

USFilter

**STRANTROL SYSTEM6
TECHNICAL GUIDE**

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water company

Mounting the System6 Chapter 1

Plumbing Flowcell Chapter 2

Assembling the Flowcell..... 2-1
 Plumbing the Flowcell 2-1
 Checking the Flowcell 2-2

System Startup Chapter 3

System6 Board Types 3-1
 Running Power to System6..... 3-2
 CPU Board Connections 3-4
 Running Power for Relays through External Relay Module 3-6
 External Relay Module Connections 3-7
 External Relay Module 3-8
 Wiring Devices to the System6 3-9
 Wiring Devices to the External Relay Module 3-11
 Backwash Relay 3-11
 Typical Installation Diagram 3-12
 Connecting Flowcell to System6 3-13
 pH, HRR and Temperature 3-13
 Water Ground 3-13
 Flow Switch..... 3-13
 Optional: Signal Transmitter 3-14
 Input Board Connections..... 3-15
 Output Board 4-20 Connections..... 3-17
 Serial Input/Output Connections on the Modem Printer Board..... 3-19
 Modem/Printer Board Connections 3-20
 Pin Connections Between System6 Terminal
 and Printer DB25 Pin Connector..... 3-20
 Common Installation Errors..... 3-21
 Review of common problems and solutions..... 3-21
 Feed devices will not start..... 3-21
 The HRR or pH Displays Fluctuate Rapidly 3-21
 The Chlorine Reading is WAIT 3-21
 Menu Access 3-22
 Quick Reference Guide - Functions & Access Levels..... 3-23
 Data Logging 3-24
 Event..... 3-24
 Event Buffer 3-24
 High/Low Resolution Logs 3-24
 Control Logic & Functionality..... 3-26
 System Startup 3-26
 Temperature Option..... 3-26
 Enabling the Temperature Control Option 3-26

Technical Guide

| | |
|--------------------------------|------|
| Ozone Option..... | 3-27 |
| Enabling the Ozone Option..... | 3-27 |

Control Tuning **Chapter 4**

| | |
|---|-----|
| pH Control Options..... | 4-1 |
| Chlorine or Bromine Control Options | 4-2 |
| Alarm Warning Bands | 4-3 |
| Availability..... | 4-3 |
| Rules/Logic..... | 4-3 |
| Example — High Alarm Warning Band..... | 4-4 |
| Example — Low Alarm Warning Bands..... | 4-5 |

Recorder Outputs **Chapter 5**

| | |
|----------------------------------|-----|
| 4-20 mA Outputs..... | 5-1 |
| 4-20 mA Linear Relationship..... | 5-2 |

Menu Options **Chapter 6**

| | |
|--|-----|
| Menu Tree v 5.10 — Reference Guide | 6-1 |
| Menu Tree v 5.10 — Definitions..... | 6-7 |

Sensor Wash Option **Chapter 7**

| | |
|-------------------------------|-----|
| Sensor Wash..... | 7-1 |
| Configure Sensor Wash | 7-1 |
| Programming Sensor Wash | 7-2 |
| Menu Displays..... | 7-3 |
| Example..... | 7-4 |

Backwash Filter Option **Chapter 8**

| | |
|---|-----|
| Backwash Filter..... | 8-1 |
| Programming Backwash | 8-1 |
| Menu Displays..... | 8-2 |
| Configure Backwash | 8-3 |
| Programming Backwash Time | 8-3 |
| Wiring External Relay Box to Adjustable Differential Pressure Switch .. | 8-4 |

Recirculation Pump Option **Chapter 9**

| | |
|--------------------------------------|-----|
| Recirculation Pump | 9-1 |
| Programming Recirculation Pump..... | 9-1 |
| Menu Displays..... | 9-2 |
| Configure Recirculation Pump..... | 9-3 |
| Programming Recirculation Time | 9-3 |

| | |
|---|-------------------|
| Superchlorination Option | Chapter 10 |
| Superchlorination Programming..... | 10-1 |
| Superchlorination Functionality | 10-2 |
| Example..... | 10-3 |
| Calculate LSI Setup Option | Chapter 11 |
| LSI Programming | 11-1 |
| LSI | 11-1 |
| Ryznar Index..... | 11-1 |
| Dosage Calculated | 11-1 |
| Example..... | 11-2 |
| Alternate HRR Setpoint Option | Chapter 12 |
| Alternate HRR Setpoint Programming | 12-1 |
| Alternate HRR Setpoint Functionality | 12-2 |
| Dechlorination Setpoint | Chapter 13 |
| Dechlorination Programming..... | 13-1 |
| Dechlorination Functionality | 13-2 |
| Cl/Br Booster Option | Chapter 14 |
| Cl/Br Booster Functionality..... | 14-1 |
| Communication Capabilities | Chapter 15 |
| Communication Functionality..... | 15-1 |
| Direct Connection | 15-1 |
| Data Modem Connection | 15-1 |
| Voice Data Modem Connection (optional) | 15-1 |
| Programming Call Out Feature | 15-2 |
| Programming Fax Out Feature | 15-3 |
| Programming Pager Out Feature..... | 15-4 |
| Voice Data Modem Terminology & Operations..... | 15-5 |
| Call into the Voice Data Modem for Reports..... | 15-8 |
| Setup the Voice Data Modem to Call Out | 15-8 |
| Customize the Ring Pickup Value..... | 15-9 |
| Customize the Call Out Pre-Delay | 15-9 |
| Customize the Delay..... | 15-9 |
| The FCC and Your Voice Data Modem | 15-10 |

Mounting the System6 - Chapter 1

The System6 and the External Relay Module are mounted to a PVC panel, which should be mounted to the wall. The PVC panel with controller is around 15 lbs. (6.8 kg), so mount the PVC panel with 4 - #10 x 3/4" screws (Fig 1.1). Make sure that the PVC Panel is mounted in a location that is easily accessible, free from chemical fumes and excessive heat, isolated from electrical interference, and powered by a power source protected by a ground fault interrupter. The System6 enclosure is weather resistant, but if mounting outdoors, locating the unit under a hood or overhang is recommended.

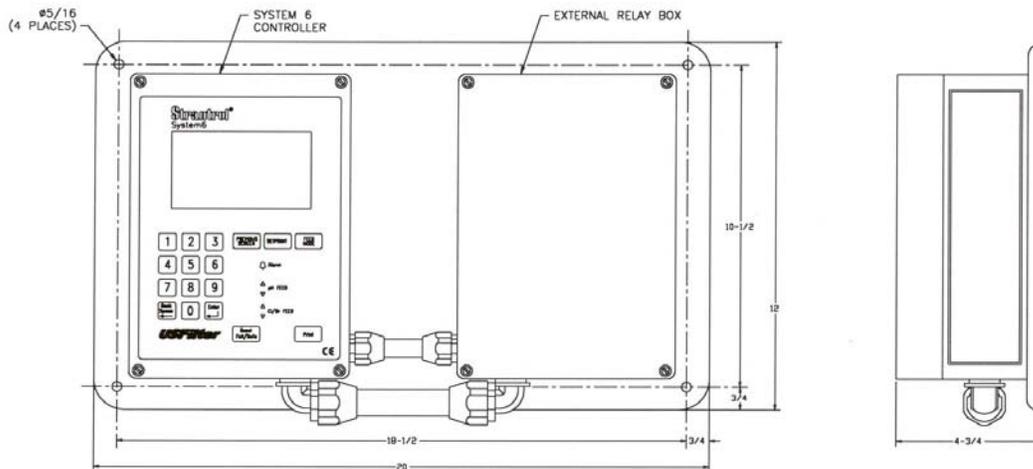


Fig 1.1

The flowcell can be mounted using two different techniques:

- Mount the flowcell next to the controller and run tubing from the flowcell to the sampling point (after filter, before heater) and discharge (before recirculation pump) of the recirculation system. (Fig 1.2)

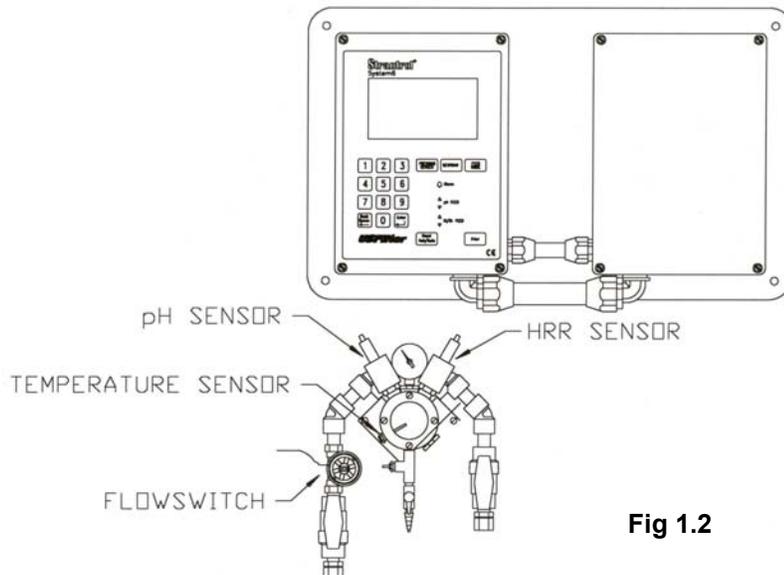


Fig 1.2

Technical Guide

- Mount the flowcell next to the sampling point (after filter, before heater) of the recirculation system and run wires to the System6 using a Signal Transmitter (refer to Signal Transmitter). (Fig 1.3)

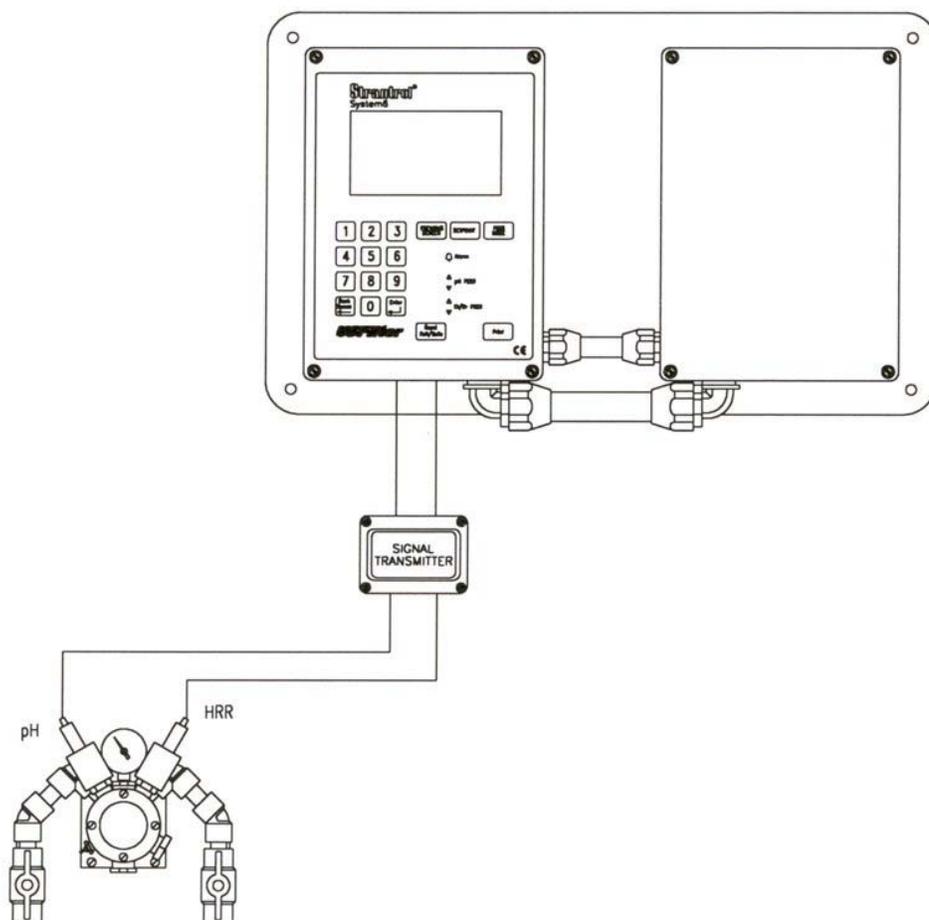


Fig 1.3

Plumbing Flowcell - Chapter 2

Assembling the flowcell

- First wrap each fitting three times around clockwise with the Teflon[®] tape provided.
- Install ½" ball valves to allow isolation of the sample lines.
- Once you have finished assembling the flowcell, close the valves.
- Install the Paddlewheel Flow Switch in the sample stream. Make sure you only wrap the male fitting three times with Teflon[®] tape so as not to risk breaking the female fitting on the Paddlewheel Flow Switch. (Fig 2.1)



“Warning” Failure to incorporate a flow switch and flowcell into the sample stream of your USFilter chemical controller can result in injury or harm to swimmers in or around the pool if the recirculation pump should fail or shut down.

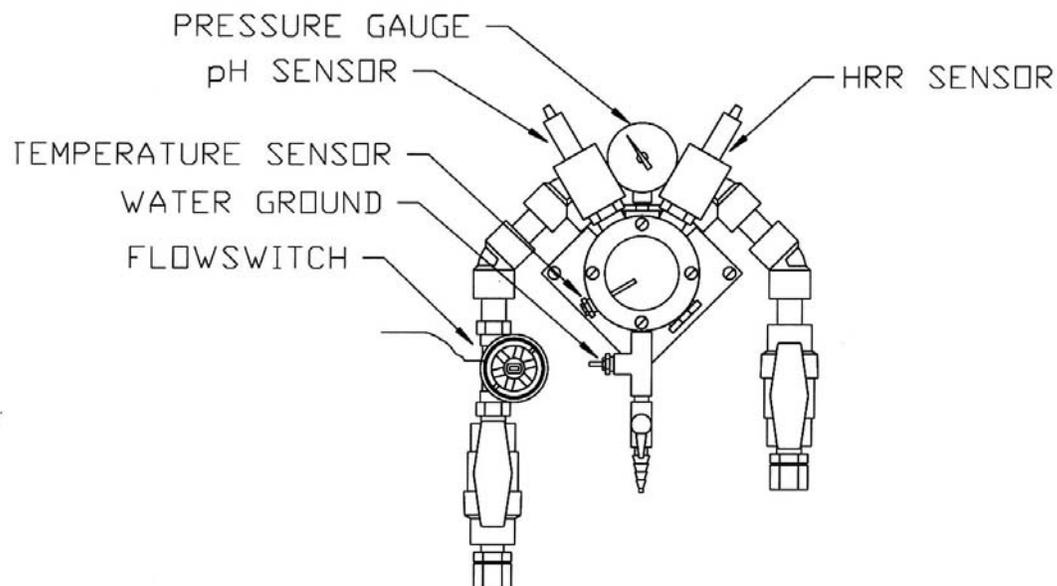


Fig 2.1

Plumbing the flowcell

- Half-inch tubing is recommended for sample stream pickup and return. We have included two connector fittings with the flowcell if needed.
- For the sampling point of the flowcell, tap downstream (after) of filter and upstream (before) of heater and chemical injection points.
- For the discharge point of the flowcell, tap upstream (before) of recirculation pump. (Fig 2.2)
- Remove the cap to the pH and HRR sensors, clean tips with a toothbrush and dish soap and then a light acid.
- Screw pH, HRR and Temperature sensors into flowcell. (Fig 2.2)

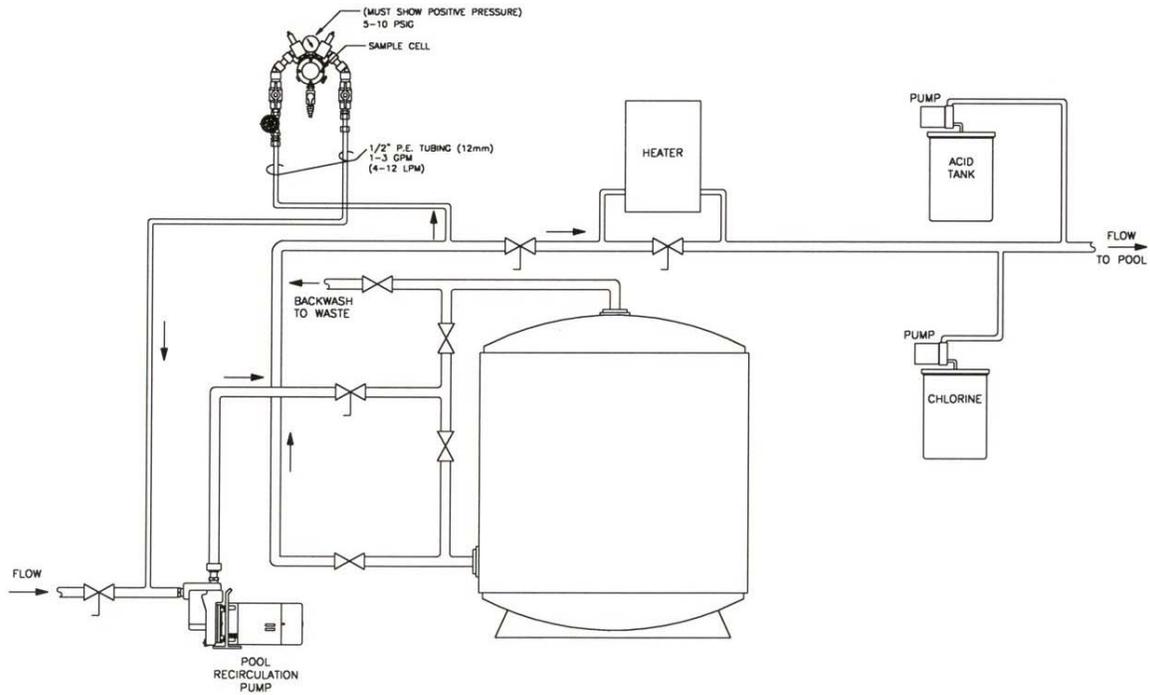


Fig 2.2

Checking the Flowcell

- Open the sample stream valves and check for leaks.
- Make sure the compound pressure gauge is showing a positive and steady pressure.
- Adjust the valves or relocate point at which the sample stream is connected to the recirculation system to ensure positive and steady pressure.
- Allow the sensors to rinse in the sample flowcell while you do the wiring.
- Open wet-test valve and make sure that it generates a vigorous stream.

