# PC-5500
# PC-5750
# Operation Manual

Rev. 12/14/2001

Custom Control Systems Inc.

# Operation

# Configuration

# Troubleshooting

# PC-5500

# PC-5750

# Industrial Washer Controls

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### Introduction

The Custom Control Systems PC-5500 and PC-5750 combine cutting-edge technology with ease of use and low maintenance. These compact, easily-programmed, microcomputer-based industrial controls are capable of communication, data logging and user-programmable process control. The PC-5500 and PC-5750 are designed to be easily expandable and accomodates a wide variety of Input/Output requirements.

## Hardware

The hardware includes essential components such as nonvolatile memory, real-time clock and calendar, analog input channels, timers, counters, optically-isolated DC I/O lines. An RS-485 communications port is provided to facilitate remote programming and data collection between controls or a Personal Computer. The display and control panel consists of a 31-key membrane panel, two 40 character alphanumeric vacuum fluorescent displays, and 40 LED indicators, 28 of which can be custom labeled with text to continuously indicate the status of inputs and outputs.

## Software

The software is designed to be modular and consists of a library of functions that were developed in a combination of C and Assembly Language. As new features and needs are identified, additional drivers can be added to this library. Specific applications can be constructed by Custom Control Systems from this library to meet various control needs. The resultant code is compiled and placed into an EPROM on the processor board. The control is specifically designed to control industrial washing machines, however it can be modified for use with many different types of industrial machine.

## A System in Control

In order to insure that the PC-5500 and PC-5750 execute formulas exactly as they were programmed, a check sum error detection scheme is used to check the integrity of nonvolatile memory. If an error is detected all operations stop and an error alarm is sounded and displayed.

# Hardware Specifications

## Control/Display Unit

| | |
|---|---|
| Microcontroller: | Siemens SAB 80C535 (PC-5500)<br>Intel 80386ex (PC-5750) |
| RAM: | 128k (PC-5500)<br>512k + 128k battery-backed (PC-5750) |
| ROM: | 64k (PC-5500)<br>512k (PC-5750) |
| Serial Port: | RS-485, supports data rates up to 28,800 bps (PC-5500)<br>Software-selectable RS-232 and RS-485, supports data rates up 115,200bps (PC-5750) |
| Display: | Two 2x20 character vacuum fluorescent displays |
| Status LEDs: | 40 |
| Keypad: | Sealed membrane, 31 keys |

## Input/Output Unit

| | |
|---|---|
| Relay Outputs: | Contacts rated at 5A 250VAC (Normally open contacts)<br>24 relays standard, expandable to 48 |
| Inputs: | 16 contact-closure inputs standard, expandable to 32 |
| Analog Outputs: | Two optional 12-bit D/A channels, can be configured as 0-5V, 0-10V, 4-20mA, -10 to +10V |
| Analog Inputs: | Seven 12-bit analog input channels, can be configured for 0-2.5V or 0-5V; two channels with thermocouple conditioning capability<br>Water Temperature and Level inputs are standard, all other analog inputs are optional |
| Counters: | Two optional high-speed counter inputs for measuring RPM or chemical or water flowmetering |

## Software Features

**Formulas**

96 dry formulas

**Steps**

60 steps per formula

**Step Time**

Time can be programmed from one second to 99 minutes and 99 seconds in one-second increments.

**Water Temperature Control**

Water temperature can be programmed from 0ºF to 255ºF or 0ºC to 145ºC, in one-degree increments.

**Water Level Control**

Water level can be programmed from 0" to 25" in .1" increments, or 0cm to 62cm in 1cm increments.

# Warranty

All products manufactured by Custom Control Systems Inc. (CCS), are warranted against defects in material and workmanship for two years from the date of purchase. Warranty is extended to the original purchaser only.

If a defect occurs, the product will be repaired, provided that inspection proves the claim, and that the purchaser give CCS written notice, or returns such defect within 30 days. Defective product shall be returned to the factory, freight prepaid, in original shipping package.

Custom Control Systems Inc. extends this warranty in lieu of any other warranties expressed or implied, and CCS neither assumes, nor authorizes any other person to assume for it, any other liability in connection with its equipment. Remedies provided in this warranty shall constitute the exclusive remedies available to the original purchaser, and all other warranties and damages, statutory or otherwise, are hereby expressly waived by the original purchaser.

## Exclusions

1. This warranty is void if the equipment is not properly installed, operated, and serviced as specified by the factory or if the equipment is not operated under normal conditions and with competent help.

2. Parts subject to normal wear or damaged by corrosion or exposure to weather, are not covered under this warranty.

3. This warranty does not cover labor to replace defective parts.

4. Expenses for removal and replacement of defective parts are not assumed by CCS.

5. Any modification made to CCS equipment after shipment from the factory or replacement of parts with types or makes other than originally furnished with the equipment, voids this warranty, unless such change or replacement has been approved in writing by CCS.

6. This warranty does not include any liability for consequential or incidental damage attributable to failure of any part of the equipment.

7. Although sold by CCS, equipment manufactured by others which is not an integral part of a CCS control, is excluded from this warranty, but may be covered by a warranty of the other manufactures.

## Replacement of Parts Under Warranty

**Ordering Replacement Parts**

When ordering replacement parts, furnish the following information:

1. Model number and serial number.
2. Part number, description and quantity.
3. Shipping instructions.

**Returning Parts Under Warranty**

All parts furnished under warranty will be invoiced by CCS. If we do not want the part to be returned for inspection, the invoice will show that the replacement part was furnished at no charge. If however, the part is to be returned for inspection and possible credit, the invoice will show the cost of the part, and credit will be issued upon receipt of the defective part provided:

1. The replaced parts must be returned to the factory, freight prepaid, within 30 days from the date of invoice.

2. Each part to be returned for credit and inspection must be tagged, showing name of customer, invoice number of replacement part, and a brief explanation of difficulty. *(Be more explicit than stating "N.G. or Defective".)* Pack parts carefully, to avoid damage in shipment.

3. The inspection must prove that the part was defective and had to be replaced.

4. Replacement parts will be shipped freight prepaid and the amount will be added to the invoice. If the returned part proves to be defective, the credit issued for the part will include minimum shipping charges incurred. No allowance will be made for air freight or express shipments.

5. Replacement parts which are returned unused are subject to a 25% restocking charge. Special made parts that are not normally stocked by CCS are not returnable for credit.

# 1. Run Mode/Idle

## 1.1 Active Keys

| | |
|---|---|
| [0] - [9] | Used to enter formula number |
| [UP ARROW] | Used to increment formula number |
| [DOWN ARROW] | Used to decrement formula number |
| [RIGHT ARROW] | Used to increment step number (only active in run mode if Step Advance is Enabled - see Section 6.5.23) |
| [LEFT ARROW] | Used to decrement step number (only active in run mode if Step Advance is Enabled - see Section 6.5.23) |
| [HELP] | Used to display control status information |
| [LEVEL/TEMP] | Used to toggle display between actual level and temperature and programmed values |
| [MODE SEL] | Used to select operation mode |
| [TIME] | Used to switch display between step, programmed, elapsed, or remaining time |
| [NAME] | Used to toggle display between formula name and step name |
| [START] | Used to START the FORMULA at the selected step and enter Run Mode/Running |

## 1.2 Mode Select

When the processor is first powered up, it will be in the Run Mode. To change to any of the other modes (Program Mode, Manual Mode, Options Mode), press the [MODE SEL] key. You may be required to enter a password to leave the Run Mode.

## 1.3 Select Formula

Formulas may be selected by one of the two following methods:

1. Press the [UP ARROW] and [DOWN ARROW] keys to scroll through the available formulas. The formula name and number will appear on the top line of the top display. The step number, inlet and outlet temperatures, and time will appear on the bottom line of the top display.
2. Press the keys on the numeric keypad ([0]-[9]) to enter the desired formula number ([0][1] = formula 1, [1][6] = formula 16, etc.). The formula name and number will appear on the top line of the top display. The step number, inlet and outlet temperatures, and time will appear on the bottom line of the top display.

**Note:** Formulas can only be selected after the current formula has run to the end step and the [SIGNAL] or [STOP] button has been pressed.

## 1.4 Select Step

1. To scroll through the available steps in the selected formula, use [RIGHT ARROW] and [LEFT ARROW] to scroll to the desired step. The step name will appear on the top line of the top display, and the step number will appear on the bottom line of the top display.
2. Press [EXIT] to return to formula selection.

**Note:** Selecting steps is protected by an option setting, but can be unprotected if desired. See Step Advance in section 6.5.23 of the manual.

### 1.5 Run a Formula

1. Select desired formula.
2. Press the [START] key. The control will start the dryer, and will enter Run Mode/Running.

# 2. Run Mode/Running

## 2.1 Active Keys

[STOP] Used to stop the dryer. The control will enter the Run Mode/Stopped mode.

[SIGNAL] Used to cancel the signal and resume processing the formula. If the formula has reached the end step, the control will enter Run Mode/Idle.

[HELP] Used to display control status information

[TEMP] Used to switch display between actual inlet and outlet temperatures, programmed inlet and outlet temperatures, the programmed and actual temperature difference, and the set and actual modulating gas valve positions

[TIME] Used to switch display between programmed step time, formula remaining time, formula elapsed time, and step time remaining

[NAME] Used to switch display between formula name and step name

[HUMID] Used to switch display between programmed humidity, outlet humidity, and ambient humidity

## 2.2 Running Formula

The control will begin running the formula with the currently selected step. The step timer will be started when the step's other criteria are met.

### 2.2.1 Maintain Water Level Setting

A. Turn off water valves as soon as set point or greater level is reached.
B. Turn on water valves if after a specified period of time, the level is still below the set point. See fill delay option, Section 6.5.17.

### 2.2.2 Maintain Water Temperature Setting

A. Below Water Level
   1. Activate hot water if water temperature is below set point. (Hot water will be activated in addition to the programmed water, for example if cold water is programmed in the step both the hot and cold water will be activated but if hot water is programmed in the step then only hot water will be activated).
   2. Activate cold water if temerature is above set point. (Cold water will be activated in addition to the programmed water, for example if hot water is programmed in the step both the hot and cold water will be activated but if cold water is programmed in the step then only cold water will be activated.)

B. Above Water Level
   1. Turn on steam if temperatuere is below set point. (Steam will only be activated if it has been programmed into the step.)
   2. Turn off steam if temperature is above set point. (Steam will only be activated if it has been programmed into the step.)

### 2.2.3 Add Chemicals

A. Timed
   1. Turn on programmed chemical outputs if chemical timer is less than the programmed time.
   2. Turn off programmed chemical outputs when chemical timer is equal to the programmed time.

#### 2.2.4 Step Timer

Function is started as soon as level, temperature and chemicals are satisfied. The step timer will continue to run until the timer reaches 00:00 or if the [STOP] key is pressed or an external timer hold input is detected. (Some Option Settings can affect when the step timer holds, and when it runs. See Options, Section 6.5 for more detail.)

## 2.3 Help

If the timer is holding, press the [HELP] key, and display will indicate why the timer is holding.

# 3. Run Mode/Stopped

## 3.1 Active Keys

| | |
|---|---|
| [MODE SEL] | Used to Select Mode |
| [START] | Used to start the formula at the selected step and enter Run Mode/Running |
| [HELP] | Used to display hold information |
| [0] - [9] | Used to enter formula number |
| [UP ARROW] | Used to increment formula number |
| [DOWN ARROW] | Used to decrement formula number |
| [RIGHT ARROW] | Used to increment step number (only active in run mode if Step Advance is Enabled - see Section 6.5.28) |
| [LEFT ARROW] | Used to decrement step number (only active in run mode if Step Advance is Enabled - see Section 6.5.28) |
| [TIME] | Used to display Step, Programmed, Elapsed, or Remaining Time. |
| [LEVEL/TEMP] | Used to display Actual Level and Temperature or programmed values. |

# 4. Program Mode

The Program Mode is used to program up to 96 formulas, with 60 steps within each formula. This section explains how to select and name formulas, program outputs, water level and temperature, time and chemicals. Steps can be inserted, deleted, and renamed.

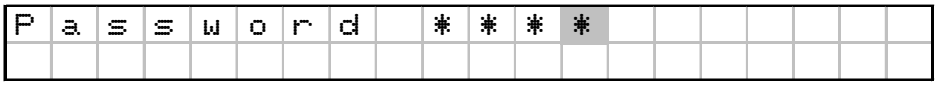
## 4.1 Entering Program Mode

If the password feature has not been enabled, press the [MODE SEL] key and proceed to step 4 below. Otherwise, start with step 1.

**Note:** the factory default password is 5500 on the PC-5500, and 5750 on the PC-5750. To change the control password, see the Password entry under Options, section 6.5.25. This example assumes that the control has been set up with the factory default password. If your password is different, use it instead.

1. Press the [MODE SEL] key.
   The top display will now read:

2. Press the 5, then the 5, then the 0, and then the 0.
   The top display will now read:




3. Press the [ENTER] key. The control will now be in the Program Mode, and the "PRO" light will be illuminated.

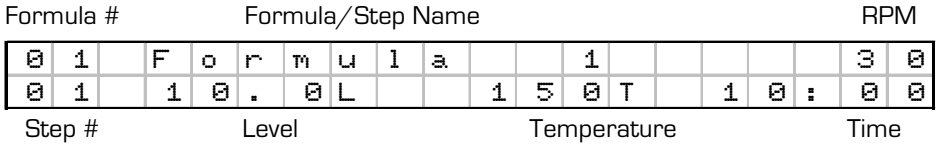
## 4.2 Active Keys

| | |
|---|---|
| [UP ARROW] | Used to increment formula number |
| [DOWN ARROW] | Used to decrement formula number |
| [UP ARROW] | Used to increment step number |
| [DOWN ARROW] | Used to decrement step number |
| [MODE SEL] | Used to exit Program Mode and enter Manual Mode |
| [NAME] | Used to display or edit formula name |
| [AUX OUTS] | Used to activate or deactivate auxiliary outputs |
| [EXIT] | Used to exit from current mode |
| [ENTER] | Used to save step |
| [EDIT] | Used to access special editing functions |
| [LEVEL/TEMP] | Used to enter level and temperature for the current step |
| [CHEM] | Used to enter supply injections for the current step |
| [TIME] | Used to enter time for the current step |

[RPM] Used to enter step RPM for machines equipped with variable-frequency drives

## 4.3 Displays

When the control first enters the Program Mode, the top line of the top display will show the formula name and number. The bottom line of the top display will show the step number, level, temperature, and time. The output status LEDs will show the outputs that are programmed to activate in the selected step.




## 4.4 Selecting a Formula

Select the formula number to be programmed or edited using the [UP ARROW] (to increment the formula number) and [DOWN ARROW] keys (to decrement the formula number). Notice that the two left most digits of the top line of the top display increase by one and decrease by one with the [UP ARROW] and [DOWN ARROW] keys respectively. These digits represent the formula number.

## 4.5 Editing the Formula Name

The formula name is displayed to the right of the formula number. To edit the formula name:

1. If the formula name is not displayed, press [UP ARROW] followed by [DOWN ARROW]. This will force the display back to the formula name.

2. Press the [NAME] key. A flashing cursor will appear on first character of the formula name. You are now in the alphanumeric entry mode which will allow you to program the formula name.

3. The multifunction keys 0 - 9 also contain the alphabet. Below each number there are three letters. For example, the [1] key also contains the letters “ABC”. The first time the key is pressed, the number “1” will appear at the cursor location. The second time the key is pressed, the letter “A” will replace it. The third consecutive time the key is pressed, the letter “B” will replace it, then the letter “C”, and then back to the number “1”.

4. Using the multifunction keys, select the first letter of the formula name. Press the [RIGHT ARROW] key to move the cursor to the second position in the formula name and proceed with the next letter.

5. If you make a mistake, the [RIGHT ARROW] and [LEFT ARROW] keys can be used to position the cursor over any of the letters in the formula name to make a correction. The [CLEAR] key can be used to clear the entire formula name.

6. Proceed with the method described above for programming the rest of the formula name. When you are finished, press [ENTER] to save the formula name. The bottom line of the top display will read “Name Saved”.

## 4.6 Selecting a Step

Select the formula you wish to edit using the [UP ARROW] and [DOWN ARROW] keys. To select the step to be edited, use the [RIGHT ARROW] key to move to the next step, and the [LEFT ARROW] key to move to the previous step. Notice that the two left most digits of the bottom line of the top display increase or decrease by one with the [RIGHT ARROW] and [LEFT ARROW] keys respectively. These digits represent the step number. The step name is shown on the top line of the top display.

The first time you edit a formula, the PC-5500 will have an end step programmed for step one. Before you can program anything, you must first clear this end step by pressing the [CLEAR] key.

## 4.7 Programming Outputs (Hot, Cold, Steam, Etc.)

Above each number on the numeric keypad (also referred to as the Multi-Function Keys), are "quick select" outputs. For many steps, the outputs can be programmed in a single keystroke using these keys.

1. To select the outputs to be activated in the step, press the multifunction keys with the desired output functions marked on them.

| **Output** | **Multi-Function Key #** |
|---|---|
| Hot Water | 2 |
| Cold Water | 7 |
| Steam | 6 |
| Drain | 3 |
| Reuse Water | 1 |
| Reuse Drain | 8 |
| Poly Rinse/Cool down | Press 7 twice |
| Low Extract | 9 |
| High Extract | 4 |
| Wash Motor Forward | 5 |
| Wash Motor Reverse | 0 |
| Signal | Signal |
| Auxiliaries | Press [AUX OUTS] to view list, [UP ARROW] and [DOWN ARROW] to select the desired auxiliary output, and [ON/OFF] to enable or disable the output |
| Indirect Heat | Press 6 twice |
| Indirect Cool | Press 7 three times |
| Optional Motor Forward | press 5 twice |
| Optional Motor Reverse | press 0 twice |

2. Once you have selected the outputs needed for this step, proceed to programming water level and temperature.

## 4.8 Programming Level and Temperature

When you first start programming a step on the washer control, it will automatically set the water level and water temperature on that step to zero. If the step you are programming requires a temperature or level, use the procedure below to add the settings you need.

1. Press [LEVEL/TEMP] key. Notice that the right most digit in the level field begins to flash. (The washer control uses the cursor to indicate that it is waiting for a number to be entered.)

2. Enter the required water level using the multifunction keys (numeric keypad). For example, if you require a water level of 13, press the [1] key, and then the [3] key. The display will now read "13", with the cursor flashing on the "3".

3. Once you have entered the water level needed for this step, press the [LEVEL/TEMP] key. The cursor will now begin to flash on the temperature display.

4. Enter the required water temperature, using the multifunction keys (numeric keypad). For example, if you require a water temperature of 145°, press the [1] key, then the [4] key and then the [5] key, The temperature display will now read "145" with the 5 flashing.

5. When the desired level and temperature has been selected press the [LEVEL/TEMP] key.

6. **(Dye Control Only)** If you have indirect steam or indirect cooling programmed, "Temperature ramp rate" will appear on the display, and the cursor will begin flashing on the value for the temperature ramp. Use the numeric keypad to enter the desired number of degrees per unit time you want for the ramp, and press the [LEVEL/TEMP] key again. The flashing cursor will turn off, and you will be able to program other functions on the current step. (See section 6.5.77 and 6.5.78 for more information on the heating and cooling ramps.)

**NOTE:** If the wrong level or temperature has been selected, it is important to make sure that **the cursor is flashing** in either the level or the temperature field before making any change. After you have verified that the cursor is flashing in the correct field, press the [CLEAR] key and the field will change to "0". If the [CLEAR] key is pressed without any cursor flashing, the entire step will be erased, including any outputs or time that had been programmed.

## 4.9 Programming Time

If you need to program a time for the step you are editing:

1. Press the [TIME] key. Notice that the right most digit of the time display begins to flash. As with level and temperature, the flashing cursor is the control's way of requesting input from the user.

2. Enter the required time for this step by using the multifunction keys. For example, to program a step time of 1 minute and 30 seconds, press the [1] key, then the [3] key and then the [0] key. The time field will now read "01:30", with the 0 flashing.

3. When the desired time has been entered, press the [TIME] key and notice that the flashing cursor has turned off.

## 4.10 Programming the Step Name

If the default step name is acceptable, proceed to Section 4.11. If you wish to change or edit the step name:

1. If the formula name is being displayed, press the [ENTER] key to save the current step, then press the [LEFT ARROW] key to return to the step you were editing.

2. Press the [NAME] key. A flashing cursor will appear in the top display. You are now in the alphanumeric entry mode that will allow you to program the step name.

3. The multifunction keys 0 - 9 also contain the alphabet. Below each number there are three letters. For example, the [1] key also contains the letters "ABC". The first time the key is pressed, the number "1" will appear at the cursor location. The second time the key is pressed, the letter "A" will replace it. The third consecutive time the key is pressed, the letter "B" will replace it, then the letter "C", and then back to the number "1".

4. Using the multifunction keys, select the first letter of the step name. Press the [RIGHT ARROW] key to move the cursor to the second position in the step name and proceed with the next letter.

5. If you wish to use a preprogrammed step name, enter the first letter of the preprogrammed name you want to use and press the [NAME] key. The first preprogrammed name that begins with that letter will appear on the top line of the top display. Press the [NAME] key again to get the second name that begins with that letter, and so on.

6. If you make a mistake, the [RIGHT ARROW] and [LEFT ARROW] keys can be used to position the cursor over any of the letters in the step name to make a correction. The [CLEAR] key can be used to clear the entire step name.

7. Proceed with the method described above for programming the rest of the step name. When you are finished, press [ENTER] to save the step name. The bottom line of the top display will read "Name Saved".

