



# PC-5000

# Operation

# Manual

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## **INTRODUCTION**

The **PC-5000** is a compact, state of the art, easy to program, microcomputer based Industrial Control. It is capable of communications, data logging and user programmable process control. It was designed to accommodate a wide variety of I/O requirements.

## **HARDWARE**

The hardware options include essential components such as nonvolatile memory, optional real time clock and calendar, analog input channels, timers, counters, and 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, a two line alphanumeric adjustable brightness or contrast display, and 32 LED light bars that can be custom labeled with text to continuously indicate control status.

## **SOFTWARE**

The Software for the **PC-5000** was designed to be modular and consists of a library of functions that were developed in a combination of C and Assembly Language. As time passes and new features and needs are identified, additional drivers will be constructed and added to the library. A specific application can be constructed by Custom Control Systems from this library and some additional C programming to meet various control needs. The resultant code is compiled and placed into an EPROM on the processor board. The application described in the following pages was specifically designed to control an Industrial Washing Machine.

## **SOFTWARE RELIABILITY**

In order to insure that the processor executes formulas exactly as they were written 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**

### **PROCESSOR BOARD**

Micro controller - Siemens 80535  
64K or 128K ROM  
128K Battery backed RAM (Optionally Expandable to 512K)  
Real Time Clock and Calendar, Optional  
RS-485 Communications Port

### **DISPLAY BOARD**

2 Lines x 16 Character Alphanumeric LED Display  
32 LED Light Blocks with Custom Printed Text  
3 Display Brightness or Contrast Settings

### **MEMBRANE PANEL**

31 Key Keyboard

### **HIGH SPEED OPTICALLY ISOLATED DIGITAL I/O**

## **SOFTWARE FEATURES**

### **FORMULAS**

96 Formulas Standard, Expandable to 512  
Up to 16 Chemical Injections  
Formulas can be LINKED

### **STEPS**

60 Steps per Formula  
Step consists of: Time in Minutes and Seconds  
Chemical Injections  
25 Programmable Digital Levels (0-25 inches)  
255 Programmable Digital Temperatures (0-255°F)  
Washer Functions

### **OPTIONAL REAL TIME CLOCK & CALENDAR**

Date and time stamps the Operation Log.  
Time kept even when power is off.

### **OPTIONAL OPERATION LOG**

64 Blocks of data stored in internal memory  
Function used to track production, actual formula run time, turn around time, idle time, programming and calibration.

## **WARRANTY**

All products manufactured by CUSTOM CONTROL SYSTEMS INC. (CCS), are warranted against defects in material and workmanship for one (1) year from the date of purchase. Warranty is extended to the original purchaser only.

If 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 repair 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.



# **MODES OF OPERATION**



## 1. RUN MODE IDLE

### 1.1 ACTIVE KEYS

- [0] - [9]            Used to enter FORMULA NUMBER.
- [UP ARROW]        Used to INCREMENT FORMULA NUMBER. *(only active in the run mode after the formula has run to the end step.)*
- [DOWN ARROW]     Used to DECREMENT FORMULA NUMBER. *(only active after the formula has run to the end step.)*
- [RIGHT ARROW]    Used to INCREMENT STEP NUMBER. *(only active in run mode after formula has been started and stopped).*  
See STEP ADVANCE OPTION, Section 6.5.14.
- [LEFT ARROW]     Used to DECREMENT STEP NUMBER. *(only active in run mode after formula has been started and stopped).*  
See STEP ADVANCE OPTION, Section 6.5.14.
- [EDIT (HELP)]     Used to DISPLAY HOLD INFORMATION & FORMULA
- [LEVEL/TEMP]     Used to Display Actual Level and Temperature or programmed values.
- [MODE SEL.]       Used to SELECT MODE.
- [TIME]             Used to Display Step, Programmed, Elapsed, or Remaining Time.
- [FORM. NAME]     Used to display FORMULA NAME.
- [OPER. NAME]     Used to display OPERATION NAME.
- [START]            Used to START the FORMULA at the selected step and enter the RUN MODE RUNNING.
- [EXIT]             Used to EXIT current operation.
- [ENTER]            Used to complete numeric entry.

## 1.2 MODE SELECT

When the processor is first powered ON, it comes up in the RUN MODE. To change to any other mode press [MODE SEL.] key. Entry into any other mode may be protected by the assignment of a Password.

See PASSWORD OPTION, Section 6.5.16.

## 1.3 SELECT FORMULA

Formulas can be selected by one of two methods:

1. Press the [UP ARROW] and [DOWN ARROW] keys to scroll through the available formulas. The FORMULA NAME and NUMBER will appear in the TOP DISPLAY with the STEP NO., TEMP, LEVEL and TIME appearing in the BOTTOM DISPLAY.
2. Press the numeric keypad ([0]-[9]) to enter the desired formula number (01=formula 1; 16=formula 16). The FORMULA NAME and NO. will appear in the TOP DISPLAY and the STEP NO. will appear in the BOTTOM DISPLAY. If a mistake is made, reenter the desired formula number.

NOTE: Formulas can only be selected after the current formula has run to the end step and the signal or stop buttons have been pressed. This feature can be bypassed if desired, See STEP ADVANCE OPTION, Section 6.5.14.

## 1.4 SELECT STEP

1. To scroll through the available STEPS in the selected formula, press [ENTER] then use [RIGHT ARROW] or [LEFT ARROW] to scroll to the desired STEP. The STEP NAME will appear in the TOP DISPLAY and the STEP NO. will appear in the BOTTOM 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 OPTION, Section 6.5.14.

## 1.5 RUN A FORMULA

1. Select desired FORMULA.
2. Press [START] key. RUN MODE RUNNING is started.

## 2. RUN MODE RUNNING

### 2.1 ACTIVE KEYS

[STOP]	Used to STOP the FORMULA processing and enter the RUN MODE STOPPED MODE.
[SIGNAL]	Used to cancel the SIGNAL and resume processing of the FORMULA or if it is the END STEP of the FORMULA it enter the RUN MODE IDLE MODE.
[EDIT(HELP)]	Used to DISPLAY HOLD INFORMATION. E.g. Why is Control Timer Holding.
[TIME]	Used to Display Step, Programmed, Elapsed, or Remaining Time.
[LEVEL/TEMP]	Used to Display Actual Level and Temperature or programmed values.

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### 2.2 RUNNING FORMULA

Function is started at the beginning of the selected STEP. The FORMULA TIMER will be started when all timer hold related conditions 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 6.5.7.

#### 2.2.2 Maintain WATER TEMPERATURE Setting

- A. BELOW WATER LEVEL
  1. Activate HOT WATER if TEMP. 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 TEMP. 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 TEMP. is BELOW set point. (Steam will only be activated if it has been programmed into the step.)
2. Turn OFF STEAM if TEMP. 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.