System Startup - Chapter 3

System6 Board Types

This page describes connections that your Strantrol Representative needs to make in order for your System6 to function. Connections are presented in order of board type (or location):

| Key | Description |
|-----|--|
| 5 | Modem/Printer Board (for Serial/Output connections) (Fig 3.1) |
| 4 | Output Board(4-20 mA) (Fig 3.1) |
| 3 | Input Board (Fig 3.1) |
| 2 | External Relay Module (Fig 3.2) |
| 1 | CPU Board (Fig 3.1) |

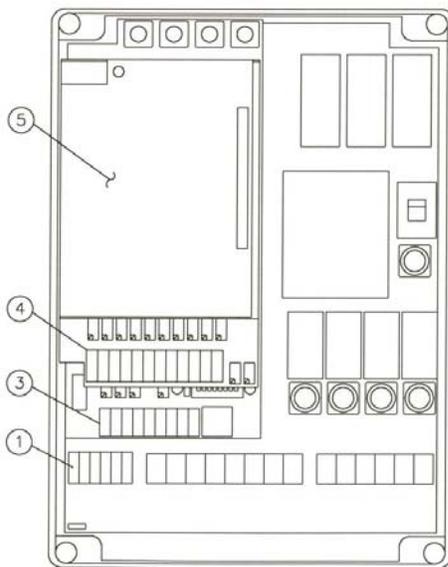


Fig 3.1

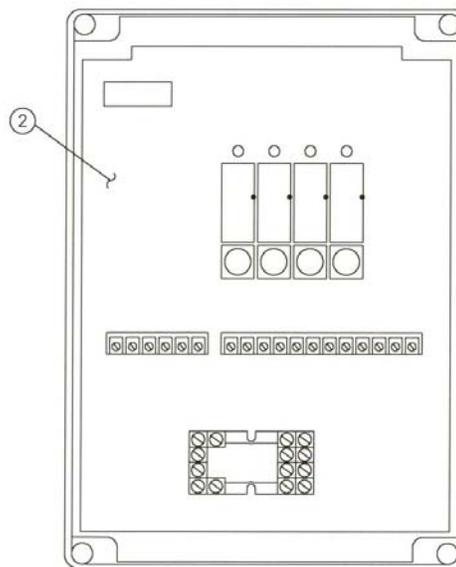


Fig 3.2

Running Power to System6

- Open System6 and place lid to the left, lining up the right two holes of the lid with the left two holes of the base. (Fig 3.3)

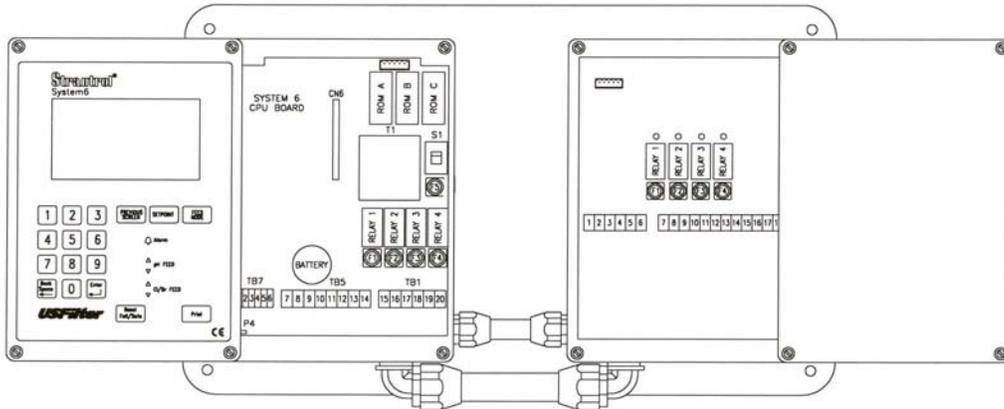
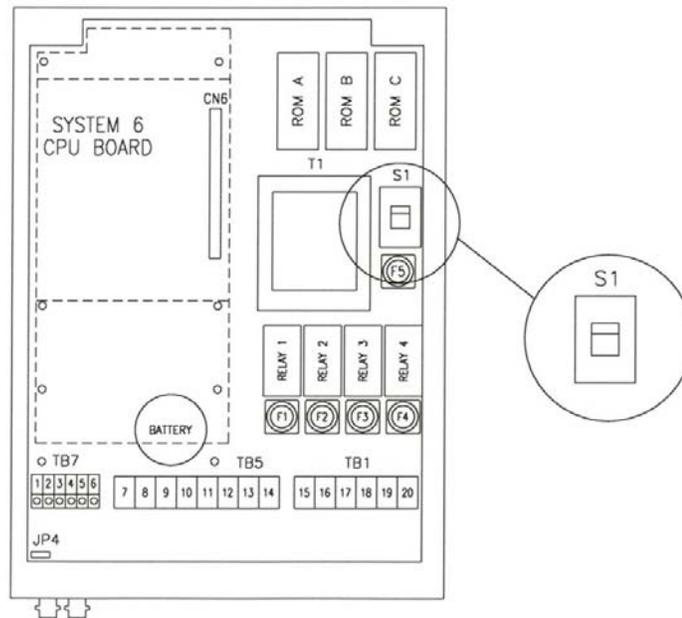


Fig 3.3

- If you are planning to use pigtailed for the power, be sure to use NEMA 4X cord grips and plugs for unused holes.
- Before wiring System6, locate and check the “S1” switch for the right type of line voltage. (Fig 3.4)



CPU PCB
IN ENCLOSURE

Fig 3.4

- Locate Terminal labeled “TB5”.
- Run Line (Black) to terminal labeled “Line”. (Both “Line” terminals are connected.)
- Run Ground (Green) to terminal labeled “Ground”. (All three “Ground” terminals are connected.)
- Run Neutral (White) to terminal labeled “Neutral”. (All three “Neutral” terminals are connected.) (Fig 3.5)

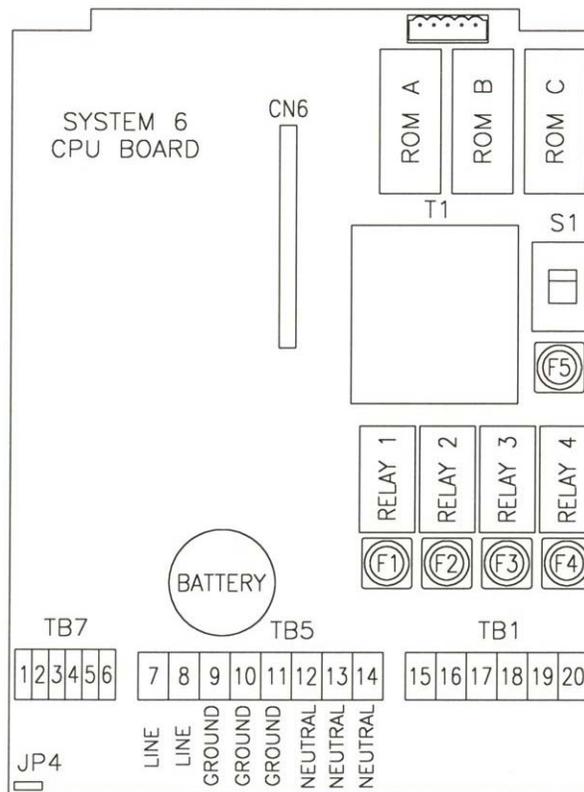


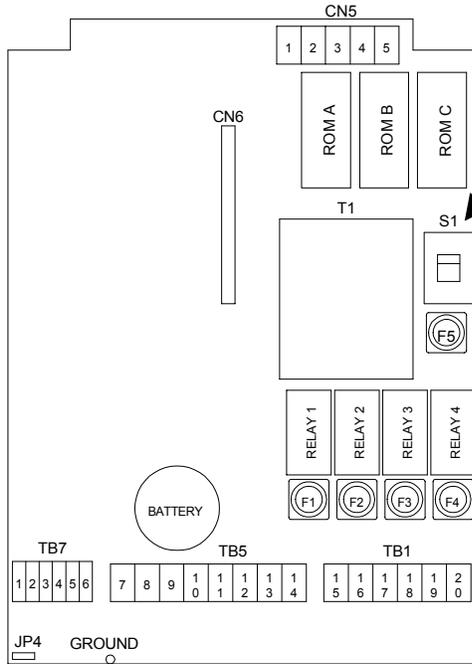
Fig 3.5

CPU Board Connections

| CPU BOARD TERMINAL DESCRIPTIONS | | | |
|---------------------------------|-------------|---|---|
| Terminal | Description | Comments/Notes | |
| TB7 | 1 | Connects to face panel board terminal 1 (RS422 A) | TB7 provides wiring positions for connection to the user interface. Terminals 1 through 6 should be connected to TB1 on the user interface in the same order. (This cable may be extended up to 4000 feet by using the remote interface kit.) |
| | 2 | Connects to face panel board terminal 2 (RS422B) | |
| | 3 | Connects to face panel board terminal 3 (RS422 Y) | |
| | 4 | Connects to face panel board terminal 4 (RS422 Z) | |
| | 5 | Connects to face panel board terminal 5 (RS422 V+) | |
| | 6 | Connects to face panel board terminal 6 (RS422 GND) | |
| TB5 | 7 | AC Line (Black) | One line terminal is used for power in. |
| | 8 | AC Line | |
| | 9 | Earth Ground (Green) | Used as Main Power, Earth, and Neutral connections. NEVER connect controller power neutral to pump power neutral. Warranty will be voided! |
| | 10 | Earth Ground | |
| | 11 | Earth Ground | |
| | 12 | AC Neutral (White) | |
| | 13 | AC Neutral | |
| | 14 | AC Neutral | |
| TB1 | 15 | Dry-Contact Relay Output 1 | There are two common terminals on TB1. Each one is a common for two of the dry-contact relays. The other four terminals on TB1 are the remaining contacts of the relays. |
| | 16 | Common AC Power for Relay Output 1 & 2 | This connection is already wired from factory. |
| | 17 | Dry-Contact Relay Output 2 | |
| | 18 | Dry-Contact Relay Output 3 | |
| | 19 | Common AC Power for Relay Output 3 & 4 | This connection is already wired from factory. |
| | 20 | Dry-Contact Relay Output 4 | |

CPU Board Connections

S1-Line Voltage Selector Switch.
This switch is factory-set for either 115 or 230 volts.



| CPU BOARD FUSE DESCRIPTIONS | |
|-----------------------------|---|
| Terminal | Description |
| F1 | 5 amp fuse for Relay Output 1 |
| F2 | 5 amp fuse for Relay Output 2 |
| F3 | 5 amp fuse for Relay Output 3 |
| F4 | 5 amp fuse for Relay Output 4 |
| F5 | Internal 3/4 amp Fuse for Strantrol Power |

Fig 3.6

JP4 is the battery switch. Place jumper to the two right most pins to turn the battery ON. Typical life of the battery is 5 years.

- Connect the Signal Generator 700 (SG-700) the (Shield) to the test Ground for Calibration.

- 1 on CN5 connects to terminal 1 on TB3 in Extended Relay Module
- 2 on CN5 connects to terminal 2 on TB3 in Extended Relay Module
- 3 on CN5 connects to terminal 3 on TB3 in Extended Relay Module
- 4 on CN5 connects to terminal 4 on TB3 in Extended Relay Module
- 5 on CN5 connects to terminal 5 on TB3 in Extended Relay Module

Running Power for Relays through External Relay Module

For proper operation, the **relay power**, not the main power, **should be interlocked with recirculation pump**.

- Relay power must be taken from a separate circuit or **WARRANTY WILL BE VOID**.
- Open External Relay Module and place lid to the right, lining up the right two holes of the lid with the left two holes of the base.
- If you are planning to use pigtails for the power, be sure to use NEMA 4X cord grips and plugs for unused holes.
- Locate Terminal labeled “TB2” (Fig 3.7, Page 3-8).
- Run Line from starter auxiliary contact to terminal labeled “Line”. 120VAC power may need to be supplied to the motor starter auxiliary contact. Use 14-gauge wire. (Both “Line” terminals are connected)

WARNING:

Failure to provide recirculation pump interlock could result in equipment damage and/or constitute a safety hazard.

- Run Ground to terminal labeled “Ground”. (Both “Ground” terminals are connected)
- Run Neutral to terminal labeled “Neutral”. (All “Neutral” terminals are connected)
- Do not use the same Neutral as main power or **WARRANTY WILL BE VOID**.

External Relay Module Connections

For wiring, refer to tables below.

| Low Voltage | | |
|-------------------------------------|--------------------------------|----------------------------------|
| Terminal (TB3) Figure 3.7 | Description | Comments (Fig 3.6) |
| 1 | Low voltage switch for Relay 8 | Connect to terminal 1 in System6 |
| 2 | Low voltage switch for Relay 7 | Connect to terminal 2 in System6 |
| 3 | Low voltage switch for Relay 6 | Connect to terminal 3 in System6 |
| 4 | Low voltage switch for Relay 5 | Connect to terminal 4 in System6 |
| 5 | DC Common | Connect to terminal 5 in System6 |

| High Voltage | |
|-------------------------------------|--------------------------------|
| Terminal (TB2) Figure 3.7 | Description |
| 1 | AC Line Power for Relay Module |
| 2 | AC Line Power for Relay Module |
| 3 | AC Ground |
| 4 | AC Ground |
| 5 | AC Neutral for Relay Module |
| 6 | AC Neutral for Relay Module |
| 7 | Dry-Contact Relay 5 Output |
| 8 | AC Power in for Relay 5 |
| 9 | AC Neutral |
| 10 | Dry-Contact Relay 6 Output |
| 11 | AC Power in for Relay 6 |
| 12 | AC Neutral |
| 13 | Dry-Contact Relay 7 Output |
| 14 | AC Power in for Relay 7 |
| 15 | AC Neutral |
| 16 | Dry-Contact Relay 8 Output |
| 17 | AC Power in for Relay 8 |
| 18 | AC Neutral |

External Relay Module

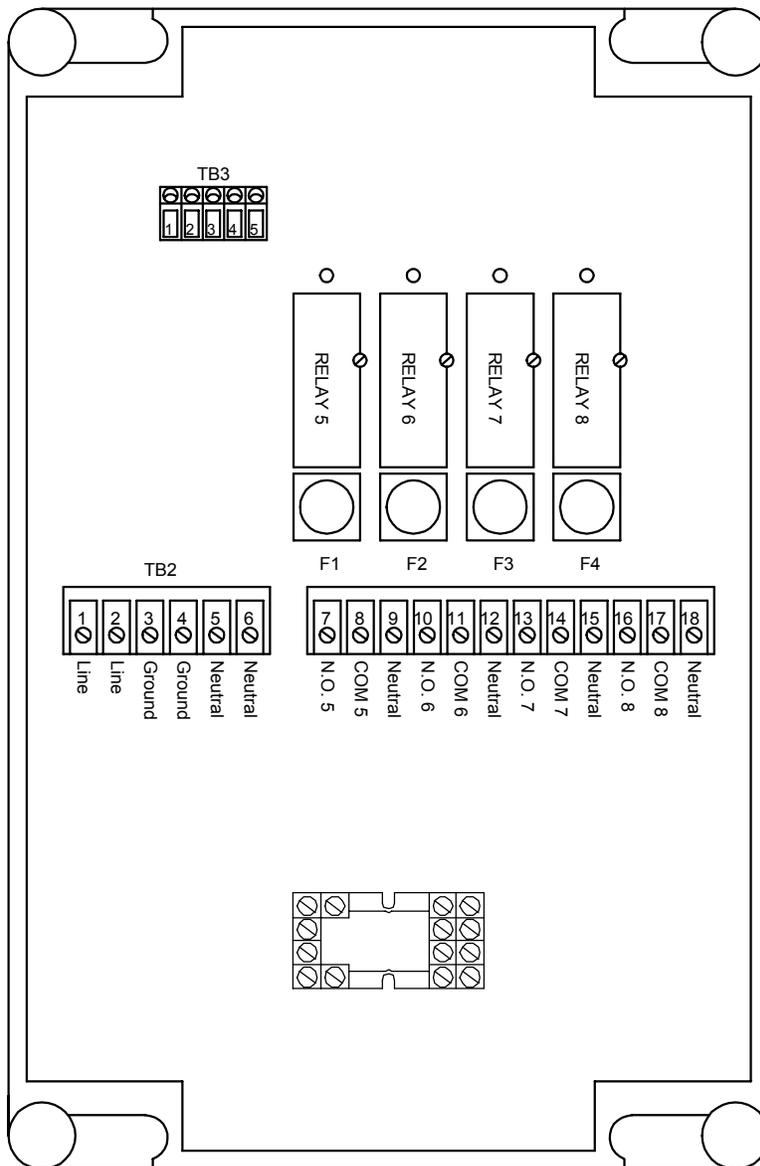


Fig 3.7

Wiring Devices to Relays in the System6

WARNING!

Controller power and pump power must be separated. This setup reduces noise inside the controller and eliminates controller damage due to transient spikes from the pumps.

NEVER connect controller power neutral to pump power neutral or **WARRANTY WILL BE VOID!**

- Relays 1 through 4 are already configured for specific functions but can be reconfigured for your application.

| | |
|---------|-------------------------|
| Relay 1 | pH Feed Down |
| Relay 2 | Sensor Wash |
| Relay 3 | Chlorine Feed |
| Relay 4 | Audible or Visual Alarm |

- Other relay functions are below.

| Control Action | Factory Default |
|---|-----------------|
| pH Feed - Down | Relay 1 |
| pH Feed - Up | |
| Sensor Wash | Relay 2 |
| Chlorine/Bromine | Relay 3 |
| Alarm | Relay 4 |
| Dechlorination | |
| Superchlorination | |
| Heater | |
| Backwash Filter | |
| Recirculation Pump | |
| Chlorine/Bromine Boost System | |
| Ozone | |
| The relays can be interchanged in any order, including multiple relays controlling the same function. | |
| Note: If two relays control the same function, they will trigger at the same setpoint. | |

- Locate Terminal labeled "TB1" in the System6.
- Connect device line to terminal labeled "N.O.#" (the # corresponds to the Relay #).

Technical Guide

(Example: pH feed and Chlorine feed)

pH feed

- Locate Terminal labeled “N.O.1”.
- Run Line from pH feed device to “N.O.1”
- Run Neutral to Relay circuit neutral.
- Run Ground to Relay circuit ground.

