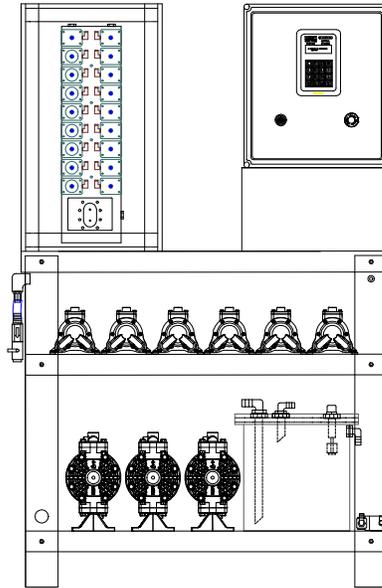# SOFTROL

Software & Control for Automation

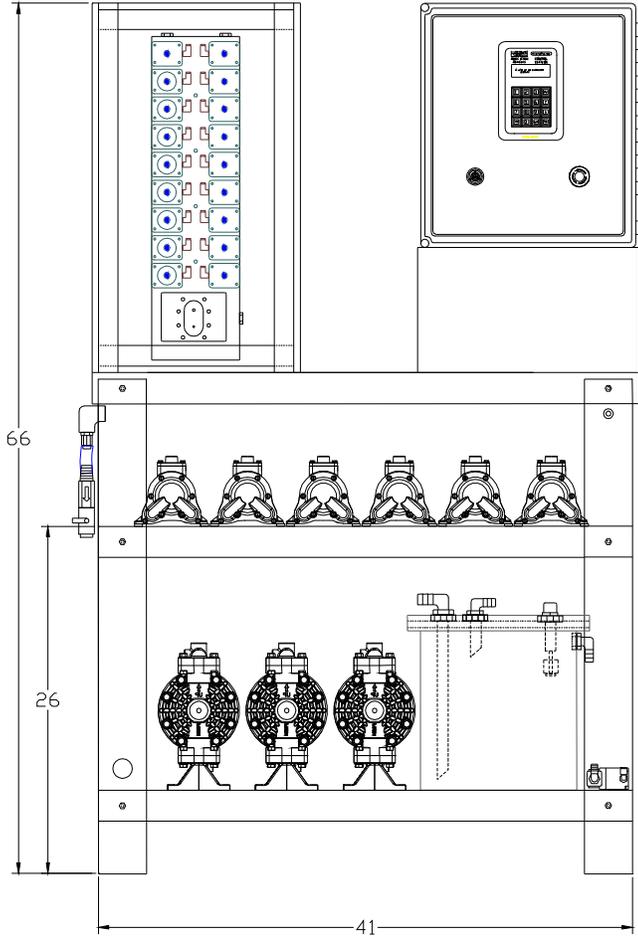# CATALYST LITE
Installation and
Operation Manual

Softrol Systems Inc.
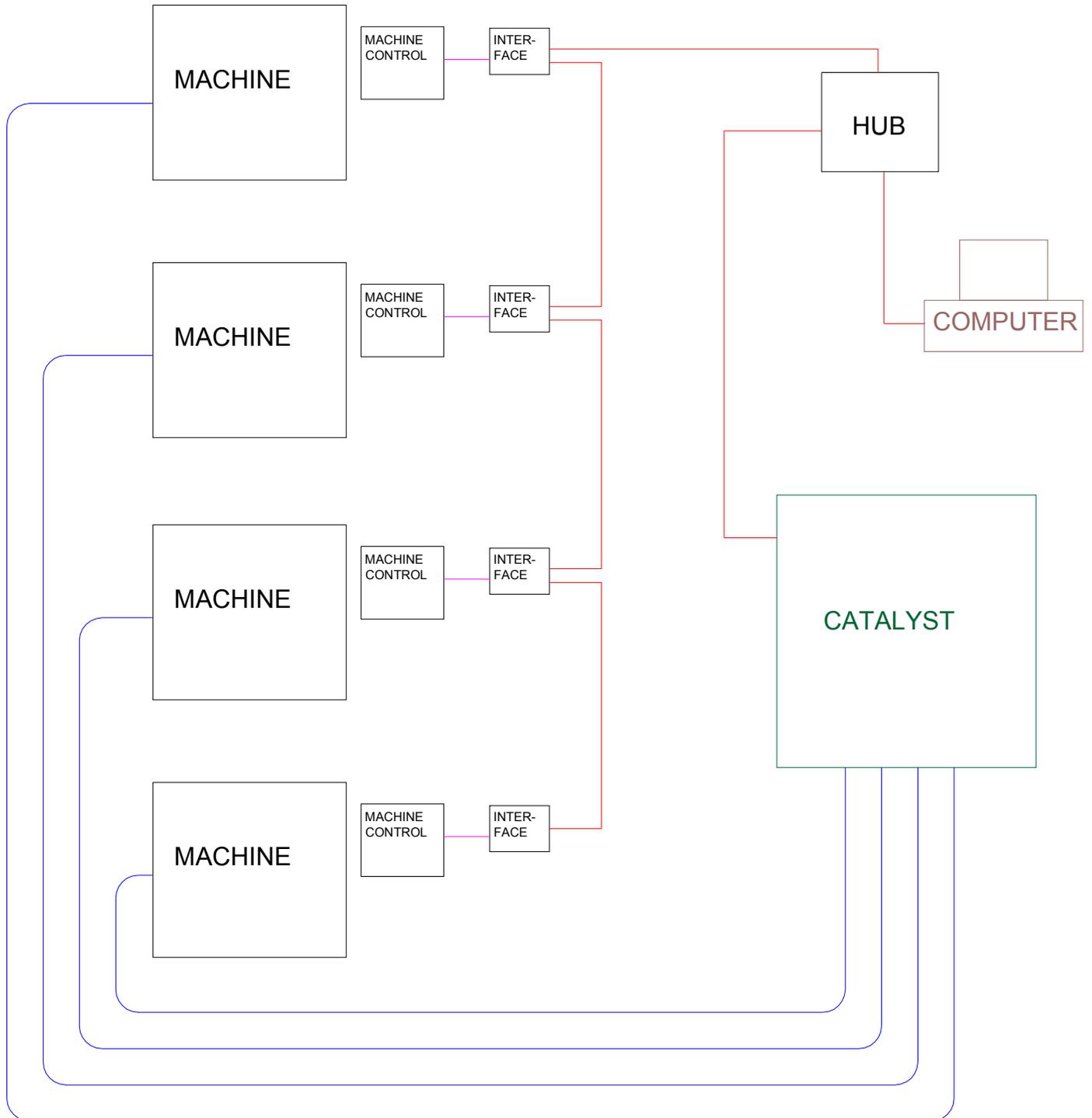4867 N. Main St.
Acworth, GA 30101
(770) 974-2700

1. Introduction: The Catalyst System
The Catalyst System is a chemical metering and injection system that delivers liquid chemicals to multiple washers. The system is flexible and can be customized to serve up to twenty machines with a possible sixteen chemicals.

The Catalyst System offers precise chemical deliveries with consistent results. The system has the ability to interface with various types of controllers, and production data may be gathered for a variety of washers. Formula entry is simplified with a with the PulseNet PC software and all formulas are stored in the Interface Box or on the microPulse washer controller.

Typical System Layout

─────── COMMUNICATION LINE

─────── MULTI-CONDUCTOR LINE

─────── CHEMICAL DELIVERY LINE

| MACHINE | MACHINE CONTROL | INTER-FACE |

HUB

COMPUTER

| MACHINE | MACHINE CONTROL | INTER-FACE |

| MACHINE | MACHINE CONTROL | INTER-FACE |

CATALYST

| MACHINE | MACHINE CONTROL | INTER-FACE |

Catalyst Lite

The Catalyst Lite System is a low cost flow metered chemical injection system capable of delivering up to eight (8) chemicals to a maximum of eight (8) washers in a compact all-inclusive chemical resistant enclosure. The Softrol designed and manufactured manifold systems, with built-in flow meter, assures that precise delivery of chemicals is maintained during formula execution. By using the standard Softrol Catalyst software package, this unit delivers many of the features of the Catalyst Classic. In order to provide a low cost solution for the automatic injection of chemicals, Softrol has been able to engineer a system with slightly less automation, primarily in the calibration of chemicals, which is more automated on the upper line systems. Additionally, the Catalyst Lite incorporates an integrated 6-gallon flush tank providing immediate water for flushing the manifold.

2. Catalyst Installation & Configuration

Several weeks prior to the installation, an on site survey should be conducted to determine the best location in the plant for the Catalyst system. Consideration should be given to the location of the chemicals in relation to the washroom and the length of the run from the chemical storage area to the washers. The shorter the length of the Catalyst to the machines, the faster the injection times will be. This is **very** important with the Catalyst Tunnel system. A plant layout with the proposed location for the Catalyst along with the list of chemical and typical injection amounts should be sent to Softrol when the system is ordered. Also include a list of machines and their controller types with the chemical output voltage. This will help ensure that the configuration and layout of the system is optimal.

Before beginning the installation, Softrol Systems recommends that plant personnel be familiar with the types of chemicals they will be working with and the potential hazards that are associated with the chemicals (this information must be supplied in the form of a Material Safety Data Sheet, or MSDS.)

Softrol Systems also recommends that, at the very minimum, plant personnel be required to wear all protective equipment suggested in the MSDS. Extreme care should be taken when working with a pressurized chemical system. Ensure that all pressure has been removed from the system and that all power to the machine is turned off before undergoing maintenance.

Injection Unit
Remove the equipment from the shipping packages. Check the system carefully

to assure that no damage occurred in shipment. If any damage from shipment is

apparent call Softrol Systems immediately at (770) 974-2700.

Clear the area in which it is to be placed. This should have already been determined in the Site Survey. Uncrate and stand the Catalyst Injection System in the position where it is to be located. Be careful in transporting the Catalyst- it **is** heavy.

120 VAC Power Cord

Utility Connections

3/8" PTC Air Connection
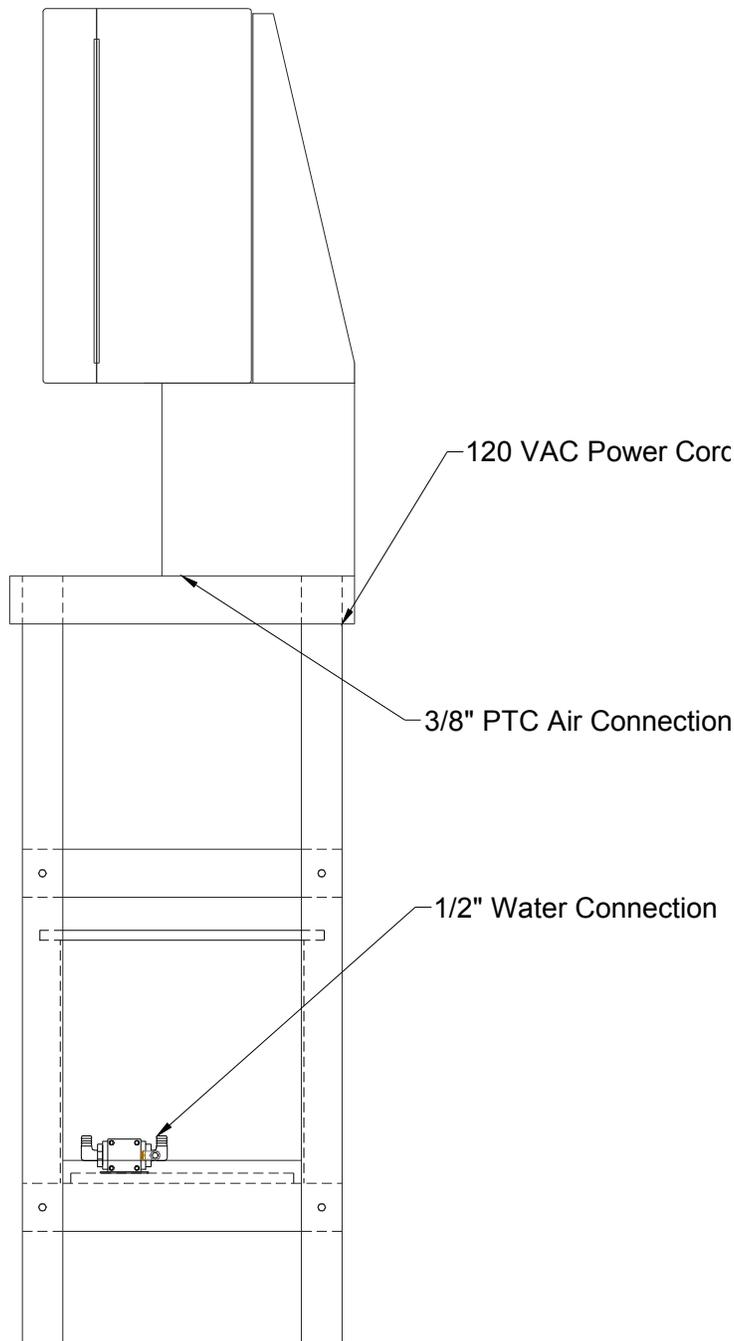
1/2" Water Connection

Make all the electrical, air and water connections as explained below.
Water Connections
The Catalyst requires water > 3 GPM at a temperature no greater then 110°F or less than 80°F. (This can be either tempered water, or hot and cold with a mixing valve- valve is not supplied) The supply line should be valved and stubbed to a 1/2" barb. Flexible tubing should be used to connect the water supply line to the fill valve for the flush tank on the Catalyst System. The unit has a 1/2" barb connection. (Tubing not supplied) Water pressure should be no more than 45 psi.

Air Connections
A ½" line of clean, dry air at 90 psi minimum is required for the system. The system uses about 8 SCFM maximum (12 SCFM for the Catalyst DI) at 90 PSI. For multiple or redundant systems, the supply line should be upsized accordingly. The unit has a 3/8" OD flexible tubing connection. (Tubing not supplied)

Electrical Connections:

he Catalyst requires 120 VAC at 5 Amps. The unit is supplied with a 15' US power cord. The Active Hub) also requires 120 VAC at 5 Amps. These circuits should be dedicated for the chemical system use only.

Chemical Connections

The chemical feed lines should be run from the source (Tank, Drum, Tote, etc…) and connected to the appropriate pump. The pump's inlet is at the bottom and the outlet (to the chemical valves) is at the top. On the inlet of the pump, use ½" tubing for the small pump and ¾" tubing for the large pump. It might be necessary to use reinforced tubing on some of the inlets if chemical is being drawn a long distance and/or uphill.

The inlet lines to the pumps *must* have adequate strainers (#12 Mesh minimum). These may be incorporated with drum wands (available from Softrol) or can be piped inline. It is recommended that if the strainers are piped inline, a shutoff valve be located on either side as to allow for easier cleaning.

3/4" Y-Strainer #12 Mesh

3/4" Drum Wand
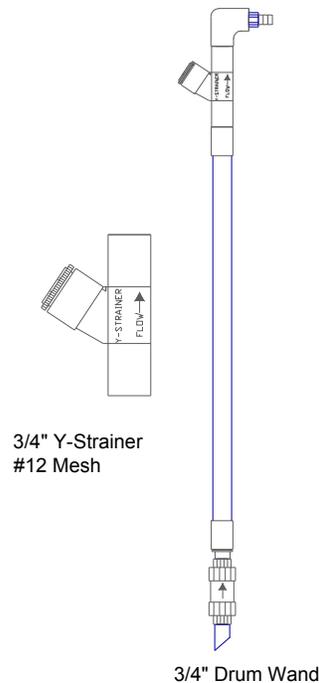
Chemical Pumps

The chemical pumps should be tightened to the proper torque range before use. The proper torque is 70 in.-lbs.

Tighten all 8 bolts 55 in-lbs front and rear.

Tighten all 6 screws 35 in-lbs front and rear
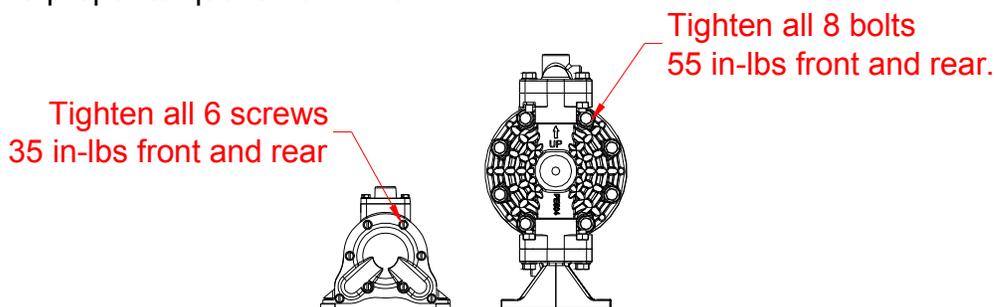
Machine Connections

The Catalyst has 3/4" hose barb (1/2" for the Catalyst Tunnel) connections for the machine delivery lines. A minimum of 5' of tubing should be used even if the machine lines are hard piped. For a redundant Catalyst setup or a Catalyst DI, there should be multiple lines to each washer or the lines should be connected together with check valves to form a single line to the washer. These connectors are not included but can be ordered from Softrol. See drawing below.

Check Valve Assembly for Catalyst DI Systems and Redundant Systems
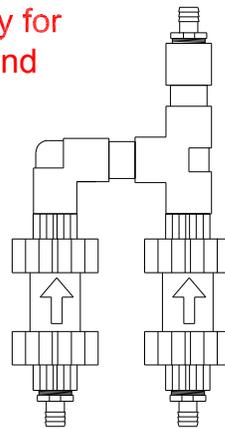
Check Valve Assembly for multiple DI systems or more than 2 redundant Catalyst systems.
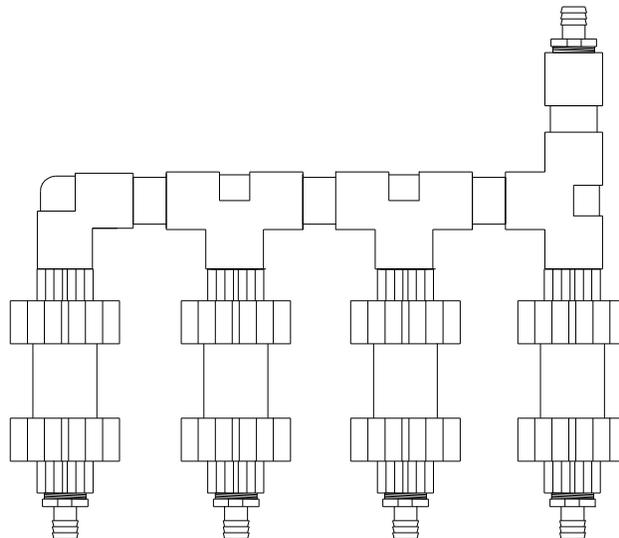
Drain Connection

There are 2 drain connections for the Catalyst with 1/2 " NPT connections. The back-flush outlet **MUST** be plumbed to an applicable drain. Since this outlet can be pressurized, the drain line does not have to be a gravity drain. The overflow is for the flush tank and cannot be run any higher than the top of the tank. It is not necessary to hook up the overflow line, however, if the level switch fails in the tank, water will be forced out this outlet.

