is 510 oz, this parameter is 1%; the tolerance alarm will be triggered if actual is higher than 515 oz.

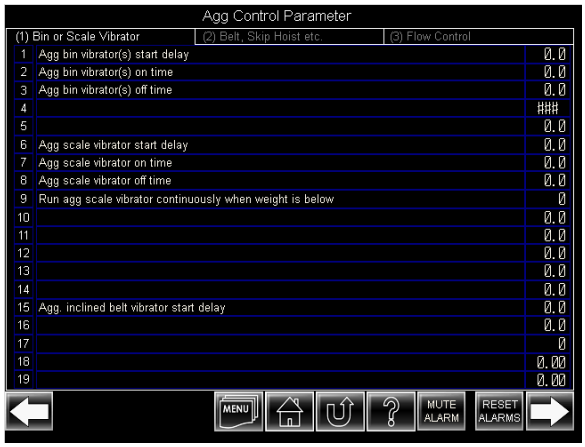
Allowable Under Error -
Admix allowable under target weight. When target is very small, parameter 07 result will be too low; in this case, the value will be used to stop feeding. For example, if this parameter is 5 oz and target is only 430 oz, under tolerance is 1%; the feeding will stop at 475 oz.

Allowable Over Error
Admix allowable over target weight; when target is very small, parameter 08 result will be too low; in this case, the value will be used to trigger alarm.

Time Between Jogs
Admix time between jogs. 3 second is typical; increase this value if weigh scale is not stable. Increasing this value will increase the total batching time. Increasing this value may improve the tolerance performance. This parameter is only used if admix is measured by weigh scale.

3.9 Aggregate Control Parameters

This screen controls equipment for aggregate. There are several tabs on top, select one to see the details. It can be reached by double clicking on screen 25 in MENU and entering the setup password.



Tab (1) Bin or Scale Vibrator

Aggregate bin vibrator(s) start delay (sec). Turn on vibrator after this time delay when feeding aggregate from bin to weigh hopper (scale). This and next two parameters control the vibrator in a start delay; on period; off period pattern. If the material does not flow by itself; after a time delay, the vibrator will run and stop and repeat this on off pattern continually. The time values should be optimized to run the vibrator as least as possible to aid the material flow.

Aggregate bin vibrator(s) on time (sec). Runs vibrator for this time when feeding aggregate from bin to weigh hopper (scale).

Aggregate bin vibrator(s) off time (sec). Stops vibrator for this time when feeding aggregate from bin to weigh hopper (scale).

Aggregate scale vibrator start delay (sec). Runs vibrator after this time delay when discharging aggregate from weigh hopper (scale). This and next two parameters control the vibrator in a start delay, on period, off period pattern. If the material does not flow by itself, after a time delay, the vibrator will run and stop and repeat this on/off pattern continually. The time values should be optimized to run the vibrator as least as possible to aid the material flow.

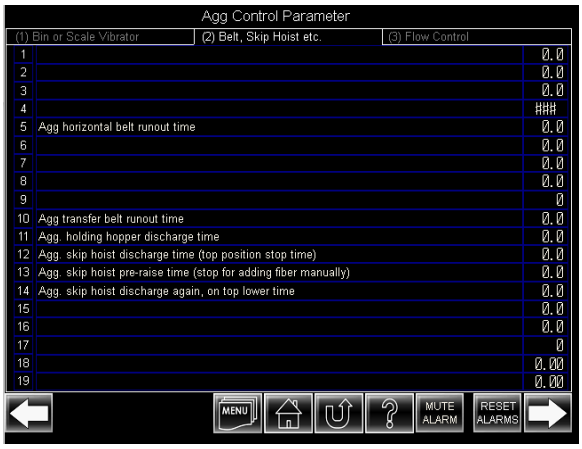
Aggregate scale vibrator on time (sec). Run vibrator for this time when discharging aggregate from weigh hopper (scale).

Aggregate scale vibrator off time (sec). Stop vibrator for this time when discharging aggregate from weigh hopper (scale).

Weight threshold to run scale vibrator continuously. This parameter will help to speed up the purge of the weigh hopper.

Aggregate holding hopper vibrator start delay (sec). This parameter only used if the conveyer or holding hopper has vibrator. This is the time delay between the hopper opening and the vibrator starting.

Tab (2) Belt, Skip Hoist etc



Agg horizontal belt run-out time (sec). In case there are two aggregate transfer belts, the aggregate discharges from a weigh hopper to first belt and the first belt discharges to a second (inclined) belt. The first conveyer will keep running for this time after the weigh hopper weight has reduced below the zero band.

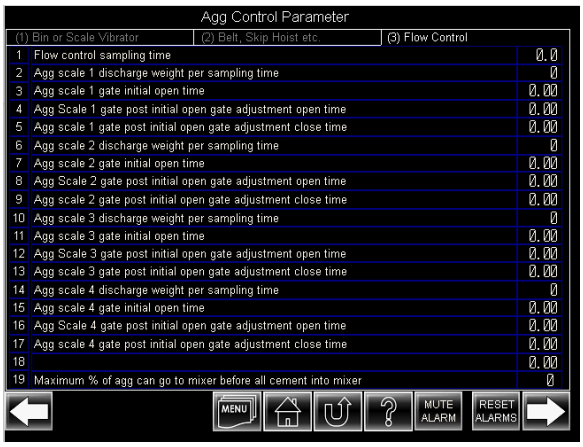
Aggregate transfer belt run out time (sec). In case the aggregate discharge from a weigh hopper to a transfer conveyer or a horizontal conveyer discharges to another (inclined) conveyer, this second conveyer will keep running for this time after weigh hopper is empty or horizontal conveyer stops.

Aggregate holding hopper discharge time. In case there is an aggregate holding hopper on top of the mixer, the hopper discharge gate will hold open for this time to empty the hopper.

Aggregate skip hoist discharge time (sec). In case there is an aggregate skip hoist, the skip hoist will stay in the top position for this time to empty the skip hoist.

Aggregate skip hoist pre-raise time (stop for adding fiber manually). In case the aggregate skip hoist is used to transfer some manually added material to the mixer; the skip hoist will raise for this time to move it to a position that is suitable for operator to manually add something into the skip hoist. Skip hoist will raise again after control system receives an input signal of manual material feeding complete.

Aggregate skip hoist discharge repeat time (sec). In case the skip hoist needs jogging discharge on its top position. The skip hoist will lower itself from the top position and rise back to the top three times to aid the material flow from skip hoist to mixer.



Tab (3) Flow Control

Flow control sampling time (sec). In case the material flow speed from a gate needs to be regulated (onto a conveyor belt), a three position double solenoid valve, with flow control valves to regulate the opening and closing speed, must be used to control the gate. The control system will adjust the gate open angle to regulator the flow rate from time to time; this time period is called sampling time. It is recommended to set this to 1 second.

Aggregate scale 1 discharge weight per sampling time.
If previous parameter is 1 second, for example, this parameter will set how much material can flow out of the gate per second.

Aggregate scale 1 gate initial open time (sec).
When the material flow speed from a gate needs to be regulated, a three position double solenoid valve must be used to control the gate. This parameter should be long enough for the gate to move to the approximate position of best flow. This setting should not allow overflow.