## 4.11 Programming Chemicals/Supplies

When supplies or chemicals need to be entered or changed the following procedure must be used:

1. Press the [CHEM] key. The top display now reads the name of Supply 1, with 0 and 1 or 2 letters at the end of the display. Also notice that the SUP-1 LED light turns on. Pressing [CHEM] repeatedly will cycle through the list of available chemical supplies. If supplies have not been configured, see chemical name and calibration options, Section 6.4.

2. Once the proper supply has been selected, enter the desired number of units, using the numeric keypad. Supply units can be time, volume or weight. See chemical name and calibration options, Section 6.4.

3. Repeat steps 1 & 2 for all required supplies for the current step.

4. When finished, press [EXIT] key.

**NOTE:** If the wrong volume has been selected, it is important to make sure that **the cursor is flashing** in the volume field before making any changes. Press the [CLEAR] key and the supply unit display will clear to "0". If the [CLEAR] key is pressed without a cursor flashing the entire step will be erased, including any outputs, time, level or temperature that were previously programmed.

## 4.12 Program Step RPM

To program the step RPM:

1. Press the [RPM] key. On the top line of the top display, you should see the number at the right hand side start flashing.

2. Use the multifunction keys to enter the desired RPM for the current step.

3. Press the [RPM] key again when finished.

## 4.13 Saving a Step

When you are finished working with a step, the step must be recorded into memory. To do this, press [ENTER]. The bottom display will show "Step Saved", then automatically advance to the next step.

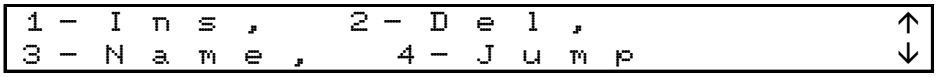
## 4.14 End Step

When you have completed entering all required step for a formula, the last step **must** be an end step. Simply go to the next available step in your formula and the press [STOP/END] key. Display will read "** END **". Without this end step, the formula will cycle around to the beginning and repeat the entire formula again.

## 4.15 Programming Edit

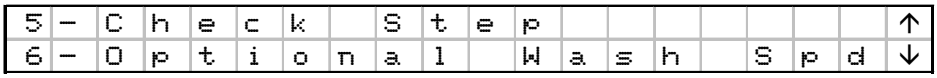
The Programming Edit Function was developed specifically to allow the user to perform special programming tasks, such as inserting a step, deleting a step, jumping to a step, changing the step nam or setting step options. The first four options: insert, delete, change name, and jump, initially appear on the display (screen 1). To access the step options (4.15.5 and 4.15.6), press the [DOWN ARROW] key.

Screen 1:



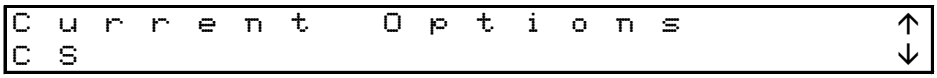

Screen 1 allows access to the basic editing functions: inserting, deleting, renaming and jumping to a step.

Screen 2:




Screen 2 allows access to the check step and optional wash speed options.

Screen 3:




Screen 3 displays the currently selected options, such as the check step option.

### 4.15.1 Insert a Step

The new step being added will always be inserted **before** the selected step. For example, if you want to insert a new step between step 3 and 4, proceed as follows:

1. Select step 4 using the [RIGHT ARROW] or [LEFT ARROW] keys.

2. Press the [EDIT] key. The top display will now read "1-Ins, 2-Del", and the bottom display will read "3-Name, 4-Jump".

3. Press the [1] key.

4. Step will be inserted and the bottom display will now read "Step Saved".

After the insertion is complete, the contents of the following steps will be renumbered one higher. When the renumbering is complete, the bottom line of the top display will flash "Step Saved". The Programming Edit Mode will be exited and the Program Mode reentered automatically.
See Section 4.7 for programming step data.

### 4.15.2 Delete a Step

1. Select the step you wish to delete using the [RIGHT ARROW] or [LEFT ARROW] keys.

2. Press the [EDIT] key. The top line of the top display will now read "1-Ins, 2-Del", and the bottom line of the top display will read "3-Name, 4-Jump".

3. Press the [2] key.

4. Deletion is complete.

After the deletion is complete, the current step will have been removed from memory and will be replaced by the step that followed it. The washer control will automatically move all steps after the one you deleted down one step.

### 4.15.3 Edit Step Name

1. Select the step whose name you wish to change.

2. Press the [EDIT] key. The top line of the top display will now read "1-Ins, 2-Del", and the bottom line of the top display will read "3-Name, 4-Jump".

3. Press the [3] key. The displays will show the current step, with a flashing cursor in the name display.

4. The multifunction keys 0 - 9 also contain the alphabet. Below each number there are three letters. For example, the [1] key also contains the letters "ABC". The first time the key is pressed, the number "1" will appear at the cursor location. The second time the key is pressed, the letter "A" will replace it. The third consecutive time the key is pressed, the letter "B" will replace it, then the letter "C", and then back to the number "1".

5. Using the multifunction keys, select the first letter of the step name. Press the [RIGHT ARROW] key to move the cursor to the second position in the step name and proceed with the next letter.

6. If you wish to use a preprogrammed step name, enter the first letter of the preprogrammed name you want to use and press the [NAME] key. The first preprogrammed name that begins with that letter will appear on the top line of the top display. Press the [NAME] key again to get the second name that begins with that letter, and so on.

7. If you make a mistake, the [RIGHT ARROW] and [LEFT ARROW] keys can be used to position the cursor over any of the letters in the step name to make a correction. The [CLEAR] key can be used to clear the entire step name.

8. Proceed with the method described above for programming the rest of the step name. When you are finished, press [ENTER] to save the step name. The bottom line of the top display will read "Name Saved".

### 4.15.4 Jump / Go To

This feature is useful when you need to jump by several steps.

1. Press the [EDIT] key. The top display will now read "1-Ins, 2-Del", and the bottom display will read "3-Name, 4-Jump".

2. Press the [4] key. The display will read "Jump to Step", with a flashing cursor.

3. Using the numeric keypad, select the step you wish to go to. Press [ENTER] and notice that the step number has changed to the desired step.

### 4.15.5 Check Step

This feature stops the washer at the end of the current step while running the formula and sounds the signal. The operator then has the option of programming additional run time for the step, or continuing on to the next step in the formula.

1. Press the [EDIT] key. The top display will now read "1-Ins, 2-Del", and the bottom display will read "3-Name, 4-Jump".

2. Press the [UP ARROW] key. The top display will now read "1-Check Step". If you are working with a dye machine control, "2-Optional Wash Spd" will also appear.

3. Press the [1] key to program or clear the check step option.

4. Press the [EXIT] key to return to the program mode.

#### 4.15.6 Optional Wash Speed

This feature switches between the "normal" wash speed forward and reverse motor and the "optional" forward and reverse motor. This option is available only on the dye machine control.

1. Press the [EDIT] key. The top display will now read "1-Ins, 2-Del", and the bottom display will read "3-Name, 4-Jump".

2. Press the [UP ARROW] key. The top display will now read "1-Check Step". If you are working with a dye machine control, "2-Optional Wash Spd" will also appear.

3. Press the [1] key to program or clear the check step option.

4. Press the [EXIT] key to return to the program mode.

### 4.16 Exiting Program Mode

Press [MODE SEL] to move from the Program Mode into the Manual Mode.
Press [MODE SEL] again to move from the Manual Mode into the Options Mode.
Press [MODE SEL] again to move from the Options Mode into the Run Mode.

# 5. Manual Mode

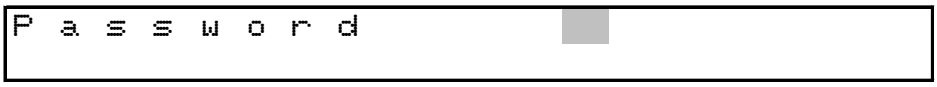
The Manual Mode is used to view the formula counters and hour meter and to check the raw values of the control system's analog channels.

## 5.1 Entering Manual Mode

If the password feature has not been enabled, press the [MODE SEL] key and proceed to step 4 below. Otherwise, start with step 1.

**Note:** the factory default password is 5500 on the PC-5500, and 5750 on the PC-5750. To change the control password, see the Password entry under Options, section 6.5.25. This example assumes that the control has been set up with the factory default password. If your password is different, use it instead.

1. Press the [MODE SEL] key.
   The top display will now read:




2. Press the 5, then the 5, then the 0, and then the 0.
   The top display will now read:

3. Press the [ENTER] key. The control will now be in the Program Mode, and the "PRO" light will be illuminated.

4. Press [MODE SEL] again. The control will now be in the Manual Mode, and the "MAN" light will be illuminated.

## 5.2 Active Keys

[MODE SEL] Used to exit the Manual Mode and enter the Options Mode

[EDIT] Used to review the hour meter and formula counters

## 5.3 Displays

When first entering the Manual Mode the top line of the top display will show "Manual Mode". The bottom line of the top display will show the current water temperature and level. The bottom display shows the current uncorrected analog input and high-speed counter values.

## 5.4 Reviewing the Hour Meter and Formula Counters

1. Press the [EDIT] key. The review hour meter/formula count section of the Manual Mode will be entered. The top line of the top display will read "Hour meter" and the bottom line of the top display will read hours and minutes of run time.

2. Press the [UP ARROW] key. The top display will read "01 {formula name}" and the bottom display will read: Load XX, Total XXXX. {Load Count, if not reset, will count 255 loads and then roll over and start at zero again. Total Count, regardless of resets, will count to 65,535 loads and then roll over and start at zero.

3. Press [UP ARROW], to advance to the next formula for review.

4. Press the [EXIT] key to exit the review hour meter/formula count section and return to the Manual Mode.

NOTE: Formulas will only be displayed if they have been previously run. The total counter will not be reset.

## 5.5 Resetting Formula Counters

1. Press the [EDIT] key to enter the review hour meter/formula count section. The top display will read "Hour meter" and the bottom display will read Load XX, Total XXXX.

2. Press the [CLEAR] key. The display will read "Clear Daily Counters: No". Press the [ON/OFF] key to change the "No" to "Yes".

3. Press [ENTER] to finalize reset of Load Counters for all formulas.

4. Press the [EXIT] key to exit the review hour meter/formula count section and return to the Manual Mode.

## 5.6 Exiting Manual Mode

Press [MODE SEL] to exit the Manual Mode and go into the Options Mode.
Press [MODE SEL] again to exit the Options Mode and return to the Run Mode.

# 6. Options Mode

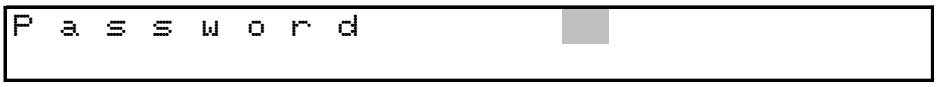
The Options Mode is used to configure the washer control's various option settings and to access the technical configuration mode and the communication functions.

## 6.1 Entering Options Mode

If the password feature has not been enabled, press the [MODE SEL] key and proceed to step 4 below. Otherwise, start with step 1.

**Note:** the factory default password is 5500 on the PC-5500, and 5750 on the PC-5750. To change the control password, see the Password entry under Options, section 6.5.25. This example assumes that the control has been set up with the factory default password. If your password is different, use it instead.

1. Press the [MODE SEL] key.
   The top display will now read:




2. Press the 5, then the 5, then the 0, and then the 0.
   The top display will now read:

3. Press the [ENTER] key. The control will now be in the Program Mode, and the "PRO" light will be illuminated.

4. Press [MODE SEL] again. The control will now be in the Manual Mode, and the "MAN" light will be illuminated.

5. Press [MODE SEL] again. The control will now be in the Options Mode, and the "OPT" light will be illuminated.

## 6.2 Active Keys

| | |
|---|---|
| [UP ARROW] | Used to go to the next option |
| [DOWN ARROW] | Used to go to the previous option |
| [EDIT] | Used to edit option values |
| [CLEAR] | Used to reset the option value. Use only when cursor is flashing on an option value. |
| [ENTER] | Used to save the changed option value. |
| [MODE SEL] | Used to exit the Options Mode and enter Run Mode. |
| [1] - [0] | Used to enter numeric option values. |
| [EXIT] | Used to exit the editing function. |
| [ON/OFF] | Used to toggle from NO to YES in the Options Mode. |

## 6.3 Displays

When first entering the Options Mode the display will show the option that was selected the last time the Options Mode was used.

## 6.4 Chemical Name and Calibration Settings

Press [CHEM] key to program chemical names and calibration settings.

### 6.4.1 Chemical Name

Press [UP ARROW], to select chemical name to be edited. Press the [NAME] key to begin to edit. Using the multifunction keys, program desired name. Press [ENTER] to save change and the cursor will automatically advance to the Unit of Measure field.

### 6.4.2 Unit of Measure

Is a 2 character field, representing the unit of measure to be injected. The unit of measure can be programmed in one of two ways. Press [UP ARROW] or [DOWN ARROW] keys to scroll through a preprogrammed list, or use the multifunction keys to program desired characters. Press [ENTER] to save.

### 6.4.3 Calibration Time/Volume

To calibrate chemical output so that 1 unit equals 1 second of output time, set both calibration time and volume to 1. Press [EDIT], to enter time, and the press [ENTER] to enter volume. Press [ENTER] to save and advance to Chemical Rule. For more information, consult a Factory Authorized Technician.

### 6.4.4 Chemical Rule

The following settings will apply:
0 - inject after temperature
1 - inject before temperature
2 - Bleach inject after temperature and **never** steam with bleach in water.
Select the desired value. Press [ENTER] to save and advance to Injection Group.

### 6.4.5 Injection Group

The following settings will apply:
0 - Chemicals will inject simultaneously.
1 - Chemicals will inject individually.
Select the desired value. Press [EXIT] to save.
For programming the next chemical, press [RIGHT ARROW] and repeat from step 1. Or press [EXIT] to return to the Options Mode.

### 6.4.6 Flush Type

On machines with a flush valve configured in the Supply I/O Assignments (section 7.5), the following settings apply:
0 - After injection only
1 - Both during and after the injection

### 6.4.7 Flush Time

On machines with a flush valve configured in the Supply I/O Assignments (section 7.5), enter the time in seconds that the flush valve should remain open after the chemical has been injected.

### 6.4.8 Maximum Wait Time

On supplies that are manually added to the machine, enter the time in seconds that the washer control should wait for the operator to manually add the chemical and re-start the washer. If this time is exceeded, the washer control will display an error.

## 6.5 Option Settings

### 6.5.1 Motor On

Enter the time for the wash motor run time. The valid range for this field is from 1 second to 4 minutes and 15 seconds. The default for this field is 20 seconds.

### 6.5.2 Motor Off

Enter the time for the wash motor pause. The valid range for this field is from 0 seconds to 12.5 seconds, the smallest unit of change is .05 seconds. The default for this field is 10 seconds.

### 6.5.3 Wash RPM Min (0%)

Enter the rotational speed of the machine in RPM when the analog output is at 0V. The default for this field is 0. This feature is available only on washers equipped with variable-frequency drives. If the washer has a single motor/single drive system, ensure that the Motor Forward I/O Assignment (Section 7.3.8) type is set to 1. The Wash RPM Min/Max settings will apply to both wash and extract speeds. If the washer has a dual motor/single drive system, ensure that the Motor Forward I/O Assignment type is set to 2, and that the low extract I/O Assignment (Section 7.3.11) type is set to 6. The Wash RPM Min/Max settings will apply only to wash, drain and balance speeds. The Extract RPM Min/Max settings will apply to extract speeds.

### 6.5.4 Wash RPM Max (100%)

Enter the rotational speed of the machine in RPM when the analog output is at 5V (maximum output). This feature is available only on washers equipped with variable-frequency drives.

### 6.5.5 Default Wash RPM

Enter the RPM you want to use as your standard wash speed. The default for this field is 30. This feature is available only on washers equipped with variable-frequency drives.

### 6.5.6 Default Drain RPM

Enter the RPM you want to use as your standard drain speed. The default for this field is 30. This feature is available only on washers equipped with variable-frequency drives.

### 6.5.7 Low Distribution RPM

Enter the RPM for the low distribution speed. The default for this field is 40. This feature is available only on washers equipped with dual-motor drive systems (variable-frequency drive for wash and drain speeds, separate motor for extract speeds).

### 6.5.8 Medium Distribution RPM

Enter the RPM for the medium distribution speed. The default for this field is 50. This feature is available only on washers equipped with dual-motor drive systems (variable-frequency drive for wash and drain speeds, separate motor for extract speeds).

### 6.5.9 High Distribution RPM

Enter the RPM for the high distribution speed. The default for this field is 60. This feature is available only on washers equipped with dual-motor drive systems (variable-frequency drive for wash and drain speeds, separate motor for extract speeds).

### 6.5.10 Extract RPM Min (0%)

Enter the rotational speed of the machine in RPM when the analog output is at 0V. The default for this field is 0. This feature is available only on washers equipped with dual-motor/single variable-frequency drive systems (Motor Forward I/O Assignment (Section 7.3.8) type set to 2). To set the minimum and maximum speeds for the wash speeds, use the Wash RPM Min/Max settings.

### 6.5.11 Extract RPM Max (100%)

Enter the rotational speed of the machine in RPM when the analog output is at 5V (maximum output). This feature is available only on washers equipped with dual-motor/single variable-frequency drive systems (motor forward I/O Assignment (Section 7.3.8) type set to 2).

### 6.5.12 Extract RPM Ramp Rate

Enter the ramp rate in RPM/s for this washer. This feature is available only on washers equipped with dual-motor/single variable-frequency drive systems (motor forward I/O Assignment (Section 7.3.8) type set to 2).

### 6.5.13 Default Low Extract RPM

Enter the RPM you wish to use as a standard speed for low extract steps. This feature is available only on machines with a single-motor variable-frequency drive system.

### 6.5.14 Default High Extract RPM

Enter the RPM you wish to use as a standard speed for high extract steps. This feature is available only on machines with a single-motor variable-frequency drive system.

### 6.5.15 Jog RPM

Enter the RPM you wish to use as a jog speed when jogging the washer. This feature is available only on washers equipped with single-motor variable-frequency drives.

### 6.5.16 Unload Jog RPM

Enter the RPM you wish to use a jog speed when unloading the washer. This feature is available only on washers equipped with dual-motor/single variable-frequency drive systems (motor forward I/O Assignment (Section 7.3.8) type set to 2).

### 6.5.17 Load Jog RPM

Enter the RPM you wish to use as a jog speed when loading the washer. This feature is available only on washers equipped with dual-motor/single variable-frequency drive systems (motor forward I/O Assignment (Section 7.3.8) type set to 2).

### 6.5.18 Steam Level

Enter the minimum water level required before the steam valve is allowed to open. The valid range for this field is 2.0 to 10.0 inches, the smallest unit of change is .1 inches. The default for this field is 3.0 inches. Setting this field to zero will require the programmed water level to be satisfied before the steam valve is opened. This field will not appear unless the machine has been configured with a steam output, consult a Factory Authorized Technician to setup the steam output.

### 6.5.19 Low Level

If the machine is equipped with a low level output, enter the water level required before the low level output will turn off. This feature is required on machine that must disable the door open if there is water in the machine. The valid range for this field is 1.0 to 20.0 inches, the smallest unit of change is .1 inches. This field will not appear unless the machine has been configured with a low level output, consult a Factory Authorized Technician if this feature is required.

### 6.5.20 Signal On

Enter the on time for the signal output. The valid range for this field is .1 seconds to 10 seconds, the smallest unit of change is .05 seconds. The default for this field is .5 seconds. If a mechanical bell is connected, this field can be changed to 10 seconds and the next field, signal off time, can be changed to zero seconds, this will cause the signal to ring the bell continuously.

### 6.5.21 Signal Off

Enter the off time for the signal output. The valid range for this field is 0 seconds to 10 seconds, the smallest unit of change is .05 seconds. The default for this field is .5 seconds. Changing this field to zero will cause the signal to ring without any pulsing.

### 6.5.22 Fill Delay

Enter the time for level to stay below set point before water values will turn on to satisfy water level set point. The valid range for this field is 1 second to 60 seconds, the smallest unit of change is 1 second. The default for this field is 5 seconds. (This setting helps to dampen the effects of the bouncing water level in the washer.)

### 6.5.23 Water Level Offset

Enter the water level adjustment offset. The valid range for this field is zero to 9.9 inches, and the smallest unit of change is .1 inches. The default for this field is 2.0 inches. The value of this option will be subtracted from the highest level (25.5 inches), for a new maximum programmable level. By using the default of 2.0 inches, the programmable water level range is 0 to 23.5 inches. Do not change this field to compensate for errors in the water level readings.

### 6.4.24 Display Brightness

Enter the number from the following chart to set the display brightness.

2- Dim (25%)
5- Medium Dim (50%)
7- Medium Bright (75%) (Default setting )
1- Bright (100%)

Changes to this field will take effect immediately.

### 6.5.25 Fill Timeout

Enter the time in minutes and seconds for the maximum allowable time for any water fill. The default for this field is 5:00 minutes. The valid range for this field is zero to 25 minutes, the smallest unit of change is 15 seconds. This may cause some confusion if the user tries to set the time-out to 1:10 minutes, the washer control will round this entry to 1:15 minutes. This field must be used for proper control operation.

### 6.5.26 Temperature Timeout

Enter the time in minutes and seconds for the maximum allowable time for the steam valve to remain open. The default for this field is 10:00 minutes. The valid range for this field is zero to 25 minutes, the smallest unit of change is 15 seconds. This may cause some confusion if the user tries to set the time-out to 4:10 minutes, the washer control will round this entry to 4:15 minutes. Setting this field must be used for proper control operation.