Connect Backflush Here
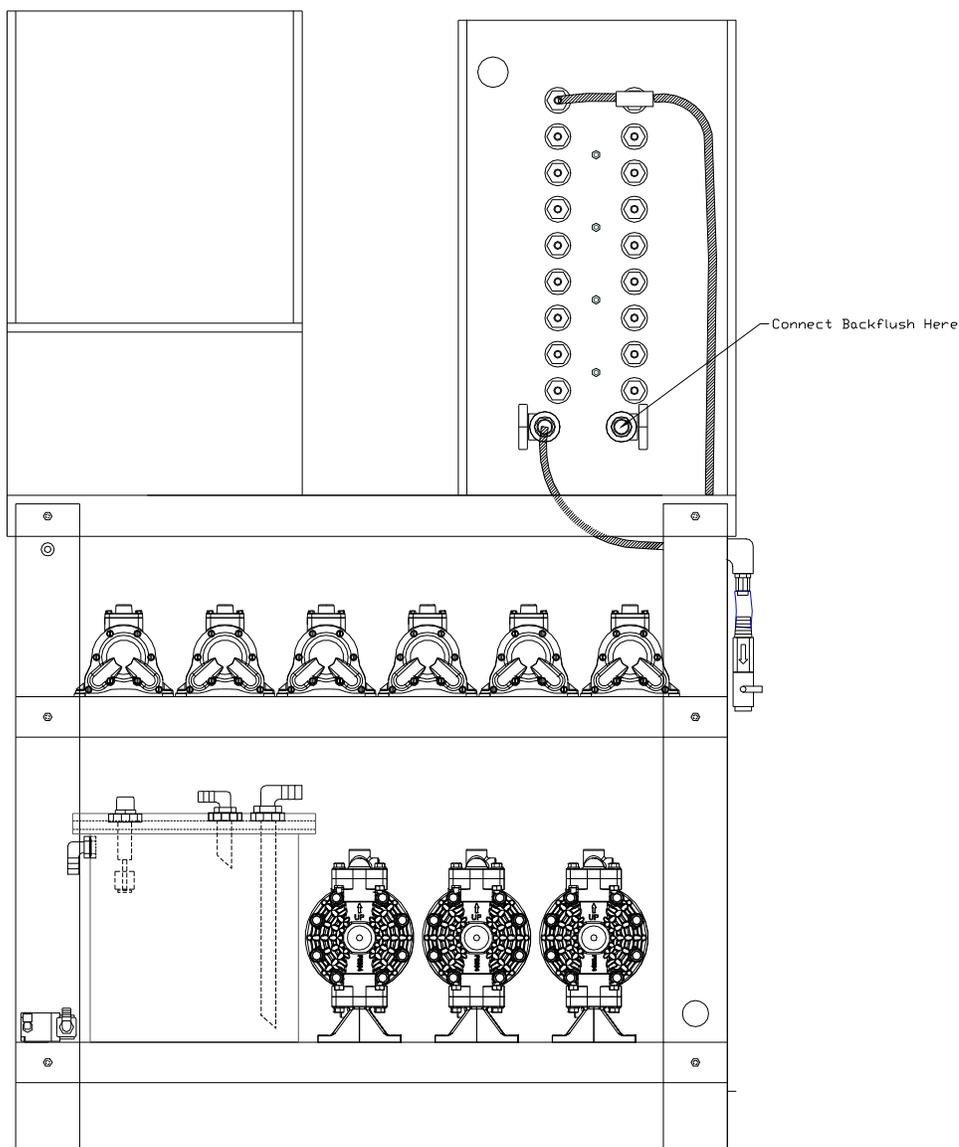
Configuration: Injection Controller

The Catalyst machine setups tailor the operation to suit individual preferences and applications. These parameters are global meaning they effect all formulas. Some of these parameters (AutoChem Flush, for example) can also be set on the machine and override the global parameters and only effect the current injection. Use the following sequence to set up the user programmable features.

From the "Waiting for Chemical Injection Request!" display, enter a valid level 7 password (please refer to Passwords).

1=Setup   2=Program
3=Maint.   4=Calib.
5=Totals   6=Clock
Selection?   0=exit

Select 1=Setups

1=Watchdogs/Setups
2=Chemical Setups

Select 1=Watchdogs/Setups

1=Machine Setup
2=Maintenance Setup
3=Clear Ram Vocabs
4=Passwords   0=exit

Select 1=Machine Setup

The current setting is shown on the display. The Programmable Functions section describes all of the questions in detail.

Note: Use the [YES] or [NO] keys and the numbers on the keypad to change the answer to the setup questions. Some questions require the operator to enter a value.

- Press the [ENT] key to accept the answer.
- Press only the [ENT] key to accept the default or keep the previously programmed value.
- You cannot go backwards through the questions. If you need to change the answer to a previous question, press the [ENT] key to accept the current values to the remaining questions then restart the procedure.
- Press the [CLR] key to clear the numeric value of the current question.

11
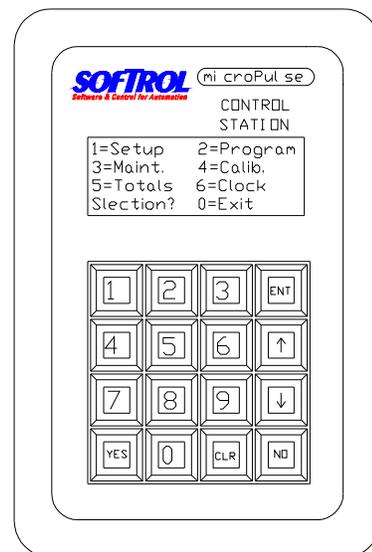
After all setups are complete pressing the [CLR] key will accept the changes. The MicroPulse does not store any of the changes in memory until the last setup question is answered and the [CLR] key is pressed. If the power is lost during the setup procedure, the changes will not take effect.

- AutoChem Flush

This setup answered in seconds is the amount of time the Catalyst will flush the system with water after each chemical injection. The Catalyst will read the time on the machine and use the time that is the greatest.

- Chems 9-12 Auto

If answered YES, the Catalyst will turn on the chemical outputs for chemicals 9 through 12. Answer No if the Catalyst will process with automatic chemicals 1 thru 8 only.

- Chems 13-16 Auto

If answered YES, the Catalyst will turn on the chemical outputs for chemicals 13 through 16. Answer No if the Catalyst will process with automatic chemicals 1 thru 12 only.

- Flow Sensors

This setup tells the Catalyst to use the flow sensor input

- Chemical Watchdog

This is the time in mm:ss the user defines is sufficient for a Catalyst to hold itself while dispensing the chemical.

- Prompt Weight

This indicates whether the operator wishes to prompt the weight of the load before the start of each manual formula. This allows the operator to use ratio metric chemical additions. This will most likely be set to NO.

- Signal Mute Time

This is the time in mm:ss the user defines how long a signal will be ignored when pressing the CLR key.

- First Washer ID

This setup informs the Catalyst the ArcNet networking ID of the first washer to be serviced.

- Last Washer ID

This setup informs the Catalyst the ArcNet networking ID of the last washer to be serviced.

- Preferred ID Lo

This setup is used to assign the lowest ArcNet networking ID that determines the preferable range for the Catalyst to inject chemicals. Decisions by the Catalyst will be given preference according to the programmed range.

- Preferred Range Hi

This setup is used to assign the highest ArcNet networking ID that determines the preferable range for the Catalyst to inject chemicals. Decisions by the Catalyst will be given preference according to the programmed range.

Installation: Machine Interface

Mount the Machine Interface Boxes on or near each washer. Use nuts and bolts for a machine mount, and screws for a wall mount. The interface should be connected to the washer controller with 15-conductor wire. 24 VDC will be supplied from the Catalyst for the power. Refer to the interface schematic for specific wiring instructions.

Once the interface is powered, the setups may be entered. The setups in the interface are accessed in the same manner as the setups in the podium.

If the interfaces are the CataPulse LT units, then the setups must be done from the computer, or from a remote FPD.
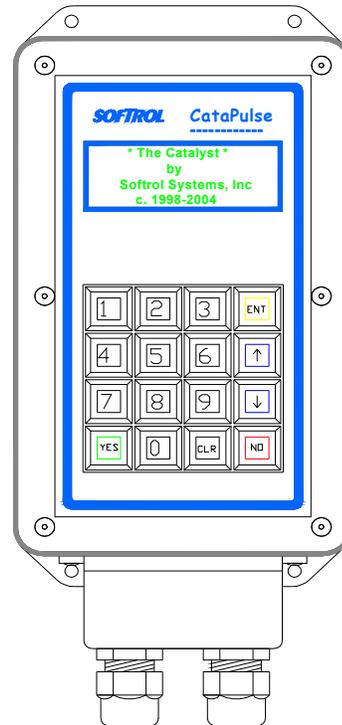
Wiring-

The interface comes pre-wired with a 20' length of 15 conductor 18 gauge wire. This wire should be cut to length and wired to the input converter.
The illustration above shows three "Daisy Chains" from the Catalyst. The first one is machines 1-4 the second daisy chain covers machines 5-9. The third daisy chain is from the communication card of the Catalyst to the computer. Machines 4 and 9 and the computer should have terminators. If there are multiple Catalysts, then the network will be wired in a similar fashion, but a Hub will be used for communications. Refer to the Catalyst manual for this layout.
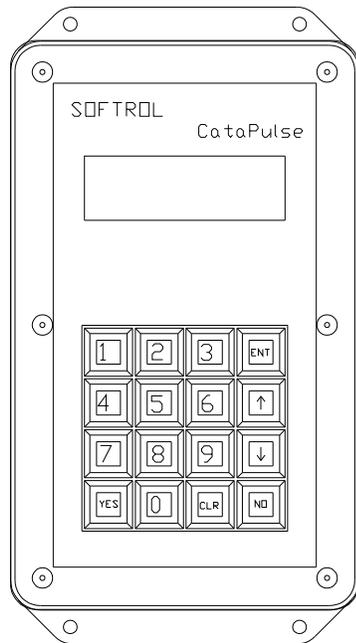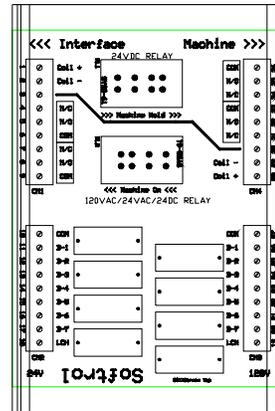
CATAPULSE INTERFACE   INPUT CONVERTER

The input converter should be wired on the interface side. The wires should be as follows:

Fig.2

Terminal	Wire Color
1	Orange
2	White
5	Blue/Black
6	Jump to #2
10	Black
11	Blue
12	Blue/White
13	Green
14	Green/White
15	Red
16	Red/White
17	Black/White
18	White/Black

Once the connections are made, the power and the Arcnet communications must be connected to the interface. The Arcnet runs on stranded Cat 5 twisted pair wire. The power line is a two conductor 18 ga. Wire. To access these connections, remove the small box at the base of the interface.

The power is 24 VDC. The black wire is the 0V and connects to the terminal that is connected to the black wire that enters the CataPulse. The white wire is

+24VDC and should be connected to the terminal that connects to the red wire.
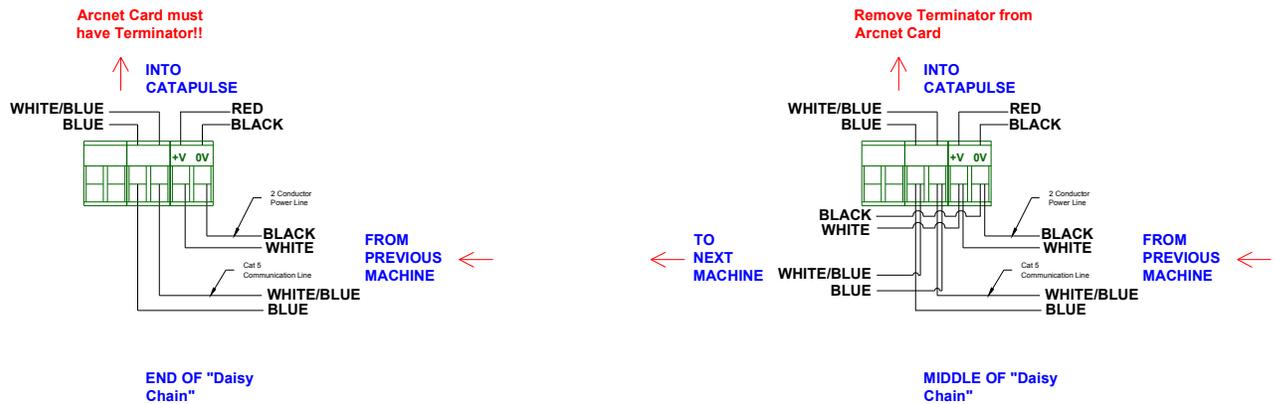
The communication cable uses the Blue pair. The Blue wire should connect to the terminal on the right side and the Blue/White wire should connect to the left side of the terminal. If there is another machine on the daisy chain, then the 2 conductor power wire should be connected parallel to the +V and 0V and run to the next machine. Also, a Cat 5 cable should run in parallel to incoming communications cable to the next interface. If this is the last machine in the daisy chain, then only two lines will enter the interface, one for power and one for communications. The arcnet card in the Catapulse should have the terminating jumper.

Node ID-

The LAN ID on the CataPulse is set via a set of dip switches. This located in the bottom of the interface and is accessed via the small box on the bottom interface. The dip switches give the interface a binary code for the LAN ID. This LAN ID should be set the same as the machine number. This is very important since the interface communicates this ID and the Catalyst will dispense chemical out the valve associated with this machine ID. The ID goes from right to left. When the switch is in the up position, it is on. See figure on the next page for the proper configuration.

Bottom of CataPulse with connection box removed.

LAN ID
128 64 32 16 8 4 2 1

1		11	
2		12	
3		13	
4		14	
5		15	
6		16	
7		17	
8		18	
9		19	
10		20	
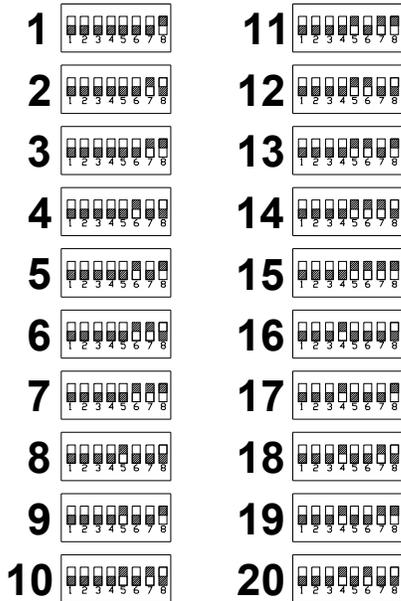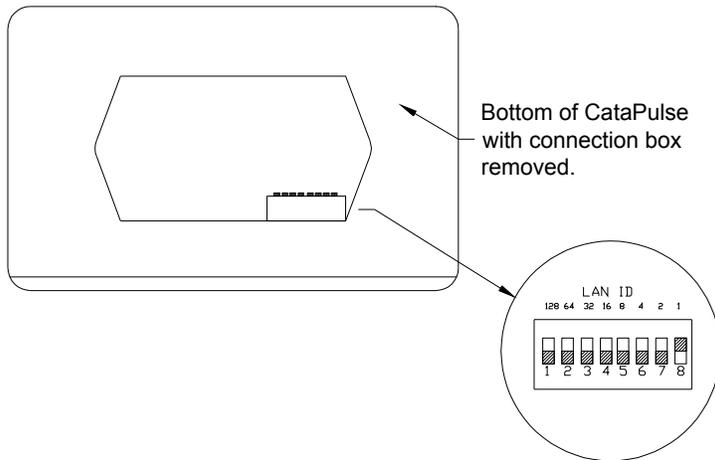
The ID may be checked by pressing the Up and Down arrow keys at the same time. This will enter the override display. Press the Up arrow 3 times. This will display the arcnet node ID. This is the ID of the machine. Press CLR to exit the override display.

Configuration: Machine Interface

From the "Waiting for Chemical Injection Request!" display, enter a valid level 7 password (please refer to Passwords).
1=Setups   2=Program
3=Maint.   4=Calibrate
5=Totals   6=Clock
Selection?   0=exit

Select 1=Setups

1=Watchdogs/Setups
2=Chemical Setups

Select 1=Watchdogs/Setups

1=Machine Setup
2=Maintenance Setup
3=Clear Ram Vocabs
4=Passwords   0=exit

Select 1=Machine Setup
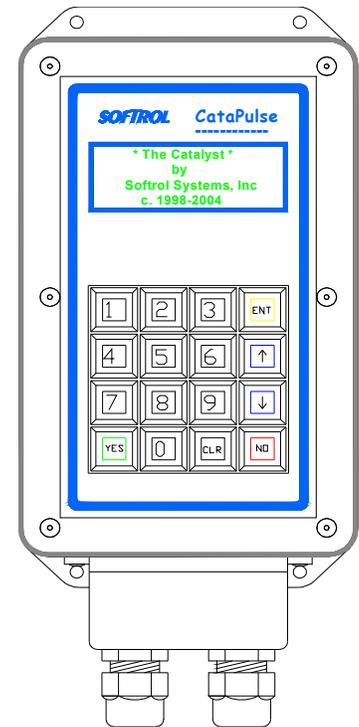
The setups are:

- **AutoChem Flush-** (5-99 sec) This setup tells the Catalyst how long to flush the chemical to the machine. The further away from the Catalyst the machine is, the longer the flush time.

- **Chemical Watchdog-** (0:00- 99:00) This a timer that will alarm if the Catalyst does not answer the chemical request in the specified time.

- **Prompt Weight-** (YES or NO) This will allow an operator to enter the weight at the beginning of the formula for reporting or ratiometric chemical addition purposes.

- **Signal Mute Time-** (0:00- 5:00) This is the amount of time that the alarm will be silenced by pressing the CLR button.

Latch Delay

The latch time for the interface will also need to be set. To set this time, first exit to the waiting for formula screen. Then enter 273685. This will take you to the main menu. Then enter 1 for the setup mode. Then enter 935483. This will take you to the EEPROM setups. Enter through the setups until you reach Latch Delay. This time is noted on the schematic notes for the specific machines. This time should never be less than 1 second. For machines that can turn on all of their chemical signals at once, this time should be 1 second. If the machine cannot give multiple signals at once, (for example a Braun or Milnor EP+) the latch time will be longer. (About 30 seconds for a Braun and 20 seconds for a Milnor EP+) Refer to the Catalyst manual for more programming information as well as the interface schematic.