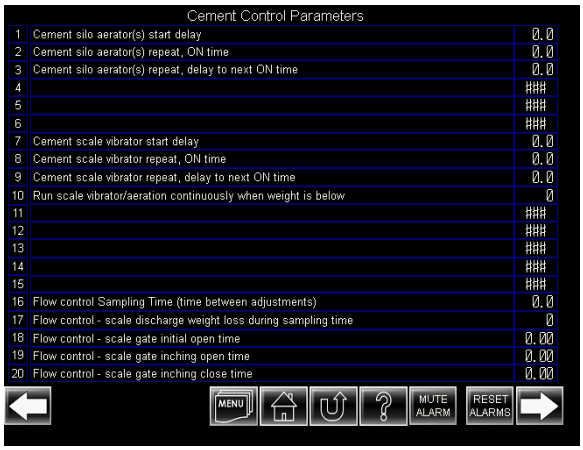
Aggregate scale 1 gate inching open time (sec).
After the flow control gate is initially opened, if the material flow rate is lower than intended, the gate open angle will be increased by pulsing it again. This parameter should be long enough to change the gate open angle a small amount.

Aggregate scale 1 gate inching close time (sec).
After the flow control gate is initially opened, if the material flow rate is lower than intended, the gate open angle will be decreased by pulsing it in the close direction. This parameter should be long enough to change the gate open angle a small amount.

% of aggregate fed to mixer before cement scale discharge.
In case the mixer needs to receive some aggregate first, then cement, then the rest of the aggregate, this parameter can be used to hold the aggregate flow to the mixer temporarily and resume aggregate flow after mixer receives all the cement.

3.10 Cement Control parameters

This screen controls the cement feed and aeration equipment. It can be reached by double clicking on screen 26 in MENU and entering the setup password.



Cement silo aerator(s) start delay.
Turns on material flow aid device (aerator or vibrator) after this time delay when feeding cement from silo to weigh hopper (scale). This and next two parameters control the device in a start delay, on period, off period pattern. If the material does not flow by itself, after a time delay, the device will repeat this on/off pattern continually. The time values should be optimized to use the device as little as possible to ensure adequate and consistent material flow.

Cement silo aerator(s) ON time.
Material flow aid device (aerator or vibrator) runs for this time when feeding cement from silo to weigh hopper (scale).

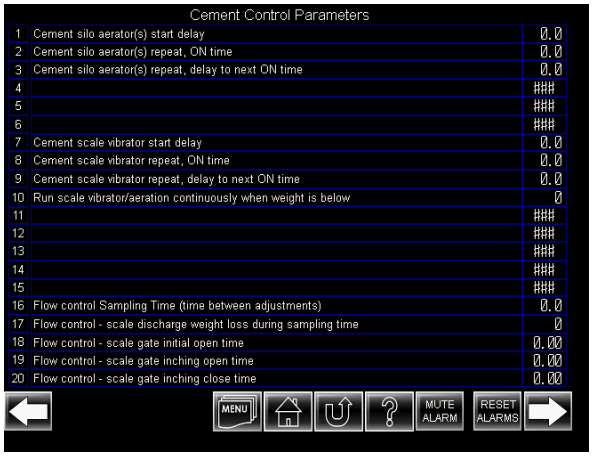
Cement silo aerator(s) delay to next ON time.
Material flow aid device (aerator or vibrator) stops for this time when feeding cement from silo to weigh hopper (scale). After each on/off cycle, it will repeat.

Cement scale vibrator start delay.
Runs material flow aid device (aerator or vibrator) after this time delay when discharging cement from weigh hopper (scale). This and next two parameters control the device in a start delay, on period, off period pattern. If the material does not flow by itself, after a time delay, the device will repeat this on/off pattern continually. The time values should be optimized to use the device as little as possible to ensure adequate and consistent material flow.

Cement scale vibrator ON time.
Run flow aid device (aerator or vibrator) for this time when discharging cement from weigh hopper (scale).

Cement scale vibrator delay to next ON time.
Stop material flow aid device (aerator or vibrator) for this time when discharging cement from weigh hopper (scale).

Weight threshold to run scale vibrator continuously. This parameter will help to speed up the purge of the weigh hopper.



For feed rate control of cement scale to truck or mixer, adjust the following as for aggregate flow control:

Flow control sampling time

Flow control scale discharge weight loss per sampling time

Flow control scale gate initial open time

Flow control scale gate inching open time.

Flow control scale gate inching close time.

Keep silo aerator running during jogging feed cycle.
Keep cement silo material flow aid device (aerator or vibrator) running when the feeding cycle is in jogging feed cycle

3.11 Water and Admix Control

This screen provides timing control for Water and Admix and can be reached by double clicking on screen 27 in **MENU** and entering the setup password.

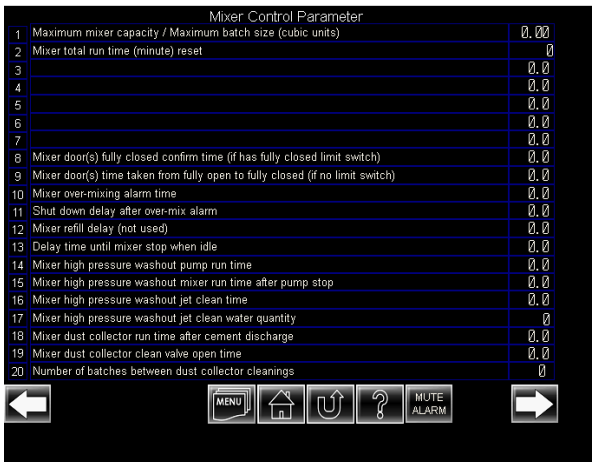
Pre-water as percent of total water. Sets the percentage of the water to be discharged into the truck or mixer before the dry ingredients are discharged. A value of zero will allow all the water to be added after the dry ingredients.

Water scale refill target weight.
If water scale is always full and de-cumulated to the mixer for the amount of pre-water and final water, the control system will refill the water scale to this target after mixer get all its water. This target should be larger than the largest normal water target.

Admix 1 bottle normal discharge time. Applies to all admixtures. The maximum time to discharge all the admixture to the truck or mixer. The discharge valve will be held open for this time.

3.12 Mixer Control parameters

This screen provide control for Mixer parameters, and can be reached by double clicking on screen 28 in **MENU** and entering the setup password.



The following line items can be entered:

Maximum mixer capacity / Maximum batch size (In cubic units). Enter mixer output capacity or maximum batch size in cubic units (cu. yd. or cu. m.).

Mixer total run time (minute) reset. This is an UP counter. Enter zero to reset. This is used for mixer maintenance schedule.

Mixer doors fully closed confirm time (if mixer has fully closed limit switch). Maintains mixer door close signal for this time after door fully closed signal is active. This ensures that the door is watertight during mixing.

Mixer doors time taken from fully open to fully closed (if no limit switch). Set this time to a little longer than the door travel time, to ensure that it is closed.

Mixer over mixing-alarm time. Warns the operator if the maximum mixing time is exceeded.

Shut down delay after over-mix alarm. Shuts down the mixer after alarm plus this delay.

Mixer refill delay. (not used)

Delay time until mixer stop when idle. Stop mixer after this time when no batching or mixing are in progress.

Mixer door maximum move time. Turn on the alarm during opening or closing the mixer door when a “mixer door fully open” or “fully closed” signal is not received during this time period.

Mixer high pressure washout pump run time. During an automatic high pressure wash-out cycle, the washout pump will run for this time period, after which the pump will stop while the mixer keeps running.

Mixer high pressure washout mixer run time after pump stop. Mixer discharge door will open after this time period.

