ProAll Mobile Mixer

Operator's Manual
COMMANDER 2.0

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Rev.1.1

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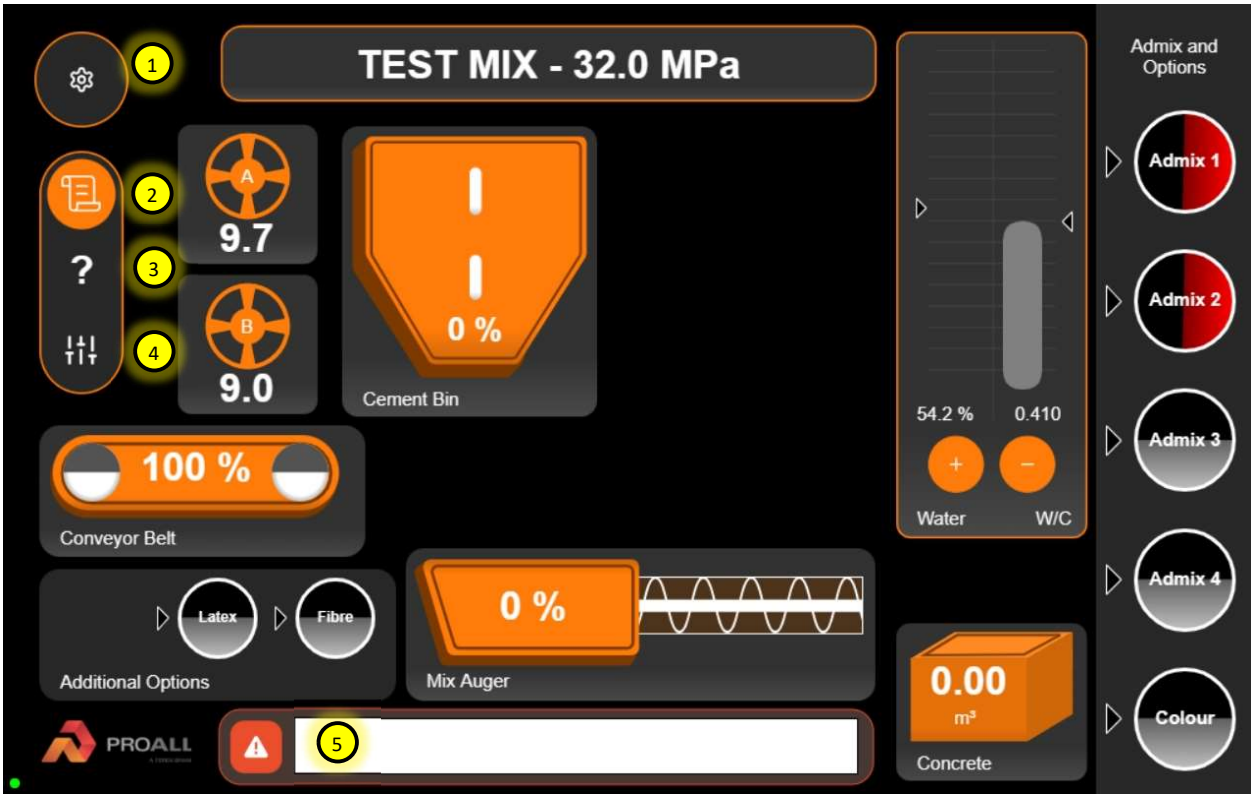
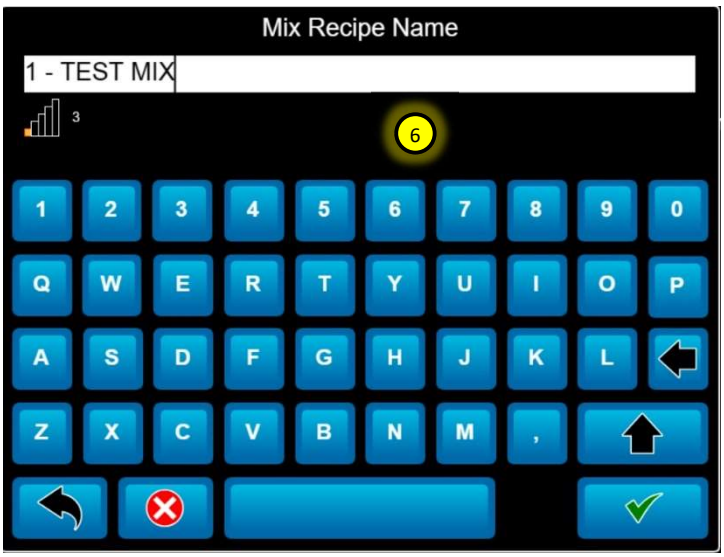
1. HOME

1.01 SCREEN NAVIGATION / OPERATION

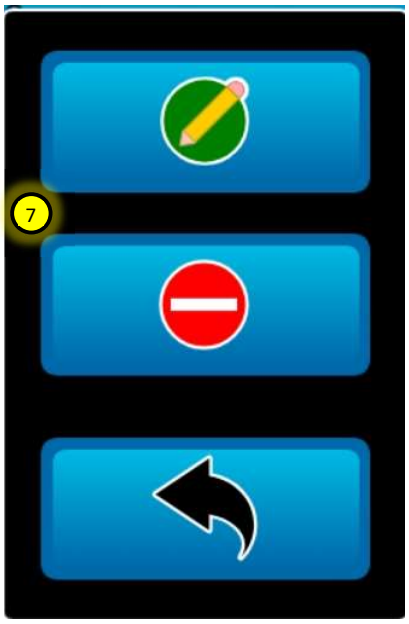


The Commander 2 display is touch screen only. There are no soft keys or buttons. Most mixer operation functions can be performed using the external keypads in the display box.

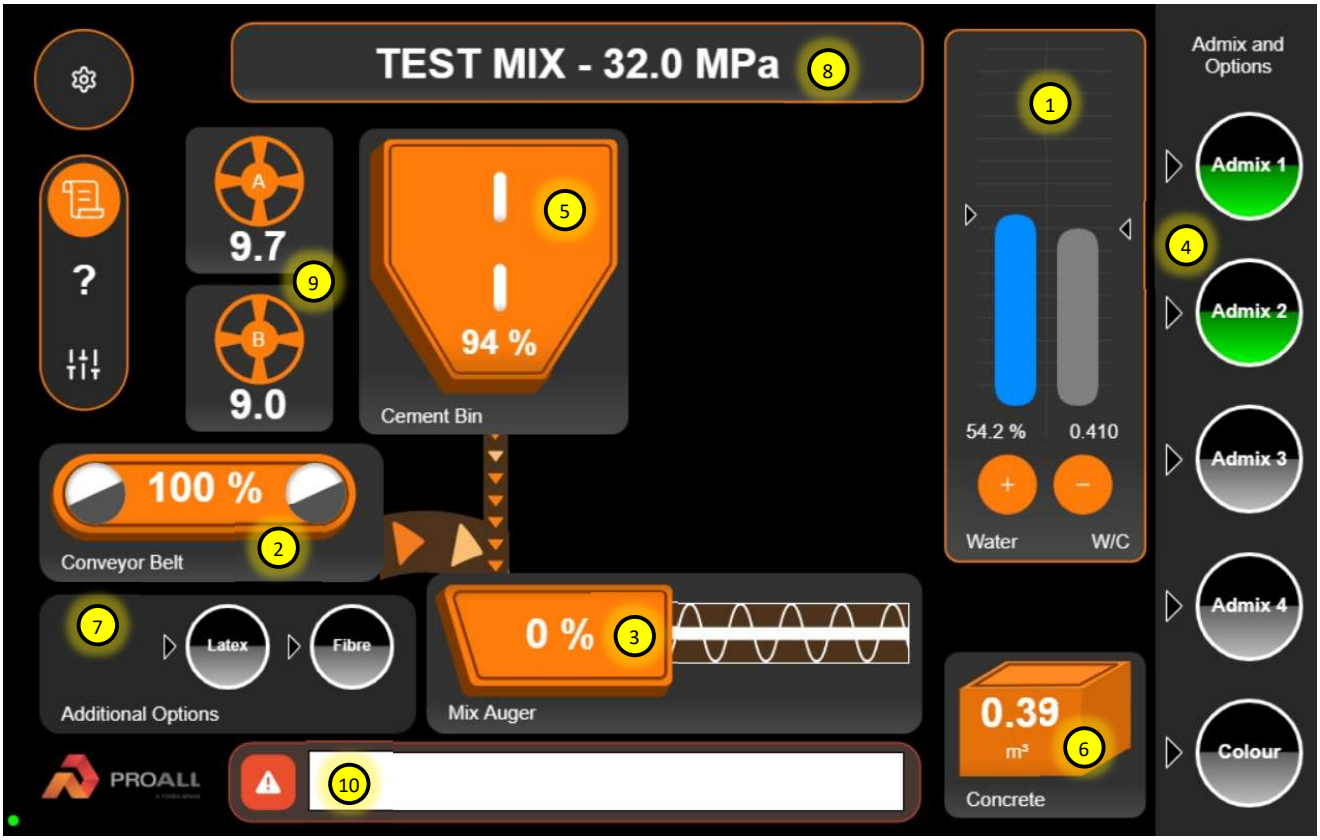
1. Mixer manager. This will also lead to the initial login page if the mixer has just been powered on. The mixer manager is the main access point to settings, calibrations and mix designs.
2. Job manager. This page will give the operator access to the currently queued jobs and start new jobs. It also has access to the job history for printing batch tickets.
3. Mixer information. Main page for viewing mixer operation from a component level. Includes information that can be used for diagnostics and each installed components drive information such as current speed.
4. Controls Manager. Setup and redundancy page used by the operator. Things like vibrator auto timing is adjusted here.
5. Alarm manager. Current and historical alarms are show here. Alarms can be acknowledged here.
6. Pop-up keypad for data entry on the display. Use the shift key for special characters.



7. Selection pop-up. From the top down the options are edit, delete and go back.
8. Go back button. Used to go to previous screen or cancel a selection. If this button is pressed any values updated on the page will not be saved.
9. Save/Acknowledge button. This button is used to save current data edited on the page and go to previous screen. If this button is not pressed the user entered data will not be saved. Make sure the data is correct before pressing.



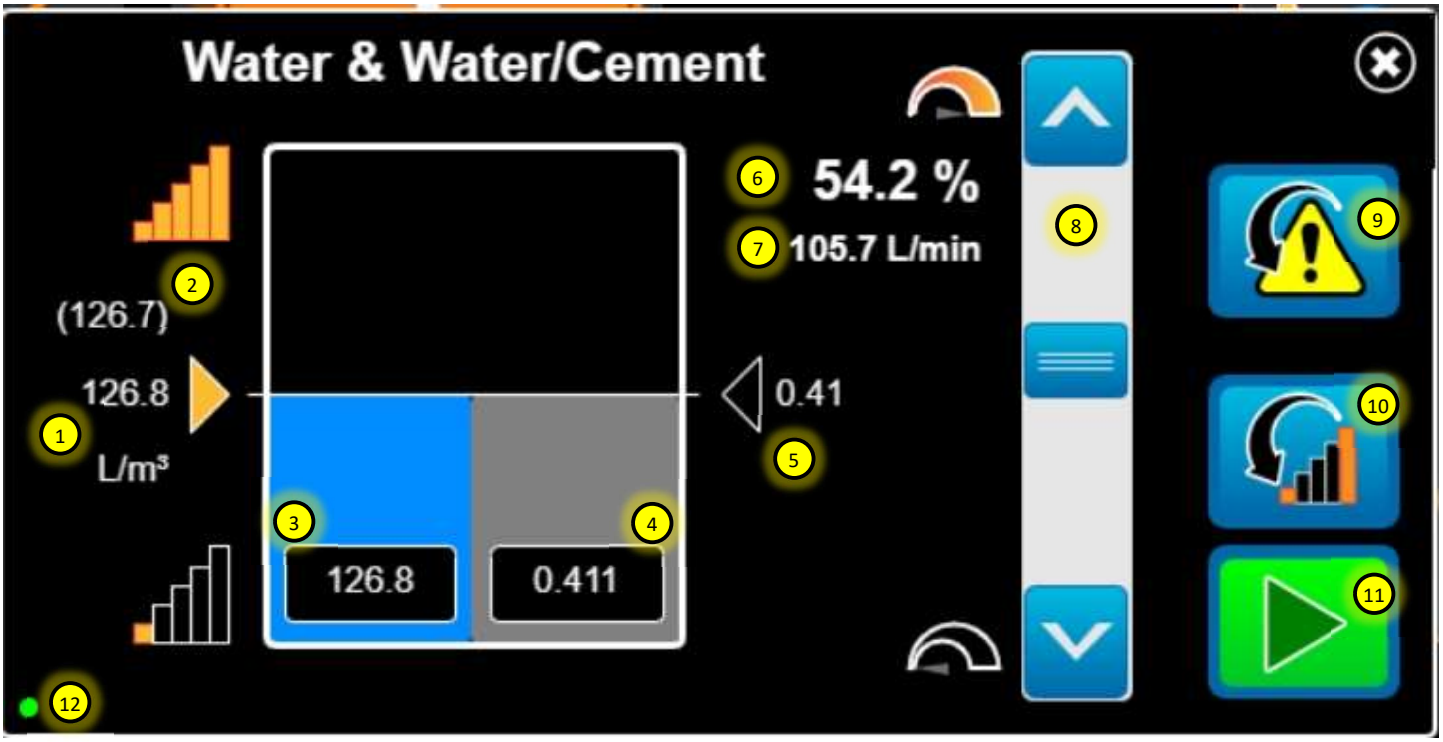
1.02. HOME SCREEN – MIXER OVERVIEW



Note: The gauges on the home screen if touched will bring up pop-up windows that will allow further functionality. This will be explained further in subsequent sections.

1. Water control gauge. This gauge shows the current water output rate vs. target. The target is the triangle, and the vertical bar is the actual. The water to cement ratio is calculated based on the current water output vs. the cement in real time. This is not the total W/C ratio that is shown on the batch ticket.
2. Conveyor belt output. The percentage is the belt speed out of 100% or max speed.
3. Mix auger output. The percentage is the auger speed out of 100% or max speed.
4. Admix control gauge. The target is the triangle. When the bar in the center is green and horizontal / in-line with the triangle then the actual is meeting the target.
5. Cement bin gauge. The percentage is the current output relative to the belt. When the cement bin is active and running the animation will show it dispensing into the mix auger bowl.
6. Volume poured gauge. This shows the current volume poured.
7. Additional admix options are show here.
8. Current job selected showing the mix description and strength. This will show no job selected if nothing is in the queue. The mixer components in this case can be manually run for priming / unloading purposes.
9. Gate wheel position indicators. If gate sensors installed these will show red if the gates are not set to the proper height.
10. Alarms and other messages will be displayed in this window.

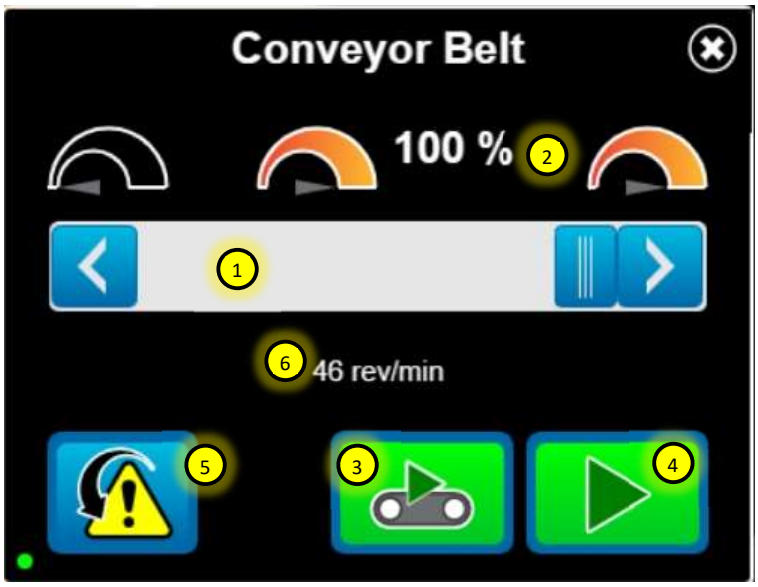
1.03. HOME SCREEN - WATER



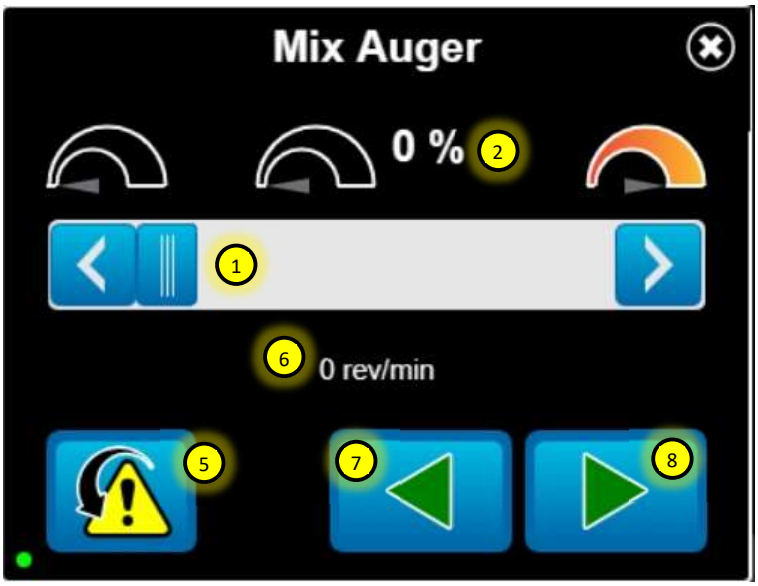
1. Water production rate currently set by the operator. If the arrow is orange, then the production rate selected is different from the mix design.
2. Water production rate per the selected mix design.
3. Actual production rate digital reading and bar graph showing if the rate is within the target (horizontal line).
4. Actual water/cement ratio calculated based on current water and cement outputs.
5. Water/cement ratio target per the selected mix design.
6. Water control speed percentage from 0-100%.
7. Actual water output flow rate.
8. Water pump speed control slider. Up to increase the flow and down to decrease.
9. Reset auto alarm.
10. Reset current water output production rate back to the rate per the selected mix design.
11. Water pump ON/OFF. Same as button 11 on the main operating keypad.

Note: If the water pump has been set to auto alarm off in mixer control, then the computer does not have control of the pump speed. This is done manually by the operator. In order to set the output, the operator will match the setting in #3 with the selected mix value in #2. The value in #1 will not match the blue bar in manually mode.

1.04. HOME SCREEN – CONVEYOR/MIX AUGER



1. Speed control slider. Right arrow to increase speed, left arrow to decrease speed.
2. Speed control percentage from 0-100%.
3. Conveyor belt unload. Latching button.
4. Mix start button. Same as button 6 on encoder keypad.
5. Reset auto alarm.
6. Speed feedback of the belt/auger functions.
7. Mix auger forward, latched ON.
8. Mix auger reverse, momentary ON.



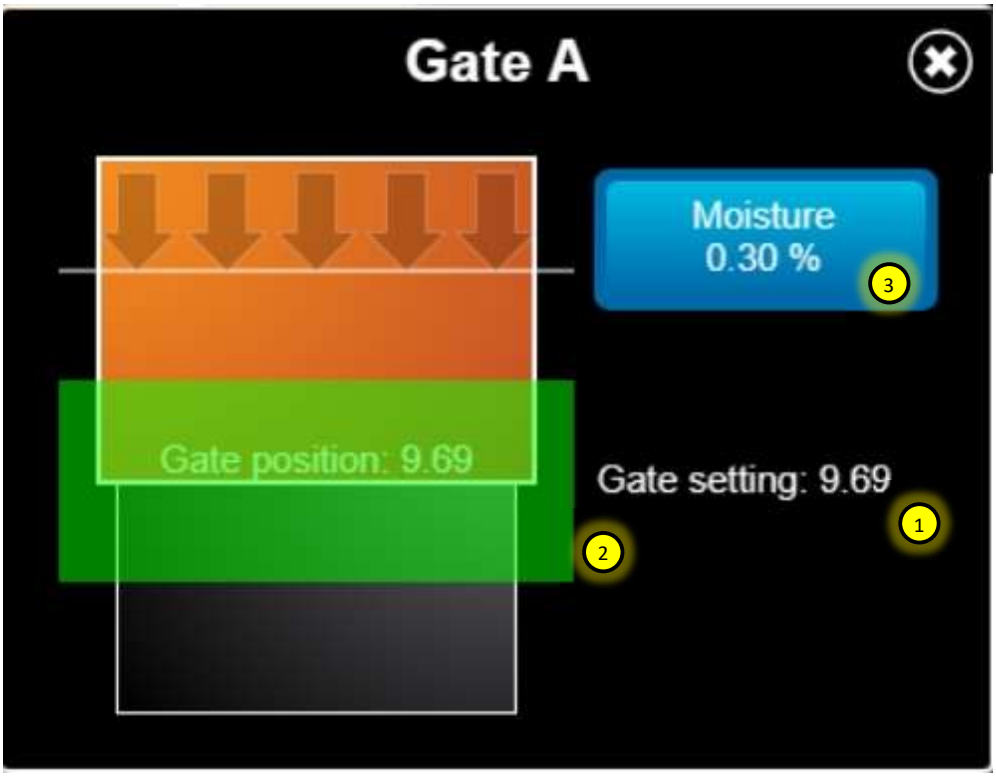
1.05. HOME SCREEN - ADMIX

1. Admix production rate currently set by the operator. If the arrow is orange, then the production rate selected is different from the mix design.
2. Admix production rate per the selected mix design.
3. Actual production rate digital reading and bar graph showing if the rate is within the target (horizontal line). This graph rotates to show target status. Above target value is more and below is less than target value.
4. Admix control speed percentage from 0-100%.
5. Actual admix output flow rate.
6. Admix pump speed control slider. Up to increase the flow and down to decrease.
7. Reset auto alarm.
8. Reset current admix output production rate back to the rate per the selected mix design.
9. Admix prime, momentary button.