#### B. Weight (Load Cell)

1. Turn ON programmed CHEMICAL OUTPUTS if chemical weight is less than the programmed weight.
2. Turn OFF programmed CHEMICAL OUTPUTS when chemical weight is equal to the programmed weight.

#### C. Counted (Flow Meter)

1. Turn ON programmed CHEMICAL OUTPUTS if chemical volume is less than the programmed volume.
2. Turn OFF programmed CHEMICAL OUTPUTS when chemical volume is equal to the programmed volume.

#### **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 OPTIONS SETTINGS can affect when the STEP TIMER holds, and when it runs. See OPTIONS, Section 6.5 for more detail.

#### **2.3 EDIT (HELP)**

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

### 3. RUN MODE STOPPED

#### 3.1 ACTIVE KEYS

- [MODE SEL] Used to ENTER MODE SELECT MODE.
- [START] Used to START the FORMULA at the selected STEP and ENTER the RUN MODE RUNNING .
- [EDIT (HELP)] Used to DISPLAY HOLD INFORMATION and FORMULA NAME.
- [0] - [9] Used to enter FORMULA NUMBER. *(only active in the RUN MODE after the formula has run to the end step or if option STEP ADVANCE is set to YES and the stop button has been pressed)*. See STEP ADVANCE, Section 6.5.14.
- [ENTER] Used to complete the numeric entry of the PASS CODE when entering into other MODES.
- [RIGHT ARROW] Used to INCREMENT STEP NUMBER. *(only active in the run mode if option STEP ADVANCE is set to YES and stop button has been pressed)*.
- [LEFT ARROW] Used to DECREMENT STEP NUMBER. *(only active in the run mode if option STEP ADVANCE is set to YES and the stop button has been pressed)*.
- [TIME] Used to Display Step, Programmed, Elapsed, or Remaining Time.
- [LEVEL/TEMP] Used to Display Actual Level and Temperature or programmed values.

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## 4. PROGRAM MODE

The **PROGRAM MODE** is used to program up to 32 Formulas and 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 Lock Code (Optional Password) has not been enabled, then press [MODE SEL.] and proceed to Step 4. below.

If the Lock Code has been enabled, then start at Step 1. below.

NOTE: The Factory Default Entry Code is 5000.  
See PASSWORD, Section 6.5.16.

1. Press [MODE SEL.] key.  
The top display will now read: "Password \_"
2. Press the 5, then the 0, then the 0, and then the 0.  
The top display will now read: "Password \*\*\*\*\_"
3. Press [ENTER] key. The active "MODE STATUS DISPLAY" has now changed to "PROG."
4. You are now in the "PROGRAM MODE" ready to program new or edit old formulas.

### 4.2 ACTIVE KEYS

[UP ARROW] Used to INCREMENT FORMULA NUMBER, when in EDIT MODE.

[DOWN ARROW] Used to DECREMENT FORMULA NUMBER, when in EDIT MODE.

[UP ARROW] Used to INCREMENT STEP NUMBER, when in EDIT MODE.

[DOWN ARROW] Used to DECREMENT STEP NUMBER, when in EDIT MODE.

[MODE SEL.] Used to EXIT PROGRAM MODE and ENTER NEXT MODE.

[FORM. NAME] Used to DISPLAY and EDIT FORMULA NAME.

[OPER. NAME] Used to DISPLAY and EDIT STEP/OPERATION NAME.

[PROG. OUTS] Used to ACTIVATE / DEACTIVATE PROGRAM OUTPUTS cursor.

[OPER. NO.] Used to SELECT STEP/OPERATION MODE.

[EXIT] Used to EXIT from current mode.

[ENTER] Used to COMPLETE ENTRY and SAVE DATA.

[EDIT] Used to EDIT various items in areas of PROGRAM MODE.

### **4.3 DISPLAYS**

When first entering the PROGRAM FORMULA MODE the TOP DISPLAY will Show the FORMULA NAME and NUMBER. The BOTTOM DISPLAY will show the STEP NUMBER, LEVEL, TEMPERATURE and TIME. The LED BAR LIGHT DISPLAY will show the OUTPUTS that are programmed to activate in the selected STEP.

### **4.4 SELECT FORMULA**

Select the FORMULA NUMBER to be programmed or edited using the [UP ARROW] key to INCREMENT to the next FORMULA NO. or the [DOWN ARROW] key to DECREMENT to the previous FORMULA NO. Numeric keys can also be used to advance directly to desired FORMULA NO. Notice that the two left most digits of the top display increment and decrement with the "UP ARROW" and "DOWN ARROW" keys respectively. These digits represent the FORMULA NUMBER.

## 4.5 EDIT FORMULA NAME

The FORMULA NAME is displayed to the right of the FORMULA NO. To edit the FORMULA NAME use the following procedures:

1. Press the [FORM. NAME] key. A flashing cursor will appear on first character of the FORMULA NAME. This can only be done in Step 01 of the formula to be edited. You are now in the Alpha-Numeric Entry Mode which will allow you to program the FORMULA NAME.
2. The MULTIFUNCTION keys 0 - 9 also contain the alphabet. Under each number there are three letters. For example the number [1] key also contains the letters "ABC". The first time the key is pressed the number "1" will appear at the cursor location. The next time the key is pressed the letter "A" will replace it. The next time the key is pressed the letter "B" will replace it, then the letter "C" and then back to the number "1".
3. Use these MULTIFUNCTION keys to select the first letter of the FORMULA NAME. Press the [RIGHT ARROW] key to move the cursor to the second letter position of the FORMULA NAME and proceed with your next letter.
5. If a mistake is made, the [RIGHT ARROW] and [LEFT ARROW] keys can be used to position the cursor over the desired letter to make a correction or the [CLEAR] key can be used to clear the entire formula name.
6. Continue the above described method for programming the rest of the FORMULA NAME. When editing is complete, press [ENTER] to save FORMULA NAME. The BOTTOM DISPLAY will read "NAME SAVED" for 1.5 seconds.

## 4.6 SELECT FORMULA STEPS

First select the FORMULA in which you would like to edit STEPS, then

1. To select the STEP NUMBER to be Programmed or Edited, using the [RIGHT ARROW] key to INCREMENT to the NEXT STEP and the [LEFT ARROW] key to DECREMENT to the PREVIOUS STEP. Notice that the two left most digits of the bottom display increment and decrement with the [RIGHT ARROW] and [LEFT ARROW] keys respectively. These digits represent the STEP NUMBER. The STEP NAME is shown on the top display.