Mixer high pressure washout jet clean time. During every mixing cycle, to avoid concrete blocking the washout jets, the washout system should run for a short time. The water will be counted as part of the batch.

Mixer high pressure washout jet clean water quantity (in water units)**.** The amount of water that will flow to the mixer during the jet cleaning cycle. This is based on the pump which is a constant volume unit, giving a precise volume per second.

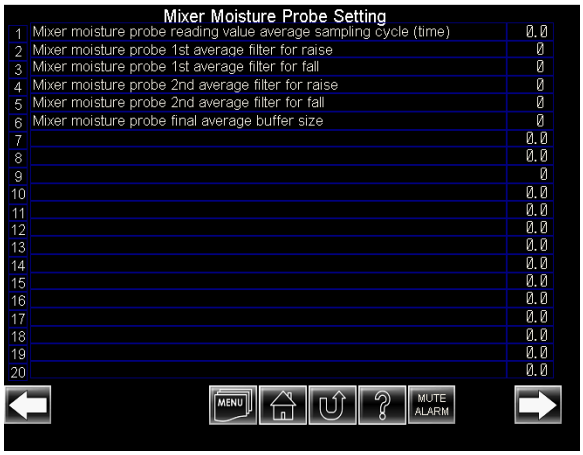
Mixer dust collector run time after cement discharge. Turns on the mixer dust collector before cement discharge to mixer; and keeps it running for set time period.

Mixer dust collector clean valve open time. Time to clean the mixer dust collector bag.

Number of batches between dust collector cleanings. Clean the mixer dust collector bag after this number of mixing cycles.

3.13 Mixer Moisture Sensor Setting

This screen allows setting of the moisture sensor averaging (smoothing) parameters and can be reached by double clicking on screen 30 in **MENU** and entering the setup password.



The following line items can be entered:

Mixer moisture probe reading value average sampling cycle (time). The control system will average the moisture probe signal. The time from one average to the next average calculation is the average sampling time. This value should be 1 sec.

Mixer moisture probe 1st average filter rising. During each average calculation, the new signal will be compared with the previous average result. If the new signal is higher, the difference will be divided by this filter and the result will be added to the previous average and saved as a new average result. Example: previous average result is 2000, new signal is 2100, the filter parameter value is 5, the new average result will be 2000 + (2100 - 2000) / 5 = 2020.

Mixer moisture probe 1st average filter falling. During each average calculation, the new signal will be compared with previous average result. If the new signal is lower, the difference will be divided by this filter and the result will be deducted from the previous average and saved as new average result. Example: previous average result is 2000, new signal is 1900, the filter parameter value is 2, the new average result will be 2000 - (2000 - 1900) / 2 = 1950

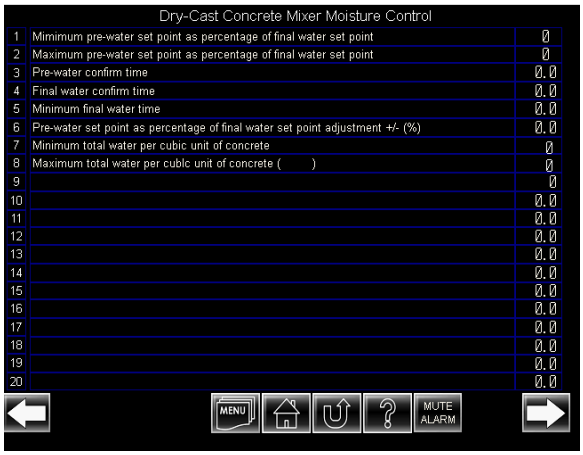
Mixer moisture probe 2nd average filter rising. The first average result will be used to calculate second average in the same way.

Mixer moisture probe 2nd average filter falling. The first average result will be used to calculate second average in the same way.

Mixer moisture probe final average buffer size. The second average result is saved in a buffer area. The final average is the sum of the value inside the buffer and divided by this buffer size. Example, the buffer is 5, then five previous second average results will be saved and the final average will be the sum of five second averages, divided by 5.

3.14 Dry-Cast Concrete Moisture

This screen provides control for dry-cast concrete production when a mixer moisture sensor is used. It can be reached by double clicking on screen 31 in **MENU** and entering the setup password.



The following line items can be entered:

Minimum pre-water set point as percentage of final water set point. The control system can use the moisture sensor inside the mixer to control the water for dry-cast concrete production. The pre-water will be added to the mixer and will stop when the moisture probe value is higher than the pre-water set point. The final water will then be added to the mixer and will stop when the final moisture setting is reached.

Maximum pre-water set point as percentage of final water set point.

Pre-water confirm time. Pre-water will stop after the mixer moisture probe value is higher than pre-water set point plus this time.

Final water confirm time. Final water will stop after the mixer moisture probe value is higher than final water set point plus this time.

Minimum final water time. This value will guarantee a minimum amount of final water be added to mixer. After this final water feed time, the mixer moisture probe value will be compared with final water set point to stop the final water.

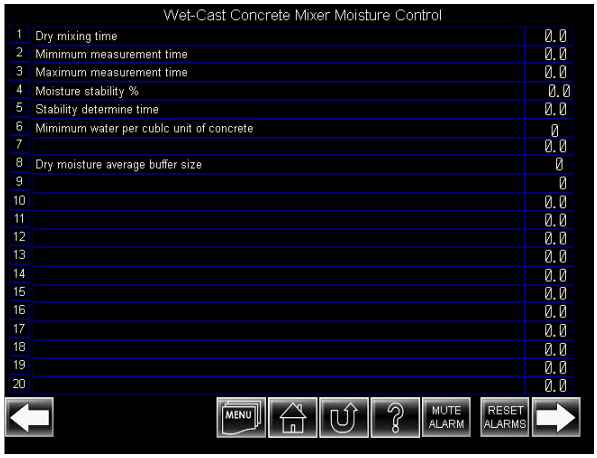
Pre-water set point as % of final water set point adjustment +/- (%). The pre-water set point will be automatically lowered or raised to allow a minimum amount of final water. Enter zero if pre-water set point does not need to be adjusted automatically.

Minimum total water per cubic unit of concrete. In case the mixer moisture probe is not functional correctly, final water may be stopped too early. As a result, the concrete will be too dry to be discharged. This value will avoid the situation from occurring.

Maximum total water per cubic unit of concrete. In case the mixer moisture probe is not functional correctly, final water may be stopped too late and the resulting concrete will be too wet. This value will avoid the situation from occurring.

3.15 Wet-cast Concrete Moisture

This screen provides control for wet-cast concrete production when a mixer probe is used. It can be reached by double clicking on screen 32 in **MENU** and entering the setup password.



The following line items can be entered:

Dry mixing time. The time needed for the aggregate to clean the water left on the mixer floor from the previous wet concrete mixing cycle. The mixer moisture probe value will decrease after the mixer floor has been dried by the newly added aggregate.

Minimum measurement time. The minimum time needed for the mixer moisture probe to get a stable aggregate moisture.

Maximum measurement time. The maximum time needed for the mixer moisture probe to get a stable aggregate moisture.

Moisture stability %. The aggregate moisture variation must be less than this value to be treated as stable moisture. This stable moisture will be used to calculate the total amount of water contained by the aggregate.

Stablility determination time. The aggregate moisture variation must be less than Moisture stability % value for this to time to be treated as stable moisture. This stable moisture is the moisture of the dry material, before water is added.