Installation: ArcNet Network

CataPulse Interface

CataPulse Interface

CataPulse Interface

5

6

7

CataPulse Interface

CataPulse Interface

CataPulse Interface

CataPulse Interface

1

2

3

4

To Computer

Catalyst LT
chemical injection system

---------- 15 Conductor wire

————— Cat 5 Twisted Pair & 18 ga 2 Cond. Wire
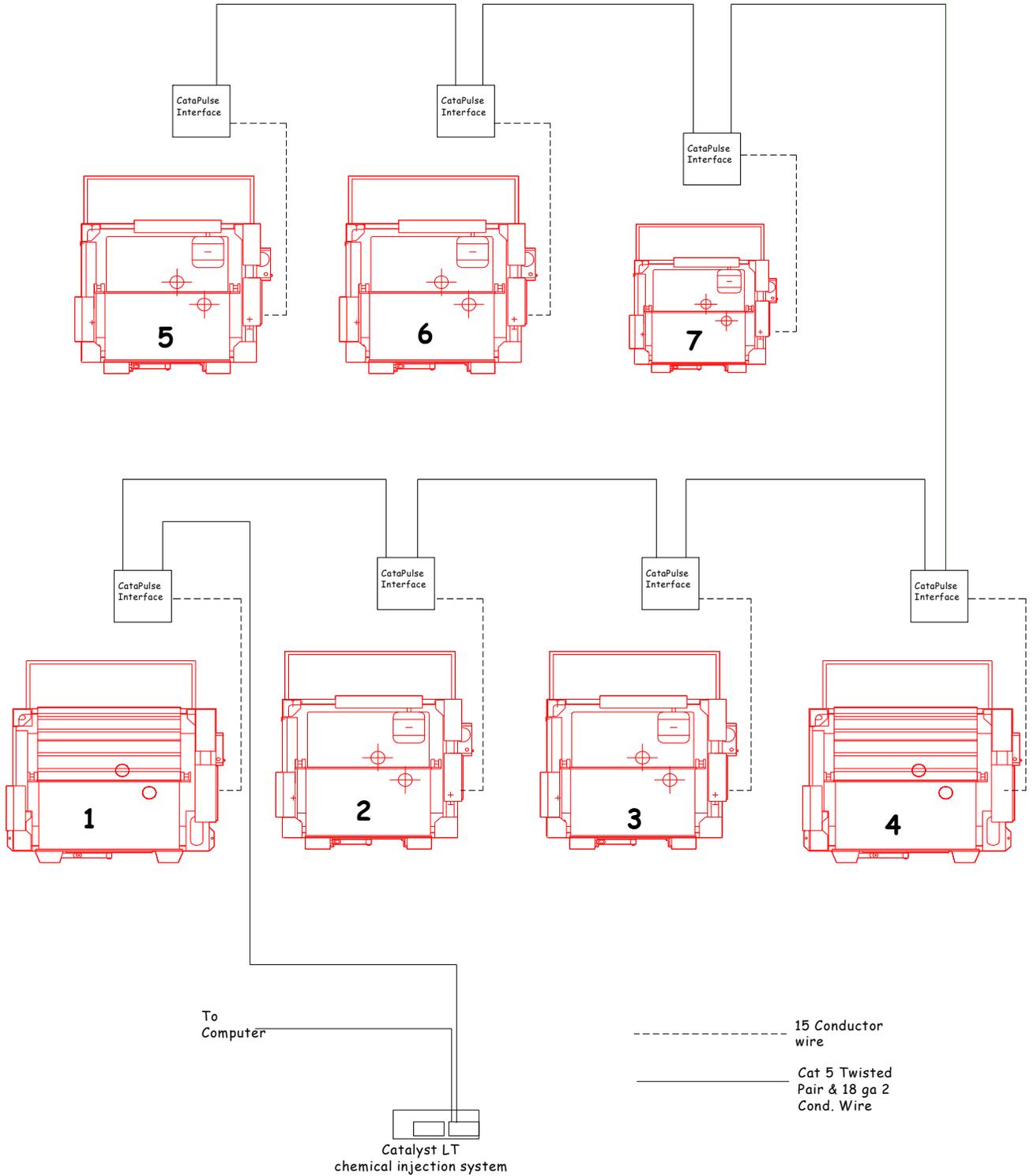
- The ArcNet cable is run as a bus system with the lines from the Catalyst LT in a daisy chain fashion.
- The maximum number of nodes (machines, interface, computer, or Catalyst) on the line is 10.
- The last node on each end of the line should have a 93-ohm terminator.
- The cable should be installed to avoid coming in close contact with high voltage lines (do not attach cable to incoming power to a machine) and variable speed drives for motors. If you must cross a high voltage line, run the communication cable perpendicular to it.

The arcnet layout varies with each plant, but a typical layout is as shown above:

Note: The Catalyst LT system has a maximum of 8 machines and does not use an active hub unless the system is redundant. All the nodes on the network are in one daisy chain.

Once the network is functional, communications can be tested from the PC. Formulas should be downloaded to the Catalyst and the machines/interfaces. This will load the proper chemical names into the Catalyst for priming and calibration.

3. Getting Started

Injection Controller

While an injection formula is running, the LCD will show the name and number of the formula, the current step and line number, the selected machine, the total time elapsed (T), and the step time as shown below:

```
        SOFTROL  (microPulse)
   Software & Control for Automation
                    CONTROL
                     STATION
   ┌─────────────────────────────┐
   │ 128: Chemical Injection      │
   │ Alkali  064     018          │
   │ Machine B     002            │
   │ T= 0:12   Step= 0:00         │
   └─────────────────────────────┘

       [1]  [2]  [3]  [ENT]
       [4]  [5]  [6]  [↑]
       [7]  [8]  [9]  [↓]
      [YES] [0] [CLR] [NO]
```
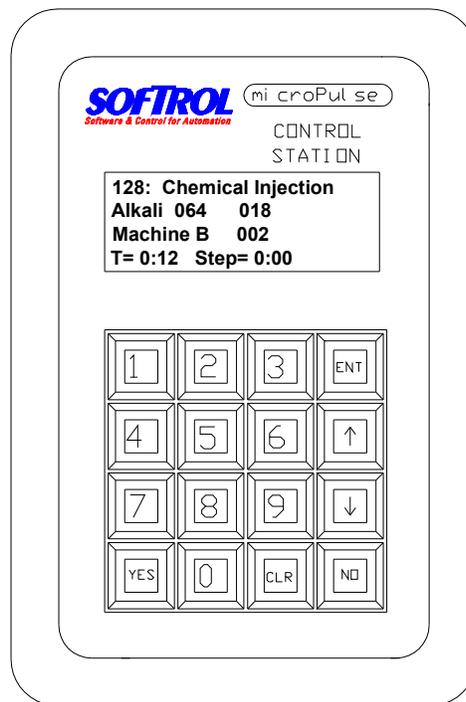
After the injection is completed the system will be flushed with water.

The LCD will display:
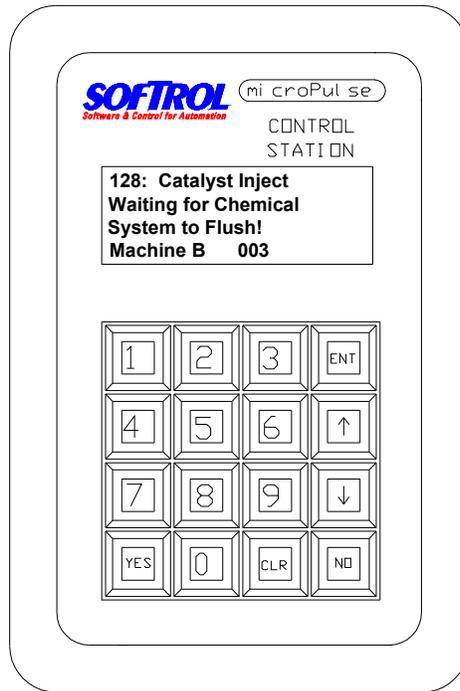
While the controller is idle, and waits for an injection request the LCD alternates between the two displays below:
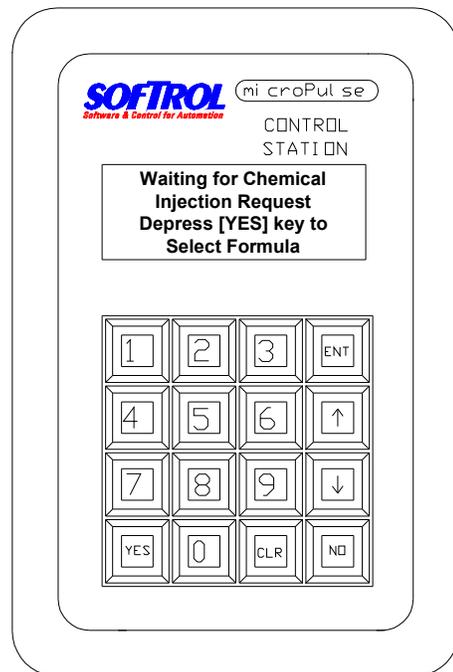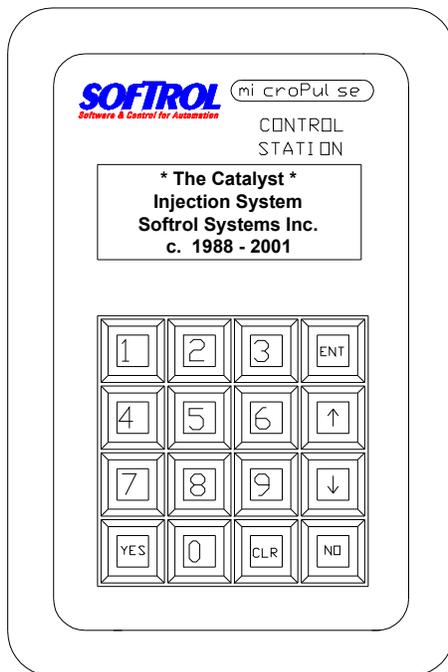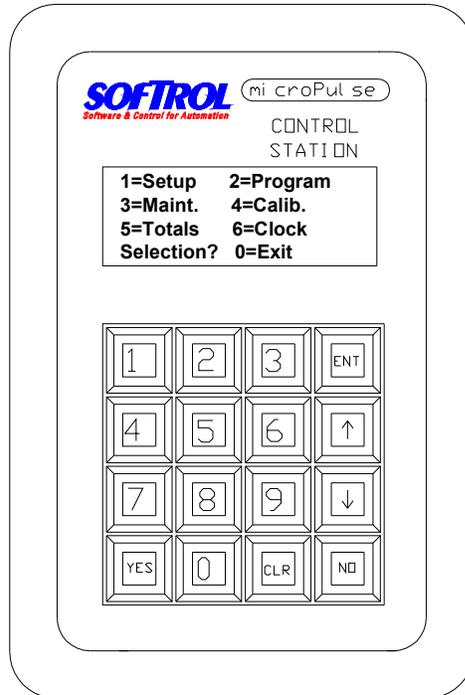
The Main Menu

To access the Main Menu you must enter a password. The Injection Controller is shipped from the manufacturing facility with 8 pre-programmed passwords. Each password consists of 6 digits that correspond to each password level. For example:

Level 1 = 111111   Level 5 = 555555
Level 2 = 222222   Level 6 = 666666
Level 3 = 333333   Level 7 = 777777
Level 4 = 444444   Level 8 = 888888 (freezes the timer only)

These passwords should be changed (see below) and customized for each level. There can only be one password assigned to each level for a total of eight passwords. To determine which password level is needed for access to each function see the following table:

Action	Password Level
Manual Chemical Injection	No Password
Cancel Signal	Levels 4-7
Cancel Steps	Levels 1-7
Access Totals	Levels 2-7
Calibrate	Levels 3-7
Set Clock	Levels 3-7
Cancel Maintenance Watchdogs	Levels 4-7

Setups	**Levels 6-7**
Program Formulas	Levels 6-7
Freeze Timers	Level 8

To Edit/Change Passwords at the Controller

Input the Level 6 or 7 password to access the Main Menu
Press the [1] key 1=Setup
Press the [1] key 1=Watch Dogs/Setup
The LCD screen displays:

> 1=Machine Setup
> 2=Maintenance Setup
> 3=Clear Ram Vocabs
> 4=Passwords 0=Exit

Press the [4] key 4=Passwords
The LCD screen displays:

> Level # 1
> Password =111111
> Use arrows to scroll
> ENTER=Accept NO=Exit

Use the arrows to scroll to the password level desired. Enter the six-digit password for this level.

Press the [ENT] key to accept.
Use the arrow keys to scroll to another password level if desired

CATALYST

Press the [NO] key to exit

Disabling the System

The system can be placed in the disabled mode. This will allow for maintenance and calibration without the machines calling for chemical. From the main screen:

- Press the [NO] & [ENT] keys at the simultaneously to DISABLE the system.
- Hold down the [ENT] key and then press the [YES] key to ENABLE the system.

Downloading Chemical Names

Once the system has been installed and the network connections have been established, the chemical names and check formulas can be downloaded from the PulseNet computer. See section 5 for more details on configuring PulseNet. The names and formulas will be downloaded when a Group Formula Update for the Catalyst Group is preformed. Once this is accomplished, it will be easier to calibrate and prime the system.

Priming the System

To check the Chemical Output Valves (Priming the System)
At the Injection Controller screen:

> Waiting for Chemical
> Injection Request!

- Enter the Level 7 password (factory default: 777777).
- Press the [3] key for Maintenance at the Main Menu.
- Press the [1] key for Manual Outputs.
- Open the calibration port in back of the machine.
- Press the [1] key for Chemicals.
- Use the arrows to scroll to the chemical to be checked.
- Press and hold the [YES] key to turn on the chemical's delivery valve and pump. Releasing the [YES] key turns off the valve and pump.
- Use the Stroke Limiting adjustment nut to adjust the flow through the valve. Low flow = .5 to 1 gpm, High flow = 1—3 gpm.
- Press the [CLR] + [ENT] keys to flush the system between each chemical injection.
- Repeat this procedure for each chemical. Press the [0] key to exit.

Key Strokes for the Catalyst

CLR + ENT = Flush all valves down the Calibration port
1 + ENT = Flush Chemicals 1-8 thru Calibration port
5 + ENT = Flush machine flush valves thru Backflush port
No + ENT = Disable the Catalyst
YES + ENT = Enable the Catalyst

Interface Operation

If the interfaces are the CataPulse LT units, then the setups must be done from the computer, or from a remote FPD.

Typically the interface is set-up to automatically read the formula from the machine when it starts and end the formula when the machine ends its cycle. When this is the case, no operator intervention is required.
Operator intervention is required when the formula on the interface is started manually. This can be useful when the machine lacks multiple chemical outputs or the machine has a chart controller and a normal interface is used. To start a formula manually, press YES and the enter in the appropriate formula number.

Additionally, it may be useful to have the operator enter in the weight of the load at the start of each cycle. This can be used for weight tracking as well as ratiometric chemical additions.
To use this option, turn the setup for Prompt Weight= **YES**. It is useful to have the formula started manually if the weight is being tracked. This will help speed up the process since the formula identification step will be eliminated.
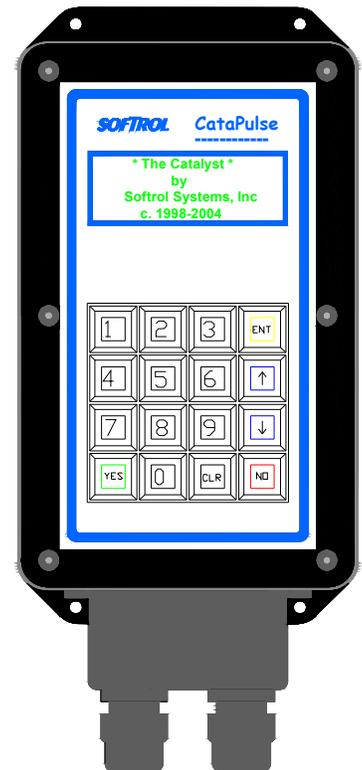
ANY FORMULA THAT IS STARTED MANUALLY SHOULD NOT HAVE THE FORMULA IDENTIFICATION STEP.

Press and hold the [1] button to view the chemicals 1-8 that are in the step. The 1st column is the desired amount, the 2nd column is the received amount. Button [2] shows chemicals 9-16.

Advancing a Formula:

If a formula on the machine needs to be advanced, the best option is to advance the machine to the chemical identification step. This will tell the interface to go to the appropriate step in its formula.

Ending a Formula:

To end a formula, the machine can be advanced to the end formula signal (Latch by itself) or it can be ended manually. To end the formula manually do the following:

Press **NO**-   This will pause the formula

Press **CLR**-   This will silence the alarm

Enter in a Password- This can be level 1 thru 7. (**111111 or 777777**)

Press **NO + ENT** at the same time to take the formula to the end. This will cancel the formula and it will not accrue weight or runs in the totals report. It will show up as a canceled load. If the formula is advanced to the end (use UP arrow), the load will be considered complete.

4. Calibration

Calibration of chemicals with the Injection Controller is done on a per chemical basis. This allows you to have extremely accurate injections of chemicals with a wide range of varying specific gravity and viscosity. The flow properties of a heavy, viscous surfactant will be quite different from those of a low viscosity acid.

Softrol Systems recommends that plant personnel become very familiar with the types of chemicals they will be handling and the potential hazards that are associated with each chemical. This information is contained in the MSDS (Material Safety Data Sheet) supplied by the chemical vendors. Softrol Systems also recommends that, at the very minimum, plant personnel be required to wear all protective equipment recommended in the MSDS.

FRONT VIEW   BACK VIEW

Claibration Port

Calibration Valve
Backflush Valve
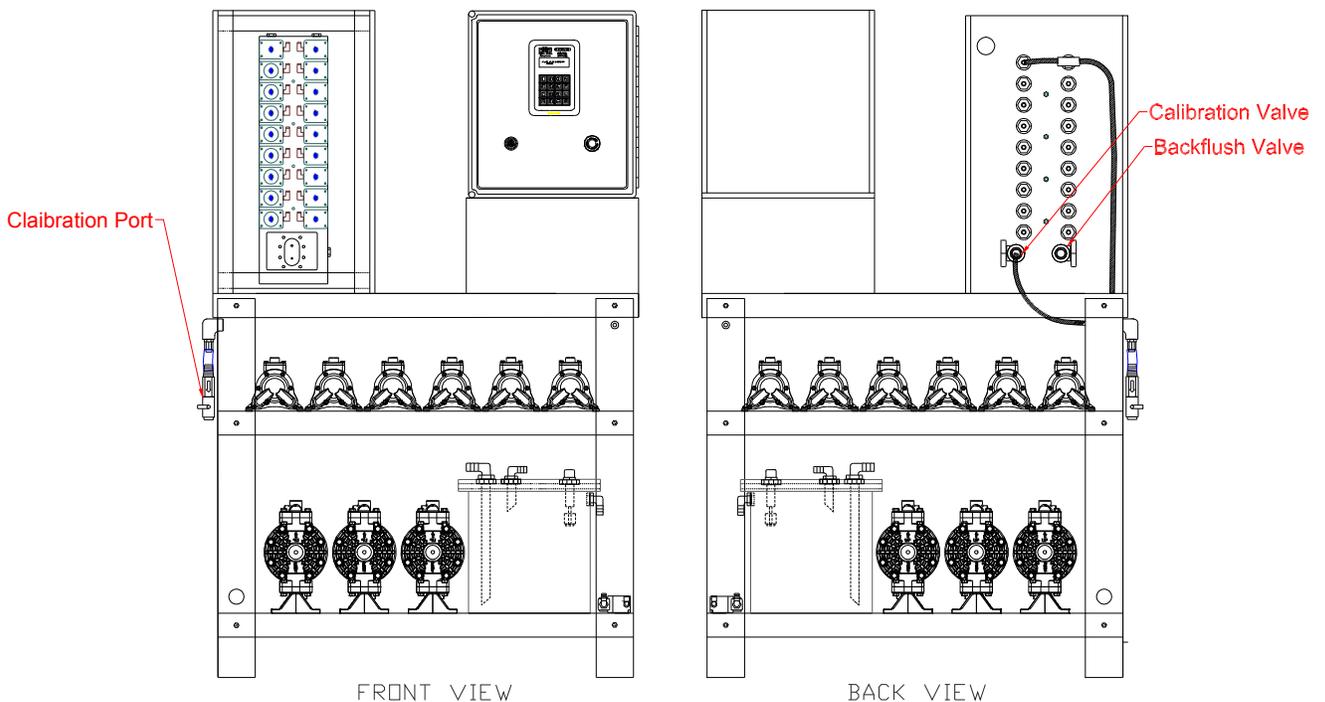
Flow Meter Based Calibration

To calibrate chemicals using the flow meter, please do the following:

1. At the Waiting for Chemical Injection screen on the Injection Controller – disable the system by pressing [No] & [ENT]. This will prevent the system from receiving chemical requests from machines.
2. Open the calibration valve on the back of the machine. Open the valve at the end of the calibration line and place the graduated cylinder underneath it.
3. Press [CLR] + [ENT] to flush the system. Make sure the system is thoroughly flushed. Empty and dry the cylinder.
4. Enter the Level 7 password to access the Main Menu.
5. Press [4] 4=Calib.
6. Press [1] 1=Calibrate Chems.
7. Use the [↑] and [↓] arrows to scroll through the available chemical numbers until the chemical to be calibrated is displayed on line 1 of the LCD display.
8. Press the [ENT] key to select that chemical.
9. Select [1] for flow sensor calibrations.
10. Press and *hold* the [YES] key to dispense chemical. This will stop when the [YES] key is released.
   For chemicals with large injections (Alkali, Detergent, Bleach…etc), fill the cylinder to 1800 ml. For chemicals with small injections (<6oz ex. Sour, A/C, …etc) fill the cylinder to about 800 ml.

