CB-1

Automated Concrete Batch Controller

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Getting Started Instructional Guide

RICE LAKE WEIGHING SYSTEMS
Industrial Solutions on a Global Scale®

ISO 9001 REGISTERED

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Contents

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1.0 About This Manual

The purpose of this manual is to serve as "quick-reference" guide while tuning the CB-1 during the first few hours of operation. All touchscreen and front panel buttons appear in bold text. All words from the touchscreen appear in SMALL CAPS. It is a supplement to the *CB-1 Installation/Operation Manual*, PN 45045, and not intended for use as an alternative to reading the manual. After the manual has been read and capabilities and features of the CB-1 understood, following the steps outlined here, in order, should get your plant batching concrete as quickly as possible without wasting valuable material. Remember that this document only covers the essentials required to start producing concrete.

Note: There are many references to units like pounds, gallons, ounces, and cubic yards. If your primary unit of measure is S.I. (metric), you should mentally substitute kilograms for pounds, liters for gallons, milliliters for ounces, and cubic meters for cubic yards. In addition be sure to see section 4.2.

2.0 Preparation

Please resist the temptation to enter all your mix designs and configuration parameters at this time. Wait until after you have completed this procedure.

3.0 Wiring

From the **Hardware Test Screen** off the **Options** menu, test the wiring to the plant by testing each individual I/O point and all digital indicators.

3.1 Relays

The only way to test an output relay is to turn it on and confirm that it does what it is supposed to do. However, it may be inconvenient to actually open some gates (cement in the weigh hopper with no where to go), so you may chose to turn off the air compressor and confirm the wiring by watching the air solenoids instead. Using the Up/Down arrow keys and the On/Off keys, test each individual output.

⚠Caution *CAUTION: TURNING ON A RELAY MAY ENERGIZE PLANT EQUIPMENT. MAKE SURE IT IS SAFE TO DO SO.*

Also, if you plan to turn a relay on then quickly turn it off, you must press the Off key, since the on key is maintained until the Off key is pressed. Input relays are tested by selecting the input relay using the Up/Down arrow keys and noting the state of the relay. Input relays read a state so the On/Off keys are not functional when an input relay is selected. An input relay is considered "on" if a 120 volt signal is present. Change the physical state of the equipment (limit switch or other) and confirm that the state of the input relay changes. There are a few input relays that you should pay special attention to. The limit switches on the discharge gates should send 120V when the gate is "closed". In other words, the CB-1 should read **On** when the gate is closed. The bottle empty signals from the admixture bottles may be either "On" or "Off". By default, the CB-1 expects to see a 120V signal when the bottle is empty. If your admix system is the opposite of this you can correct this by changing the EMPTY RESERVOIR INPUT STATE to Off. See Section 5.3.3 in the CB-1 manual for more details.

3.2 Indicators and/or Load Cells

If your CB-1 came equipped with indicators mounted in the panel, then you must wire the load cells. If your CB-1 was purchased to interface with existing indicators then you need to wire the indicators EDP port to the CB-1. Consult the indicator and CB-1 manuals for wiring diagrams. Once the wiring is complete press the **Test Scales** button on the CB-1 from the HARDWARE TEST screen off the OPTIONS menu. The actual weight value displayed on the cement indicator should appear on the touchscreen. Pressing the **Test Scales** button a second time will display the reading from the aggregate scale. If a **NO SCALE WT** message appears then the indicator is not communicating with the CB-1. The most common cause of this error is that the indicator is not streaming weight data. See section 9.1 in the CB-1 manual for appropriate indicator setting. If you are interfacing to an indicator other then an IQ plus 310A, then also consult the indicator's manual on how to configure it to stream weight data.

4.0 DIP Switches

4.1 Initializing

After all the wiring has been tested to be correct, the system should be initialized. This is done by setting DIP Switch 1 to the ON position. Follow Section 2.1 in the CB-1 manual for further instructions.

4.2 Primary Units

DIP Switch 3 determines the primary units of measure for the CB-1. If your primary units of measure are S.I. (metric), move DIP switch 3 to the ON position and cycle power to the CB-1. DIP switch 3 must remain ON. See Section 2.3 in the CB-1 manual.