### 6.5.27 Unbalance Refill Water Level

Enter the water level to refill the machine with after an extract unbalance. The default for this field is 3 inches. The valid range for this field is 0 to 10 inches, and the smallest unit of change is 1 inch. Setting this field to zero will cause the washer control to backup in the formula to the previous fill step and use the water level programmed for that step. To disable this feature and cause the washer control to remain in the extract step after an unbalance condition enter a level of 25.5 inches. This field will not appear if the machine has not be configured with an extract, consult a Factory Authorized Technician to setup the extract outputs.

### 6.5.28 Step Advance

Press [ON/OFF] key, to toggle between YES (enabled) or NO (disabled). If this feature is enabled, it will allow the operator to change steps during a formula, or to start a formula on a step other than step one. If this feature is disabled the step can still be changed if the machine has a supervisor key option. If the supervisor key option has not been configured consult a Factory Authorized Technician to setup this option.

### 6.5.29 Temperature Offset

Enter the temperature adjustment offset. The valid ranges for this field are -127 to +127 degrees, and the smallest unit of change is 1 degree. The default for this field is 0 degrees. To change the sign (+/-) of this field, press [ON/OFF] key. Changing this field will effect the overall range of temperature sensing. Any number entered less than zero will be subtracted from the top of the temperature range (255 degrees), for a new maximum programmable temperature. Any number greater than zero will effectively be the lowest programmable temperature.

### 6.5.30 Password

Enter the password required for entry to the program, manual and options modes. The factory default for this field is 5000. It is recommended that the user change this field. If this field is set to 0 the password feature will be disabled. The operator may also enter the program and options modes with the use of the supervisor key, if this feature has been configured. If the supervisor key feature has not been configured consult a Factory Authorized Technician to setup the feature.

### 6.5.31 Communication Unit ID

Enter the unit identification number for the communications network. The default for this field is zero, which will disable the communications network features. Care MUST be taken to ensure that no two controls have the same communication identification number, if this happens communication error will occur on both machines.

### 6.5.32 Chirp Time

Enter the on time for the key chirp output. The valid range for this field is .05 seconds to .95 second, the smallest unit of change is .05 seconds. The default for this field is .10 seconds. This feature may be disabled by setting this field to zero.

### 6.5.33 Default Drain Time

Enter the time in minutes and seconds for the default time. This time will appear when programming a drain or reuse drain step. The default drain time can be overridden when programming a drain step.

### 6.5.34 Minimum Supply Water Level

Enter the level of water required for any supply injection. This is to prevent supplies from being injected into a wash load without enough water to dilute the supply. Setting this field to zero will require the programmed water level to be satisfied before the supplies will be injected.

### 6.5.35 Cold Water Prescale

Enter the number for the cold water flowmeter pre-scale.

### 6.5.36 Hot Water Prescale

Enter the number for the hot water flow meter pre-scale.

### 6.5.37 Auto Position Time

Future option.

### 6.5.38 Level Count

Enter the water level process averaging constant. Valid Range: 10-90

### 6.5.39 Display Count

Future option.

### 6.5.40 Communication Speed

Used to set the baud rate of the washer control's on board serial port. If no value is entered, the port defaults to 19,200 baud.

Valid settings:
- 96 - 9600 baud
- 192 - 19,200 baud
- 200 - maximum port rate (available only to facilities using ComLink (CL-1000)).

### 6.5.41 Low Extract Lead Time

On Washex Floataire-style machines, this is used to set the time that the low extract motor will run before the high extract motor will start on an extract step. The valid range for this field is 30 seconds to 4 minutes, 15 seconds.

### 6.5.42 Low Temperature

Enables the temperature interlock features of the washer control. This feature keeps the door latch and door seal engaged while the temperature of the water in the machine is above the set value. The valid range for this field is 0 to 255 degrees Fahrenheit.

### 6.5.43 Poly-Rinse (Cooldown) Temperature Timeout

Enter the time in minutes and seconds for the maximum allowable time for the machine to cool down when the Poly-Rinse valve is open. The default for this field is 10:00 minutes. The valid range for this field is zero to 25 minutes, the smallest unit of change is 15 seconds. This may cause some confusion if the user tries to set the time-out to 4:10 minutes, the washer control will round this entry to 4:15 minutes. Setting this field must be used for proper control operation on machines equipped with Poly-Rinse.

### 6.5.44 Safe Speed Time

Enter the time in minutes and seconds that it takes for the machine to slow down at the end of an extract step. This feature is available only on washers configured to use timed safe speed (Zero Speed I/O Assignment type 1). If no setting is entered in this field, the control will default to 30 seconds.

### 6.5.45 Level Multiplier

The level multiplier option is used to select the range of the washer control's water level input. The valid settings for this field are:

1- 0-25.5 inches, 0.1 inch resolution
2- 0-51 inches, 0.2 inch resolution

### 6.5.46 Metric Measurements

The Metric Measurements option allows the user to switch the control between English system measurements (levels in inches, temperatures in ºF) and Metric measurements (levels in centimeters, temperatures in ºC).

### 6.5.47 Overflow Level

The Overflow Level option is used to set the water level at which the washer control will force the drain open to prevent the machine from overflowing. Setting this field to 0 disables this feature.

### 6.5.48 Machine Raise Time

The Machine Raise Time option is used to set the amount of time a Washex Floataire machine needs to be clear of the left and right unbalance switches before starting an extract step. The default for this field is 5.

### 6.5.49 RPM Limit

Enter the RPM limit for this washer (the maximum allowable RPM). The washer control will stop the washer and display an error message if the measured speed of the machine exceeds this setting. This feature is available only on washers equipped with dual-motor/single variable-frequency drive systems (motor forward I/O Assignment (Section 7.3.8) type set to 2).

### 6.5.50 Optional Reversing On

Enter the time for the wash motor run time. The valid range for this field is from 1 second to 4 minutes and 15 seconds. The default for this field is 20 seconds. This time will be used for the motor run time when the optional reversing rate is selected.

### 6.5.51 Optional Reversing Off

Enter the time for the wash motor pause. The valid range for this field is from 0 seconds to 12.5 seconds, the smallest unit of change is .05 seconds. The default for this field is 10 seconds. This time will be used for the motor pause time when the optional reversing rate is selected.

### 6.5.52 Automatically Raise Door

This option tells the control whether it should automatically open the machine's door at the end of a formula. The default for this field is yes.

### 6.5.53 Motor Cooling Fan Run Time

This option is used to determine the amount of time that the motor cooling fan will run after the wash motor has stopped. The default for this field is 10 minutes.

### 6.5.54 Spanish Language Messages

This option determines whether the washer control will display error and status messages in English (if this option is set to "No") or Spanish (if this option is set to "Yes").

### 6.5.55 Maximum Rotation Time

This option is used to determine the maximum amount of time between inputs from the positioning switch while the machine is operating. The control will sound an error if this time is exceeded while the machine is running. The default for this field is 30 seconds.

### 6.5.56 One Way Manual Chemicals

This option determines whether the machine rotates only one direction or reverses in steps where the formula calls for manual chemicals. The default for this field is Yes.

### 6.5.57 Jog Delay Time

This option determines the amount of time the control will wait after receiving a jog input to jog the wash cylinder one direction before it will accept an input telling it to rotate the opposite direction. The default for this field is 3 seconds.

### 6.5.58 Chemical System Timeout

This is the maximum amount of time that the washer will wait to receive delivery of chemicals from the chemical system. The default for this field is 10 minutes.

### 6.5.59 A/D Converter Resolution

This is used to set the resolution of the analog to digital converter used in the I/O unit to ensure proper level and temperature display. The default for this field is 8.

### 6.5.60 I/O Unit Type

This is used to set the type of I/O unit connected to the control. If set to 0, the control has an IO-5500 attached. If set to 1, the control has an IO-2500 attached.

### 6.5.61 Auto Position On Time 1

When the machine is automatically positioning the cylinder to line up the inside doors with the outside doors, this is the amount of time it will initially spin the cylinder in reverse after it has passed the door position the first time.

### 6.5.62 Auto Position Off Time 1

When the machine is automatically positioning the cylinder to line up the inside doors with the outside doors, this is the amount of time it will pause the cylinder after it has passed the door position the first time.

### 6.5.63 Auto Position On Time 2

When the machine is automatically positioning the cylinder to line up the inside doors with the outside doors, this is the amount of time it will initially spin the cylinder forward after it has passed the door position the second time.

### 6.5.64 Auto Position Off Time 2

When the machine is automatically positioning the cylinder to line up the inside doors with the outside doors, this is the amount of time it will pause the cylinder after it has passed the door position the second time.

### 6.5.65 Auto Position On Time 3

When the machine is automatically positioning the cylinder to line up the inside doors with the outside doors, this is the amount of time it will spin the cylinder forward after it has passed the door position the third time.

### 6.5.66 Auto Position Off Time 3

When the machine is automatically positioning the cylinder to line up the inside doors with the outside doors, this is the amount of time it will pause the cylinder forward after it has passed the door position the third time.

### 6.5.67 Auto Position Time Limit

This option is used to set the maximum amount of time the control will wait for the auto-positioning routine to position the cylinder. If this time is exceeded, the control will stop auto-positioning and sound an alarm.

### 6.5.68 Raise Time

On controls for American L-Tron washer-extractors:

The raise time option is used to control the process of raising the machine for extract. When the control activates the raise output, it starts watching the front down and rear down whisker switches. When the machine raises off of the switch, the control loads a timer with the number of seconds set in this option. When the timer runs out, the control considers the machine raised, and if it sees this input again before it tells the machine to lower, it will consider the machine to be unbalanced. For example, if this option is set to ten, when the machine first rises off of the front down limit switch, ten seconds later, the control will consider the front to be raised.

On standard PC-5500 and PC-5750 controls:

The raise time option is the amount of time re-loaded into the raise timer when raising the machine for extract. For example, on a Washex 46/100 Floataire machine, if this option is set to 5 seconds, while raising the machine for extract, the control waits until it has not seen either of the unbalance whisker switches for 5 seconds before it starts extract.

### 6.5.69 Raise Timeout (American L-Tron Washers)

This option sets the maximum amount of time that the control will wait for the machine to raise in an extract step. This time starts counting down as soon as the control activates the raise machine output. If the machine has not risen off of the front and rear down limit switches within the time set by this option, it will stop the machine and display an error message.

### 6.5.70 Low Balance Current Limit (American L-Tron Washers)

On American L-Tron washers, the low balance current limit is the reading from the current draw analog input from the variable frequency drive that will cause the control to attempt to re-balance the machine. The control uses this setting when checking the current draw when the machine is at balance speed, before it is raised for extract.

### 6.5.71 High Balance Current Limit (American L-Tron Washers)

On American L-Tron washers, the high balance current limit is the reading from the current draw analog input (provided by the variable frequency drive) that will cause the control to attempt to re-balance the machine. The control uses this setting when checking the current draw when the machine is at balance speed, after it is raised for extract.

### 6.5.72 Manual Buttons Operational

This option is used to enable the manual operation buttons in the run mode. When enabled, the operator may manually operate the following functions: hot water, cold water, reuse water, steam, waste drain, and reuse drain. If the control is in the manual mode, the operator can also manually operate motor forward and reverse and low and high extract.

### 6.5.73 Unload Jog On Time

On machines with an automatic reversing routine for unloading (such as a Washex 64/40), the unload jog on time option is used to set the on time for the unloading cycle. **Note:** the type on the Jog Input I/O Assignment (section 7.3.97) must be set to one for this option to be available.

### 6.5.74 Unload Jog Off Time

On machines with an automatic reversing routine for unloading (such as a Washex 64/40), the unload jog off time option is used to set the dwell time for the unloading cycle. **Note:** the type on the Jog Input I/O Assignment (section 7.3.97) must be set to one for this option to be available.

### 6.5.75 Unload Jog Reversals

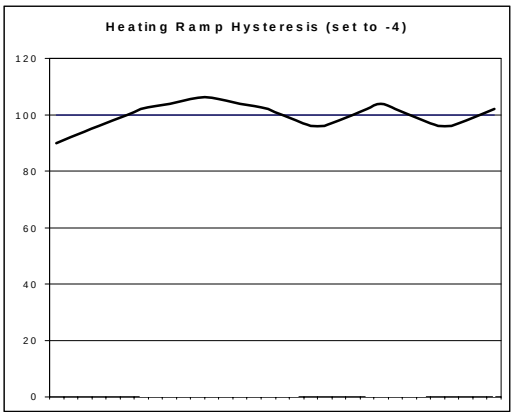
On machines with an automatic reversing routine for unloading (such as a Washex 64/40), the unload jog reversals option is used to set the number of times the machine will go through the reversing routine for the unloading cycle. **Note:** the type on the Jog Input I/O Assignment (section 7.3.97) must be set to one for this option to be available.

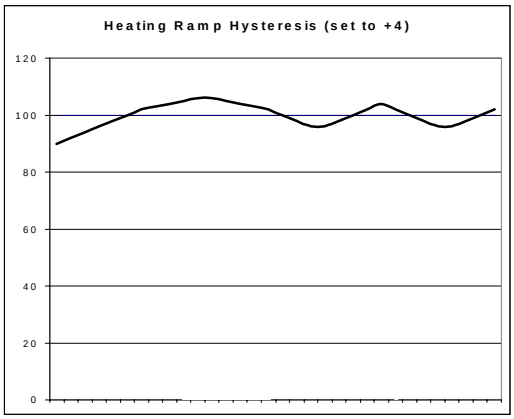
### 6.5.76 Temperature Ramp Time Interval (Dye Machine Control)

The temperature ramp time interval option is used to set the time base for temperature ramps. When programming a step with a temperature ramp, you set the number of degrees per time interval in the Program Mode. When actually running the formula, the control will raise or lower the temperature that number of degrees over the time interval set here. So if your time interval is set to sixty seconds, and your ramp is set to 5 degrees, the control will raise or lower the temperature five degrees every minute.

### 6.5.77 Heating Ramp Hysteresis (Dye Machine Control)

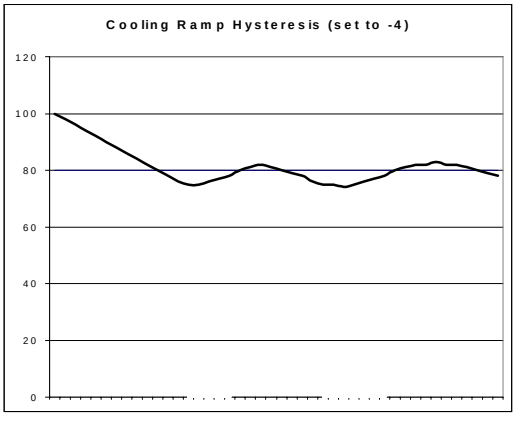
The heating ramp hysteresis option is used to control the heating ramp. When the hysteresis setting is set to a negative number, the temperature must drop that number of degrees below the setpoint to activate the indirect heat valve. The indirect heat valve will then stay on until the setpoint is achieved again, then shut off. When hysteresis is set to a positive number, the temperature must rise to that number of degrees above setpoint before the control will shut the indirect heat valve off. Once that temperature is achieved, the valve will stay closed until the temperature drops to the setpoint temperature again. In the illustrations that follow, the solid line represents the actual temperature in the machine, and the dashed line indicates when the indirect heat valve is open or closed. The setpoint in this example is 100°.

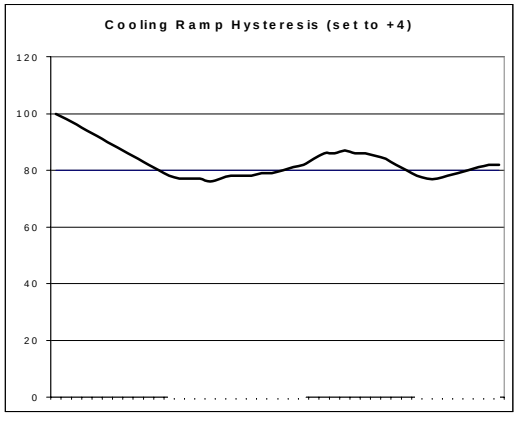



### 6.5.78 Cooling Ramp Hysteresis (Dye Machine Control)

The cooling ramp hysteresis option is used to control the cooling ramp. When the hysteresis setting is set to a negative number, the control will activate the indirect cool valve whenever the temperature is at or above setpoint, and will leave it on until it gets to the set number of degrees below setpoint. If the hysteresis is set to a positive number, the indirect cool valve will turn on whenever the temperature in the machine is that many degrees above setpoint or more, and stay on until the temperature falls to setpoint. In the illustrations that follow, the solid line represents the actual temperature in the machine, and the dashed line indicates when the indirect cool valve is open or closed. The setpoint in this example is 100°.




### 6.5.79 Network Configuration

The Network Configuration options are used to set communication addresses for the control.

**1. Control IP Address** - the IP network address of the control. If set to 0.0.0.0, the control will not be able to communicate over the network.
**2. Chemical System** - the IP network address of the chemical system. Leave set to 0.0.0.0 if you are not using a CCS chemical system connected to ethernet.
**3. Reporting System** - the IP network address of the reporting system computer. Leave set to 0.0.0.0 if you are not using a CCS reporting system.

### 6.5.80 Purge Unused Operation Names

The washer control has 96 preprogrammed step names, which cannot be edited or erased. It also has the ability to store 127 user programmed step names. When a step is programmed with a custom name, one of the locations is consumed. If at any time, a step with a custom name is deleted, the custom name remains in memory. Purge all unused custom step names when memory is full or as desired, by pressing [EXIT], then [ENTER].

### 6.5.81 Communication Functions

Used to transfer formula program and setup information between PC-5500 controls. Press [EDIT] to view the scrolling list of communications functions. Press [ENTER] to activate a particular function, or [EXIT] to leave the Communication Functions menu.
**Send Formulas** - Used to send formula information to another control or to a computer running WashComm. When you select the send formulas option, the control will ask, "# of formulas to send." The control will then send the number of formulas that you selected to the destination control. The destination control will then clear the remaining formulas in it's memory.
**Receive Formulas** - Used to prepare a control to receive formula information from another control or from a computer running WashComm. When a control that is in receive mode is finished receiving, it will erase any formulas that were not replaced by information from the sending unit.
**Send I/O** - Used to send configuration information (I/O Assignments, Supply I/O and Calibration, Multi-Relay Assignment, and Option) to another control or to a computer running WashComm.
**Receive I/O** - Used to prepare a control to receive configuration information from another control or from a computer running WashComm.

### 6.5.82 Clear Formulas

Press [EDIT], enter the password (2428), then press [CLEAR] to clear formulas from the washer control. **This will erase all programmed formulas!** This will not reset the supply names or calibration information. See the following paragraph for clearing the supplies.

### 6.5.83 Clear Supplies

Press [EDIT], enter the password (2428), then press [CLEAR] to reset all user programmable fields to the default values for the chemical supplies. After they are cleared, the user may review and modify fields by pressing the [CHEM] key. This will erase the supply calibration for timed supplies, so the data must be reentered or the supplies calibrated before any formulas are run.

### 6.5.84 Factory Options

This option is for use by Factory Authorized Technicians only. See Section 7.

## 6.6 Exiting Options Mode

Press [MODE SEL] to exit from the Options Mode and into the Run Mode.

# 7. Technical Configuration Mode

This section provides the information that controls proper setup and operations of your washer. **Only Qualified Service Personnel should change I/O assignments, since the safe operation of the washer may be affected. Failure to fully understand this data may result in the improper operation of the washer and the washer control. Incorrect setup may result in washer malfunction, which could result in personal injury, dismemberment or death. Custom Control Systems Inc. assumes no responsibility for improper use or setup of this unit. Contact a Factory Authorized Service Technician to establish correct setup procedures.**

Up to 48 input channels and 72 output relays are available on the PC-5500. The PC-5750 will accept up to 32 input channels and 48 output relays. Configuration settings are described below. Again, it is critical to understand the overall effect to the washer before any changes are made.

## 7.1 Entering Technical Configuration Mode

If the password feature has not been enabled, press the [MODE SEL] key and proceed to step 4 below. Otherwise, start with step 1.

**Note:** the factory default password is 5500 on the PC-5500, and 5750 on the PC-5750. To change the control password, see the Password entry under Options, section 6.5.25. This example assumes that the control has been set up with the factory default password. If your password is different, use it instead.

1. Press the [MODE SEL] key.
   The top display will now read:

2. Press the 5, then the 5, then the 0, and then the 0.
   The top display will now read:

3. Press the [ENTER] key. The control will now be in the Program Mode, and the "PRO" light will be illuminated.

4. Press [MODE SEL] again. The control will now be in the Manual Mode, and the "MAN" light will be illuminated.

5. Press [MODE SEL] again. The control will now be in the Options Mode, and the "OPT" light will be illuminated.

6. Press the [DOWN ARROW] key until the display reads "Factory Options". Press [EDIT] key and enter password 1206.

7. The display will now read "I/O Assignments". Proceed with Section 7.3.
   When in Configuration Mode, the [UP ARROW] Key will scroll through the following:
   - I/O Assignments
   - Multi I/O Assignments
   - Supply I/O Assignments
   - Clear Entire Memory

## 7.2 Active Keys

| | |
|---|---|
| [UP ARROW] | Used to increment I/O Assignment |
| [DOWN ARROW] | Used to decrement I/O Assignment |
| [RIGHT ARROW] | Used to select LED relay, input, and type |
| [LEFT ARROW] | Used to select LED relay, input, and type |
| [EDIT] | Used to edit values |
| [CLEAR] | Used to clear value. Use only when cursor is flashing on value |
| [ENTER] | Used to complete entry and save data |
| [MODE SEL] | Used to exit Options Mode and enter Run Mode |
| [1] - [9] | Used to enter numeric values. |
| [EXIT] | Used to EXIT the editing function. |

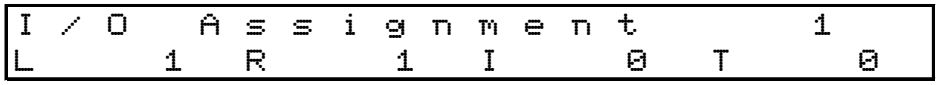
## 7.3 Configuring I/O Assignments

To configure the I/O Assignments:

1. Select I/O Assignments, press [EDIT], to begin configuring.

2. Use the [UP ARROW] and [DOWN ARROW] keys to scroll through each I/O, or, using the numeric keypad, enter the number of the I/O Assignment you wish to jump to.