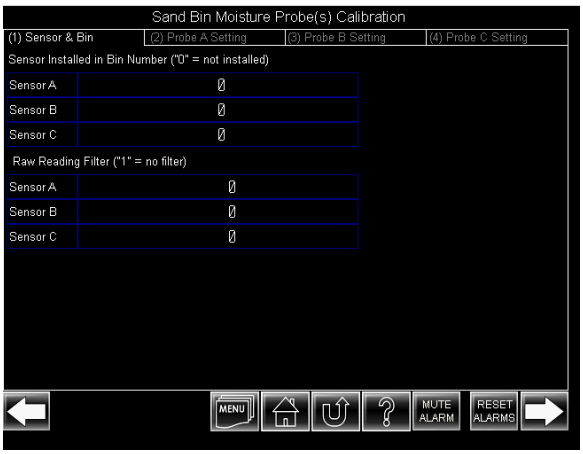
Minimum water per cubic unit of concrete. In case the mixer moisture probe is not functioning correctly, the resulting concrete will be too dry to be discharged. This value will avoid the situation from occurring.

Dry moisture average buffer size. This value should normally be 1.

3.16 Sand Moisture Probe Calibration

This screen provides sand bin moisture probe calibration. It can be reached by double clicking on screen 35 in **MENU** and entering the setup password.

The top row has tabs for **(1) Sensor & Bin** and **(2) Probe A Setting**. (3) and (4) are additional bin probes, C and D.

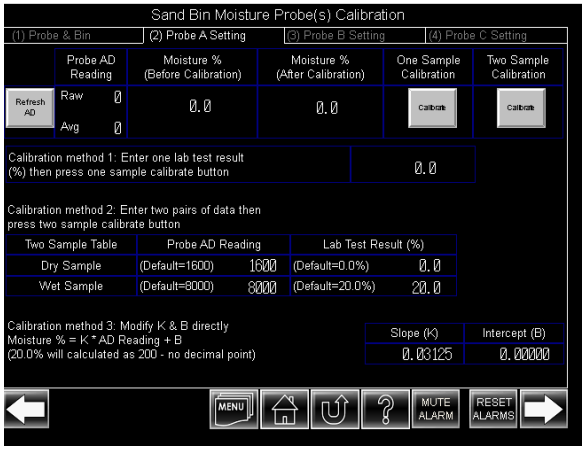


The following items can be entered in screen 1, Sensor & Bin:

Sensor installed in Bin Number (“0”= not installed). Enter the bin number. The aggregate bin which is furthest away from the mixer is normally bin 1.

Raw Reading Filter (“1” = no filter). This value should be 1 for each sensor.

The tab for (2) or (3) or (4) allows for the following screen entries:



Probe AD reading/Raw value. This is the probe analog output (AD)value.

Probe AD reading/Average value. This is the average result of sensor AD readings.

Refresh AD Pushbutton. Pushing this button will make probe AD average equal to its raw value.

Moisture % (Before Calibration). The moisture value from the sensor.

Moisture % (After Calibration). The control system can calibrate the sensor as follows:

Calibration method 1. Take one aggregate sample and do an oven-dry moisture test. The result should be entered here.

Calibration for One Sample Calibration Pushbutton. Following entry above, pushing this button will do the calibration.

Calibration method 2 Take two aggregate samples, one as dry as possible and one as wet as possible, while noting the average AD reading from the sensor. The sensor AD reading average values corresponding to the dry and wet samples should be entered here. (1600 is default value corresponding to 0.0% free (SSD) moisture, 8000 is default value corresponding to 20.0% moisture).

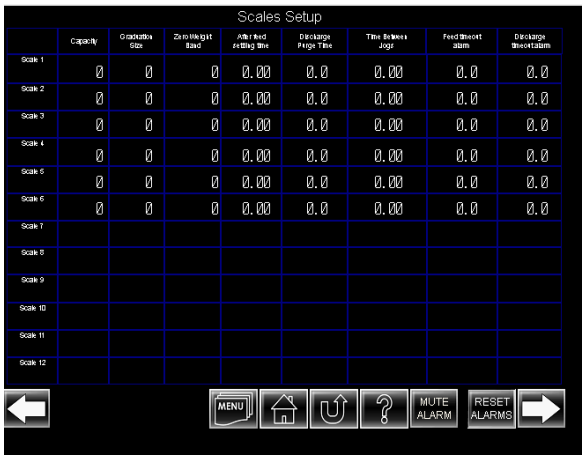
Calibration method 2 /laboratory test result (%) Take two aggregate samples. One dry, one wet. The laboratory oven-dry test result corresponding to the dry sample should be entered here. 0.0 is default value corresponding to the dry sample.The laboratory test result corresponding to the dry sample should be entered here. 20.0 is default value for wet sample and the laboratory test result corresponding to the wet sample should be entered here.

Calibration for Two Sample Calibration Pushbutton. After above, pushing this button will do the calibration.

NOTE: The aggregate weights entered in the formula database must be weights of Saturated Surface Dry (SSD) aggregate. Moisture sensors are normally calibrated using the same convention and the appropriate ASTM testing method for moisture in aggregates uses this same principle. If this is used, the moisture sensor(s) will be calibrated to read the free (SSD) moisture content. However, it is possible, by baking all the internal moisture out of the sample, to measure absolute or 'bone-dry' moisture and if the is done, the sensor will be calibrated to read in absolute (bone-dry) moisture %. In this case, or if absolute (bone-dry) moisture % values are manually entered, an absorption % value can be entered for the material. This value will be subtracted from all subsequent moisture values, whether entered automatically from moisture sensors or manually. The resulting free (SSD) moisture value will be displayed in the moisture location on the batching or Home screen.

Scale Setup

This screen provides the scale setup.It can be reached by double clicking on screen 36 in **MENU** and entering the setup password.



Before starting calibration, verify that a reading is displayed on each of the scale symbols on the screen. Have an associate stand on or hang from each scale hopper somewhere near each load cell. Alternatively, use test weights. The readings obtained should be similar for each load cell and the weight display should show an increase (not a decrease) in value at each location.

Corner adjustment Verify that the hopper is empty and attach weight lifting gear such as chain hoists, etc. to the hopper. Using a small amount of test weights, place the weights on the hopper or scale structure near each load cell in turn and verify that the readings are identical. If not identical, adjust the summing unit (see summing unit instructions). Increase the amount of test weights used as the correct adjustment is approached.

Offset - Locate the load cell transmitter inside the BatchTron cabinet, for the scale to be calibrated. These transmitters are green circuit boards mounted in the top rear area. While monitoring the display, turn the **OFFSET** rotary switch to the position which gives the lowest positive reading.

Using a small screwdriver turn the transmitter **ZERO** control to obtain a zero reading on the display. If necessary, turn the **OFFSET** switch to its next position.

If the OFFSET switch is turned too high, a negative reading will be obtained, which will not vary when the ZERO control is turned. Reduce the OFFSET setting until a positive reading is obtained.

NOTE: **Do not touch the ZERO control on the screen prior to this adjustment. If it has been pressed, turn the power off and on again to reset the system.**

Capacity. The maximum amount the weigh hopper or weigh belt can hold. Another way to determine capacity is the maximum amount that will be used in production, plus 20% as spare.

Graduation size. This should be 0.1% of capacity or smaller, in 1, 2, 5 increments. Example, for a 4000 lb capacity scale, this should be 2 lb. For a 8000 lb capacity, this should be 5 lb. For a 20,000 lb capacity, it should be 10 lb.