5.0 Weighing Aggregates

5.1 Assignment of Aggregates Bin

The CB-1 will always weigh the aggregates in the order they appear in the MIX DESIGN AND INGREDIENTS list. By default, the order is Aggregate 1, Aggregate 2, Aggregate 3, and Aggregate 4. The aggregate number doesn't have to correspond to the bins on the plant in any physical order. Many operators will use the middle bin (bin #2), as their sand bin and they prefer to always weigh the sand on top of any aggregates already weighed. However, when they batch a mix using the coarse aggregate in bin #3, the sand is weighed first. This is not what some operator's desire. The solution is to assign the sand to Aggregate 4. This means that the output to feed aggregate 4 , now named Sand, should be wired to bin #2. If you are only using two or three aggregates at this time, but might add another bin in the future, you should place this aggregate now. It doesn't hurt to leave the contribution at 0 in all the mixes. This might save you from having to re-enter the mix in the event your new aggregate would get added before the sand.

Once you determine the order you wish to weigh your aggregates, edit the names of the aggregates to correspond to the materials you use. This is done from the INGREDIENTS LIST, under the CONFIGURATION PARAMETERS menu. Select the ingredient you wish to edit by using the up/down arrow keys. Press Enter to view the parameters for this specific ingredient. Select the first parameter AGGREGATE 1 EDIT TXT, for example, and press Enter. Enter the new label for this ingredient using the alphanumeric keypad on the touchscreen.

5.2 Determination of Preact (Free-Fall) Weights

All ingredients weighed by dropping material into a weigh hopper will need to have a value entered for free-fall compensation. This value, called a preact, is critical to prevent over-batching. Improperly entered preact values are the #1 cause of over-batching. The first thing we need to do is determine the preact values for each aggregate. Follow these steps and repeat for each aggregate. This procedure assumes the plant is equipped with manual controls of some sort.

1. Set the AUTO PREACT ACTIVE value to Off to disable automatic preact compensation. To locate this parameter, go to GLOBAL PARAMETERS from the CONFIGURATION PARAMETERS menu. Select AGGREGATE SCALE, then select PREACT COMPENSATION. Use the Enter key to toggle the value of AUTO PREACT ACTIVE to Off.
2. Confirm the parameter JOG MODE, found under the INGREDIENTS parameters, is set to JOG OFF. If not, press the Enter key until JOG OFF appears.
3. Set both the SMALL PREACT WT. and PREACT WT IN LB values to 1000 for this aggregate.
4. Create a mix design named 3/4 INCH ROCK TEST (or whatever name is appropriate for your aggregate) with 2000 lbs of this aggregate per yard. All other ingredients should be left at 0 lbs.
5. Select RUN BATCH from the Main Menu. The CB-1 will ask you what mix design you want to batch if more than 1 mix design exists. Select the 3/4 INCH ROCK TEST (the one you just created). Next the CB-1 will ask you for how many yards to batch. Enter 1 yard. The RUN SCREEN should now appear. The target weight for the single ingredient in the mix should be located under the target column. Confirm the target weight is 2000 lbs (or whatever value you entered in the mix design).
6. Make sure the aggregate bin discharge gate is closed.
7. Press the Start key on the keypad. Be prepared to press the E-STOP if anything should go wrong. You can expect the CB-1 to over-batch by up to 1000 lbs.
8. The CB-1 may give an out-of-tolerance alarm. Press the Tolerance Accept key on the keypad. The amount over the desired target added to the starting preact, is the actual preact value. If you under-batched, the weight under the desired target subtracted from the starting preact, is the actual preact value. Record the actual preact value.

9. At this point the aggregate weigh hopper needs to be discharged. You can either abort the batch by pressing the Abort key and discharge manually, or you can jump down to Section 7.0 and tune the discharge parameters as the CB-1 discharges the aggregate. The reason for batching only one aggregate at a time is so you can discharge into a truck or loader and recycle the material back into your stockpiles.
10. Repeat Steps 5-9 three or four more times, or until you feel you have a reliable estimate of the preact for this aggregate. Add 15% to the largest value to arrive at a new preact.
11. Return to the INGREDIENT parameters for this aggregate and set both the SMALL PREACT WT. and PREACT WT IN LB values to the preact value calculated for this aggregate in Step 10. If proceeding onto the next section, DETERMINATION OF AUTO-JOG PARAMETERS, leave the INGREDIENT parameters displayed.