Note: If the admix pump has been set to auto alarm off in mixer control, then the computer does not have control of the pump speed. This is done manually by the operator. To set the output, the operator will match the setting in #3 with the selected mix value in #2. The value in #1 will not match the green horizontal bubble in manual mode.

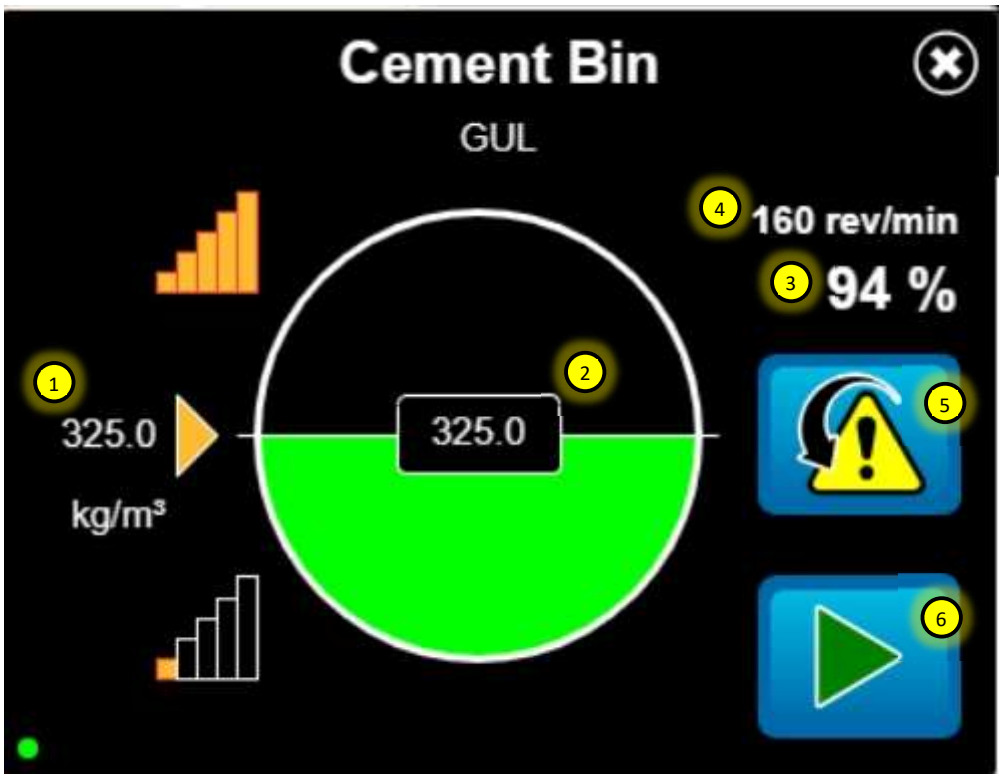
Note: Admix applies to both liquid admix (eg. air entrainment, water reducer) and dry admix (eg. Color, fiber). The functionality of the screen is the same just the units of measure are different.

1.06. HOME SCREEN - GATES



1. Gate setting per the selected mix design.
2. Gate setting reading if gates verify sensors installed. The bar will be green if the gate is positioned within the selected tolerance range (see Mixer Control Gate A/B for tolerance range). If outside of the tolerance range the bar will be red as will the gate wheel icon on the Home screen. The width of the bar also indicates the tolerance level. Wider it is the more margin there is for the gate to be positioned within the mix design value.
3. Gate material moisture setting. This will always populate with the materials absorption value initially on job play. To include the free moisture in the mixer water output calculation, enter the current total moisture percentage for each job.

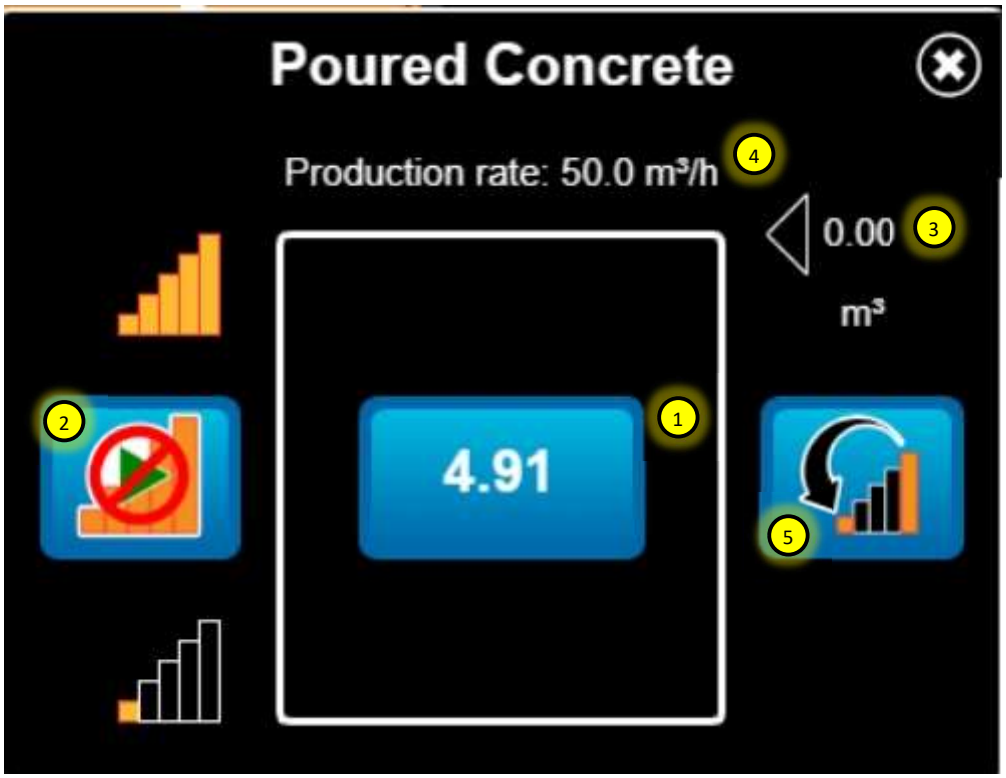
1.07. HOME SCREEN – CEMENTITIOUS



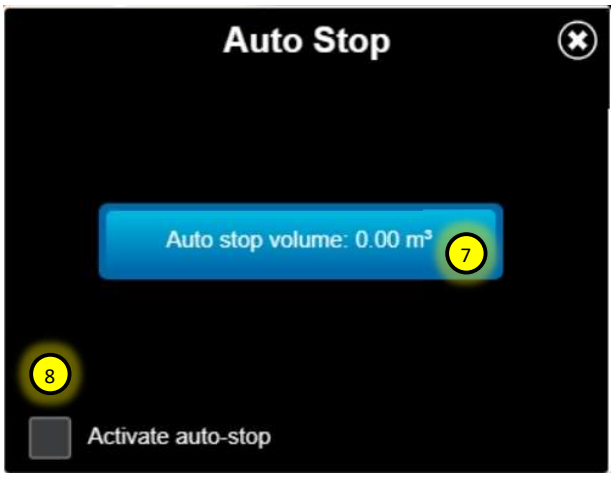
1. Cementitious production rate as per the selected mix design.
2. Actual production rate value calculated based on the calibration and speed output.
3. Cementitious material control speed percentage from 0-100%.
4. Actual auger feed rate in RPM.
5. Reset auto alarm.
6. Cementitious material unload, latching button.

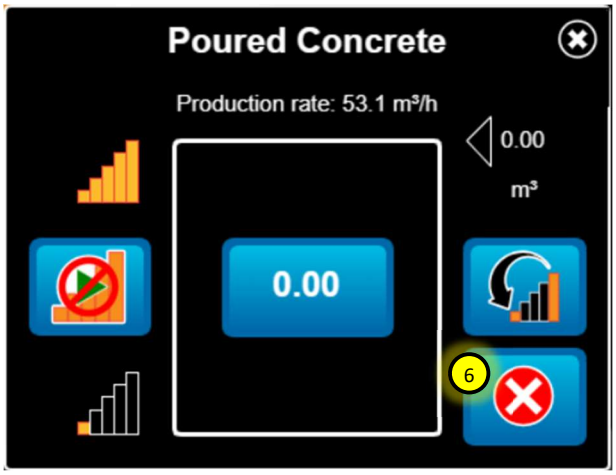
Note: There is no control of the speed / production rate for cementitious materials when in mix mode / job is loaded. This sceen is for reference only and to be used to unload material or reset alarms. This same screen applies to high volume SCM bins (eg. Flyash) and low volume SCM bin (eg. Silica).

1.08. HOME SCREEN – VOLUME POURED

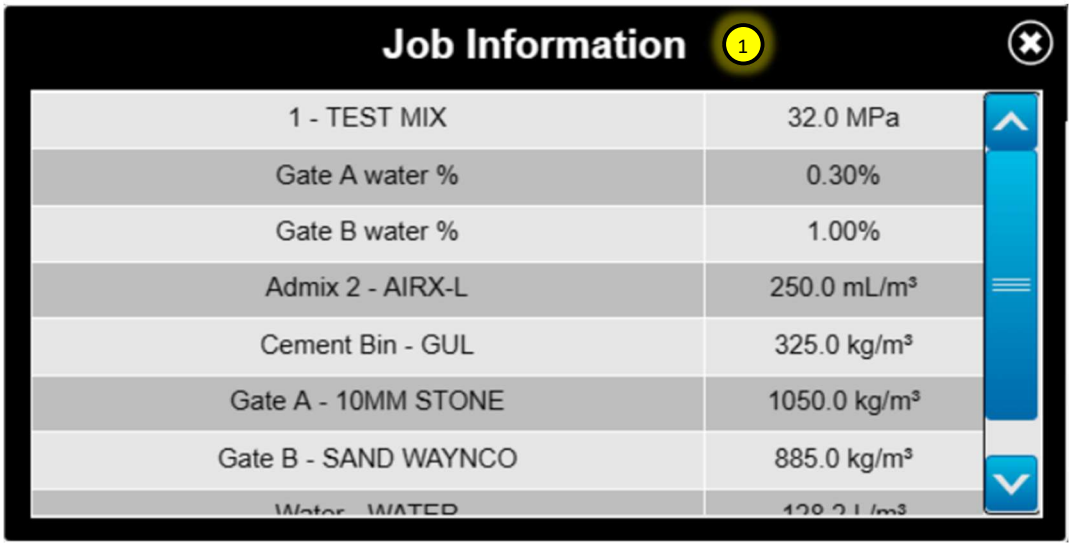


1. Current volume of concrete produced. This can be pressed to show table of current totals of each mix ingredient.
2. Volume stop activation.
3. Auto stop volume entered.
4. Calculated production rate based on currently selected belt speed.
5. Reset job. Yes/No pop-up will appear, and job will be logged into completed job history.
6. Cancel job. This will not show if volume poured is not zero.
7. Auto stop volume setpoint.
8. Activate volume stop (check the box).

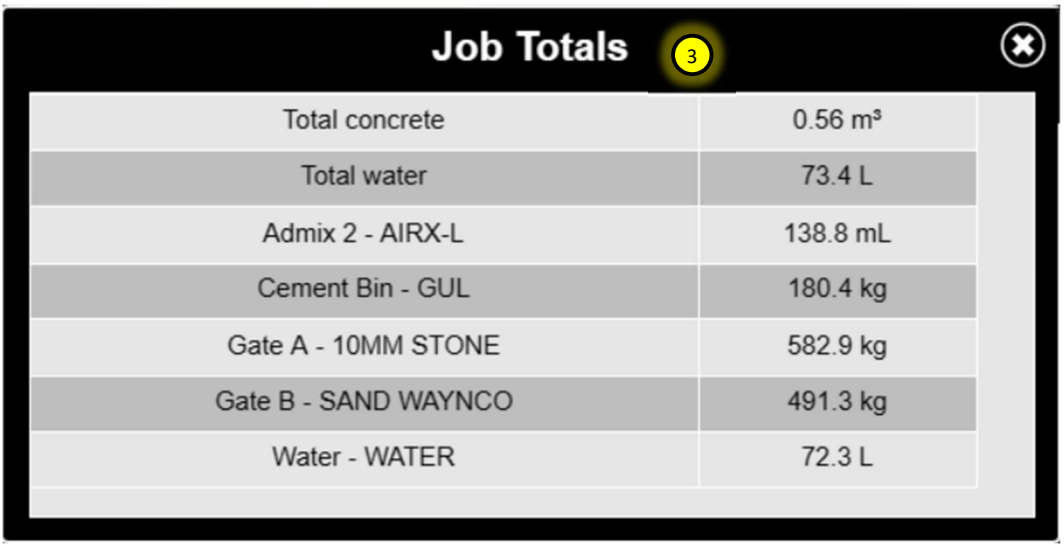




1.09. HOME SCREEN – JOB INFORMATION



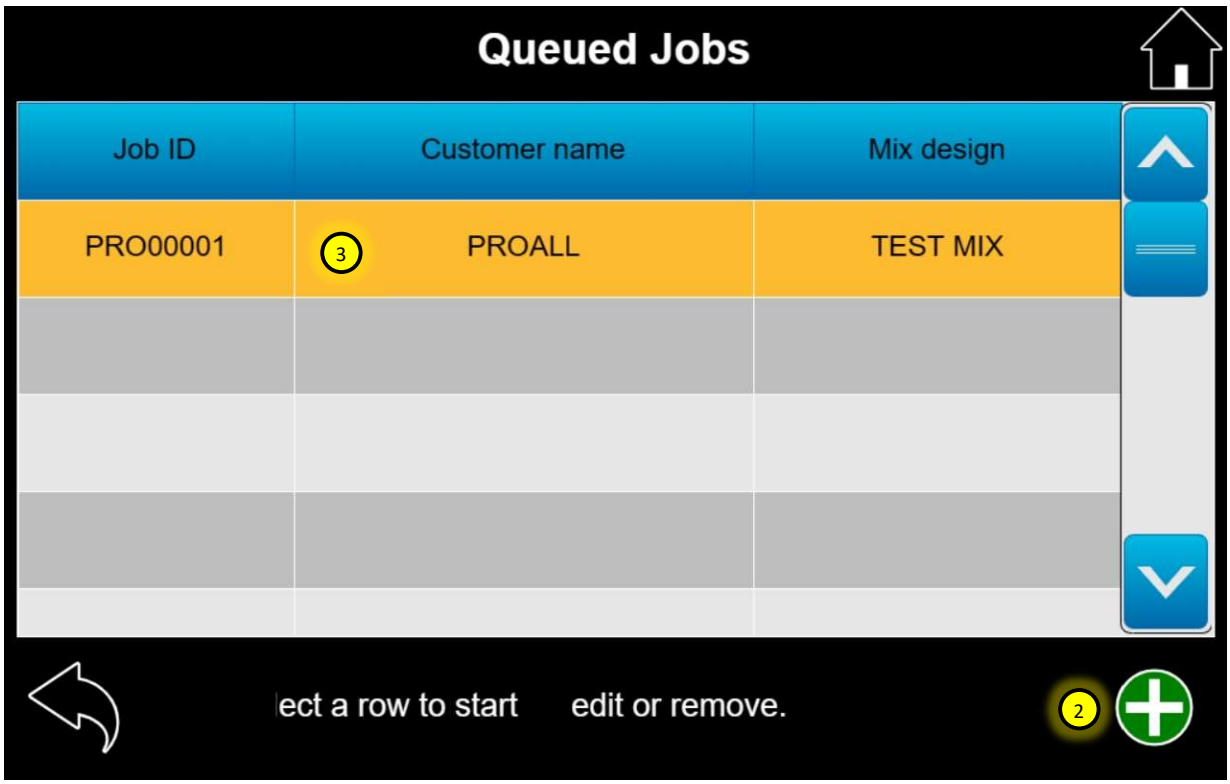
1. Job Information pop-up. Shows the mix design selected for the current job and the associated ingredients.
2. To show the job information pop-up press anywhere in the mix description dialog at the top of the home screen.
3. Job Totals shows the currently accumulated mix ingredients.
4. To show the job totals pop-up press the volume box inside the Poured Concrete window.



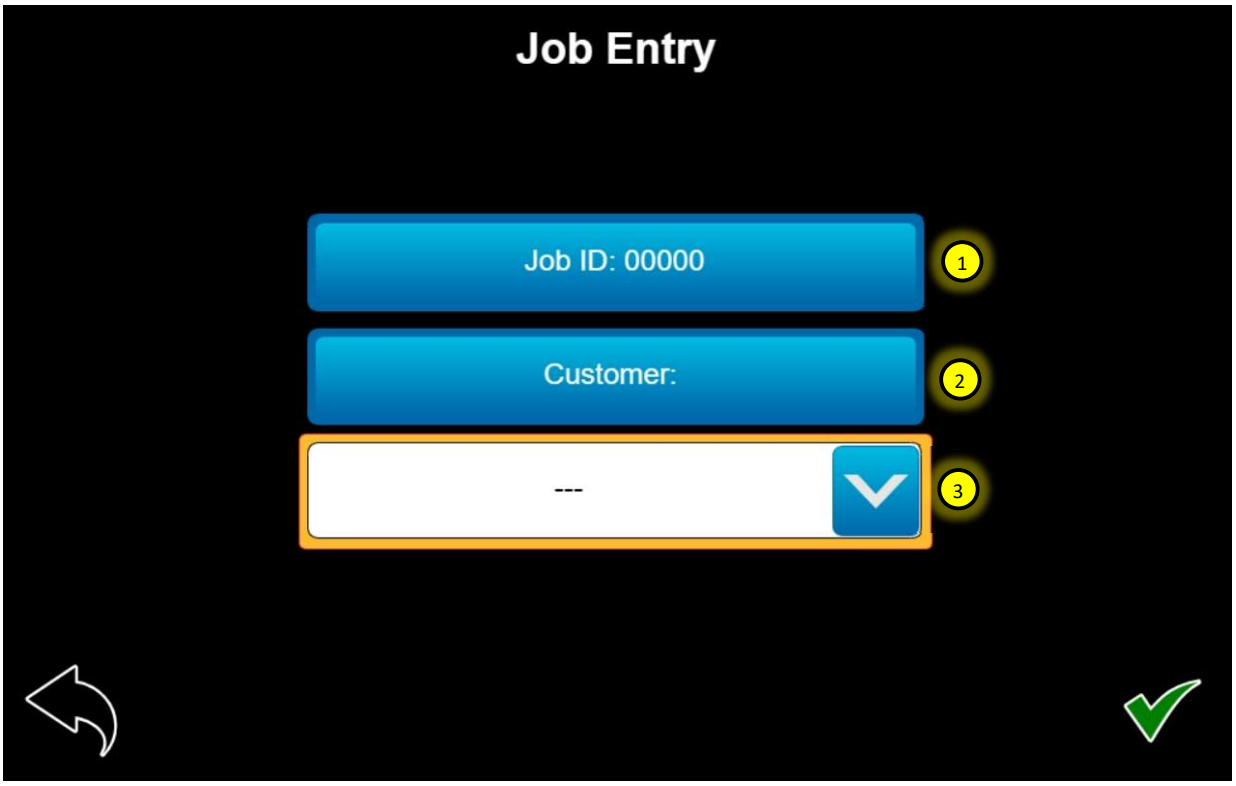
2. JOB MANAGER

2.01 QUEUED JOBS

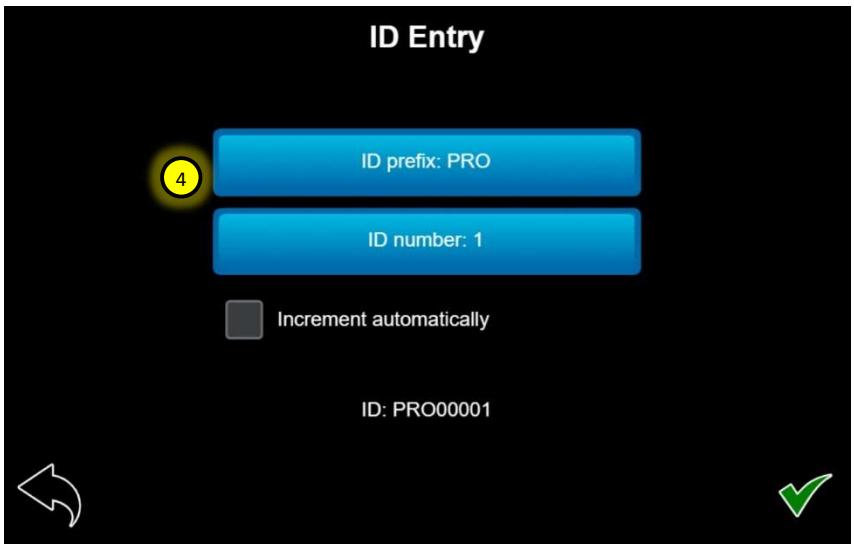
1. Queued jobs select.
2. Add a new job to the queue.
3. Queued jobs table. Shows the currently queued jobs. Multiple jobs can be queued. They can also be edited or deleted by pressing the row with the required Job ID to change.