Chlorine Feed

- Locate Terminal labeled “N.O.3”.
- Run Line from chlorine device to “N.O.3”
- Run Neutral to Relay circuit neutral.
- Run Ground to Relay circuit ground.

System6 Wiring

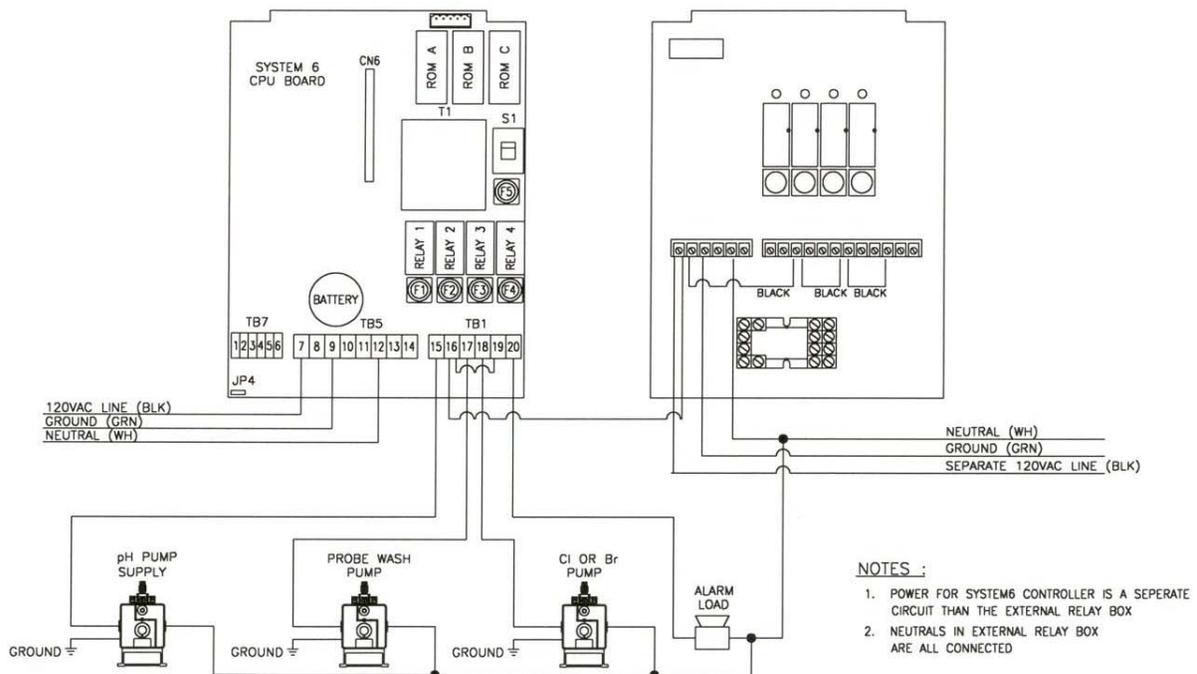


Fig 3.8

Wiring Devices to Relays in the External Relay Module

With the relay module, the System6 has four additional relays. These four relays may be programmed for any functionality as described on page 3-9.

For the System6 to recognize the relay module, Switch #7 on S5 must be in the “on” position. Refer to page 3-15.

WARNING!

Controller power and pump power must be separated. This setup reduces noise inside the controller and eliminates controller damage due to transient spikes from the pumps.

NEVER connect controller power neutral to pump power neutral.

Warranty will be voided!

Backwash Relay

- Relay 5 is wired to a dry contact relay for backwash control.
- Locate the Dry Contact Relay inside the External Relay Module.
- Locate Terminal “12” and Terminal “8”.
- Locate the Adjustable Differential Pressure Switch for the Filter.
- Locate Terminal “N.O.” (Normal Open) and Terminal “Common” or “C”.
- Connect Terminal “12” to Terminal “Common” or “C”.
- Connect Terminal “8” to Terminal “N.O.” (Normal Open).
- Relays 6 through 8 are not configured for specific functions, but can be configured for your application.
- Locate Terminal labeled “TB1” in the External Relay Module.
- Connect device Line to terminal labeled “N.O.#” (the # corresponds to the Relay #).
- Connect device Neutral to terminal labeled “Neutral” that corresponds to Relay #.

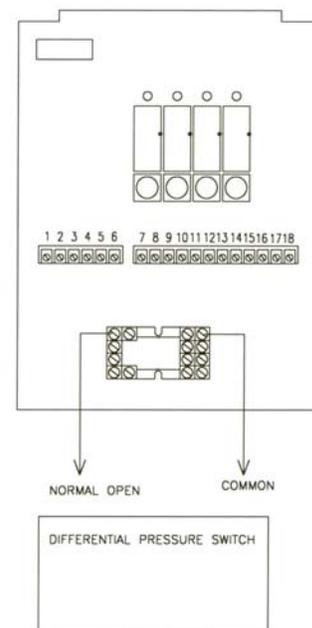


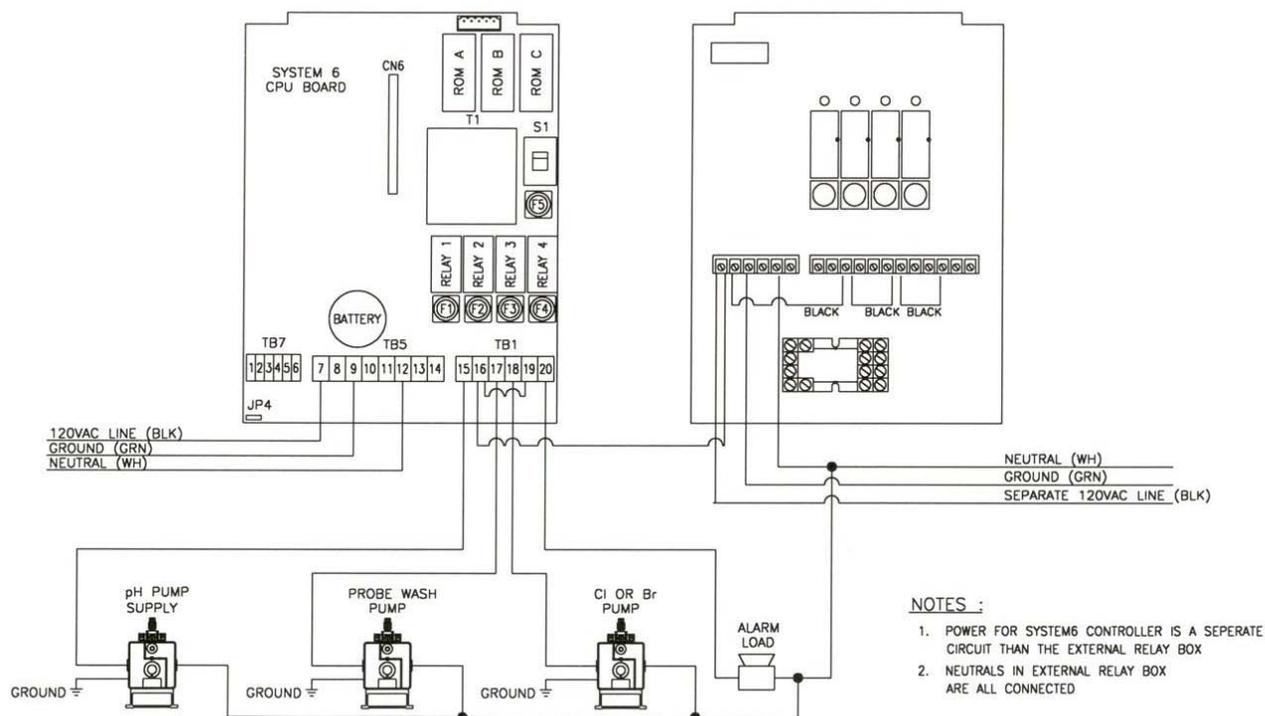
Fig 3.9

(Example: Superchlorination)

Superchlorination feed

- Locate Terminal labeled “N.O.6”.
- Run Line from Superchlorination device to “N.O.6”.
- Run Neutral to “Neutral”.
- Run Ground to TB2 “Ground”.

Typical Installation Diagram



System6 Wiring

Fig 3.10

Connecting Flowcell to System6

pH, HRR and Temperature Sensors

- Plug pH sensor into the BNC jack on the left side of the System6 by twisting it a quarter of a turn to lock it.
- Plug HRR sensor into the BNC jack on the right side of the System6 by twisting it a quarter of a turn to lock it.
- Use a Nema4X cord grip to insert the Temperature Sensor cable into the System6.
- Locate the Input Board.
- Locate “+Temp-” in the Terminal labeled TB1.
- Connect the white wire to TB1 position 3.
- Connect the black wire to TB1 position 4.

Water Ground

- Locate the Input Board.
- Locate “W.Gnd” in the Terminal labeled TB1.
- Locate the stainless steel grounding screw provided as a part of the Flowcell.
- Using a recommended 18 gauge wire.
- Connect the stainless steel grounding screw to “W.Gnd” in TB1 position 1.

Flow Switch



“Warning” Failure to incorporate a flow switch and flowcell into the sample stream of your USFilter chemical controller can result in injury or harm to swimmers in or around the pool if the recirculation pump should fail or shut down.

- Locate the Input Board
- Locate “Flow”, “V+”, “V-” in the Terminal labeled TB1.
- Locate the Flow Switch from the flowcell.
- Connect the White wire to “Flow” in TB1 position 5.
- Connect the Red wire to “V+” in TB1 position 6.
- Connect the Black wire to “V-” in TB1 position 7.

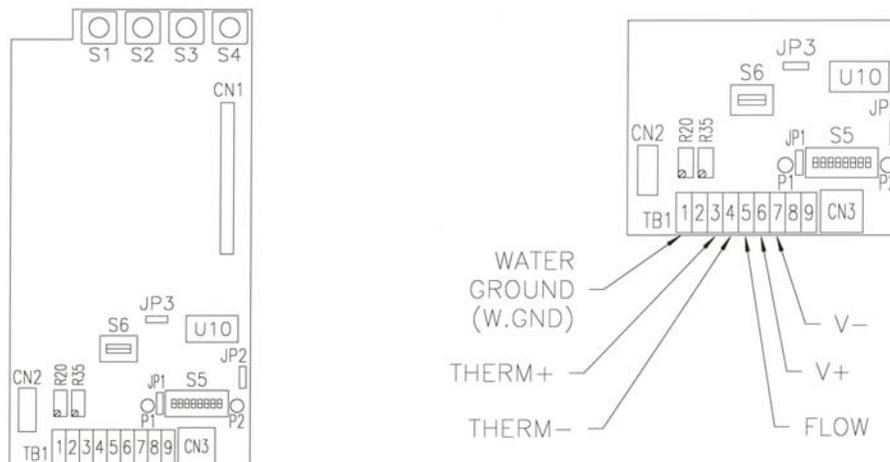


Fig 3.11 & Fig 3.12

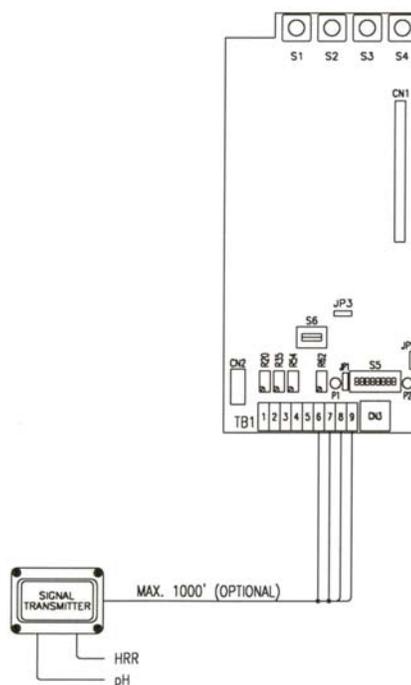
Optional: Signal Transmitter

- Locate Input Board
- Locate Switch labeled S6 just above TB1.
- S6 must be in the up position.
- Locate the Terminal labeled JP1 in the Signal Transmitter.
- Connect “Flow” on the Input Board to JP1 position 5.
- Connect “V+” on the Input Board to JP1 position 1.
- Connect “V-“ on the Input Board to JP1 position 2.
- Connect “1Pamp” on the Input Board to JP1 position 3.
- Connect “Pamp2” on the Input Board to JP1 position 4.

| System6 Input Board | Signal Transmitter |
|------------------------|--------------------|
| Flow (TB1 position 5) | JP1 position 5 |
| V+ (TB1 position 6) | JP1 position 1 |
| V- (TB1 position 7) | JP1 position 2 |
| 1Pamp (TB1 position 8) | JP1 position 3 |
| Pamp2 (TB1 position 9) | JP1 position 4 |

- Connect the White wire from the Flow Switch to JP1 position 5 in the Signal Transmitter.
- Connect the Red wire from the Flow Switch to JP1 position 1 in the Signal Transmitter.
- Connect the Black wire from the Flow Switch to JP1 position 2 in the Signal Transmitter.
- Plug pH sensor into the BNC jack on the left side of the Signal Transmitter by twisting it a quarter of a turn to lock it.
- Plug HRR sensor into the BNC jack on the right side of the Signal Transmitter by twisting it a quarter of a turn to lock it.
- Connect the Temperature sensor to the terminals on the lid of the Signal Transmitter.
- Connect the terminals of the lid to the Temperature TB1 positions 3 & 4 on the Input Board.
- Make sure the polarity is correct.
- Red in “+Temp” (TB1 position 3).
- Black in “Temp-“ (TB1 position 4).
- The Signal Transmitter is just a junction box for the Temperature Sensor.

Fig 3.13



Input Board Connections

| Input Board Terminal Descriptions (TB1) - Analog Input Connections | | |
|--|----------------------------|--|
| Terminal/Description | Comments/Notes | |
| 1 | Water Ground | The water ground MUST be connected to the water. This may be done by connecting wire between Terminal 1 and stainless screw provided in flowcell. |
| 2 | Chlorine reference voltage | 4 channel unit only. |
| 3 | Temperature (+) signal | Connect from Temperature Probe (White) |
| 4 | Temperature (-) signal | Connect from Temperature Probe (Black) |
| 5 | Flow Input | Connect to white wire from flow switch. |
| 6 | +12VDC | Connect to red wire from flow switch. |
| 7 | DC Common | Connect to black wire from flow switch. |
| 8 | Transmitter Input #1 | Isolated signal transmitter hook-up. Remote mounting up to 1000 ft. |
| 9 | Transmitter Input #2 | |

Caution: Failure to connect flowswitch wires properly will result in damage to flowswitch.

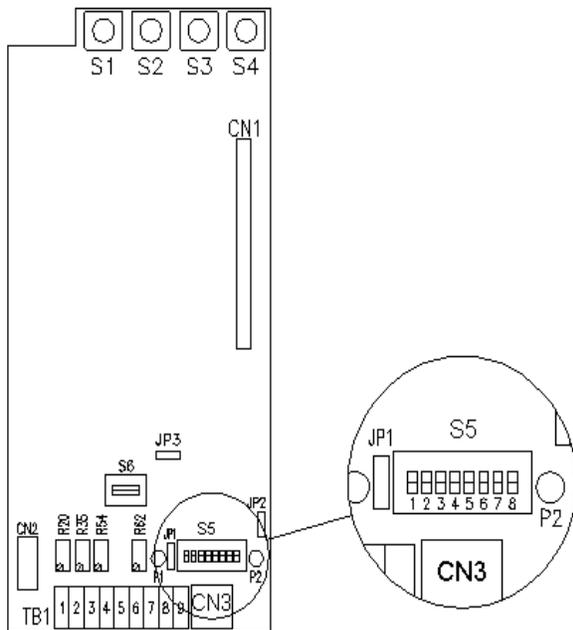


Fig 3.14

| INPUT BOARD S5 POSITIONS / DESCRIPTIONS | |
|---|---|
| Position | Description |
| 1 | ON Removes ppm reading OFF Normal display |
| 2 | 4 channel units only |
| 3 | European Date. ON=dd/mm/yy English Date. OFF=mm/dd/yy |
| 4 | Not Used |
| 5 | Direct / Modem selection OFF = Direct ON = Modem (or voice) |
| 6 | Voice Modem. ON = voice modem OFF = No voice modem |
| 7 | ON = Relay Module Connected |
| 8 | Stranco use only |

Input Board Connections

| INPUT BOARD PUSH BUTTONS (MOMENTARY CONTACT) | |
|--|-----------------------------------|
| Switch # | Description |
| S1 | Manual Override for Relay 1 and 5 |
| S2 | Manual Override for Relay 2 and 6 |
| S3 | Manual Override for Relay 3 and 7 |
| S4 | Manual Override for Relay 4 and 8 |
| S1 through S4 will be used only by authorized personnel during installation. | |

| INPUT BOARD NOTES | | |
|--------------------------|---|---|
| | Description | Comments/Notes |
| CN2 | Connector for BNC inputs from pH/HRR sensors | See S6 below and use input terminal connections if using a signal transmitter. |
| S5 | Main Dip Switch Bank | |
| S6 | Determines whether the pH/HRR sensor inputs are from the BNC connector or from a remote signal transmitter. | Set this switch UP to use the signal transmitter input. Set this switch DOWN to use the BNC input. |

Output Board 4-20 Connections

All output signals are 4-20 mA. Output connections are made to TB1.