5.3 Determination of Auto-jog Parameters

Auto-jog is a tool used to weigh small amounts of material in the case where the initial drop of material, after shutting of material flow and allowing for material in suspension, has left the weight below the desired weight value. The jog on/off cycle in the CB-1 is simply: Open the feed gate for X time, close the feed gate, wait for Y time, read the weight, then determine if another jog cycle is necessary (where X is the jog-on time in milliseconds, and Y is the jog-off time in 1/10 seconds). The following procedure will start with the JOG ON TIME (MSEC) very small and increase it until the desired weight of material is dropped on 1 jog cycle. Remember that accuracy and speed are inversely related, so if speed is important then 1 large jog is desirable. However, if accuracy is paramount, then 3-5 small jogs will work best.

1. From the INGREDIENT parameters for this material, set the JOG MODE to TARGET. Set the value of JOG ON TIME (MSEC) to 10. Set the value of JOG OFF TIME (.1SEC) to 50. Set the value of JOG ONLY WEIGHT to 3000, or any value greater then the target batch weight entered is step 3.2.4 above, to force the CB-1 to jog from the start. Exit back to the Main Menu.
2. Prepare to run a 1-yard batch of the mix design in Step 4 above. Follow Step 5 above if you don't remember how to do this. Get prepared to write down the stable weight readings after each jog cycle.
3. Press the Start key on the keypad. Be prepared to press the E-STOP if anything should go wrong. The CB-1 may give a NO FLOW alarm message, this is normal and means that the JOG ON TIME (MSEC) value needs to be increased. Without aborting the batch, press the Configure key on the keypad. This will allow you to change the INGREDIENT parameters for this ingredient before restarting the batch. Increase the JOG ON TIME (MSEC) value by 10 milliseconds. Exit back to the run screen and press Start.
4. Repeat Step 3 until the CB-1 is JOGGING along without any NO FLOW alarm conditions
5. Record the stable weights for at least ten jog cycles and then press the Pause key. This will allow you time to calculate the average weight delivered for one jog cycle. This is done by finding the differences between the ten or more weights you just recorded, adding them together, then dividing by the # of weights.
6. At this point, a judgement about the jog weight is needed. Is it too small or too large? In making this decision, you must consider the following factors:

   When calculating the preact in Step 10 in Section 5.2, what was the range in values? Because of inconsistencies in materials, the material in suspension changes from batch to batch. It can be assumed that, even with an accurate preact, you may under batch an aggregate by 500 lbs occasionally.

   The capacity of the plant. Most of the numbers used in these examples assume a ready-mix plant with a 10 yard capacity. A small pre-cast plant with a 2.5-yard capacity may need to be more accurate.

   How busy is your plant? Will an extra 8-12 seconds (the time it takes for 2-3 jog cycles) slow down your operation?

   How expensive is this ingredient? You probably don't want to consistently over-batch your most expensive ingredient.

   How tight of tolerance conditions are you working under? Stricter tolerances require more accurate (smaller) jogs.

   As a rule of thumb, an aggregate jog might be around 100 pounds. If the jog is too small, you will have to increase the JOG ON TIME (MSEC) value. Without aborting the batch, press the Configure key on the keypad. This will allow you to change the INGREDIENT parameters for this ingredient before restarting the batch. Increase the JOG ON TIME (MSEC) value by 10 milliseconds. Exit back to the run screen and press Start. If the jog is too big, decrease the JOG ON TIME (MSEC) value by 5 milliseconds. Repeat Steps 5 and 6 in

Section 5.3 until an acceptable jog time is found.

7. Set the value of JOG OFF TIME (.1SEC) back to 25. Set the value of JOG ONLY WEIGHT to the value of the preact found in Step 10, Section 5.2. You may want to set the JOG MODE to UPTO TOL instead of Target. The UPTO TOL jog mode will only jog until the weight is within the under tolerance band instead of jogging until the weight is at or greater then the target. Exit back to the Main Menu.
8. You may abort the batch at any time, or if you reach the target before an appropriate JOG ON TIME (MSEC) has be determined, start back at Step 2, Section 5.3 with a new batch after discharging the last batch.

   Repeat the procedures for finding the preact weights and jog on times for each aggregate before continuing onto cements.