Zero weight band. Weight in the scale must be lower than this value to allow a batch to start, and weight in the scale must be lower than this value for scale discharge cycle to complete.

After feed settling time (sec). Time for the scale weight to become stable.

Discharge purge time (sec). During scale discharge, after scale weight is lower than Scale zero weight band, this time begins counting. The scale discharge will close after this time is complete.

Time between jogs (sec). 3 second is typical; increase this value if scale variation is seen. Increasing this value will increase the total batching time. Increasing this value may improve the tolerance performance.

Feed timeout alarm (sec). Control system will turn on alarm if feeding time is longer than this value.

Discharge timeout alarm (sec). Control system will turn on alarm if discharge time is longer than this value.

3.17 Liquid Meter Setup

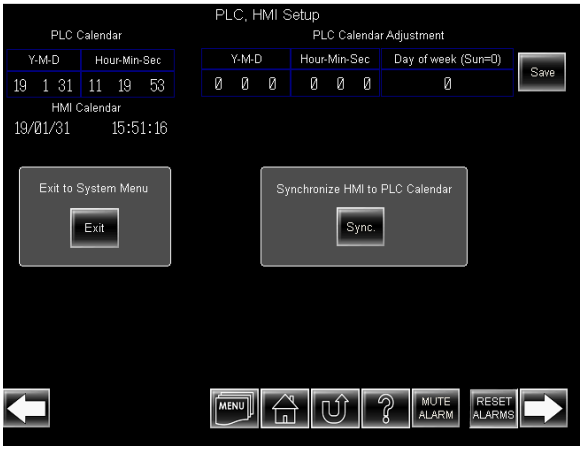
This screen sets up the liquid meter. It can be reached by double clicking on screen 37 in **MENU** and entering the setup password.

Water: Volume per pulse. The liquid meter pulse will be converted to volume by this ratio. If water display has no decimal place, ratio of 1 will convert one pulse to one water unit amount. If water display has one decimal place, ratio of 10 will convert one pulse to one water unit amount, etc. It is best to set the meter and this value to less than 1% of the smallest water amount to be used in the formulas, but not so small that you will get more than 20 pulses per second.

Admix 1-8: Volume per pulse. Same as for water. In these cases, volume per pulse will be much smaller but the same rule applies.

3.18 PLC HMI Setup

This screen provides PLC HMI Setup. It can be reached by double clicking on screen 38 in **MENU** and entering the setup password.

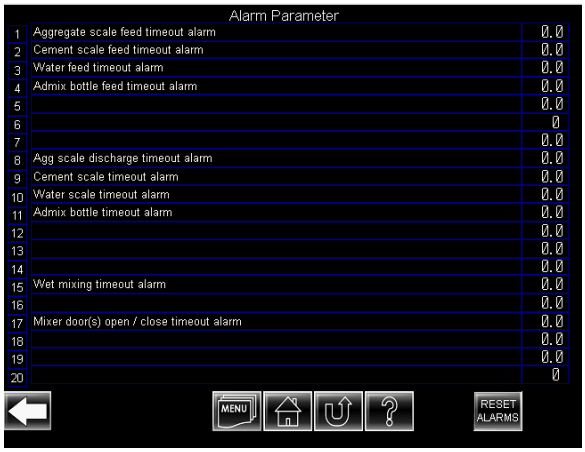


Operator can enter date and time for the PLC from this screen. Operator can also synchronize the HMI data time to the PLC.

Operator can open the HMI system to change HMI setting from this screen.

3.19 Alarm Setup

This screen provides Alarm Setup. It can be reached by double clicking on screen 39 in **MENU** and entering the setup password.



All parameters regarding alarms are listed on this screen. These are identical to the alarms of the same name parameters listed in all previous sections. Operator can edit the parameters either from the corresponding previous section or, more conveniently, from this screen.

They include:
Aggregate scale feed timeout alarm.
Cement scale feed timeout alarm.
Water feed timeout alarm.
Admix bottle feed timeout alarm.
Agg scale discharge timeout alarm.
Cement scale discharge timeout alarm.
Water scale discharge timeout alarm.
Admix sight glass timeout alarm.
Wet mixing timeout alarm.
Mixer door(s) open/close timeout alarm.

4 INSTALLATION

4.1 Power Connection

The BatchTron can be powered from 110 volt or 240 volt power, 50 or 60Hz. Connect the **LINE** input to the L1 terminal, the **NEUTRAL** input to the L2 terminal and **POWER GROUND** to the green/yellow ground terminal. Route the wires through the cable duct to one of the rear openings (console model) or bottom openings (wall mount model), using an appropriate conduit connector or strain relief. If using 220/240 volt power, check the jumpers (if they exist) on the 24 volt (or 12 volt) power supply (upper right rear of cabinet) to ensure that they are set for the correct voltage; to change, cut both jumpers with wire cutters and solder together in the 240V position. The PLC and some models of power supply handle both supply voltages without change.

4.2 Input and Output Connection

Inputs can be either 24-volt DC, or 110 or 220 volt. Outputs are controlled via relays which can be connected to the line voltage (110 to 240 volts) or to the internal 24 volt DC supply. The standard (default) connection is to the line voltage. The fuse holders include a neon “blown fuse” indicator which operates on 110-240 volt power; they will not illuminate on 24 volt power. These are replaced by 24 volt LED indicators for 24 volt DC operation.

Inputs should be connected to the PLC Channel 0, 1, 2 etc. terminal strips according to the schematic diagram supplied. Route the wires, through the cable ducts provided, to one of the rear openings, using an appropriate conduit connector or strain relief. Leave a loop of wire at least 6” long beneath the PLC terminal strip, to allow the terminal strip to be removed for service.

4.3 Load cell Connection

In multiple load cell scales, all load cells of the same scale should be electrically summed at a summing junction box (these are available from Scale-Tron). The INDICATOR output from the summing box, or the single load cell in mechanical scale conversions, should be wired to the connector on the load cell transmitter, located in the upper rear area of the BatchTron cabinet. Four conductor SHIELDED cable must be used, with conductor size 16 to 24 gauge. Connect the shield directly to the BatchTron cabinet ground next to the terminal strip. Route the cables through the cable duct and the rear or bottom openings provided.

BatchLink Connection

The BatchLink cable plugs into the CIF01 unit adjacent to the PLC, or directly to the CS1W-CN118 cable. See Schematic for details.

4.4 Moisture Sensor Connection

Up to six moisture sensors, such as the AquaSense 2800D, can be connected to the BatchTron II. See Schematic for connection details.

4.5 Wiring Verification

Before applying power, verify with a test meter that there is no connection between the mains power circuits and the 24 volt dc circuits. Any connection between these circuits will destroy all internal electronics. This damage is not covered by warranty.

After verifying that the power jumpers are in the correct position and that there are no connections between the high voltage and 24 vdc circuit, apply power and turn on the circuit breaker on the front panel. If the breaker trips now or during testing, there is a short circuit in the added wiring.

Successful operation is shown by the appearance of the batching graphic screen. If the screen does not illuminate, check the 24 volt power supply. Its output should be between 22 and 28 volts DC. If an error message is displayed, proceed to **Section 5.3, screen failure**.

To verify the output connections to valves and motor starters, press the manual buttons on the

various graphic screens while monitoring the appropriate devices. If one or more do not operate, check the **LED** indicators on the PLC output module, then check the fuses. Use a voltmeter if necessary to verify that the output is energized when the button is pressed and proceed to **TROUBLESHOOTING**, **Section 5.** Remember that there is a 10 second warning alarm delay before the mixer motor is energized. During this time, the graphic symbol flashes.