## 4.7 PROGRAMMING STEP NAME

If the DEFAULT STEP NAME is acceptable, proceed to Section 4.8. If you wish to change or edit the STEP NAME use the following procedures:

1. Press the [EDIT] key, then select 3-NAME. A flashing cursor will appear in the top display. You are now in the Alpha-Numeric Entry Mode that will allow you to program the STEP NAME.
2. The MULTIFUNCTION keys 0 - 9 also contain the alphabet. Under each number there are three letters. For example the number [1] key also contains the letters "ABC". The first time the key is pressed the number "1" will appear at the cursor location. The next time the key is pressed the letter "A" will replace it. The next time the key is pressed the letter "B" will replace it, then the letter "C" and then back to the number "1".
3. Use these MULTIFUNCTION keys to select the first letter of the STEP NAME. Press [OPER. NAME] key to scroll this of Pre-Programmed Step Names (See Appendix B for complete list). Or continue with these procedures if you would like a custom name.
4. Press the [RIGHT ARROW] key to move the cursor to the second letter position of the STEP NAME.
5. If a mistake is made, the [RIGHT ARROW] and [LEFT ARROW] keys can be used to position the cursor over the desired letter to make a correction or the [CLEAR] key can be used to clear the entire step name.
6. Continue the above described method for programming the rest of the STEP NAME and the press [EXIT] to Save the STEP NAME.

## 4.8 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. Many 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.

<u>Output</u>	<u>Multi-Function Key #</u>
Hot Water	2
Cold Water	7

Steam	6	
<u>Output</u>	<u>Multi-Function Key #</u>	(continued)
Drain	3	
Reuse Water	1	
Reuse Drain	8	
Poly Rinse/Cool down - Press 7 twice		
Low Extract	7	
High Extract	4	
Wash Motor For.	5	
Wash Motor Rev.	0	
Signal	Signal	
Auxiliaries	Press [PROG. OUTS] to view list, [UP ARROW]	
and	[DOWN ARROW] to select the	
desired auxiliary	output, and [ON/OFF]	
to enable or disable the output		

2. Proceed to programming water level and temperature for this STEP.

#### 4.9 PROGRAMMING WATER LEVEL and WATER TEMPERATURE

When water level and/or water temperature need to be programmed the following procedure must be used:

1. Press [LEVEL/TEMP.] key. Notice that the right most digit in the LEVEL field begins to flash. The flashing cursor is the controls way of requesting input in this field.
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]". The display will now read "13" with the 3 flashing.
3. When the desired level has been selected, press [LEVEL/TEMP.] key. The temperature display will now begin to flash.
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 and notice that the flashing cursor has turned off.

NOTE: If the wrong level 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". The correct value can be now programmed. **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.**

#### 4.10 PROGRAMMING TIME

When step time needs to be entered or changed the following procedure must be used:

1. Press the [TIME] key. Notice that the right most digit of the time display begins to flash. Again, as with level and temperature, the flashing cursor is the control's way of requesting input from the MULTIFUNCTION keys.
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 selected press the [TIME] key and notice that the flashing cursor has turned off.

#### 4.11 PROGRAMMING CHEMICALS / SUPPLIES

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

1. Press the [SUP.] 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 [SUP] repeatedly will cycle through a List of Pre-programmed Supplies. If supplies have not been pre-programmed, 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 Step 1 & 2 for all required supplies for that 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". The correct volume can now be programmed. **If the [CLEAR] key is pressed without a cursor flashing the entire step will be erased, including any other outputs, time, level or temperature that were previously programmed.**

## 4.12 SAVE STEP

When all the desired elements of the step have been entered, the step must be recorded into memory. To do this, press [ENTER]. The bottom display will flash "Step Saved" for about 1 second and then automatically advance to the NEXT STEP.

## 4.13 END STEP

When you have completed entering all required STEPS 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.

## 4.14 PROGRAMMING EDIT

The Programming Edit Function was developed specifically to allow the user to perform Special Programming Tasks, such as, Edit Step Name, Insert a Step, Delete a Step, Program Wash RPM, or Gentle Action Timer. The use of these Special Functions are as follows:

### 4.14.1 Edit Step Name

- A. Select the desired STEP to be edited.
- B. Press the [EDIT] key. The top display will now read "1-Ins, 2-Del",

and the bottom display will read "3-Name, 4-Jump".

- C. Press the [3] key. The displays will show the current step data with a flashing cursor in the name display.
- D. Use the Multi-Function keys [0 - 9] to edit the old name or use the [CLEAR] key to clear the entire line and enter a new name.
- E. Press [EXIT] to complete the changes and leave the EDIT MODE.

#### 4.14.2 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:

- A. Select STEP (4) using the [RIGHT ARROW] or [LEFT ARROW] keys.
- B. Press the [EDIT] key. The top display will now read "1-Ins, 2-Del", and the bottom display will read "3-Name, 4-Jump".
- C. Press the [1] key.
- D. 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 display will flash "Step Saved". The Program Edit Mode will be exited and the Program Mode reentered automatically.

See Section 4.7 for programming STEP data.

#### 4.14.3 Delete a Step

- A. Select the STEP you wish to DELETE using the [RIGHT ARROW] or [LEFT ARROW] keys.
- B. Press the [EDIT] key. The top display will now read "1-Ins, 2-Del", and the bottom display will read "3-Name, 4-Jump".
- C. Press the [2] key.

D. Deletion is complete.

After the deletion is complete, the contents of the selected step will be cleared and all of the steps following the current step will be renumbered one lower. When the renumbering is complete, the Program Edit Mode will be exited and the Program Mode reentered automatically.

#### **4.14.4 Jump / Go To**

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

- A. Press the [EDIT] key. The top display will now read "1-Ins, 2-Del", and the bottom display will read "3-Name, 4-Jump".
- B. Press the [4] key. The display will read "Jump to Step", with a flashing cursor.
- C. Using the numeric keypad, select the step you wish to go to. Press [ENTER] and notice that the step no. has changed to the desired step.

#### **4.14.5 Program Wash RPM (optional)**

#### **4.14.6 Gentle Action Timer (optional)**

### **4.15 EXIT PROGRAM MODE**

Press [MODE SEL] to move from PROGRAM MODE into MANUAL MODE. Press [MODE SEL] again to move from MANUAL MODE into OPTION MODE. Press [MODE SEL] again to move into the RUN MODE.



## 5. MANUAL MODE

The **MANUAL MODE** is used to manually active the outputs on the machine. This feature is commonly used test outputs or run the machine with a simple formula (e.g. Rinse, Drain).

### 5.1 ENTERING MANUAL MODE

If the Lock Code (Optional Password) has not been enabled then press the [MODE SEL.] key and go to Step 4. below.

If the Lock Code has been enabled, start at Step 1. below.

NOTE: The Factory Default Entry Code is 5000.  
See PASSWORD, Section 6.5.16.

1. Press the [MODE SEL.] key.  
The top display will now read: "Password \_"
2. Press the 5, then the 0, then the 0, and then the 0.  
The top display will now read: "Password \*\*\*\*\_"
3. Press the [ENTER] key. The active "MODE STATUS DISPLAY" has now changed to "PROG."
4. Press [MODE SEL.] again and notice that the active "MODE STATUS DISPLAY" has now changed to "MAN." You are now in the "MANUAL MODE".