Output signals may be for either:

- Control** and/or
- Recording.**

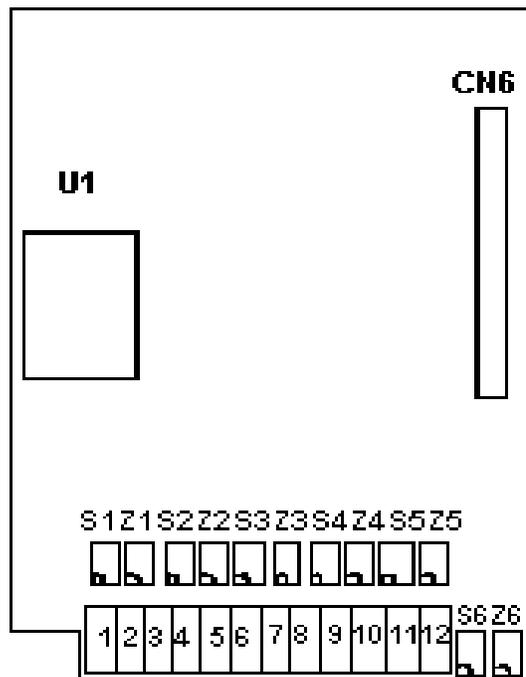


Fig 3.15

Output Board 4-20 Connections

| 4-20 mA OUTPUT BOARD TERMINAL DESCRIPTIONS | | |
|---|---|-----------------------|
| TERMINAL | DESCRIPTION | DEFAULT VALUES |
| 1 | (+) 4-20 mA output signal for Channel #1 Recorder | pH 6.0 - 9.0 |
| 2 | (-) 4-20 mA output signal for Channel #1 Recorder | |
| 3 | (+) 4-20 mA output signal for Channel #2 Recorder | HRR 0 -1000 mV |
| 4 | (-) 4-20 mA output signal for Channel #2 Recorder | |
| 5 | (+) 4-20 mA output signal for Channel #3 Recorder | ppm 0 - 20 ppm |
| 6 | (-) 4-20 mA output signal for Channel #3 Recorder | |
| 7 | (+) 4-20 mA output signal for Channel #4 Recorder | Temperature 60 - 100 |
| 8 | (-) 4-20 mA output signal for Channel #4 Recorder | |
| 9 | (+) 4-20 mA output signal for Channel #5 Recorder | pH 6.0 - 9.0 |
| 10 | (-) 4-20 mA output signal for Channel #5 Recorder | |
| 11 | (+) 4-20 mA output signal for Channel #6 Recorder | ppm 0 - 20 ppm |
| 12 | (-) 4-20 mA output signal for Channel #6 Recorder | |

Serial Input/Output Connections on the Modem Printer Board

CN2 (phone) is the phone line connection for the modem.

CN3 (PC-Con) is the RS-232 direct connect port.

TB1 is the connector for the optional printer.

NOTICE: If you plan to use the Voice Modem (optional) with the System6, ignore this page and the next page on Modem/Printer Board Connection.

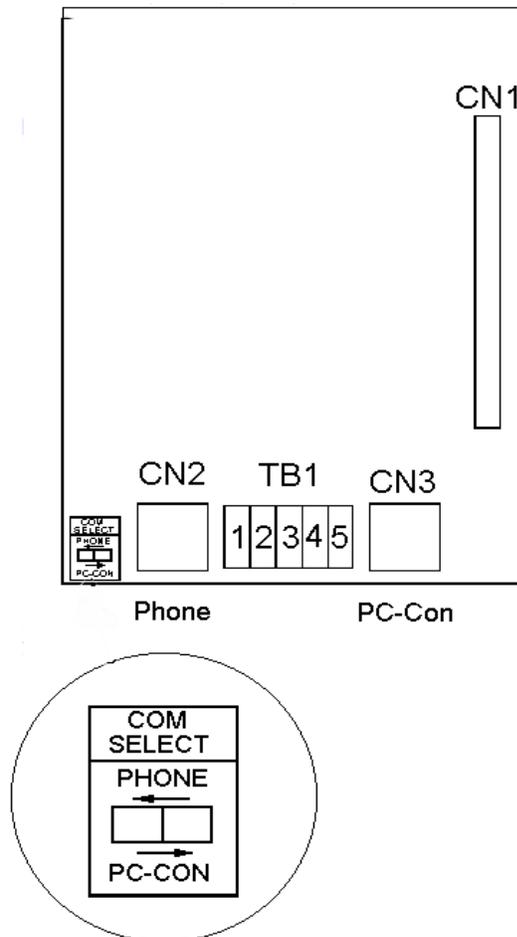


Fig 3.16

Modem/Printer Board Connections

| Modem/Printer Board Terminal Descriptions | | |
|---|-------------------------------|-------|
| Terminal | Description | Color |
| 1 | Signal Ground | Black |
| 2 | Receive (no connection) | |
| 3 | Transmit | Red |
| 4 | Clear to Send | White |
| 5 | Ready to Send (no connection) | |

COM SELECT switch allows a switch between remote access and direct access. Along with dipswitch #5 on input board.

Fig 3.16

For remote connection, CN2 is a standard RJ-11 phone connection. This connector utilizes remote communication outlet only. (Switch COM SELECT to phone (toward left) and use CN2). Dipswitch #5 on input board to up position.

For direct computer connection, switch COM SELECT to PC-Con (toward right) and use CN3 (offset MMJ connector). Set dipswitch #5 to off position.

Note: To connect to a printer other than supplied by USFilter Stranco Products, please consult your authorized USFilter Stranco Products representative.

Pin Connections Between System6 Terminal and Printer DB25 Pin Connector:

| System6 Terminal | Printer 25 Pin |
|------------------|----------------|
| 1 | 7 |
| 3 | 2 |
| 4 | 5 |

TAN PRINTER

| System6 Terminal | Printer 25 Pin |
|------------------|----------------|
| 1 | 7 |
| 3 | 3 |
| 4 | 11 |

**GRAY PRINTER
(OLD)**

Common Installation Errors

Review of Common Problems and Solutions

Before contacting the Stranco Products service staff with questions on your new installation, review the following common problems and solutions.

| |
|---|
| <p>The most common installation error is an improperly connected water ground.</p> |
|---|

The **water ground** must be connected to the proper terminal in the controller and to the connector on the flowcell.

Feed devices will not start

The relays are dry-contact. To activate a feed device, power must be provided to the relay contacts.

To provide 120 VAC to all four relays:

- Connect a jumper wire from the CPU board TB5 #7 or #8 (both are AC line) to TB1 #16 (Com 1,2). Connect another jumper from TB1 #16 to TB1 #19 (Com 3,4).

WARNING: This will bypass the interlocking protection and should only be done for troubleshooting purposes.

- Consult the wiring diagram for correct wiring. Fig 3.12

The HRR or pH Displays Fluctuate Rapidly

- Check the **water ground connection**, both in the controller and on the flowcell.
- Connect a signal generator and verify that the SG-700 ground lead is connected.
- Verify that the display matches the signal generator readings.
- Check BNC to input board connections.
- Check S6 input switch position.
Down (off) for BNC/sensor input,
Up (on) for preamp input.

The chlorine reading is WAIT.

If the pH changes more than .08 in one minute, the WAIT message is displayed in place of the ppm reading. It prevents standardization of the chlorine display until pH stabilizes. This wait time may be up to 30 seconds.

Menu Access

An Operator, Manager or Representative access code is required to perform procedures described in this chapter.

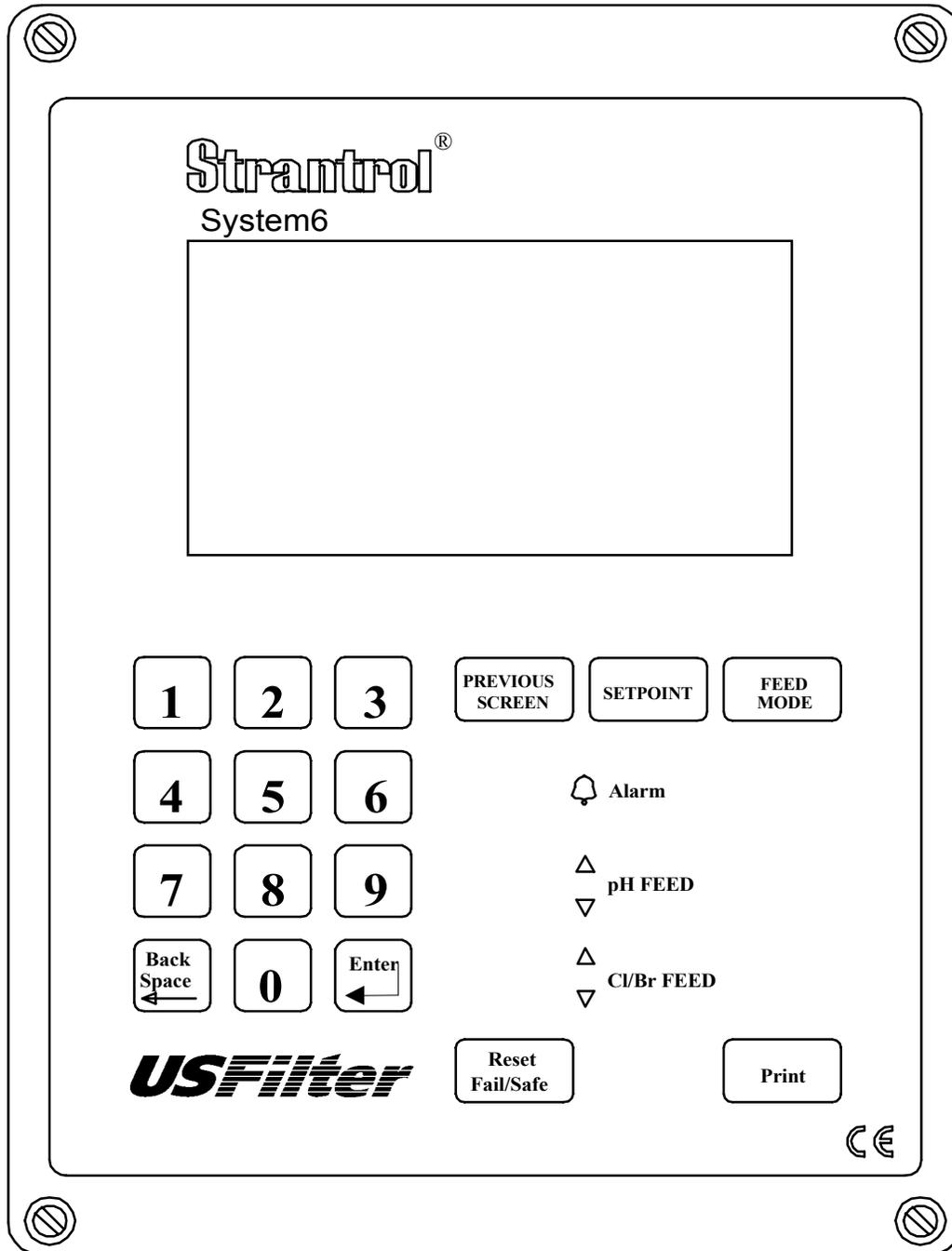


Fig 3.17

Quick Reference Guide - Functions & Access Levels

| Functions - Listed by Level: | | | |
|-------------------------------------|--|--|--|
| | Representative Level | Manager Level | Operator Level |
| | Hardware Calibration Recorder Outputs Software Calibration Rep startup All Manager Level options All Operator Level options Control tuning | Alarm setup Sensor wash programming Superchlorination programming Current date programming Current time programming All Operator Level options Backwash filter Recirculation pump | pH setpoint pH auto-off-manual pH calibration (standardize) HRR setpoint HRR auto-off-manual ppm setpoint ppm auto-off-manual ppm calibration |
| To Gain Access: | | | |
| | Representative Level | Manager Level | Operator Level |
| 1 | Press the <i>Enter</i> key to display the different viewing options. | | |
| 2 | Press 9 to enter the Representative access code. | Press 2 to enter the Manager access code. | Press 1 to enter the Operator access code |
| 3 | Press the Numbered keys to enter in your access code. | | |
| 4 | Menus have a two-minute time-out. If there is no activity on the control buttons for at least two minutes, the system exits the menu and reverts to the Display Level. | | |

Data Logging

Event

The System6 considers changes within its system as **events**. Examples of events would be:

- Relays opening and closing
- Alarm conditions
- Parameter changes

Event Buffer

Each time an **event** occurs, an entry is made in the event buffer.

When an event is stored it received a time stamp. You can, therefore, trace changes to the system to the time the event occurred.

The event buffer has room for 1000 entries. When the buffer fills up, the oldest entry is erased to make room for new entries.

The SVC program allows you to download the event buffer to a PC hard drive or a floppy diskette. If you download the event buffer before it fills up, you will have a PC-compatible record of the event history saved. In the meantime, the System6 will erase the oldest entries to make room for new ones.

How frequently you schedule your downloads depends on whether you want to save high resolution or low resolution storage information.

High/Low Resolution Logs

The System6 stores parameter readings at two resolutions simultaneously:

High Resolution, which stores minimum, maximum, average and sample values for the specified time frame.

Low Resolution, which stores minimum, maximum, average and sample values for the specified time frame.

| | High Resolution | Low Resolution |
|--|-------------------------|-----------------------|
| The default time period stores values every: | 6 minutes | 2 hours |
| The minimum setting is: | 1 minute | 1 hour |
| The maximum setting is: | 6 minutes (the default) | 4 hours |
| When using the minimum setting, history is stored for: | 9 hours | 17 days |
| When using the maximum setting, history is stored for: | 2 days - 6 hours | 68 days |
| When using the default setting, history is stored for: | 2 days - 6 hours | 34 days |

The amount of time that history is stored represents the maximum amount of time you can schedule downloads. For example, if your high resolution is set at the default, you must download high-resolution data every 2 days -6 hours. If you wait 2 days - 7 hours between downloads, System6 will erase the oldest information in the buffer in order to make room for the new information.

Control Logic & Functionality

System Startup

A system startup occurs after a power cycle or a system reset. During system startup the LCD displays the message "System Startup." An underscore moves along the bottom of the System Startup message.

Temperature Option

The temperature is displayed on the screen and is used in determining the LSI and the Ryznar index. The temperature default for this calculation, if temperature probe is not present, is 83°F.

Enabling the Temperature Control Option

To enable or disable the Temperature Option. Enter the menu through the Representative Level.
[Diagnostics] : [Hardware Calibration] : [Temperature] :
0 [enable] : 1 [disable].

Here is some useful information on the ranges and resolution of pH and HRR.

| | pH Input | HRR Input | ppm Input High Scale |
|-------------|-----------------|------------------|-----------------------------|
| Range: | 0.0 to 14.0 pH | 0 mV to 1000 mV | 0.0 to 6.0 ppm |
| Resolution: | 0.01 pH | 1 mV | 0.1 ppm |

Ozone Option

The purpose of the ozone option is to allow control of an ozonator.

The operation of the ozonator relay is basic. The relay is normally closed (i.e. the ozonator is "ON") under normal operation. When the System6 recognizes a high HRR alarm, the relay switches (in other words, the ozonator is "OFF").

Enabling the Ozone Option

1. Enter the menu system using the Representative access code.
2. Select [Rep Startup].
3. Select one of the eight relays to operate the ozone. Selecting a relay for ozone enables ozone control on that relay.
4. Adjust HRR High Alarm parameter as needed.

Control Tuning - Chapter 4

pH Control Options

| | pH Feed-down | pH Feed-up |
|---|--|--|
| | Feed-down means that when chemical is fed, the pH lowers. | Feed-up means that when chemical is fed, the pH rises. |
| | Hook-up the pH feed device to appropriate relay as shown in the wiring diagrams. | Hook-up the pH feed device to appropriate relay as shown in the wiring diagrams. (Reprogram Relay) |
| 1 | Enter the menu system using a Manager or Representative access code. | |
| 2 | Select [pH SETUP]:[pH feeddn or feedup Mode]. | |
| 3 | Select whether the pH control is on/off[0] or proportional[1]. | |
| | With on/off control (and pH feed-down), whenever the pH is above the setpoint, the pH feed device will be [on] until setpoint is reached. | With on/off control (and pH feed-up), whenever the pH is below the setpoint, the pH feed device will be [on] until setpoint is reached. |
| 4 | Select [pH prop span](proportional span). | |
| 5 | If you selected on/off control, ignore this step. | |
| | If you selected proportional mode, select the control proportional span. The proportional span defines the "window" of control for the pH chemicals. | |
| | <u>Settings</u> Setpoint 7.5 Proportional span .5 <u>Input pH Value</u> <u>Feed device Duty Cycle</u> 8.0 100% 7.8 60% 7.5 0% | <u>Settings</u> Setpoint 7.5 Proportional span .5 <u>Input pH Value</u> <u>Feed device Duty Cycle</u> 7.0 100% 7.2 60% 7.5 0% |
| 6 | Select [pH feed down F/S]. | Select [pH feed down F/S]. |
| 7 | The fail/safe alarm sets a feed time-out value. If the feed device operates for this period of time without reaching setpoint, a fail/safe alarm is recognized and the control relay is disabled (locked out). | |

Chlorine or Bromine Control Options

Hook-up the chlorine (or bromine) feed device to the appropriate relay. Action of chlorine feed device will be controlled from an HRR sensor.

| Software Programming for the Chlorine (or Bromine) Relay (relay 3). | | | | | | | | | | | | | | | | | |
|--|--|---------------------|--|-------------|-----|---------------------|----|------|--|-----------------------|-------------------------------|-----|------|-----|-----|-----|----|
| 1 | Enter menu system using Manager or Representative access codes. | | | | | | | | | | | | | | | | |
| 2 | Select [HRR SETUP: HRR/Cl ppm cntrl]. | | | | | | | | | | | | | | | | |
| 3 | Select [HRR]. Select [ppm]. | | | | | | | | | | | | | | | | |
| 4 | Select [HRR (Cl/Br) Feed Mode]. | | | | | | | | | | | | | | | | |
| 5 | Select whether the chlorine control is on/off [0] or proportional [1]. NOTE: With on/off control, whenever the chlorine is below the set point, the chlorine feed device will be [on] until setpoint is reached. | | | | | | | | | | | | | | | | |
| 6 | Select [HRR F/S Alarm]. | | | | | | | | | | | | | | | | |
| 7 | The fail/safe alarm sets a feed time-out value. If the feed device operates for this period of time without reaching set point, a fail/safe alarm is recognized and the control relay is disabled (locked out). | | | | | | | | | | | | | | | | |
| 8 | Select [HRR prop span]. | | | | | | | | | | | | | | | | |
| 9 | If proportional mode was selected (in step #6), select the control proportional span. If on/off was selected, ignore this step. | | | | | | | | | | | | | | | | |
| 10 | NOTE: The proportional span defines the "window" of control for the System6. | | | | | | | | | | | | | | | | |
| | <table border="0"> <tr> <td colspan="2"><u>HRR Settings</u></td> </tr> <tr> <td>Set point =</td> <td>750</td> </tr> <tr> <td>Proportional span =</td> <td>20</td> </tr> <tr> <td colspan="2"> </td> </tr> <tr> <td><u>Input pH Value</u></td> <td><u>Feed device Duty Cycle</u></td> </tr> <tr> <td>730</td> <td>100%</td> </tr> <tr> <td>740</td> <td>50%</td> </tr> <tr> <td>750</td> <td>0%</td> </tr> </table> | <u>HRR Settings</u> | | Set point = | 750 | Proportional span = | 20 | | | <u>Input pH Value</u> | <u>Feed device Duty Cycle</u> | 730 | 100% | 740 | 50% | 750 | 0% |
| <u>HRR Settings</u> | | | | | | | | | | | | | | | | | |
| Set point = | 750 | | | | | | | | | | | | | | | | |
| Proportional span = | 20 | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | |
| <u>Input pH Value</u> | <u>Feed device Duty Cycle</u> | | | | | | | | | | | | | | | | |
| 730 | 100% | | | | | | | | | | | | | | | | |
| 740 | 50% | | | | | | | | | | | | | | | | |
| 750 | 0% | | | | | | | | | | | | | | | | |

Alarm Warning Bands

Alarm **warning bands** and **warning time counters** are exclusive features of the Strantrol product line. A warning band serves as a time delay for an alarm and allows the controller to anticipate the trend of the reading as it nears the alarm setpoint. As the values approach the alarm setpoint, the warning time needed to recognize and respond to an alarm condition is triggered.