3. Press the [RIGHT ARROW] key, to edit LED, Output, Input, Type. The cursor will flash on the "I" location to enable editing of the LED Number.




4. Record your machine's I/O Assignment information the chart provided in Appendix C.

### 7.3.1 Hot Water

LED: Enter the number corresponding to the hot water LED. The default for this field is 1.
Relay: Enter the output number corresponding to the hot water relay. The default for this field is 1.
Input: Enter the input number corresponding to the hot water flow meter. There is no default for this field.
Type: This field is not currently used.

### 7.3.2 Cold Water

LED: Enter the number corresponding to the cold water LED. The default for this field is 2.
Relay: Enter the output number corresponding to the cold water relay. The default for this field is 2.
Input: Enter the input number corresponding to the cold water flow meter.
Type: This field is not currently used.

### 7.3.3 Steam

LED: Enter the number corresponding to the steam LED. The default for this field is 4. This field should be set to zero on machines that do not use steam.

Relay: Enter the output number corresponding the steam valve relay. The default for this field is 3. This field should be set to zero on machines that do not use steam.

Input: This field is not currently used.

Type: This field is not currently used.

### 7.3.4 Drain

LED: Enter the number corresponding to the drain LED. The default for this field is 5.

Relay: Enter the number corresponding to the drain valve relay. The default for this field is 4. On machines that require that the drain be powered to close, this field should be changed to 104.

Input: This field is not currently used.

Type: This field is not currently used.

### 7.3.5 Poly Rinse

LED: Enter the number corresponding to the poly rinse LED. The is no default for this field.

Relay: Enter the number corresponding to the poly rinse valve relay. There is no default for this field.

Input: This field is not currently used.

Type: This field is not currently used.

### 7.3.6 Reuse Water

LED: Enter the number corresponding to the reuse water LED. The default for this field is 3. Machines that do not have a water reuse system should change this field to zero.

Relay: Enter the output number corresponding to the reuse water supply relay. There is no default for this field.

Input: Enter the input number corresponding to the reuse water tank lower limit switch. The washer control assumes that a normally closed contact means that reuse water is available. To use a normally open contact add 100 to the input number.

Type: This field is not currently used.

### 7.3.7 Reuse Drain

LED: Enter the number corresponding to the reuse drain LED. The default for this field is 6. Machines that do not have a reuse water system should change this field to zero.

Relay: Enter the output number corresponding to the reuse drain relay. There is no default for this field.

Input: Enter the input number corresponding to the reuse water tank upper limit switch. There is not default for this field. The washer control assumes that a normally closed contact means that reuse water tank is full. To use a normally open contact add 100 to the input number.

Type: This field is not currently used.

### 7.3.8 Motor Forward

LED: Enter the number corresponding to the motor forward LED. The default for this field is 10.

Relay: Enter the number corresponding to the motor forward starter relay. The default for this field is 9.

Input: Enter the number corresponding to the jog forward input. There is no default for this field.

Type:
- 0: Standard motor forward and reversing relays are used. Additional fields in the options list should also be reviewed for setting the motor on and motor off times.
- 1: Variable frequency drive with analog inputs, single-motor drive system. (Please review you variable frequency drive's manual for more information.) Additional fields in the option list must also be reviewed for setting the RPM minimum and RPM maximum settings and the default washing RPM and default drain RPM speeds.
- 2: Variable frequency drive with analog inputs, dual-motor/single drive system. See the RPM option settings (Sections 6.5.3-6.5.12) before proceeding.

### 7.3.9 Motor Reverse

LED: Enter the number corresponding to the motor reverse LED. The default for this field is 11.

Relay: Enter the number corresponding to the motor reverse start relay. The default for this field is 10.

Input: Enter the number corresponding to the jog reverse input. There is no default for this field.

Type: This field is not currently used. Setting of the different motor configurations is done in the Motor Forward I/O assignment.

### 7.3.10 Balance Motor

LED: Enter the number corresponding to the LED you wish to use to indicate that the balance motor is running. The default for this field is 12.

Relay: Enter the number corresponding to the output you wish to use to activate the balance motor for your machine. There is currently no default for this field.

Input: Enter the number corresponding to the input you wish to use to indicate to the control that there is a balance motor overload.

Type: This field is not currently used.

### 7.3.11 Low Extract

LED: Enter the number corresponding to the low extract LED. The default for this field is 8.

Relay: Enter the number corresponding to the low extract motor starter relay. There is no default for this field. This output will be energized whenever the washer control wishes to run the low extract motor.

Input: Enter the number corresponding to the Low Extract motor overload. There is no default for this field. The washer control assumes that a contact between this input and the input common means that a low extract motor overload has occurred.

Type: Describes the behavior of this machine's extract outputs.

- 0: For non-integration control installations. Low and high extract outputs behave like the extract outputs of a card controller.
- 1: For total integration installations on washer-extractors. The washer control automatically controls the balance/drain motor, low and high extract motors. The low extract motor is turned on for 30 seconds following a high extract to slow the machine before applying the brake (regenerative braking).
- 2: For total integration installations on washer-extractors. The washer control automatically controls the balance/drain motor, low and high extract motors. The brake is applied immediately following the programmed extract (no regenerative braking).
- 3: For non-integration installations using dual extract motor coils.
- 4: For total integration installations on Washex Floataire machines. The washer control automatically controls the extract motors and balance/drain motor, as well as the raising and lowering of the machine. For this type of extract to function properly, inputs must be configured for both the left air mount (I/O assignment 70) and right air mount (I/O assignment 71). Other outputs controlled during this sequence are the Floataire valve (I/O assignment 72), and the left and right air vents (I/O assignment 73).
- 5: For Brim tilting washer-extractors and similar machines with a variable-frequency drive on the wash motor and a separate extract motor. The washer control automatically controls the extract motors, and uses the wash motor to provide wash, drain, and distribution speeds. The washer control also makes use of the Balance Verify input (I/O Assignment 26) to determine machine balance before starting extract.

  Machines with this extract type will, upon entering the extract step, run at low distribution speed in reverse, then low distribution speed forward, then accelerate to medium distribution speed. If the machine can verify balance at the medium distribution speed, it will accelerate to high distribution speed, then disengage the clutch and start the extract. If it cannot verify balance at the medium distribution speed, it will return to low distribution speed in reverse and repeat the process. If, on the third try, it cannot verify balance, the washer control will force the machine to start extract. If the machine unbalances during extract, it will return to low distribution speed in reverse and repeat the process.
- 6: For machines equipped with dual motor/single variable frequency drive systems. The washer control will run the machine at the distribution speeds with the low-speed motor, then switch over to the high-speed motor for extract. This extract type also requires that the Motor Forward (I/O Assignment 8) type be set to 2, and that the Low Speed and High Speed Motor Select outputs (I/O Assignments 110 and 111) and the Base Block (I/O Assignment 112) output be configured.

### 7.3.12 High Extract

LED: Enter the number corresponding to the high extract LED. The default for this field is 7. Machines that do not have high extract cycles should change this field to zero.

Relay: Enter the number corresponding to the high extract starter relay. There is no default for this field.

Input: Enter the number corresponding to the High Extract motor overload. There is no default for this field. The washer control assumes that a contact between this input and the input common means that a high extract motor overload has occurred.

Type: This field is not currently used.

### 7.3.13 Signal

LED: Enter the number corresponding to the signal LED. The default for this field is 9. This field should not be changed zero, although the signal will still operate there will be no visual indication on the washer control

Relay: Enter the number corresponding to the signal relay. The default for this field is 8. If the piezo signal output from the back of the washer control is used this field may be changed to zero. Additional fields in the options list should also be reviewed for setting the signal on and signal off times.

Input: Enter the number corresponding to the signal input. This input is normally floating high, connecting this input to the input common will acknowledge the signal.

Type: 0: The chirp output will sent to the CPU output and the relay output.
1: The chirp output will not be sent to the signal relay output.
2: The chirp output will not be sent to the signal relay output. The washer control will leave the signal relay output on solid when signalling an error, and will pulse the signal relay output when signalling at the end of a wash formula.

### 7.3.14 Medium Extract

LED: Enter the number corresponding to the medium extract LED. Machines that do not have medium extract cycles should set this field to zero.

Relay: Enter the number corresponding to the medium extract starter relay. There is no default for this field.

Input: This field is not currently used.

Type: This field is not currently used.

### 7.3.15 Indirect Cool (Dye Machine Control)

LED: Enter the number corresponding to the indirect cool LED. There is no default for this field. This LED will be on solid when indirect cool is programmed on a step, and will blink when the indirect cool output is active.

Relay: Enter the number corresponding to the indirect cool output relay. There is no default for this field. The indirect cool output will be active in steps where indirect cool and a cooling temperature ramp is programmed when the actual machine temperature is above the calculated temperature for that point in the cooling ramp.

Input: This field is not currently used.

Type: This field is not currently used.

### 7.3.16 Indirect Steam (Dye Machine Control)

LED: Enter the number corresponding to the indirect steam LED. There is no default for this field. This LED will be on solid when indirect steam is programmed on a step, and will blink when the indirect steam output is active.

Relay: Enter the number corresponding to the indirect steam output relay. There is no default for this field. The indirect steam output will be active in steps where indirect steam and a heating temperature ramp is programmed when the actual machine temperature is below the calculated temperature for that point in the heating ramp.

Input: This field is not currently used.

Type: This field is not currently used.

### 7.3.17 Optional Motor Forward (Dye Machine Control)

LED: Enter the number corresponding to the optional motor forward LED.. There is no default for this field. This LED will be on solid when optional motor forward is programmed on a step, and will blink when the optional motor forward output is active.

Relay: Enter the number corresponding to the optional motor forward starter relay. There is no default for this field.

Input: This field is not currently used.

Type: This field is not currently used.

### 7.3.18 Optional Motor Reverse (Dye Machine Control)

LED: Enter the number corresponding to the optional motor reverse LED.. There is no default for this field. This LED will be on solid when optional motor reverse is programmed on a step, and will blink when the optional motor reverse output is active.

Relay: Enter the number corresponding to the optional motor reverse starter relay. There is no default for this field.

Input: This field is not currently used.

Type: This field is not currently used.

### 7.3.19 Overflow Drain (Dye Machine Control)

LED: Enter the number corresponding to the overflow drain LED.. There is no default for this field. This LED will be on solid when overflow drain is programmed on a step, and will blink when the overflow drain output is active.

Relay: Enter the number corresponding to the overflow drain relay. There is no default for this field. The overflow drain is used on steps in conjunction with poly-rinse (I/O Assignment #5, section 7.3.5) to allow water to be drained from the machine.

Input: This field is not currently used.

Type: This field is not currently used.

### 7.3.20 Filter Pump (Dye Machine Control)

LED: Enter the number corresponding to the filter pump LED. There is no default for this field. The filter pump LED will blink when the filter pump output is active.

Relay: Enter the number corresponding to the relay you wish to use for the filter pump output. There is no default for this field. The control will activate the filter pump output while running steps where indirect steam, indirect cool, reuse water, reuse drain or chemicals are programmed.

Input: This field is not currently used.

Type: This field is not currently used.

### 7.3.21 Auxiliary 1

LED: Enter the number corresponding to the auxiliary output LED. There is no default for this field.

Relay: Enter the number corresponding to the auxiliary output relay. There is no default for this field.

Input: This field is not currently used.

Type: 0: This output will turn off if the washer control is stopped while running a formula.
1: This output will remain on if the washer control is stopped while running a formula.

### 7.3.22 Auxiliary 2

Refer to the I/O assignment for auxiliary 1.

### 7.3.23 Auxiliary 3

Refer to the I/O assignment for auxiliary 1.

### 7.3.24 Auxiliary 4

Refer to the I/O assignment for auxiliary 1.

### 7.3.25 Unbalance

LED: Enter the number corresponding to the unbalance condition LED. The washer control will flash this light if the washer unbalances, in addition to displaying an error message.

Relay: Enter the number corresponding to the unbalance output relay. There is no default for this field.

Input: Enter the number corresponding to the unbalance input. The default for this field is 2. The washer control uses a normally closed switch for this feature. For machines that do not have an unbalanced input, this field must be set to zero. If your machine uses a normally open switch change this field to 102, for inverted logic on input channel 2.

Type: 0: All outputs will be turned off if an unbalanced condition occurs.
1: All active outputs will remain on. Also please see the option list for the unbalance fill.

### 7.3.26 Balance Verify

LED: This field is not currently used.

Relay: This field is not currently used.

Input: Enter the number corresponding to the "balance verified" input. There is no default for this field. The washer control will assume that a connection between this input and the input common means that the machine is balanced and ready to enter extract. Used in conjunction with low extract (I/O Assignment 11) type 5.

Type: This field is not currently used.

### 7.3.27 Brake

LED: Enter the number corresponding to the brake LED. There is no default for this field.

Relay: Enter the number corresponding to the brake output relay. There is not default for this field.

Input: Enter the number corresponding to the brake input contact. There is no default for this field. The washer control expects to see a contact between this input and the input common to mean that the brake is disengaged.

Type: 0: The brake will stay engaged during the jog forward and reverse.
1: The brake will release during jog forward or reverse.
2: The brake is applied only when the machine is slowing down from extract speed.

### 7.3.28 Clutch

LED: This field is not currently used.

Relay: Enter the number corresponding to the clutch output relay. There is no default for this field.

Input: Enter the number corresponding to the clutch input contact. There is no default for this field. The washer control expects to see a contact between this input and the input common to mean that the clutch is disengaged.

Type: This field is not currently used.

### 7.3.29 Start

LED: Enter the number corresponding to the Run Mode led. The default for this field is 29.

Relay: Enter the number corresponding to the start output. There is no default for this field.

Input: Enter the number corresponding to the external start switch. The default for this field is 4. The washer control expects to see a connection between this input and the input common to start the currently displayed formula.

Type: 0: Will turn the relay on whenever the washer control is running a formula, and will turn the relay off whenever the formula is stopped.
1: Will pulse the Start relay for 1 second when the machine is started and pulse the Stop relay for 1 second when the machine is stopped.
2: Will turn the Start relay on whenever the washer control is running a formula, and will turn the relay off whenever the formula is stopped. The Stop relay is turned on when the machine is ready to be started. The Start relay pulses whenever the signal is running.
3: Will pulse the Start relay and the hydraulic pump relay for 1 second when the machine is started.

### 7.3.30 Stop

LED: Enter the number corresponding to the Program Mode LED. The default for this field is 30.

Relay: Enter the number corresponding to the stop output. There is no default for this field.

Input: Enter the number corresponding to the external stop switch. The default for this field is 5. The washer control expects to see a connection between this input and the input common to stop the formula and turn off all active outputs. See the I/O assignments for the auxiliary 1-4 outputs, these outputs are controlled by the type field.

Type: 1: Will use the falling edge of the Start input as the external stop input.

### 7.3.31 Formula Up

LED: Enter the number corresponding to the Manual Mode LED. The default for this field is 31.

Relay: This field is not currently used.

Input: Enter the number corresponding to the external formula up selector switch. There is no default for this field.

Type: 1: Will prevent the Formula Up/Down, Start and Signal keys on the membrane keypad from working while the control is in the Run Mode.

### 7.3.32 Formula Down

LED: Enter the number corresponding to the Options Mode LED. The default for this field is 32.

Relay: This field is not currently used.

Input: Enter the number corresponding to the external formula down selector switch. There is no default for this field.

Type: This field is not currently used.

### 7.3.33 Hold

LED: Enter the number corresponding to the hold LED. The default for this field is 33. This field should not be set to zero, there are many reasons why the washer control may place a formula on hold. Please refer to the help key in the run section of this manual.

Relay: Enter the number corresponding to the hold output. There is no default for this field. If an output number is entered, the output will turn on whenever the washer control enters a hold state.

Input: Enter the number corresponding to the external hold input. The default for this field is 3. The washer control expects to see a connection between this input and the input common to place the formula timer on hold. The external hold input will stop an extract step from beginning but will not halt the timer once the extract step has begun.

Type: This field is not currently used.

### 7.3.34 Communication

LED: Enter the number corresponding to the communication LED. The default for this field is 34.

Relay: This field is not currently used.

Input: This field is not currently used.

Type: This field is not currently used.

### 7.3.35 Extract Overload

LED: This field is not currently used.

Relay: This field is not currently used.

Input: Enter the number corresponding to the extract overload relay contact. There is not default for this field. If the contact is normally closed, enter the input number plus 100.

Type: This field is not currently used.

### 7.3.36 Motor Overload

LED: This field is not currently used.

Relay: This field is not currently used.

Input: Enter the number corresponding to the wash motor overload relay contact. There is not default for this field. If the contact is normally closed, enter the input number plus 100.

Type: 0: Normal wash motor overload message is displayed.

1: A general motor overload is displayed. This will allow machines that have all motor overload tied to a single common to be monitored.

### 7.3.37 Hydraulic Pump

LED: Enter the number corresponding to the hydraulic motor LED. There is no default for this field.

Relay: Enter the number corresponding to the hydraulic motor relay. There is no default for this field.

Input: Enter the number corresponding to the hydraulic overload relay contact. There is no default for this field. If the contact is normally closed, enter the input number plus 100.

Type: 0: The hydraulic pump runs whenever the hydraulic function button is pressed.

1: The hydraulic pump runs on a three-minute timer. Whenever the hydraulic function button is pressed, the washer control restarts the timer. At the end of the three minutes, the washer control will turn the hydraulic pump off.

### 7.3.38 Extract Request

LED: Enter the number corresponding to the extract request LED. The default for this field is 28. It is recommend that a LED be used for this feature even though the help button will inform the operator the washer control is waiting for an extract request to be acknowledged.

Relay: Enter the number corresponding to the extract request output. The default for this field is 11.

Input: Enter the number corresponding to the extract request contact. The default for this field is 6. If there is no extract request system installed in the plant this field must be set to 0 to disable this feature. Do not set this field to zero, it will prevent the washer control from ever entering an extract step. This feature is only used on drain steps immediately preceding an extract step. If an extract step is programmed without the request being acknowledged, from the previous step, the washer control will stop and display an error message that the previous step was not a drain.

Type: This field is not currently used.

### 7.3.39 Zero Speed

LED: Enter the number corresponding to the zero speed LED. There is currently no default for this field. The zero speed LED will be lit whenever the cylinder is not rotating below extract speed.

Relay: Enter the number corresponding to the relay used to energize the zero speed circuit. There is currently no default for this field. This output will be energized for the first fifteen seconds that the low extract motor runs during an extract step. This output is only functional with zero speed type 3.

Input: Enter the number corresponding to the zero speed input switch contact There is currently no default for this field. The washer control expects to see a contact between this input and the input common to mean that the cylinder is rotating at a speed below extract speed. This input must be configured for zero speed types 0 and 2.

Type: Describes the behavior of this machine's zero speed input.

- 0: The machine's speed is determined by a mechanical speed switch. The washer control will assume that five continuous seconds of contact on the zero speed input means that the cylinder is rotating below extract speed.
- 1: The machine's speed is determined by the washer control. The washer control will assume that whenever either extract motor is running, the cylinder is rotating at extract speed. The washer control will wait for 30 seconds after the brake has been applied following an extract, then assume that the cylinder is rotating below extract speed.
- 2: The machine's speed is determined by a timer in the washer control and a centrifugal switch. At the end of an extract step, the washer control will wait for 45 seconds, then check to see if there is an input from the centrifugal switch. If an input is present, the washer control will assume that the machine is stopped.
- 3: The machine's speed is determined by a centrifugal switch on the machine's shaft. At the beginning of the low extract portion of an extract step, the washer control will energize the zero speed output for 15 seconds.
- 4: Uses a proximity switch to count the number of rotations the machine has made in the last five seconds. The washer control will assume that whenever the extract motor is running, the cylinder is rotating at extract speed. The washer control will wait unit it has not received any input from this proximity switch for five seconds to assume that the machine is stopped.
- 5: The washer control uses a proximity switch connected to a high speed counter input to determine RPM. At the end of an extract step, the washer control waits for the measured rotational speed of the machine to be zero for one second.

### 7.3.40 Chemical Hold

LED: Enter the number corresponding to the chemical hold LED. There is no default for this field. If this field is not set the normal hold led will light during a chemical hold.

Relay: This field is not currently used.

Input: Enter the number corresponding to the chemical hold contact. There is no default for this field. The washer control expects to see a contact between this input and the input common to mean that machine timer will hold until this input is released by the chemical system.

Type: This field is not currently used.

### 7.3.41 RPM

LED: This field is not currently used.

Relay: This field is not currently used.

Input: Enter the number corresponding to the RPM input contact or high speed counter input used for determining the machine's rotational speed. There is no default for this field. See type for more information.