11. The Catalyst screen will display the counts from the flowmeter. These should be about 18-30 counts per oz.
12. Close the valve at the end of the calibration line. Place the graduated cylinder on a level surface and accurately read the amount of chemical in the graduated cylinder.

The cylinder has graduations in 20 ml increments. To convert ml to Oz., divide by 29.57. Be sure to measure the chemical only and not foam. This will result in more accurate injections.

Example 1760 ml / 29.57= 59.5 Oz.
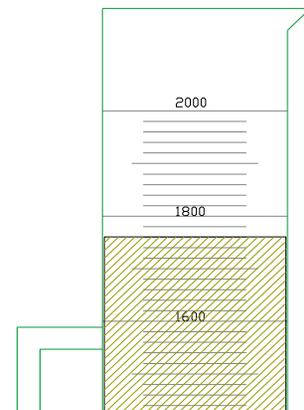
13. Press [ENT] to accept the counts. The controller will display a suggested amount based on the previous calibration. Press [CLR] and enter in the new amount. Enter the amount to the tenths place. Example- 58 Oz. = 58.0
14. Press [ENT]. The Catalyst will display:

Save Calibration As

1= Initial   2= H-Factor

3= Update 4= V-Factor

0= Discard and Exit

15. Select [1] to store the calibration as the initial calibration. This is very important, if it is not done, the calibration will be lost.
16. The controller will then return to the calibration menu.
17. Press and hold [1] & [ENT] to flush chemicals 1-8 for 5 seconds. Then press and hold [3] & ENT to flush chemicals 9-16 for 5 seconds. Finally, press and hold [CLR] & [ENT] to flush the system for about 15 seconds.

H-Factor Calibrations- This is used for greater accuracy for small dispense amounts (<6 Oz.). If you do wish to do a H-Factor calibration, skip to step 26.

18. Select [1] for calibrate chemicals.
19. Select the same chemical as previously calibrated.
20. Select #1 for Flow sensor calibration.
21. Place the 250 ml graduated cylinder under the calibration port.
22. Press and hold [YES] to dispense 200-220 ml. (it will contain mostly water)

The small graduated cylinder is marked in 2 ml graduations. Accurately read the amount and divide by 29.57 to convert to Oz.

Example 226 ml / 29.57 = 7.6 Oz.
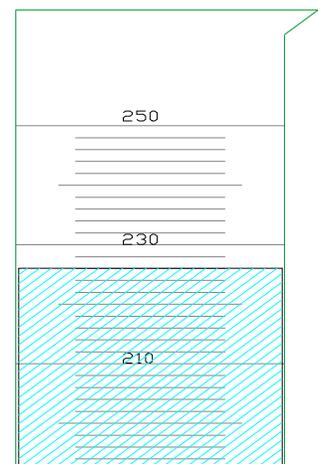
23. Press [ENT] to accept the counts.
24. Enter in the amount dispensed. It should be slightly more than the suggested amount. If the amounts differ by more than 1 oz. then it might be necessary to recalibrate.
25. Select #2 H-Factor.
26. Flush the system by the same procedure in step 17
27. Press 0 to exit to the main menu.
28. Close the Calibration valve on the back of the unit.
29. Enable the system by holding down the [ENT] key and pressing [YES]

Time Based Calibration

Due to certain circumstances, it may be beneficial to calibrate the chemicals based on time rather than flow meter input.

To calibrate the chemicals without the flow meter, do the following:

- Follow the normal calibration procedure. At step 9 select #2 for Time Based Calibration.
- Press YES to dispense the chemical as described in step 11. The controller will display the time on the screen in tenths of a second.
- Once the product has been dispensed, press enter to accept the counts and then enter in the received amount. The controller will automatically save the calibration as the Initial calibration.
- The Catalyst will now dispense that particular chemical without reference from the flow meter.
- There is no need to change the programming on the machines or interfaces, the Catalyst will still dispense the chemical in the desired units.
- On time based delivery, the controller will open the chemical valve and turn on the pump for a specified time. If there is no flow or lack of product, the Catalyst will not alarm.

Calibration Errors-

- 0 cannot be entered in for a Calibration.
- If No counts or low counts (>1 per second) are detected, the Catalyst will alarm with a Minimum Frequency Error. If this occurs, press No to exit and check the flow rate as well as the response from the meter.

Checking the Calibration

WARNING: DO NOT USE THE CALIBRATION ROUTINE TO CHECK CALIBRATION ACCURACY OR THE CALIBRATION WILL BE ALTERED. INSTEAD, PROGRAM A CALIBRATION TEST FORMULA.

After the chemical is calibrated, it is preferable to run a calibration check formula. These are the formulas that are stored on the Catalyst itself. These formulas should correspond to the chemical number. For example, formula #1 checks chemical #1. If chemical #1 is Alkali, formula #1 should be called Check Alkali and when run, it will dispense the requested amount of Alkali.

Check Formula example:
```
:001 Check Alkali
:002    Set Chemical Flush = 0
:003    Add 0 oz of Alkali
:004    Run Time 0:00
:005    END FORMULA
```

To run the check formula, do the following:

1. At the Waiting for Chemical Injection screen on the Injection Controller – disable the system by pressing [No] & [ENT]. This will prevent the system from receiving chemical requests from machines.
2. Open the calibration port and place the graduated cylinder underneath it.
3. Press [YES] and then enter in the formula number. Press [ENT] to begin.
4. The controller will ask you to select the destination. Press [ENT] to select the Calibration port. (This is very important so the unit will not flush after dispensing the chemical.
5. The controller will then ask you to key in the desired amount.
6. Then press [YES] to begin the dispensing of the chemical.
7. The controller will display the desired amount as well as the received amount. The received amount should be counting up to the desired amount.
8. Once the injection is complete, measure the amount of chemical that has been dispensed.

Desired Amount

Delivered Amount

```
128:  Chemical Injection
Alkali  005      000
Machine B     002
T= 0:12  Step= 0:00
```
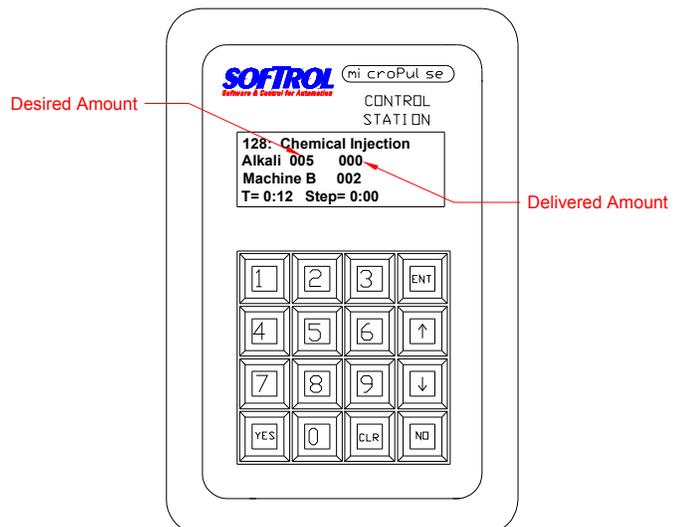
9. To determine the amount of error, subtract the measured amount received from the amount desired. Divide this number by the amount desired and then multiply by 100. This will give you the percentage error

Example-	**Desired 64 Oz**	**Received 62 Oz**
	64-62=2	2/64=.03125
	.03125 X 100 =	3.125 % error

If any calibrations are outside the desired tolerance (normally 1%-5%), see the section, Trouble With Calibrations. Taking a painstaking approach to the calibration procedure will pay off later with extremely accurate chemical injections. By contrast, a poorly executed calibration routine will result in inaccurate and possibly costly chemical injections.

Flush the system when finished by the procedure in step 17 and press [ENT] & [YES] to enable the Catalyst to resume pumping.

ML to Oz. Conversion Table

ML	OZ	ML	Oz	ML	OZ	ML	OZ	ML	OZ	ML	OZ
50	1.7	140	4.7			660	22.3	1110	37.5	1560	52.8
52	1.8	142	4.8	230	7.8	670	22.7	1120	37.9	1570	53.1
54	1.8	144	4.9	240	8.1	680	23.0	1130	38.2	1580	53.4
56	1.9	146	4.9	250	8.5	690	23.3	1140	38.6	1590	53.8
58	2.0	148	5.0	260	8.8	700	23.7	1150	38.9	1600	54.1
60	2.0	150	5.1	270	9.1	710	24.0	1160	39.2	1610	54.4
62	2.1	152	5.1	280	9.5	720	24.3	1170	39.6	1620	54.8
64	2.2	154	5.2	290	9.8	730	24.7	1180	39.9	1630	55.1
66	2.2	156	5.3	300	10.1	740	25.0	1190	40.2	1640	55.5
68	2.3	158	5.3	310	10.5	750	25.4	1200	40.6	1650	55.8
70	2.4	160	5.4	320	10.8	760	25.7	1210	40.9	1660	56.1
72	2.4	162	5.5	330	11.2	770	26.0	1220	41.3	1670	56.5
74	2.5	164	5.5	340	11.5	780	26.4	1230	41.6	1680	56.8
76	2.6	166	5.6	350	11.8	790	26.7	1240	41.9	1690	57.2
78	2.6	168	5.7	360	12.2	800	27.1	1250	42.3	1700	57.5
80	2.7	170	5.7	370	12.5	810	27.4	1260	42.6	1710	57.8
82	2.8	172	5.8	380	12.9	820	27.7	1270	42.9	1720	58.2
84	2.8	174	5.9	390	13.2	830	28.1	1280	43.3	1730	58.5
86	2.9	176	6.0	400	13.5	840	28.4	1290	43.6	1740	58.8
88	3.0	178	6.0	410	13.9	850	28.7	1300	44.0	1750	59.2
90	3.0	180	6.1	420	14.2	860	29.1	1310	44.3	1760	59.5
92	3.1	182	6.2	430	14.5	870	29.4	1320	44.6	1770	59.9
94	3.2	184	6.2	440	14.9	880	29.8	1330	45.0	1780	60.2
96	3.2	186	6.3	450	15.2	890	30.1	1340	45.3	1790	60.5
98	3.3	188	6.4	460	15.6	900	30.4	1350	45.7	1800	60.9
100	3.4	190	6.4	470	15.9	910	30.8	1360	46.0	1810	61.2
102	3.4	192	6.5	480	16.2	920	31.1	1370	46.3	1820	61.5
104	3.5	194	6.6	490	16.6	930	31.5	1380	46.7	1830	61.9
106	3.6	196	6.6	500	16.9	940	31.8	1390	47.0	1840	62.2
108	3.7	198	6.7	510	17.2	950	32.1	1400	47.3	1850	62.6
110	3.7	200	6.8	520	17.6	960	32.5	1410	47.7	1860	62.9
112	3.8	202	6.8	530	17.9	970	32.8	1420	48.0	1870	63.2
114	3.9	204	6.9	540	18.3	980	33.1	1430	48.4	1880	63.6
116	3.9	206	7.0	550	18.6	990	33.5	1440	48.7	1890	63.9
118	4.0	208	7.0	560	18.9	1000	33.8	1450	49.0	1900	64.3
120	4.1	210	7.1	570	19.3	1010	34.2	1460	49.4	1910	64.6
122	4.1	212	7.2	580	19.6	1020	34.5	1470	49.7	1920	64.9
124	4.2	214	7.2	590	20.0	1030	34.8	1480	50.1	1930	65.3
126	4.3	216	7.3	600	20.3	1040	35.2	1490	50.4	1940	65.6
128	4.3	218	7.4	610	20.6	1050	35.5	1500	50.7	1950	65.9
130	4.4	220	7.4	620	21.0	1060	35.8	1510	51.1	1960	66.3
132	4.5	222	7.5	630	21.3	1070	36.2	1520	51.4	1970	66.6
134	4.5	224	7.6	640	21.6	1080	36.5	1530	51.7	1980	67.0
136	4.6	226	7.6	650	22.0	1090	36.9	1540	52.1	1990	67.3
138	4.7	228	7.7			1100	37.2	1550	52.4	2000	67.6

5. Configuring PulseNet

The Catalyst Chemical System comes standard with the PulseNet Catalyst Plus Module. This software can be used to easily program formulas, monitor the system, and generate production and consumption reports. Before the software can be used properly, it must be configured to meet the plant specifications. The manual for the PulseNet software has specific details on how to set-up the software for your plant. The key items for setup can be found in the PulseNet manual and start on page 15. They are as follows:

- **Configure Plant Location-** This needs to be completed for the reports.
- **Configure Ports-** This should already be done if the computer was received from Softrol. If not, this will need to be completed per the manual.
- **Configure Groups-** This will need to be completed. There should be a group for each different size / type of machine.
  Note: All machines in the same group will have the exact same formulas.
  There should also be a group created for the Catalyst. The controller type for this group will be the Catalyst Plus Podium.
- **Configure Supply Inventory Data-** This will need to be entered to have chemical totals reports. The units are the units that the bulk chemical is delivered in. This will most likely be in Gal. Then the cost would be entered in cost per gallon. This will give the Plant Chemical totals report in Gallons, not ounces. (If the units of measurement on the Catalyst are Oz.)
- **Configure Plant Utility Data-** This is generally not used in a Catalyst only plant. Please refer to the PulseNet Manual if this option is desired.
- **Configure Classification**- This can be done for the plant production report. Each formula can be assigned to a classification for convenience in reporting.

Now we get into the group setups. These should be done for the first group and then can be copied into each of the other groups.

- **Edit Vocab Files-** The only Vocab that needs to be created is under chemical units and is unit 001. This will be set to whatever units that you will be calibrating in- most likely Oz.
- **Edit Chemical Assignments-** This setup is very important for proper operation of the system. In this screen, the name of the chemical is created as well as the units it is measured in, if it can be used with steam, and the units per pound if it is to be used with ratiometric processing. Also, the chemical supply is identified and corresponding amount is entered.

Note: Most likely, the bulk units are in gallons while the calibrated units are in ounces. Then the amount of gallons per ounce would be entered as .007812. See page 22 of the PulseNet manual for examples.

Once this page is completed, save it and then change the Group ID to another group.   Now import the data from the first group into the new group and save. Repeat this until all of the groups have been completed.

Finally, enter the system defaults Menu and set the RSR to have an automatic time.   You will need to enter in the time the RSR will occur. This should be at the end of a shift or the end of the day.

Note: The machines/interfaces and the computer need to be powered on to communicate to the totals to the computer.

Also, check the box to also upload history. This will allow the plant history reports to be viewed for specified time periods.

PulseNet is a very powerful software tool and has many features. The above information is just the basic amount that needs to be entered to have the system function properly.

6. Programming from PulseNet

The Catalyst Chemical System comes standard with the Pulsenet Catalyst Plus Module. This software can be used to easily program formulas, monitor the system, and generate production and consumption reports.

One of the best features of PulseNet is the ease with which formulas can be programmed. We will show you how to program a few simple formulas in order to get you started quickly and painlessly. There are many details involved in programming a formula. These are covered fully in the PulseNet User's Manual included with this installation. We will only use the basic programming tools on this tutorial.


```
Wet Process Formula Editor                                          _ □ ×

File   Edit   Tunnel   Utilities   Help

                                              IOP    I2    I3    I4
                                              01     02    03    04

0001: LIGHT REACT.VS
0002:    Fill Hot When Level < 10.0" Until Next Step
0003:    Fill Cold When Level < 20.0" Until Next Step
0004:    Steam When Temperature < 160°F Until Next Step
0005:    Cooldown When Temp > 138°F Until Next Step
0006:    Extract High Until Next Step
0007:    Extract Low Until Next Step
0008:    Run Time 5:00                                   001/0005:00
0009: Desize
0010:    Normal Rotation
0011:    Fill Hot When Level < 15.0" Until Next Step
0012:    Steam When Temperature < 140°F Until Next Step
0013:    Wait to Satisfy
0014:    Run Time 1:00                                   002/0006:00
0015: HOT SUDS
0016:    Dwell Timer 999 Seconds
0017:    Fill Hot When Level < 10.0" Until Next Step
0018:    Wait to Satisfy
0019:    Steam When Temperature < 180°F Until Next Step
0020:    Wait to Satisfy

  Group #1: Dirty Laundry Eaters        Formula #1, LIGHT REACT.VS
       22,905 bytes free                 MANAGER 10-01-1997 11:46
        Class: Blue Cotton              Estimated Run Time: 46:00
  Yield: 400 Lbs.      Count: 200       Empirical Run Time: 0:00
```

Programming a Wash Formula

At the main screen of PCPM, click on Group. Select Edit Formulas to bring up the editing screen.

Click on File on the menu then select Open Formula.

A list of Formulas will be displayed. For this example, please click on 001 Unassigned to select formula 1.

The editing window will display two lines. One line will be the unedited formula name and the other with END FORMULA instruction.

Click on the first line and press <Enter>.

Input the name of the formula. In this case input Hot Wash.

The display will show the edited name.

Move the cursor to the END FORMULA line and press the <Insert> key.

A window with icons for all the available instructions will be displayed. The set of instructions displayed will vary according to the type of controller used. For this example we will be using a washer controller.

The display shows 10 icons, one icon for each set of instructions.