To verify input connections from motor starters and position switches, operate each switch in turn and monitor the appropriate symbols on the graphic screen, which should darken. For the few inputs which do not have a symbol, monitor the **LED** indicator on the PLC input module. It is essential to have all inputs connected; they are interlocked with the internal sequence and will prevent proper automatic operation proceeding if not present. It is possible to operate in this condition but Scale-Tron Inc. cannot be held responsible for the consequences.

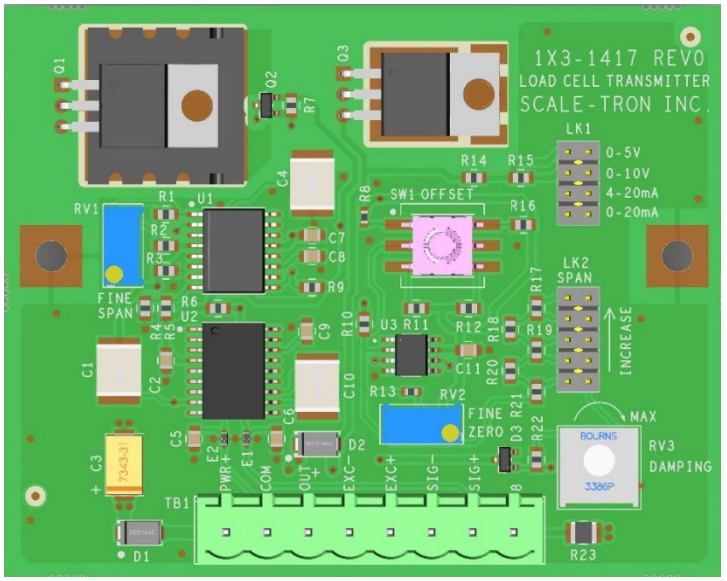
4.6 Calibration Procedure

4.6.1 Dead load

Since most load cells support a platform, hopper or other structure, a positive offset is generally present; this must be eliminated before calibration can take place. Connect a digital voltmeter or other indicating device (set to 20 volt or 20mA range, as appropriate) to the output. Starting at the "0" setting, increase the **OFFSET** switch one step at a time, observing the reduction in output voltage or current. When it reaches zero output (0.00 volt or 4.00 mA) turn it back one step to obtain the smallest above-zero reading. Adjust the **FINE ZERO** 25 turn pot to obtain zero output (0.00 volt or 4.00mA), taking care not to go past this position, since this will eliminate measuring ability below this point. It is usually better to deliberately offset the zero by a few percent in the indicating device in order to create a small range below zero. Note also that the 0-20 mA output setting can be used to obtain a negative range from 0 to 4mA and a normal positive range from 4 to 20mA as long as the indicating device can handle this input range.

In cases where the offset exceeds the negative range, add a high value resistor (in the 50K to 200K range, high stability metal film) between EXC+ and SIG+.

Note that for ultimate temperature stability, the FINE ZERO pot should be disabled by turning it to either extreme (end of travel). Use other means of adjustment to obtain the zero indication (i.e. software).



4.6.2 Span.

Apply a known, accurate weight of value as close as possible to the capacity, to the load cell(s). Adjust the **SPAN** jumper and **FINE SPAN** 25 turn pot to obtain the appropriate output. If the test weight is equal to the intended system capacity, the output should be adjusted to full scale (20mA, 10 volt etc.). If the test weight is exactly half the capacity, adjust the output to half full scale (12mA, 5 volt etc.) Span can be adjusted with any proportion of the system capacity but is progressively more inaccurate and difficult to adjust as the proportion is reduced.
Example: 4 load cells of 1000 lb capacity and 3mV/V output are used on a hopper, dead load approx. 700 lb, full scale capacity 3000 lb. 1000 lb of test weights are available for calibration.

Total load cell capacity = 4 x 1000 = 4000 lb. Full scale capacity ("live load") = 3000 lb. Load cell output = 3000/4000 x 3 mV/V = 2.25 mV/V. This is well above the minimum input requirement and will exhibit minimal drift due to temperature changes in the load cells.

Voltage output, 0-10 volt.

Full scale output of 10 volt corresponds to 3000 lb. Test weights are 1000 lb which is equivalent to 1000/3000 x 10 = 3.333 volt. Adjust **SPAN** until 3.333 volt obtained.

Current output, 4-20mA.

Since the zero to full scale range of the 4-20mA signal = 16mA, use 16 mA for calculation and add the 4mA offset afterwards. Full scale = 3000 lb.
Test weights of 1000 lb are equivalent to 1000/3000 x 16 = 5.333mA, plus 4mA, = 9.333mA. Adjust **SPAN** until 9.333mA obtained.

4.6.3 Damping.

For fastest output response, turn **DAMPING** pot fully counterclockwise. If mechanical vibration or electrical interference causes erratic output, turn **DAMPING** clockwise to increase the response time and filter out the disturbance. Large agitators in tanks can be effectively suppressed in this way.

4.7 Readjust offset.

Although designed to be non-interactive, a large span adjustment may affect the offset setting slightly. After removing test weights, re-check the reading and adjust **FINE ZERO** if necessary. If an adjustment was made, re-apply test weights and check **SPAN** also.

5 TROUBLESHOOTING

5.1 Scale Calibration issues

It is important to verify the scale calibration regularly. We recommend that the scales be checked EACH DAY at the start of operation by having an employee stand on or hang from each scale hopper in turn, while having an associate read the weight display. This will identify a large error before any faulty product is produced. A more accurate check using test weights or the Scale-Tron Shunt Calibration Tester should be carried out once per week and the scales should be verified by a qualified scale technician and test weights every 6 months. It is your responsibility to verify the accuracy of the scales and other equipment. Scale-Tron Inc. cannot be held responsible for the consequences of poor maintenance.

The calibration procedure is given in **Section 4.6.**

A scale reading of the capacity value, a fixed negative number or a reading which does not change when the scale is loaded indicates a failure of a load cell, cables, transmitter or PLC input module. Locate the transmitter for the affected scale and jumper the **OUTPUT** and **COM** terminals together with a short piece of wire. The scale reading should change to a small negative number. If this does not occur, the PLC module is probably faulty.

If this occurs correctly, temporarily connect the **SIG+** and **SIG-** terminals together. The reading should change to a small negative number, if not showing this already. Both conditions indicate a faulty load cell connection, a faulty load cell or a mechanical fault on the load cell mount. Try adjusting the **OFFSET** switch and pot to re-zero the display. If successful, the scale zero has been altered, either by some mechanical work being done, an overstressed load cell or an electrical problem.

Monitor it closely while running. If the reading does not change, turn the **OFFSET switch** to each extreme position. If the display still remains unchanged, the transmitter is probably at fault.

5.2 Output Failure

If a motor or valve fails to operate, first check the fuses (bottom front of cabinet); if one is blown, its indicator will be lit. If fuses are not the problem, check the output associated with the device. Each output has an LED indicator at the top of its PLC module; if the LED is illuminated, the output should be on. Check the output terminal and its associated power wire at the COM terminal (or “A” terminal if all “A”s on the terminal strip are jumpered), with a voltmeter. If the voltage is present at the input but zero at the output, the PLC output module should be replaced.