Type:
- 0: The RPM input is connected to a proximity switch or mechanical switch that makes contact once per rotation.
- 1: The RPM input number determines which high-speed counter is connected to a rotary encoder that provides 60 pulses per rotation.
- 2: The RPM input number determines which high-speed counter is connected to the machine speed proximity switch. This switch should be mounted to provide 12 pulses per machine rotation.
- 3: The RPM input number determines which high-speed counter is connected to the machine speed proximity switch. This switch should be mounted to provide 6 pulses per machine rotation.

### 7.3.42 Auto Position Enable

LED: Enter the number corresponding to the Auto Position Enable LED. There is no default for this field. The Auto Position Enable LED will be lit whenever the Auto Position circuit is enabled.

Relay: Enter the number corresponding to the Auto Position Enable relay. There is no default for this field. The washer control will enable this output when the machine is stopped at the end of a formula to allow the machine's auto position system to operate.

Input: This field is not currently used.

Type: This field is not currently used.

### 7.3.43 Supervisor Key

LED: This field is not currently used.

Relay: This field is not currently used.

Input: Enter the number corresponding to the external supervisor key switch. There is no default for this field. When the washer control sees a contact between this input and the input common it will allow the supervisor to advance or decrement the step number, or even change the current formula number without completing the current formula.

Type:
- 0: Allow password or supervisor key to use mode select.
- 1: Requires password and supervisor key to use mode select.

### 7.3.44 Jog Safety/Tilt Function

LED: This field is not currently used.

Relay: This field is not currently used.

Input: Enter the number corresponding to the jog safety contact. There is no default for this field. The washer control expects to see a contact between this input and the input common to mean that the jog safety, hydraulic function, or tilt function switch is being pressed.

Type: This field is not currently used.

### 7.3.45 Run/Unload

LED: This field is not currently used.

Relay: This field is not currently used.

Input: Enter the number corresponding to the run / unload contact. There is no default for this field. The washer control expects to see a contact between this input and the input common to mean that the machine is in the run mode.

Type: This field is not currently used.

### 7.3.46 Wash Position

LED: This field is not currently used.

Relay: This field is not currently used.

Input: There is currently no default for this field. (see type)

Type: Describes the behavior of this machine's wash/load/unload position inputs.

0: For Brim-style machines. The Wash Position, Load Position, and Unload Position inputs indicate to the machine that it has been tilted to each position. The Wash Position input should be connected to the "no tilt" limit switch, the Load Position input should be connected to the "tilted back" limit switch, and the Unload Position input should be connected to the "tilted forward" limit switch.

1: For machines equipped with a tilt selector switch. The Wash Position input should be connected to the contacts on the selector switch that close when the user selects the "run" or "wash" position, the Load Position input should be connected to the contacts on the selector switch that close when the user selects the "load" position, and the Unload Position input should be connected to the contacts on the selector switch that close when the user selects the "unload" position. The machine can also be configured with normally open contacts for unload and load and no switch for wash. The balance motor is used to rotate the cylinder while loading, and the forward and reverse wash motors are used to rotate the cylinder while unloading.

2: For machines equipped with a tilt selector switch. The Wash Position input should be connected to the contacts on the selector switch that close when the user selects the "run" or "wash" position, the Load Position input should be connected to the contacts on the selector switch that close when the user selects the "load" position, and the Unload Position input should be connected to the contacts on the selector switch that close when the user selects the "unload" position. The machine can also be configured with normally open contacts for unload and load and no switch for wash. The forward and reverse wash motors are used to rotate the cylinder while loading and unloading.

3: For the Washex 48/40 and similar machines. The wash position input should be connected to the wash position ("no tilt") limit switch and the unload position input should be connected to the unload position ("tilted") limit switch. The forward and reverse wash motors are used to rotate the cylinder while unloading.

4: For machines equipped with a tilt selector switch. The Lower Rear (I/O Assignment 63) input should be connected to the contacts on the selector switch that close when the user selects the "load" position, and the Raise Rear (I/O Assignment 62) input should be connected to the contacts on the selector switch that close when the user selects the "unload" position. The Wash Position, Load Position (I/O Assignment 48) and Unload Position (I/O Assignment 50) inputs are connected to the limit or proximity switches that indicate when the machine has been tilted to each position. The forward and reverse wash motors are used to rotate the cylinder while loading and unloading. The wash motor forward and reverse inputs are used to select the jog direction.

5: For machines equipped with a tilt selector switch. The Lower Rear (I/O Assignment 63) input should be connected to the contacts on the selector switch that close when the user selects the "load" position, and the Raise Rear (I/O Assignment 62) input should be connected to the contacts on the selector switch that close when the user selects the "unload" position. The Wash Position input is connected to a proximity switch that indicates that the machine has been tilted to the wash position. The Load Position (I/O Assignment 48) input is connected to a proximity switch that indicates that the machine is at or below wash position. The Unload Position (I/O Assignment 50) input is connected to a proximity switch that indicates that the machine has been tilted to either the load or the unload position. These machines use a jog switch (I/O Assignment 97) to initiate an automatic jog sequence for loading and unloading using a variable-frequency wash motor.

### 7.3.47 Inverted Wash Position

LED: This field is not currently used.
Relay: This field is not currently used.
Input: Enter the number corresponding to the inverted wash position switch contact. There is no default for this field. The washer control expects to see a contact between this input and the input common to mean that the machine is not fully down in the wash position. This is a safety input and will trigger an error if this is not the inverted signal from assignment 27. There can be up to a one second delay between the inputs.
Type: This field is not currently used.

### 7.3.48 Load Position

LED: This field is not currently used.
Relay: This field is not currently used.
Input: See type under Wash Position.
Type: This field is not currently used.

### 7.3.49 Inverted Load Position

LED: This field is not currently used.
Relay: This field is not currently used.
Input: Enter the number corresponding to the inverted load position switch contact. There is no default for this field. The washer control expects to see a contact between this input and the input common to mean that the machine is not fully in the load position. This is a safety input and will trigger an error if this is not the inverted signal from assignment 48. There can be up to a one second delay between the inputs.
Type: This field is not currently used.

### 7.3.50 Unload Position

LED: This field is not currently used.
Relay: This field is not currently used.
Input: See type under Wash Position.
Type: This field is not currently used.

### 7.3.51 Inverted Unload Position

LED: This field is not currently used.
Relay: This field is not currently used.
Input: Enter the number corresponding to the inverted unload position switch contact. There is no default for this field. The washer control expects to see a contact between this input and the input common to mean that the machine is not fully in the unload position. This is a safety input and will trigger an error if this is not the inverted signal from assignment 50. There can be up to a one second delay between the inputs.
Type: This field is not currently used.

### 7.3.52 Water Inlet

LED: Enter the number corresponding to the inlet LED. There is no default for this field.
Relay: Enter the number corresponding to the inlet relay. There is no default for this field.
Input: Enter the number corresponding to the inlet released switch contact. There is no default for this field. The washer control expects to see a contact between this input and the input common to mean that the inlet is fully released.
Type: This field is not currently used.

### 7.3.53 Inverted Water Inlet

LED: This field is not currently used.
Relay: This field is not currently used.
Input: Enter the number corresponding to the inverted inlet released switch contact. There is no default for this field. The washer control expects to see a contact between this input and the input common to mean that the inlet is not fully released. This is a safety input and will trigger an error if this is not the inverted signal from assignment 52. There can be up to a one second delay between the inputs.
Type: This field is not currently used.

### 7.3.54 Door Open

LED: This field is not currently used.
Relay: This field is not currently used.
Input: Enter the number corresponding to the door open switch contact. There is no default for this field. The washer control expects to see a contact between this input and the input common to mean that the door is fully opened.
Type: This field is not currently used.

### 7.3.55 Inverted Door Open

LED: This field is not currently used.
Relay: This field is not currently used.
Input: Enter the number corresponding to the inverted door open switch contact. There is no default for this field. The washer control expects to see a contact between this input and the input common to mean that the door is not fully open. This is a safety input and will trigger an error if this is not the inverted signal from assignment 54. There can be up to a one second delay between the inputs.
Type: This field is not currently used.

### 7.3.56 Door Closed

LED: This field is not currently used.
Relay: This field is not currently used.
Input: Enter the number corresponding to the door closed switch contact. There is no default for this field. The washer control expects to see a contact between this input and the input common to mean that the door is fully closed.
Type: 0: Allows the machine to jog if the machine's door is open.
1: Will not allow the machine to jog unless the door is closed.

### 7.3.57 Inverted Door Closed

LED: This field is not currently used.
Relay: This field is not currently used.
Input: Enter the number corresponding to the inverted door closed switch contact. There is no default for this field. The washer control expects to see a contact between this input and the input common to mean that the door is not fully closed. This is a safety input and will trigger an error if this is not the inverted signal from assignment 56. There can be up to a one second delay between the inputs.
Type: This field is not currently used.

### 7.3.58 Raise (Open) Door

LED: This field is not currently used.
Relay: Enter the number corresponding to the door raise relay. There is no default for this field.
Input: Enter the number corresponding to the raise door switch contact. There is no default for this field. The washer control expects to see a contact between this input and the input common to mean that the door should be raised. On machines configured with a Type 3 door latch, the raise door input is connected to the machine's door latch release switch.
Type: This field is not currently used.

### 7.3.59 Lower (Close) Door

LED: This field is not currently used.

Relay: Enter the number corresponding to the door lower relay. There is no default for this field.

Input: Enter the number corresponding to the lower door switch contact. There is no default for this field. The washer control expects to see a contact between this input and the input common to mean that the door should be lowered.

Type: Determines whether the machine should be returned to the no-tilt position before closing the door.

0: On machines equipped with a load/run/unload tilt selector switch, when tilted back (in the load position) the washer control will close the door of the machine before lowering into the run position.

1: On machines equipped with a load/run/unload tilt selector switch, when tilted back (in the load position) the washer control will lower the machine back to the run position before closing the door.

### 7.3.60 Door Seal

LED: This field not currently used.

Relay: Enter the number corresponding to the relay that you wish to use to inflate the door seals on the machine. There is currently no default for this field.

Input: Enter the number corresponding to the input that you wish to use for a pressure switch or limit switch that indicates when the door is sealed. The washer control expects to see a contact between this input and the input common. There is currently no default for this field.

Type: Describes the behavior of the door seal output.

**Note:** For all door seal types, the washer control must be stopped; the machine must be not spinning at extract speed, the water level in the machine must be below the safety level, and the water temperature in the machine must be below the safety temperature. If the machine is equipped with the Washex Floataire (or similar) system, the machine must be in the lowered position.

0: The door seal output will be released when:
-the door is not closed, or
-the door latch is not set, or
-the machine is in not in the run position, or
-the water level is below the programmed low water level.

1: The door seal output will be released when the machine is stopped.

2: For Washex 64/40 and similar machines. The door seal output will be released when:
-the tilt position selector is in either the load position or the unload position, or
-the door is not closed, or
-the door is not latched.

3: For Washex 48/40 and similar machines. The door seal output will be released when:
-the "open/close door" switch is in the open door position, or
-the door is not latched.

### 7.3.61 Door Latch/Lock

LED: This field not currently used.

Relay: Enter the number for the relay used to disengage the door latch. There is currently no default for this field.

Input: Enter the number corresponding to the input which indicates that the door latch is engaged. The washer control expects to see a contact between this input and the input common to indicate that the door latch is engaged. There is currently no default for this field.

Type: Describes the behavior of the machine's door latch output.

**Note:** For all door latch types, the washer control must be stopped; the machine must be not spinning at extract speed, the water level in the machine must be below the safety level, and the water temperature in the machine must be below the safety temperature. If the machine is equipped with the Washex Floataire (or similar) system, the machine must be in the lowered position.

1: The washer control will release the door latch output when the machine door is closed (door open input is low, and/or door closed input is high)

2: The washer control will energize the door latch output when the machine is stopped.

3: The washer control will energize the door latch output when
-the door seal has been released, and
-the raise door (I/O Assignment #58) input is energized.

4: The washer control will release the door latch when all the conditions of type 2 are met. However, the type 4 door latch stays energized until the machine is started.

5: (Washex 64/40) The washer control will release the door latch when
-the load or unload position has been selected on the tilt selector switch, and
-the door is unsealed.
Type 5 door latches remain released until the door is fully closed.

6: (Milnor) The washer control will release the door latch when
-the door is unsealed, and
-the load or unload position has been selected on the tilt selector switch.
Type 6 door latches are extended when the "lower door" output is energized.

7: (Washex 48/40) The washer control will release the door latch when
-the door is unsealed (based on a 4 second timer), and
-the "open/close door" switch is in the "open" position.
Type 7 door latches remain released until the door is fully closed.

8: The washer control will release the door latch whenever the Run/Unload selector switch is not in the "Run" position or the machine is not tilted to the run position.

9: (Washex Anti Cross-Contamination) At the end of a formula, the washer control will release the door lock on the unload side of the machine. If the operator presses the load/unload switch, the washer control will lock the door on the unload side of the machine and unload the door on the load side of the machine. If the operator presses the load/unload switch again, the washer control will load the load side and unlock the unload side again. If the machine is stopped during a wash formula, the washer control will release the door lock on the load side of the machine.

### 7.3.62 Raise Rear

LED: This field is not currently used.

Relay: (see type) The Jog Safety/Tilt Function input (I/O Assignment 44) must be present to tilt the machine. There is currently no default for this field.

Input: For machines with a type 0 wash position (i.e., Brim washers), enter the number corresponding to the "raise machine" control panel switch contacts. For machines with a type 1, 2, or 3 wash position, enter the number corresponding to the "machine rear fully raised" limit switch contact. There is currently no default for this field.

Type: Describes the behavior of this machine's tilting outputs.

- 0: For Washex-style machines. Energizes the output corresponding to the "raise rear" hydraulic valve.
- 1: For Milnor-style machines. Energizes the output corresponding to the "raise" hydraulic valve.

### 7.3.63 Lower Rear

LED: This field is not currently used.

Relay: The Jog Safety/Tilt Function input (I/O Assignment 44) must be present to tilt the machine. For Washex-style machines, enter the number corresponding to the "lower machine rear" hydraulic valve. For Milnor-style machines, enter the number corresponding to the "lower machine" hydraulic valve. There is currently no default for this field.

Input: For machines with a type 0 wash position (i.e., Brim washers), enter the number corresponding to the "lower machine" control panel switch contacts. For machines with a type 1, 2, or 3 wash position, enter the number corresponding to the "machine rear fully lowered" limit switch contact. There is currently no default for this field.

Type: This field is not currently used.

### 7.3.64 Raise Front

LED: This field is not currently used.

Relay: Enter the number corresponding to the relay used to energize the raise machine front hydraulic valve (Washex) or front hydraulic valve (Milnor). The Jog Safety/Tilt Function input (I/O Assignment 44) must be present to tilt the machine. There is currently no default for this field.

Input: For machines with a type 1, 2, or 3 Wash Position, enter the number corresponding to the "machine front fully raised" limit switch contact. There is currently no default for this field.

Type: Describes the behavior of this machine's tilting outputs.

- 0: The machine leaves the raise rear or raise front outputs energized whenever the machine has been tilted to the load or unload positions.
- 1: The machine does not leave the raise rear or raise front outputs energized when the machine has been tilted to the load or unload positions.

### 7.3.65 Lower Front

LED: This field is not currently used.

Relay: Enter the number corresponding to the relay used to energize the lower machine front hydraulic valve (Washex) or "rear" hydraulic valve (Milnor). The Jog Safety/Tilt Function input (I/O Assignment 44) must be present to tilt the machine. There is currently no default for this field.

Input: For machines with a type 1, 2, or 3 Wash Position, enter the number corresponding to the "machine front fully lowered" limit switch contact. There is currently no default for this field.

Type: This field is not currently used.

### 7.3.66 Chute Down

LED: This field is not currently used.

Relay: Enter the number corresponding to the relay used to lower the loading chute. There is currently no default for this field.

Input: Enter the number corresponding to the chute lowered limit switch contact. There is currently no default for this field.

Type: This field is not currently used.

### 7.3.67 Chute Up

LED: This field is not currently used.

Relay: Enter the number corresponding to the relay used to raise the loading chute. There is currently no default for this field.

Input: Enter the number corresponding to the chute raised limit switch contact. There is currently no default for this field.

Type: This field is not currently used.

### 7.3.68 Chute Lock

LED: This field is not currently used.

Relay: Enter the number corresponding to the chute lock relay contact. There is currently no default for this field. The washer control assumes that when this output is energized, it releases the chute lock.

Input: This field is not currently used.

Type: This field is not currently used.

### 7.3.69 Chute Spray

LED: This field is not currently used.

Relay: Enter the number corresponding to the chute spray relay contact. There is currently no default for this field. If the machine is not equipped with a chute spray switch, the chute spray output will be energized when the machine is tilted to the load position, the door is open, the chute is down, and the operator has pressed the tilt function button. If the machine is equipped with a chute spray switch, the chute spray output will be energized when the machine is tilted to the load position, the door is open, the chute is down, and the operator has energized the chute spray switch

Input: Enter the number corresponding to the chute spray switch input contact. The washer control expects contact between this input and the input common to mean that it should energize the chute spray.

Type: This field is not currently used.

### 7.3.70 Left Air Mount

LED: This field is not currently used.

Relay: For a WASHEX Floataire machine or other machine that uses inflatable air mounts during extract, enter the number corresponding to the output you wish to use to open the valve that inflates the left air mount. There is currently no default for this field.

Input: On Floataire-style machines, there is a pair of limit switches that are used to indicate that the machine has been elevated, or that an elevated machine is unbalanced. Connect this input to the limit switch for the left side of the machine. There is currently no default for this field.

Type: This field not currently used.

### 7.3.71 Right Air Mount

LED: This field is not currently used.

Relay: For a WASHEX Floataire machine or other machine that uses inflatable air mounts during extract, enter the number corresponding to the output you wish to use to open the valve that inflates the right air mount. There is currently no default for this field.

Input: On Floataire-style machines, there is a pair of limit switches that are used to indicate that the machine has been elevated, or that an elevated machine is unbalanced. Connect this input to the limit switch for the right side of the machine. There is currently no default for this field.

Type: This field not currently used.

### 7.3.72 Floataire Valve

LED: This field is not currently used.

Relay: For a WASHEX Floataire machine, enter the number corresponding to the output you wish to use to energize the Floataire Valve. The Floataire Valve is used to supply air pressure to the left and right air mounts. There is currently no default for this field.

Input: This field is not currently used.

Type: This field is not currently used.

### 7.3.73 Left & Right Air Vents

LED: This field is not currently used.

Relay: On WASHEX Floataire and similar machines, there is a pair of valves that are used to deflate the air bags used to raise the machine. Enter the number that corresponds to that output. There is currently no default for this field.

Input: This field is not currently used.

Type: This field is not currently used.

### 7.3.74 Low Brake 1

LED: This field is not currently used.

Relay: On WASHEX Floataire and similar machines, enter the number that corresponds to the output you wish to use to engage this brake. There is currently no default for this field.

Input: This field is not currently used.

Type: This field is not currently used.

### 7.3.75 High Brake

LED: This field is not currently used.

Relay: On WASHEX Floataire and similar machines, enter the number that corresponds to the output you wish to use to engage this brake. There is currently no default for this field.

Input: This field is not currently used.

Type: Used to determine the interaction of the high brake and the brake pressure switch.

- 0: For WASHEX Floataire machines. The washer control will look for a brake released limit switch input **only** when both the high brake and LB2 are released.
- 1: For Milnor machines. The washer control's brake released input is not interlocked with the high brake output.

### 7.3.76 Brake Pressure Switch

LED: Enter the number corresponding to the LED you wish to use to indicate that a Brake Pressure Switch failure has occurred. There is currently no default for this field. This LED will begin flashing whenever a Brake Pressure Switch error occurs, and will continue flashing until the next time the control is powered down and powered back up. It is safe to assign this LED to the Brake Wear Switch as well.

Relay: This field is not currently used.

Input: Enter the number that corresponds to the machine's brake pressure switch input. There is currently no default for this field. If the washer control sees a connection between this input and the input common, it will assume that there has been a brake pressure failure, and will display an error message and stop the control.

Type: This field is not currently used.

### 7.3.77 Brake Wear Switch

LED: Enter the number corresponding to the LED you wish to use to indicate that a Brake Wear Switch failure has occurred. There is currently no default for this field. This LED will begin flashing whenever a Brake Wear Switch error occurs, and will continue flashing until the next time the control is powered down and powered back up. It is safe to assign this LED to the Brake Pressure Switch as well.

Relay: This field is not currently used.

Input: Enter the number that corresponds to the machine's brake wear switch input. There is currently no default for this field. If the washer control sees a connection between this input and the input common, it will assume that there has been a brake wear failure (the pad has excessive wear), and will display an error message and stop the control.

Type: This field is not currently used.

### 7.3.78 Walkway Down

LED: This field is not currently used.

Relay: This field is not currently used.

Input: Enter the number corresponding to the service walkway lowered limit switch contact. There is currently no default for this field.

Type: This field is not currently used.

### 7.3.79 Panel Door Interlock

LED: This field is not currently used.

Relay: This field is not currently used.

Input: Enter the number corresponding to the electrical panel interlock limit switch contact. There is currently no default for this field.

Type: This field is not currently used.

### 7.3.80 Supply Hopper Door

LED: This field is not currently used.

Relay: This field is not currently used.

Input: Enter the number corresponding to the supply hopper door input. The washer control expects a contact between this input and the input common to mean that the supply hopper door is closed.

Type: This field is not currently used.

### 7.3.81 Hot Oil

LED: This field is not currently used.