Click on the rightmost icon on the top, which depicts a water faucet.
A list of all the selections will be displayed. Click on the first selection.

Input the inches of water of hot fill. In this case input 10.0

Press <Enter>
The main editing display will show the newly inserted instruction.

The next instruction to be inserted is a Run instruction. Move the cursor to the END FORMULA line and press the <Insert> key. The window with the instruction icons will be displayed.

Click on the Clock Icon, the first icon on the top left.

Input the Run Time. For this example input 5:00

The newly inserted instruction will be displayed on the editing screen.
The formula has been programmed. The display should look like below:

0001: Hot Wash
0002: Fill Hot When Level < 10.0" Until Next Step
0003: Run Time 5:00
0004: END FORMULA

The formula must be saved or it will be lost when the computer is turned off. To save the formula, click on **File** and then click on **Save**. To exit the editor, click on the Door Icon on the top of the window. For additional information refer to the PulseNet User's Manual.

Programming Operations using PulseNet
Operations are small but complete sections of instructions that perform a specific task. They are reusable and are used to construct the more complex formulas.

Operations are programmed in the same manner as formulas. From the main screen in the formula editor, click on the **File** and select **Open Operation**. Refer to the PulseNet User's Manual for more information on Programming Formulas and Operations.

The washer formulas can be very complex and are beyond the scope of this. For more information on developing these formulas, consult the washer manual as well as the PulseNet manual.

Programming the Interface

Using the PulseNet software in the same way as the washer formulas can program the interface. However, since the interface does not have all of the capabilities of the washer controller, it has a limited instruction set. These are the instructions that may be used:

Add Chemical by Percent
Add Chemical by Unit
Chemical Step
Run Time
Signal
Wait to Satisfy

The formula on an interface consists of chemical steps and chemical amounts. Each step must end with a Run Time 0:00. This tells the interface to wait there until the washer calls for the next step.

The formula always begins with the Formula Name and ends with the End of Formula. When the washer identifies the formula to the interface, the interface starts the formula. The interface will execute all the instructions in the first step. This can include chemical injections. If no injection is desired at the identification of the formula, the formula name should be immediately followed by a run time of 0:00. For example a flush at the beginning of a formula:

Formula #18, Bar Mops

0001: Bar Mops
0002:   Run Time 0:00
0003:   *******Chemical Step 1*******
0004:   Add 30 Oz. of Alkali
0005:   Add 15 Oz. of Detergent
0006:   Run Time 0:00

If there is chemical desired upon identifying the formula, then the first step should include these amounts. For example a break at the beginning of a formula:

Formula #8, Color Pants

0001: Color Pants
0002:   *******Chemical Step 1*******
0003:   Add 30 Oz. of Alkali
0004:   Add 15 Oz. of Detergent
0005:   Run Time 0:00

All of the Chemical steps should end with a Run Time 0:00. This includes the last step before the end of formula. For example:

0012:   *******Chemical Step 4*******
0013:   Add 12 Oz. of Softener
0014:   Add 10 Oz. of Sour
0015:   Run Time 0:00
0016:   END OF FORMULA

The chemicals in a step are injected in order of their chemical number. For instance, if Detergent is set-up as chemical #1 and Alkali as Chemical #2, The Detergent will always be injected before the Alkali when they are in the same step. Example-

0001:   Color Pants
0002:   *******Chemical Step 1*******
0003:   Add 30 Oz. of Alkali
0004:   Add 15 Oz. of Detergent
0005:   Run Time 0:00

 Some examples of formulas and their functional descriptions are on the following page.

Programming the Injection Controller

Only calibration test formulas should be programmed for the injection controller. These formulas will be used to test the accuracy of chemical calibrations. Chemical units should be set to 0. When the formula is ran the controller will prompt for a unit input.

A typical test formula is shown below.

:0001   Check Alkali
:0002   Set Chemical Flush = 0
:0003   Add 0 Oz of Alkali
:0004   Wait to Satisfy
:0005   Run Time 0:00
:0006   END FORMULA

Go ahead and program the formula by yourself. If you run into problems take another look at the other formula examples. Refer to the PulseNet User's Manual for additional information.

7. Programming the Washers

Washers with Softrol controllers can be programmed by PulseNet and can interface directly with the Catalyst unit. The section on Programming from PulseNet describes how to create washer formulas. The chemical additions are simply programmed with the chemical name and the desired amount.

Note: The injection must be followed by a Wait to Satisfy in order for the machine to hold while chemical is being injection. (Softrol controllers only)

Non-Softrol controlled washers will require an interface to work with the Catalyst chemical system. The interface reads signals from the washer's chemical outputs and determines the formula that is being run and the step that it is at. See the section on Programming from PulseNet for information on how to program washers with Softrol controls.

The interface has 8 inputs that correspond to the binary formula identifier:

Input	1	2	3	4	5	6	7	8
Binary	1	2	4	8	16	32	64	Latch

The inputs to the interface are wired to the chemical outputs of the washer. If there are not 8 outputs, the last output should be wired to the input #8 of the Interface.

To identify the formula, the washer needs to be programmed to give the corresponding binary number followed by a latch. Example:

Formula	Outputs
1	1,8
2	2,8
3	1,2,8
7	1,2,3,8
63	1,2,3,4,5,6,8

The outputs should be programmed to turn on for 5 seconds. The Latch output should be programmed to turn on last. This will cause the interface to read all inputs that are on or that were on during a specified time period.

Once the formula is identified to the interface, the washer should be programmed to identify the chemical step that is desired. The chemical step is identified in the same binary manner; however, the latch is *not* called for. The maximum number of chemical steps is 16. Example:

Chemical Step	Outputs
1	1
2	2
3	1,2
4	3
5	1,3

To signal the end of the formula, the washer should be programmed to turn on the Latch input for 5 seconds. There should not be any other binary inputs to the interface on at this time. Some washers require a water level to turn on any chemical outputs; in this case, the end of the formula signal should be programmed before the extract step.

The number of formulas depends on the number of outputs available from the washer. Additionally, some machines require that chemical be used for the hold. This will reduce the number of outputs available for the interface. Ideally, all 8 outputs from the washer can be turned on at the same time. If the washer cannot do this, then the maximum time between output signals should be no more than 20 seconds.

The following pages show examples of formulas for different machines. These are general guidelines for programming and should be used only as such.

Braun Formula

Program 14   **Bar Mops**

Step	Operation	Time	Level	Temp	Flush	SS	SPL A	VOL A	SPL B	VOL B	Option	
1	Rinse	0	0	0	0	B	2	5	3	5		*2+4+8+Latch*
2	Rinse	2	17	140	0	B	4	5	11	5		*=Formula 14*
3	Drain											
4	Break	12	9	170	0	B	1	5	0	0	ST + T	**Chem Step 1**
5	Drain											
6	Rinse	2	17	160	0	B	0	0	0	0		
7	Drain											
8	Wash	2	9	170	0	B	2	5	0	0	ST + T	**Chem Step 2**
9	Drain											
10	Rinse	2	17	170	0	B	0	0	0	0		
11	Drain											
12	Rinse	2	17	160	0	B	0	0	0	0		
13	Drain											
14	Rinse	2	17	160	0	B	0	0	0	0		
15	Drain											
16	Wash	10	9	145	0	B	1	5	2	5		**Chem Step 3**
17	Drain											
18	Rinse	2	17	145	0	B	0	0	0	0		
19	Drain											
20	Rinse	2	17	130	0	B	3	5	0	0		**Chem Step 4**
21	Drain											
22	Wash	5	9	100	0	B	1	5	3	5		**Chem Step 5**
23	Extract	2									Low Spd	
24	Shakeout	1	0	0	0	B	0	0	0	0		
25	Extract	6										
26	Shakeout	0	0	0	0	B	11	5	0	0		**Formula End**
27	End											

Catalyst Formula
Formula #14, Bar Mops
```
0001:  Bar Mops
0002:         Run Time 0:00
0003:         *******Chemical Step 1*******
0004:         Add 280 Oz. of Alkali
0005:         Add 60 Oz. of Detergent
0006:         Run Time 0:00
0007:         *******Chemical Step 2*******
0008:         Add 48 Oz. of Detergent
0009:         Run Time 0:00
0010:         *******Chemical Step 3*******
0011:         Add 256 Oz. of Bleach
0012:         Run Time 0:00
0013:         *******Chemical Step 4*******
0014:         Add 10 Oz. of Antichlor
0015:         Run Time 0:00
0016:         *******Chemical Step 5*******
0017:         Add 12 Oz. of Mildewcide
0018:         Add 9 Oz. of Sour
0019:         Run Time 0:00
0020:  END OF FORMULA
```

Braun Formula

Braun outputs	1	2	3	4	5	6	7	11
Interface inputs		1	2	4	8	16	32	64	Latch

Steps 1 & 2 Identify the formula as formula 14. The Catalyst interface will recognize the formula and start formula 14. The formula will proceed to the first step ender (line 2). No chemicals are called for and thus will not be injected.

Step 4 signals the interface to go to chemical step #1. The interface will then place the Braun on hold and request the Alkali and Detergent. Once the chemical is delivered, the interface will proceed to the next step ender (line 6) and release the washer.

Steps 5- 25 will continue to call for the appropriate chemical steps and deliver the chemicals.

Step 26 signals the interface to end the formula. This will start the Load/Unload timer until the next formula is run.

Program 31   **White Bath Towel**

Step	Operation	Time	Level	Temp	Flush	SS	SPL A	VOL A	SPL B	VOL B	Option	
1	Break	0	0	0	0	B	1	5	2	5		*1+2+4+8*
2	Break	0	0	0	0	B	3	5	4	5		*+16+Latch*
3	Break	10	9	160	0	B	5	5	11	5	ST + T	*=Formula 31*
4	Drain											
5	Rinse	2	17	160	0	B	0	0	0	0		
6	Drain											
7	Wash	1	9	155	0	B	0	0	0	0	ST + T	
8	Wash	2	9	155	0	B	2	5	0	0		*Chem Step 2*
9	Drain											
10	Rinse	2	17	145	0	B	0	0	0	0		
11	Drain											
12	Rinse	2	17	130	0	B	1	5	2	5		*Chem Step 3*
13	Drain											
14	Rinse	2	17	115	0	B	0	0	0	0		
15	Drain											
16	Wash	5	9	100	0	B	3	5	0	0		*Chem Step 4*
17	Extract	7										
18	Shakeout	0	0	0	0	B	11	5				*Formula End*
19	End											

Catalyst Formula
Formula #31, White Bath Towel

0001: White Bath Towel
0002:   *******Chemical Step 1*******
0003:   Add 30 Oz. of Alkali
0004:   Add 15 Oz. of Detergent
0005:   Run Time 0:00
0006:   *******Chemical Step 2*******
0007:   Add 48 Oz. of Bleach
0008:   Run Time 0:00
0009:   *******Chemical Step 3*******
0010:   Add 6 Oz. of Antichlor
0011:   Run Time 0:00
0012:   *******Chemical Step 4*******
0013:   Add 12 Oz. of Softener
0014:   Add 10 Oz. of Sour
0015:   Run Time 0:00
0016: END OF FORMULA

Braun Formula

Braun outputs	1	2	3	4	5	6	7	11
Interface inputs		1	2	4	8	16	32	64	Latch

The Braun formula above is programmed to identify formula 31 and call for the appropriate chemical injections.

Steps 1-3 Identify the formula to the interface as formula 31. The interface will start the formula and proceed to the step ender (line 5) This includes chemical step 1 so the Alkali and Detergent will be injected as the washer fills.

Step 8 tells the interface to go to chemical step 2. The interface will add the bleach and stop at line 8.

Step 18 signals the interface to end the formula. The Load/Unload timer will start and run until the next formula is run.

Ellis / AWC 1000 Formula 1> BAR TOWELS

#	OPERATION	MIN	SEC	TEMP	LEV	CHEMICAL	KEY #'S	ACS Output	Chem #	Binary
1	*Formula Select*		05			*Formula ID & Chem Step 1*	17 - 23			
2	*Fill*		01	180	12		2	17	1	1
3	**ALKALI FLUSH**	3		180	12		2 - 3	18	2	2
4	*Drain*	1					5	19	3	4
5	**FLUSH**	1	30	180	12		2	20	4	8
6	*Drain*	1					5	21	5	16
7	*Fill*		01	180	6		2	22	6	32
8	*Inject*		05			Chem Step 2	18	23	7	Latch
9	**BREAK**	10		180	6		2 - 3			
10	*Drain*	1					5			
11	**FLUSH**	1	30	175	12		2			
12	*Drain*	1					5			
13	*Fill*		01	175	6		2			
14	*Inject*		05			Chem Step 3	17 - 18			
15	**SUDS**	6		175	6		2 - 3			
16	*Drain*	1					5			
17	**FLUSH**	1	30	170	12		2			
18	*Drain*	1					5			
19	**FLUSH**	1	30	165	12		2			
20	*Drain*	1					5			
21	**FLUSH**	1	30	160	12		2			
22	*Drain*	1					5			
23	**FLUSH**	1	30	155	12		2			
24	*Drain*	1					5			
25	*Fill*		01	150	6		2 - 3			
26	*Inject*		05			Chem Step 4	19			
27	**BLEACH**	10		150	6		2			
28	*Drain*		45				5			
29	**RINSE**	2		135	12		2			
30	*Drain*		45				5			
31	*Fill*		01	120	12		2			
32	*Inject*		05			Chem Step 5	17 - 19			
33	**ANTICHLOR**	2		120	12		2			
34	*Drain*		45				5			
35	**RINSE**	1		105	12		1			
36	*Drain*		45				5			
37	*Fill*		01	90	6		1			
38	*Inject*		05			Chem Step 6	18 - 19			
39	**SOUR**	5		90	6		1			
40	*Drain*	1					5 - 10			
41	*High Extract*	6					5 - 14			
42	*Shakeout*	1	30				5 - 11			
43	*Stop*		30			*Formula End*	5 - 23			
44	*End*						4 - 5 - 8 - 16			

Catalyst Formula
Formula #1, White Bar Towels

```
0001: Bar Towels
0002:          *******Chemical Step 1*******
0003:          Add 30 Oz. of Alkali
0004:          Run Time 0:00
0005:          *******Chemical Step 2*******
0006:          Add 72 Oz. of Alkali
0007:          Add 48 Oz. of Detergent
0008:          Run Time 0:00
0009:          *******Chemical Step 3*******
0010:          Add 24 Oz. Alkali
0011:          Add 24 Oz. Detergent
0012:          Run Time 0:00
0013:          *******Chemical Step 4*******
0014:          Add 64 Oz Bleach
0015:          Run Time 0:00
0016:          *******Chemical Step 5*******
0017:          Add 4 Oz Antichlor
0018:          Run Time 0:00
0019:          *******Chemical Step 6*******
0020:          Add 8 Oz Sour
0021:          Run Time 0:00
0017: END OF FORMULA
```

Ellis Formula

AWC outputs	17	18	19	20	21	22	23
Interface inputs	1	2	4	8	16	32	Latch

The Ellis formula above is programmed to identify formula 1 and call for the appropriate chemical injections.

Step 1 Identifies the formula to the interface as formula 1. The interface will start the formula and proceed to the step ender (line 4). This includes chemical step 1 so the Alkali will be injected as the washer fills.

Step 8 tells the interface to go to chemical step 2. The interface will add the break chemicals and stop at line 8.

-
-
-

Step 43 signals the interface to end the formula. The Load/Unload timer will start and run until the next formula is run.

Milnor Mark Formula 01> BAR TOWELS

T = Type of Step (0 = End Formula   1 = 1-Way Wash   2 = 2-Way Wash   3 = Soak Wash
    4 = Pre + Final Extract   5 = Intermediate Extract   6 = Final Extract   7 = Double Ext)

MMQ = Time (Minutes [10's], Minutes [1's], Quarter Minutes)

FFF = Bath Temperature

H = Hot Water (0 = Off   1 = On   2 = Raises Temp)

C = Cold Water (0 = Off   1 = On   3 = Lowers Temp)

3 = 3rd Water (0 = Off   1 = On)

B = Bottom Fill (0 = No   1 = Yes)

L = Liquor Level (0 = No Water   1 = Level 1   2 = Level 2   3 = Level 3)

S = Steam (0 = None   1 = After + Timer Run   2 = Timer Stop Only   3 = After + Timer Stop
    4 = 4 = Early & After + Timer Run   5 = Early + Timer Stop   6 = Early & After + Timer Stop)

CC = Chemical Number (00, 01, 02, 03, 04, 05   16 = Signal Only)

NN = Chemical Name (00 = Same as Chemical Number)

W = When to Inject (0 = With Fill   1 = Level OK   2 = Level + Temp OK)

SSS = Seconds of Chemical Injection

* = Signal with Chemical? (0 = No   1 = Yes)

RPM = Basket Speed in % of Normal

D = Drain (0 = Standard   1 = 2-Way Wash Speed   2 = Do Not Drain   3 = Stop w/ Drain
    4=Stop w/ Fill   5=Stop w/ F & D   6=Stop w/ F & no D   7=D w/ 25 sec Spray Rinse)

R = Drain Destination (0 = Drain to Sewer   1 = Drain to Reuse)

S = Spray Rinse at End of Intermediate Extract (0 = No   1 = Yes)

E = How to End (0 = Stopped   1 = Reversing   2 = Drain Speed   3 = Break Cake   4=Tumbling)

					@		@@		@							@	@@				@ = Option
STEP	OPERATION	TYPE	MMQ	FFF	H	C	3	B	L	S	CC	NN	W	SSS	*	RPM	D	R	S	E	CHEMICAL
01	15/Alk Flsh	2	030	180	1	0	0	0	3	3	01	01	0	005	0		0			-	Formula ID & Chem Step 1
											05	01	0	005	0		0			-	Latch
02	02/Flush	2	012	000	1	0	0	0	3	-	00	00	0	000	0		0			-	
03	03/Break	2	100	180	1	0	0	0	2	3	02	02	0	005	0		0			-	Chem Step 2
04	02/Flush	2	012	000	1	0	0	0	3	-	00	00	0	000	0		0			-	
05	04/Suds	2	060	175	1	0	0	0	2	3	01	01	0	005	0						Chem Step 3
											02	02	0	005	0		0			-	
06	02/Flush	2	012	170	2	3	0	0	3	0	00	00	0	000	0		0			-	
07	02/Flush	2	012	165	2	3	0	0	3	0	00	00	0	000	0		0			-	
08	02/Flush	2	012	160	2	3	0	0	3	0	00	00	0	000	0		0			-	
09	02/Flush	2	012	155	2	3	0	0	3	0	00	00	0	000	0		0			-	
10	06/Bleach	2	100	150	1	0	0	0	2	5	03	03	2	005	0		0			-	Chem Step 4
11	07/Rinse	2	020	135	2	3	0	0	3	0	00	00	0	000	0		0			-	
12	08/Anticlor	2	020	120	2	3	0	0	3	0	01	01	0	005	0		0			-	Chem Step 5
											03	03	0	005	0		0			-	
13	07/Rinse	2	010	105	2	3	0	0	3	0	00	00	0	000	0		0			-	
14	10/Sour	2	042	090	2	3	0	0	2	0	02	02	0	005	0						Chem Step 6
											03	03	0	005	0		2			-	
15	11/Stop	2	002	090	2	3	0	0	2	0	05	05	0	005	0		0			-	*Formula END*
16	14/Extract	6	070													-				4	

Milnor Mark (I – V) Formula   01- BAR TOWELS

STEP	OPERATION	TYPE	MMQ	FFF	H	C	3	B	L	S	CC	NN	W	SSS	*	RPM	D	R	S	E	CHEMICAL
01	15/Alk Flsh	2	030	180	1	0	0	0	3	3	01	01	0	005	0		0			-	Formula ID & Chem Step 1
											08	0	0	005	0		0			-	Latch
											09	0	1	030	0		0			-	Hold
02	02/Flush	2	012	000	1	0	0	0	3	-	00	00	0	000	0		0			-	
03	03/Break	2	100	180	1	0	0	0	2	3	02	02	0	005	0		0			-	Chem Step 2
											09	0	1	030	0		0			-	Hold
04	02/Flush	2	012	000	1	0	0	0	3	-	00	00	0	000	0		0			-	
05	04/Suds	2	060	175	1	0	0	0	2	3	01	01	0	005	0						Chem Step 3
											02	02	0	005	0		0			-	
											09	0	1	030	0		0			-	Hold
06	02/Flush	2	012	170	2	3	0	0	3	0	00	00	0	000	0		0			-	
07	02/Flush	2	012	165	2	3	0	0	3	0	00	00	0	000	0		0			-	
08	02/Flush	2	012	160	2	3	0	0	3	0	00	00	0	000	0		0			-	
09	02/Flush	2	012	155	2	3	0	0	3	0	00	00	0	000	0		0			-	
10	06/Bleach	2	100	150	1	0	0	0	2	5	03	03	2	005	0		0			-	Chem Step 4
											09	0	2	030	0		0			-	Hold
11	07/Rinse	2	020	135	2	3	0	0	3	0	00	00	0	000	0		0			-	
12	08/Anticlor	2	020	120	2	3	0	0	3	0	01	01	0	005	0						Chem Step 5
											03	03	0	005	0		0			-	
											09	0	1	030	0		0			-	Hold
13	07/Rinse	2	010	100	2	3	0	0	3	0	00	00	0	000	0		0			-	

				5							0	0		0						
14	10/Sour	2	042	090	2	3	0	0	2	0	02	02	0	005	0		2			Chem Step 6
											03	03	0	005	0		0		-	
											09	0	0	030	0		0		-	Hold
15	11/Stop	2	002	090	2	3	0	0	2	0	08	05	0	005	0		0		-	*Formula END*
16	14/Extract	6	070														-		4	

Note: The washer must have the option for Chemsave and be enabled for more than 8 chemicals. If not, the washer should be programmed as shown in the previous Milnor example and held by the water levels.