This prevents an alarm from tripping due to a short term out-of-range condition. The System6 uses alarm warning bands and warning times to:

Ignore transient conditions, which could create unnecessary alarms.

Extend the "range of concern" beyond the alarm setpoint:

Values beginning to move toward a high (or low) alarm are allowed a degree of warning time.

Values closely approaching a high (or low) alarm are allowed less warning time than values further away from the alarm point.

Values that exceed an alarm point will trigger an immediate alarm (the warning time become 0).

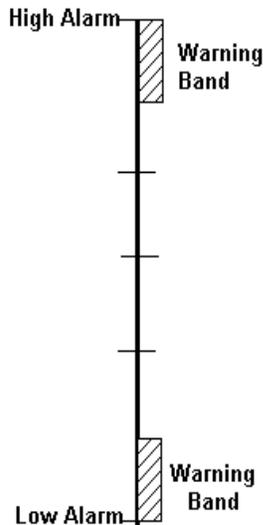


Figure 2.1

Availability

The System6 is shipped from the factory with all warning bands disabled (i.e., set to 0.0 or 0 mV).

Rules/Logic

| | |
|--|---|
| A counter for the warning time activates whenever a value falls within a warning band range. | |
| If the value: | Then ... : |
| Stays within the warning band long enough to exceed the warning time, ... | The alarm is sounded. |
| Changes, but still falls within the warning band, ... | The warning time is automatically adjusted. |
| Drops back out of the warning band, ... | The alarm will be cleared. |

Example — High Alarm Warning Band

For an explanation of high alarm warning bands, follow the example below.

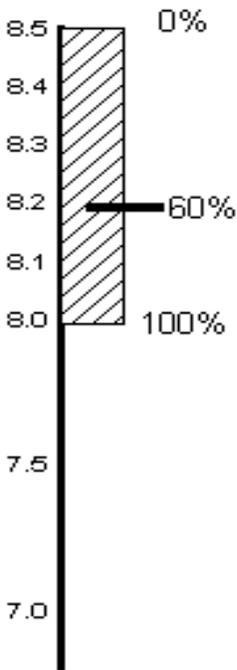


Figure 2.2

| Scenario | |
|----------------------|-------------|
| pH High Alarm = | 8.5 |
| Warning band = | 0.5 |
| Current pH reading = | 8.2 |
| pH high reading time | 5.0 minutes |

This current pH reading (8.2) is 60% away from high alarm.

Calculation:
 $(\text{High Alarm} - \text{Current Reading}) / \text{Warning Band}$
 $(8.5 - 8.2) / .5 = .6 = 60\%$

The proportional warning time will be 60% of the standard warning time.

Calculation:
 % from High Alarm * Warning Time
 $60\% * 5 \text{ minutes} = 3 \text{ minutes}$

Consequently, if the alarm counter exceeds 3 minutes, a high alarm occurs.

If the pH changes to 8.1 (before the 3 minute alarm), then System6 automatically re-adjusts the standard alarm warning time to a new proportional warning time:

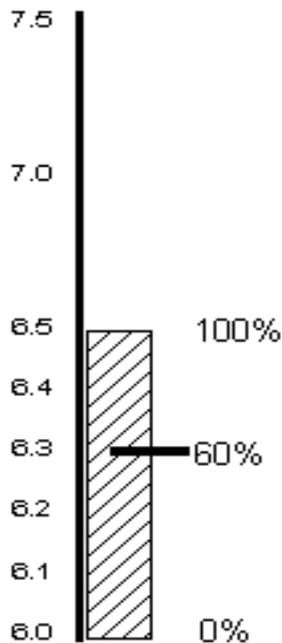
Calculation:
 $(\text{High Alarm} - \text{Current Reading}) / \text{Warning Band}$
 $(8.5 - 8.1) / .5 = .8 = 80\%$

% from High Alarm * Warning Time
 $0.80\% * 5 \text{ minutes} = 4 \text{ minutes}$

In this case, the alarm counter will not reset because the pH changed **within** the warning band. Remember that the high alarm is the **absolute** high. Whenever the current reading exceeds the high alarm, a high alarm occurs regardless of any warning band time counters.

Example — Low Alarm Warning Bands

The **low alarm warning band** is very similar; however, the warning band is reversed.



| Scenario | |
|----------------------|-------------|
| pH High Alarm = | 6.0 |
| Warning band = | 0.5 |
| Current pH reading = | 6.3 |
| pH high reading time | 5.0 minutes |

If current pH value remains at 6.3 for 3 minutes, a low alarm occurs.

Calculation:

$$(6.3 - 6.0) / .5 = .6 = 60\% \text{ away from setpoint}$$

$$0.60 * 5 \text{ minutes} = 3 \text{ minutes}$$

Figure 2.3

Recorder Outputs - Chapter 5

4-20 mA Outputs

The Strantrol System6 two-channel controller is capable of handling two or four analog outputs. Each of the channels can be independently configured for pH, HRR, ppm or temperature from within the menu system. Furthermore, the values corresponding to 4 mA and 20 mA (0-100%) can be specified for each channel, thus making the channel available as either a recorder or control output. All analog channels are configured in the same way.

| Example: Configure Channel #1 for recording pH from 6.0 to 9.0 | |
|--|---|
| 1 | Enter menu system using Representative access code. |
| 2 | Select [RECORDER OUTPUTS: Channel #1 Recorder]. |
| 3 | Select, by pressing the corresponding number to the left, which input channel #1 will record or control. The choices are pH, HRR, ppm and Temperature. (For this example, choose pH.) |
| 4 | Select [Channel #1 Recorder: Chan #1 Rec]. This is a display only of the current parameter to be recorded or controlled. |
| 5 | Select [RECORDER OUTPUTS: Channel #1 Recorder: Chan #1 Rec Min]. |
| 6 | Select the minimum value to be recorded or controlled. (Select 6.0 for this example.) A pH of 6.0 = 4 mA output. |
| 7 | Select [RECORDER OUTPUTS: Channel #1 Recorder: Chan #1 Rec Max]. |
| 8 | Select the maximum value to be recorded or controlled. (Select 9.0 for this example.) A pH of 9.0 = 20 mA output. |

Channel #1 is now configured to record pH from 6.0 to 9.0.

The output signal is the same for control as it is for recording. Consult the factory if using outputs for control.

4-20 mA Linear Relationship

If the analog 4-20 mA output is being used for control, the following example explains the linear relationship that the Strantrol System6 utilizes.

NOTE: The control algorithm is proportional only.

| Example: Channel #1 | | | |
|------------------------------|------------|---------------|----------|
| Channel #1 Recorder = | HRR | Output | % |
| Chan #1 Min = | 500 | 4 mA | 0% |
| Chan #1 Max = | 900 | 20 mA | 100% |

The example shows with an HRR reading of 500 mV the controller will output a 4 mA signal. In addition, with an HRR reading of 900 mV the controller will output a 20 mA signal. Having understood this the halfway point would be the HRR reading 700 mV and the controller would be sending a 12 mA signal.

Menu Options - Chapter 6

Menu Tree v 5.10 — Reference Guide

This section outlines the options that may appear in the Strantrol System6 menus. The menu hierarchy is represented by the indented options. (For example, the pH Low Alarm can only be accessed from the Alarms menu.) Descriptions of each option can be found later in this chapter. Some options may not appear, depending on how your authorized Strantrol Representative set up your system. For this reason, symbols are used.

A plus (+) indicates that this option is ALWAYS present when you work through the menu system.

An asterisk (*) indicates that this option may not appear, depending on the system state.

An "R" indicates that this option appears ONLY under Strantrol Representative access.

The brackets { } indicate the default values that were shipped on the ROM chip.

- + pH SETUP
 - * pH feed down Setpoint {7.5}
 - * pH feed up Setpoint {7.5}
 - + pH High Alarm {8.0}
 - + pH Low Alarm {7.0}
 - * pH feed-down F/S {04:00 hr/min}
 - * pH feeddn Mode {on-off}
 - * pH prop span {.5}
 - * pH cycle time {01:00 min/sec}
 - + pH Calibrate

- + HRR SETUP
 - + HRR Setpoint {740mV}
 - + HRR High Alarm {800mV}
 - + HRR Low Alarm {650mV}
 - + HRR F/S Alarm {04:00 hr/min}
 - + HRR (Cl/Br) Feed Mode {proportional}
 - * HRR prop span {20 mV}
 - * HRR cycle time {01:00 min/sec}
 - + HRR/Cl ppm cntrl {HRR}
 - + HRR Calibrate

- + ppm SETUP
 - * Cl ppm Setpoint {1.5 ppm Cl}
 - + Cl ppm High Alarm {5.0 ppm Cl}
 - + Cl ppm Low Alarm {0.5 ppm Cl}
 - + Cl ppm Calibrate

- * TEMPERATURE SETUP
 - * Temperature Setpoint {80°F}
 - * Temperature High Alarm {90°F}
 - * Temperature Low Alarm {70°F}
 - * Temperature Calibrate

Technical Guide

- * CALCULATE LSI SETUP
 - * Based on {00/00/00}
 - * Calculated LSI {0.0}
 - * Alkalinity {0}
 - * Ca hardness {0}
 - * TDS {0}
 - * Temperature {32°F}
 - * pH {0.0}
 - * Enter LSI parameters
 - * Alkalinity {0}
 - * Ca hardness {0}
 - * TDS {0}
 - * Exit (don't compute LSI)
 - * Other LSI parameters
 - * Pool Size {0 gal}
 - * LSI Hi band {0.0}
 - * LSI Lo band {0.0}

- * RYZNAR STABILITY SETUP
 - * Based on {00/00/00}
 - * Ryznar Index {0.0}

- * DOSAGE CALCULATED
 - * Based on {00/00/00}
 - * Pool Size {0 gal}
 - * Pool is balanced: {No chemical treatment is needed now.}

- + SENSOR WASH
 - + current week/day
 - + Event #1 {every week/every day}
 - + Start Time #1 {23:59 hr/min}
 - + Wash Duration #1 {02:00 min/sec}
 - + Event #2 {disabled}
 - + Start Time #2 {00:00 hr/min}
 - + Wash Duration #2 {00:00 min/sec}
 - + Event #3 {disabled}
 - + Start Time #3 {00:00 hr/min}
 - + Wash Duration #3 {00:00 min/sec}
 - + Event #4 {disabled}
 - + Start Time #4 {00:00 hr/min}
 - + Wash Duration #4 {00:00 min/sec}

- + BACKWASH FILTER
 - + Start Backwash
 - + Backwash Counter {0}
 - + Reset Counter
 - + Filter Relay Time {1:00 min/sec}
 - + Recirculation Pump Time {5:00 min/sec}
 - + Lockout Chemicals {yes}
 - + current week/day
 - + Event #1 {disabled}
 - + Start Time #1 {00:00 hr/min}
 - + Event #2 {disabled}
 - + Start Time #2 {00:00 hr/min}

| | |
|--------------------------|----------------|
| + Event #3 | {disabled} |
| + Start Time #3 | {00:00 hr/min} |
| + Event #4 | {disabled} |
| + Start Time #4 | {00:00 hr/min} |
| + RECIRCULATION PUMP | |
| + Recirculation Time | |
| + current week/day | |
| + Event #1 | {disabled} |
| + Start Time #1 | {00:00 hr/min} |
| + Event #2 | {disabled} |
| + Start Time #2 | {00:00 hr/min} |
| + Event #3 | {disabled} |
| + Start Time #3 | {00:00 hr/min} |
| + Event #4 | {disabled} |
| + Start Time #4 | {00:00 hr/min} |
| + ALTERNATE HRR SETPOINT | |
| + current week/day | |
| + Event #1 | {disabled} |
| + Alt. HRR Setpoint #1 | {740 mV} |
| + Start Time | {00:00 hr/min} |
| + Duration | {00:00 hr/min} |
| * DECHLORINATION | |
| * current week/day | |
| * Auto Dechlor | {yes} |
| * Cl/HRR stop point | {chlorine} |
| * Stop HRR point | {750 mV} |
| * Stop Cl ppm point | {1.0 ppm Cl} |
| * Duration #1 | {04:00 hr/min} |
| + SUPER CHLORINATION | |
| + current week/day | |
| + SuperCl start day | {disabled} |
| + Start Time | {00:00 hr/min} |
| + Cl/HRR stop point | {chlorine} |
| * HRR setpoint | {800 mV} |
| * Cl ppm setpoint | {5.0 ppm Cl} |
| + Duration | {00:04 hr/min} |
| + Elapsed time | {00:00 hr/min} |
| + RELAY MODES | |
| * pH feed down | {automatic} |
| * pH feed up | {automatic} |
| * Cl/Br feed | {automatic} |
| * Dechlor feed | {automatic} |
| * SuperCl feed | {automatic} |
| * Sensor wash | {automatic} |
| * Ozone | {automatic} |
| * Heater | {automatic} |
| * Cl/Br booster | {automatic} |
| + COMMUNICATION | |
| + Connection type | {direct} |
| + Direct baud | {1200} |
| + Modem baud | {2400} |

Technical Guide

- + MODEM CALL OUT
 - + Callout enable {enable}
 - + Callout Type {fax}
 - + Ring pickup {1}
 - + Call begin {08:00 hr/min}
 - + Call end {17:00 hr/min}
 - + Pre-delay {30:00 min/sec}
 - + Phone #1 {}
 - + Delay#1 {00:00 min/sec}
 - + Phone #2 {}
 - + Delay#2 {00:00 min/sec}
 - + Phone #3 {}
 - + Delay#3 {00:00 min/sec}
 - + Phone #4 {}
 - + Delay#4 {00:00 min/sec}
 - + Phone #5 {}
 - + Delay#5 {00:00 min/sec}
 - + Phone #6 {}
 - + Delay#6 {00:00 min/sec}

- + CALENDAR
 - + Current date {01/01/1997 mm/dd/yy}
 - + Current time {00:00 hr/min}

- + ACCESS CODES
 - + MANAGER CODES
 - + Manager #1 {000}
 - + Manager #2 {000}
 - + OPERATOR CODES
 - + Operator #1 {000}
 - + Operator #2 {000}
 - + Operator #3 {000}
 - + Operator #4 {000}
 - + Operator #5 {000}
 - + Operator #6 {000}
 - + ENABLE OPTIONS FOR OPERATOR LEVEL
 - + Setpoints {enable}
 - + Alarms {enable}
 - + Feed Modes {enable}
 - + Calibrate pH, HRR {enable}
 - * Calibrate temperature {enable}
 - + LSI calculations {enable}
 - + Pool Size {enable}
 - + Sensor Wash {enable}
 - + Alt. HRR Setpoint. {enable}
 - + Dechlorination {enable}
 - + Super Chlor {enable}
 - + Relay Modes {enable}
 - + Communication {enable}
 - + Modem Call Out {enable}

- R+ RECORDER OUTPUTS
 - + Channel #1 Recorder

- + Chan #1 Rec {pH}
- + Chan #1 Rec Min {6.0}
- + Chan #1 Rec Max {9.0}
- + Channel #2 Recorder
 - + Chan #2 Rec {HRR}
 - + Chan #2 Rec Min {0 mV}
 - + Chan #2 Rec Max {1000mV}
- + Channel #3 Recorder
 - + Chan #3 Rec {ppm}
 - + Chan #3 Rec Min {0.0 ppm Cl}
 - + Chan #3 Rec Max {20.0 ppm Cl}
- + Channel #4 Recorder
 - + Chan #4 Rec {Temp}
 - + Chan #4 Rec Min {60°F}
 - + Chan #4 Rec Max {100°F}
- + Channel #5 Recorder
 - + Chan #5 Rec {pH}
 - + Chan #5 Rec Min {6.0}
 - + Chan #5 Rec Max {9.0}
- + Channel #6 Recorder
 - + Chan #6 Rec {ppm}
 - + Chan #6 Rec Min {0.0 ppm Cl}
 - + Chan #6 Rec Max {20.0 ppm Cl}

R+ DIAGNOSTICS

- + Version
 - + Program Version {v5.10*}
 - + Factory Defaults
- + Software Calibration
 - + pH point 1 cal
 - + pH point 2 cal
 - + HRR Point 1 Cal
 - + HRR Point 2 Cal
 - + Cyanuric {disable}
 - + Alt ppm Lookup {disable}
 - * pH for ppm lookup {7.5}
 - + Lookup offset {250}
 - + Temp point1 cal
 - + Temp point2 cal
 - + Temperature units {°F}
 - + Units (US/ metric) {U.S.}
- + Hardware Calibration
 - + Temperature {disable}
 - + Connection Type {direct}
 - + Direct Baud {1200}
 - + Modem Baud {2400}

R+ WARNING BANDS

- + pH hi band {0.0}
- + pH hi warn time {00:05 hr/min}
- + pH lo band {0.0}
- + pH lo warn time {00:05 hr/min}
- + HRR hi band {0 mV}
- + HRR hi warn time {00:05 hr/min}
- + HRR lo band {0 mV}

Technical Guide

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| + HRR lo warn time | {00:05 hr/min} |
| + Cl ppm hi band | {0.0 ppm Cl} |
| + Cl ppm hi warn tm | {00:05 hr/min} |
| + Cl ppm lo band | {0.0 ppm Cl} |
| + Cl ppm lo warn tm | {00:05 hr/min} |
| R+ DATA LOGGING | |
| + High frequency | {Every 6 minutes} |
| + Low frequency | {Every 2 hours} |
| + Print time intrvl | {01:00 hr/min} |
| R+ REP. STARTUP | |
| + Current date | {01/01/1997 mm/dd/yy} |
| + Current time | {00:00 hr/min} |
| + System ID | {0} |
| + customer name | {!} |
| + system location | {!} |
| + rep phone num | {!} |
| + Startup date | {00/00/00} |
| + Rep code | {000} |
| + Relay #1 | {pH feed-down} |
| + Relay #2 | {sensor wash} |
| + Relay #3 | {Cl/Br} |
| + Relay #4 | {alarm} |
| + Relay#5 | {not used} |
| + Relay#6 | {not used} |
| + Relay#7 | {not used} |
| + Relay#8 | {not used} |
| * pH feeddn Point | {7.5} |
| * pH feedup Point | {7.5} |
| + pH High Alarm | {8.0} |
| + pH Low Alarm | {7.0} |
| * pH feeddn Mode | {on-off} |
| * pH feedup Mode | {on-off} |
| + HRR/Cl ppm control | {HRR} |
| * HRR Setpoint | {740 mV} |
| + HRR High Alarm | {800 mV} |
| + HRR Low alarm | {650 mV} |
| * HRR (Cl/Br) Mode | {proportional} |
| * Cl ppm setpoint | {1.5 ppm Cl} |
| + Cl ppm High Alarm | {5.0 ppm Cl} |
| + Cl ppm Low Alarm | {0.5 ppm Cl} |
| * Cl ppm Feed Mode | {proportional} |
| + Cyanuric | {disable} |
| + LSI | {enable} |
| + Ryznar | {enable} |
| + TDS | {enable} |
| + Dosage | {enable} |

Menu Tree v5.10 — Definitions

The menu options in the front of this chapter are shown in the order that they appear in the Menu Tree structure. Factory defaults are listed in the right column of the Menu Tree pages.