6.0 Weighing Cements

6.1 Assignment of Cement Silos

The CB-1 will always weigh the cements in the order they appear in the MIX DESIGN AND INGREDIENTS list. By default, the order is CEMENT 1, CEMENT 2 and CEMENT 3. The cement number doesn't have to correspond to the silos in any physical order. Many operators like to always weigh their cement or flyash first. If you plan on adding flyash or slag at a later date, now is the time to consider the order you want to weigh them. It is perfectly OK to assign CEMENT 1 as "Flyash" if you would weigh flyash first if you had it. Planning ahead like this might avoid having to re-enter your mix designs in the event you add one or two more cements. Once you determine the order you wish to weigh your cements, edit the names of the cements to correspond to the materials you use. This is done from the INGREDIENTS LIST, under the CONFIGURATION PARAMETERS menu. Select the ingredient you wish to edit by using the Up/Down arrow keys. Press Enter to view the parameters for this specific ingredient. Select the first parameter CEMENT 1 EDIT TXT, for example, and press Enter. Enter the new label for this ingredient using the alphanumeric keypad on the touchscreen.

6.2 Determination of Preact (free-fall) Weights

Note: All ingredients weighed by dropping material into a weigh hopper will need to have a value entered for free-fall compensation.

This value, called a preact, is critical to prevent over-batching. Improperly entered preact values is the #1 cause of over-batching. The first thing we need to do is determine the preact values for each cement. Unlike aggregates, once cement is in the weigh hopper it is difficult or impossible to get it back into the silo. For this reason, you may want to perform this procedure as a prelude to a real load of concrete. You may either follow this procedure to weigh 500 pounds of cement, and then manually finish the cement and other ingredients. Alternatively, you may create a mix-design for a load you need to batch, and manually correct for under-batching and then discharge manually if the discharge parameters have not been set yet. Follow these steps and repeat for each cement. This procedure assumes the plant is equipped with manual controls of some sort.

1. Set the AUTO PREACT ACTIVE value to Off to disable automatic preact compensation. To locate this parameter, go to GLOBAL PARAMETERS from the CONFIGURATION PARAMETERS menu. Select CEMENT SCALE, then select PREACT COMPENSATION. Use the Enter key to toggle the value of Auto Preact Active to Off.
2. Confirm the parameter JOG MODE, found under the INGREDIENTS parameters, is set to JOG OFF. If not, press the Enter key until JOG OFF appears.
3. Set both the SMALL PREACT WT. and PREACT WT IN LB values to 250 for this cement.
4. Create a mix design named CEMENT TEST (or whatever name is appropriate for your cement) with 500 lbs of this cement per yard. All other ingredients should be left at 0 if you are batching only this ingredient. If you will to create a mix design of a concrete you need to batch, then enter the cement and aggregate weights for one yard. You should only batch aggregates simultaneously if the preact and jog-on values have already been determined in procedure 2 above.
5. Aeration of the cement silos has a huge difference on the flow characteristics of fine powders like Portland cement and flyash. We recommend as much aeration as possible. Though it is true that the material will flow much faster, we feel it will be more consistent resulting in more accurate batching. At this time please aerate the cement silo the same way you would during a normal batch.
6. Select RUN BATCH from the Main Menu. The CB-1 will ask you what mix design you want to batch if more than 1 mix design exists. Select the mix you just created. Next the CB-1 will ask you for how many yards to batch. Enter 1 yard. The Run Screen should now appear. The target weights for all the ingredients in the mix should be located under the target column. Confirm the target weight is 500 lbs (or whatever value you entered in the mix design).
7. Make sure the cement bin discharge gate is closed.
8. Press the Start key on the keypad. Be prepared to press the E-STOP if anything should go wrong. You can expect the CB-1 to over-batch by up to 250 lbs.
9. The CB-1 may give an out-of-tolerance alarm. Press the Tolerance Accept key on the keypad. The amount over the desired target added to the starting preact, is the actual preact value. If you under-batched, the weight under the desired target subtracted from the starting preact, is the actual preact value. Record the actual preact value.
10. At this point the cement weigh hopper needs to be discharged. You can either abort the batch by pressing the Abort key and discharge manually, or you can jump to Section 7.0, Discharging Weighed Ingredients, and tune the discharge parameters as the CB-1 discharges the cement.
11. Repeat Steps 6-11 three or four more times, or until you feel you have a reliable estimate of the preact for this cement. Add 15% to the largest value to arrive at a new preact.
12. Return to the Ingredient parameters for this cement and set both the SMALL PREACT WT. and PREACT WT IN LB values to the preact value calculated for this cement in Step 4.2.11. If proceeding onto the next section, Determination of AUTO-JOG PARAMETERS, leave the Ingredient parameters displayed.