Milnor Formula

Milnor outputs	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
Interface inputs	**1**	**2**	**4**	**8**	**16**	**32**	**64**	**Latch**

The Milnor formula above is programmed to identify formula 1 and call for the appropriate chemical injections.

Step 1 Identifies the formula to the interface as formula 1. The interface will start the formula and proceed to the step ender (line 4). This includes chemical step 1 so the Alkali will be injected as the washer fills.

Step 3 tells the interface to go to chemical step 2. The interface will add the break chemicals and stop at line 8.

Step 10 tells the interface to go to chemical step 4. The interface will add the Bleach and stop at line #15.

Note: The **W** for when to add chemicals is a 2, which will wait until the washer has filled and reached temp before the bleach is added.

Step 16 signals the interface to end the formula. The Load/Unload timer will start and run until the next formula is run.

Catalyst Formula

Formula #1, White Bar Towels

```
0001:  Bar Towels
0002:        *******Chemical Step 1*******
0003:        Add 30 Oz. of Alkali
0004:        Run Time 0:00
0005:        *******Chemical Step 2*******
0006:        Add 72 Oz. of Alkali
0007:        Add 48 Oz. of Detergent
0008:        Run Time 0:00
0009:        *******Chemical Step 3*******
0010:        Add 24 Oz. Alkali
0011:        Add 24 Oz. Detergent
0012:        Run Time 0:00
0013:        *******Chemical Step 4*******
0014:        Add 64 Oz Bleach
0015:        Run Time 0:00
0016:        *******Chemical Step 5*******
0017:        Add 4 Oz Antichlor
0018:        Run Time 0:00
0019:        *******Chemical Step 6*******
0020:        Add 8 Oz Sour
0021:        Run Time 0:00
0017:  END OF FORMULA
```

Maintenance

The Catalyst Chemical system will require periodic maintenance. Doing a few simple procedures can dramatically increase the life of the chemical system. The following is a suggested maintenance plan. Due to site-specific conditions, the intervals may need to be changed.

1st Week
- Re-torque all chemical pumps.
- Carefully inspect all connections for signs of chemical or water leaks. If any leaks are found, fix them immediately.
- Back-flush the system thoroughly for at least 5 min. ([5] & [ENT])
- Check calibration of the chemicals.
- Tighten all hose clamps.
- Check the water temperature- it should be 80-110 degrees F.

Weekly-
- Check the strainers on the chemical lines for blockage.
- Check air filters; drain if necessary.
- Clean system by wiping down with a damp cloth. Use air to blow off the pump section.
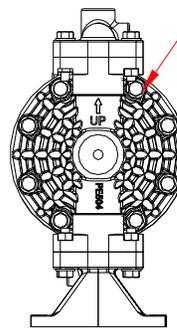
Monthly-
- Check the torque on the pumps.
- Inspect the system for leaks.
- Check Calibrations.
- Tighten hose clamps

Torque on pumps:
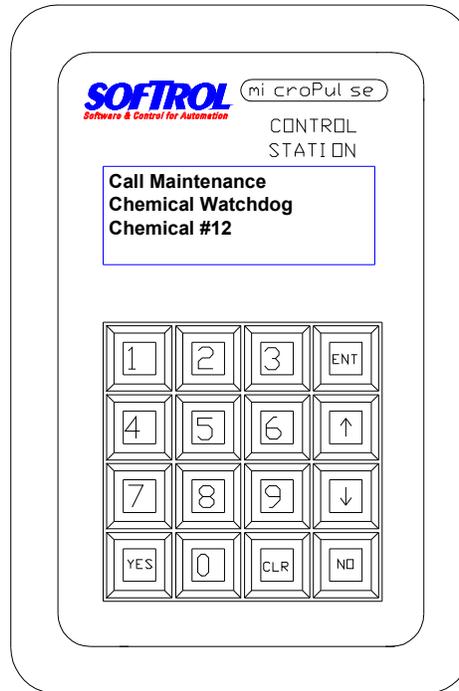
Tighten all 8 bolts
55 in-lbs front and rear.
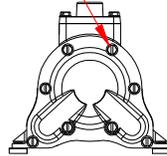
Tighten all 6 screws
35 in-lbs front and rear

Catalyst Alarms

The Catalyst can have 4 different alarms while running. They are:

- **Power Interrupted During Formula.** This happens when the power is lost to the processor while running a formula. Press the YES button to resume the formula.

> Power Interruption
> During Formula
> Execution! Press
> [YES] to Continue

- **Low Air Pressure.** This happens when the air pressure drops below 65 psi during a chemical injection. Once the air pressure is above 65 psi, pressing the YES button will resume the formula. The Catalyst will display low air pressure, but will not alarm if it is not running a formula.

> 128: Chemical Injection
> Alkali 005   000
> Low Air Pressure !!

- **Chemical Watchdog.** This alarm occurs when the flow meter senses that it is out of chemical, sensor is jammed, or the injection took too long. Use the password to reset this error. If the system is out of chemical and needs to be primed, holding the YES button will allow pump to turn on and ignore the watchdog. Release the YES button when the pump is primed. See the next section for more details.

> Call Maintenance !!!
> Chem watchdog
> Chemical #1
> Chemical #2

- **Sensor Flush.** This is similar to the Chemical watchdog, however, it occurs during the metered flush after the injection. This should be corrected the same as a chemical watchdog.

> Call Maintenance
> Sensor Flush Watchdog
> Sensor #1

- **Flush Water Tank Not at Minimum Level.** This message will be displayed when the water level in the flush tank is not at the minimum level needed to start an injection. This message will only display and not alarm when the system is enabled. If the system is enabled and this condition exists, the system will display the message and continue to fill the tank for 1 minute before sounding the alarm. The injection cannot start until this has been corrected. To silence the alarm, disable the Catalyst by pressing No & Ent and correct the problem. The input for flush tank low is S7-04 and turns on when the tank level is low.

- **Current Calibrations Do not Match Slot 5.** The Catalyst will check the calibration value in the REM K-4 and compare it to the value held in the memory card in slot 5; if they do not match, an alarm will occur and the system will display this message. This problem will occur when either the memory card (Flowmem- Slot 5) or processor memory card (REM K4- Proc Slot) is replaced. If the Flowmem is replaced, the calibrations will need to be copied *to* Slot 5. If the REM K4 is replaced, the calibrations will need to be copied *from* Slot 5. To copy the calibrations, do the following:
- Enter in the level 7 password.
- Select 2 for Program.
- Select 5 for Copy.
- Select 3 for Copy Calibrations.
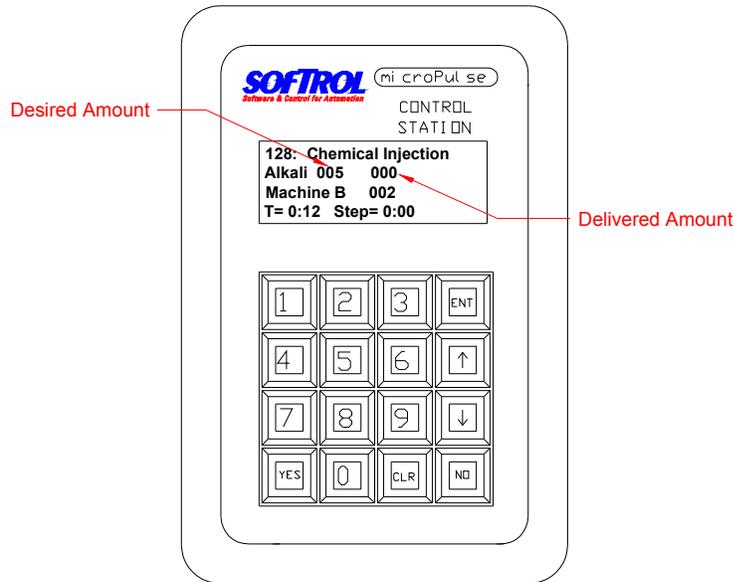- Select 1 to copy the Calibrations *to* Slot 5.
                    Or
- Select 2 to copy the Calibrations *from* Slot 5.
- The controller will prompt you to enter in a password. Enter the level 7 password. The controller will return to the main menu.
- Exit the menu and the controller should return to the waiting for formula state.
- The chemicals can also be re-calibrated to eliminate this error.

If the memory card has been replaced, you will also need to send a Group Formula Update from PulseNet. This should be done for the Catalyst group.

If this error occurs and no cards have been replaced in the controller, then it is likely that the calibrations on the processor RAM have been corrupted. Follow the same procedure and copy the calibrations *from* Slot 5.

- **Check Chemical Tanks**. This error occurs when the input S7-07 turns on. This can be used for low level in day tanks. Once this input is on, the system will not dispense until it is corrected. To clear this error, disable the system by pressing No & Ent and fill the tank.

![SOFTROL CATALYST]

How to clear a chemical watchdog on the Catalyst

Desired Amount

CONTROL
STATION

128: Chemical Injection
Alkali 005   000
Machine B   002
**T= 0:12   Step= 0:00**

Delivered Amount

The Catalyst will alarm with a chemical watchdog when the injection takes too long or when the controller does not register any pulses from the flow meter. If the controller encounters these faults, it will alarm and display the watchdog with the chemical number. Do the following:

1. Press [CLR] to silence the alarm.
2. Check the supply tank or drum to make sure there is sufficient chemical supply.
3. If there is chemical, enter the level 7 password. The default is 777777. If the unit is out of chemical, replace the drum or fill the tank. To prime the system, enter in the level 7 password and then press and hold YES. Once the pump has been primed, release the YES key.
4. The formula will reset; press [YES] to restart the injection.
5. Watch the display. It will show the desired amount and the delivered amount. The delivered amount should be counting up. If not, the unit will alarm again.
6. If the system alarms and chemical is pumping, the flowmeter is likely obstructed and will need to be cleared. If chemical did not pump, go to step 12.
7. Press & hold [CLR] & [ENT] for approximately 15 seconds to flush the system.
8. Press & hold [5] & [ENT] for approximately 15 seconds to back flush the system.
9. Enter in the level 7 password and press [YES] to restart the injection. Observe the display to see if the delivered amount is increasing. If it is not, the system will alarm.

10. If the system is still not metering the chemical, flush the system and disassemble the flowmeter. Make sure there are no obstructions and the gears turn freely. (Make sure when replacing the gears, the numbers face the back of the meter)

11. Enter in the level 7 password and restart the injection by pressing [YES]. Make sure the system is pumping chemical.

12. Check the air pilot valve for the chemical valve and pump. They should both turn on (LED on air valve should come on).

13. The chemical valve has a stroke limiting adjustment; make sure the valve is opening enough to let chemical flow. Turn the adjustment counter-clockwise to increase flow.

14. If the valves are not turning on, troubleshoot the output cards in the controller.

Flowmeter Disassembly
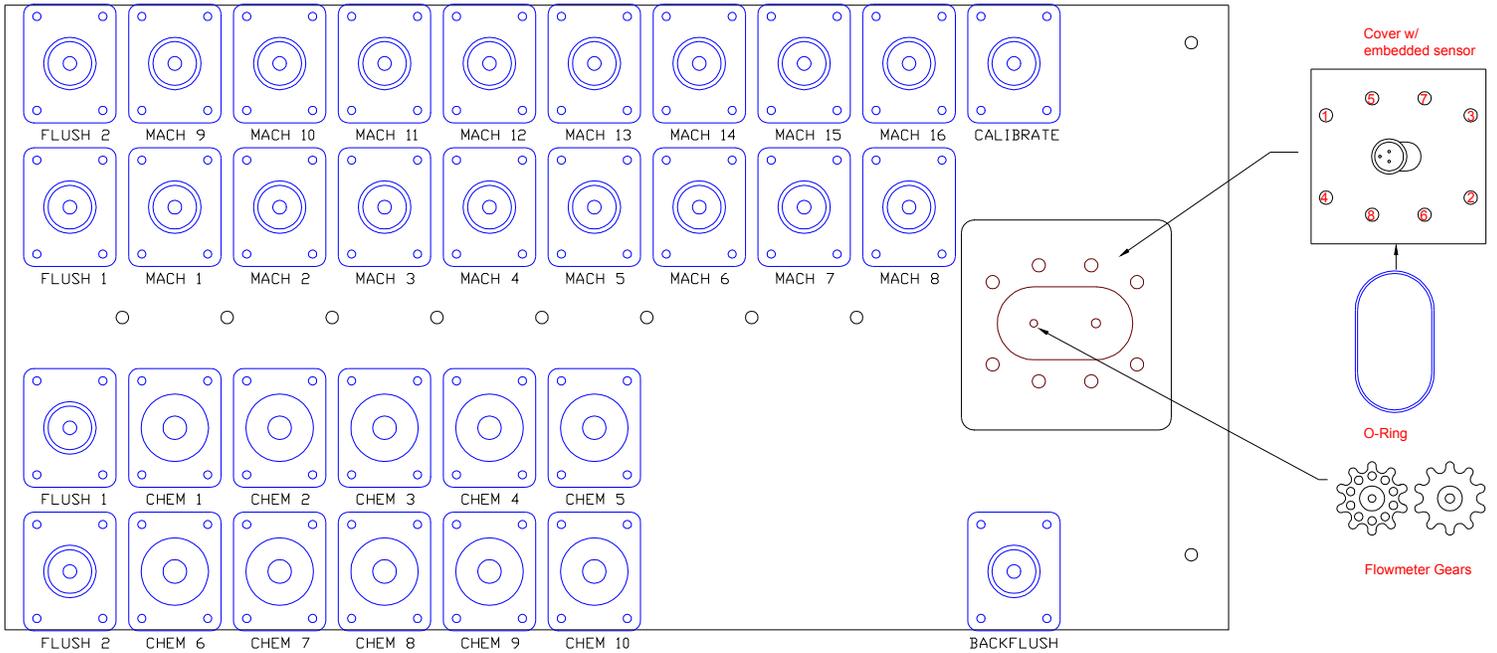
If the flowmeter becomes clogged with debris and cannot be cleared by back flushing, it will be necessary to disassemble and clean the flowmeter. To disassemble the meter, do the following:

- Press and hold [5] & [ENT] for 20 seconds to flush the system with water.
- Place several rags or towels under the meter. (The manifold will be full of water)
- Press the **Emergency Stop Button**
- Remove the cable that attaches to the cover of the flowmeter.
- Remove the 8 bolts that hold the cover in place.
- Carefully remove the cover from the manifold. Use a screwdriver to pry it loose if necessary.
- Remove the gears from the meter. Remove any debris that may be blocking them.
- Replace the gears. **Make sure the magnets on the gears face the front of the flowmeter.** The gears should turn freely when in place.
- Replace the O-ring with a new one. Replace the cover. Tighten the bolts in a staggered manner. The bolts should only be finger tight (10-12 in.-lbs.)
- Attach the cable. Release the **Emergency Stop Button**.
- Restart the system and check flowmeter to make sure it is functioning properly.

The O-ring should be checked whenever the cover is removed.

CATAPULSE INTERFACE
Troubleshooting-

The CataPulse interface can have 6 different alarms while running. They are:

1. **Power Interrupted During Formula.** This happens when the power is lost to the processor while running a formula. Press the YES button to resume the formula.

> Power Interruption
> During Formula
> Execution! Press
> [YES] to Continue

2. **Machine Disabled.** This happens when the machine on input is lost during the formula. The machine on light (ENTER key) at the top right of the keypad must be on to run the formula. This is input D1.

> Machine Disabled !
>
> Press [YES] to Continue

3. **Chemical Watchdog.** This alarm occurs when the interface has requested chemical and the Catalyst has not responded. Enter in a level 4 password or higher and then press YES to resume. If the Catalyst does not answer the chemical request, then there might be a problem with the Catalyst or the network. Also, check the chemical watchdog time in the setups. This time should be 4 to 10 min.

> Call Maintenance!!!
> Chem watchdog
> Chemical #1

4. **Invalid Formula.** This will be displayed when the interface receives an input that indicates a formula that is not currently programmed.
   - To clear the formula, press [CLR] + [NO]+[ENT].
   - To select the correct formula, use the arrow keys.
   - Check the machine programming and chemical outputs to verify proper operation.

> Formula Number = 63
> Not Assigned
> Use arrows to scroll
> ENT=Accept   NO=Exit

5. **Invalid Formula Request.** This will be displayed when the interface, in the waiting for formula state, receives the latch input without a valid formula number.
   - To clear the formula, press [CLR] + [NO]+[ENT].
   - To select the correct formula, use the arrow keys.
   - Check the machine programming and chemical outputs to verify proper operation.