Relay: This field is not currently used.

Input: Enter the number corresponding to the hydraulic oil over temperature switch contact. There is currently no default for this field.

Type: This field is not currently used.

### 7.3.82 Oil Filter

LED: This field is not currently used.

Relay: This field is not currently used.

Input: Enter the number corresponding to the replace hydraulic oil filter switch contact. There is currently no default for this field.

Type: This field is not currently used.

### 7.3.83 Start Inhibit

LED: This field is not currently used.

Relay: This field is not currently used.

Input: Enter the number corresponding to the start inhibit switch contact. There is currently no default for this field. The washer control will not start or perform hydraulic functions while there is contact between this input and the input common.

Type: Describes the behavior of the start inhibit input.

0: The control displays "waiting for start inhibit" when the start inhibit input is present.

1: The control displays "waiting for machine power" when the start inhibit input is present. The control will also stop the machine and sound an error if the start inhibit input appears while the machine is running.

### 7.3.84 Safety Reset

LED: This field is not currently used.

Relay: For Milnor machines. Enter the number corresponding to the safety reset relay. There is currently no default for this field. The washer control will energize this output whenever both the front and rear of the machine are down (the machine is not tilted).

Input: This field is not currently used.

Type: This field is not currently used.

### 7.3.85 Vibration Switch

LED: This field is not currently used.

Relay: This field is not currently used.

Input: Enter the number corresponding to the machine vibration switch contact. There is currently no default for this field. The washer control will stop the machine and display a "vibration switch tripped" message any time there is contact between the input and the input common.

Type: This field is not currently used.

### 7.3.86 Balance Enable

LED: This field is not currently used.

Relay: On a machine equipped with a balancing circuit, enter the number corresponding to the output used to activate that circuit. There is currently no default for this field. The balance enable output will be energized any time that either the low or high extract motor is running.

Input: This field is not currently used.

Type: This field is not currently used.

### 7.3.87 ACC Door

LED: Enter the number corresponding to the unload side door lock LED. There is no default for this field. This LED will flash when the door lock on the unload side of the machine is released.

Relay: Enter the number corresponding to the unload side door lock solenoid relay. There is no default for this field. The washer control will energize this output at the end of a wash formula, or when the Load/Unload switch (I/O Assignment 88) has been used to switch control to the unload side.

Input: Enter the number corresponding to the unload side door closed input. The washer control expects a connection between this input and the input common to mean that the unload side door is closed.

Type: This field is not currently used.

### 7.3.88 ACC Load/Unload Switch

LED: This field is not currently used.

Relay: This field is not currently used.

Input: Enter the number corresponding to the Load/Unload switch input. When the washer control sees a connection between this input and the input common, it will switch "control" from the load side of the washer to the unload side of the washer, or vice-versa. To switch control from one side of the machine to the other, the doors on both sides of the machine must be closed.

Type: This field is not currently used.

### 7.3.89 ACC Unload Side Jog Forward

LED: This field is not currently used.

Relay: This field is not currently used.

Input: Enter the number corresponding to the unload side jog forward switch. There is no default for this field. When the washer control sees a connection between this input and the input common when the unload side of the machine has control, it will use the wash motor to jog the cylinder in the "forward" direction.

Type: This field is not currently used.

### 7.3.90 ACC Unload Side Jog Reverse

LED: This field is not currently used.

Relay: This field is not currently used.

Input: Enter the number corresponding to the unload side jog reverse switch. There is no default for this field. When the washer control sees a connection between this input and the input common when the unload side of the machine has control, it will use the wash motor to jog the cylinder in the "reverse" direction.

Type: This field is not currently used.

### 7.3.91 ACC Unload Light/Unload Side

LED: This field is not currently used.

Relay: Enter the number corresponding to the relay used to energize the "Unload" light on the unload side of the machine. There is no default for this field. The washer control will energize this output when the unload side door lock has been released and the unload side door has not been opened.

Input: This field is not currently used.

Type: This field is not currently used.

### 7.3.92 ACC Load Light/Unload Side

LED: This field is not currently used.

Relay: Enter the number corresponding to the relay used to energize the "Load" light on the unload side of the machine. There is no default for this field. The washer control will energize this output when the door on the load side of the machine is open.

Input: This field is not currently used.

Type: This field is not currently used.

### 7.3.93 ACC Unload Light/Load Side

LED: This field is not currently used.

Relay: Enter the number corresponding to the relay used to energize the "Unload" light on the load side of the machine. There is no default for this field. The washer control will energize this output when the door on the unload side of the machine is open.

Input: This field is not currently used.

Type: This field is not currently used.

### 7.3.94 ACC Load Light/Load Side

LED: This field is not currently used.

Relay: Enter the number corresponding to the relay used to energize the "Load" light on the load side of the machine. There is no default for this field. The washer control will energize this output when the load side door lock has been released and the load side door has not been opened.

Input: This field is not currently used.

Type: This field is not currently used.

### 7.3.95 Low Level

LED: This field is not currently used.

Relay: Enter the number corresponding to the low level output. There is no default for this field. See the option list for setting the water level for this feature. If the water level in the machine is below this level the output will turn on.

Input: This field is not currently used.

Type: This field is not currently used.

### 7.3.96 Auto/Manual

LED: This field is not currently used.

Relay: This field is not currently used.

Input: Enter the number corresponding to the input for the Auto/Manual switch. There is no default for this field. When the washer control sees a connection between this input and the input common, it will assume that the machine has been placed in the "Manual" mode. When in the manual mode, the washer control will not automatically tilt the machine to load or unload (available only on automated conveyer and sling systems) and will not automatically attempt to rebalance the machine before extract.

Type: This field is not currently used.

### 7.3.97 Jog Input

LED: This field is not currently used.

Relay: This field is not currently used.

Input: Enter the number corresponding to the input for the jog switch. There is no default for this field. When the washer control sees a connection between this input and the input common, it will start the jog sequence when in load or unload position. (This feature is available only for washers with Wash Position set to type 5. See "Type" under "Wash Position," I/O Assignment 46 for more information)

Type: This field is not currently used.

### 7.3.98 Inverter Fault

LED: This field is not currently used.

Relay: This field is not currently used.

Input: Enter the number corresponding to the inverter fault input. There is no default for this field. The inverter fault input should be connected to the "Fault" or "Error" output on the machine's variable-frequency drive. When the washer control sees a connection between this input and the input common, it will display an "Inverter Fault" error message and stop running the current formula.

Type: This field is not currently used.

### 7.3.99 Door Seal Vent

LED: This field is not currently used.

Relay: Enter the number corresponding to the door seal vent solenoid relay. There is no default for this field. The washer control will energize this output to release the door seal on the machine prior to releasing the door latch. (This feature is used only on machines that have separate solenoids for applying and releasing the door seal, and must be used in conjunction with door seal type 2).

Input: This field is not currently used.

Type: This field is not currently used.

### 7.3.100 At Set Frequency

LED: This field is not currently used.

Relay: This field is not currently used.

Input: Enter the number corresponding to the at set frequency input. There is no default for this field. This input should be connected to the variable-frequency (inverter) drive's "At Set Frequency" or "At Speed" output. When the washer control sees a connection between this input and the input common, it assumes that the variable frequency drive is rotating the cylinder at the correct speed for the current analog output voltage.

Type: This field is not currently used.

### 7.3.101 AutoJog Position Select (Load Side)

LED: This field is not currently used.

Relay: This field is not currently used.

Input: Enter the number corresponding to the load side autojog position select input. There is no default for this field. This input should be connected to the autojog position select switch on the load side of the machine. When the washer control sees a connection between this input and the input common, it assumes that the operator has told the machine to automatically jog to a cylinder position.

Type: This field is not currently used.

### 7.3.102 AutoJog Position Select (Unload Side)

LED: This field is not currently used.

Relay: This field is not currently used.

Input: Enter the number corresponding to the unload side autojog position select input. There is no default for this field. This input should be connected to the autojog position select switch on the unload side of the machine. When the washer control sees a connection between this input and the input common, it assumes that the operator has told the machine to automatically jog to a cylinder position.

Type: This field is not currently used.

### 7.3.103 AutoJog At Position (Load Side)

LED: This field is not currently used.

Relay: This field is not currently used.

Input: Enter the number corresponding to the load side autojog at position input. There is no default for this field. This input should be connected to the autojog at position proximity switch on the load side of the machine. When the washer control sees a connection between this input and the input common, it assumes that the machine has automatically jogged to the selected cylinder position.

Type: This field is not currently used.

### 7.3.104 AutoJog At Position (Unload Side)

LED: This field is not currently used.

Relay: This field is not currently used.

Input: Enter the number corresponding to the unload side autojog at position input. There is no default for this field. This input should be connected to the autojog at position proximity switch on the unload side of the machine. When the washer control sees a connection between this input and the input common, it assumes that the machine has automatically jogged to the selected cylinder position.

Type: This field is not currently used.

### 7.3.105 AutoJog Jog Switch (Load Side)

LED: This field is not currently used.

Relay: This field is not currently used.

Input: Enter the number corresponding to the load side autojog input. There is no default for this field. This input should be connected to the autojog switch on the load side of the machine. When the washer control sees a connection between this input and the input common, it assumes that the operator wishes to have the machine jog to the selected position.

Type: This field is not currently used.

### 7.3.106 AutoJog Jog Switch (Unload Side)

LED: This field is not currently used.

Relay: This field is not currently used.

Input: Enter the number corresponding to the unload side autojog input. There is no default for this field. This input should be connected to the autojog switch on the unload side of the machine. When the washer control sees a connection between this input and the input common, it assumes that the operator wishes to have the machine jog to the selected position.

Type: This field is not currently used.

### 7.3.107 AutoJog Motor Forward

LED: Enter the number corresponding to the autojog motor forward LED. There is no default for this field.

Relay: Enter the number corresponding to the autojog motor forward motor starter relay. There is no default for this field. The washer control will energize this output when it wishes to jog the cylinder in the forward direction using the autojog motor instead of the wash motor.

Input: Enter the number corresponding to the autojog motor overload input. There is no default for this field. The washer control will assume that a connection between this input and the input common means that an autojog motor overload has occurred, and will display an “AutoJog Motor Overload” message and stop the machine.

Type: This field is not currently used.

### 7.3.108 AutoJog Motor Reverse

LED: Enter the number corresponding to the autojog motor reverse LED. There is no default for this field.

Relay: Enter the number corresponding to the autojog motor reverse motor starter relay. There is no default for this field. The washer control will energize this output when it wishes to jog the cylinder in the reverse direction using the autojog motor instead of the wash motor.

Input: This field is not currently used.

Type: This field is not currently used.

### 7.3.109 AutoJog Clutch

LED: This field is not currently used.

Relay: Enter the number corresponding to the autojog clutch relay. There is no default for this field. The washer control will energize this output whenever it is using the autojog motor instead of the wash motor to jog the cylinder.

Input: This field is not currently used.

Type: This field is not currently used.

### 7.3.110 Low Speed Motor Select

LED: Enter the number corresponding to the low-speed motor select LED. There is no default for this field.

Relay: Enter the number corresponding to the low-speed motor select relay. There is no default for this field. On machines equipped with a two-motor/single inverter drive system, the washer control will energize this output when it wishes to use the low-speed motor (usually during wash, drain, and balance speeds).

Input: This field is not currently used.

Type: This field is not currently used.

### 7.3.111 High Speed Motor Select

LED: Enter the number corresponding to the high-speed motor select LED. There is no default for this field.

Relay: Enter the number corresponding to the high-speed motor select relay. There is no default for this field. On machines equipped with a two-motor/single inverter drive system, the washer control will energize this output when it wishes to use the high-speed motor (usually during extract speeds).

Input: This field is not currently used.

Type: This field is not currently used.

### 7.3.112 Base Block

LED: Enter the number corresponding to the base block LED. There is no default for this field.

Relay: Enter the number corresponding to the base block relay. There is no default for this field. The washer control will enable this output when it wishes to disable the output of the variable-frequency drive unit when switching from the low-speed motor to the high-speed motor or vice-versa.

Input: This field is not currently used.

Type: This field is not currently used.

### 7.3.113 Push Forward or Speed Search

Push Forward (Standard PC-5500)

LED: Enter the number corresponding to the push forward LED. There is no default for this field.

Relay: Enter the number corresponding to the push forward relay. There is no default for this field. On Milnor tilting washer-extractors, the washer control will energize this output when the load/unload/wash position selector switch is in the "load" position or the front of the machine is not down.

Input: This field is not currently used.

Type: This field is not currently used.

Speed Search (American L-Tron and Dual Motor/Single Variable Frequency Drive Machines)

LED: Enter the number corresponding to the speed search LED. There is no default for this field.

Relay: Enter the number corresponding to the speed search relay. There is no default for this field. On L-Tron and dual motor/single drive machines, the speed search output is used to tell the variable frequency drive to match its output frequency to the current actual speed of the cylinder.

Input: This field is not currently used.

Type: This field is not currently used.

### 7.3.114 Push Back or System Air Pressure

Push Back (Standard PC-5500)

LED: Enter the number corresponding to the push back LED. There is no default for this field.

Relay: Enter the number corresponding to the push back relay. There is no default for this field. On Milnor tilting washer-extractors, the washer control will energize this output when the load/unload/wash position selector switch is in the "unload" position or the rear of the machine is not down.

Input: This field is not currently used.

Type: This field is not currently used.

System Air Pressure (American L-Tron)

LED: Enter the number corresponding to the push back LED. There is no default for this field.

Relay: Enter the number corresponding to the push back relay. There is no default for this field. On tilting machines, the washer control will energize this output when the load/unload/wash position selector switch is in the "unload" position or the rear of the machine is not down.

Input: This field is not currently used.

Type: This field is not currently used.

### 7.3.115 Cylinder Position

LED: This field is not currently used.

Relay: This field is not currently used.

Input: Enter the number corresponding to the input you wish to use to indicate that the washer's cylinder is in position (the inner doors and outer doors are lined up).

Type: This field is not currently used.

### 7.3.116 Position Cylinder

LED: This field is not currently used.

Relay: This field is not currently used.

Input: Enter the number corresponding to the input you wish to use to tell the washer control to rotate the washer's cylinder into position. There is no default for this field.

Type: 0: The washer control will use the wash motor running forward to position the cylinder.
1: The washer control will use the wash motor running in reverse to position the cylinder.
2: The washer control will alternate between wash motor forward and wash motor reverse to position the cylinder.

### 7.3.117 Door Unlock

LED: This field is not currently used.

Relay: Enter the number corresponding to the relay you wish to use as a door unlock output. There is no default for this field. This output is necessary only on machines that require separate signals to lock and unlock the door.

Input: This field is not currently used.

Type: This field is not currently used.

### 7.3.118 Motor Fan

LED: Enter the number corresponding to the Motor Fan LED. There is no default for this field. The Motor Fan LED will blink when the motor fan is running.

Relay: Enter the number corresponding to the relay you wish to use as the motor fan output. There is no default for this field. This output will run for the amount of time specified in the motor cooling fan run time option (section 6.5.53) after the wash motor has shut off.

Input: Enter the number corresponding to the motor fan overload input. There is no default for this field. If the washer control does not see a circuit between this input and the input common, it will stop the washer, sound an alarm, and display an error message.

Type: This field is not currently used.

### 7.3.119 Front Lock Pins

LED: Enter the number corresponding to the front lock pins LED. There is no default for this field. The front lock pins LED will blink when the front lock pins output is active.

Relay: Enter the number corresponding to the relay you wish to use for the front lock pins output. There is no default for this field. On Ellis tilting side-loading washers, the front lock pins output is active whenever the machine is tilted to the unload position to lock the front of the machine in position.

Input: Enter the number corresponding to the front lock pin input. There is no default for this field. The washer control looks for this input to be active when the front lock pins are extended. The washer control will not allow the machine to tilt to the unload position until it sees this input.

Type: This field is not currently used.

### 7.3.120 Rear Lock Pins

LED: Enter the number corresponding to the rear lock pins LED. There is no default for this field. The rear lock pins LED will blink when the rear lock pins output is active.

Relay: Enter the number corresponding to the relay you wish to use for the rear lock pins output. There is no default for this field. On Ellis tilting side-loading washers, the rear lock pins output is active whenever the machine is tilted to the load position to lock the rear of the machine in position.

Input: Enter the number corresponding to the rear lock pin input. There is no default for this field. The washer control looks for this input to be active when the rear lock pins are extended. The washer control will not allow the machine to tilt to the load position until it sees this input.

Type: This field is not currently used.

### 7.3.121 Lock Cylinder

LED: Enter the number corresponding to the lock cylinder LED. There is no default for this field. The lock cylinder LED will blink when the lock cylinder output is active.

Relay: Enter the number corresponding to the relay you wish to use for the lock cylinder output. There is no default for this field. On Ellis tilting side-loading washers, the cylinder is locked in position whenever the machine is being tilted to the load or unload positions. It is also active when the machine is in the run position, the washer is stopped, and the machine is not being jogged. The lock cylinder output only stays on until the lock cylinder input is seen by the control.

Input: Enter the number corresponding to the cylinder locked in position input. There is no default for this field. The washer control looks for this input to be active when the cylinder is locked in position. The washer control will not allow the machine to tilt until it sees this input.

Type: This field is not currently used.

### 7.3.122 Unlock Cylinder

LED: Enter the number corresponding to the unlock cylinder LED. There is no default for this field. The unlock cylinder LED will blink when the unlock cylinder output is active.

Relay: Enter the number corresponding to the relay you wish to use for the unlock cylinder output. There is no default for this field. On Ellis tilting side-loading washers, the cylinder is not locked in position whenever the machine is running or being jogged. The unlock cylinder output only stays on until the unlock cylinder input is seen by the control.

Input: Enter the number corresponding to the cylinder unlocked input. There is no default for this field. The washer control looks for this input to be active when the cylinder is unlocked. The washer control will not allow the wash motor to run until it sees this input.

Type: This field is not currently used.

### 7.3.123 Hydraulic Fault

LED: Enter the number corresponding to the hydraulic fault LED. There is no default for this field. The hydraulic fault LED will blink when the control has detected a hydraulic system fault.

Relay: Enter the number corresponding to the relay you wish to use for the hydraulic fault output. There is no default for this field. On Ellis tilting side-loading washers, the hydraulic fault output will be active when the control senses a hydraulic system fault..

Input: Enter the number corresponding to the hydraulic fault input. There is no default for this field. If the washer control sees this input, it will stop the washer, display an error message, and activate the hydraulic fault output.

Type: This field is not currently used.

### 7.3.124 Condensate Return (Dye Machine Control)

LED: Enter the number corresponding to the condensate return LED. There is no default for this field. The condensate return LED will blink when the condensate return output is active.

Relay: Enter the number corresponding to the relay you wish to use for the condensate return output. There is no default for this field. The control will activate the condensate return output while running steps where indirect heat is programmed.

Input: This field is not currently used.

Type: This field is not currently used.

### 7.3.125 Indirect Cool Out

LED: Enter the number corresponding to the indirect cool out LED. There is no default for this field. The indirect cool out LED will blink when the indirect cool out output is active.

Relay: Enter the number corresponding to the relay you wish to use for the indirect cool out output. There is no default for this field. The control will activate the indirect cool out output while running steps where indirect cool is programmed.

Input: This field is not currently used.

Type: This field is not currently used.

### 7.3.126 I/O Assignment 126 - Not Used

### 7.3.127 I/O Assignment 127 - Not Used

### 7.3.128 I/O Assignment 128 - Not Used

## 7.4 Multi Relay Assignments

The washer control, under normal conditions, only assigns one relay output per logical output-for example, it will only activate one relay on the I/O unit to engage or disengage the brake. Multi Relay Assignments become necessary when you are in a situation where you need to activate or deactivate more than one output to properly control the machine. The washer control allows as many as four relay outputs to be assigned to each Multi Relay Assignment.

### 7.4.1 Configuring Multi Relay Assignments

Setting up a Multi Relay is a two stage process. First, you must figure out which I/O Assignment corresponds to the function you need to control. Then, you need to decide which relay outputs you need to control, and whether they need to be normally open or normally closed.

**Caution**: Be very careful that you do not assign a relay output in both the Multi Relay Assignments and the regular I/O Assignments. If you do assign an output in more than one place, the control will behave unpredictably.

**Example Configuration**: For the sake of example, let us say that your machine has a brake that is disengaged when the current is on, and engaged when current is off. This machine also has a special clutch that has to be disengaged when the brake is engaged, and engaged when the brake is disengaged. We'll assume that you plan to use output 10 on the relay unit for the brake, and output 11 for the clutch.
The first step would be to go into the factory options section and edit I/O Assignment 27, which controls the brake inputs and outputs. In the "relay" field, enter the number "201," which tells the control to use the Multi Relay Assignment #201 for the brake outputs. Exit the I/O Assignment editing section, and enter the Multi Relay Assignment section. In the first field of Multi Relay 201, enter the number "110." This tells the control that we want output 10 to be "on" when the brake is disengaged, and "off" when it's engaged. In the second field of Multi Relay 201, enter the number "11," which tells the control that you want to use relay 11, and the output is on when the clutch is engaged.

## 7.5 Chemical Supply I/O Assignments

The PC-5000's Chemical Supply I/O Assignments are used to set up the control for use with a chemical injection system. The washer control supports timed chemical injections, flowmetered chemical injections, and manual (signalled) injections.

### 7.5.1 Configuring Chemical Supply I/O Assignment

1. Select Supply I/O Assignments, press [EDIT] to begin configuring.

2. Press [UP ARROW] key, to scroll through each Supply I/O or by using the numeric keypad, enter the desired Supply I/O number that you wish to jump to.