6.3 Determination of Auto-jog Parameters

1. Often cement or flyash is delivered with a screw or auger instead of an air-actuated gate. Some concrete plant manufactures do not recommend jogging a screw as frequent starts and stops put extra wear on the motor used to turn the screw or auger. It is up to you to decide if you want to use the jog feature for screw or auger fed materials. If you don't choose to use the auto jog feature, make sure it is disabled by setting the JOG MODE to JOG OFF. In addition, without a jog cycle, the preact needs to be more accurate. Return to the Ingredient parameters for this cement and set both the SMALL PREACT WT. and PREACT WT IN LB values to the average of the preact values(without the 15% extra) found in Step 11 shown above in Section 6.2.
2. If you decide to use auto-jog, the procedure is exactly the same as for aggregates. Follow the steps for determining the aggregate auto jog parameters. You should shoot for a JOG ON TIME (MSEC) that delivers from 10-25 pounds per cycle.

   Repeat the procedures for finding the preact weights and jog on times for each cement.

7.0 Discharging of Weighed Ingredients

The CB-1 has the ability to control the rate of discharge (pounds per second) for both aggregates and cements provided the plant is equipped with "inching" type gates. You may set a target discharge rate and have the CB-1 control the "inching" gates to maintain this rate. At any time, the operator may increase the target discharge rate using the Rate Control keys. The CB-1 may also be configured so the operator has total control over the discharge rate, and the CB-1 will not automatically open/close the "inching" gates. Some plants are designed without "inching" gates. In this case the CB-1 can only open the gate completely to discharge the material. There are separate and independent controls and configuration parameters for both the cement weigh hopper and the aggregate weigh hopper. The procedure is the same for both the aggregates and cements, but it will probably be easier to start with the aggregates.

1. If you do NOT have inching gates then you need to set the DISCHARGE BY RATE option to NO. This parameter is located under the OPTION selection on the CONFIGURATION PARAMETERS menu. If you have inching gates, then it is recommended that DISCHARGE BY RATE be set to YES. This will allow the CB-1 to monitor the discharge rate and make adjustments to the gate opening to maintain a target discharge rate specified by you.
2. If your plant is NOT equipped with "inching" type gates, then you must set the parameter INCH GATES PRESENT to NO. To locate this parameter, select CONFIGURATION PARAMETERS from the Main Menu. Next select Global Parameters, then AGGREGATE SCALE or CEMENT SCALE from the global parameters list. Next, using the arrow keys, arrow up to select the DISCHARGE CONTROL LIST and press Enter. The first parameters is INCH GATES PRESENT. Set the value to NO if you don't have inching gates on the weigh hopper. If you DO have inching gates, confirm it is set to YES. Without inching gates, you may proceed to the Section 8.0.
3. The macro control of the discharge gates is controlled by the FULL OPEN TIME (.1SEC) and FULL CLOSE TIME (.1SEC) parameters. This is the amount of time in 1/10 seconds that the CB-1 will hold the open or close output relay on to completely open or close the gate respectively. Some plants have gates that take less then one second to open or close, while others take up to ten seconds. Make sure the weigh hopper is completely empty before continuing. Manually open the discharge gates and record the amount of time (in seconds) it take to completely open the gate. Repeat a few times. Multiply the number of seconds by 10 and enter this value in FULL OPEN TIME (.1SEC). Repeat this for the FULL CLOSE TIME (.1SEC). For example, if it took 2 seconds to open the gate completely, enter a value of 20 in FULL OPEN TIME.
4. The micro control, or "Inching" control is controlled by the INCH OPEN TIME (MS) and INCH CLOSE TIME (MS) parameters. The "inching" time should be around 1/100 of the "full" time to provide the CB-1with the ability to accurately control the gate opening. Because the full time parameters were entered at 1/10 seconds and the inch time parameters are in milliseconds, the same value entered for the FULL OPEN TIME should be entered for the INCH OPEN TIME. Repeat this for the INCH CLOSE TIME (MS). For example, if it took 2 seconds to open the gate completely, and a value of 20 was entered in for FULL OPEN TIME, enter a 20 for the INCH OPEN TIME.
5. The INITIAL BURST (.1SEC) parameter is how long the inching gates will open at the start of the discharge cycle. This parameter is more relevant when the CB-1 is NOT configured to discharge by rate. When the CB-1 is configured to discharge by rate, this value should be set to 1 or 2, since the CB-1 will compensate and open the gate. After experience is gained, this value may be increased if it noticed that the initial discharge rate is always below the target discharge rate. If you are not discharging by rate, then the INITIAL BURST (.1SEC) needs to be as accurate as possible since it will determine the gate position and subsequently the discharge rate.
6. The DISCHARGE RATE (LB/S) is the target discharge rate previously mentioned. We recommend leaving these values at the default for now. If you have a problem with the aggregate belt overflowing, or the cement dusting, or the truck boot overflowing, you should decrease the discharge rates. The aggregate discharge rate is usually 4 to 5 times larger then the cement discharge rate.