### 5.2 ACTIVE KEYS

- |            |   |
|------------|---|
| [1] - [4]  | Used to energize the outputs that are designated on each of the keys. |
| [MODE SEL] | Used to EXIT MANUAL MODE and ENTER the next MODE.                     |
| [EDIT]     | Used to enter the REVIEW HOUR METER / FORMULA COUNT Section.          |

### 5.3 DISPLAYS

When first entering the MANUAL MODE the TOP DISPLAY will Show "Manual Mode". The BOTTOM DISPLAY will show the current water level and temperature.

### 5.4 MANUALLY ACTIVATING OUTPUTS

Select the output to be activated by pressing the MULTIFUNCTION keys, [1] - [4]. Hot, Cold, Steam or Drain are the only outputs that can be manually activated. The output will remain active, only while the key is being depressed.

### 5.5 REVIEW HOUR METER / FORMULA COUNTERS

1. Press the [EDIT] key. The review HOUR METER / FORMULA COUNT Section of the MANUAL MODE will be entered. The top display will read "Hour meter" and the bottom 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 COUNTER MODE and return to the Manual Mode.

NOTE: Formulas will only be displayed if they have been previously run. Total Counter will not be reset.

## **5.6 RESET FORMULA COUNTERS**

1. Press the [EDIT] key to enter the review HOUR METER / FORMULA COUNT MODE. 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 option 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 COUNTER MODE and return to the Manual Mode.

## **5.7 EXIT MANUAL MODE**

Press [MODE SEL.] to exit the MANUAL MODE and into the OPTION MODE.  
Press [MODE SEL.] again to exit OPTION MODE and return to RUN MODE.



## 6. OPTIONS MODE

The **OPTIONS MODE** is used to select, review and set certain important parameters that effect the operations of the PC-5000. Selection 6.5 outlines all **OPTIONS**. Depending on the configuration of your control, some of the listed **OPTIONS** may not be available to you. The only **OPTIONS** that will be displayed, are the **OPTIONS** available based on your control configuration.

### 6.1 ENTERING OPTIONS MODE

If the Lock Code (Optional Password) has not been enabled then press the [MODE SEL.] key and go to Step 4. below.

If the Lock Code has been enabled, start at Step 1. below.

NOTE: The Factory Default Entry Code is 5000.

See **PASSWORD**, Section 6.5.16.

1. Press the [MODE SEL.] key.  
The top display will now read: "Password \_"
2. Press the 5, then the 0, then the 0, and then the 0.  
The top display will now read: "Password \*\*\*\*\_"
3. Press the [ENTER] key. The active "MODE STATUS DISPLAY" has now changed to "PROG."
4. Press [MODE SEL.] again and notice that the active "MODE STATUS DISPLAY" has now changed to "MAN.". You are now in the "MANUAL MODE".
5. Press [MODE SEL.] again, you are now in the "OPTIONS MODE".

### 6.2 ACTIVE KEYS

[UP ARROW] Used to INCREMENT OPTION.

[DOWN ARROW] Used to DECREMENT OPTION.

[EDIT] Used to EDIT OPTION VALUES.

[CLEAR] Used to CLEAR OPTION VALUE. Use only when cursor is flashing on OPTION VALUE.

[ENTER]	Used to COMPLETE ENTRY and SAVE DATA.
[MODE SEL]	Used to EXIT OPTION MODE and enter RUN MODE.
[SUP.]	Used to ENTER CHEMICAL NAME / CALIBRATION Section of the OPTION 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 OPTION MODE.

### 6.3 DISPLAYS

When first entering the OPTIONS MODE the DISPLAY will show the first available OPTION.

### 6.4 CHEMICAL NAME AND CALIBRATION SETTINGS

Press [SUP.] 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 [OPER. NAME] key to begin to edit. Using the Multi-Function 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 pre-programmed list or use the Multi-Function 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 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.

**6.5.5 INJECTION GROUP:** The following setting 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 Step1. Or press [EXIT] to return to OPTIONS MODE.

## 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 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.

**6.5.4 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.

- 6.5.5 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.
- 6.5.6 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.
- 6.5.7 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.)*
- 6.5.8 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.
- 6.5.9 LEVEL COMPENSATE:** Enter the water level compensation for slow closing water valves. The default for this field is zero. The valid range for this field is zero inches to 2.0 inches, and the smallest unit of change is .1 inches. Setting this field will cause the PC-5000 to begin closing the water valve when the water level is this set amount below the programmed level.
- 6.5.10 DISPLAY BRIGHTNESS:** Enter the number from the following chart to set the display brightness. (This is a VFD Option Only)
- 1- Dim
  - 2- Medium (*Default setting*)
  - 3- Bright
- Changes to this field will take effect immediately.

- 6.5.11 FILL TIME OUT:** 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 PC-5000 will round this entry to 1:15 minutes. This field must be used for proper control operation.
- 6.5.12 TEMPERATURE TIME OUT:** 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 PC-5000 will round this entry to 4:15 minutes. Setting this field must be used for proper control operation.
- 6.5.13 UNBALANCE FILL:** 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 PC-5000 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 PC-5000 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 been configured with an extract, consult a Factory Authorized Technician to setup the extract outputs.
- 6.5.14 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.
- 6.5.15 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.

**6.5.16 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.

**6.5.17 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.

**6.5.18 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.

**6.5.19 MANUAL BUTTONS OPERATIONAL:** Press [ON/OFF] key to toggle between YES (*enabled*) or NO (*disabled*). If this feature is enabled, it allows the operator to adjust the water level and temperature while running a formula.

**6.5.20 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.

**6.5.21 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.

**6.5.22 COLD WATER PRE-SCALE:** Enter the number for the cold water flow meter pre-scale.

**6.5.23 HOT WATER PRE-SCALE:** Enter the number for the hot water flow meter pre-scale.

**6.5.24 LEVEL COUNT:** Enter the water level process averaging constant.

Valid Range: 10-90

**6.5.25 DISPLAY COUNT:** *Future option.*

**6.5.26 COMMUNICATION MASTER UNIT ID:** Used to enable control network features. Enter the number corresponding to the communication master's unit ID. This setting is available only to facilities using a CCS ComLink (CL-1000) or Extract Master (EM-1000).

**6.5.27 COMMUNICATIONS SPEED:** Used to set the baud rate of the PC-5000'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)).

**6.5.28 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.

**6.5.29 LOW TEMPERATURE:** Enables the temperature interlock features of the PC-5000. 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.

**6.5.30 PURGE UNUSED STEP NAMES:** The PC-5000 has over 100 preprogrammed step names, which cannot be edited or erased. It also has the ability to store over 100 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].