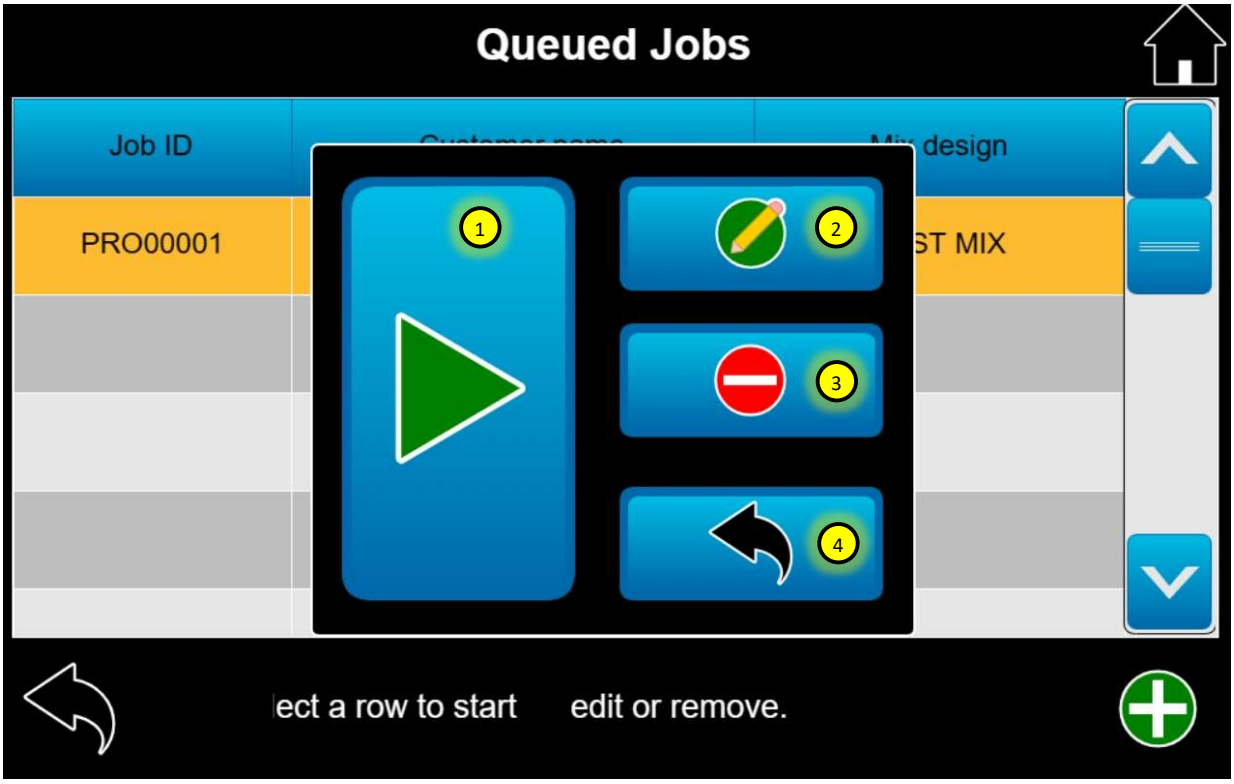


2.02 ADDING JOB



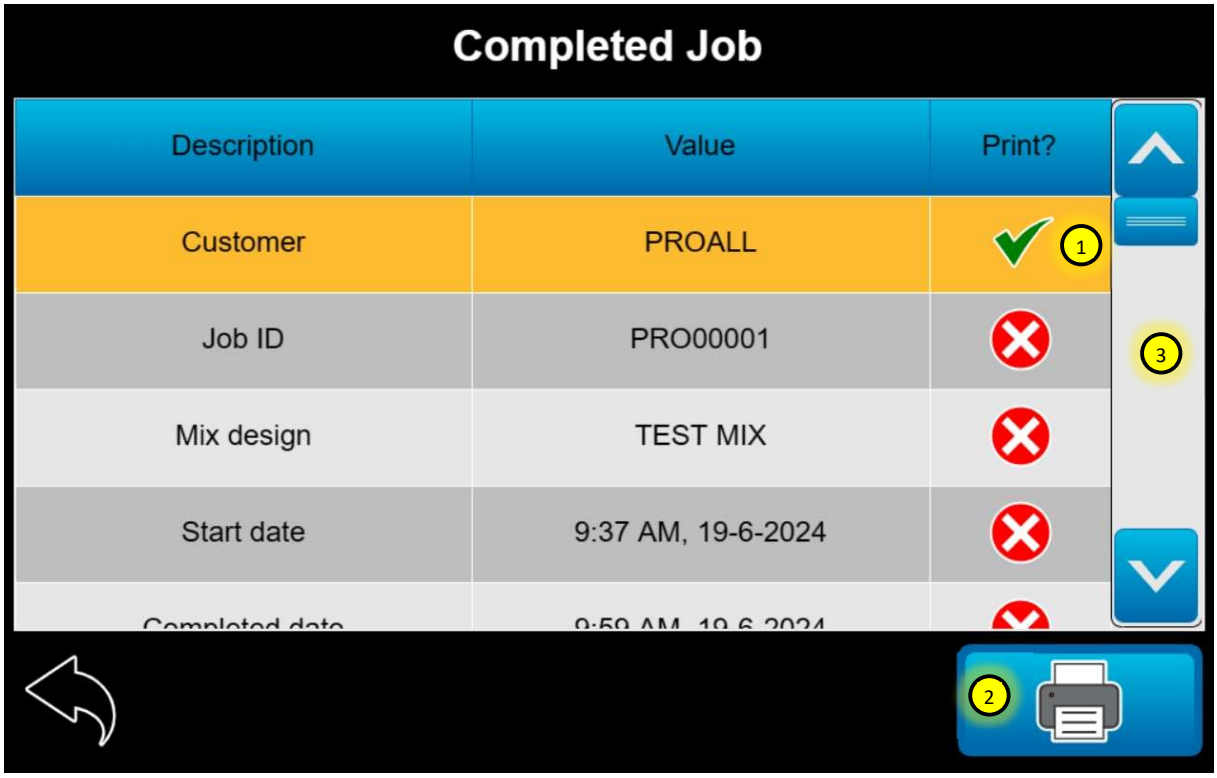
1. Job ID number. This ID is used as a reference for each job. It can be customized and incremented automatically.
2. The customer information can be added here for each specific job if required.
3. Select the desired mix design for the job here.
4. The Job ID can have a unique prefix related to your company or specific customer. The ID number is just a numerical value that can incremented automatically be selecting this option.



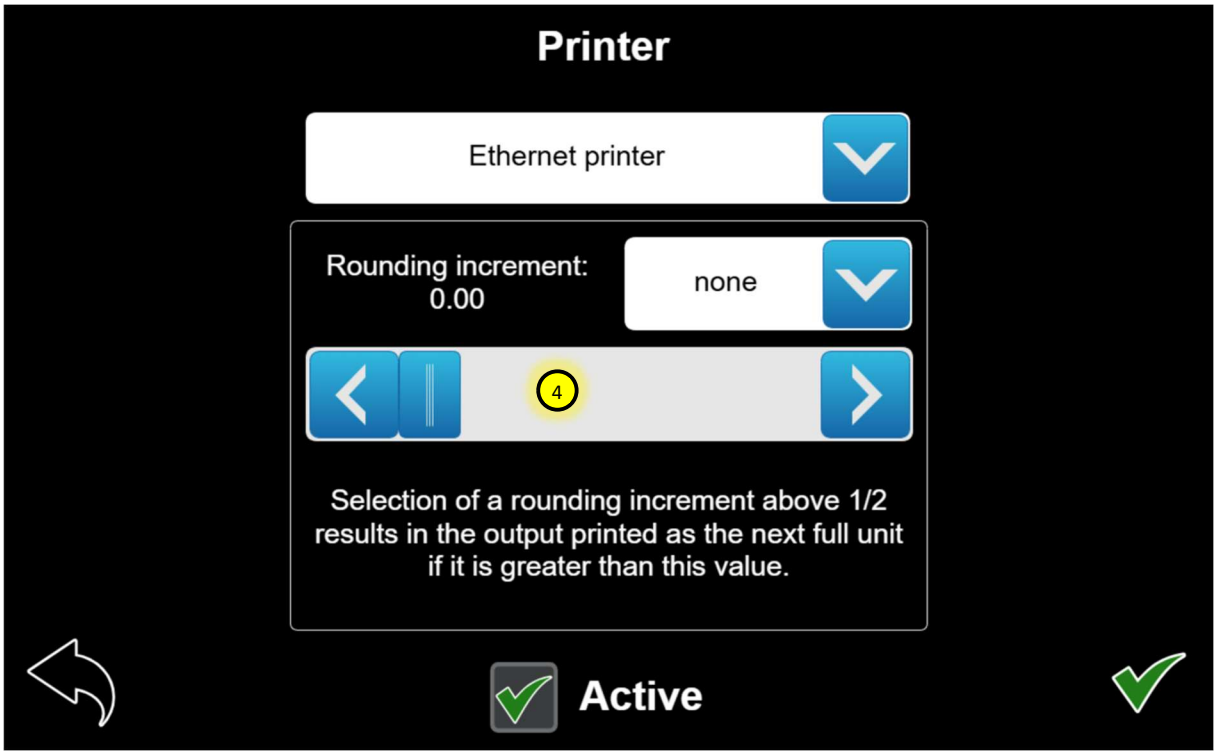


1. Start job (play) button. When this button is pressed the job details and mix design information will be loaded and the HOME page will display the mix design and subsequent component target settings will be calculated.
2. Edit the job.
3. Delete the job.
4. Go back to Queued jobs table.

2.04 COMPLETED JOBS / HISTORY

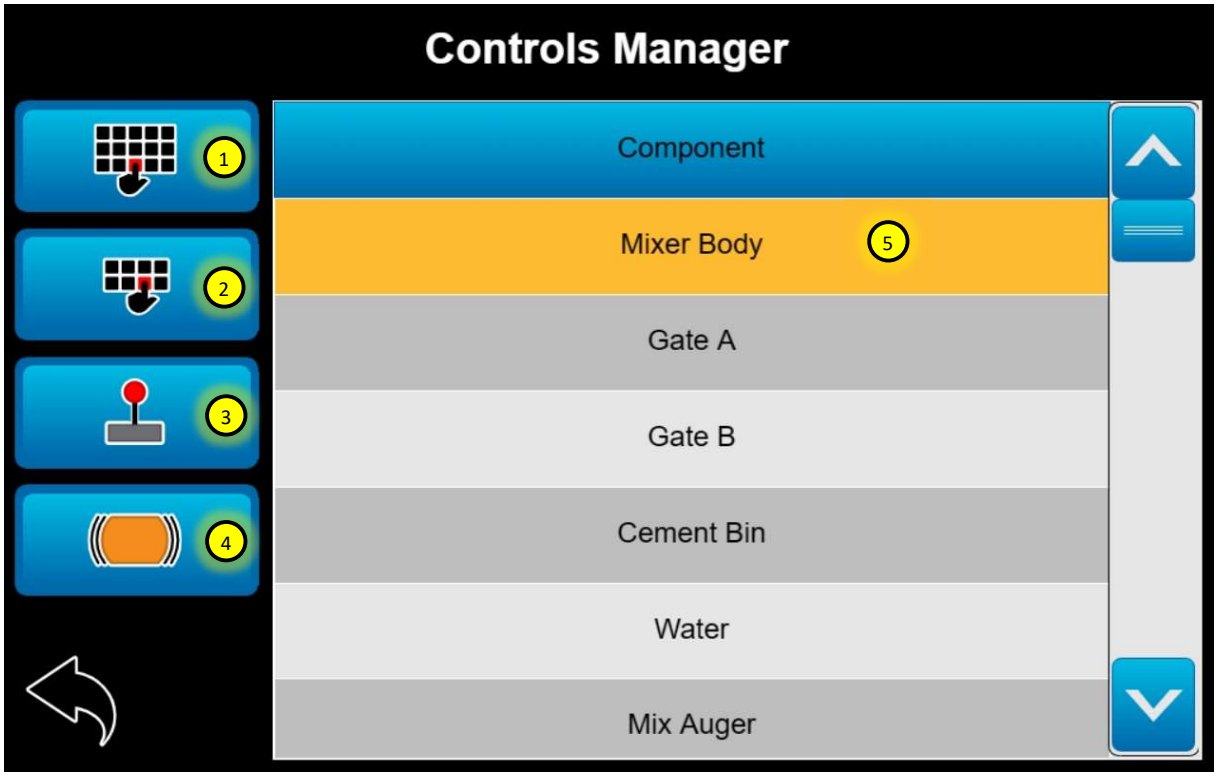


1. Completed jobs can be reviewed and specific items can be selected to show on a printed batch ticket.
2. Press the print button to send a print job.
3. Use the slider to scroll through list of printable items.
4. It is possible to select a total volume rounding value in the Components Manager/Printer settings of the display. This rounded value will show on the printed ticket only.



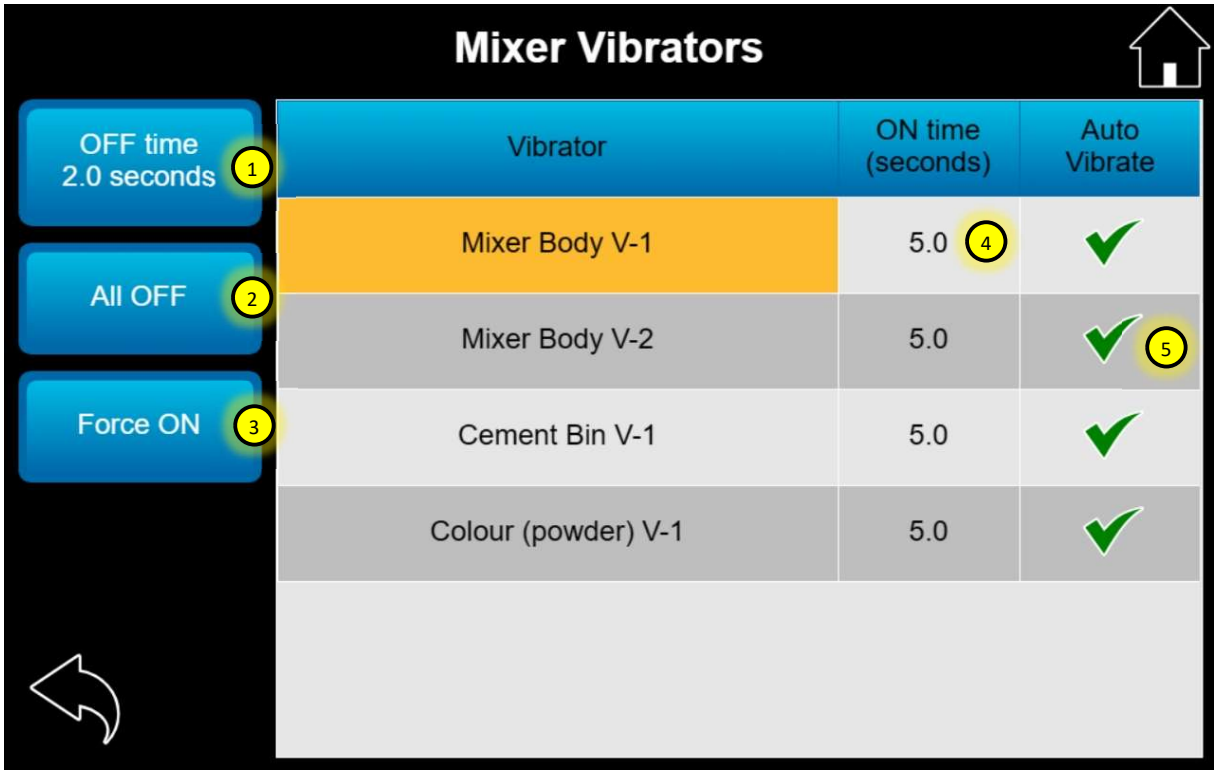
3. CONTROLS MANAGER

3.01 CONTROLS OVERVIEW



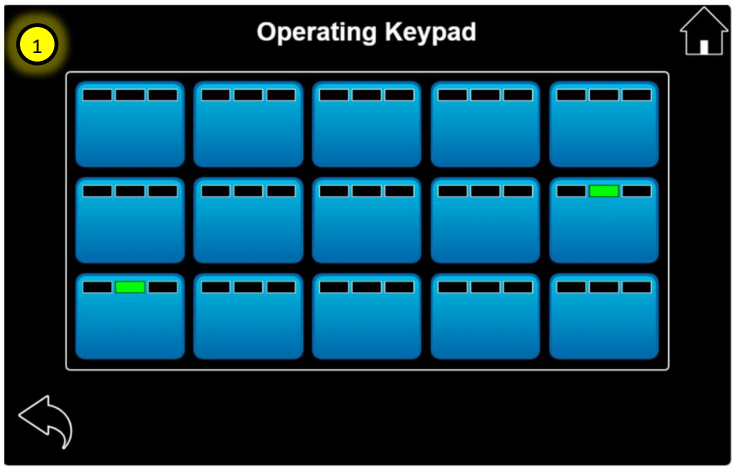
1. Main operating keypad screen.
2. Auxiliary operating keypad screen.
3. Joystick screen
4. Mixer vibrators screen.
5. Component selection. Press the component you want to modify settings.

3.02 MIXER VIBRATORS

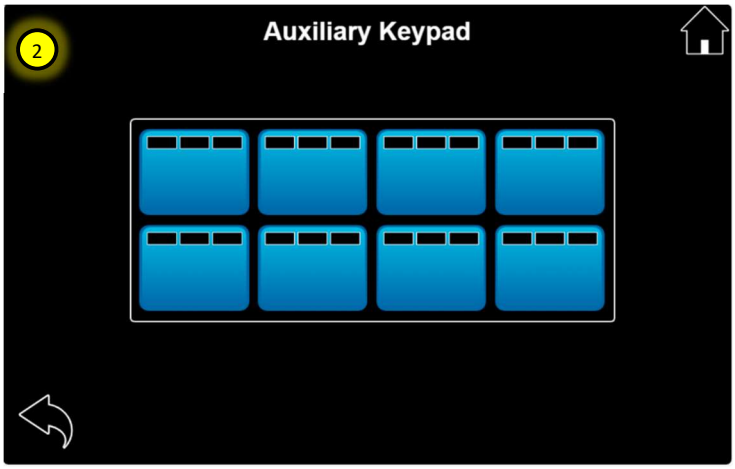


1. OFF time is the time between vibrator ON cycles where no vibrators are active. This should be a minimum of 2 seconds.
2. All OFF de-selects any vibrators setup to auto vibrate.
3. Force ON starts the auto vibrate cycle regardless of the mixer not started, and belt is not turning.
4. ON time is the time the sequenced vibrator will run between OFF cycles.
5. Select the specific vibrators you want to cycle automatically when mixer is running, and belt is turning.

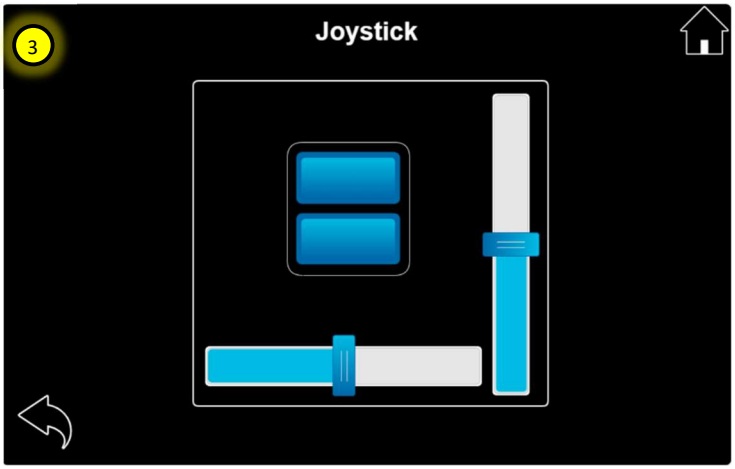
1. Main Operating Keypad



2. Auxiliary Keypad



3. Joystick

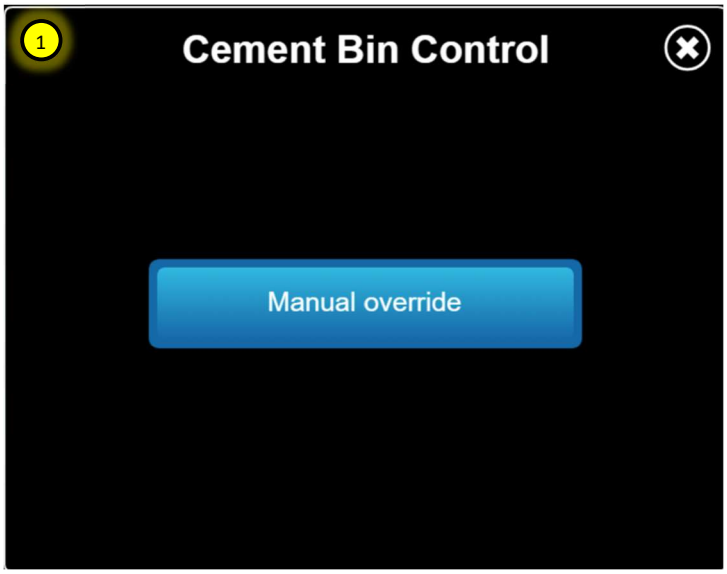


3.03 ALARM/AUTO OVERRIDE

1. Auto/Manual Override button. This will turn off automatic control and force the user to run the function in a manual mode. If the function does not have specific operator control (eg. Cement) then the computer will revert to a pre-defined speed control curve that will change the speed when the belt (production rate) setting is changed. There will be no speed control monitoring in this situation, so it is important that the automatic control issue be fixed as soon as possible. In the case of cement this override is only there to be able to finish a pour should an issue arise (ie. broken speed sensor).

Functions with auto/manual override.