5.3 Screen Failure

If the screen fails to light up, check the 24 volt power supply at the upper left rear of the cabinet. Its output should be between 22 and 28 volts DC. Next check the backlight (**section 5.7**). If the screen shows **RECEIVE ERROR** plus one of several detail messages such as **PARITY ERROR** etc., communication with the PLC is faulty due to a faulty screen unit, PLC or a communication setting has been changed. Refer to the OMRON manual for screen communication settings. If the message **TIME OUT** is displayed, the cable from screen to PLC is probably disconnected.

5.4 Screen Error Messages

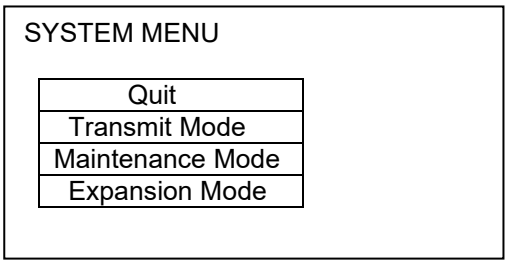
The OMRON screen unit provides for multiple error messages. If the screen shows **PARITY ERROR**, communication with the PLC is faulty due to a faulty screen unit, PLC or a communication setting has been changed and the OMRON Operation Manual should be referred to. When a communications error occurs the buzzer sounds. Pressing the **OK** button on the **ERROR SCREEN** will return it to the operational screen and the operation will restart. If the message **TIME OUT** is displayed, the cable from screen to PLC is

probably disconnected. Refer to the OMRON manual for more details.

5.5 Screen Device Checks

The **SYSTEM MENU** screen allows functional checks of:
Buzzer
LED
LCD
Backlight
Screen data memory
Touch switches
Battery voltage

The screen **SYSTEM MENU** can be displayed by lightly pressing any two corners of the screen at the same time. If there are symbols at some corners, first press a clear corner and then any other corner, or access a different screen; the **ADMIXES** screen is a good choice**.** This stops the operation of the unit and the **RUN LED** goes **OFF**.



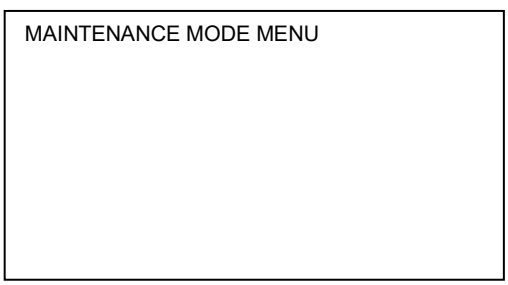
QUIT - returns you to the operating screen.

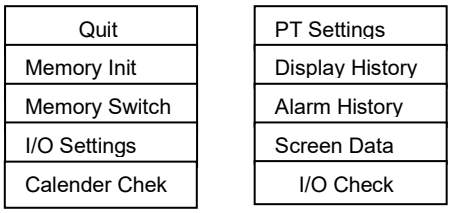
TRANSMIT - MODE is for use in transferring screen programs. This should not be accessed.
MAINTENANCE MODE - will allow you to check operation of the touch screen.

EXPANSION MODE - should not be accessed, it allows access the programming console function.

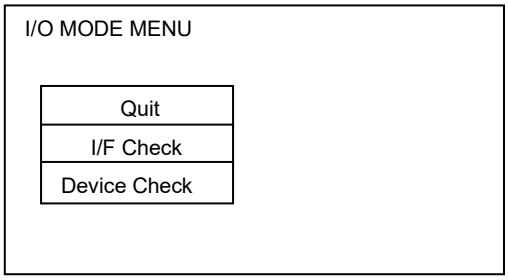
Relevant sub-menus are selected from the screens.

From the **SYSTEM MENU** select
MAINTENANCE MODE to display the menu.

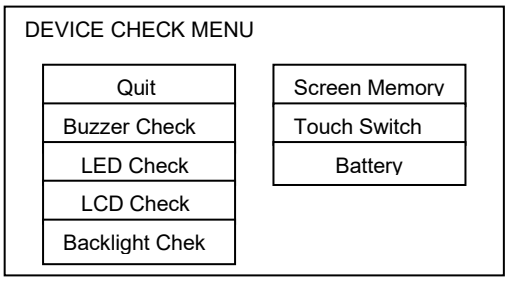




Select I/O Check for the I/O MODE MENU



Select Device Check for the DEVICE CHECK MENU>



Select each device as required.
Buzzer Check - if the buzzer functions correctly, it will sound continuously. At this time the **"Buzzer Check"** will be displayed in reverse video. To stop the buzzer press **Buzzer Check** again.

LED Check - it will be displayed in reverse video and will flash green and red if the **RUN LED** is functioning normally. To end the check touch the **LED Check** again.

LCD Check - the check screen displays all the dots on the screen for three seconds, for each color in turn. On completion of the display it returns to the **DEVICE CHECK MENU**.

Backlight Check - it will be in reverse video and will flash if normal. Touch to end check.

WARNING
CAUTION

DO NOT select Screen Data Memory except under instruction as it deletes all the operational screens during the test and these will need to be reloaded.

Touch Switch - a grid will be displayed and the **TOUCH SWITCH** areas displayed. When the top right corner block is displayed in reverse video the touch switch blocks can be touched in turn. This will not affect plant operation. If correct each block will be displayed in reverse video while pressed. Press the top right corner block to return to **DEVICE CHECK MENU**.

Battery Check – displays the internal battery status.

BATTERY CHECK	Quit
The voltage is within the normal range.	

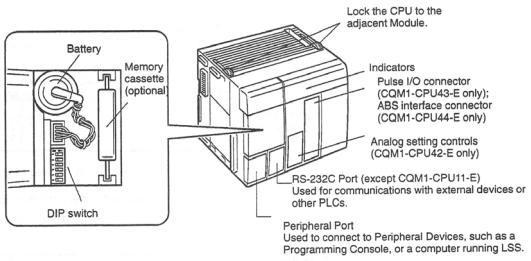
"The voltage is within the normal range." Or "The voltage lowered." is displayed, in which case replace the battery immediately. Press Quit to return to **DEVICE CHECK MENU**.
The PRINTER screen is not valid with the printer connection used and should be ignored.

5.6 PLC Unit Components

The folowing diagram shows the basic components of the CPU that are used in the general operation of the PLC.

DIP Switch

The DIP switch is located in the battery compartment of the CPU. The switches should be set to the following;



Pin	1	2	3	4	5	6
	Off	Off	On	On	Off	Off

Pin 5 is the RS-232C setting for the modem. For use with the printer or **BATCHLINK** it should be **OFF**. For use with the modem it should be **ON.**

Battery replacement

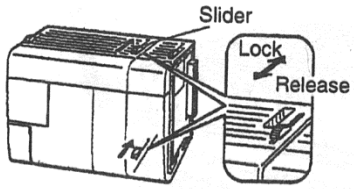
The CPU contains a lithium battery for memory back up. The battery type 3G2A9-BAT08 is good for 5 years at an ambient temperature of 25° C (80°F). Higher ambientes will reduce this time and a spare should be carried in order to replace it when a warning of low voltage is received. Low voltage will cause the ALARM/ERROR indicator to blink and the. The screen will display "The voltage is lowered" when switching on the power, or when checking the Battery mode in **SYSTEM MENU** Maintenance.

The battery must be replaced within 5 days of the warning, using the following procedure. Ensure that the unit has been powered for at least 5 minutes to charge the capacitor and then turn off the power. This gives 5 minutes to replace the battery before the memory is lost.