> Formula Number = 131
> INVALID FORMULA RQX!
> Use arrows to scroll
> ENT=Accept   NO=Exit

6. **Invalid Injection Request.** This will be displayed when the interface, in the waiting for formula state, receives binary inputs without the latch.
   - To clear the formula, press [CLR] + [NO]+[ENT].
   - To select the correct formula, use the arrow keys.
   - Check the machine programming and chemical outputs to verify proper operation.

> Formula Number = 130
> INVALID INJECT RQX!
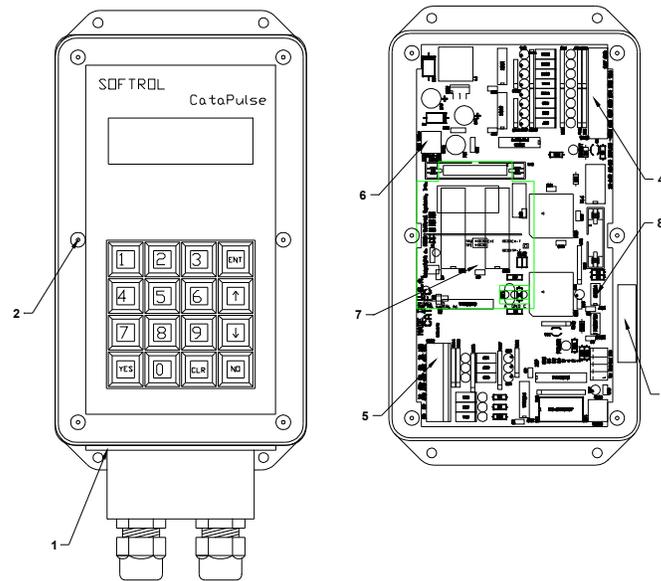> Use arrows to scroll
> ENT=Accept   NO=Exit

Hardware replacement-

The CataPulse is designed for limited in field service.   The two main components of the interface are the mother board and the arcnet card. The following directions should be used for replacement of the mother board.

Replacement Procedure

1. Remove the small junction box at the bottom of the interface. Unplug the power connection and the communications connection. Be careful, the power will have 24 VDC.
2. Remove the 6 screws that hold the cover in place. Remove the cover and disconnect the 4 wires that connect it to the mother board.
3. Rotate the horn 180 deg. The wire connectors should be at the top.
4. Remove the plug that connects to the inputs.
5. Remove the connector from the outputs.
6. Remove the plug for the mother board power.
7. Remove the screw that holds the arcnet card in place. Remove the arcnet card.
8. Remove the EEPROM chip. Note the orientation of the chip in the socket. The notch on the chip should line up with the notch on the socket. *If you do not change this chip, the latch time will need to be set. This is found in the installation and configuration section.*
9. Remove the mother board from the plastic holder. You may need to pry back the sides to release the board.

10. Replace the mother board with a new one. Be sure to set the LAN ID to the correct number by using the dip switches in the lower right hand coner of the card. You can use the old mother board as a reference or refer to the installation and configuration section.   Replace the new EEPROM with the old one. *If you do not change this chip, the latch time will need to be set. This is found in the installation and configuration section.*
11. Put the arcnet card back in the holder and insert the screw that holds it in place.
12. Reconnect all the plugs for the wires that connect to the mother board in the reverse order in which they were removed.
13. Reconnect the cover and the power. Once the unit is powered up, you will need to do the machine setups and passwords. These can be found in the installation and configuration section. Download the formulas to the interface. You may wish to run a test formula at this time.

To replace the Arcnet card:
1. Turn power off the interface. Open the interface.
2. Remove the wires that go to the arcnet card.
3. Remove the retaining screw that holds the arcnet card in place.
4. Remove the card and replace with a new one.
5. Check the terminating jumper. If the interface has only one communication line going to it (it is at the end of the "daisy chain") then the jumper should be in place. If not, remove the jumper and discard.
6. Replace the retaining screw and reconnect the wires to the card. The white wires go to terminal A and the colored wires go to terminal B.
7. Check the communications. The red LED on the card should be on steady.

ArcNet Communications
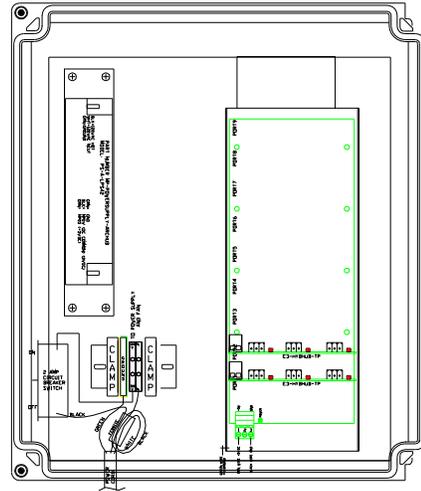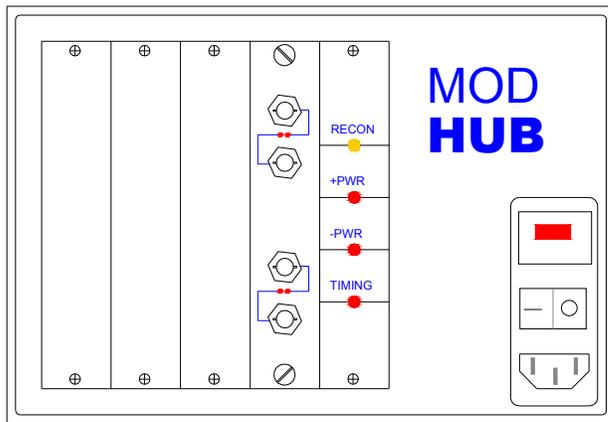
All of the communications involved with the Catalyst are run on an ArcNet network. ArcNet is an industrial, high-speed network designed to be rugged and trouble free. The network can be run on RG-62 Coaxial cable, Cat 5 twisted pair, or fiber optic cables. Most all of the Catalyst installations now use Cat 5 Twisted pair cable and is attached to the controller with Phoenix connectors.

All the chemical requests from the machines and interfaces to the Catalyst are transmitted over this network. If the network is not functioning properly, the delivery of chemicals can be impeded. The network is typically laid out in a bus fashion with an active hub. If it is a single Catalyst, the hub card will be located in the controller in slot 8. If there are multiple Catalysts, or the system is older, an active hub will be used. The illustration above depicts a Mod Hub on the left (for older, coax networks) and an Arc hub on the right. (Usually twisted pair) For more information on the layout of the network, please see section 2:10 of Installation and Configuration.

Troubleshooting the network:

The active hub (Pictured above) is the central piece of equipment that brings the all of the branches of the network together. In normal operation, the yellow RECON light should be off. If this light is on steady or blinking, then there may be a problem with the network. If this light blinks occasionally (once every 100 seconds), then the network should be OK as this is the normal reconfiguration of ArcNet. The ArcHub does not have this light- All the red LEDs should be on steady. If you suspect a problem with the Network try the following:

Communications can be verified from the Pulsenet computer by bringing up the multiple display feature. If the front panel displays of all the machines that are turned on are shown, then it is likely that communications are OK.

If there is a problem with communications, remove one of the lines from the Hub. If the hub continues to Reconfigure, plug that line back in an unplug another. Repeat this process until the network is stable. You can then recheck communications at the computer to see which machines are causing the trouble.

Once the line that is causing the problems is identified, the machine can usually be identified by the process of elimination. To do this, plug the line back into the hub and remove the tee from the first machine (or node) on that line. Check to see if communications are restored. Repeat this process until offending machine or the end of the line is reached.

Things that can cause network trouble:

- Duplicate IDs.- Each node must have a unique ID from 1 to 255. The ID is usually set in the machine setup menu. The exception is the ArcFiber card and the CataPulse interface which is used with the K4 Processor. This card has a set of 8 dip switches that determine the ID.
- Terminating Jumper- Only the last machine on the line should be terminated. This terminator can be either a jumper on the card, or a BNC terminator connected to the other side of a tee. It should not have both. The computer must have a tee and terminator if it is at the end of the line. (it does not have terminating capability) If twisted pair is used, then the terminating jumpers must be used at the end of the line.
- Un-terminated Line- This will cause the network to reset. This can be a card at the end of the line that does not have a terminator, or when the cable is damaged or cut.
- CX / TP Jumper- The ArcNet cards can be configured for either Coax or twisted pair communications. For the Coax networks, the jumpers should be on the CX side. For   Refer to the parts manual for exact jumper positions.
- Faulty ArcNet Card- Due to excessive noise on the line, ArcNet cards can be damaged and cause the network to fail. If this is the case, try to locate the source of electrical noise and correct it. Some sources of electronic noise are:
  - Cables run too close to power wires. If you must cross a power line, the cable should be run perpendicular to the line.
  - Poorly grounded controllers and machines.
  - Cables run too close to Variable Speed Drives.
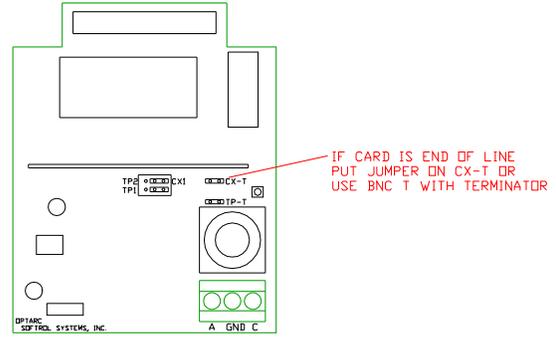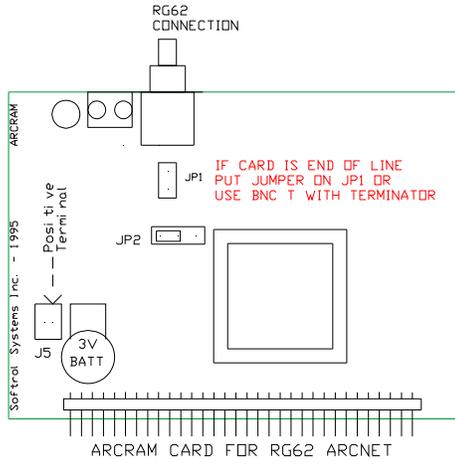
RG62
CONNECTION

ARCRAM

Softrol Systems Inc. - 1995

Positive
Terminal

J5

3V
BATT

JP1   IF CARD IS END OF LINE
       PUT JUMPER ON JP1 OR
       USE BNC T WITH TERMINATOR

JP2

ARCRAM CARD FOR RG62 ARCNET

TP2   CX1
TP1   CX-T

TP-T

OPTARC
SOFTROL SYSTEMS, INC.

A   GND   C

IF CARD IS END OF LINE
PUT JUMPER ON CX-T OR
USE BNC T WITH TERMINATOR

SOFTROL

Software & Control for Automation

4867 N. MAIN ST. — ACWORTH, GA 30101
PH: (770)974-2700   FAX:(770)974-0435

CATALYST LITE PUMP AND VALVE CONTROL 8 CHEMS BY 8 MACHINES

REF	A	B	C	D	E	F	G	H	I	J	K	L	M

2 AMP BREAKER

A

120VAC SERVICE

GND

B

DC POWER SUPPLY

C

+24

0V

+24VDC

0VDC

V IN   0VDC

5VDC POWER SUPPLY

VOUT   GND
+5   0V

MB8 Power

SEE PAGE 5 FOR CONNECTIONS

INPUT S7-01

INPUT S7-02

INPUT S7-03   FLUSH TANK HIGH LEVEL ACHIEVED

INPUT S7-04   FLUSH TANK LOW LEVEL (OPTIONAL)