The definitions on this and the following pages are presented in **alphabetical** order.

| Option Name | Description |
|--|--|
| pH SETUP | Title text only. Houses all pH control parameters. |
| pH feed down Setpoint | For feeding a chemical (like acid) that will cause the pH to decrease. |
| pH feed up Setpoint | For feeding a chemical (like base) that will cause the pH to increase. |
| pH High Alarm | The high alarm triggers when the pH reaches this amount. |
| pH Low Alarm | The low alarm triggers when the pH drops to this amount. |
| pH feed-down F/S Alarm pH feed-up F/S Alarm | The amount of time that the feeder will feed continuously without achieving setpoint before it stops feeding and alarms. |
| pH feeddn Mode pH feedup Mode | Describes whether the pH control relay is in proportional mode or on/off mode. |
| pH prop span | The proportional span for the pH relay. |
| pH cycle time | The total time the feeder will be both on and off while in proportional mode cycle. |
| pH Calibrate | Use a test kit to determine actual pH and type it in. |
| HRR SETUP | Title text only. Houses all HRR control parameters. |
| HRR feed down setpoint | For feeding a chemical (like dechlor) that will cause the HRR to decrease. |
| HRR feed up setpoint | For feeding a chemical (like chlorine or bromine) that will cause the HRR to increase. |
| HRR High Alarm | The high alarm triggers when the HRR reaches this amount. |
| HRR Low Alarm | The low alarm triggers when the HRR drops to this amount. |
| HRR F/S Alarm | The amount of time that the feeder will feed continuously without achieving setpoint before it stops feeding and alarms. |
| HRR prop span | If HRR control mode is selected, this option sets the proportional span for the HRR control. |
| HRR cycle time | The total time the feeder will be both on and off while in proportional mode. |
| HRR/Cl ppm cntrl | Mode of control for process chlorine. <i>If HRR is selected, the control is based from the HRR setpoint.</i> <i>If ppm is selected, the control is based from the derived value.</i> |

Technical Guide

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| HRR (Cl/Br) Feed up/down Mode | If HRR control mode is selected, this option sets what type of control is needed. |
| HRR Calibrate | Allows Representative to align HRR on controller to HRR on mV generator. |
| ppm SETUP | Title text only. Houses all Cl ppm control parameters. |
| Cl ppm High Alarm | Alarm that warns user when Cl ppm is too high. |
| Cl ppm Low Alarm | Alarm that warns user when Cl ppm is too low. |
| Cl ppm Calibrate | Allows user to align Cl ppm readout to water test. |
| TEMPERATURE SETUP | Title text only. Houses all Temperature control parameters. Temperature must be enabled. |
| Temperature Setpoint | Desired temperature of water. Relay must be assigned to heater. |
| Temperature High Alarm | Alarm that warns user when Temperature is too high. |
| Temperature Low Alarm | Alarm that warns user when Temperature is too low. |
| Temperature Calibrate | Allows user to align Temperature readout to actual water temperature. |
| CALCULATE LSI SETUP | Title text only. Houses all LSI parameters to be entered by user. |
| Based on | Date that the LSI was last calculated. |
| Calculated LSI | LSI from the last calculation. |
| Alkalinity | Alkalinity of the last LSI calculation. |
| Ca Hardness | Ca Hardness of the last LSI calculation. |
| TDS | TDS of the last LSI calculation. TDS is normally done by a lab. |
| Temperature | Temperature of the last LSI calculation from probe. |
| pH | pH of the last LSI calculation from probe. |
| Enter LSI Parameters | Title text only. Parameters to be entered to calculate LSI. |
| Alkalinity | Entered after a test kit reading. |
| Ca Hardness | Entered after a test kit reading. |
| TDS | From test kit or enter zero. |
| Sensor wash | Title text only. This is only present when one of the relays has been assigned to sensor wash. |
| Current week/day | This is a read only value of the current week and day. |
| Event #1 | You may choose the first sensor wash to be in the first, second, third or fourth weeks of operation (sensor wash operates on a four-week calendar). You may choose it occur in even or odd weeks, every week or disable it completely. Enter in day - Mon., Tues., Wed., Thurs., Fri., Sat., Sun. or All days. NOTE: Each event for the sensor wash (-2, -3, -4) has the identical description as -1 above. |

| | |
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| Start Time #1 | Enter the time you would like the first sensor wash to begin using military time (24-hour clock). NOTE: Each start time for the sensor wash (-2, -3, -4) has the identical description as -1 above. |
| Wash Duration#1 | Enter the duration of the first sensor wash from 0 to 2 minutes. NOTE: Each wash duration for the sensor wash (-2, -3, -4) has the identical description as -1 above. |
| Backwash Filter | Title text only. House all Backwash Filter parameters. |
| Start Backwash | Yes or no. Allows operator to initiate backwash manually. Backwash will be initiated for the Filter Relay Time. |
| Backwash Counter | Indicates how many backwashes have been initiated. |
| Reset Counter | Sets Backwash Counter to zero. |
| Filter Relay Time | Duration for the Backwash Filter to be initiated. |
| Recirculation Pump Time | If the System6 is controlling the Recirculation Pump, the System6 will initiate the Recirculation Pump before Backwash. The recirculation pump will then be initiated through this set time and the Filter Relay Time. |
| Lockout Chemicals | Chemical Relays will lockout during Backwash Filter. |
| Current week/day | This is a read-only value of current week and day. |
| Event #1...#4 | You may choose the Backwash Filter to be in the first, second, third or fourth weeks of operation. You may choose it to occur in even or odd weeks , every week or disable it completely. Enter in day – Mon., Tues., Wed., Thurs., Fri., Sat., Sun. or All Days. |
| Start Time #1...#4 | Enter the time you would like the first Backwash Filter to begin using military time (24-hour clock). |
| Recirculation Pump | Title text only. House all Recirculation Pump parameters. |
| Recirculation Time | This is the time the recirculation pump will be on. |
| Current week/day | This is a read-only value of current week and day. |
| Event #1...#4 | You may choose the Recirculation Pump to be in the first, second, third or fourth weeks of operation. You may choose it to occur in even or odd weeks , every week or disable it completely. Enter in day – Mon., Tues., Wed., Thurs., Fri., Sat., Sun. or All Days. |
| Start Time #1...#4 | Enter the time you would like the first Recirculation Pump to begin using military time (24-hour clock). |
| Alternate HRR Setpoint | Title text only. Houses all parameters for the alternate HRR setpoint function. |
| Current week/day | This is a read only value of the current week and day. |
| Event #1 | You may choose the alternate HRR setpoint to be in the first, second, third or fourth weeks of operation. You may choose it occur in even or odd weeks, every week or disable it completely. Enter in day - Mon., Tues., Wed., Thurs., Fri., Sat., Sun. or All days. NOTE: Each event for the alternate HRR setpoint (-2, -3, and -4) has the identical description as -1 above. |

Technical Guide

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| Alt. HRR Setpoint | This is the alternate setpoint. |
| Start Time | Enter the time you would like the Alternate setpoint to begin using military time (24-hour clock). |
| Duration | Enter how long you would like the Alternate Setpoint to be in effect (number of hours and minutes). |
| Dechlorination | Title text only. Houses all parameters for the Dechlorination function. This is only present when one of the relays has been assigned to dechlorination. |
| Current week/day | This is a read only value of the current week and day. |
| Auto Dechlor | Yes if you want dechlorination to automatically begin after the superchlorination process and No if, you don't.. |
| Cl/HRR stop point | The Chlorine or HRR point at which the process will stop. |
| Duration | How long you want the process to last in hours and minutes. This functions as a failsafe timer, stopping the process after a certain time even if the stop setpoint has not yet been reached. |
| Superchlorination | Title text only. Houses all parameters for the Superchlorination function. This is only present when one of the relays has been assigned to superchlorination. |
| Current week/day | This is a read only value of the current week and day. |
| SuperCl start day | You may choose the first super chlorination to be the first, second, third or fourth weeks of operation. You may choose to have it occur in only even or odd weeks, every week or disable it completely. Enter in day - Mon., Tues., Wed., Thurs., Fri., Sat., Sun. or All days. |
| Start Time #1 | Enter the time you would like the super chlorination to begin using military time. |
| Cl/HRR stop point | Do you want to use chlorine or HRR setpoint to stop the process. |
| Duration | How long you want the process to last in hours and minutes. This functions as a failsafe timer, stopping the process after a certain time even if the stop setpoint has not yet been reached. |
| Elapsed Time | The time since the process began. |
| Relay Modes | Title text only. This menu displays what function the relays are operating and what mode the relay is currently. |
| pH Feed down | For pH control. |
| pH Feed up | For pH control. |
| Cl/Br feed | For disinfection control. |
| Cl/Br booster | A booster is a secondary feed device that comes on a low alarm. |
| Heater | For Temperature control. |
| Dechlor | To quickly lower ppm residual valve after superchlor. |
| SuperCl | To eliminate ammonia in pool. |
| Sensor wash | To auto clean the Sensors. |
| Alarm | General alarm to signal horn, etc... |
| Ozone | To feed ozone for the disinfection process. |
| Communication | Title text only. Provides the parameters that the controller uses to communicate. |
| Connection type | Based on Dip Switch #5. |

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| Direct baud rate | Select the correct baud rate for direct. |
| Modem baud rate | Select the correct baud rate for modem. |
| Modem Callout | Title text only. If the controller has a Voice modem, this menu will allow to enable and specify the restrictions for the controller to follow when calling out. DipSwitch #6 needs to be on to see this option. |
| Callout enable | Select enable if you want the modem to call out.. |
| Ring Pickup | Number of rings the modem allows before answering. |
| Call begin | The time the modem will begin calling. |
| Call end | The time the modem will stop calling. |
| Pre delay | The amount of time the controller waits after an alarm before calling. |
| Phone #1....6 | The telephone number and Pager message will call out (up to six different telephone numbers). |
| Delay #1....5 | The amount of time the modem will wait before going to the next telephone number. |
| Calendar | Title text only. This option will display the current date and time. |
| Current Date | Enter the current date as follows: month/day/year. |
| Current Time | Enter the current date as follows: hour/minutes. |
| Access Codes | Title text only. This option allows the user to enter in access codes for managers and operators. For both manager and operator access the controller will not require a code if no code has been programmed. |
| Manager Codes | Three digit codes may be entered for up two different managers. |
| Operator Codes | Three digit codes may be entered for up six different operators. |
| Enable options for operator level | Operators may be enabled to have access to Main Menu. |
| Data Logging | Title text only. Sub-menu appears when <i>Select/Enter</i> key is pressed. |
| Chan #1...6 Rec | Selects which item that the first 4-20 mA output will record or control. The options are pH, HRR, ppm, temperature. |
| Chan #1...6 Min | Selects minimum value to be recorded. For example, if pH is selected and this value is set at 6, the bottom of the recorder or controller (4 mA) will represent a pH of 6. |
| Chan #1...6 Rec Max | Selects maximum value to be recorded. For example, if pH is selected and this value is set at 9, the top of the recorder or controller (20 mA) will represent a pH of 9. NOTE: Each Chan output (#2, #3, #4, #5, and #6) has the identical description as Chan #1 min and Chan #1 max above. |
| Diagnostics | Title text only. If the <i>Select/Enter</i> key is pressed, a sub-menu is displayed. This is present using a Representative access code only. |
| Program Version | Display only if ROM software version present in the controller. |
| Factory Default | [Factory Default] Command that allows all parameters to be reset to factory calibration. The <i>Select/Enter</i> key must be pressed twice to avoid accidental engagement. |
| Software Calibration | Title text only. If the <i>Select/Enter</i> key is pressed, a sub-menu is displayed. This is present ONLY using a Representative access code. |

Technical Guide

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| pH point 1 cal | Use a buffer solution or signal generator to generate a pH point, wait 30 seconds and type it in. |
| pH Point 2 Cal | Use a buffer solution or signal generator to generate a second, higher pH point, wait 30 seconds and type it in. |
| HRR Point 1 Cal | Use a signal generator to generate an HRR point, wait 30 seconds and type it in. |
| HRR Point 2 Cal | Use a signal generator a second, higher HRR point, wait 30 seconds and type it in. |
| ppm Point 1 Cal | Use a buffer solution to generate a ppm point, wait 30 seconds and type it in. |
| ppm Point 2 Cal | Use a buffer solution to generate a second ppm point, higher point, wait 30 seconds and type it in. |
| Cyanuric | Enable if using stabilizer in pool. |
| alt ppm lookup | This uses a fixed pH for the lookup table. |
| Lookup offset | 250 mV is defined as 0 ppm. Any difference represents how much the unit has been calibrated. WARNING: A 50 mV difference or more. |
| Temp point 1 Cal | Use a signal generator or buffer solution to generate a Temp point, wait 30 seconds and type it in. Press Enter. |
| Temp Point 2 Cal | Use a signal generator or buffer solution to generate a second, higher, Temp point. Wait 30 seconds and type it in. Press Enter. |
| Temperature Units | Fahrenheit (F) or Centigrade (C). |
| Units (US/metric) | Select U.S. or Metric units for dosage calculations. |
| Hardware Calibration | Title text only. Includes temperature enable or disable and communication parameters. |
| Temperature | You must enable temperature in order to use a temperature sensor with the system and see temperature menu. |
| Connection Type | This is a display only of the current connection type as selected by the controller or the PC software. |
| Direct baud | The com port on your PC talks to the controller com port at this baud rate. The max setting is 19200. |
| Modem Baud | The modem talks to the PC at this baud rate. Currently, the Data Modem is 2400 baud; the Data/Voice modem is 2400 baud. |
| Warning Bands | Title text only. Warning bands provide a series of gradual alarms over a time period. They alert the user before water gets too far out of control. |
| pH hi band | High end pH alarm that will trigger before the actual alarm. |
| pH hi warn time | The time the warning band will sound and wait before triggering the actual alarm. |
| pH lo band | Low end pH alarm that will trigger before the actual alarm. |
| pH hi warn time | The time the warning band will sound and wait before triggering the actual alarm. |
| HRR hi band | High end HRR alarm that will trigger before the actual alarm. |
| HRR hi warn time | The time the warning band will sound and wait before triggering the actual alarm. |
| HRR lo band | Low end HRR alarm that will trigger before the actual alarm. |

| | |
|--------------------------|--|
| HRR lo warn time | The time the warning band will sound and wait before triggering the actual alarm. |
| Cl ppm hi band | High end Cl ppm alarm that will trigger before the actual alarm. |
| Cl ppm hi warn time | The time the warning band will sound and wait before triggering the actual alarm. |
| Cl ppm lo band | Low end Cl ppm alarm that will trigger before the actual alarm. |
| Cl ppm hi warn time | The time the warning band will sound and wait before triggering the actual alarm. |
| Datalogging | Title text only. Specifications for the controller to follow while datalogging information. |
| High Frequency | Information will be recorded in 1 - 6 minute intervals. |
| Low Frequency | Information will be recorded in 1 - 4 hour intervals. |
| Print time Interval | Specify when the controller is to print out the water parameters. |
| Rep Start Up | Title text only. Quick controller setup menu. |
| Current Date | Current date shown as mm/dd/yy |
| Current Time | Current time shown as 0-24:00 |
| System ID | Type in the serial number of the unit here. |
| Customer Name | The name entered here will show on the facepanel |
| System Location | Location entered here will show on the facepanel. |
| Rep Phone Num. | Number entered here will show on the facepanel. |
| Startup Date | This is the date the unit was put into use. |
| Rep. Code | This is the access code of the Rep. |
| Relay #1 . . . 8 | Relays may be configured as pH Feed down, pH Feed up, Cl/Br Feed Cl/Br booster, heater, Dechlor feed, SuperCl feed, Sensor Wash, Backwash Filter, Recirculation Pump, Alarm and Ozone. |
| pH High Alarm | The pH High Alarm point. |
| pH Low Alarm | The pH Low Alarm point. |
| pH Mode | pH feeding on/off or proportional |
| HRR/Cl ppm control | The form of control you wish. |
| HRR setpoint | The HRR setpoint. |
| HRR High Alarm | The HRR High Alarm point. |
| HRR Low Alarm | The HRR Low Alarm point. |
| HRR (Cl/Br) Mode | HRR feeding on/off or proportional. |
| Cl ppm High Alarm | The range for ppm is 0-20 if you have a ppm sensor and 0-6 if you do not.. |
| Cyanuric | Cyanuric acid lowers the HRR disinfection values. This value is configured for levels between 10 - 20 ppm of Cyanuric. |
| LSI, Ryznar, TDS, Dosage | If you disable LSI, then LSI, Ryznar, TDS (Total Dissolved Solids) and Dosage will not appear under Manager Access. |

SENSOR WASH OPTION - Chapter 7

Sensor Wash

If the optional sensor wash is used, install the plumbing and configure the system for Sensor Wash use.