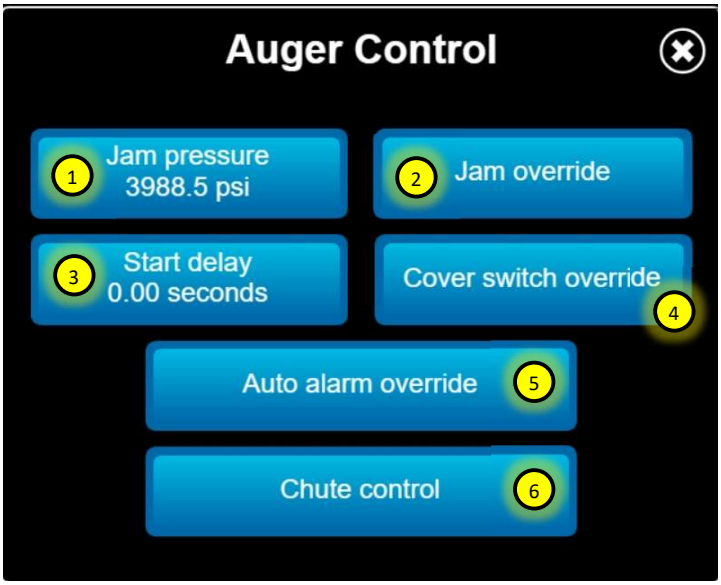
- Belt
- Auger
- Admix 1
- Admix 2
- Admix 3
- Admix 4
- Water
- Mix Auger
- Cement
- Color
- High Volume SCM
- Low Volume SCM
- Hydraulic Fiber
- Latex



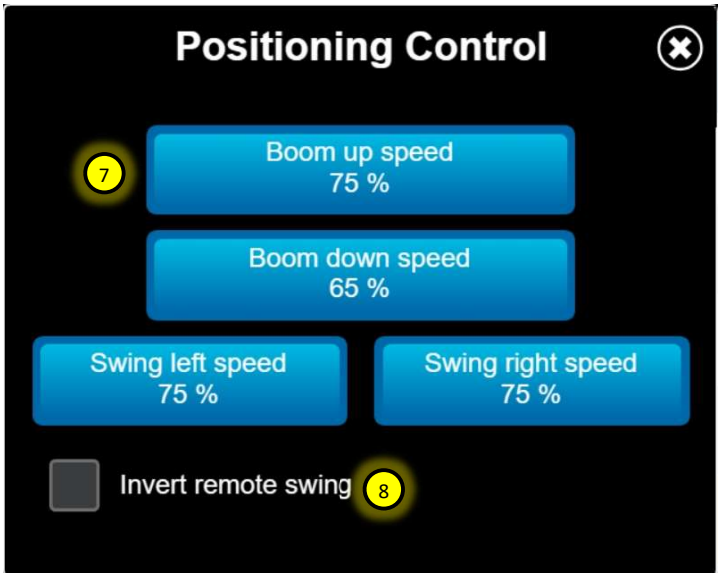
2. The belt has an extra setting called Belt start delay. This was primarily setup for wheelbarrows to allow the water to come on just before the belt starts turning.

3.04 MIX AUGER CONTROL/POSITIONING

1. Auger Jam pressure is the pressure that the auger must reach before it will stop the mixer / turn off the belt.
2. Jam override if active will ignore the auger jam pressure shut-off functionality.
3. Start delay (not used).
4. Cover switch override when active will turn off the auger lid switch temporarily. A warning will appear when this is activated indicating the safety risk.
5. Mix auger speed control override.
6. Chute speed control percentage for up and down.

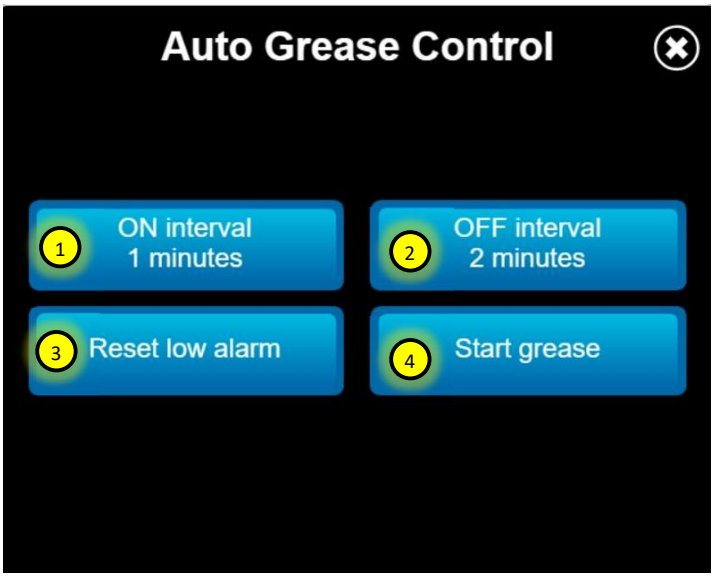


7. Boom and swing speed control settings.
8. Invert remote swing switches the swing left and right functionality on the remote control. This is dependant on where the operator usually stands when using the remote.

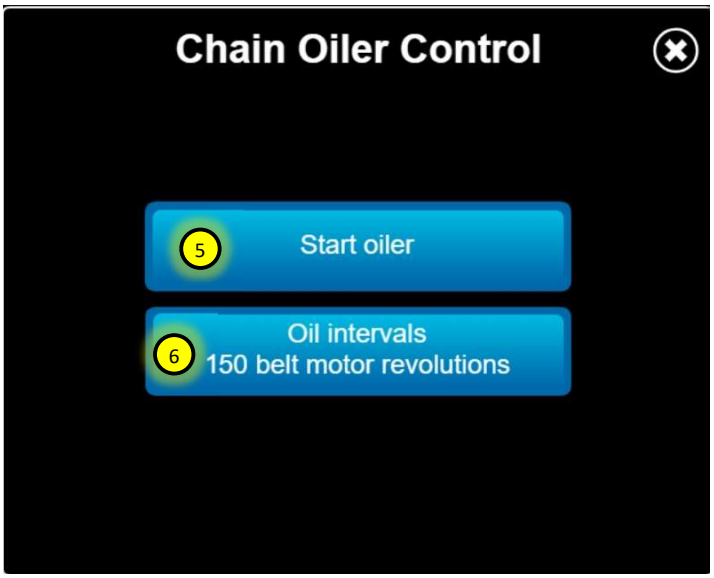


3.05 LUBRICATION SETTINGS

1. ON interval is the time the auto grease pump stays running before turning off.
2. OFF interval is the time the auto grease pump stays off before turning on again.
3. Reset/Override grease low alarm.
4. Manually start the auto grease cycle. In auto mode the greaser only cycles when the mix auger is running.

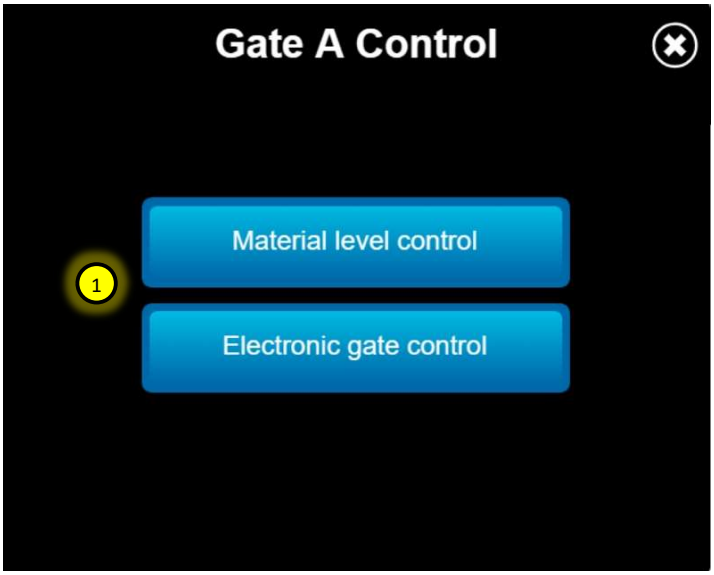


5. Manually start the chain oiler. In auto mode the chain oiler only cycles when the motor revolutions are surpassed.
6. This is the total belt revolutions before the oiler cycles. The oiler will pulse 5 times over the length of the belt.



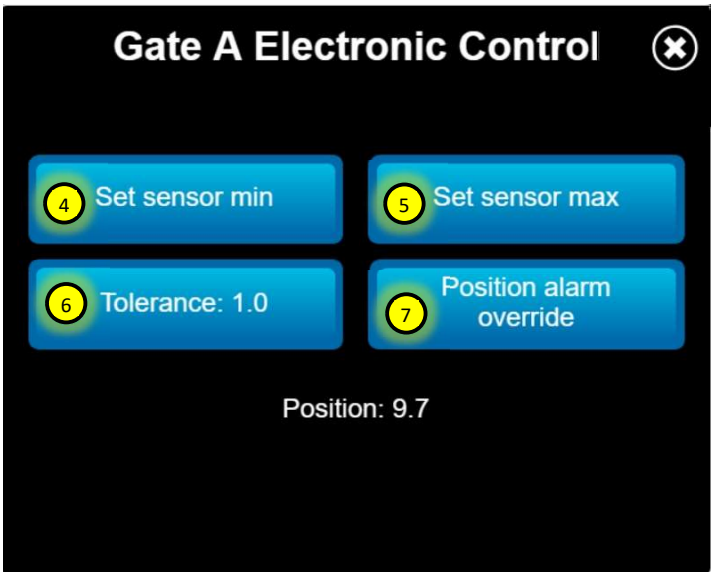
3.06 GATE SETTINGS

1. Gate control is the same for both A and B gates and allows the operator to control the settings for the gate position sensors and the gate material (level control) sensors.

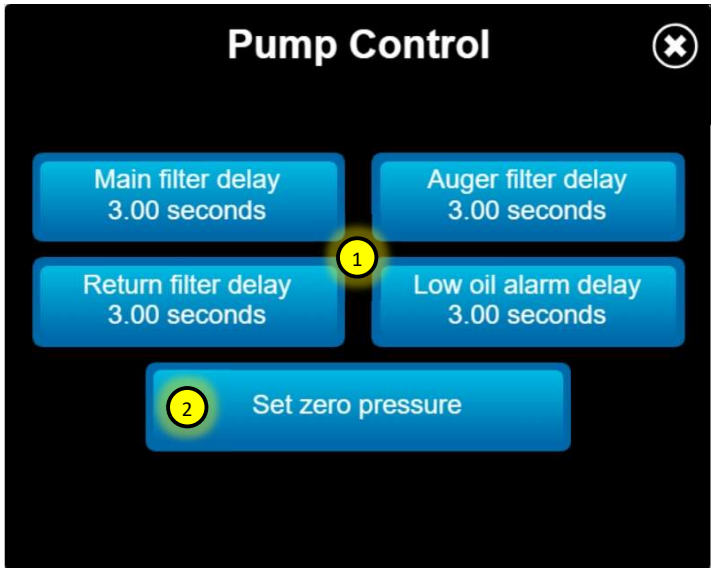


2. Gate material (level control) can be overridden by pressing the low alarm override.
3. The same sensor can be taught where the material level should be (ie. just below the gate). To teach the sensor make sure material is leveled off at the selected gate height. Adjust the wheel one gate height position higher and hold he teach button. When the sensor flashes amber and then stays release the teach button.

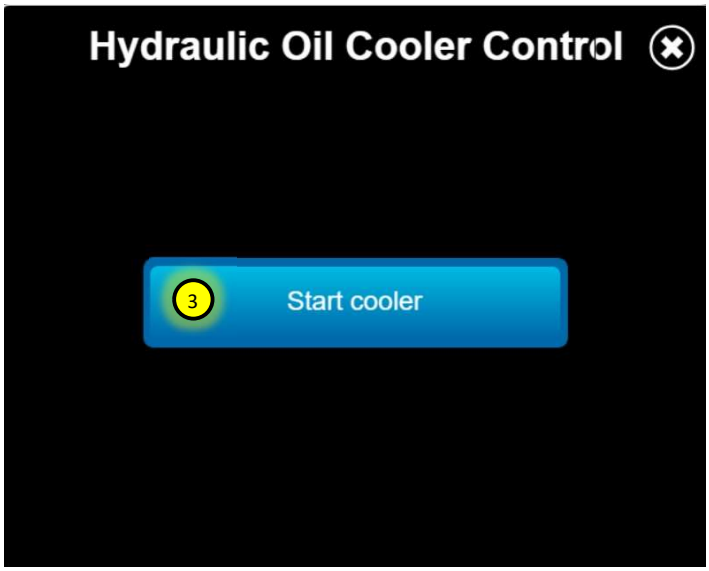
4. Calibrate the gate position minimum position. Set the gate to zero on the wheel and press the button.
5. Calibrate the gate position maximum position. Set the gate to 18 and press the button. You should get a position reading of 18.
6. Gate tolerance can be set to allow for small variances of gate position outside of the mix design. This will show up on the HOME page gate wheel pop-up.
7. Override the gate position sensor and ignore the alarm.



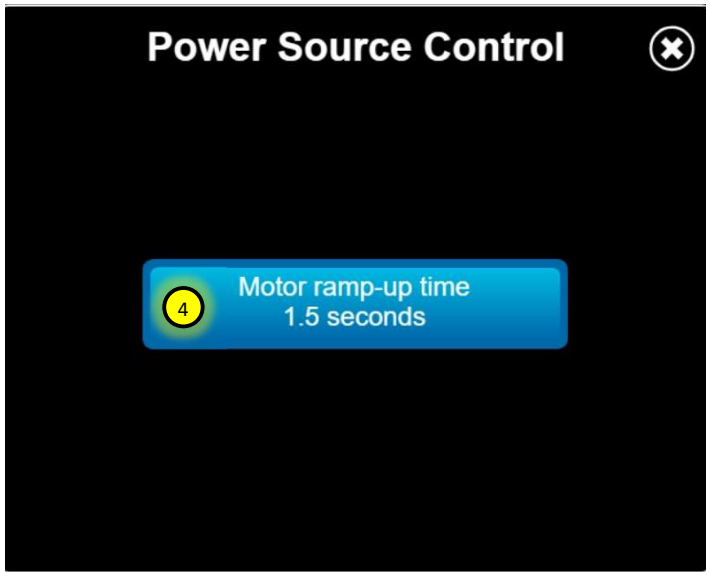
1. Optional electrical filter indication and low oil indicator alarm delay settings.
2. Zero hydraulic pressure transducers. This must be done with the PTO off and hydraulic pressures at zero.



3. Manually override the hydraulic oil cooler. Used to test the connection. Otherwise, the oil cooler fan speed is proportionally controlled by a temperature sensor in the hydraulic return line.

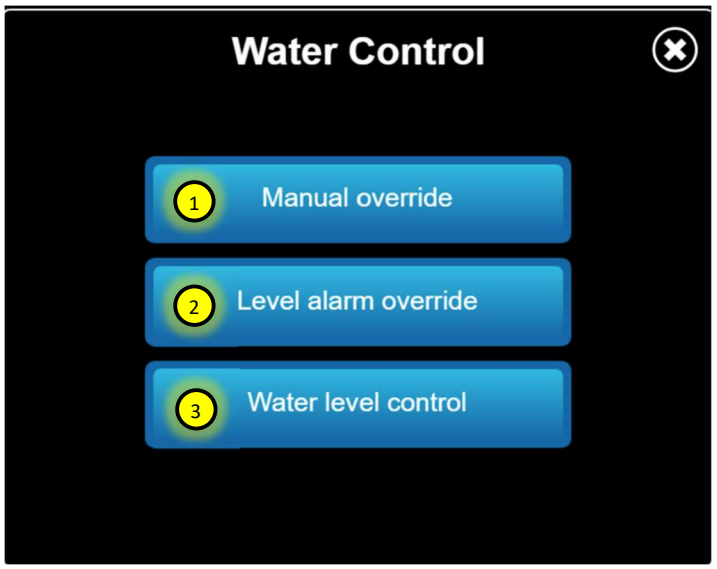


4. Motor ramp-up time is used to ensure the prime mover / motor is given time to get to speed before the mixer starts.

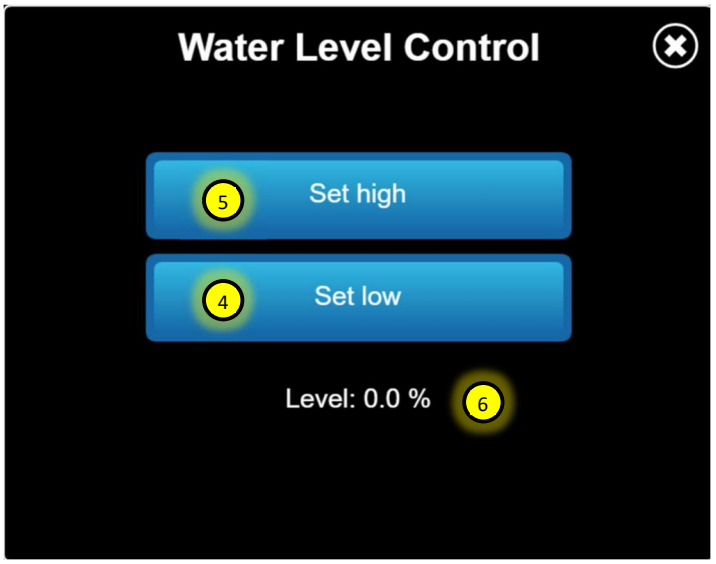


3.08 WATER SETTINGS

1. Manual override (see section 3.03)
2. Override for low water level alarm.
3. Water level control setup.



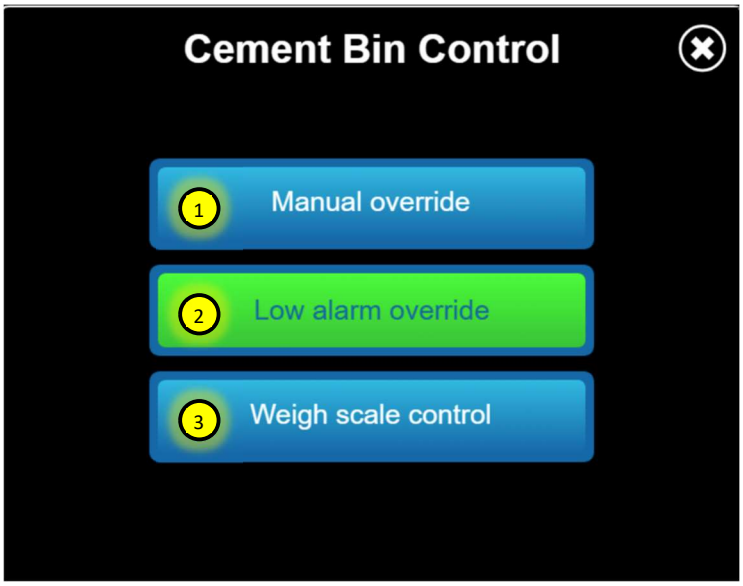
4. Calibrate the low water level setting. This can be done with a small amount of water in the tank or empty. It depends on where the user wants the 0% reading to start.
5. Calibrate the high water level setting. This would be the 100% full mark. Set this with the water tank full to the maximum limit desired.
6. The water level reading from 0-100% based on the limits set above.



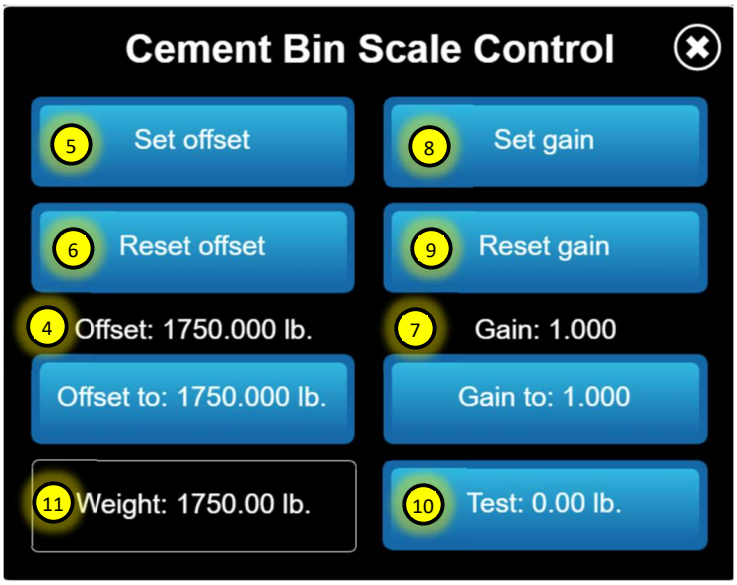
Note: Low water level alarm message is triggered when water is below 20%. The high water level alarm message is triggered when water is above 90%.

3.09 CEMENT SETTINGS

1. Manual override (see section 3.03).
2. Cement (level control) can be overridden by pressing the low alarm override.
3. Cement scale setup. This will only show if cement bin scales are activated in the components manager.

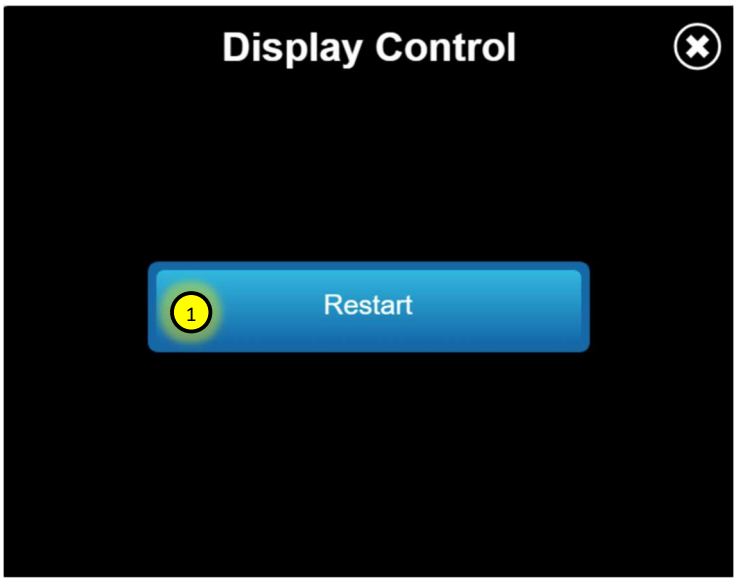


4. Offset is the empty weight of the bin. This is used to "Zero" the bin weight from the actual cement weight in the bin. This should only need to be set once at the factory, but may need to be inputted manually if the value is reset.
5. If the value needs to be re-entered, then type the value into the Offset to: entry field and press the Set Offset button.
6. Reset offset will go back to the previous or zero value.
7. This is the load cell amplifier gain value. The default value is 1.000, but may need to be adjusted to fine tune the weight reading. Adjusting the gain value is affectively adjusting the slope of the weight vs. output curve.
8. Set gain is used to change the gain value to either the number manually entered, or a calculated value based on a test weight.
9. Resets the gain value back to previous value or zero.
10. The known test weight loaded into or onto the bin to calibrate the gain value.
11. The calculated output weight of the cement bin materials based on the offset and gain values entered.