**6.5.31 COMMUNICATIONS FUNCTIONS:** Used to transfer formula program and setup information between PC-5000 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.

**6.5.32 CLEAR FORMULAS:** Press [EDIT], Password (2428), then [CLEAR] to clear formulas from the PC-5000. This will ERASE ALL PROGRAMMED FORMULAS! This will not reset the supply names or calibration information, see the following paragraph for clearing the supplies.

**6.5.33 CLEAR SUPPLIES / CHEMICALS:** Press [EDIT], Password (2428), then [CLEAR] to reset all user programmable fields to the default values for the supplies / chemicals. After they are cleared, the user may review and modify fields by pressing the [SUP.] key. This will ERASE and supply calibration for timed supplies, so the data must be reentered or the supplies calibrated before any formulas are run.

**6.5.34 FACTORY OPTIONS:** This option is for use by Factory Authorized Technician only. See Section 7.

**6.5.35 POLY RINSE TEMPERATURE TIMEOUT:** Enter the time in minutes and seconds for the poly rinse temperature timeout. This is the maximum amount of time that the PC-5000 will wait during a poly rinse step for the washer to reach programmed temperature. The default for this field is 20:00.

**6.5.36 SAFE SPEED TIME:** Used to set the amount of time that it takes the machine to slow down to a safe speed after extract. The PC-5000 will assume that after this period of time, it is safe to re-engage the clutch. The PC-5000 will always wait at least 30 seconds after an extract before re-engaging the clutch, so if this option is set to a time less than 30 seconds, it will be ignored. This option is available only on machines with timed safe speed (I/O Assignment 35, Type 1).

**6.5.37 LEVEL MULTIPLIER:** Used to set the scaling factor of the PC-5000 water level input. The Level Multiplier, in conjunction with special calibration of the water level input board, allows the PC-5000 to sense very high water levels.

Setting	Level at 0V	Level at 25.5V (assumes Level Offset of 0")
0	0	25.5" 0.1" precision
1	0	25.5" 0.1" precision

## 7. TECHNICAL CONFIGURATION

This section provides the information that controls proper setup and operations of your washer. **Only Qualified Service Personnel may change I/O assignments, as the safe operation of the washer may be effected. Failure to fully understand this data may result in the improper operation of the washer and the PC-5000. Incorrect setup may result in washer malfunctioning, 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 32 Input Channels and 32 Output Relays, are described below. Again, it is critical to understand the overall effect to the washer before any changes are made.

### 7.1 ENTERING CONFIGURATION MODE

If the Lock Code (Optional Password) has not been enabled then press the [MODE SEL.] key and go to Step 3. below.

If the Lock Code has been enabled, start at Step 1. below.

NOTE: The Factory Default Entry Code is 5000.

See PASSWORD, Section 6.5.16.

1. Press the [MODE SEL.] key.  
The top display will now read: "Password \_"
2. Press the 5, then the 0, then the 0, and then the 0.  
The top display will now read: "Password \*\*\*\*\_"
3. Press the [ENTER] key. The active "MODE STATUS DISPLAY" has now changed to "PROG."
4. Press [MODE SEL.] again and notice that the active "MODE STATUS DISPLAY" has now changed to "MAN.". You are now in the "MANUAL MODE".
5. Press [MODE SEL.] again, you are now in the "OPTIONS MODE".
6. Press [DOWN ARROW] key, and display will read "Factory Options". Press [EDIT] key and enter Password 1206.
7. Display now read "I/O Assignments". Proceed to Section 7.3

## 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, INPUT, OUTPUT, TYPE.
- [LEFT ARROW] Used to SELECT LED, INPUT, OUTPUT, 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 OPTION 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

When configuring the PC-5000, refer to Figure A, for factory default information. This is the Standard LED Overlay on the PC-5000 and all configuration details will refer to this standard.

1-HOT	5-DRAIN	9-SIG.	13-AUX-1	17-SUP-1	21-SUP-5	25-UNBAL	29-RUN
2-COLD	6-R-DRN	10-MOT-F	14-AUX-2	18-SUP-2	22-SUP-6	26-HOLD	30-PROG.
3-REUSE	7-H-EXT	11-MOT-R	15-AUX-3	19-SUP-3	23-SUP-7	27-	31-MAN.
4-STEAM	8-L-EXT	12-SPARE	16-AUX-4	20-SUP-4	24-SUP-8	28-	32-OPT.

**Figure A**

When in Configuration Mode, the [UP ARROW] Key will scroll through the following:

- I/O Assignments
- Multi I/O Assignments
- Supply I/O Assignments
- Test I/O Assignments

Clear Entire Memory

1. Select I/O Assignments, press [EDIT], to begin configuring.
2. Press [UP ARROW] key, to scroll through each I/O or by using the numeric keypad, enter the desired I/O number which you wish to jump to.
3. Press [RIGHT ARROW] key, to edit LED, Output, Input, Type. The cursor will flash on the "I" location, to enable editing of the LED Number. See *Figure B* below.
4. Record your specific I/O information on provided chart, See Appendix C.

I / O A s s i g n m e n t										
L		1	R		1	I		0	T	0

*Figure B*

**7.3.1 HOT WATER**

LED: Enter the number corresponding to the hot water LED. The default for this field is 1.

Output: 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.

Output: 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 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 reuse system should change this field to zero.

Output: 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 PC-5000 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.

#### **7.3.4 STEAM**

LED: Enter the number corresponding to the steam LED. The default for this field is 4. Machines that do not use steam should change this field to zero.

Output: Enter the output number corresponding to the steam valve relay. The default for this field is 3. Machines that do not have steam should change this field to zero.

Input: This field is not currently used.

Type: This field is not currently used.

#### **7.3.5 DRAIN**

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

Output: Enter the number corresponding to the drain valve relay. The default for this field is 4. For 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.

#### **7.3.6 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.

Output: 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 no default for this field. The PC-5000 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.

#### **7.3.7 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.

Output: Enter the number corresponding to the high extract starter relay.

There is no default for this field.  
 Input: This field is not currently used.  
 Type: This field is not currently used.

### 7.3.8 LOW EXTRACT

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

Output: 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 PC-5000 wishes to run the low extract motor.

Input: This field is not currently used.

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

0: For non-integration type 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 PC-5000 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 PC-5000 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 PC-5000 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 62) and right air mount (I/O assignment 63). Other outputs controlled during this sequence are the Floataire valve (I/O assignment 64), and the left and right air vents (I/O assignment 65).

### 7.3.9 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 PC-5000

Output: 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 PC-5000 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 relay assignment.

### 7.3.10 MOTOR FORWARD

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

Output: 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. Please review the section on connecting variable frequency drive controllers.

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.

### 7.3.11 MOTOR REVERSE

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

Output: 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.

### 7.3.12 POLY RINSE

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

Output: 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.