PLC module replacement

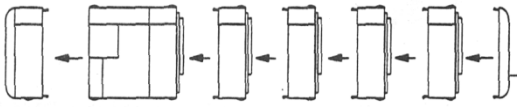
If the PLC output indicators are not illuminating, or the display indicates communication problems, a PLC fault is indicated. Verify that the power indicator on the PLC power supply is illuminated. If not, check the incoming power voltage and the power connections.

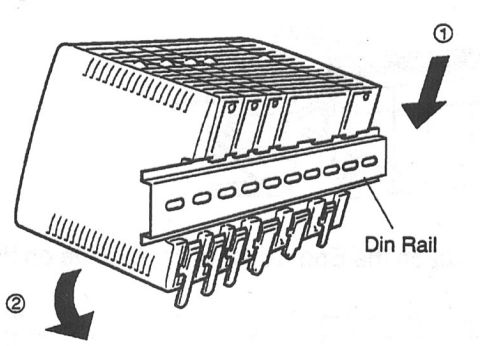
If the **RUN** indicator is not illuminated, check the connection of the plug-in I/O modules. These units all plug together in an end-to-end manner and locking tabs, on the top and bottom of each unit, lock them in place. Verify that all units are tightly plugged together and the locking tabs are pushed towards the rear panel.



If a module is faulty, remove the wiring connector by opening the gray locking tabs on each end of the connector and pulling the connector out of the module body.

Unlock the orange locking tabs at the top and bottom of each side of the faulty module by pulling them forward. Then carefully pry the modules apart sideways until the connectors part. (If locking brackets are fitted at each end of the PLC on the DIN rail, loosen one end).

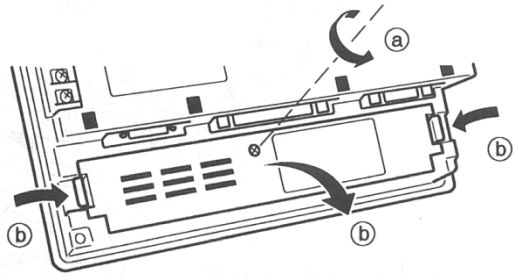




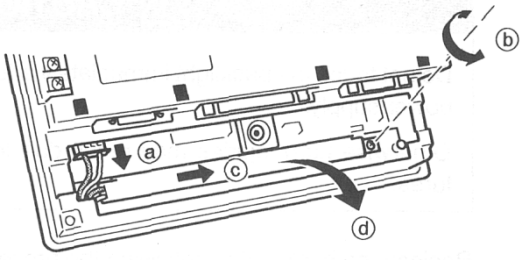
Finally release the module from the DIN rail by levering down the yellow mounting pin, located at the bottom rear of the module, until the module can rotate upward. Pull it free of the rail.

5.7 Screen Unit Components

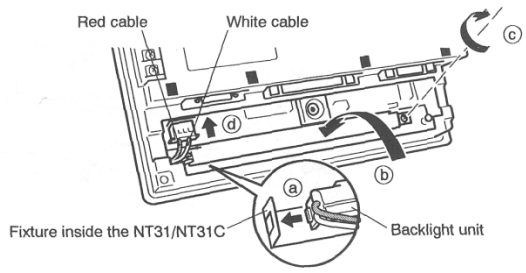
Backlight - Turn the power off and disconnect the terminal block wiring, the communications cable and the printer cable. If a memory unit or interface unit is mounted remove them. Open the cover by undoing the centre captive screw, action (a) below. Press end tabs (b) and lift out.



Disengage the connector, (a) below. Loosen the retaining screw (b) and slide the light unit to the right (c) and out (d).



Replace a new light by reversing the process. Note the engagement (a) and the connector orientation (d) shown below.



Replacing the Battery

The Screen unit has the same type of lithium battery for memory back up as the PLC. The battery type 3G2A9-BAT08 is good for 5 years at an ambient temperature of 25° C (80°F). Higher ambient will reduce this time. Replacement is warned by the RUN LED showing orange during operation, or red when the unit is stopped. The screen will display “The voltage is lowered.” when switching on the power, or when checking the Battery mode in SYSTEM MENU Maintenance.

The battery must be replaced within 5 days of the warning, using the following procedure. Ensure that the unit has been powered for at least 5 minutes to charge the capacitor and then turn off the power. This gives 5 minutes to replace the battery before the memory is lost.

With a screwdriver pry open the battery cover located at the left top corner on the rear face of the unit..

Remove the battery that is secured under the battery cover, grip the cable and pull the connector straight out.

Insert the connector of the new battery into the connector on the unit, making sure that the projection on it faces left, and press it fully home while keeping it straight.

Close the battery cover, making sure that the cable is not trapped.

5.8 Scale-board (1417) replacement

To replace boads and sub-assemblies, first remove all power oto the cabinet. Remove connectors and using the tab at the bottom of the module, snap the module from the DIN rail and replace it with the new module. Caution – take precautions against static electricity. Electronic devices are sensitive to static charges and can be destroyed by careless handling. Only remove items from the protective package at a static workstation. If this is impossible, eliminate any static charge by grasping the grounded metal cabinet or a nearby metal water pipe, conduit, building column or concrete wall. Do not touch the module unless these steps have been followed first. Ensure that the equipment cabinet is securely grounded to earth ground or power ground. Always connect the shield, power or communication wires before connecting signal or load cell wires. Static damage is not covered by warranty.

5.9 Troubleshooting Online

Using a specific program, Scale-Tron Inc. service personnel can check the contents of the PLC and screen, check your setup data, upload this data and correct it if necessary. Scale-Tron Inc can also view the system while it runs and locate faults which are holding up operation. If necessary, Scale-Tron Inc can modify the program to overcome problems and download new or updated software.

6 APPENDIX

6.1 Passwords

The passwords should be given to supervisory personnel only; they are intended to prevent unauthorized persons from altering the setup data.

SETUP PASSWORD: **9625**

FORMULA PASSWORD: **1515**

GENERAL RESET**:** **9999**

Screens 20 to 39 are protected by the setup password.
Screens 40 to 42 are protected by the formula password.
To change to English language, use English password.
To change to Spanish language, use Spanish password.
To change to French language, use French password.
Screens 43 and above are only accessible to the system designer. These screens are not accessible to the user.

CERTIFICATE OF COMPLIANCE

Certificate Number	20190325 - E342318
Report Reference	E342318 - 20101021
Issue Date	2019-MARCH-25
Issued to:	SCALE-TRON INC 2113C St Regis St Dollard des Ormeaux, QC H9B 2M9 CANADA
This is to certify that representative samples of	Industrial Control Panels Industrial Control Panels - General Coverage
	Have been investigated by UL in accordance with the Standard(s) indicated on this Certificate.
Standard(s) for Safety:	UL508A - Industrial Control Panels CAN/CSA C22.2 No. 14-05 - Industrial Control Equipment CAN/CSA C22.2 No. 94-M91 - Special Purpose Enclosure CAN/CSA C22.2 No. 73–1953 - Electrically Equipped Machine Tools
Additional Information:	See the UL Online Certifications Directory at https://iq.ulprospector.com for additional information.

This *Certificate of Compliance* does not provide authorization to apply the UL Mark. Only the UL Follow-Up Services Procedure provides authorization to apply the UL Mark.

Only those products bearing the UL Mark should be considered as being UL Certified and covered under UL's Follow-Up Services.

Look for the UL Certification Mark on the product.

Bruce Mahrenholz, Assistant Chief Engineer, Global Inspection and Field Services

UL LLC