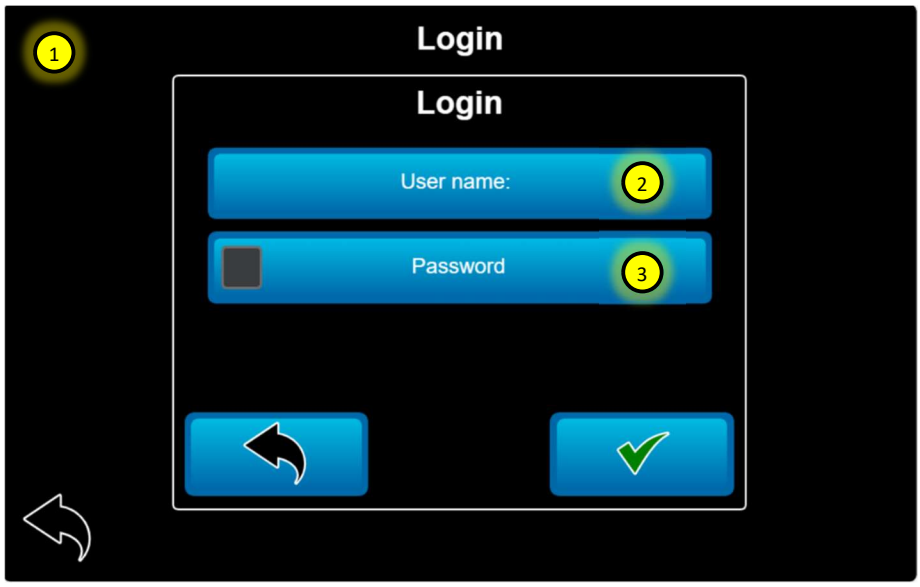
3.10 DISPLAY SETTINGS

1. Restart the display. This will force the display to reboot without having to power off the mixer. It is typically used after doing a software update or for trouble shooting purposes.

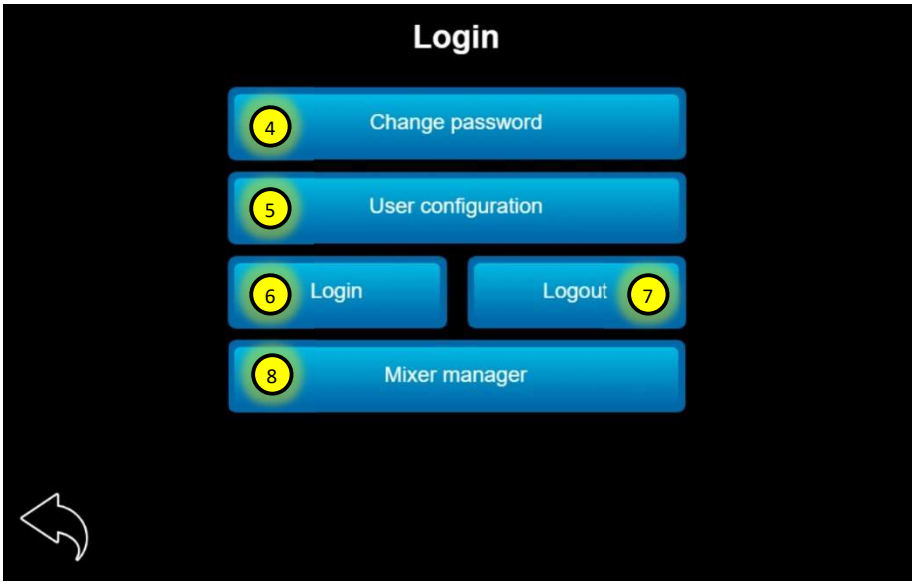


4. MIXER MANAGER

4.01 LOGIN/USER MANAGEMENT



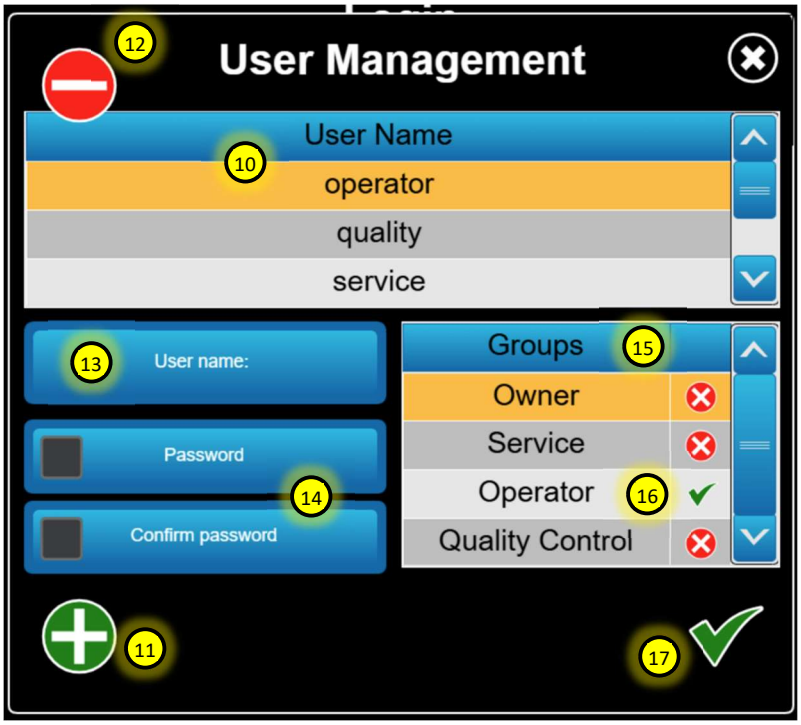
1. On first run when the Mixer Manager button is pressed on the HOME screen this login screen will appear.
2. The default user name is “owner”.
3. The default password is “owner”.
4. Change the current users password.
5. Open user management screen where new users and groups can be assigned.
6. Login with a new user.
7. Logout existing user.
8. Open mixer manager screen.



9. Mixer Manager screen (see next section for details).
10. Current user table. Scroll to see all active users and their associated groups.
11. Create a new user. Must enter in credentials and password first before creating a new user.
12. Delete user from list. **DON'T DELETE OWNER GROUP USER!**
13. Create user name (company specific).
14. Create new password and confirm.
15. Select associated user group to the new user.
16. If nothing checked user will be de-activated.
17. Save new settings.

Groups (Access rights)

A. Owner
    a. Access to all management screens.
B. Service
    a. Login
    b. Mixer Manager
    c. Job Manager
    d. Controls Manager
    e. File Manager
    f. Mixer Information
    g. Simulation
    h. Mixer Settings
    i. Components
C. Operator
    a. Login
    b. Job Manager
    c. Controls Manager
    d. Mixer Information
D. Quality Control
    a. Login
    b. Mixer Manager
    c. Job Manager
    d. Controls Manager
    e. File Manager
    f. Mixer Information
    g. Mixer Settings
        i. Materials
        ii. Calibrations
        iii. Mix Designs

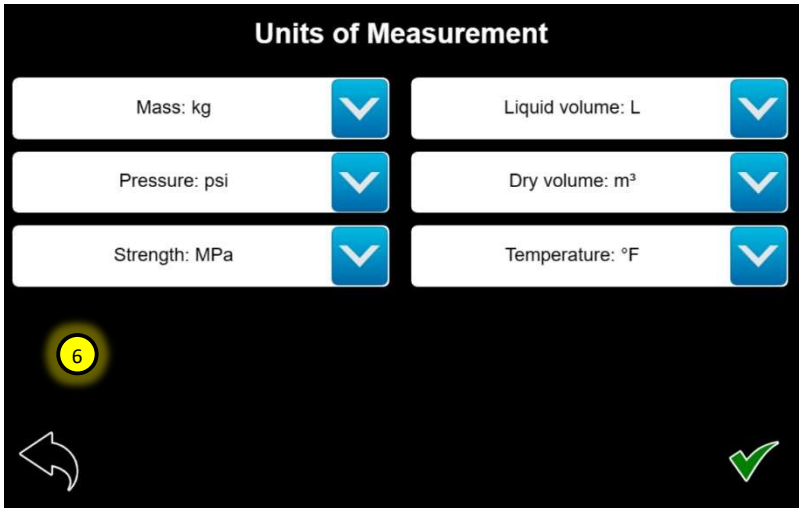


4.02 MIXER PROPERTIES

1. Company name and address. This will print on the batch ticket.
2. Mixer / truck unique name.
3. Language for the display.
4. Units of measure
5. Set the date and time.

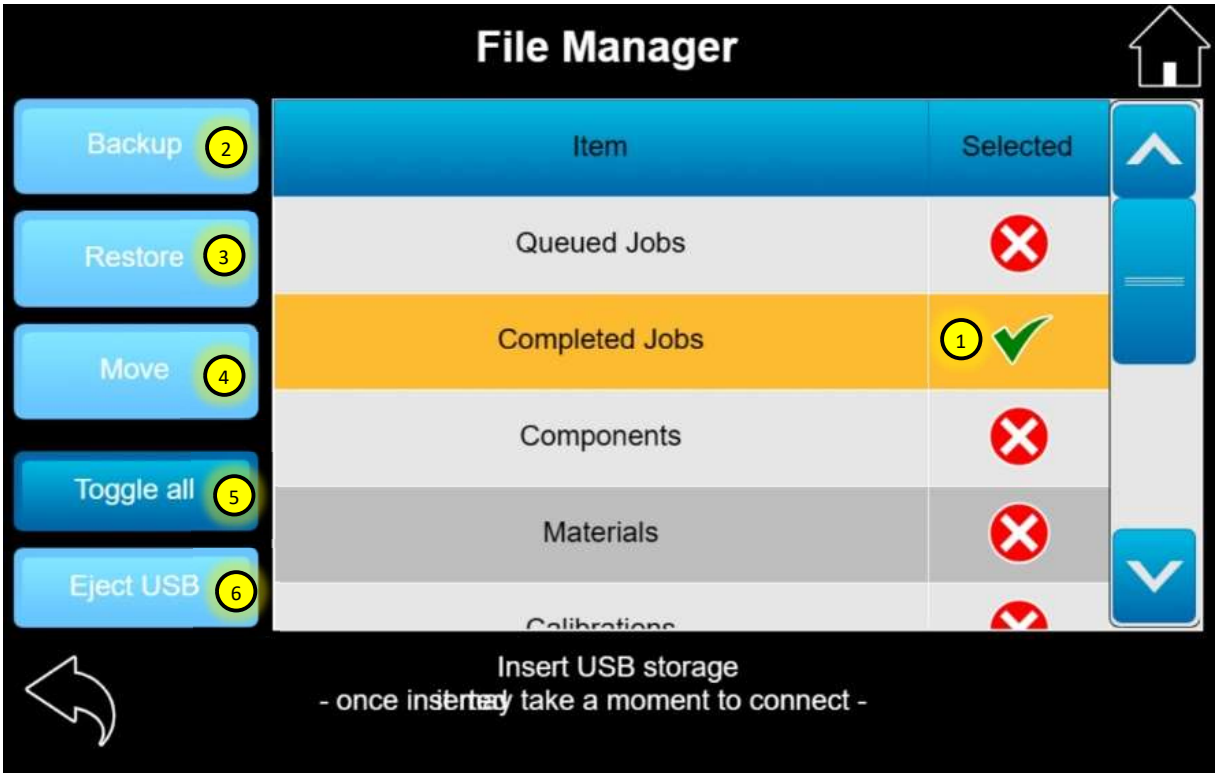
6. Units can be changed individually based on preference. They can be mixed and matched in both metric and US / Imperial measurements.

Note: The units selected here will affect what the wireless remote displays as well.



7. Language options at time of writing are English, Spanish and French.

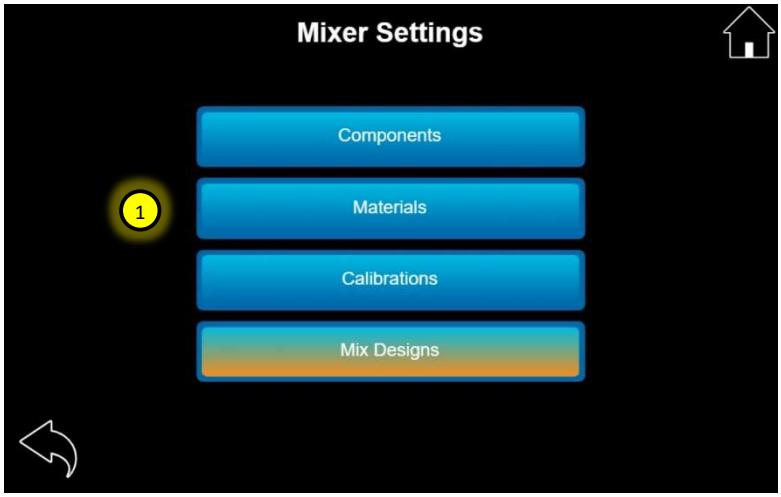
4.03 FILE MANAGER

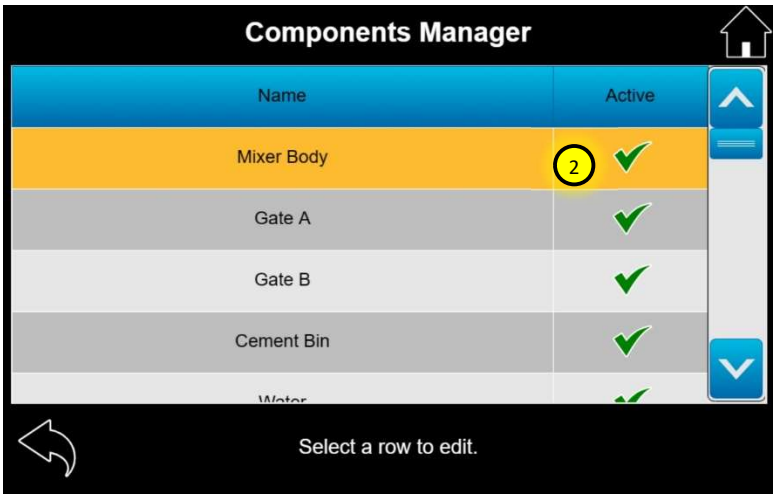


1. Select the items you want to use.
2. Backup selected items to usb stick.
3. Restore selected items from usb stick. Be careful before pressing this button that the specific items you want to restore are selected.
4. Move files from display to usb. The data for this file will no longer reside on the display and could create issues with subsequent databases.
5. Select all the items on the list.
6. Eject the usb stick when function is complete.

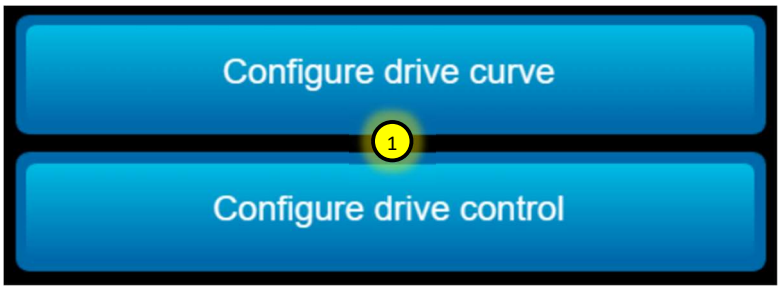
4.04 MIXER SETTINGS

1. Mixer Settings has four main sections.
    a. Components - consists of factory settings and setup values for each component /function on the mixer.
    b. Materials – Add material names and types here. This must be done prior to calibrating or entering mix designs.
    c. Calibrations – Add material calibrations for aggregates, dry materials, and liquids.
    d. Mix Designs – Add mix designs here using materials and calibrations from previous steps.
2. Components Manager
    a. Components manager is broken down by the physical components / functions on the mixer. If there is a check mark in the active column, then the mixer believes that component is installed. Be careful not to de-activate a component that exists or active one that does not exist. The mixer software will prompt you if that component is being used in a subsequent calibration or mix design if you delete it.
    b. Most of the settings in the components manager are setup at the factory and are beyond the scope of the manual. This will be covered in more depth in the service manual.

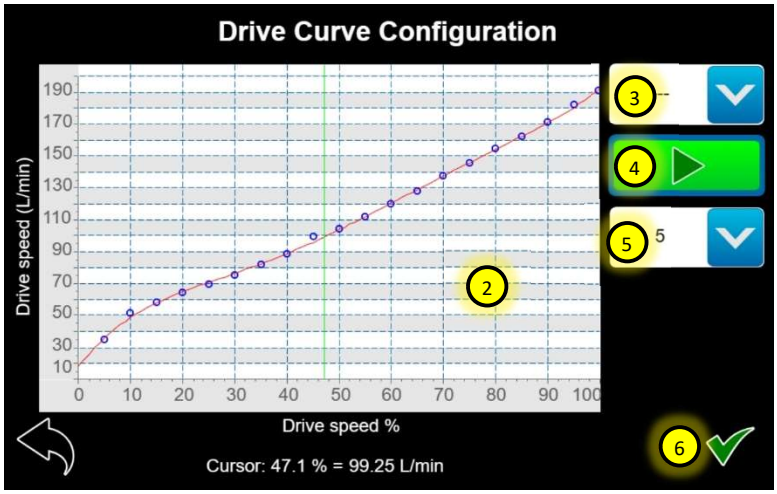




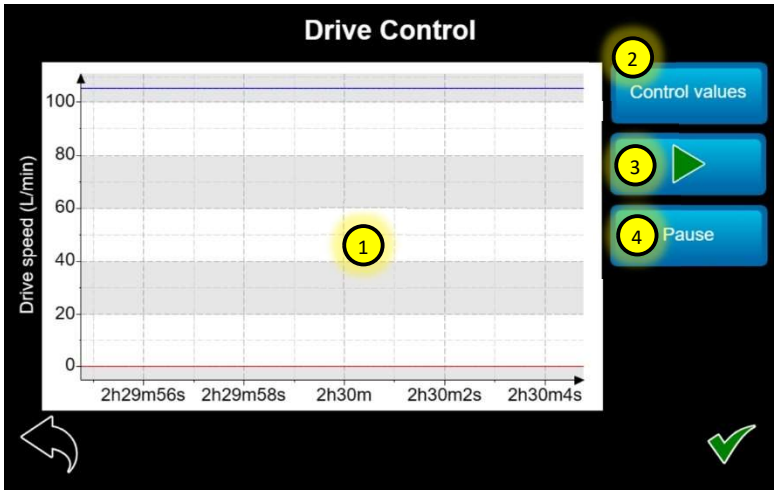
4.05 CONFIGURE DRIVE CURVE



1. Drive configuration has two parts.
    a. Drive Curve (applies to liquids at this time).
    b. Drive Control (applies to all auto controlled components/functions.
2. Drive curve configuration teaches the computer the output flow relative to the drive speed. This is used to help predict the drive speed requirement before the drive is activated. It is especially useful for non-linear outputs or output flow characteristics that may change based on the viscosity of the fluid being pumped.
    a. The drive curve chart shows the output data points and has a green curser that can be moved to show the drive % vs. output flow. This same chart is used to show the best fit line.
3. Regression type. This must be selected first before a trial is run. There are three options.
    a. None (defaults to linear on exit).
    b. Linear (use for water)
    c. Log (use for admix)
    d. Bilinear (can also be used for admix)
4. Play or start the test. Be sure before pressing this button that liquids can be collected or dispersed safely. As soon as play is pressed the mixer will run the function and start collecting data points (fluid flow samples).
5. Once the data points are collected select the polynomial degree to best fit the data points. Typical is 4th or 5th order for liquid pumps.
6. Once the curve looks good make sure to press the check mark (SAVE) button to exit.



4.06 CONFIGURE DRIVE CONTROL

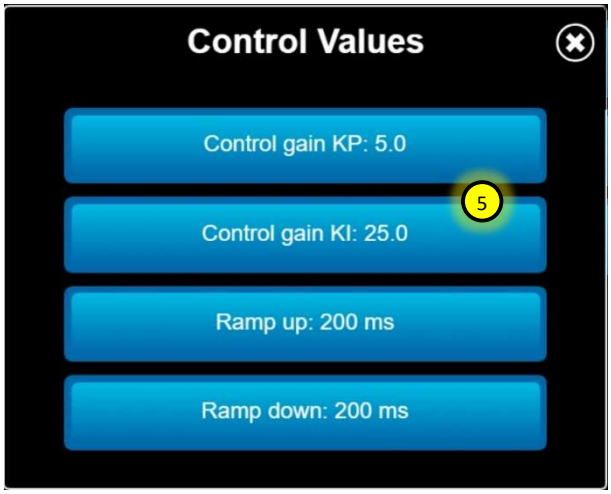


1. Drive control is used as a visual tool to help adjust closed loop control gains and see how the component is reacting to changes in setpoint. The blue bar is the setpoint and the red bar is the actual. The drive control tool can be used for all automatically controlled components (speed and flow controlled). The tool allows the user to see if the component is meeting the setpoint and if it settles in quickly or needs to be more reactive. These settings are factory set but may need some adjustment from time to time.

2. Control values pop-up screen.

3. Play button. When ready to test the component press the play button and that mixer function will begin to run. Be sure everything and everyone is in a safe state before pressing play.