**7.3.13 AUXILIARY 1**

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

Output: 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 PC-5000 is stopped while running a formula.

1: This output will remain on if the PC-5000 is stopped while running a formula.

**7.3.14 AUXILIARY 2**

Refer to the I/O assignment for auxiliary 1.

**7.3.15 AUXILIARY 3**

Refer to the I/O assignment for auxiliary 1.

**7.3.16 AUXILIARY 4**

Refer to the I/O assignment for auxiliary 1.

**7.3.17 UNBALANCE**

LED: Enter the number corresponding to the unbalance condition LED. This option does not have to be used because the PC-5000 will display the unbalanced error condition on the display.

Output: 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 PC-5000 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.

**7.3.18 HOLD**

LED: Enter the number corresponding to the hold LED. The default for this field is 26. This field should not be set to zero, there are many reasons why the PC-5000 may place a formula on hold. Please refer to the help key in the run section of this manual.

Output: 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 PC-5000 enters a hold state.

Input: Enter the number corresponding to the external hold input. The default for this field is 3. The PC-5000 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.

**7.3.19 START**

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

Output: 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 PC-5000 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 PC-5000 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 PC-5000 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.

**7.3.20 STOP**

LED: Enter the number corresponding to the PROGRAM mode LED. The default for this field is 30.

Output: 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 PC-5000 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.

**7.3.21 FORMULA UP**

LED: Enter the number corresponding to the MANUAL mode LED. The default for this field is 31.

Output: 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 disable the membrane Formula Up/Down, Start and Signal keys from working in the run mode.

**7.3.22 FORMULA DOWN**

LED: Enter the number corresponding to the OPTIONS mode LED. The default for this field is 32.

Output: 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.

**7.3.23 SUPERVISOR KEY**

LED: This field is not currently used.

Output: 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 PC-5000 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: Allow password and supervisor key to use mode select.

**7.3.24 EXTRACT OVERLOAD**

LED: This field is not currently used.

Output: 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.

### 7.3.25 MOTOR OVERLOAD

LED: This field is not currently used.

Output: 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.

### 7.3.26 HYDRAULIC PUMP

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

Output: 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: This field is not currently used.

### 7.3.27 WASH POSITION

LED: This field is not currently used.

Output: 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 "tilted" limit switch. The forward and reverse wash motors are used to rotate the cylinder while unloading.

### 7.3.28 LOAD POSITION

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

### 7.3.29 UNLOAD POSITION

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

### 7.3.30 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 PC-5000 is waiting for an extract request to be acknowledged.

Output: 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 255 to disable this feature. Do not set this field to zero, it will prevent the PC-5000 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 PC-5000 will stop and display an error message that the previous step was not a drain.

Type: This field is not currently used.

### 7.3.31 LOW LEVEL

LED: This field is not currently used.

Output: 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.

### 7.3.32 COMMUNICATIONS

LED: Enter the number corresponding to the communication LED. The default for this field is 27.

Output: This field is not currently used.

Input: This field is not currently used.

Type: This field is not currently used.

### 7.3.33 BRAKE

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

Output: 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 PC-5000 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.

### 7.3.34 CLUTCH

LED: This field is not currently used.

Output: 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 PC-5000 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.

### 7.3.35 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.

Output: 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 PC-  
5000 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 PC-5000 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 PC-5000. The PC-  
5000 will assume that whenever either extract motor is run-  
ning, the cylin-  
der is rotating at extract speed. The PC-5000 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 mechanical speed switch. The PC-5000 will wait for 45 seconds after the brake has been applied following an extract step, then begin checking the state of the mechanical speed switch. The PC-5000 will then assume that five continuous seconds of contact on the zero speed input means that the cylinder is rotating below extract speed.

3: The machine's speed is determined by a mechanical speed switch. The PC-5000 will assume that five continuous seconds of contact on the zero speed input means that the cylinder is rotating below extract speed. The PC-5000 will also energize the zero speed output for the first fifteen seconds of low extract on total integration machines.

### 7.3.36 DOOR CLOSED

LED: This field is not currently used.

Output: 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 PC-5000 expects to see a contact between this input and the input common to mean that the door is fully closed.

Type: 1: Will not allow the machine to jog unless the door is closed.

### 7.3.37 DOOR OPEN

LED: This field is not currently used.

Output: 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 PC-5000 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.

### 7.3.38 INLET

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

Output: 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 PC-5000 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.

### 7.3.39 INVERTED WASH POSITION

LED: This field is not currently used.

Output: 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 PC-5000 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.

### 7.3.40 INVERTED INLET

LED: This field is not currently used.

Output: 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 PC-5000 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 38. There can be up to a one second delay between the inputs.

Type: This field is not currently used.

### 7.3.41 TUB RAISE

LED: This field is not currently used.

Output:(see type) The Jog Safety/Tilt Function input (I/O Assignment 45) 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.

**7.3.42 TUB LOWER**

LED: This field is not currently used.

Output: The Jog Safety/Tilt Function input (I/O Assignment 45) 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.

**7.3.43 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.

Output: This field is not currently used.

Input: Enter the number corresponding to the chemical hold contact. There is no default for this field. The PC-5000 expects to see a contact between this input and the input common to mean that machine timer will hold until this input is released.

Type: This field is not currently used.

**7.3.44 RUN / UNLOAD**

LED: This field is not currently used.

Output: This field is not currently used.

Input: Enter the number corresponding to the run / unload contact. There is no default for this field. The PC-5000 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.

**7.3.45 JOG SAFETY/HYDRAULIC FUNCTION/TILT FUNCTION**

LED: This field is not currently used.

Output: This field is not currently used.

Input: Enter the number corresponding to the jog safety contact. There is no default for this field. The PC-5000 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.

#### 7.3.46 INVERT DOOR OPEN

LED: This field is not currently used.

Output: 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 PC-5000 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 37. There can be up to a one second delay between the inputs.

Type: This field is not currently used.

#### 7.3.47 INVERT DOOR CLOSED

LED: This field is not currently used.

Output: 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 PC-5000 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 36. There can be up to a one second delay between the inputs.

Type: This field is not currently used.

#### 7.3.48 INVERT UNLOAD POSITION

LED: This field is not currently used.

Output: 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 PC-5000 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 29. There can be up to a one second delay between the inputs.

Type: This field is not currently used.

#### 7.3.49 INVERT LOAD POSITION

LED: This field is not currently used.

Output: 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 PC-5000 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 28. There can be up to a one second delay between the inputs.

Type: This field is not currently used.

### 7.3.50 RAISE DOOR

LED: This field is not currently used.

Output: 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 PC-5000 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.

### 7.3.51 LOWER DOOR

LED: This field is not currently used.

Output: 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 PC-5000 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 PC-5000 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 PC-5000 will lower the machine back to the run position before closing the door.

### 7.3.52 RPM

LED: This field is not currently used.