NOTE: For most applications, the default settings need not be changed.

Configure Sensor Wash

1. Choose one of the unused relays and assign it to sensor wash. Select Menu: [rep startup], the default sensor wash relay is #2.
2. Connect the feed device to the appropriate relay output.
3. Enter [Sensor Wash] sub-menu to modify the sensor wash settings.

Programming Sensor Wash

After the sensor wash option is enabled, steps must be taken to program the automatic sensor wash. The System6 automatic sensor wash program is based on:

- A four-week cycle that does not correspond to the day and week of the calendar.
 - The cycle begins with Sunday, week 1, and ends with Saturday, week 4.
- A 24-hour clock
 - Add 12 hours to calculate afternoon and evening times.
- Sensor Wash should be done on a daily basis. Time should be set for All week/Every day.
 - The operator should select time of day.
- Four programmable times that allows you to select 4 days out of selected weeks to run feed device.

NOTE: There is only one "on-time" duration setting.

- Start times are based on two components:
 - week and day
 - hour and minutes

Menu Displays

An explanation of the controller displays is presented in the following table.

| Controller Choices | | |
|-----------------------------|------------------|------------------|
| Characters Shown on Display | Description | Days of the week |
| 1 st week | week 1 | Monday |
| 2 nd week | week 2 | Tuesday |
| 3 rd week | week 3 | Wednesday |
| 4 th week | week 4 | Thursday |
| Odd week | odd number week | Friday |
| Even week | even number week | Saturday |
| Every week | All weeks | Sunday |
| disabled | No sensor wash | Everyday |

Technical Guide

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| EXAMPLE: Program the sensor wash system to wash the sensors every Monday, at 1:00 p.m., and every Thursday at 6:00 a.m. | |
| | Before programming a sensor wash cycle, verify that all steps in Configure Sensor Wash have been completed. |
| 1 | Enter the menu system using a Manager or Representative Level access code. |
| 2 | Select [Sensor Wash]. |
| 3 | Select [Wash Duration]. |
| 4 | Select the duration of sensor wash. If you select 2 minutes, then the sensor wash feed device will run for two minutes. |
| 5 | Select [Event #1]. |
| 6 | Select [every week] and [Monday]. This means that on Monday of every week, the sensor wash feed device will engage at the designated time. |
| 7 | Select [Start time #1]. |
| 8 | Enter [13:00]. (13.00 in military time represents 1.00 p.m.) |
| 9 | Select [Event #2]. |
| 10 | Select [every week] and [Thursday]. This means that on Thursday of every week, the sensor wash feed device will engage at the designated time. |
| 11 | Select [Start time #2]. |
| 12 | Select [06:00]. (06:00 represents 6:00 am) |

Note: This example is being used to demonstrate how the sensor wash timer is set-up. Sensor wash should be initiated every day.

BACKWASH FILTER OPTION - Chapter 8

Backwash Filter

The System6 allows the Backwash of a filter to be controlled by a general timer. The System6 will work in harmony with your filter controller.

By working with your filter controls, you will have the ability to lock out your chemical feeds of pH and chlorine during the backwash or your pool. This may allow chemical savings.

Programming Backwash

After the backwash filter option is enabled, steps must be taken to program the backwash filter. The System6 automatic backwash program is based on:

- A four-week cycle that does not correspond to the day and week of the calendar.
 - The cycle begins with Sunday, week 1, and ends with Saturday, week 4.
- A 24-hour clock
 - Add 12 hours to calculate afternoon and evening times.
- Four programmable times that allows you to select 4 days out of selected weeks to initiate backwash.

NOTE: There is only one "on-time" duration setting.

- Start times are based on two components:
 - week and day
 - hour and minutes

Menu Displays

An explanation of the controller displays is presented in the following table.

| Controller Choices | | |
|-----------------------------|------------------|------------------|
| Characters Shown on Display | Description | Days of the week |
| 1 st week | week 1 | Monday |
| 2 nd week | week 2 | Tuesday |
| 3 rd week | week 3 | Wednesday |
| 4 th week | week 4 | Thursday |
| Odd week | odd number week | Friday |
| Even week | even number week | Saturday |
| Every week | All weeks | Sunday |
| disabled | No backwash | Everyday |

Configure Backwash

| | |
|---|--|
| EXAMPLE: Assigning Relay #5 to Backwash Filter. | |
| Configure Backwash by programming a relay for backwash. | |
| 1 | Enter the menu system using Representative Level access code only. |
| 2 | Select [Rep Startup]. |
| 3 | Select [Relay #5]. |
| 4 | Select [Backwash]. |

Programming Backwash Time

| | |
|--|---|
| EXAMPLE: Program the backwash system to backwash the filter every Monday, at 1:00 p.m., and every Thursday at 6:00 a.m. | |
| | Before programming a backwash cycle, verify that all steps in Configure Backwash have been completed. |
| 1 | Enter the menu system using a Manager or Representative Level access code. |
| 2 | Select [Backwash Filter]. |
| 3 | Select [Filter Relay Time]. |
| 4 | Select the duration of backwash. If you select 2 minutes, then the backwash contact will close for two minutes. Select the time that your filter controls require a contact to be closed. |
| 5 | Select [Recirc Pump Time], if System6 is controlling Recirc Pump. |
| 6 | Enter a time in min/sec prior to the Backwash, that the recirc pump should be turned on. |
| 7 | Select [Lockout Chemicals]. |
| 8 | Select yes or no to determine if pH/Cl/Br feeds should be disabled during the Backwash of the pool. |
| 9 | Select [Feed Disable Time]. |
| 10 | Select the duration for feed to be disabled. Normally disable time is the same as Filter Relay Time. |
| 11 | Select [Event #1]. |
| 12 | Select [every week] and [Monday]. This means that on Monday of every week, the backwash contact will engage at the designated time. |
| 13 | Select [Start time #1]. |
| 14 | Enter [13:00]. (13:00 in military time represents 1:00 p.m.) |
| 15 | Select [Event #2]. |
| 16 | Select [every week] and [Thursday]. This means that on Thursday of every week, the backwash contact will engage at the designated time. |
| 17 | Select [Start time #2]. |
| 18 | Select [06:00]. (06:00 represents 6:00 am) |

Technical Guide

Wiring External Relay Box to Adjustable Differential Pressure Switch

Connect Terminal #12 to Common Contact of the Adjustable Differential Pressure Switch on the Filter System.

Connect Terminal #8 to Normal Open Contact of Adjustable Differential Pressure Switch on the Filter System.

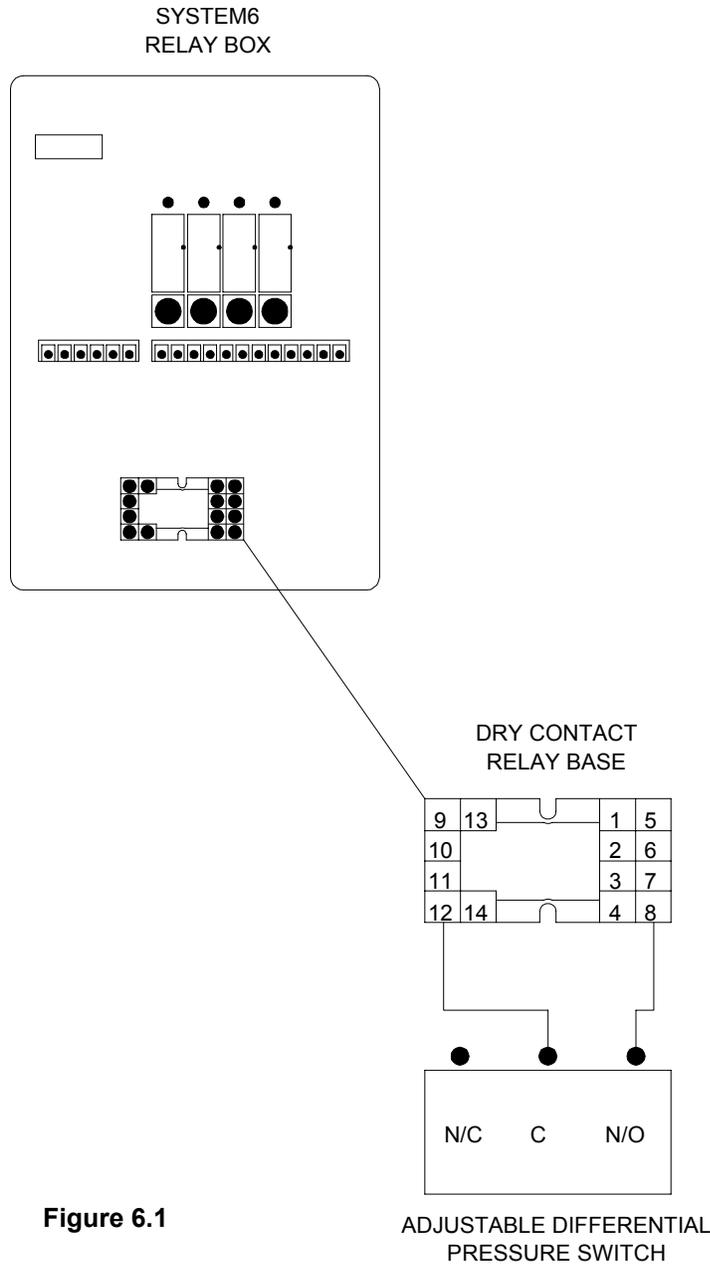


Figure 6.1

RECIRCULATION PUMP OPTION - Chapter 9

Recirculation Pump

The System6 allows your recirculation pump to be controlled on timing. This provides the ability to not run your recirculation pump during off-hours. This may provide energy savings.

Programming Recirculation Pump

After the recirculation pump option is enabled, steps must be taken to program the recirculation pump. The System6 recirculation pump program is based on:

- A four-week cycle that does not correspond to the day and week of the calendar.
 - The cycle begins with Sunday, week 1, and ends with Saturday, week 4.
- A 24-hour clock
 - Add 12 hours to calculate afternoon and evening times.
- Four programmable times that allows you to select 4 days out of selected weeks to control recirculation pumps.

NOTE: There is only one "on-time" duration setting.

- Start times are based on two components:
 - week and day
 - hour and minutes

Menu Displays

An explanation of the controller displays is presented in the following table.

| Controller Choices | | |
|-----------------------------|-----------------------|------------------|
| Characters Shown on Display | Description | Days of the week |
| 1 st week | week 1 | Monday |
| 2 nd week | week 2 | Tuesday |
| 3 rd week | week 3 | Wednesday |
| 4 th week | week 4 | Thursday |
| Odd week | odd number week | Friday |
| Even week | even number week | Saturday |
| Every week | All weeks | Sunday |
| disabled | No recirculation pump | Everyday |

Configure Recirculation Pump

| | |
|---|--|
| EXAMPLE: Assigning Relay #6 to Recirculation Pump. | |
| Configure Recirculation Pump by programming a relay. | |
| 1 | Enter the menu system using Representative Level access code only. |
| 2 | Select [Rep Startup]. |
| 3 | Select [Relay #6]. |
| 4 | Select [Recirculation]. |

Programming Recirculation Time

| | |
|---|--|
| EXAMPLE: Program the recirc pump to operate every day, between 6:00 a.m. and 6:00 p.m. | |
| | Before programming a recirc pump, verify that all steps in Configure Recirc Pump have been completed. |
| 1 | Enter the menu system using Representative Level access code only. |
| 2 | Select [Recirculation Pump]. |
| 3 | Select [Recirculation Time]. |
| 4 | Select the duration of recirculation. Select 12:00 hrs/mins.. |
| 5 | Select [Event #1]. |
| 6 | Select [every week] and [every day]. This means that on every day of every week, the recirc pump will engage at the designated time. |
| 7 | Select [Start time #1]. |
| 8 | Enter [06:00]. (06:00 in military time represents 6:00 a.m.) |

Superchlorination - Chapter 10

Superchlorination Programming

The System6 superchlorination program features a single programmable time used to start the superchlorination procedure. To obtain superchlorination one of the four relays must be assigned to superchlorination. This start time is based on:

- A four-week cycle that does NOT correspond to the day and week of the calendar.
- A 24-hour clock.
- Two components
 - week and day
 - hour and minutes

An example programming situation is outlined later in this section.

Superchlorination Functionality

Normal alarms, fail/safes, and lockouts **are not active** during superchlorination feed.

When superchlorination starts, programming temporarily suspends the normal HRR or ppm control and takes over the chlorine (or bromine) control relay (relay #3). This relay is activated and stays active until the input reading is driven up to the superchlorination point.

- If the superchlorination point is NOT reached by the end of the time set as fail/safe, an alarm [SuperCl limit] triggers.
- If the HRR value drops below the normal control setpoint, control will resume. Pressing the Reset Fail/Safe is not necessary or required in this case.

| | |
|--|--|
| You can reset this fail/safe alarm from the front panel: | Or, you can ignore the alarm: |
| Press the <i>RESET FAIL/SAFE</i> key (on the front panel). This resets all fail/safes. | After ppm or HRR, values reach normal levels.... |
| Control will automatically resume (even if the Fail/Safe timer has NOT been reset). | |

You can determine whether superchlorination timed out by looking at the [Elapsed Time].

| | |
|---|--|
| EXAMPLE: Program a superchlorination for Tuesday at 2:00 p.m. every fourth week. | |
| 1 | Enter the menu system using a Manager or Representative access code. |
| 2 | Select [superchlorination]. The current week and day of the cycle is displayed. The day of the cycle should correspond to the current day of the week. If this is not the case, consult authorized USFilter Stranco Products personnel. |
| 3 | Select [SuperCl start day]. |
| 4 | Select [4 th week] and [Tuesday]. This means that on Tuesday of every 4 th week, the superchlorination feed device will engage at the designated time. |
| 5 | Select [Start Time]. Enter [14:00]. (14:00 in military time represents 2:00 p.m.) |
| 6 | Select [Cl/HRR stop point]. Select the control of superchlorination. [chlorine] or [HRR] |
| 7 | Select [Cl ppm setpoint] or [HRR setpoint] depending on what you selected for the stop point. Enter in value that you wish the controller to superchlorinate. |
| 8 | Select [Duration]. Select the duration of superchlorination. If you select 2 hours, then the superchlorination feed device will run for two hours before triggering the F/S alarm. |
| 9 | [Elapsed Time] If the controller is in the middle of superchlorination (and the feed device is ON), this value represents how long the feed device has been running. If the feed device is not on, this value is equal to the prior [superchlorination time to complete]. For example, if the superchlorination setpoint is set to 800 mV, and superchlorination is reached in two hours, the value displayed will be 2 hours. |

Calculate LSI Setup - Chapter 11

LSI Programming

LSI

The System6 will calculate and display a LSI after the user has entered certain water chemistry values. After the user has entered a value, an asterisk will appear next to the value. **The LSI will only be calculated after all values have been entered or updated.**

Ryznar Index

The System6 will calculate and display a Ryznar Index after the user has entered the values that were previously entered for the LSI. The values only need to be entered once for the calculation of both Ryznar and LSI.

| |
|--|
| <p>NOTE: All the parameters must be re-entered with every new calculation. Even if only one parameter has changed, all must be re-entered.</p> |
|--|

Dosage Calculated

The System6 will calculate and display the chemicals needed for a balanced pool.

Technical Guide

| | | |
|--|--|---|
| Example: Entering values for LSI and Ryznar calculations | | |
| 1 | Enter the menu system using a Operator, Manager or Representative access code. | |
| 2 | Select [Calculate LSI Setup]. | |
| 3 | Select [Enter LSI parameters]. | |
| 4 | Select [Alkalinity] then enter. | Enter test kit reading. |
| 5 | Select [Ca hardness] then enter. | Enter test kit reading. |
| 6 | Select [TDS] then enter. | Most pools are from 1500 to 2500. This value doesn't have a big affect on calculations, so TDS doesn't have to be accurate. |
| NOTE: An asterisk must be on the right side of each value for step # 7 to appear. | | |
| 7 | Select [Compute LSI and Exit]. | |
| 8 | Select [Enter other parameters]. | |
| 9 | Select [Pool Size] then enter. | Enter in approximate volume of pool. |
| 10 | Select [LSI Hi band] then enter. | Usually .5 |
| 11 | Select [LSI Lo band] then enter. | Usually 0. |
| 12 | Press Previous Screen button until the Main Menu is displayed. | |
| 13 | Select [Ryznar Stability Setup]. | Date of Calculation and Ryznar will be displayed. |
| 14 | Press Previous Screen button until the Main Menu is displayed. | |
| 15 | Select [Dosage Calculated]. | Date of Calculation, Pool Size and what chemicals are needed to balance pool plus quantities. |

Alternate HRR Setpoint - Chapter 12

Alternate HRR Setpoint Programming

The System6 alternate HRR setpoint program features a single programmable time used to start the alternate HRR setpoint procedure. To obtain alternate HRR setpoint the time must be enabled and the timer set. No relay is assigned. This start time is based on:

- A four-week cycle that does NOT correspond to the day and week of the calendar.
- A 24-hour clock.
- Two components
 - week and day
 - hour and minutes

An example-programming situation is outlined later in this section.

Alternate HRR Setpoint Functionality

Normal alarms, fail/safes, and lockouts **are active** during an alternate HRR feed.