4. Pause is used to stop or pause the graph from moving to the right to look at that one snapshot in time.



5. The control values that can be adjusted are.

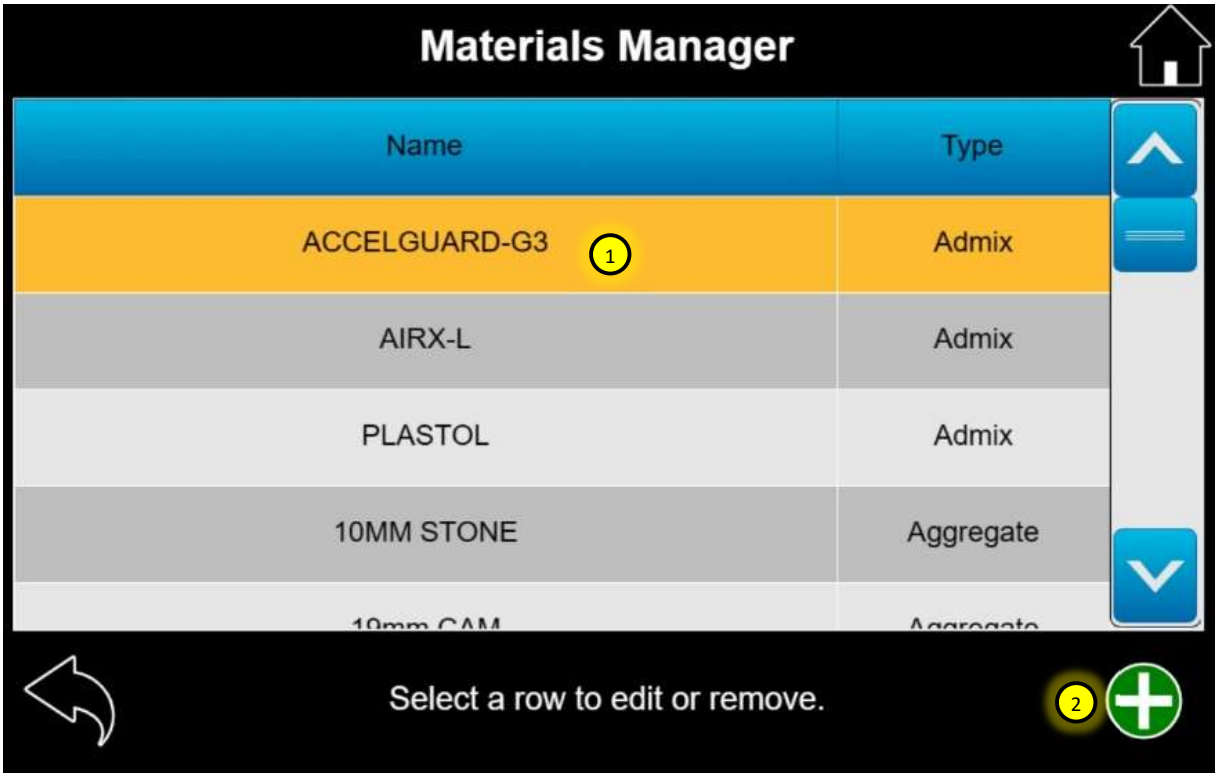
   a. KP Gain – Proportional gain. This adjusts how quickly the component reaches setpoint. If it is too high a value, it will overshoot. If it is too low, it will undershoot the setpoint or take too long to reach it. A slight overshoot is desirable.

   b. KI Gain – Integral gain. This adjusts the ability of the component to settle into the setpoint after initial change. If this is too high the output will oscillate. If it's too low, it may not reach the setpoint. The degree of oscillation depends on the component, but a perfect result would be to overlap the blue and red bars and hold indefinitely. Small disturbances will cause this to go slightly over or under the setpoint, but it should bounce back and match.

   c. Ramp up and Ramp down changes the rate at which the setpoint changes. This is typically 0-200ms for most components.

5. MATERIALS MANAGER

5.01 MATERIAL LIST



1. Materials manager is the first step in setting up the mixer for calibration and mix design entry. If no materials are entered into the table, then calibrations and mix designs can not be created.
2. To add materials to the table, press the add symbol. See next section for more details.

5.02 MATERIAL TYPES

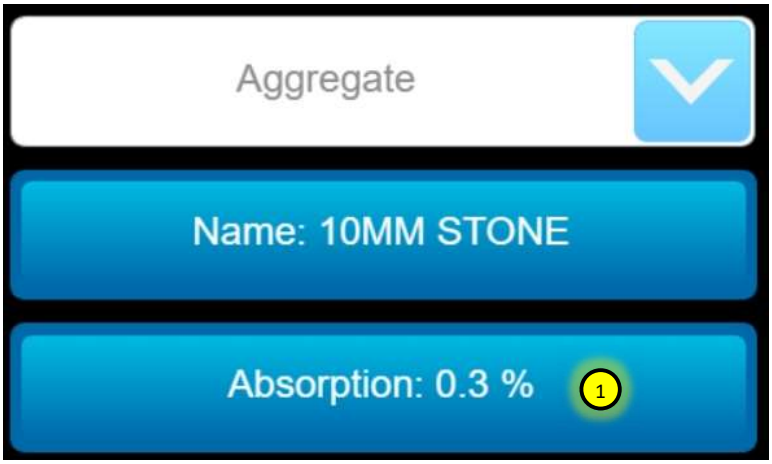
There are four main material types that can be added.

Main types are:

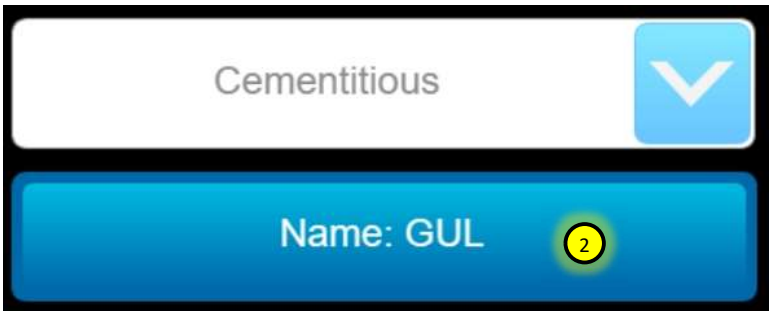
- Aggregate – Sand and Stone
- Cementitious – Cement, Flyash, Rapid Set, Silica
- Admix – Liquid (eg. Water reducer)
- Water

Optional/Aux types are:

- Colour powder – dry feeder
- Fiber – micro glass fiber
- Latex
- Color liquid – used with peristaltic pump system.
- Viscous – same as color liquid but can be specialized high viscosity admix.



1. Aggregate material types have an absorption field. This is used to store the materials absorption percentage that will be deducted from the total moisture values entered for a pour to get free moisture.
2. Cementitious materials just require a unique name identifier.
3. Admix materials have a water dilution percentage that is used for very low dosage admixes like air entrainment. If the flow rates are very low the pumps/electric motors may not run efficiently at those low speeds. Diluting the admix will increase the flow rates. The mixer computer will calculate the water amount total and add that to the total water in the mix. The totals for admix will be chemical amounts only. A 1:1 ratio would be 50% water and 50% chemical.



More examples:

80% water would be 4:1 dilution ratio.

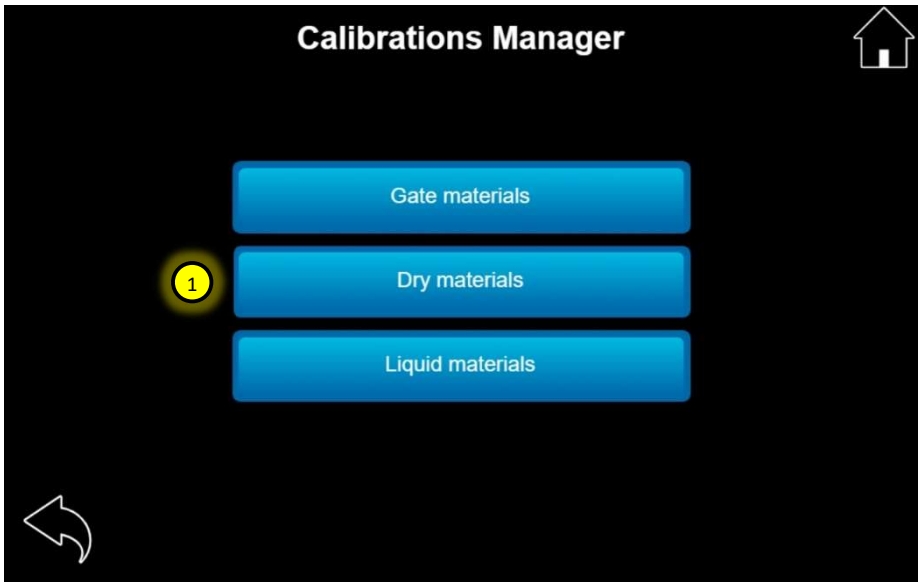
4/(4+1) = 4/5 = 0.80 x 100 = 80%

90% water would be 9:1 dilution ratio.

9/(9+1) = 9/10 = 0.90 x 100 = 90%

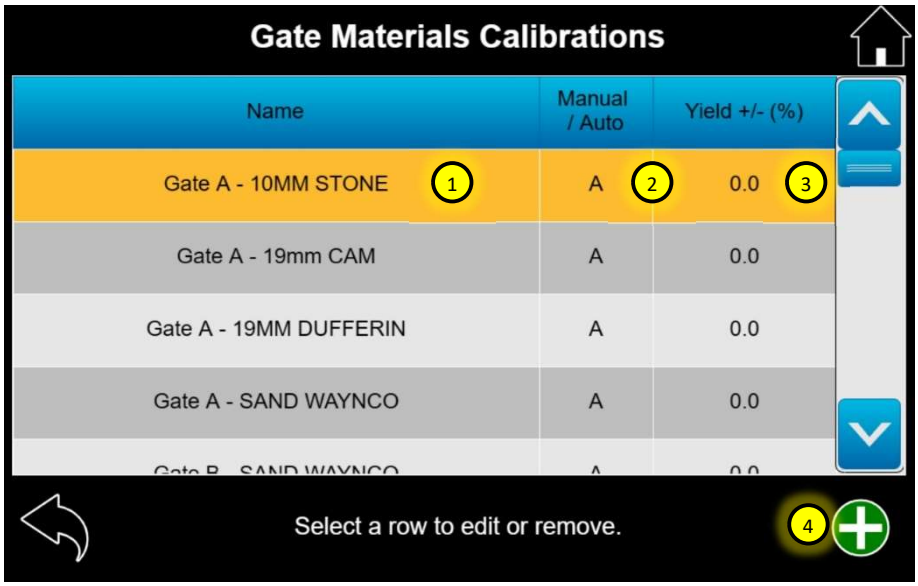
6. CALIBRATION MANAGER

6.01 MATERIAL TYPES

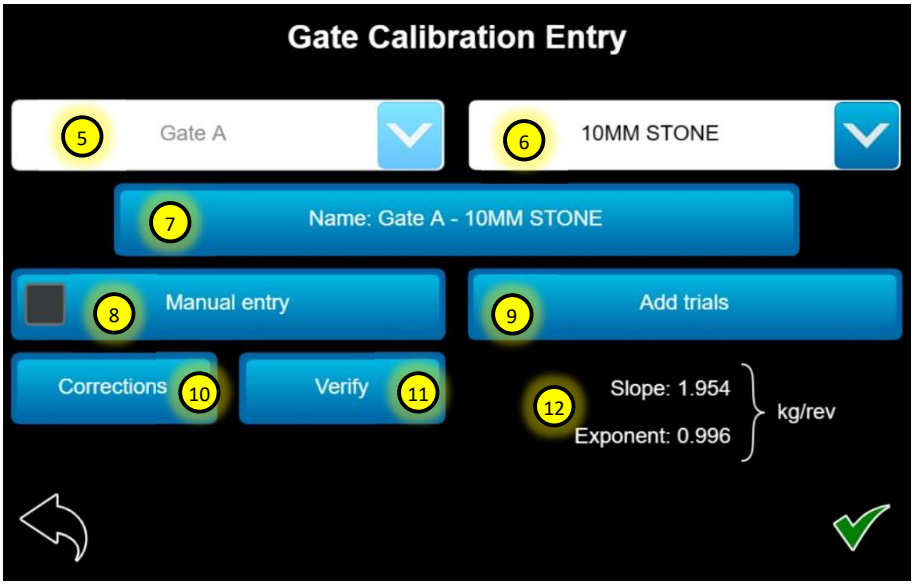


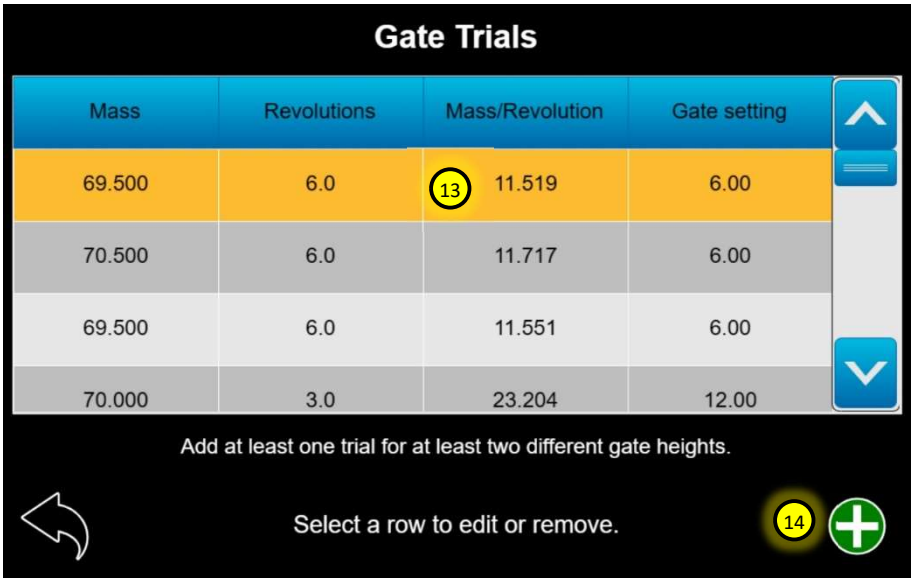
1. Calibrations manager is broken into three main groups or types of materials.
    a. Gate materials – this includes anything that would be flowing through the gates on the mixer. Typical materials would be sand and stone.
    b. Dry materials – this includes any dry powder material and would be both cementitious (cement) and non-cementitious materials (powder color).
    c. Liquid materials – this includes admix and water.
    d. Viscous materials – this includes liquid color and high viscosity admix. * Not yet implemented *

6.02 GATE CALIBRATION

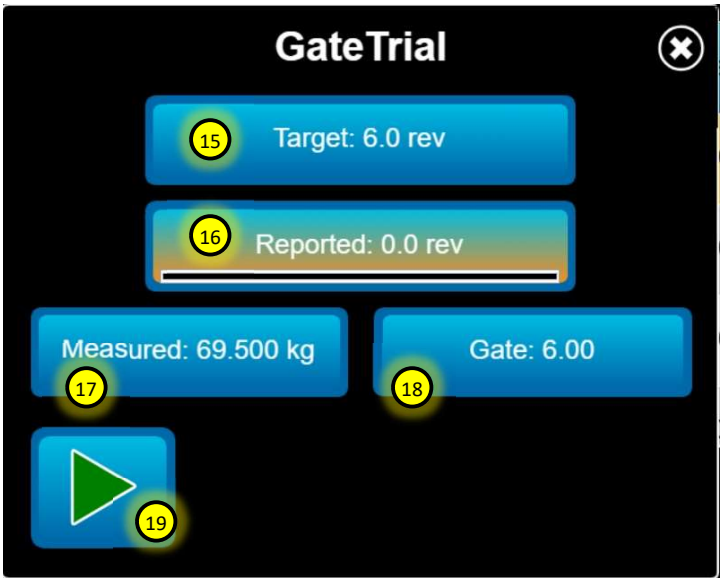


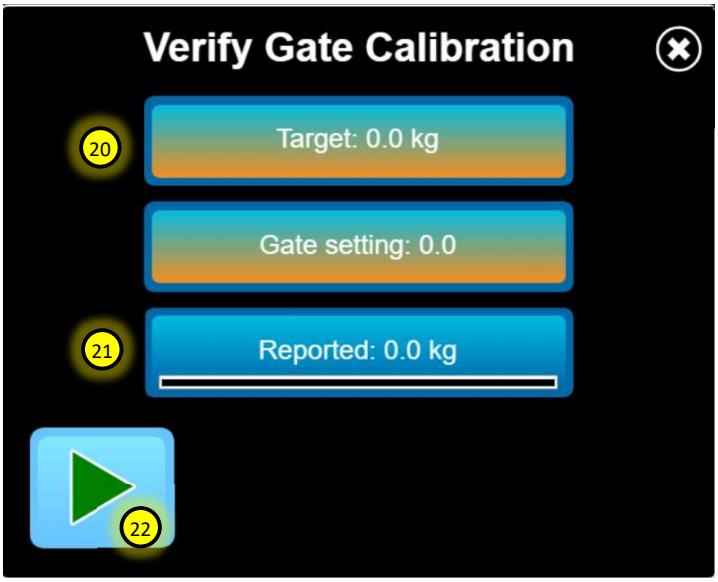
1. Gate material table shows a list of all the calibrated gate materials.
2. Mode that the calibration line slope was created.
    a. Auto – Calibrations were entered via trials and the mixer computer calculates the slope of the line.
    b. Manual – Line slope is manually entered for the material calibration.
3. Yield correction – This is used to adjust the calibration curve slope to adjust for volume yield. If after a yield test you find that the volume poured was low by 5%. Then you could increase the slope of the sand and/or stone by a small percentage equal to the 5% to effectively change the gate height in the mix design.
4. Add new gate material calibration.
5. Select the gate to be calibrated (A or B).
6. Select the material to be calibrated from the materials manager list.
7. Change the calibrated material name (default is Gate and material manager name).
8. Manually enter the line slope.
9. Add trials to calculate the line slope.
10. Add correction values for moisture and yield.
11. Verify the weight output.
12. Current line slope entered or calculated.





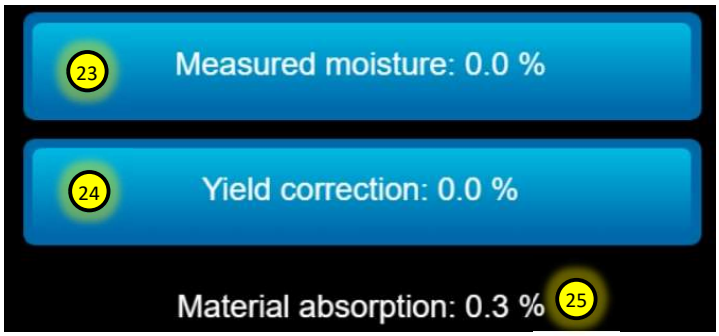
13. Gate trial table shows all the associated trials for the calibrated material. This is where outliers can be spotted and deleted / re-calibrated to ensure consistency.
14. Add new gate trial. It is important to add at least two trials for two different gate settings. Three trials at three different gate settings are recommended.
15. Target is the number of belt revolutions you want to stop at for the trial sample. The target number will change based on the gate height selected, the size of the sample bucket and the weight that can be safely handled. Gate settings less than 6 are typically 6 revolutions or higher. Above a gate setting of six the revolutions are less. For example, to achieve about the same weight at a gate setting of 12 the revolutions target would be 3.
16. Reported are the actual belt revolutions recorded after the belt stops. The trial computer will ramp down the belt speed as it approaches the target revolutions, but it may overshoot slightly. If the belt stops before reaching the target you can manually adjust the target lower to finish the trial. The important number used in the calculation is the reported.
17. Enter the measured sample weight here. Be mindful of the units and make sure your scale is set accordingly.
18. The gate height setting for the trial. Be sure your belt is primed at the selected gate height before running a trial.
19. The play button to start the trial sample. This button will start the belt, so be aware of any safety risks before pressing this button.



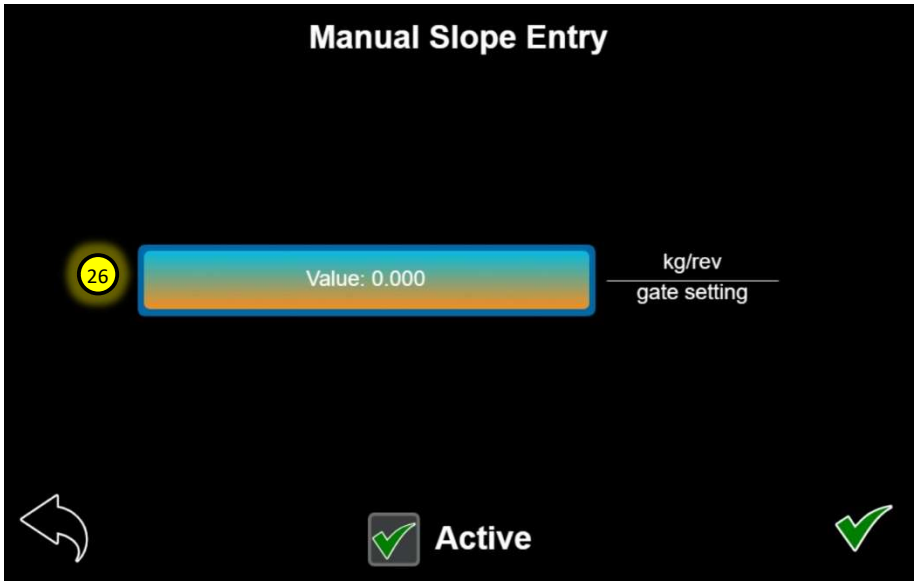


20. Verify gate calibration. Enter a target weight and the gate setting. The mixer computer will calculate the required belt revolutions to achieve that weight.
21. Reported is the calculated weight used to verify against the actual.
22. The play button to start the verification sample. This button will start the belt, so be aware of any safety risks before pressing this button.