Output: This field is not currently used.

Input: Enter the number corresponding to the RPM input contact. There is no default for this field. The PC-5000 expects to see a contact between this input and the input common to mean that the tub has made one complete revolution.

Type: This field is not currently used.

**7.3.53 SWITCHED WATER LEVEL 1**

LED: Enter the number corresponding to the switched water level 1 input LED. There is no default for this field.

Output: This field is not currently used.

Input: Enter the number corresponding to the WATER LEVEL 1 input contact. There is no default for this field. The PC-5000 expects to see a contact between this input and the input common to mean that the water is at or above the OPTION SWITCH LEVEL 1 level.

Type: This field is not currently used.

**7.3.54 SWITCHED WATER LEVEL 2**

LED: Enter the number corresponding to the switched water level 2 input LED. There is no default for this field.

Output: This field is not currently used.

Input: Enter the number corresponding to the WATER LEVEL 2 input contact. There is no default for this field. The PC-5000 expects to see a contact between this input and the input common to mean that the water is at or above the OPTION SWITCH LEVEL 2 level.

Type: This field is not currently used.

**7.3.55 SWITCHED WATER LEVEL 3**

LED: Enter the number corresponding to the switched water level 3 input LED. There is no default for this field.

Output: This field is not currently used.

Input: Enter the number corresponding to the WATER LEVEL 3 input contact. There is no default for this field. The PC-5000 expects to see a contact between this input and the input common to mean that the water is at or above the OPTION SWITCH LEVEL 3 level.

Type: This field is not currently used.

**7.3.56 SWITCHED TEMPERATURE LEVEL 1**

LED: Enter the number corresponding to the switched temperature level 1 input LED. There is no default for this field.

Output: This field is not currently used.

Input: Enter the number corresponding to the TEMPERATURE LEVEL 1 input contact. There is no default for this field. The PC-5000 expects to see a contact between this input and the input common to mean that the water is at or above the OPTION SWITCH TEMPERATURE 1 level.

Type: This field is not currently used.

**7.3.57 SWITCHED TEMPERATURE LEVEL 2**

LED: Enter the number corresponding to the switched temperature level 2 input LED. There is no default for this field.

Output: This field is not currently used.

Input: Enter the number corresponding to the TEMPERATURE LEVEL 2

input contact. There is no default for this field. The PC-5000 expects to see a contact between this input and the input common to mean that the water is at or above the OPTION SWITCH TEMPERATURE 2 level.

Type: This field is not currently used.

### 7.3.58 SWITCHED TEMPERATURE LEVEL 3

LED: Enter the number corresponding to the switched temperature level 3 input LED. There is no default for this field.

Output: This field is not currently used.

Input: Enter the number corresponding to the TEMPERATURE LEVEL 3 input contact. There is no default for this field. The PC-5000 expects to see a contact between this input and the input common to mean that the water is at or above the OPTION SWITCH TEMPERATURE 3 level.

Type: This field is not currently used.

### 7.3.59 DOOR SEAL

LED: This field not currently used.

Output: 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 PC-5000 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.

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 not spinning at extract speed, and
- the water level is below the programmed low water level,

and

- the machine is not running, and
- the machine is lowered (for WASHEX Floataire-style machines).

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, and  
 -the water in the machine is at low temperature, and low  
 level, and the machine is not running.  
 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, and  
 -the water in the machine is at low temperature, and low  
 level, and the machine is not running.

### 7.3.60 DOOR LATCH

LED: This field not currently used.

Output: 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 PC-5000 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.

- 1: The PC-5000 will release the door latch output when:
  - the machine is not running, and
  - the machine is not spinning at extract speed, and
  - the water level is below the programmed water level, and
  - the machine is lowered (for WASHEX Floataire-style machines), and
  - the machine door is closed (door open input is low, and/or door closed input is high)
- 2: The PC-5000 will energize the door latch output when
  - the machine is not running, and
  - the machine is not spinning at extract speed, and
  - the water level is below the programmed water level, and
  - the machine is lowered (for WASHEX Floataire-style machines).
- 3: The PC-5000 will energize the door latch output when
  - the machine is not running, and
  - the machine is not spinning at extract speed, and
  - the water level is below the programmed water level, and
  - the machine is lowered (for WASHEX Floataire-style machines), and
  - the door seal has been released, and
  - the raise door (I/O Assignment #50) input is energized.
- 4: The PC-5000 will release the door latch when all the

conditions of type 2 are met. However, the type 4 door latch remains released until the machine is started.

5: (Washex 64/40)

The PC-5000 will release the door latch when

- the machine is not running, and
- the machine is not spinning at extract speed, and
- the water level is below the programmed water level, and
- the machine is lowered (for WASHEX Floataire-style machines), and
- the load or unload position has been selected on the tilt selector switch.
- the door is unsealed

Type 5 door latches remain released until the door is fully closed.

6: (Milnor)

The PC-5000 will release the door latch when

- the machine is not running, and
- the machine is not spinning at extract speed, and
- the water level is below the programmed water level, and
- the machine is lowered (for WASHEX Floataire-style machines), and
- the door is unsealed
- 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 PC-5000 will release the door latch when

- the machine is not running, and
- the machine is not spinning at extract speed, and
- the water level is below the programmed water level, and
- the machine is lowered (for WASHEX Floataire-style machines), and
- the door is unsealed (based on a 4 second timer)
- the “open/close door” switch is in the “open” position.

Type 7 door latches remain released until the door is fully closed.

### 7.3.61 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.

Output: 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.

#### **7.3.62 LEFT AIR MOUNT**

LED: This field is not currently used.

Output: 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.

#### **7.3.63 RIGHT AIR MOUNT**

LED: This field is not currently used.

Output: 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.

#### **7.3.64 FLOATAIRE VALVE**

LED: This field is not currently used.

Output: 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.

#### **7.3.65 LEFT & RIGHT AIR VENT**

LED: This field is not currently used.

Output: 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.

#### **7.3.66 LOW BRAKE 1**

LED: This field is not currently used.

Output: 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.

#### **7.3.67 LOW BRAKE 2**

LED: This field is not currently used.

Output: 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.

#### **7.3.68 HIGH BRAKE**

LED: This field is not currently used.

Output: 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.

### **7.3.69 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.  
Output: 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.  
Type: This field is not currently used.

### **7.3.70 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.  
Output: 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.  
Type: This field is not currently used.

### **7.3.71 RAISE MACHINE FRONT (FRONT)**

LED: This field is not currently used.  
Output: 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 45) 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: This field is not currently used.

**7.3.72 LOWER MACHINE FRONT (REAR)**

LED: This field is not currently used.

Output: 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 45) 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.

**7.3.73 WALKWAY DOWN**

LED: This field is not currently used.

Output: 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.

**7.3.74 PANEL DOOR INTERLOCK**

LED: This field is not currently used.