3. Press the [RIGHT ARROW] key to edit Type of Supply, LED Number, Chemical Value Relay, Reset Relay, Flowmeter Input, Pump Relay and Flush Valve Relay. See Figure below. The cursor will flash on "t" location, to enable editing of Supply Type.

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| S | | | 1 | | t | | | 0 | | l | | | 0 | | c | | | | 0 |
| r | | | 0 | | i | | | 0 | | p | | | 0 | | f | | | | 0 |

S: Supply Number currently displayed. You may configure up to 16 supplies.

t: Type of Supply. Enter a value from the following:
0: Not installed
1: Signalled supply
2: Timed injection
3: Flowmetered supply
4: CCS Chemical Injection System supply
5: Dye machine supply

l: LED Number. Enter the number corresponding to the supply LED. Most common settings for chemical supplies 1 to 8, are LED numbers 17 to 24 respectively. The LED for a given supply will be on solid on steps where the supply is programmed, and will flash when the control is actually injecting the supply.

c: Chemical Valve Relay. Enter the number corresponding to the chemical valve output. There is no default for this field. The chemical valve is the output that is activated to inject the chemical, i.e., the peristaltic pump on a pump rack.

r: Reset Prescaler Relay. Enter the number corresponding to the pre-scaler reset output. There is no default for this field. This field is used to reset the prescaler for the supply flowmeter prior.to each injection of this supply.

i: Flowmeter Input. Enter the number corresponding to the flowmeter input. There is no default for this field. The flowmeter input is connected to the individual flowmeter used to measure the quantity of chemical being injected.

p: Pump Relay. Enter the number corresponding to the pump relay output. There is no default for this field. If this feature is used, please remember to setup the pump on time in the Chemical Supply configuration, Section 6.4. The pump relay will be activated for the number of seconds set in the pump time setting prior to the activation of the chemical valve relay. (So if you have a 10 second pump time programmed, this output will be on for 10 seconds before the chemical valve relay turns on. It then remains on until the end of the injection.)

f: Flush Valve Relay. Enter the number corresponding to the flush value output. There is no default for this field. If this feature is used, please remember to setup the flush type and time in the Chemical Supply configuration, Section 6.4. If the supply is configured to flush during and after injection (flush type 1), this output will be activated as soon as the chemical valve output is activated. Otherwise, it will turn on after the chemical valve output is deactivated. In both cases, the flush valve output will stay on after the chemical is injected for the amount of time specified in the flush time setting (see Section 6.4).

4. Use the [LEFT ARROW] and [RIGHT ARROW] keys to move to the previous or next fields (respectively) in the current Supply I/O Assignment.

5. Record your specific Chemical Supply I/O Assignments on provided chart, See Appendix D.

## 7.6 Clearing Entire Memory

This function will clear all configurations, settings, formulas, and steps previously programmed in to the washer control. Be absolutely certain you want to clear the entire unit of all configurations and programming before proceeding.

To clear entire memory:

1. Press [EDIT] key.
2. Press [ON/OFF] key, to select YES to enable clearing.
3. Press [ENTER] to process.
4. Clearing is complete.

## 7.7 Clearing Formula and Hour Counters

This function will clear all formula counters and the hour meter (see section 5). To clear:

1. Press [EDIT] key.
2. Press [ON/OFF] key, to select YES to enable clearing.
3. Press [ENTER] to process.

## 7.8 Exit Technical Configuration

Press [EXIT] key, then press [MODE SEL] to return to the Run Mode.

# 8. Error Messages and Troubleshooting

## 8.1 Error Messages

The washer control has been designed to detect many fault conditions and alert machine operators when they occur to simplify troubleshooting and promote safe operation of the equipment. Some of the error messages and the suggested troubleshooting method for those errors follows.

**Note:** The washer control allows the user to invert the operation of its inputs and relay contacts. In the relay and input fields of the washer control's I/O Assignment settings, any field that has a number above 100 is considered to be inverted. For example, if the relay field is set to 110, it means that relay 10 has been configured to operate as a normally closed relay instead of a normally open relay.

### 8.1.1 AutoJog Motor Overload Tripped

Explanation: The washer control has lost its input from the AutoJog motor overload heater. (Most motor overloads use normally-closed contacts, so the input will be on when the motor has **not** overloaded.) The AutoJog motor overload is the input for the AutoJog Motor Forward I/O Assignment (Section 7.3.107).

Troubleshooting: Check the motor overload heater for the AutoJog motor and reset the overload if necessary.

Check the AutoJog Motor Forward I/O Assignment and make sure that it is configured correctly. If the motor overload heater uses normally closed contacts, the input field for the AutoJog Motor Forward I/O Assignment should be inverted. If the motor overload heater uses normally open contacts, the input field should not be inverted. If this field is set to zero and you encounter this error, contact Custom Control Systems.

### 8.1.2 Balance Motor Overload Tripped

Explanation: The washer control has lost its input from the balance motor overload heater. (Most motor overloads use normally-closed contacts, so the input will be on when the motor has **not** overloaded.) The balance motor overload is the input for the Balance Motor I/O Assignment (Section 7.3.10).

Troubleshooting: Check the motor overload heater for the balance motor and reset the overload if necessary.

Check the Balance Motor I/O Assignment and make sure that it is configured correctly. If the motor overload heater uses normally closed contacts, the input field for the Balance Motor I/O Assignment should be inverted. If the motor overload heater uses normally open contacts, the input field should not be inverted. If this field is set to zero and you encounter this error, contact Custom Control Systems.

### 8.1.3 Brake Input Timeout

Explanation: The washer control has an input for a brake applied limit or pressure switch. If the input field is configured for the Brake I/O Assignment (Section 7.3.27) and the washer control does not see an input from this switch within five seconds of applying the brake, or does not see this input go away within five seconds of releasing the brake, it will display this error.

Troubleshooting: Check the brake pressure or limit switch to make sure it is properly adjusted. Ensure the machine is receiving proper air pressure from the plant's air system. Check the brake for proper operation (that it is engaging and disengaging properly).

Check the Brake I/O Assignment relay field (section 7.3.27). If you apply power to the brake solenoid to release the brake, ensure that the relay field is inverted. If you apply power to the brake solenoid to release the brake, ensure that the relay field is not inverted.

Check the Brake I/O Assignment input field (section 7.3.27). If the limit switch closes when the brake is applied, ensure that the input field is inverted. If the limit switch closes when the brake is released, ensure that the input field is not inverted.

### 8.1.4 Brake Pressure Malfunction

Explanation: The washer control has an input for a brake air supply pressure switch. If the input field is configured for the Brake Pressure Switch I/O Assignment (Section 7.3.76) and the washer control does not see an input from this switch indicating that the plant air supply to the brake has sufficient pressure to operate the brake, it will display this error.

Troubleshooting: Ensure the machine is receiving proper air pressure from the plant's air system.
Check the air pressure switch for proper operation.
Check the Brake Pressure Switch I/O Assignment (Section 7.3.76) input field. If the contacts on the pressure switch close when there is correct air pressure, this field should not be inverted. If the contacts on the pressure switch are open when there is correct air pressure, this field should be inverted.

### 8.1.5 Brake Wear Malfunction

Explanation: The washer control has an input for an excessive brake pad wear switch. If the input field is configured for the Brake Wear Switch I/O Assignment (Section 7.3.77) and the washer control sees an input from this switch, it will display this error.

Troubleshooting: Ensure that the brake wear limit switch is properly adjusted.
Ensure that the brake is operating properly.
Ensure that the brake pad is not excessively worn.
Check the Brake Wear Switch I/O assignment (Section 7.3.77) input field. If the contacts on the brake wear switch close when there is excessive wear, this input should be inverted. If the contacts on the brake wear switch open then there is excessive wear, this input should not be inverted.

### 8.1.6 Change Oil Filter

Explanation: Some washers equipped with hydraulic pumps have a switch that indicates that the hydraulic oil filter needs to be replaced. If the washer control sees an input from this switch, it will display the Change Oil Filer error.

Troubleshooting: Check the hydraulic oil filter and replace if necessary.
Check the Oil Filter I/O Assignment (Section 7.3.82) input field. If the contacts on the oil filter switch close when the filter needs replacement, this field should not be inverted. If the contacts on the oil filter switch open when the filter needs replacement, this field should be inverted.

### 8.1.7 Clutch Input Timeout

Explanation: The washer control has an input for a clutch engaged position limit or pressure switch. If an input is configured for the Clutch I/O Assignment (Section 7.3.28), and the washer control does not see an input from this switch within five seconds of energizing the output to engage the clutch, or does not see the input from the clutch go away within five seconds of de-energizing the output to disengage the clutch, it will display this error.

Troubleshooting: Check the clutch for proper operation.
Ensure that the clutch limit or pressure switch is operating correctly.
Ensure that the machine is receiving adequate air pressure from the plant air system.
Check the Clutch I/O Assignment input field. If the pressure or limit switch closes when the clutch is engaged, this field should not be inverted. If the pressure or limit switch opens when the clutch is engaged, this field should be inverted.

### 8.1.8 Door Closed Switch Damaged

Explanation: The washer control has the ability to monitor both the normally open (Door Closed I/O Assignment, Section 7.3.56) and the normally closed (Invert Door Closed I/O Assignment, Section 7.3.57) contacts on the door closed limit switch. If the washer control does not see the inputs from these switches in opposite states (the normally open contact's input on and the normally closed contact's input off when the door is closed, for example), it will display this error.

Troubleshooting: Check the door limit switch for proper adjustment and alignment.
Check the door limit switch contacts for proper operation.
Ensure that the correct inputs are assigned in the input fields of the Door Closed and Invert Door Closed I/O Assignments. The Door Closed input field should be configured for the switch that closes when the door is closed and opens when the door is not closed. The Invert Door Closed input field should be configured for the switch that opens when the door is closed and closes when the door is not closed. The input fields for these I/O Assignments should not be inverted.

### 8.1.9 Door Closed Switch Failure

Explanation: The washer control monitors the state of its door closed input while running a formula. If the washer control does not see an input from the door closed switch while it is running a formula, it will display this error.

Troubleshooting: Check the door closed switch for proper adjustment and alignment.
Check the door limit or proximity switch for proper operation.
Ensure that the input field of the Door Closed I/O Assignment (Section 7.3.56) has been assigned correctly.

### 8.1.10 Door Latch Timeout

Explanation: The washer control has an input for a door latched limit or proximity switch. If the washer control does not see an input from this switch within five seconds of engaging the door latch, or does not see this input go away within five seconds of releasing the door latch, it will display this error.

Troubleshooting: Check the door latch for proper operation.
Check the door latch limit or proximity switch for adjustment and alignment.
Check the door latch limit or proximity switch for proper operation.
Ensure that the machine has adequate pressure from the plant air system.
Ensure that the input field of the Door Latch I/O Assignment (Section 7.3.61) is configured correctly. If the switch closes when the door latch is applied, this input should not be inverted. If the switch opens when the door latch is applied, this field should be inverted.
Ensure that the output field of the Door Latch I/O Assignment (Section 7.3.61) is configured correctly. If the latch is applied when power is applied, this field should

be inverted. If the latch is released when power is applied, this field should not be inverted.

### 8.1.11 Door Not Fully Open

Explanation: On unloading washers, if the machine is tiled forward in the unload position and the door stops making contact with the door open (Section 7.3.54) limit switch, the washer control will display this error.

Troubleshooting: Check that the door is not drifting off of the limit switch when the machine is tilted forward.
Check the limit switch for proper alignment and adjustment.
Check the limit switch contacts for proper operation.

### 8.1.12 Door Open Switch Damaged

Explanation: The washer control has the ability to monitor both the normally open (Door Open I/O Assignment, Section 7.3.54) and the normally closed (Invert Door Open I/O Assignment, Section 7.3.55) contacts on the door closed limit switch. If the washer control does not see the inputs from these switches in opposite states (the normally open contact's input on and the normally closed contact's input off when the door is closed, for example), it will display this error.

Troubleshooting: Check the door limit switch for proper adjustment and alignment.
Check the door limit switch contacts for proper operation.
Ensure that the correct inputs are assigned in the input fields of the Door Open and Invert Door Open I/O Assignments. The Door Open input field should be configured for the switch that closes when the door is open and opens when the door is closed. The Invert Door Open input field should be configured for the switch that opens when the door is open and closes when the door is closed. The input fields for these I/O Assignments should not be inverted.

### 8.1.13 Door Open Switch Failure

Explanation: The washer control monitors the state of its door open input while running a formula. If the washer control sees an input from the door open switch while it is running a formula, it will display this error.

Troubleshooting: Check the door open switch for proper adjustment and alignment.
Check the door limit or proximity switch for proper operation.
Ensure that the input field of the Door Open I/O Assignment (Section 7.3.54) has been assigned correctly.

### 8.1.14 Door Seal Timeout

Explanation: The washer control has an input for a door sealed switch. If the washer control does not see an input from this switch within five seconds of engaging the door seal, or does not see this input go away within five seconds of releasing the door seal, it will display this error.

Troubleshooting: Check the door seal for proper operation.
Check the door seal switch for adjustment and alignment.
Check the door seal switch for proper operation.
Ensure that the machine has adequate pressure from the plant air system.
Ensure that the input field of the Door Seal I/O Assignment (Section 7.3.62) is configured correctly. If the switch closes when the door seal is applied, this input should not be inverted. If the switch opens when the door seal is applied, this field should be inverted.
Ensure that the output field of the Door Seal I/O Assignment (Section 7.3.62) is configured correctly. If the seal is applied when power is applied, this field should not be inverted. If the seal is released when power is applied, this field should be inverted.

### 8.1.15 Door Switch Failure

Explanation: The washer control checks the Door Closed (Section 7.3.56) and Door Open (Section 7.3.54) inputs to ensure that they are not both on at the same time. If the washer control does see both inputs (indicating that the door is open and closed at the same time) it will display this error.

Troubleshooting: Check the door closed and open limit or proximity switches for proper alignment and adjustment.
Check the door closed and open limit or proximity switches for proper operation.

### 8.1.16 Extract Motor Overload Tripped

Explanation: The washer control has lost its input from the extract motor overload heater. (Most motor overloads use normally-closed contacts, so the input will be on when the motor has **not** overloaded.) The extract motor overload is the input for the Extract Overload I/O Assignment (Section 7.3.35).

Troubleshooting: Check the motor overload heater for the extract motor and reset the overload if necessary.
Check the Extract Overload I/O Assignment and make sure that it is configured correctly. If the motor overload heater uses normally closed contacts, the input field for the Extract Overload I/O Assignment should be inverted. If the motor overload heater uses normally open contacts, the input field should not be inverted. If this field is set to zero and you encounter this error, contact Custom Control Systems.

### 8.1.17 Formula Memory Failure

Explanation: The washer control uses a check value on each formula to keep track of changes and ensure that its memory has not been damaged. Each time the washer control is powered on, and each time the user starts a formula, it recalculates the check value to make sure it agrees with the check value calculated the last time the formula was edited. If the check values do not match, the washer control will display this error.

Troubleshooting: To clear a formula memory error, go into the Program Mode and select the formula that caused the error using the procedures in Section 4. Use the [LEFT ARROW] and [RIGHT ARROW] keys to check the formula contents to ensure that the formula is correct. If the formula is correct, select the formula's End Step and press the [STOP] key to correct the formula's check value. If you are encountering frequent formula memory failures, contact Custom Control Systems.

### 8.1.18 Front and Rear Doors Open

Explanation: The washer control monitors the status of the load side (Door Closed I/O Assignment, Section 7.3.56) and unload side (ACC Door I/O Assignment, Section 7.3.87) inputs. If it loses both inputs (indicating that both the load side and unload side doors are open) the washer control will display this error. This error will occur only on Anti-Cross Contamination washers.

Troubleshooting: Ensure that the doors on the load side and the unload side are not both open.
Check the door closed limit switches on the load and unload sides for proper alignment and adjustment.

### 8.1.19 Front Up/Down Switch Failure

Explanation: The washer control monitors the status of the front up (Raise Front I/O Assignment, Section 7.3.64) and front down (Lower Front I/O Assignment, Section 7.3.65) inputs. If it sees both inputs (indicating that the machine is up and down at the same time) it displays this error.

Troubleshooting: Check the front up and front down switches for proper alignment and operation.

### 8.1.20 High Extract Overload Tripped

Explanation: The washer control has lost its input from the high extract motor overload heater. (Most motor overloads use normally-closed contacts, so the input will be on when the motor has **not** overloaded.) The extract motor overload is the input for the High Extract I/O Assignment (Section 7.3.12).

Troubleshooting: Check the motor overload heater for the high extract motor and reset the overload if necessary.
Check the High Extract I/O Assignment and make sure that it is configured correctly. If the motor overload heater uses normally closed contacts, the input field for the High Extract I/O Assignment should be inverted. If the motor overload heater uses normally open contacts, the input field should not be inverted. If this field is set to zero and you encounter this error, contact Custom Control Systems.

### 8.1.21 Hydraulic Oil Temp. Too High

Explanation: The washer control has an input for a hydraulic oil temperature switch (Hot Oil I/O Assignment, Section 81). If the washer control sees this input, it will display this message.

Troubleshooting: Check the hydraulic oil temperature switch for proper operation. If the switch has been tripped, wait for the oil temperature to cool down.

### 8.1.22 Hydraulic Pump Overload Tripped

Explanation: The washer control has lost its input from the hydraulic pump motor overload heater. (Most motor overloads use normally-closed contacts, so the input will be on when the motor has **not** overloaded.) The hydraulic pump overload is the input for the Hydraulic Pump I/O Assignment (Section 7.3.37).

Troubleshooting: Check the motor overload heater for the hydraulic pump motor and reset the overload if necessary.
Check the Hydraulic Pump I/O Assignment and make sure that it is configured correctly. If the motor overload heater uses normally closed contacts, the input field for the Hydraulic Pump I/O Assignment should be inverted. If the motor overload heater uses normally open contacts, the input field should not be inverted. If this field is set to zero and you encounter this error, contact Custom Control Systems.

### 8.1.23 Inlet Switch Damaged

Explanation: The washer control has the ability to monitor both the normally open (Water Inlet I/O Assignment, Section 7.3.52) and the normally closed (Invert Water Inlet I/O Assignment, Section 7.3.53) contacts on the door closed limit switch. If the washer control does not see the inputs from these switches in opposite states (the normally open contact's input on and the normally closed contact's input off when the door is in position, for example), it will display this error.

Troubleshooting: Check the door limit switch for proper adjustment and alignment.
Check the door limit switch contacts for proper operation.
Ensure that the correct inputs are assigned in the input fields of the Water Inlet and Invert Water Inlet I/O Assignments. The Water Inlet input field should be configured for the switch that closes when the water inlet is in position and opens when the inlet is not in position. The Invert Water Inlet input field should be configured for the switch that opens when the water inlet is in position and closes when the inlet is not in position. The input fields for these I/O Assignments should not be inverted.

### 8.1.24 Inlet Switch Failure

Explanation: The washer control monitors the state of its water inlet input while running a formula. If the washer control does not see an input from the water inlet switch while it is running a formula, it will display this error.

Troubleshooting: Check the water inlet switch for proper adjustment and alignment.
Check the water inlet switch for proper operation.
Ensure that the input field of the Water Inlet I/O Assignment (Section 7.3.52) has been assigned correctly.

### 8.1.25 Inlet Switch Timeout

Explanation: The washer control has an input for a water inlet limit or proximity switch. If the washer control does not see an input from this switch within five seconds of energizing the water inlet output, or does not see this input go away within five seconds of releasing the water inlet output, it will display this error.

Troubleshooting: Check the water inlet for proper operation.
Check the water inlet limit or proximity switch for adjustment and alignment.
Check the water inlet limit or proximity switch for proper operation.
Ensure that the machine has adequate pressure from the plant air system.
Ensure that the input field of the Water Inlet I/O Assignment (Section 7.3.52) is configured correctly. If the switch closes when the water inlet is moved into position, this input should not be inverted. If the switch opens when the water inlet is moved into position, this field should be inverted.

### 8.1.26 I/O Assignment Memory Failure

Explanation: The washer control uses a check value on the I/O Assignments to keep track of changes and ensure that its memory has not been damaged. Each time the washer control is powered on, and each time the user starts a formula, it recalculates the check value to make sure it agrees with the check value calculated the last time the I/O Assignments were edited. If the check values do not match, the washer control will display this error.

Troubleshooting: To clear an I/O Assignment memory failure, follow the instructions in Section 6 for entering the Options Mode, and the instructions in Section 7 for getting into Factory Options. Double-check your I/O Assignments against your machine's drawing to ensure that they are all correct. If you spot any errors, correct them following the procedure in Section 7.3. If the I/O Assignments appear to be correct, follow the procedure in Section 7.3 to reenter I/O Assignment 1 and press the [EXIT] key. You will need to power the washer control down and back up once you have finished.

### 8.1.27 Load Position Switch Damaged

Explanation: The washer control has the ability to monitor both the normally open (Load Position I/O Assignment, Section 7.3.48) and the normally closed (Invert Load Position I/O Assignment, Section 7.3.49) contacts on the load position limit switch. If the washer control does not see the inputs from these switches in opposite states (the normally open contact's input on and the normally closed contact's input off when the machine is tilted to the load position, for example), it will display this error.

Troubleshooting: Check the load position switch for proper adjustment and alignment.
Check the load position switch contacts for proper operation.
Ensure that the correct inputs are assigned in the input fields of the Load Position and Invert Load Position I/O Assignments. The Load Position input field should be configured for the switch that closes when the machine is tilted to the load position. The Invert Door Open input field should be configured for the switch that opens when the machine is not tilted to the load position. The input fields for these I/O Assignments should not be inverted.