   Repeat this procedure for the cement weigh hopper.

8.0 Metering of Liquid Ingredients

The configuring of water and admixtures is, for the most part just setting parameters, since there is little empirical data that can be found. These parameters are explained in Sections 7.2 and 7.3 and under the Ingredients section 7.2.

8.1 Metering of Water

The metering of water can be either metered directly into the truck or mixing vessel, or first metered into a reservoir and then discharged into the truck at a later time. The CB-1 can deliver water in two additions. Usually a small part of the water is heldback until all other ingredients are in the truck. First move to the water parameters. Select CONFIGURATION PARAMETERS from the Main Menu. Next select GLOBAL PARAMETERS and then arrow down to select WATER MORE-> and press the Enter key. You should now be looking at the global water parameters.

1. If you wish to put the water into the truck simultaneously with the cement and aggregate discharge, then the DISCHARGE DELAY (.1SEC) parameter is important. The discharge delay is a time delay from the moment the Discharge key is pressed. A delay here may serve to allow some aggregate to get to the truck first.
2. Will you be metering water into a water reservoir? Most systems don't. If not, you should confirm that the parameter WATER RESERVOIR is set to NO.
3. You will now need to decide how much WASH/TAILWATER you want per load. This value may be a % of the total water for this batch, or it may be a fixed amount depending on what software version you have. If your version requires a fixed amount, then try to enter the absolute minimum you need to wash down the boot and truck chute. We recommend 8-15 gallons. If your tailwater is a percent, then enter between 10-30 percent.
4. The other global water parameters are not important at this time. However we need to edit some of the water parameters found under the INGREDIENTS list. Return to the CONFIGURATION PARAMETERS menu and select INGREDIENTS. Using the arrow keys, select the ingredient WATER and press Enter.
5. The most important parameter here is the GALLONS/PULSE CONVERSION parameter. This value is a conversion factor to convert one pulse into some number of gallons. Most often water meters are setup to give one pulse for every one gallon of water delivered. If you don't know for certain what this value should be, make sure it is set to 1.00. You will be able to test this in the next step.
6. We are now ready to test the accuracy of your water meter. The best way is to weigh the water into a vessel suspended from the cement hopper. One gallon of water should weigh 8.34 pounds per gallon. If you can't weigh the water, then measure at least 50 gallons of water into a drum. The plan here is to manual feed a known amount of water, either 50 gallons or 417 (8.34 X 50 = 417) pounds, and compare this to how many pulse counts the CB-1 received from the water pulse meter. To view the number of pulses received, select the ADMIXTURE COUNTER from the Utilities menu. Press the Water button to clear the counts. The counter will display the number of gallons delivered. When the GALLONS/PULSE CONVERSION is 1.00, then the number of gallons is equal to the number of pulses. Try this test 3-5 times to make sure the results are consistent. If there is a discrepancy between the number of pulses and the true amount of water delivered, a conversion will have to be entered. Some water meters have an electronic scaling board. You may choose to make your correction there. If you choose to make the correction on the CB-1 you must first determine what the conversion factor is. This is done by the equation: conversion factor = (gallons delivered)/(pulses counted). For example if you metered out 50 gallons, but the CB-1 read only 42 counts, then the conversion factor would be 50/42 = 1.190. This means that for every 1 pulse count, the CB-1 will know that 1.19 gallons of water have been delivered. If necessary return to the Configuration Parameters menu and select INGREDIENTS. Using the arrow keys, select the ingredient WATER and press Enter and edit the value for GALLONS/PULSE CONVERSION