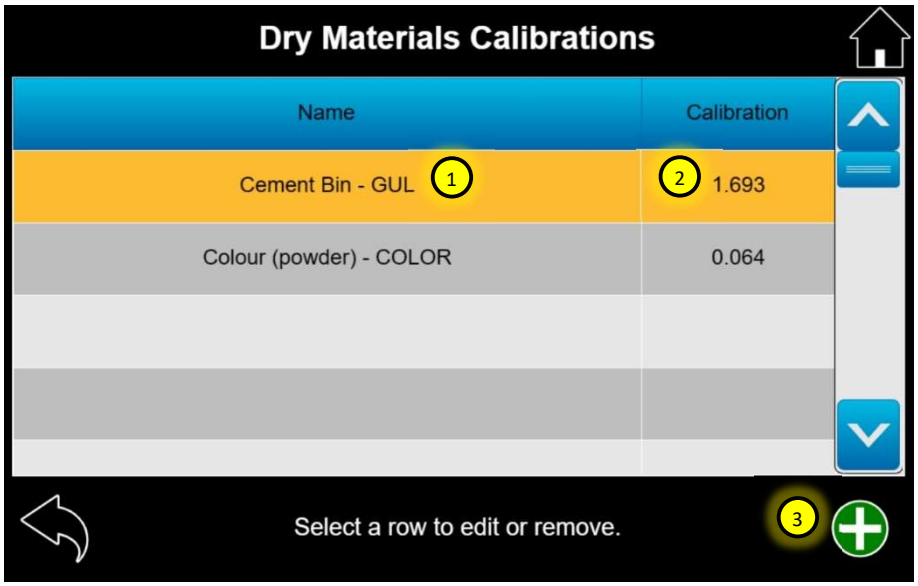
Note: The gates have two correction values that can be entered, measured moisture and yield correction.



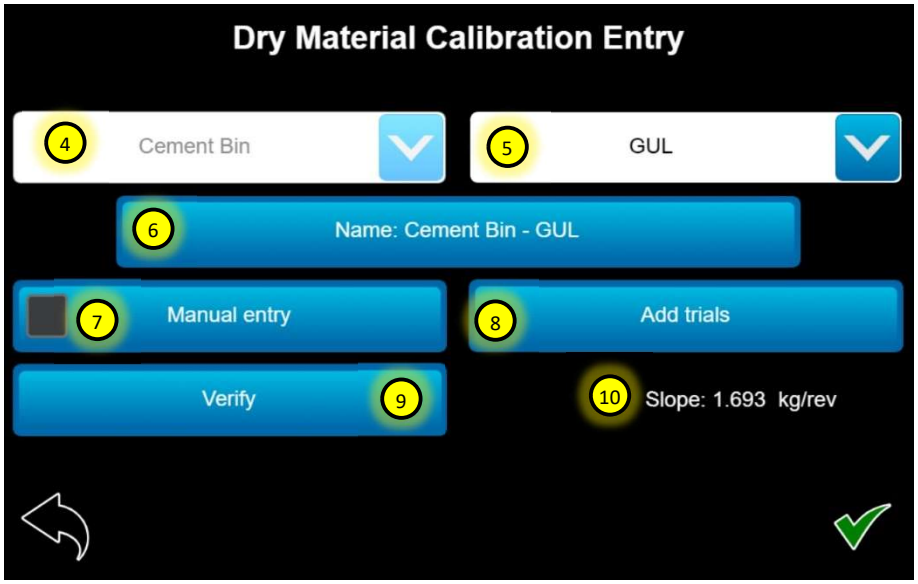
23. Measured moisture is the current moisture value of the aggregate. This is used to correct the calibration curve to SSD (saturated surface dry).
24. Yield correction is used to adjust the curve slope to adjust for yield test variation.
25. Material absorption is the absorption percentage entered in the materials manager for that specific aggregate.
26. Manual slope entry allows the user to enter the slope of the calibration curve manually. This does not allow for an intercept value.

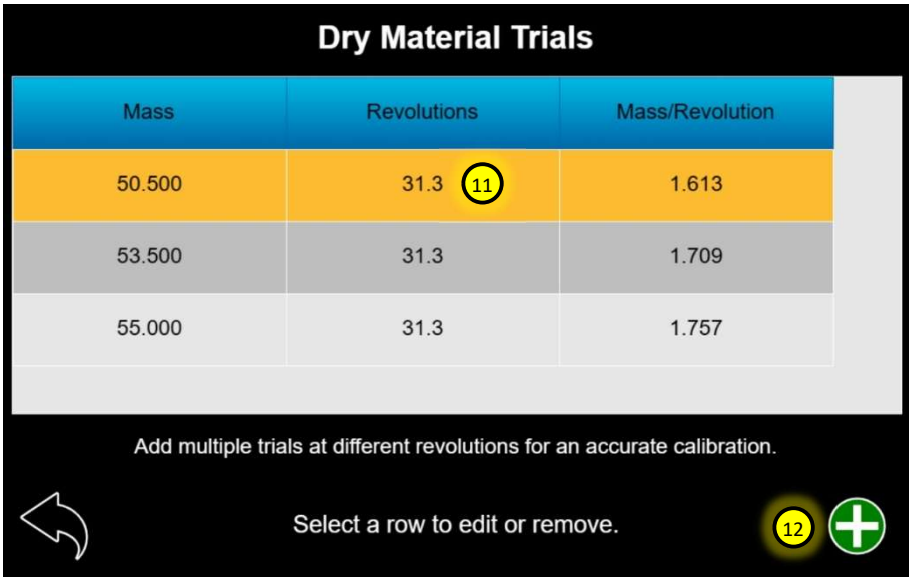


6.03 DRY MATERIAL CALIBRATION

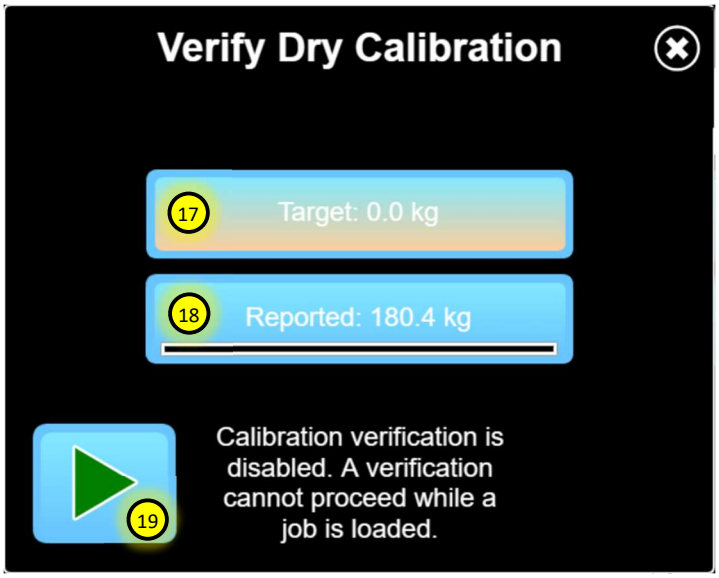


1. Dry materials table shows a list of all the calibrated dry materials.
2. Calibration value in weight/revolution.
3. Add new gate material calibration.
4. Select the component to be calibrated (eg. Cement bin or Flyash bin).
5. Select the material to be calibrated from the materials manager list.
6. Change the calibrated material name (default is component and material manager name).
7. Manually enter the calibration value.
8. Add trials to calculate the calibration value.
9. Verify the weight output.
10. Current calibration value used per revolution.

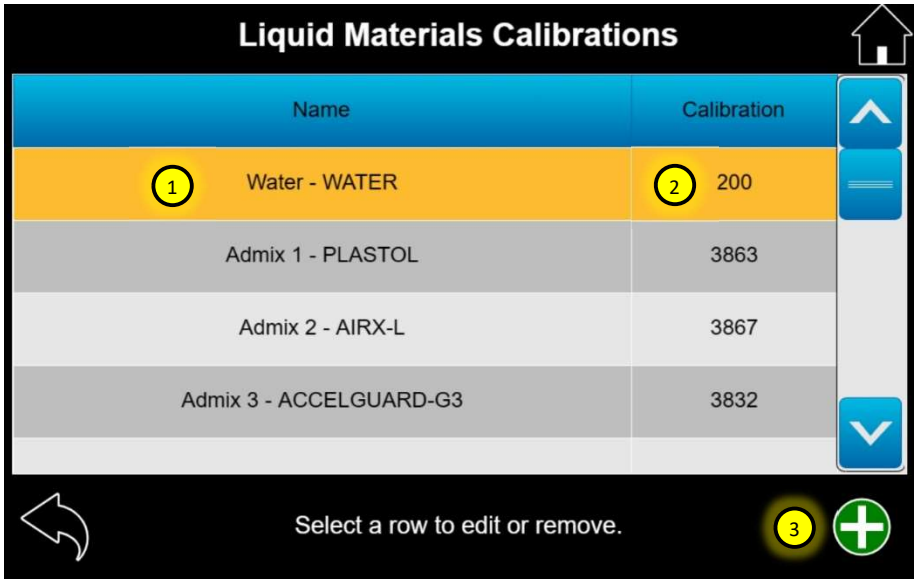




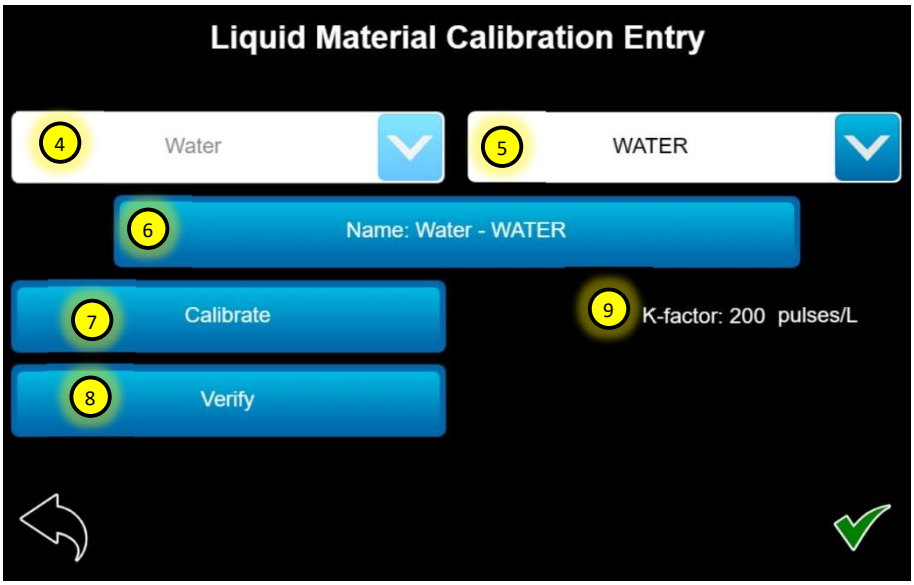
11. Dry material trial table shows all the associated trials for the calibrated material. This is where outliers can be spotted and re-calibrated to ensure consistency.
12. Add new trial. It is important to add at least three trials. The larger the sample the better the calibration average will be as well.
13. Target is the number of auger revolutions you want to stop at for the trial sample. The target number will change based on the component selected. Typical minimum revolutions for cement is 25.
14. Reported are the actual auger revolutions recorded after the auger stops. The trial computer will ramp down the auger speed as it approaches the target revolutions, but it may overshoot slightly. If the auger stops before reaching the target you can manually adjust the target lower to finish the trial. The important number used in the calculation is the reported.
15. Enter the measured sample weight here. Be mindful of the units and make sure your scale is set accordingly.
16. The play button to start the trial sample. This button will start the belt, so be aware of any safety risks before pressing this button.
17. Verify calibration. Enter a target weight. The mixer computer will calculate the required auger revolutions to achieve that weight.
18. Reported is the calculated weight used to verify against the actual.
19. The play button to start the verification sample. This button will start the auger, so be aware of any safety risks before pressing this button.



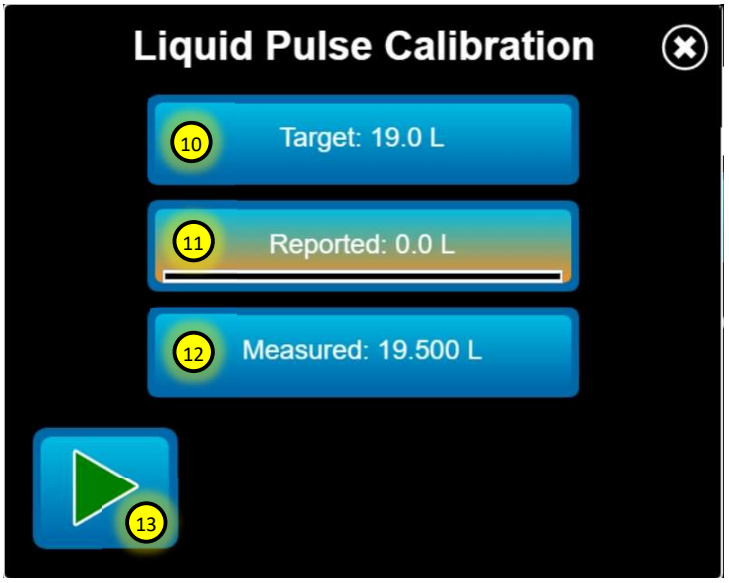
6.04 LIQUID CALIBRATION

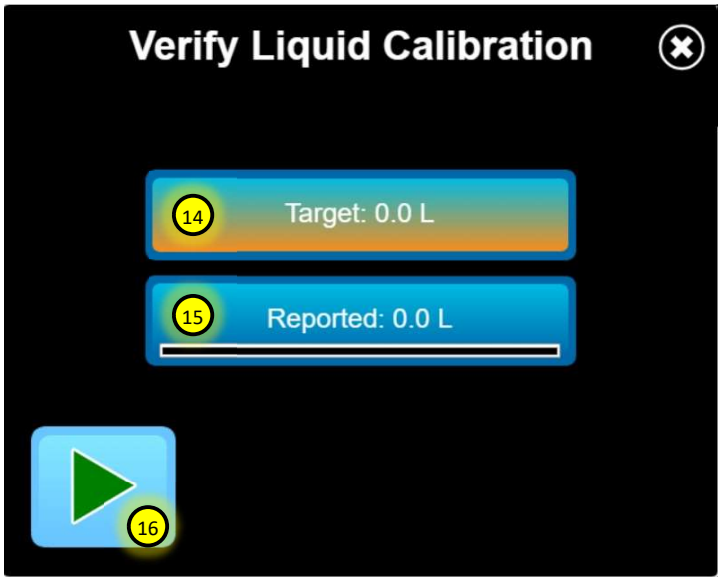


1. Liquid materials table shows a list of all the calibrated liquid materials.
2. Calibration value in pulses per unit volume (litre or gallon). Also referred to as the flow meter k-factor.
3. Add new liquid material calibration.
4. Select the component to be calibrated (eg. Water or Admix1).
5. Select the material to be calibrated from the materials manager list.
6. Change the calibrated material name (default is component and material manager name).
7. Calibrate the flow meter.
8. Verify the new calibration.
9. Calculated calibration value (k-factor).



10. Target is the volume sample size you want to achieve.
11. Reported is the calculated sample size based on the current calibration value (k-factor).
12. Enter the actual sample size here.
13. The play button to start the verification sample. This button will start the pump and open valves, so be aware of any safety risks before pressing this button.
14. Verify calibration. Enter a target volume. The mixer computer will calculate the total volume based on the current calibration value.
15. Reported is the calculated volume used to verify against the actual.
16. The play button to start the verification sample. This button will start the pump and open valves, so be aware of any safety risks before pressing this button.



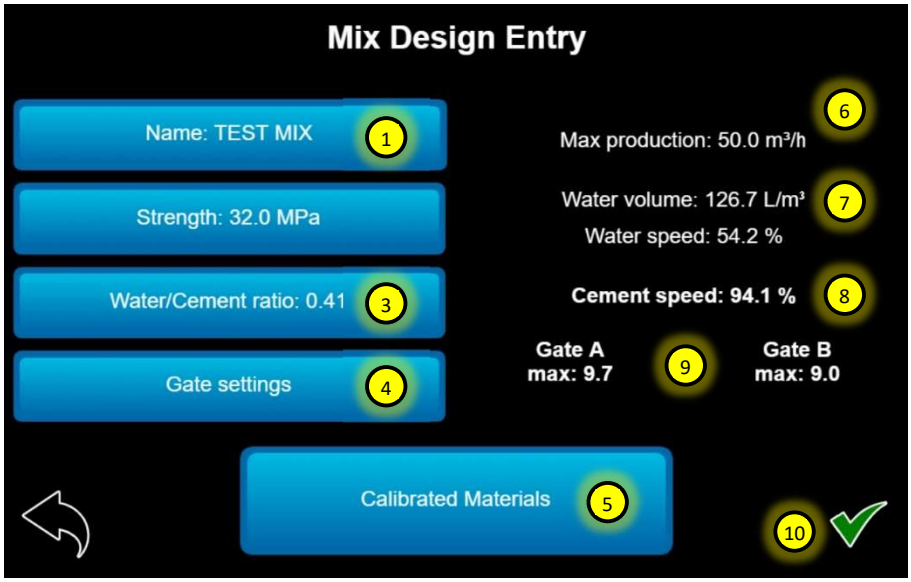


7. MIX DESIGN MANAGER

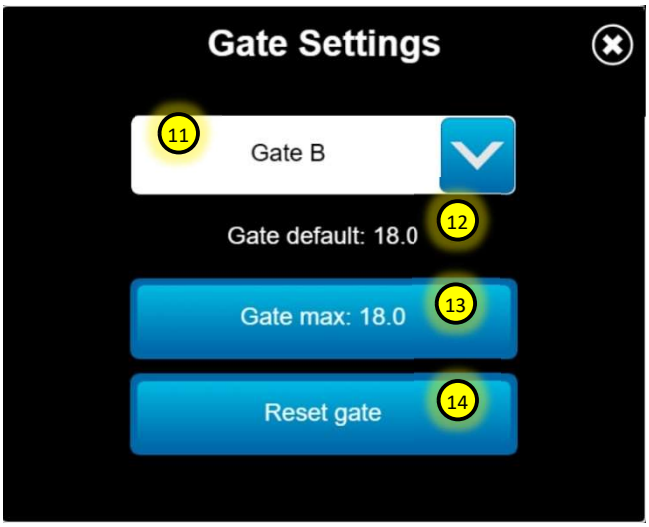
7.01 ADDING MIX DESIGNS

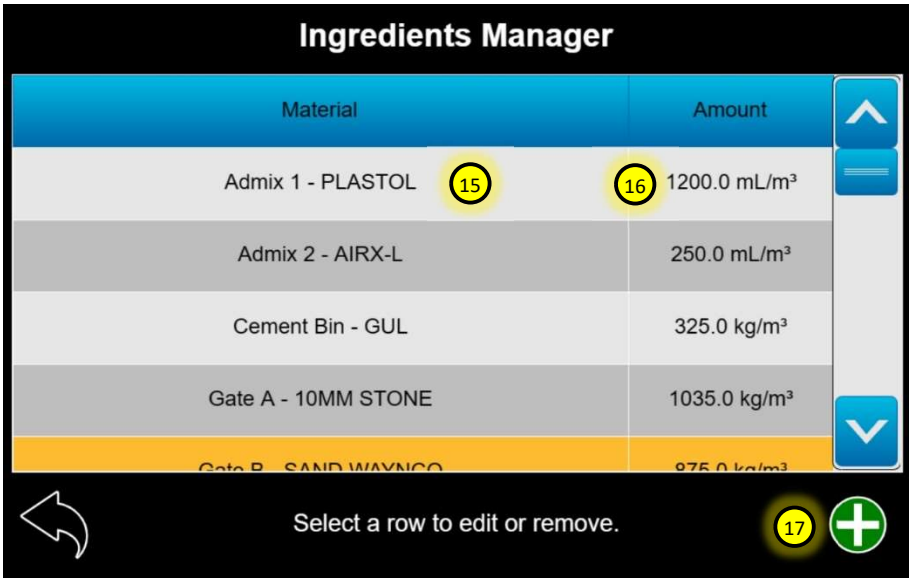
1. Mix design manager table shows all the entered mix designs. The mix design name and strength are there for reference.
2. Add a new mix design.
3. The mix design name does not include a numerical index number like the older Commander system. This can be implemented by simply adding the numerical value at the being of the mix name.

7.02 MIX DESIGN ENTRY

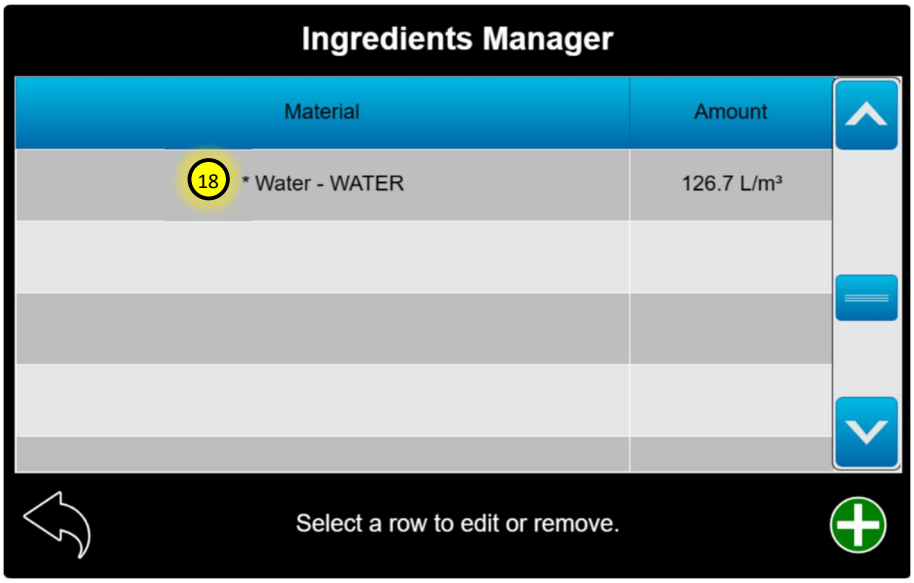


1. Mix design name.
2. Mix design strength. This is a reference field only. It's not calculated based on the ingredients.
3. Water/Cement ratio is a calculated field based on the water and cement ingredients added. It can also be manually entered here, and the water amount will be adjusted accordingly. Both water and cement ingredients must be added first for water/cement ratio to be active.
4. Gate Settings pop-up.
5. Enter the calibrated materials (ingredients) for the mix design here.
6. Calculated max production rate based on maximum belt speed.
7. Water volume per unit volume of concrete. Calculated value if W/C is manually entered. Water speed is the percentage out of 100 that the water pump will run. Used as a reference for how much water from the mixer is required.
8. Cement speed is the ratio of belt speed to cement speed. At 100% cement speed the cement auger is at it's maximum.
9. Gate settings for A and B side. These are calculated values based on mix design proportions.
10. Save and exit mix design entry.
11. Select the gate to use as a limiting factor in the mix design calculation.
12. Gate default is the maximum achievable gate height allowed.
13. Gate max is the setting below max or gate default that will be used to calculate mix design proportions.
14. Resets gate max to the default gate setting.