### 8.1.28 Load Position Switch Failure

Explanation: The washer control monitors the state of its load position switch input while running a formula. If the washer control does sees an input from the load position switch while it is running a formula, it will display this error.

Troubleshooting: Check the load position switch for proper adjustment and alignment.
Check the load position switch for proper operation.
Ensure that the input field of the Load Position I/O Assignment (Section 7.3.48) has been assigned correctly.

### 8.1.29 Load Side Door Opened

Explanation: The washer control monitors the door closed switches on both sides of Anti-Cross Contamination machines. If the washer control has released the door latch on the unload side, and the door on the load side is opened, it will display this error.

Troubleshooting: Check the door closed switches on the load an unload sides of the machine.
Check the door clamps on the load and unload sides of the machine for proper adjustment and operation.
Ensure that the Door Closed (Section 7.3.56) and ACC Door (Section 7.3.87) I/O

Assignments are properly configured.

### 8.1.30 Low Extract Overload Tripped

Explanation: The washer control has lost its input from the low extract motor overload heater. (Most motor overloads use normally-closed contacts, so the input will be on when the motor has **not** overloaded.) The extract motor overload is the input for the Low Extract I/O Assignment (Section 7.3.11).

Troubleshooting: Check the motor overload heater for the low extract motor and reset the overload if necessary.
Check the Low Extract I/O Assignment and make sure that it is configured correctly. If the motor overload heater uses normally closed contacts, the input field for the Low Extract I/O Assignment should be inverted. If the motor overload heater uses normally open contacts, the input field should not be inverted. If this field is set to zero and you encounter this error, contact Custom Control Systems.

### 8.1.31 Machine Unbalanced

Explanation: The washer control has an input for a machine unbalanced switch on washer-extractors. The washer control will display this error when it gets an input from this switch.

Troubleshooting: Ensure that the machine is loaded evenly.
Check the unbalance switch for proper adjustment and operation.
Ensure that the Unbalance I/O Assignment (Section 7.3.25) is configured properly.

### 8.1.32 Motor Overload Tripped

Explanation: The washer control has lost its input from the motor overload heater. (Most motor overloads use normally-closed contacts, so the input will be on when the motor has **not** overloaded.) The motor overload is the input for the Motor Overload I/O Assignment (Section 7.3.36).

Troubleshooting: Check the motor overload heater and reset the overload if necessary.
Check the Motor Overload I/O Assignment and make sure that it is configured correctly. If the motor overload heater uses normally closed contacts, the input field for the Motor Overload I/O Assignment should be inverted. If the motor overload heater uses normally open contacts, the input field should not be inverted. If this field is set to zero and you encounter this error, contact Custom Control Systems.

### 8.1.33 Options Memory Failure

Explanation: The washer control uses a check value on the Options to keep track of changes and ensure that its memory has not been damaged. Each time the washer control is powered on, and each time the user starts a formula, it recalculates the check value to make sure it agrees with the check value calculated the last time the Options were edited. If the check values do not match, the washer control will display this error.

Troubleshooting: To clear an Options memory failure, follow the instructions in Section 6 for entering the Options Mode. Double-check your Option settings against your machine's drawing to ensure that they are all correct. If you spot any errors, correct them following the procedure in Section 6.5. If the Options appear to be

correct, follow the procedure in Section 6.5 to reenter any option and press the [EXIT] key. You will need to power the washer control down and back up once you have finished.

### 8.1.34 Panel Door Not In Position

Explanation: Some washers have an electrical panel door interlock switch. The washer control monitors this switch, and if it does not see an input from this switch while the washer has power, it will display this error.

Troubleshooting: Ensure that the electrical panel door is closed and locked.
Check the panel door interlock switch for proper operation and adjustment.
Ensure that the Panel Door Interlock I/O Assignment (Section 7.3.79) is configured properly.

### 8.1.35 Rear Cover Not In Position

Explanation: Some washers have a hydraulically lifted rear cover panel over their motor and pulley assembly. If the washer control does not see an input from the proximity switch that indicates that this cover is lowered into place over the motor and pulley assembly, it will display this error.

Troubleshooting: Ensure that the rear cover is in the correct (lowered) position.
Check the rear cover interlock switch for proper operation and adjustment.
Ensure that the Panel Door Interlock I/O Assignment (Section 7.3.79) is configured properly. The Panel Door Interlock type should be set to 1.

### 8.1.36 Rear Up/Down Switch Failure

Explanation: The washer control monitors the status of the rear up (Raise Rear I/O Assignment, Section 7.3.62) and rear down (Lower Rear I/O Assignment, Section 7.3.63) inputs. If it sees both inputs (indicating that the machine is up and down at the same time) it displays this error.

Troubleshooting: Check the rear up and rear down switches for proper alignment and operation.

### 8.1.37 RPM Limit Exceeded

Explanation: On machines equipped with an RPM encoder, the washer control can detect when the machine's rotational speed has become too high. If the machine's measured RPM is higher than the RPM limit set in the Options Mode (Section 6.5.49) the washer control will display this error.

Troubleshooting: Check the RPM encoder or proximity switch for proper adjustment and operation.
Check the RPM Limit option for proper configuration.
Check the RPM I/O Assignment (Section 7.3.41) for proper configuration.

### 8.1.38 Supply Hopper Door Open

Explanation: On machines equipped with a supply hopper door interlock switch, the washer control will display this error if the supply hopper door is not closed while the control is running a formula.

Troubleshooting: Ensure that the supply hopper door is closed.
Check the supply hopper door switch for proper adjustment and operation.
Check the Supply Hopper Door I/O Assignment (Section 7.3.80) for proper configuration.

### 8.1.39 Supply Malfunction

Explanation: The washer control allows the user to set a time limit for manually added chemical supplies. If this time limit is exceeded, the washer control will display this error.

Troubleshooting: Check the Maximum Wait Time (Section 6.4.8) for proper configuration.
Ensure that the operator has added the necessary chemical and has restarted the machine.
Check the Supply I/O Assignments (Section 7.5) for proper configuration.

### 8.1.40 Temperature Timeout

Explanation: The washer control allows the user to set a water temperature time-out. Whenever the washer control opens the steam valve to bring the temperature of the water in the washer up to the programmed water temperature, it runs a timer to ensure that it does not take too long to bring the water up to temperature. If the time taken to bring the water up to the programmed temperature is longer than the Temperature Timeout Option (Section 6.5.26) the washer control will display this error.

Troubleshooting: Check the washer's steam valve for proper operation.
Ensure that the washer's steam cutoff valve is open.
Ensure that the plant has proper steam pressure.
Ensure that the Temperature Timeout option is properly configured.
Ensure that the Steam I/O Assignment (Section 7.3.3) is properly configured.

### 8.1.41 Unload Position Switch Damaged

Explanation: The washer control has the ability to monitor both the normally open (Unload Position I/O Assignment, Section 7.3.50) and the normally closed (Invert Unload Position I/O Assignment, Section 7.3.51) contacts on the load position limit switch. If the washer control does not see the inputs from these switches in opposite states (the normally open contact's input on and the normally closed contact's input off when the machine is tilted to the load position, for example), it will display this error.

Troubleshooting: Check the unload position switch for proper adjustment and alignment.
Check the unload position switch contacts for proper operation.
Ensure that the correct inputs are assigned in the input fields of the Unload Position and Invert Unload Position I/O Assignments. The Unload Position input field should be configured for the switch that closes when the machine is tilted to the unload position. The Invert Unload Position input field should be configured for the switch that closes when the machine is not tilted to the unload position. The input fields for these I/O Assignments should not be inverted.

### 8.1.42 Unload Position Switch Failure

Explanation: The washer control monitors the state of its unload position input while running a formula. If the washer control sees an input from the unload position switch while it is running a formula, it will display this error.

Troubleshooting: Check the unload position switch for proper adjustment and alignment.
Check the unload position switch for proper operation.
Ensure that the input field of the Unload Position I/O Assignment (Section 7.3.50) has been assigned correctly.

### 8.1.43 Unload Side Door Opened

Explanation: The washer control monitors the door closed switches on both sides of Anti-Cross Contamination machines. If the washer control has released the door latch on the load side, and the door on the unload side is opened, it will display this error.

Troubleshooting: Check the door closed switches on the load an unload sides of the machine.
Check the door clamps on the load and unload sides of the machine for proper adjustment and operation.
Ensure that the Door Closed (Section 7.3.56) and ACC Door (Section 7.3.87) I/O Assignments are properly configured.

### 8.1.44 Variable Frequency Drive Fault

Explanation: Most variable frequency drives have an output that is activated when the drive enters a fault condition (DC Bus Undervoltage, etc.). The washer control will display this error message when it sees this input.

Troubleshooting: Check the variable frequency drive and clear any fault that may be displayed.
Check the electrical connections between the washer control and the variable frequency drive.
Ensure that the Inverter Fault I/O Assignment (Section 7.3.98) is configured correctly.

### 8.1.45 Vibration Switch Tripped

Explanation: The washer control monitors an input from a machine vibration switch. If the washer control sees an input from the vibration switch, it will display this error.

Troubleshooting: Check to see if the machine has been vibrating excessively.
Check the vibration switch for proper adjustment and operation.
Ensure that the Vibration Switch I/O Assignment (Section 7.3.85) is configured correctly.

### 8.1.46 Walkway Not In Position

Explanation: Some washers have service walkway interlock switch. The washer control monitors this switch, and if it does not see an input from this switch while the washer has power, it will display this error.

Troubleshooting: Ensure that the walkway is in the correct position.
Check the walkway interlock switch for proper operation and adjustment.
Ensure that the Walkway Down I/O Assignment (Section 7.3.78) is configured properly.

### 8.1.47 Wash Motor Overload Tripped

Explanation: The washer control has lost its input from the wash motor overload heater. (Most motor overloads use normally-closed contacts, so the input will be on when the motor has **not** overloaded.) The motor overload is the input for the Motor Overload I/O Assignment (Section 7.3.36). This error will appear only if the machine has separate inputs for the wash motor and extract motor overloads.

Troubleshooting: Check the wash motor overload heater and reset the overload if necessary.
Check the Motor Overload I/O Assignment and make sure that it is configured

correctly. If the motor overload heater uses normally closed contacts, the input field for the Motor Overload I/O Assignment should be inverted. If the motor overload heater uses normally open contacts, the input field should not be inverted. If this field is set to zero and you encounter this error, contact Custom Control Systems.

### 8.1.48 Wash Position Switch Damaged

Explanation: The washer control has the ability to monitor both the normally open (Wash Position I/O Assignment, Section 7.3.46) and the normally closed (Invert Wash Position I/O Assignment, Section 7.3.47) contacts on the wash position limit switch. If the washer control does not see the inputs from these switches in opposite states (the normally open contact's input on and the normally closed contact's input off when the machine is tilted to the wash position, for example), it will display this error.

Troubleshooting: Check the wash position switch for proper adjustment and alignment.
Check the wash position switch contacts for proper operation.
Ensure that the correct inputs are assigned in the input fields of the Wash Position and Invert Wash Position I/O Assignments. The Wash Position input field should be configured for the switch that closes when the machine is tilted to the wash position. The Invert Wash Position input field should be configured for the switch that closes when the machine is not tilted to the wash position. The input fields for these I/O Assignments should not be inverted.

### 8.1.49 Wash Position Switch Failure

Explanation: The washer control monitors the state of its wash position input while running a formula. If the washer control does not see an input from the wash position switch while it is running a formula, it will display this error.

Troubleshooting: Check the wash position switch for proper adjustment and alignment.
Check the wash position switch for proper operation.
Ensure that the input field of the Wash Position I/O Assignment (Section 7.3.46) has been assigned correctly.

### 8.1.50 Water Level Fill Timeout

Explanation: The washer control allows the user to set a water level fill time-out. Whenever the washer control opens the water valves to bring the water level in the washer up to the programmed water level, it runs a timer to ensure that it does not take too long to bring the water up to level. If the time taken to bring the water up to the programmed level is longer than the Fill Timeout option (Section 6.5.25) the washer control will display this error.

Troubleshooting: Check the washer's water valves for proper operation.
Ensure that the washer's water cutoff valves are open.
Ensure that the plant has proper water pressure.
Ensure that the Fill Timeout option is properly configured.
Ensure that the Hot Water (Section 7.3.1) and Cold Water (Section 7.3.2) I/O Assignments are properly configured.

# Appendix A

## Character Set

Provided below, is a partial list of the available characters used in programming formula and step names. To access this list, you must be programming or editing a formula or step name. Press the [UP or DOWN ARROW] keys to scroll through the set of characters.

See Edit Formula Name, Section 4.5, and Editing Step Name, Section 4.7, for more details.

! " # $ % & ' ( ) * + , - . /

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[ \ ] ^ _ `

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{ | } ~

# Appendix B

## Pre-Programmed Step Names

The PC-5000 has provided a data base of Pre-Programmed Step Names. This file cannot be edited or erased, however, can be added to at any time, simply by entering a new step name. To access this list, see Programming Step Name, Section 4.7.

**A**
AC Rinse
Acid Bath

**B**
Bleach
Bleach / Suds
Bleach / Break
Break
Break / Bleach

**C**
C-Over / Suds
Carryover
Coast
Cold Flush
Cold Rinse
Cool Down

**D**
De-Hair
Drain
Drain / Still
Drain > Sewer
Drain One Way
Drain Revsing
Drain / Hi Ext
Drain L+H Ext
Drain / Lo Ext
Dye

**E**
Enzyme Flush
Extract

**F**
Fill
Fill Temp
Fill / Level / Temp
Final Extract
Fluff
Flush

**G**
Gentle Wash

**H**
Hi-Extract
High Extract
Hot Flush
Hot Rinse

**I**
Int Extract

**L**
Level
Level / Temp
Lo-Extract
Lo / Hi Extract
Low Extract

**M**
Mildewcide

**N**
No Rotation

**O**
Oil Treatment
Oxalic Bath

**P**
Pause
Poly-Rinse

**R**
Raise Level
Reuse Drain
Reuse Fill
Reuse Flush
Reuse One Way
Reuse Rinse
Reuse Water
Rinse
Rinse Part 1
Rinse Part 2

**S**
Shakeout
Signal
Softener
Sour
Sour / Dye
Sour / Soft
Sour / Starch
Sour Bath
Sour / Star / Mil
Special Drain
Split Flush
Split Rinse
Starch
Starch / Mildew
Start
Steam
Stop
Strip
Suds
Suds / Bleach
Suds 1
Suds 2

**T**
Temperature
Treatment
Tumble

**W**
Warm Flush
Warm Rinse
Wash One Way

# Appendix C
## I/O Assignments

| Number | Description | LED | Relay | Input | Type |
|---|---|---|---|---|---|
| 1 | Hot Water | | | | |
| 2 | Cold Water | | | | |
| 3 | Steam | | | | |
| 4 | Drain | | | | |
| 5 | Poly Rinse | | | | |
| 6 | Reuse Water | | | | |
| 7 | Reuse Drain | | | | |
| 8 | Motor Forward | | | | |
| 9 | Motor Reverse | | | | |
| 10 | Balance Motor | | | | |
| 11 | Low Extract | | | | |
| 12 | High Extract | | | | |
| 13 | Signal | | | | |
| 14 | Medium Extract | | | | |
| 15 | Indirect Cool | | | | |
| 16 | Indirect Steam | | | | |
| 17 | Optional Motor Forward | | | | |
| 18 | Optional Motor Reverse | | | | |
| 19 | Overflow Drain | | | | |
| 20 | Unassigned | | | | |
| 21 | Aux 1 | | | | |
| 22 | Aux 2 | | | | |
| 23 | Aux 3 | | | | |
| 24 | Aux 4 | | | | |
| 25 | Unbalance | | | | |
| 26 | Balance Verify | | | | |
| 27 | Brake | | | | |
| 28 | Clutch | | | | |
| 29 | Start | | | | |
| 30 | Stop | | | | |
| 31 | Formula Up | | | | |
| 32 | Formula Down | | | | |
| 33 | Hold | | | | |
| 34 | Communications | | | | |
| 35 | Extract Overload | | | | |
| 36 | Motor Overload | | | | |
| 37 | Hydraulic Pump | | | | |
| 38 | Extract Request | | | | |
| 39 | Zero Speed | | | | |
| 40 | Chemical Hold | | | | |
| 41 | RPM | | | | |
| 42 | Auto Position Enable | | | | |
| 43 | Supervisor Key | | | | |
| 44 | Safety/Tilt Function | | | | |
| 45 | Run/Unload | | | | |
| 46 | Wash Position | | | | |
| 47 | Invert Wash Position | | | | |
| 48 | Load Position | | | | |

| Number | Description | LED | Relay | Input | Type |
|---|---|---|---|---|---|
| 49 | Invert Load Position | | | | |
| 50 | Unload Position | | | | |
| 51 | Invert unload position | | | | |
| 52 | Inlet | | | | |
| 53 | Invert Inlet | | | | |
| 54 | Door Open | | | | |
| 55 | Invert Door Open | | | | |
| 56 | Door Closed | | | | |
| 57 | Invert Door Closed | | | | |
| 58 | Raise Door | | | | |
| 59 | Lower Door | | | | |
| 60 | Door Seal | | | | |
| 61 | Door latch | | | | |
| 62 | Raise Rear | | | | |
| 63 | Lower Rear | | | | |
| 64 | Raise front | | | | |
| 65 | Lower Front | | | | |
| 66 | Chute Down | | | | |
| 67 | Chute Up | | | | |
| 68 | Chute lock | | | | |
| 69 | Chute Spray | | | | |
| 70 | LAM | | | | |
| 71 | RAM | | | | |
| 72 | FA | | | | |
| 73 | LAVRAV | | | | |
| 74 | LB1 | | | | |
| 75 | HB | | | | |
| 76 | BPS | | | | |
| 77 | BWS | | | | |
| 78 | Walkway Down | | | | |
| 79 | Panel Door | | | | |
| 80 | Supply Door | | | | |
| 81 | Hot Oil | | | | |
| 82 | Oil Filter | | | | |
| 83 | Start Inhibit | | | | |
| 84 | Safety Reset | | | | |
| 85 | Vibration Switch | | | | |
| 86 | Balance Enable | | | | |
| 87 | ACC Door | | | | |
| 88 | ACC Load/Unload Switch | | | | |
| 89 | ACC Unload Jog Forward | | | | |
| 90 | ACC Unload Jog Reverse | | | | |
| 91 | ACC Unload Light/Unload Side | | | | |
| 92 | ACC Load Light/Unload Side | | | | |
| 93 | ACC Unload Light/Load Side | | | | |
| 94 | ACC Load Light/Load Side | | | | |
| 95 | Low Level | | | | |
| 96 | Auto/Manual | | | | |
| 97 | Jog Input | | | | |
| 98 | Inverter Fault | | | | |
| 99 | Door Seal Vent | | | | |
| 100 | At Set Frequency | | | | |

| Number | Description | LED | Relay | Input | Type |
|---|---|---|---|---|---|
| 101 | AutoJog Position Select Load | | | | |
| 102 | AutoJog Position Select Unload | | | | |
| 103 | AutoJog At Position Load | | | | |
| 104 | AutoJog At Position Unload | | | | |
| 105 | AutoJog Jog Load | | | | |
| 106 | AutoJog Jog Unload | | | | |
| 107 | AutoJog Motor Forward | | | | |
| 108 | AutoJog Motor Reverse | | | | |
| 109 | AutoJog Clutch | | | | |
| 110 | Low Speed Motor Select | | | | |
| 111 | High Speed Motor Select | | | | |
| 112 | Base Block | | | | |
| 113 | Push Forward | | | | |
| 114 | Push Back | | | | |
| 115 | Cylinder in Position | | | | |
| 116 | Position Cylinder | | | | |
| 117 | Unlock Door | | | | |
| 118 | Motor Fan | | | | |
| 119 | Front Lock Pins | | | | |
| 120 | Rear Lock Pins | | | | |
| 121 | Lock Cylinder | | | | |
| 122 | Unlock Cylinder | | | | |
| 123 | Hydraulic Fault | | | | |
| 124 | Filter Pump | | | | |
| 125 | Condensate Return | | | | |
| 126 | Indirect Cool Out | | | | |
| 127 | | | | | |
| 128 | | | | | |

# Appendix D

## Multi I/O Assignment Chart

| Number | Description | A | B | C | D |
|---|---|---|---|---|---|
| 201 | | | | | |
| 202 | | | | | |
| 203 | | | | | |
| 204 | | | | | |
| 205 | | | | | |
| 206 | | | | | |
| 207 | | | | | |
| 208 | | | | | |
| 209 | | | | | |
| 210 | | | | | |
| 211 | | | | | |
| 212 | | | | | |
| 213 | | | | | |
| 214 | | | | | |
| 215 | | | | | |
| 216 | | | | | |

## Supply I/O Assignment Chart

| Number | Supply Name | Type | LED | Relay | Reset | Flowmeter | Pump | Flush |
|---|---|---|---|---|---|---|---|---|
| 1 | | | | | | | | |
| 2 | | | | | | | | |
| 3 | | | | | | | | |
| 4 | | | | | | | | |
| 5 | | | | | | | | |
| 6 | | | | | | | | |
| 7 | | | | | | | | |
| 8 | | | | | | | | |
| 9 | | | | | | | | |
| 10 | | | | | | | | |
| 11 | | | | | | | | |
| 12 | | | | | | | | |
| 13 | | | | | | | | |
| 14 | | | | | | | | |
| 15 | | | | | | | | |
| 16 | | | | | | | | |

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