Output: 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.

**7.3.75 CHUTE DOWN**

LED: This field is not currently used.

Output: 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.

**7.3.76 CHUTE UP**

LED: This field is not currently used.

Output: 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.

**7.3.77 HOT OIL**

LED: This field is not currently used.

Output: 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.

#### **7.3.78 OIL FILTER**

LED: This field is not currently used.

Output: 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.

#### **7.3.79 START INHIBIT**

LED: This field is not currently used.

Output: 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 PC-5000 will not start or perform hydraulic functions while there is contact between this input and the input common.

Type: This field is not currently used.

#### **7.3.80 SAFETY RESET**

LED: This field is not currently used.

Output: For Milnor machines. Enter the number corresponding to the safety reset relay. There is currently no default for this field.

The PC-5000 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.

#### **7.3.81 VIBRATION SWITCH**

LED: This field is not currently used.

Output: 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 PC-5000 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.

#### **7.3.82 BALANCE ENABLE**

LED: This field is not currently used.

Output: 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.

**7.3.83 CHUTE LOCK**

LED: This field is not currently used.

Output: Enter the number corresponding to the chute lock relay contact. There is currently no default for this field. The PC-5000 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.

**7.3.84 CHUTE SPRAY**

LED: This field is not currently used.

Output: 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 PC-5000 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.

**7.3.85 CHEMICAL HOPPER DOOR**

LED: This field is not currently used.

Output: This field is not currently used.

Input: Enter the number corresponding to the supply hopper door input. The PC-5000 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.

**7.4 MULTI I/O ASSIGNMENTS**

The PC-5000, 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 I/O 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 PC-5000 allows as many as four relay outputs to be assigned to each Multi I/O Assignment.

#### 7.4.1 CONFIGURING MULTI I/O ASSIGNMENTS

Setting up a Multi I/O 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 I/O 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 33, which controls the brake inputs and outputs. In the "relay" field, enter the number "201," which tells the control to use the Multi I/O Assignment #201 for the brake outputs. Exit the I/O Assignment editing section, and enter the Multi I/O Assignment section. In the first field of I/O Assignment 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 I/O Assignment 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 CONFIGURING 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 PC-5000 supports timed chemical injections, flowmetered chemical injections, and manual (signalled) injections.

Enter specific Supply I/O Assignments, as follows:

---

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



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# NOTES

## 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 PROGRAMMING STEP NAME Section 4.7, for more details.

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

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[ \ ] ^ \_ `

a b c d e f g h i j k l m n o p q r s t u v w x y z

{ | } ~

# 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.

<b>A</b>	<b>E</b>	<b>M</b>	Sour
AC Rinse	Enzyme Flush	Mildewcide	Sour / Dye
Acid Bath	Extract		Sour / Soft
<b>B</b>	<b>F</b>	<b>N</b>	Sour / Starch
Bleach	Fill	No Rotation	Sour Bath
Bleach / Suds	Fill Temp		Sour / Star / Mil
Bleach / Break	Fill / Level / Temp	<b>O</b>	Special Drain
Break	Final Extract	Oil Treatment	Split Flush
Break / Bleach	Fluff	Oxalic Bath	Split Rinse
<b>C</b>	Flush	<b>P</b>	Starch
C-Over / Suds	<b>G</b>	Pause	Starch / Mildew
Carryover	Gentle Wash	Poly-Rinse	Start
Coast	<b>H</b>	<b>R</b>	Steam
Cold Flush	Hi-Extract	Raise Level	Stop
Cold Rinse	High Extract	Reuse Drain	Strip
Cool Down	Hot Flush	Reuse Fill	Suds
<b>D</b>	Hot Rinse	Reuse Flush	Suds / Bleach
De-Hair	<b>I</b>	Reuse One Way	Suds 1
Drain	Int Extract	Reuse Rinse	Suds 2
Drain / Still	<b>L</b>	Reuse Water	<b>T</b>
Drain > Sewer	Level	Rinse	Temperature
Drain One Way	Level / Temp	Rinse Part 1	Treatment
Drain Revsing	Lo-Extract	Rinse Part 2	Tumble
Drain / Hi Ext	Lo / Hi Extract	<b>S</b>	<b>W</b>
Drain L+H Ext	Low Extract	Shakeout	Warm Flush
Drain / Lo Ext		Signal	Warm Rinse
Dye		Softener	Wash One Way

# I/O ASSIGNMENT CHART

I/O #	DESCRIPTION	LED	OUTPUT	INPUT	TYPE
1	Hot Water				
2	Cold Water				
3	Reuse Water				
4	Steam				
5	Drain				
6	Reuse Drain				
7	High Extract				
8	Low Extract				
9	Signal				
10	Motor Forward				
11	Motor Reverse				
12	Poly Rinse				
13	Auxiliary 1				
14	Auxiliary 2				
15	Auxiliary 3				
16	Auxiliary 4				
17	Unbalance				
18	Hold				
19	Start				
20	Stop				
21	Formula Up				
22	Formula Down				
23	Supervisor Key				
24	Extract Overload				
25	Motor Overload				
26	Hydraulic Pump				
27	Wash Position				
28	Load Position				
29	Unload Position				
30	Extract Request				
31	Low Level				
32	Communications				
33	Brake				
34	Clutch				
35	Zero Speed				
36	Door Closed				
37	Door Opened				
38	Water Inlet				
39	/ Wash Position				
40	/ Water Inlet				

continued on next page

## I/O Assignment Chart Continued

I/O #	DESCRIPTION	LED	OUTPUT	INPUT	TYPE
41	Raise Machine Rear (Raise)				
42	Lower Machine Rear (Lower)				
43	Chemical Hold				
44	Run / Unload				
45	Jog Safety/Hydraulic Function/Tilt Function				
46	/ Door Opened				
47	/ Door Closed				
48	/ Unload Position				
49	/ Load Position				
50	Raise Door/Release Door Latch				
51	Lower Door				
52	RPM				
53	Water Level 1				
54	Water Level 2				
55	Water Level 3				
56	Temperature 1				
57	Temperature 2				
58	Temperature 3				
59	Door Seal				
60	Door Latch				
61	Balance Motor				
62	Left Air Mount				
63	Right Air Mount				
64	Floataire Valve				
65	Left & Right Air Vent				
66	Low Brake 1				
67	Low Brake 2				
68	High Brake				
69	Brake Pressure Switch				
70	Brake Wear Switch				
71	Raise Machine Front (Front)				
72	Lower Machine Front (Rear)				
73	Walkway Down				
74	Panel Door Interlock				
75	Chute Down				
76	Chute Up				
77	Hot Oil				
78	Oil Filter				
79	Start Inhibit				
80	Safety Reset				
81	Vibration Switch				
82	Balance Enable				
83	Chute Lock				
84	Chute Spray				
85	Supply Hopper Door				