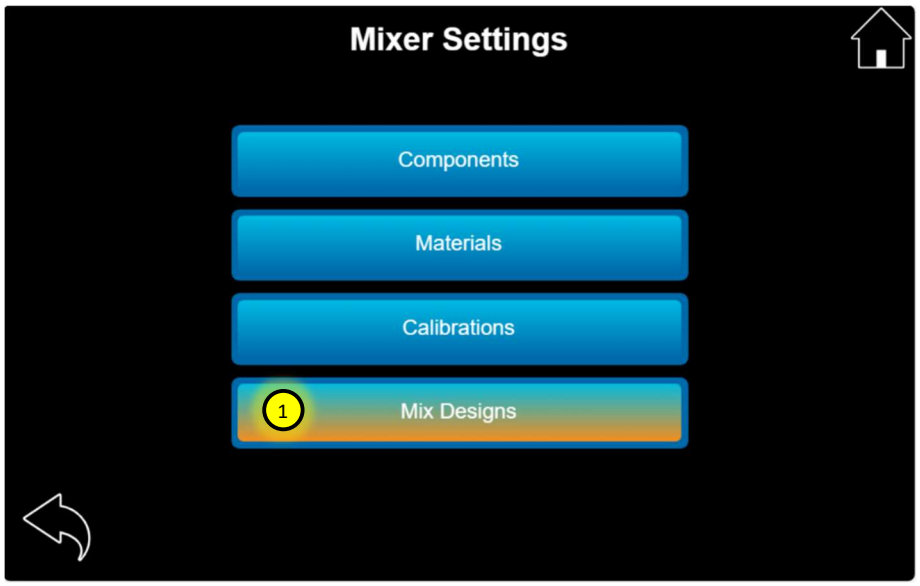




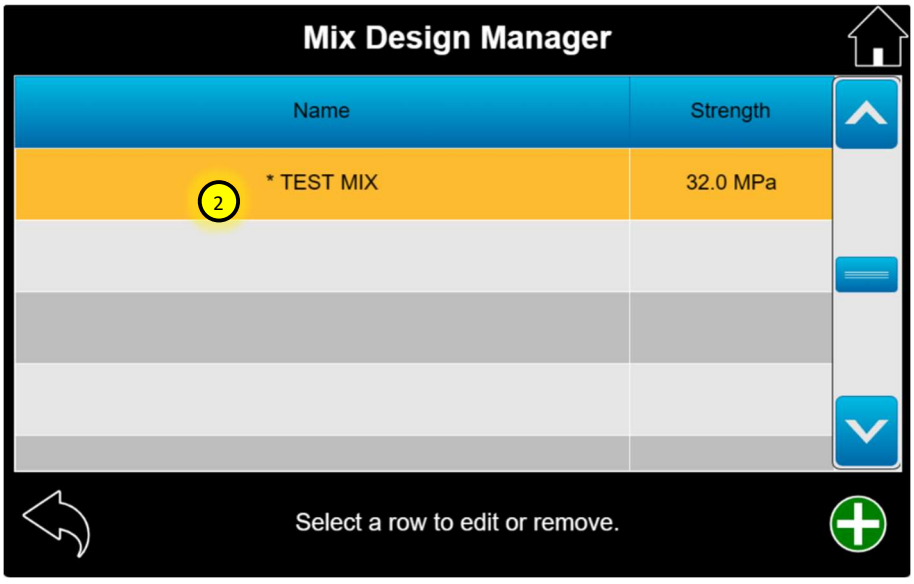
15. Material name is the name of the calibrated material used / added in the ingredients list.
16. Amount is the required weight or volume of the chosen ingredient.
17. Add ingredient. Only calibrated materials can be selected.
18. If an Asterix is shown by an ingredient name that means something has changed with the ingredient's calibration data. Select the ingredient to edit and review. Once this is acknowledged the Asterix will disappear.

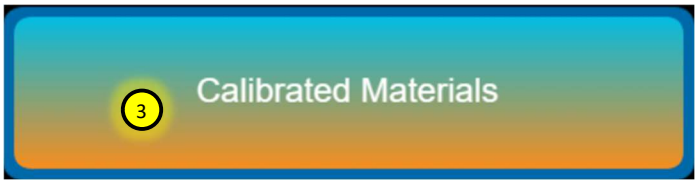


7.03 MIX DESIGN CHANGES

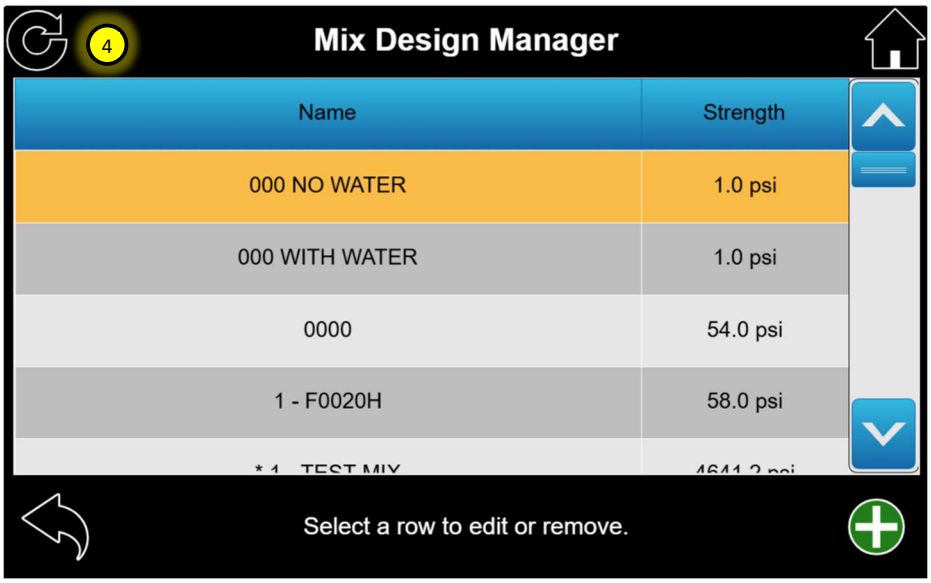


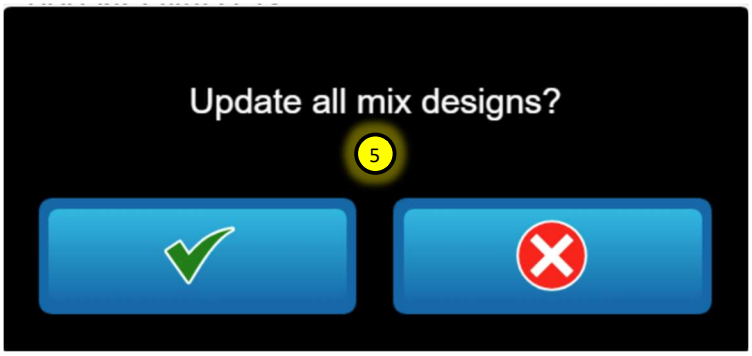
1. Changes to calibrations and mix designs will be indicated by an orange band across the button label.
    a. This is used to acknowledge that something in the database has changed and should be verified before using that mix design(s). It does not automatically re-calculate old mix design data. It must be viewed and verified before the change will take affect and the mixer computer will re-calculate the settings.
2. Mix designs that are affected by changes in calibrations will show up with an Asterix on the left of the name. These are the ones that need to be verified.
3. In mix design entry the calibrated materials button will be orange indicating a material or materials have changed. The ingredients table will show with an Asterix, which specific materials need to be verified.

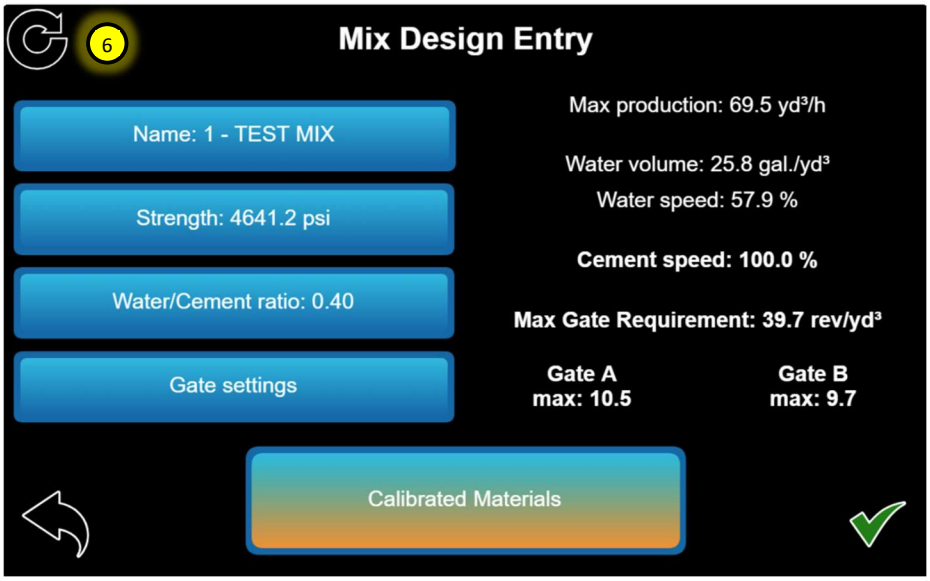




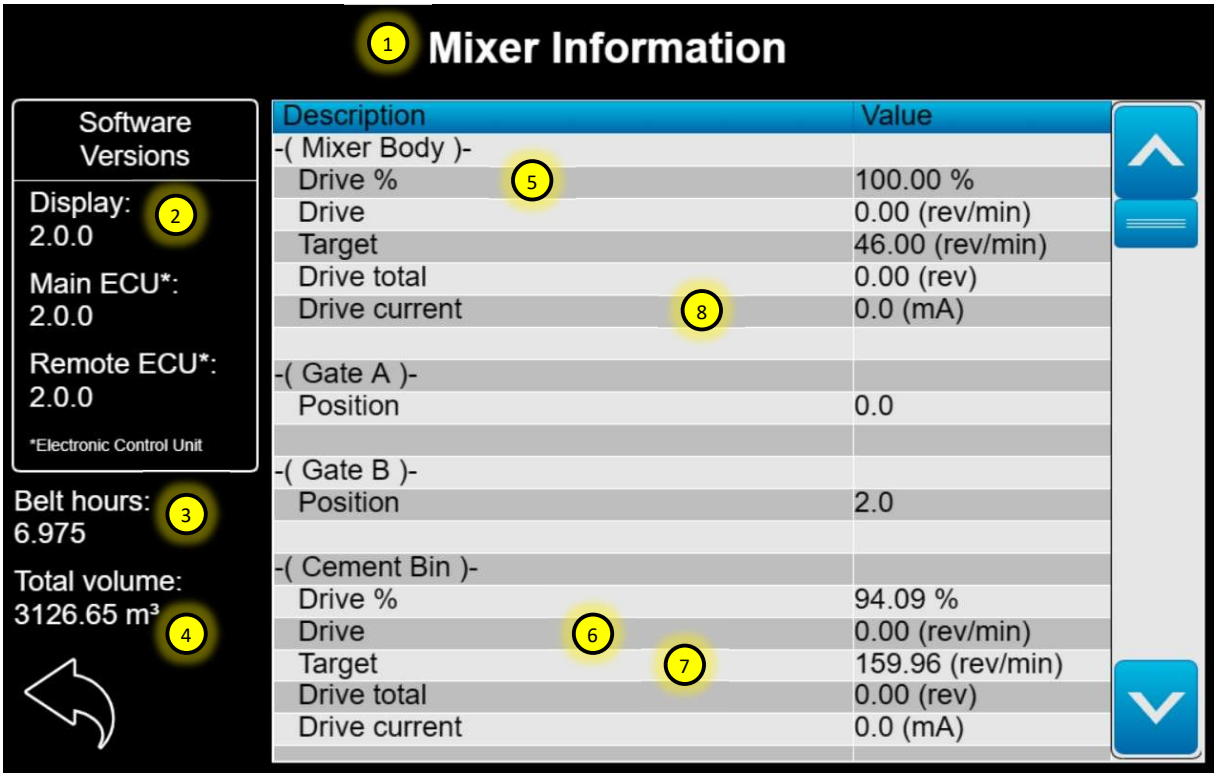
4. Mix design manager re-calculate button. This button is used to re-calculate all the mixer target data based on the updated materials calibrations.
5. An acknowledgement message will appear before this is completed. Please note this will automatically update all mix designs in the list associated with the newly calibrated material values.
6. You may also choose to only re-calculate individual mix designs using the same method. The re-calculate icon will only appear if the calibration or material data has changed as per item 1-3.







8. MIXER INFORMATION



1. Mixer information is a collection of component data used for trouble shooting and general verification of operating parameters.
2. Current software versions for the three devices are shown here. The devices are.
    a. Display – communicates directly with the main ECU and is the user interface.
    b. Main ECU – is the main control ECU and handles most of the control logic (located in the flow meter cabinet)
    c. Remote ECU – communicates only with the Main ECU. Is the connection to most of the external sensors and hydraulic outputs (located in the hydraulic valve cabinet).
    d. Software can be updated for any of the three devices using a USB stick.
3. Belt running hours. Used for maintenance reminders.
4. Total volume poured. This is a running total of the concrete poured from the mixer. It accumulates all the volumes poured regardless of the mix design.
5. Drive % is the actual running value out of 100.
6. Components drive actual value (RPM or Flow).
7. Components drive target value (RPM or Flow).
8. Drive current is the actual current value of the component.

Note: This table will only show components that are selected and installed on the mixer. Other data such as hydraulic temperature and pressures are also shown here.

9. ALARM MANAGER

1. Mixer HOME page alarm window. This shows any current alarms or notifications and is also a button that will take you to the Alarm Manager screen.
2. Alarm manager table showing the current alarm or notification messages.
3. The time and date the alarm was triggered.
4. If an alarm is green, it can be selected and acknowledged by pressing this button. The alarm will disappear if it is no longer active.
5. Alarm history table. Past alarm history can be viewed here.
6. Reset all mixer faults. This resets all mixer components regardless if they are faulted or not. If individual faults are to be reset to a specific component go to the HOME page and reset them there.
7. Diagnostics. * Not yet implemented *

Alarm colors:

Red – Shutdown alarm. Due to critical function not meeting target or a safety related issue.

Orange – Warning alarm. Indicates an issue with a component, but mixer will still run. May indicate no feedback is available for the component, which means the mixer will run, but with simulated feedback.

Blue – Notice alarm. Indicates something has been overridden.

Green – Notice of cleared state. This is not in an alarm state. It just means an alarm happened previously. This can be cleared by acknowledging the message and it will disappear.

Alarm Messages		
Message	Type	Explanation
Admix 1 automatic alarm is overridden	Blue	Manual/Auto override activated in mixer control.
Admix 1 automatic control is OFF	Red	Admix1 auto alarm has been activated. Admix1 is not meeting the flow setpoint. Is there a flow reading? Is admix1 primed? Have flow curves been set properly.
Admix 2 automatic alarm is overridden	Blue	Manual/Auto override activated in mixer control.
Admix 2 automatic control is OFF	Red	Admix2 auto alarm has been activated. Admix2 is not meeting the flow setpoint. Is there a flow reading? Is admix2 primed? Have flow curves been set properly.
Admix 3 automatic alarm is overridden	Blue	Manual/Auto override activated in mixer control.
Admix 3 automatic control is OFF	Red	Admix3 auto alarm has been activated. Admix3 is not meeting the flow setpoint. Is there a flow reading? Is admix3 primed? Have flow curves been set properly.
Admix 4 automatic alarm is overridden	Blue	Manual/Auto override activated in mixer control.
Admix 4 automatic control is OFF	Red	Admix4 auto alarm has been activated. Admix4 is not meeting the flow setpoint. Is there a flow reading? Is admix4 primed? Have flow curves been set properly.
Auger automatic alarm is overridden	Blue	Manual/Auto override activated in mixer control.
Auger cover kill switch is overridden	Blue	Auger cover safety override activated in mixer control. At own risk. Yes/No safety message appears to override.
Auger jam alarm is overridden	Blue	Auger jam override activated in mixer control.
Belt automatic alarm is overridden	Blue	Manual/Auto override activated in mixer control.
Belt automatic control is OFF	Red	Belt auto alarm has been activated. Is there a speed reading? Hydraulic pressure too high/jammed?
Belt cannot reach speed	Red	
Cement automatic alarm is overridden	Blue	Manual/Auto override activated in mixer control.
Cement automatic control is OFF	Red	Silica auto alarm has been activated. Is there a speed reading? Hydraulic pressure too high/jammed?
Cement level is low	Red	Cement low level sensor activated. Check bin level. Override to continue mixing.
Cement low alarm is overridden	Blue	Low level cement override activated in mixer control.
Colour automatic alarm is overridden	Blue	Manual/Auto override activated in mixer control.
Colour automatic control is OFF	Red	Silica auto alarm has been activated. Is there a speed reading? Hydraulic pressure too high/jammed?
Conveyor belt is in manual mode	Blue	Belt unload is active or manual override activated in mixer control.
Fibre automatic alarm is overridden	Blue	Manual/Auto override activated in mixer control.
Fibre automatic control is OFF	Red	Silica auto alarm has been activated. Is there a speed reading? Hydraulic pressure too high/jammed?
Fly ash automatic control is OFF	Red	Silica auto alarm has been activated. Is there a speed reading? Hydraulic pressure too high/jammed?
Fly ash level is low	Red	Flyash low level sensor activated. Check bin level. Override to continue.
Fly ash low alarm is overridden	Blue	Level override activated in mixer control.
Gate A low alarm is overridden	Blue	Gate A material low level alarm override activated in mixer control.
Gate A position alarm is overridden	Blue	Gate A position override activated in mixer control.
Gate A position is incorrect	Red	Gate A position is out of tolerance with the mix design setting. Check gate position. Check gate pointer isn't loose. Re-calibrate sensor if necessary.

Gate B low alarm is overridden	Blue	Gate B material low level alarm override activated in mixer control.
Gate B position alarm is overridden	Blue	Gate B position override activated in mixer control.
Gate B position is incorrect	Red	Gate B position is out of tolerance with the mix design setting. Check gate position. Check gate pointer isn't loose. Re-calibrate sensor if necessary.
Grease level is low	Orange	Automatic greaser level is low.
High volume SCM automatic alarm is overridden	Blue	Manual/Auto override activated in mixer control.
Hydraulic oil temperature is high	Orange	Hydraulic oil temperature too high. Check that oil cooler is working.
Latex automatic alarm is overridden	Blue	Manual/Auto override activated in mixer control.
Latex automatic control is OFF	Red	Latex auto alarm has been activated. Latex is not meeting the flow setpoint. Is there a flow reading? Is latex primed? Have flow curves been set properly.
Low volume SCM automatic alarm is overridden	Blue	Manual/Auto override activated in mixer control.
Material low in gate A	Red	No material on belt, gate A side. Sensor needs to be re-taught. Override to continue mixing.
Material low in gate B	Red	No material on belt, gate B side. Sensor needs to be re-taught. Override to continue mixing.
Mix auger automatic control is OFF	Red	Mix auger auto alarm has been activated. Is there a speed reading? Hydraulic pressure too high/jammed?
Mix auger cover open	Red	Mix auger cover has been opened while in operation. Close the lid and/or check magnetic switch function.
Mix auger jam pressure reached	Red	Mix auger has reached the pressure limit and the mixer stopped. Is the auger jammed or is the jam pressure set too low in mixer control.
Silica automatic control is OFF	Red	Silica auto alarm has been activated. Is there a speed reading? Hydraulic pressure too high/jammed?
Truck high idle is OFF	Blue	Truck or engine high idle is off and needs to be on for mixing.
Viscous automatic alarm is overridden	Blue	Manual/Auto override activated in mixer control.
Viscous automatic control is OFF	Red	High vis pump auto alarm has been activated. High vis pump is not meeting the flow setpoint. Is there a flow reading? Is high vis pump primed? Have flow curves been set properly.
Volume stop reached	Blue	Volume stop has been activated and the target reached.
Water automatic alarm is overridden	Blue	Manual/Auto override activated in mixer control.
Water automatic control is OFF	Red	Water auto alarm has been activated. Water is not meeting the flow setpoint. Is there a flow reading? Is water primed? Have flow curves been set properly.
Water control cannot reach setpoint	Blue	Alarm indicates the water drive control could not reach setpoint. This alarm is typically preceded by water automatic control is OFF and used for reference.
Water control has no feedback	Blue	Alarm indicates the water drive control did not see flow feedback. This alarm is typically preceded by water automatic control is OFF and used for reference.
Water level alarm is overridden	Blue	Water low level alarm override activated in mixer control.
Water level is high	Orange	Water high level sensor target is activated, water above 90%
Water level is low	Orange	Water low level sensor target is activated, water below 20%.
Water pump is OFF	Blue	Water pump is off and needs to be on for mixing.