INPUT S7-05

INPUT S7-06   AIR PRESSURE IS OK

INPUT S7-07

INPUT S7-08   E-STOP IS OK

CONTACT 1
E-STOP

CONTACT 2
E-STOP

24AE

SOFTROL SYSTEMS CATALYST LITE SCHEMATIC	S3CATALYSTLITE	05-05-05	RAC	PAGE 2

REF	A	B	C	D	E	F	G	H	I	J	K	L	M

24AE

0VDC

1   OUTPUT S7-09

2   OUTPUT S7-10   S7-10   FLUSH TANK FILL VALVE # 1 COLD

3

4   OUTPUT S7-11   FLUSH 1 CHEMS 1-8

5   OUTPUT S7-12

6   OUTPUT S7-13   FLUSH 3 ALL MACHINES

7   OUTPUT S7-14

8   OUTPUT S7-15   FLUSH PUMP

9   OUTPUT S7-16   CONTROL ALARM

10   OUTPUT S1-01   S1-01   SELECT CHEMICAL VALVE 1

11   CHEMICAL PUMP 1

12   OUTPUT S1-02   S1-02   SELECT CHEMICAL VALVE 2

13   CHEMICAL PUMP 2

14   OUTPUT S1-03   S1-03   SELECT CHEMICAL VALVE 3

15   CHEMICAL PUMP 3

16   OUTPUT S1-04   S1-04   SELECT CHEMICAL VALVE 4

17   CHEMICAL PUMP 4

18

SOFTROL SYSTEMS CATALYST LITE SCHEMATIC	S3CATALYSTLITE	05-05-05	RAC	PAGE 3

REF	A	B	C	D	E	F	G	H	I	J	K	L	M

24AE

0VDC

1 — OUTPUT S1-05 — S1-05 — SELECT CHEMICAL VALVE 5

2 — CHEMICAL PUMP 5

3 — OUTPUT S1-06 — S1-06 — SELECT CHEMICAL VALVE 6

4 — CHEMICAL PUMP 6

5 — OUTPUT S1-07 — S1-07 — SELECT CHEMICAL VALVE 7

6 — CHEMICAL PUMP 7

7 — OUTPUT S1-08 — S1-08 — SELECT CHEMICAL VALVE 8

8 — CHEMICAL PUMP 8

9 — OUTPUT S1-09 — SELECT MACHINE VALVE 1

10 — OUTPUT S1-10 — SELECT MACHINE VALVE 2

11 — OUTPUT S1-11 — SELECT MACHINE VALVE 3

12 — OUTPUT S1-12 — SELECT MACHINE VALVE 4

13 — OUTPUT S1-13 — SELECT MACHINE VALVE 5

14 — OUTPUT S1-14 — SELECT MACHINE VALVE 6

15 — OUTPUT S1-15 — SELECT MACHINE VALVE 7

16 — OUTPUT S1-16 — SELECT MACHINE VALVE 8

17

E3-FLOWMEM - SLOT 5

S5-1C — RED/BLK +5VDC

18

S5-1B — RED/WHT - SIGNAL

S5-1A — GREEN - GROUND

SOFTROL SYSTEMS CATALYST LITE SCHEMATIC	S3CATALYSTLITE	05-05-05	RAC	PAGE 4

SLOT 8

[16X9]
AC

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16

SLOT 7

ARCFIBER

SLOT 6

E3-FLOWMEM

1A 1B 1C 2A 2B 2C 3A 3B 3C 4A 4B 4C

SLOT 5

SLOT 4

SLOT 3

SLOT 2

OUT16

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16

SLOT 1

PROC1

E3-PRO-K4 AND E3-REM-K4A

COMMUNICATION RIBBON CONNECTION
TO IOX-64X BOARDS
RIBBON RED IN ARROW SIDE

RST ®   ® PWR

MATES TO 5-45, DB9 & 4 PIN LS AMP
& PIN SERV ID AMP CONNECT

GREEN WIRE
TO GROUND

ORN WIRE +5VDC

BLK WIRE 0V

FROM 5VDC
POWER SUPPLY

REF   A   B   C   D   E   F   G   H   I   J   K   L   M

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18

COM

S7-13
FLUSH
3

S1-09
MACH
1

S1-10
MACH
2

S1-11
MACH
3

S1-12
MACH
4

S1-13
MACH
5

S1-14
MACH
6

S1-15
MACH
7

S1-16
MACH
8

S7-11
FLUSH
1

S1-01
CHEM
1

S1-02
CHEM
2

S1-03
CHEM
3

S1-04
CHEM
4

S1-05
CHEM
5

S1-06
CHEM
6

S1-07
CHEM
7

S1-08
CHEM
8

ARCFIBER

JP4

JP5

JP2   JP3   JP1

SET COMMUNICATION ID
HERE IN NEG LOGIC BINARY
SHOWN FOR ID # 1

1 2 3 4 5 6 7 8

ON

END OF LINE ONLY MUST BWE TERMINATED. USE JUMPER ON CARD OR BNC T AND TERMINATOR

TWISTED
PAIR

JP1

JP2

JP3

JP4

JP5   JUMPER
      TO TERMINATE
      TWISTED PAIR

BNC NETWORK

JP1

JP2

JP3

JP4   JUMPER
      TO TERMINATE
      BNC NET

JP5

FIBER OPTIC

JP1

JP2

JP3

JP4

JP5

SOFTROL

Software & Control for Automation

4867 N. MAIN ST. – ACWORTH, GA 30101
PH: (770)974-2700   FAX:(770)974-0435

CATAPULSE

CHEMICAL INTERFACE BOX
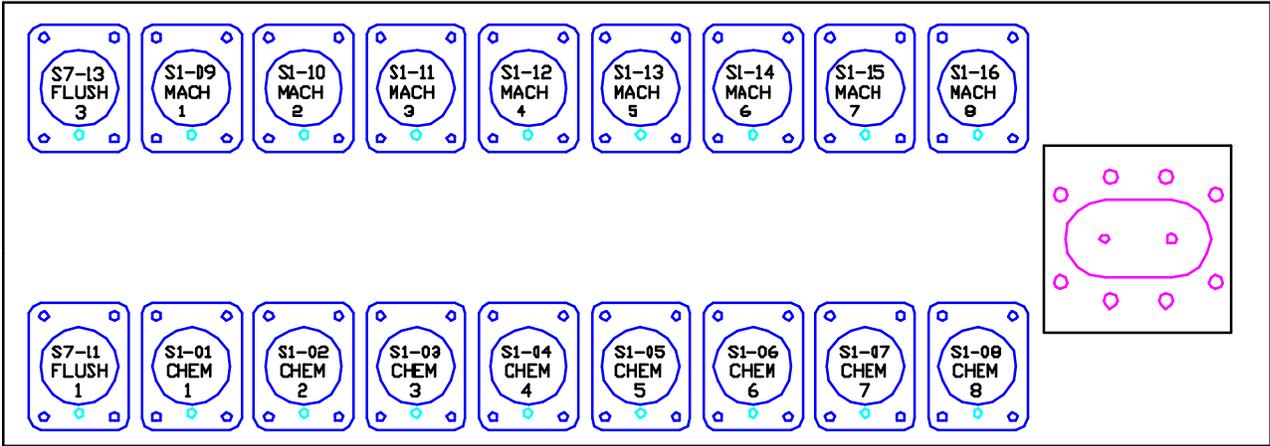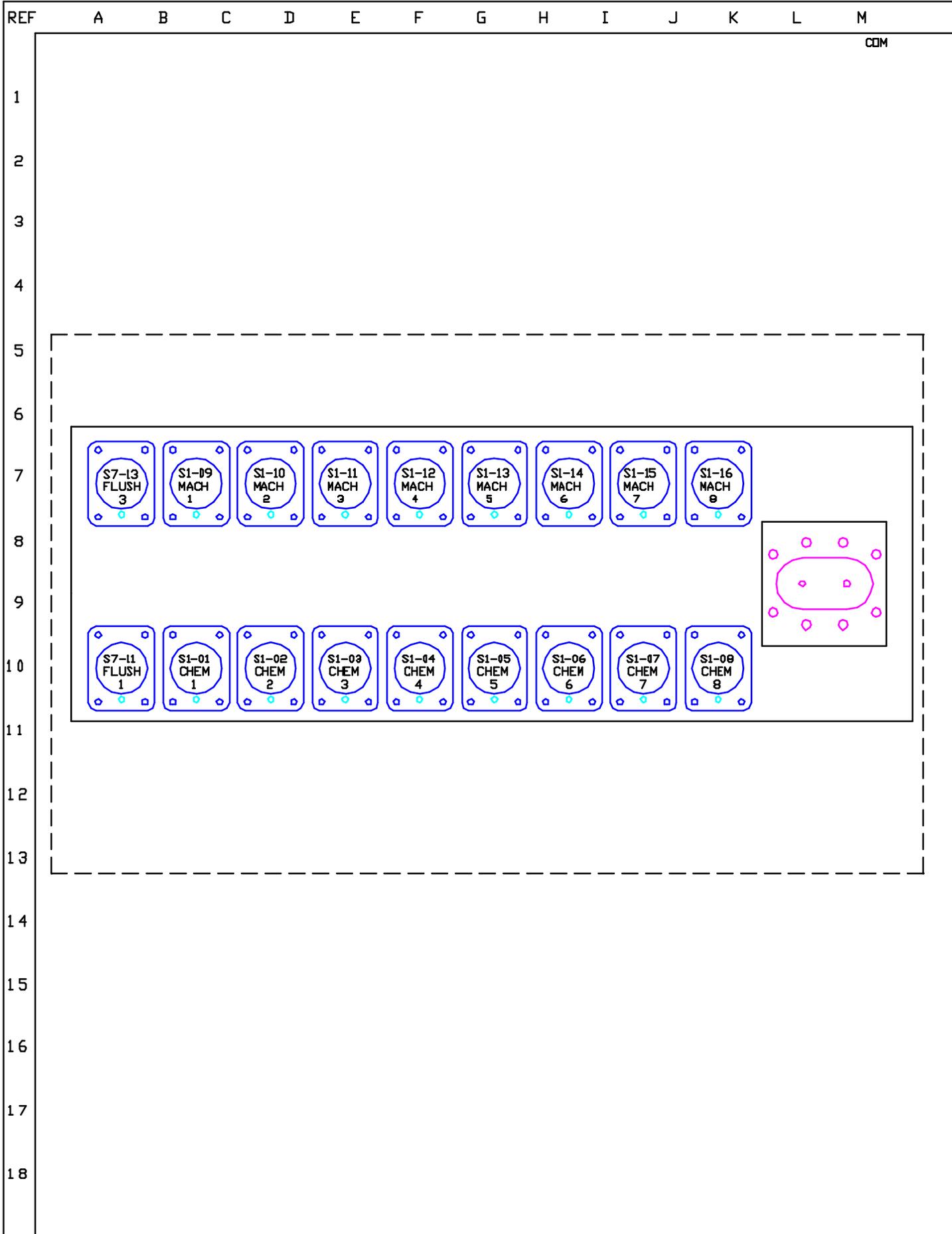
120VAC

FUSE

PHOENIX
DC POWER
SUPPLY
5AMP

L   N

+24   0V
+   −

LOCATED IN CATALYST
ELECTRONIC CABINET

WHITE

+VIN   CATIFC BOARD   GND
            ID #1

+VIN   CATIFC BOARD   GND
            ID #2

WIRE EACH CATAPULSE IN PARALLEL

INP
COM

INPUT #1   INP #1   MACHINE ON   BLUE/BLACK

INPUT #2   INP #2   SPARE

INPUT #3   INP#3   SPARE

OUT
+DC

OUTPUT #1   OUT #1   CONTROL ALARM   HORN

OUTPUT #2   OUT #2   ENABLE MACHINE FORMULA   ORANGE

OUTPUT #3   OUT #3   SPARE

35

36

ENABLE MACHINE FORMULA RELAY

34

ONE CONTACT OF THIS RELAY MUST BE
USED TO STOP FORMULA EXECUTION
WHEN ENERGIZED. SEE MACHINE SPECIFIC
INFORMATION FOR CORRECT USE.

SOFTROL SYSTEMS CATAPULSE CHEMICAL INTERFACE	S1CATAPULSE	07-28-03	KDL	PAGE 2

*USE THIS PAGE IF MACHINE VOLTAGE=12-24 VAC/DC

—— MACHINE CHEMICAL VOLTAGE ——
12-24 VAC/DC (USE APPROPRIATE VOLTAGE)

10●

BLACK

COM

INPUT 101	801	FORMULA INPUT BINARY # 1 BLUE	11
INPUT 102	802	FORMULA INPUT BINARY # 2 BLUE/WHITE	12
INPUT 103	803	FORMULA INPUT BINARY # 4 GREEN	13
INPUT 104	804	FORMULA INPUT BINARY # 8 GREEN/WHITE	14
INPUT 105	805	FORMULA INPUT BINARY # 16 RED	15
INPUT 106	806	FORMULA INPUT BINARY # 32 RED/WHITE	16
INPUT 107	807	FORMULA INPUT BINARY # 64 BLACK/WHITE	17
INPUT 108	808	DATA LATCH - FORMULA END WHITE/BLACK	18

THESE INPUTS IN INTERFACE BOX

E3-CATRLY
RELAY BOARD

THESE CONTACTS INSIDE
WASHER CONTROL

FPD LID

CN1
DATA		WHITE
CLK		GREEN
GND		BLACK
5VDC		RED

CATIFC BOARD
DATA		WHITE
CLK		GREEN
GND		BLACK
5VDC		RED

FPD WIRES 5" LONG

*USE THIS PAGE IF MACHINE VOLTAGE=120VAC

MACHINE CHEMICAL VOLTAGE
120 VAC

27

BLACK

COM

INPUT 101 — 801 — FORMULA INPUT BINARY # 1   BLUE — 11 ⟋⟍⟋⟍ 26
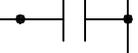
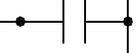INPUT 102 — 802 — FORMULA INPUT BINARY # 2   BLUE/WHITE — 12 ⟋⟍⟋⟍ 25

INPUT 103 — 803 — FORMULA INPUT BINARY # 4   GREEN — 13 ⟋⟍⟋⟍ 24

INPUT 104 — 804 — FORMULA INPUT BINARY # 8   GREEN/WHITE — 14 ⟋⟍⟋⟍ 23

INPUT 105 — 805 — FORMULA INPUT BINARY # 16   RED — 15 ⟋⟍⟋⟍ 22

INPUT 106 — 806 — FORMULA INPUT BINARY # 32   RED/WHITE — 16 ⟋⟍⟋⟍ 21

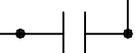INPUT 107 — 807 — FORMULA INPUT BINARY # 64   BLACK/WHITE — 17 ⟋⟍⟋⟍ 20

INPUT 108 — 808 — DATA LATCH – FORMULA END   WHITE/BLACK — 18 ⟋⟍⟋⟍ 19

THESE INPUTS IN INTERFACE BOX

E3-CATRLY
RELAY BOARD

THESE CONTACTS INSIDE
WASHER CONTROL

SOFTROL SYSTEMS CATAPULSE CHEMICAL INTERFACE	S1CATAPULSE	07-28-03	KDL	PAGE 4

CATALYST CHEMICAL INTERFACE RELAY BOARD

REF	A	B	C	D	E	F	G	F

MACHINE CONECTION SIDE
MACHINE VOLTAGE =120VAC
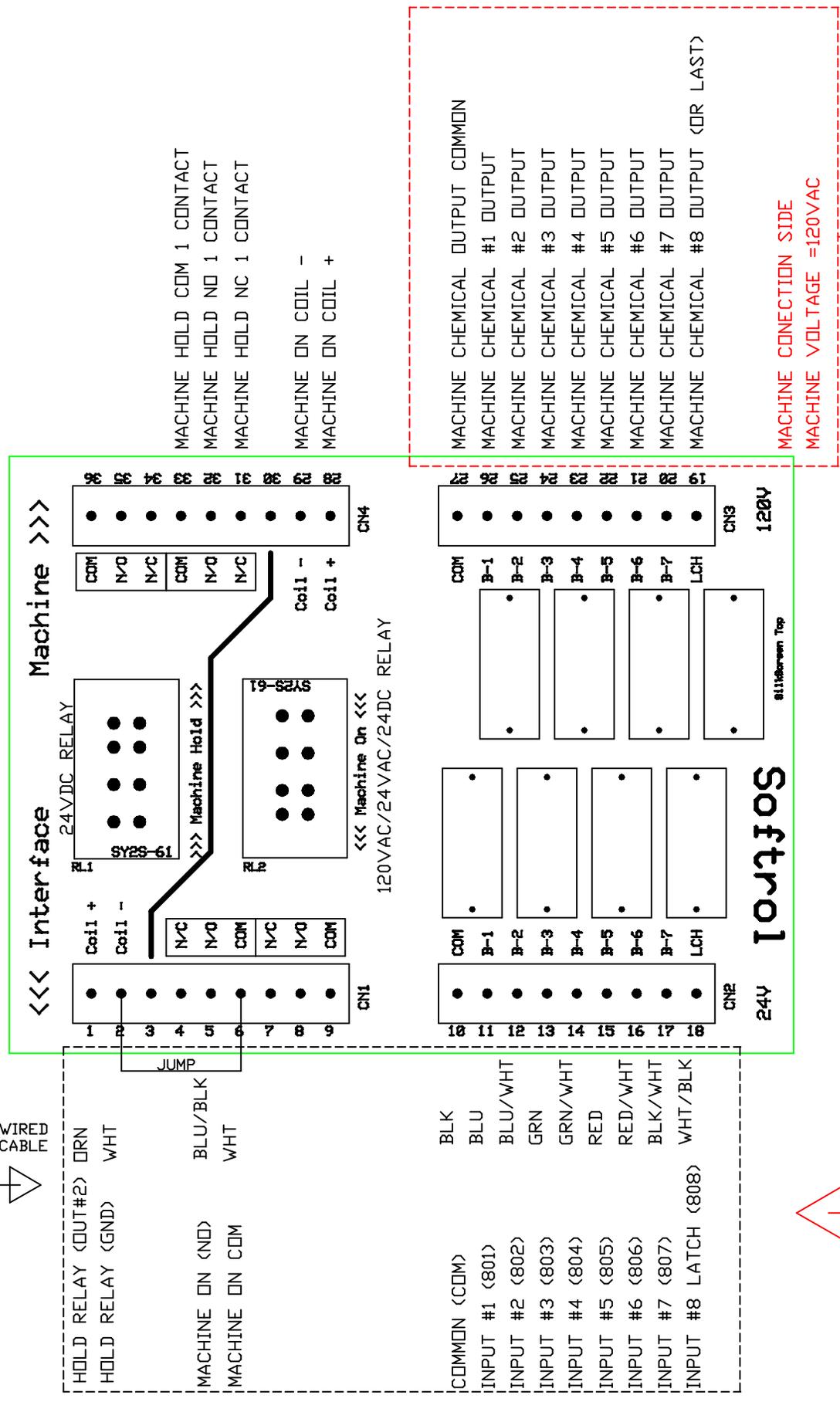
MACHINE HOLD COM 1 CONTACT
MACHINE HOLD NO 1 CONTACT
MACHINE HOLD NC 1 CONTACT
MACHINE ON COIL -
MACHINE ON COIL +

MACHINE CHEMICAL OUTPUT COMMON
MACHINE CHEMICAL #1 OUTPUT
MACHINE CHEMICAL #2 OUTPUT
MACHINE CHEMICAL #3 OUTPUT
MACHINE CHEMICAL #4 OUTPUT
MACHINE CHEMICAL #5 OUTPUT
MACHINE CHEMICAL #6 OUTPUT
MACHINE CHEMICAL #7 OUTPUT
MACHINE CHEMICAL #8 OUTPUT (OR LAST)

Machine >>>

CN4
36 35 34 33 32 31 30 29 28

COM NO NC COM NO NC

Coil -
Coil +

CN3
120V
27 26 25 24 23 22 21 20 19

COM B-1 B-2 B-3 B-4 B-5 B-6 B-7 LCH

Silkscreen Top

<<< Interface   Machine Hold >>>   >>> Machine On <<<

24VDC RELAY

SY2S-61

SY2S-61

120VAC/24VAC/24DC RELAY

RL1   RL2

Softrol

Coil +
Coil -

NC NO COM NC NO COM

CN1
1 2 3 4 5 6 7 8 9

JUMP

CN2
24V
10 11 12 13 14 15 16 17 18

COM B-1 B-2 B-3 B-4 B-5 B-6 B-7 LCH

ATTACH PREWIRED
CATAPULSE CABLE
HERE

HOLD RELAY (OUT#2) ORN
HOLD RELAY (GND) WHT

MACHINE ON (NO)
MACHINE ON COM

BLU/BLK
WHT

COMMON (COM)
INPUT #1 (801)
INPUT #2 (802)
INPUT #3 (803)
INPUT #4 (804)
INPUT #5 (805)
INPUT #6 (806)
INPUT #7 (807)
INPUT #8 LATCH (808)

BLK
BLU
BLU/WHT
GRN
GRN/WHT
RED
RED/WHT
BLK/WHT
WHT/BLK

CONNECT ON INTERFACE SIDE IF MACHINE VOLTAGE = 24VAC/DC

THE FOLLOWING CONNECTIONS ARE
BASED ON PREVIOUS INSTALLATIONS.
**VERIFY THE CONNECTIONS WITH THE
ACTUAL MACHINE SCHEMATIC FIRST.**
THESE TERMINAL CONNECTIONS
SHOULD BE USED A GUIDELINE ONLY.

NOTES: USE TERMINALS 32 & 33 ON INTERFACE BOARD TO BREAK THE ALARM CIRCUIT (WIRE NUMBER 190- Verify on machine schematic!). USE CHEM FAULT FOR HOLD. PROGRAM CHEMICAL 7 (SUPPLY G) FOR 30 SECONDS TO HOLD. RUN WIRE FROM +24 TO TERMINAL 140 FOR DRY CONTACTS ON THE SUPPLY OUTPUTS. This uses the Lavatec 24 VDC for the supply outputs.

Lavatec Washer

LATCH TIME = 5 SEC
OUTPUT = 24 VDC

CATAPULSE			LAVATEC	WIRE
FUNCTION	DESCRIPTION	TERMINAL	TERMINAL	COLOR
BINARY 1	INPUT 101	11	141	BLUE
BINARY 2	INPUT 102	12	142	BLUE / WHITE
BINARY 4	INPUT 103	13	143	GREEN
BINARY 8	INPUT 104	14	144	GREEN / WHITE
BINARY 16	INPUT 105	15	145	RED
BINARY 32	INPUT 106	16	146	RED / WHITE
BINARY 64	INPUT 107	17	DO NOT USE	BLACK / WHITE
LATCH	INPUT 108	18	148	WHITE / BLACK
COMMON	COM	10	0VDC	BLACK
HOLD	HOLD COM	36	+24	ORANGE
HOLD	HOLD NC	34	42	ORANGE / BLACK
MACHINE	ON- POWER	28	+24	BLUE / BLACK
MACHINE	ON- COMMON	29	0VDC	RED / BLACK

Ellis Washer w/ ACS Control

LATCH TIME = 5 SEC
OUTPUT = 24 VDC

NOTES: All connections to be made in Ellis control. Outputs are dry contacts. Connect +24 VDC (24) to terminal 38. This will make outputs 24 VDC. Common is 0 VDC (25)

CATAPULSE			ELLIS	WIRE
FUNCTION	DESCRIPTION	TERMINAL	TERMINAL	COLOR
BINARY 1	INPUT 101	11	89	BLUE
BINARY 2	INPUT 102	12	88	BLUE / WHITE
BINARY 4	INPUT 103	13	87	GREEN
BINARY 8	INPUT 104	14	86	GREEN / WHITE
BINARY 16	INPUT 105	15	85	RED
BINARY 32	INPUT 106	16	84	RED / WHITE
BINARY 64	INPUT 107	17	83	BLACK / WHITE
LATCH	INPUT 108	18	90	WHITE / BLACK
COMMON	COM	10	25	BLACK
HOLD	HOLD COM	36	60	ORANGE
HOLD	HOLD NC	34	61	ORANGE / BLACK
MACHINE	ON- POWER	28	24	BLUE / BLACK
MACHINE	ON- COMMON	29	25	RED / BLACK

BRAUN OP WASHER
LATCH TIME = 30 SEC
OUTPUT = 24 VAC

NOTES: FOR GREATER THAN 15 FORMULAS, MUST HAVE OUTPUT BOARD FOR SIGNALS 6,7,11-17. SET DIP SWITCH S2-4 ON TO ENABLE THESE CHEMICALS

CATAPULSE			BRAUN	WIRE COLOR
FUNCTION	DESCRIPTION	TERMINAL	TERMINAL	
BINARY 1	INPUT 101	11	21	BLUE
BINARY 2	INPUT 102	12	22	BLUE / WHITE
BINARY 4	INPUT 103	13	23	GREEN
BINARY 8	INPUT 104	14	24	GREEN / WHITE
BINARY 16	INPUT 105	15	104	RED
BINARY 32	INPUT 106	16	015	RED / WHITE
BINARY 64	INPUT 107	17	014	BLACK / WHITE
LATCH	INPUT 108	18	013	WHITE / BLACK
COMMON	COM	10	44	BLACK
HOLD	HOLD COM	36	TRS	ORANGE
HOLD	HOLD NC	34	8	ORANGE / BLACK
MACHINE	ON- POWER	28	6	BLUE / BLACK
MACHINE	ON- COMMON	29	44	RED / BLACK

BRAUN "BLUELINE" WASHER
LATCH TIME = 30 SEC
OUTPUT = 24 VDC

NOTES: THE HOLD INPUT IS NOW CALLED LSI SIGNAL.
CHEMICAL OUTPUT TIME IS PROGRAMMED IN TENTHS OF A SECOND
ex. SUPPLY A =50 IS SUPPLY A FOR 5 SECONDS

CATAPULSE			BRAUN	WIRE COLOR
FUNCTION	DESCRIPTION	TERMINAL	TERMINAL	
BINARY 1	INPUT 101	11	356	BLUE
BINARY 2	INPUT 102	12	357	BLUE / WHITE
BINARY 4	INPUT 103	13	358	GREEN
BINARY 8	INPUT 104	14	359	GREEN / WHITE
BINARY 16	INPUT 105	15	360	RED
BINARY 32	INPUT 106	16	853	RED / WHITE
BINARY 64	INPUT 107	17	854	BLACK / WHITE
LATCH	INPUT 108	18	855	WHITE / BLACK
COMMON	COM	10	219	BLACK
HOLD	HOLD COM	36	214	ORANGE
HOLD	HOLD NC	34	818	ORANGE / BLACK
MACHINE	ON- POWER	28	214	BLUE / BLACK
MACHINE	ON- COMMON	29	219	RED / BLACK