8.2 Metering of Admixtures

Some concrete producers already have sophisticated admixture dispensing equipment in place, and choose not to have the CB-1 dispense the admixtures. If this is your situation, you may exit this section now. If you would like the CB-1 to dispense your admixtures, there are a few things that need to be done. If you have admixture bottles, you need to confirm the EMPTY RESERVOIR INPUT STATE. See Section 3.1 for a description of the bottle empty state.

1. From the CONFIGURATION PARAMETERS menu select INGREDIENTS. Using the arrow keys, select the ingredient ADMIXTURE 1 and press Enter.
2. Some admixture dosages are based on the number of 100 weights of cement. Others are based on a "per yard" basis. Arrow down to the VALUE/100 WT OF CEMENT parameter and select Yes if you want the value in the mix design multiplied by the number of 100 weights of cement, not the number of cubic yards.
3. The OUNCES/PULSE CONVERSION parameter may be calculated in the same way as the GALLONS/PULSE CONVERSION was calculated in Step 6,Section 8.1. It may be easier to consult with the admixture vendor to determine this value.
4. Each admixture must be tied to either the 1st water addition or the 2nd water (tailwater) addition. Some people like to put the water reducing agent in at the end of the batch. Edit the value of ADD WITH WATER ADDITION # to determine when this admixture will discharge.
5. Some admixtures may be metered directly while others first meter into a bottle, and are then discharged when the water is being metered. Select the appropriate ADMIX DELIVERY MODE. You may want to blow out the line, if you have a bottle, to prevent freezing in the line. Set ADMIX DISCHARGE MODE to either STAYFULL or BLOW OUT. If you select BLOW OUT, you will need to set a ADMIX BLOWOUT TIME (S).
6. Repeat this procedure for each admixture.
7. To test the accuracy of the admix pulse meters, select the ADMIXTURE COUNTER from the Utilities menu. Reset any values back to 0 by pressing the Reset All Values key. When at this screen, the CB-1 will count all pulses received and convert the pulse count to ounces using the OUNCES/PULSE CONVERSION value. It is easy to check any admixtures that use a bottle. Manually run the admixture into the bottle up to the 50 or 100ml line. Compare this to the value on the ADMIXTURE COUNTER screen.

9.0 Putting it all together

You should now be ready to run a full automatic batch. Enter a mix design with cement, rock, sand, water and some admixtures if required. Remember the mix design is entered on a 1 cubic yard basis. Run a medium sized batch of this mix. Don't try to batch a 1/2 or 1 yard batch on a 12-yard plant right off the bat. You should make notes of starting and ending weights and compare these to the weight reported on the batch ticket. Confirm the correct amount of water was metered by checking the slump manually or via a slump meter in the mixer. Visually confirm the amount of admixtures metered into the bottle before the discharge key is pressed. Once you have gained some confidence that the CB-1 is batching correctly, you may want to "tweek" some of the parameters you previously set.

- You may want to turn the AUTO PREACT ACTIVE parameters back to ON. This will enable the automatic preact compensation algorithm. This CB-1 will make gradual changes to the preact values SMALL BATCH PREACT and PREACT WT IN LB if necessary.
- If the system is jogging too many times on a particular ingredient, you may want to increase the JOG ON TIME (MS). If the system is jogging but consistently over-batching then you may want to decrease the JOG ON TIME (MS).
- To prevent water "hammer", some water valves are set to close slowly. Sometimes a system will consistently over-batch water by 1-3 gallons. If this is the case you can change the value of the METER COAST PULSES found under the WATER INGREDIENTS list to compensate for this. The METER COAST PULSES acts like a preact by shutting off the output before the target is reached. The "coast" value is in pulses, so you need to divide the number of gallons over-batched by the GALLONS/PULSE CONVERSION. For example, if you over-batched by 2 gallons and the GALLONS/PULSE CONVERSION is set to 2 (2/2=1) then set the METER COAST PULSES equal to 1. A similar coast parameter is available for admixtures.