When alternate HRR setpoint starts, programming temporarily suspends the normal HRR or ppm control and takes over the chlorine (or bromine) control relay (relay #3). The Alternate Setpoint is activated and stays active through the duration time desired.

| | |
|--|---|
| EXAMPLE: Program an alternate HRR setpoint for Tuesday at 8:00 p.m. until 9:00 a.m. every first week. | |
| 1 | Enter the menu system using an Operator, Manager or Representative access code. |
| 2 | Select [Alternate HRR Setpoint]. The current week and day of the cycle is displayed. The day of the cycle should correspond to the current day of the week. If this is not the case, consult authorized USFilter Stranco Products personnel. |
| 3 | Select [Event #1]. |
| 4 | Select [1 st week] and [Tuesday]. This means that on Tuesday of every 1 st week, the alternate HRR will engage at the designated time. |
| 5 | Select [Alt. HRR Setpoint]. Enter Alternate HRR Setpoint. |
| 6 | Select [Start Time]. Enter [20:00]. (20:00 in military time represents 8:00 p.m.) |
| 7 | Select [Duration]. Enter [13:00]. (13:00 is hours from start time) |

Dechlorination Setpoint - Chapter 13

Dechlorination Programming

The System6 dechlorination program is activated only after Superchlorination is done. If a relay is assigned and Dechlor is enabled the Auto Dechlor will be activated.

Dechlorination Functionality

Normal alarms, fail/safes, and lockouts **are not active** during a dechlorination feed.

The dechlorination relay is a separate relay and needs to be assigned for activation through Representative Access. When dechlorination starts, programming temporarily suspends the normal HRR or ppm control. This relay is activated only after a Super Cl₂ and stays active until the HRR or Cl ppm reaches stop setpoint or until fail/safe time is reached.

| | |
|--|---|
| EXAMPLE: Program a dechlorination for 2:00 hours after superchlorination. | |
| 1 | Enter the menu system using an Operator, Manager or Representative access code. |
| 2 | Select [Dechlorination]. The current week and day of the cycle is displayed. |
| 3 | Select [Cl/HRR stop point]. Dechlorination can be controlled by either Cl or HRR. |
| 4 | Select [Stop HRR or Cl point]. Dechlorination will stop and regular control will engage at this point. |
| 5 | Select [Duration]. Enter [2:00]. (2:00 means hours from start time) |

CI/Br Booster Option - Chapter 14

CI/Br Booster Functionality

Normal alarms, fail/safes, and lockouts **are active** during a CI/Br Boost feed.

The CI/Br Booster is activated when the HRR low alarm is triggered. When the CI/Br Booster starts, both the CI/Br feed device and the CI/Br Booster work together to bring the HRR value above the low alarm and to feed setpoint. The CI/Br booster feed device is programmed by assigning a relay. In addition to assigning a relay, that relay must be wired to an extra CI/Br feed device. The wiring for the extra feed device is done in the same manner as the other feed devices, only to a different relay. The following example shows how to assign the relay.

| | |
|---|--|
| Example: Assigning CI/Br boost feed device to a relay. | |
| 1 | Enter the menu system using a Representative access code. |
| 2 | Select [Rep Startup]. |
| 3 | Select Relay #1 thru #8 Note: Relays #2 thru #8 will be on the second page. |
| 4 | From the list choose CI/Br booster. |
| 5 | Now if a heavy load occurs and HRR drops to a low alarm point, the boost feed device will begin to feed device and help the existing feed device increase the HRR level to setpoint. |

Communication Capabilities - Chapter 15

Communication Functionality

The user has the ability to communicate the System6 through either direct connection or telephone connection.

Direct Connection is done with a direct connection cable (RS-232). Direct connection is meant for communication up to 50'. To properly direct connect the dipswitch #5 on S5 should be in the off position and the dipswitch labeled com select on the modem board should be switched to pc-con. The purpose of a direct connection is to communication with the controller without buying a telephone line.

Data Modem Connection is done with an **analog** telephone line. Data modem connection is meant for the computer to call up the controller and communicate. The data modem connection also can be programmed to call the operator's pager or fax out in case of any alarm conditions. To properly connect via data modem the dipswitch #5 on S5 should be in the on position and the dipswitch labeled com select on the modem board should be switched to phone. **The Data Modem is standard in all System6 units.**

Voice Data Modem Connection (Optional) is done with an **analog** telephone line. Voice data modem connection is meant for the computer and/or telephone to call up the controller and communicate. The operator may use a telephone to find out parameters of the controller by selecting options given to the operator from the controller. The voice data modem connection also can be programmed to call the operator's telephone and/or pager in case of any alarm conditions. To properly connect via voice data modem the dipswitch #5 and #6 on S5 should be in the on position.

Programming the Call Out Feature

| | |
|---|--|
| Press enter to Access Menu. | |
| Press nine for rep access. | |
| Press access code. | |
| Press nine for more choices. | |
| Press the number to the left that corresponds to modem callout. | |
| Select ring pickup. | Ring pickup tells the controller to wait before transmitting. |
| Select Call begin. | Call begin tells the controller that the calling can only begin after this time. |
| Select Call end. | Call end tells the controller that the calling cannot be done after this time. |
| Select Pre-delay. | Pre-delay is the time that the controller will be in alarm before calling out. |
| Select Phone#1. | 1 st number to be called. |
| Voice and Data Modem Example: 555-1212,,,,,1234 | This method will call a pager and dial 1234 for the pager to read. The commas are for the delay if the pager has a message before the tone. Each comma is 2seconds of delay. |
| Voice Data Modem only Example: 555-1212 | This method will call a telephone, give the alarm, and ask for an access code so you can hear the parameters. |

Programming the Fax Out Feature

| | |
|--|---|
| Enter menu system by using Manager or Representative access | |
| Press 9 for More Choices | |
| Press the number that corresponds to Modem Call Out | |
| Select Callout Type | |
| Select Fax | |
| Select ring pickup | Ring pickup tells the controller to wait for the number of rings before transmitting. |
| Select Call begin | Call begin tells the controller that the calling can only begin after this time. |
| Select Call end | Call end tells the controller that the calling cannot be done after this time. |
| Select Pre-Delay | Pre-delay is the time that the controller will be in alarm before calling out. |
| Press 6 for Phone #1 | |
| Enter Fax machine number Example: 5551212 | |
| System6 will fax out the following: System ID Customer Name System Location Alarm: | |

Programming the Pager Out Feature

| | |
|--|---|
| Enter menu system by using Manager or Representative access | |
| Press 9 for More Choices | |
| Press the number that corresponds to Modem Call Out | |
| Select Callout Type | |
| Select Pager | |
| Select ring pickup | Ring pickup tells the controller to wait for the number of rings before transmitting. |
| Select Call begin | Call begin tells the controller that the calling can only begin after this time. |
| Select Call end | Call end tells the controller that the calling cannot be done after this time. |
| Select Pre-Delay | Pre-delay is the time that the controller will be in alarm before calling out. |
| Select Phone #1 | |
| Enter Pager number and numeric message Example: 5551212,,,,1234 | |
| System6 will call the pager and leave 1234 on the display | |

Voice Data Modem Terminology & Operations

Dial In Your staff can always call up (or dial) the Voice Data Modem via telephone or modem.

Call Out You have the choice of setting up the Voice Data Modem to call out pool facility staff members in the event of an alarm. You program the list of staff phone numbers for the Voice Data Modem to call. Staff answering the call will hear a synthesized voice presenting an alarm report.

Enabling the call out allows the Voice Data Modem to dial out to facility staff.

Disabling the call out means that the Voice Data Modem will not be able to call your staff.

Access Code When you call in or when the Voice Data Modem calls out, you will be asked to enter your access code. The Manager Level access code is the same as the one used on the System6 controller keypad, followed by the pound (#) sign. Manager Level access allows users to change Voice Data Modem AND System6 settings.

If you wish, staff can also use an access that allows them to only monitor the System6 and listen to reports. Use access code ##. Anyone using ## will NOT be able to modify Voice Data Modem or System6 settings.

Overall Delay The overall delay value sets the amount of time that the Voice Data Modem will wait to begin calling down the call out list AFTER an alarm has been activated.

Data Mode If you have a PC, you can use Strantrol Virtual Controller (SVC) software to call your Voice Data Modem. This offers an alternative programming method for customizing the Voice Data Modem settings. If you do not have SVC, programming the Voice Data Modem will be done from the System5 facepanel.

Decimal Placement for Values Entered Decimal Points are added automatically because the decimal placement logic is built into the Voice Data Modem factory programming. For example, when entering the pH feed point, pressing 75# will be interpreted as 7.5.

Carrier The carrier tone is the long beep that you hear before the PC connects to the Voice Data Modem.

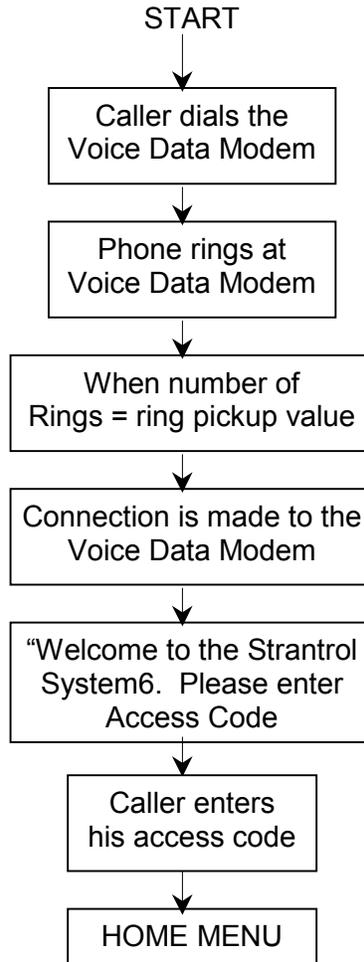
Enabling the carrier allows users to "call in" using a computer (SVC) or a telephone.

Disabling the carrier allows users to "call in" using only the telephone.

SAVE or ENTER All data entered on the telephone touch tone pad must be followed by the # button. For example:

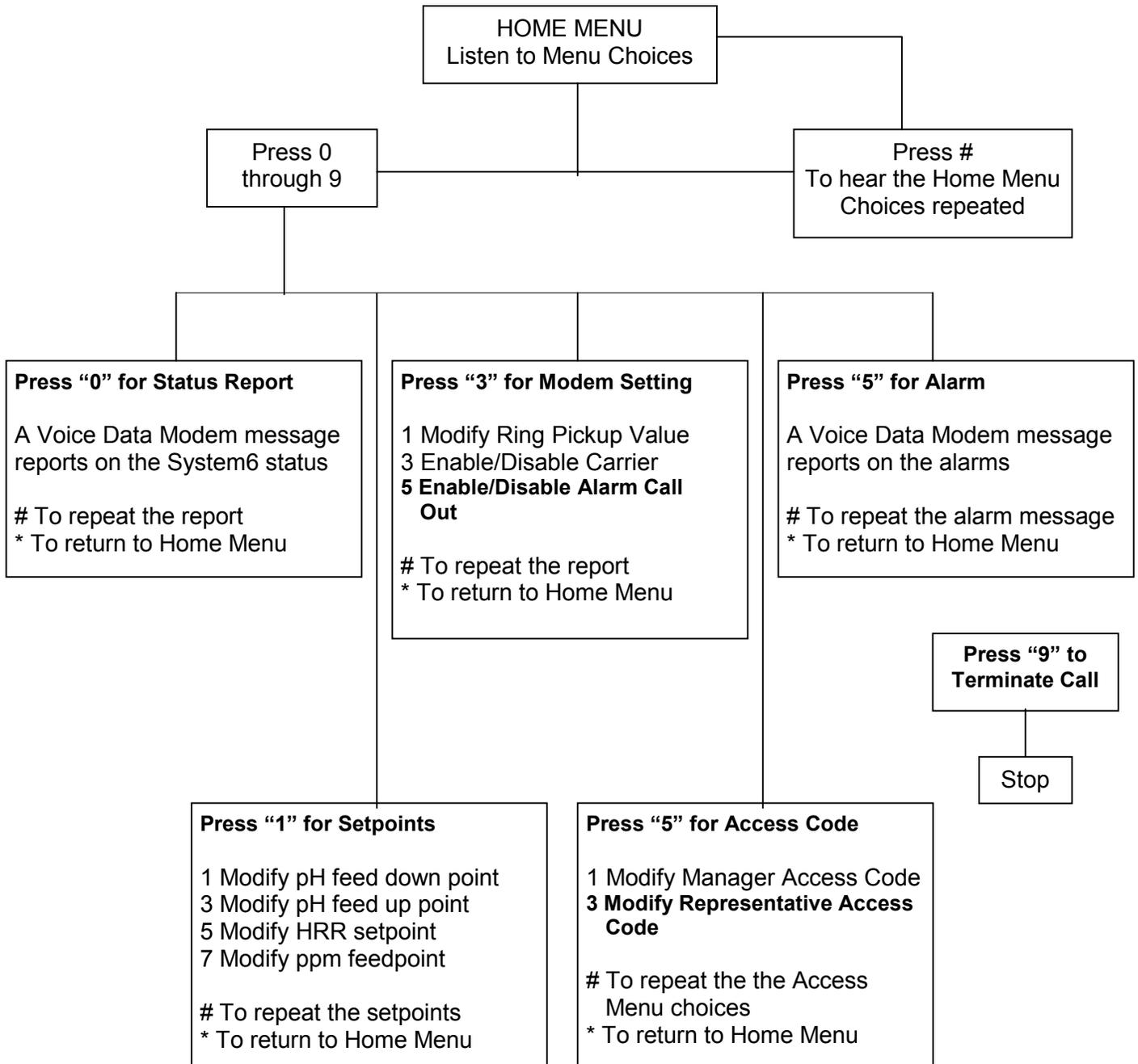
| The Voice Data Modem says: | You Enter: |
|--|------------|
| "Please enter pH feeedown point" | 75# |
| "Please enter ring pickup value" | 4# |
| "You are about to Enable [option], press # to confirm. | # |
| "You are about to Disable [option], press # to confirm. | # |

When you call the Voice Data Modem, you will be working with a simple menu structure



See the ACCESS CODE section.

See the flowchart on the next page for HOME MENU.



To Call into the Voice Data Modem for Reports

Staff can call in at any time to hear a Voice Data Modem report:

- a. Dial in and hear the welcome greeting.
- b. Enter the access code, then the # key.
- c. At the home menu level, press:

0 for a status report
7 for an alarm report

Set up the Voice Data Modem to Call Out

Enable the Alarm Call Out You can enable the alarm call out setting from either a Voice Data Modem call in or from the System6 controller.

| If you use the Voice Data Modem: (Remote connection) | If you use the System6 keypad: |
|--|---|
| a. Dial in and hear the welcome greeting. | a. Enter the menu system. |
| b. Enter a manager or representative access code. | b. Enter your manager or representative access code. |
| c. At the home menu level, press 3 to access modem settings. | c. Find [Voice Menu] option and press corresponding number. |
| d. Press 5 to modify the Alarm Call Out setting. | d. Find the [Call Out] option and press corresponding number. |
| e. Press 3 to enable the call out. The Voice Data Modem will warn that you are about to enable (or disable) the call out. Press # to confirm that you want to make the change. | e. Select [Enable] or [Disable]. |

Train Staff

To get facility staff ready to use the Voice Data Modem follow the steps listed below:

- a. Inform staff of their access code.
- b. Point out the flow charts of the Voice Data Modem menus (on page 4 and 5 of this section).
- c. Copy and distribute the quick reference guides at the back of this section.

Customize the Ring Pickup Value

Default = 1

The ring pickup value controls the number of times the Voice Data Modem will 'ring' before an incoming call will be connected. (You may need to change this value if your facility is using phone switching equipment.)

- a. Dial in and hear the welcome greeting.
- b. Enter a manager or representative access code.
- c. At the home menu level, press 3 to access Modem settings.
- d. Press 1 to modify.
- e. Enter a new value.
- f. Press the # button to save the new value.

Customize the Call Out Pre-Delay

Default = 30 minutes

The overall delay value sets the amount of time that the Voice Data Modem will wait before calling down the call out list. If no one on the list answers the Voice Data Modem call out, it will wait this same amount of time before calling down the list again.

For example, let's say the System6 has an alarm event. The Voice Data Modem calls the first person on the list, but there is no answer. It calls the rest of the people on the list. If no one answers, the Voice Data Modem will continue to call out. The delay value establishes a waiting period. If the value is set to 10 minutes, the Voice Data Modem will wait ten minutes after the last call out before it attempts to call down the list again.

To set up the call out phone numbers, use the Strantrol Virtual Controller (SVC) program (from your computer) or access the System6 facepanel using either a Representative or Manager Access Code.

Customize the Delay #1, #2, #3, #4, #5 and #6

Default = 10 seconds

In addition to setting the Overall Delay, you can set the amount of time that the Voice Data Modem waits between dialing each call out number within the list. For example, if no one answers at phone #1, delay #1 tells the Voice Data Modem to wait before calling phone #2.

The FCC and Your Voice Data Modem

Your new USFilter Stranco Products product has been registered with the Federal Communication Commission (FCC). This product complies with standards in Part 68 of the FCC rules. The FCC requires USFilter Stranco Products to provide you with the following information:

Connection and Use With the Nationwide Telephone Network

The FCC requires that you connect your Voice Data Modem to the nationwide telephone network through a modular telephone outlet or jack. The modular telephone outlet or jack to which the telephone equipment must be connected is a USOC RJ-11C or RJ-11W.

This equipment may NOT be used with Party Line Service or with coin telephone lines.

Notification to the Telephone Company

The FCC requires that upon request of you local telephone company, you provide the following information:

- A. The "line" (that is, the phone number) to which you will connect the Voice Data Modem, and
- B. The telephone equipment's FCC registration number and ringer equivalence number (REN). These numbers are on the inside of your controller/telephone equipment.

The REN is useful to determine how many devices you may connect to your telephone line and still having them ring when your telephone line is called. In most areas, the sum of all RENs should be 5 or less. You may want to contact your local telephone company.

Repair Instructions

If it is determined that your Voice Data Modem is malfunctioning, the FCC requires that it not be used and that it be unplugged from the modular outlet until the problem has been corrected. Repairs to this Voice Data Modem equipment can only be made by the manufacturer or its authorized agents or by others who may be authorized by the FCC. For repair procedures, follow the instructions outlined under the USFilter Stranco Products warranty procedure.

Rights of the Telephone Company

If your Voice Data Modem is causing harm to the telephone network, the telephone company may temporarily discontinue your telephone service. If possible, they will notify you before they interrupt service. If advance notice isn't practical, you will be notified as soon as possible. You will be given the opportunity to correct the problem, and you will be informed of your right to file a complaint with the FCC.

Strantrol System6

Technical Guide

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