

AT8™ Pool and Spa Controller



Installation and Operation Guide

For Software Version AT-8-1.6

800-831-7133

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WARRANTY

Pentair Acu-Trol warrants the AT-8 to be free from defects in manufacturing and workmanship for a period of one (1) YEAR from the date of manufacture for the electronic module.

All commercial pH and ORP sensors have a warranty of two (2) years. Flow cells have a warranty of one (1) year. Other equipment is covered by manufacturer's own warranty. During the warranty period, any defective parts will be repaired or replaced when necessary by Acu-Trol.

This warranty does not cover: (a) the buyers' labor or any servicing fees related to replacement of the Product; (b) damage resulting from the use of this Product in other than its normal manner; (c) damage from misuse, accident or neglect; (d) damage from improper testing, operation, or installation; (e) not operating the Product on a dedicated (separate) circuit or under conditions other than those recommended or at voltages or amperages other than the voltage or amperage indicated on the Product; and (f) acts of Mother Nature (i.e. lightning, electrical storms, floods, etc.). In addition, attempting to service or modify the Product will render this Warranty Void. Defective parts should be returned immediately to the local Pentair Acu-Trol dealer, any parts returned to the factory require a return of material authorization form to subsequently generate an RMA Number (Returned Materials Authorization). An Acu-Trol technician will analyze the returned part and determine the cause of failure and process accordingly.

**WARRANTY CARD MUST BE COMPLETED AND
RETURNED FOR WARRANTY TO BE VALID.**

CHAPTER 1

INFORMATION

1.1 SAFETY PRECAUTIONS

PLEASE READ THIS USER MANUAL completely before installing or operating the equipment.

The AT-8 is a Class 1 product for protection against electric shock and a Type 1 product with regards to disconnection of the control circuits.

Be sure to observe the following safety precautions:

- Do not permit anyone untrained or under the age of 18 to use this product.
- Unit must be properly connected to earth ground.
- Never apply power when front panel is not secured in the closed position.
- Never service unit with power applied, always turn OFF main circuit breaker to unit and all equipment when servicing.
- Touching the controller's internal parts could result in injury and or damage to the controller. In case of a malfunction, only a qualified technician should repair the controller.
- Risk of Electric Shock. Connect only to a grounding type receptacle protected by a ground-fault circuit interrupter (GFCI).
- Do not bury cord. Route cord to eliminate abuse from heater exhaust, lawn mowers, hedge trimmers, and other equipment.
- Be careful not to damage any of the insulation on wires or the power cord. Should the cord be damaged, return it to your dealer for a replacement. Continued use could result in fire or electric shock.
- To reduce the risk of electric shock, do not use an extension cord to connect unit to electric supply; provide a properly located GFCI.
- Never remove or install any cables between the circuit cards when power is applied, damage to the components may occur.

WARNING:

CHEMICAL BURN HAZARD - If possible, make sure pumps are OFF before drilling into pipes. Securely fasten all electrical, water and chemical lines. Locate chemical feed pumps and chemical storage tanks in a safe and secure area.

SAVE THIS INSTRUCTION GUIDE!

1.3 AT-8 OVERVIEW

Acu-Trol, the technological leader in swimming pool automation, congratulates you on your selection of the AT-8 swimming pool controller. The AT-8 will maintain the pH and sanitizer levels, and monitor and report temperature levels.

The AT-8 features:

- **Easy Read Display:** The AT-8 uses an easy to read LCD display screen.
- **Data Recording:** The AT-8 has the ability to record data from all sensors and to store a selected amount of that data.
- **Easy Programming:** The AT-8 uses a simple and intuitive programming method.
- **Selectable Voltage:** The AT-8 can be configured to use either 110 VAC or 220 VAC. This allows the controller to be plugged in to an existing outlet, or wired directly in to the electrical system.

1.4 IMPORTANCE OF WATER MAINTENANCE

A chemical controller is designed to maintain specific levels of sanitizing and balancing chemicals. Sanitizing chemicals help to control the growth of bacteria and other organisms in the water of a pool or spa. Balancing chemicals keeps a pool or spa at a certain pH level, preventing the water from becoming acidic, and corroding the pool and its equipment, or becoming basic, and causing buildup on the equipment.

Water maintenance is an important part of operating a pool and or spa. Pool operators should be trained in water maintenance by an authority recommended by their local health department. Water maintenance requirements are generally determined by the county or state and can vary widely. However, most requirements fall within the following range recommended by the National Swimming Pool Foundation:

- Filtration – Minimum turnover rate of six hours for a pool and 30 minutes for a spa.
- Water Balance – pH 7.2 – 7.6, alkalinity 80-120 PPM.
- Oxidation Reduction Potential (ORP) – A reading of 650 mV - 750 mV.
- Total Dissolved Solids – Should not exceed 2000 PPM. (excluding salt pools)

This information is meant to provide pool operators with a basic idea of the range of water maintenance requirements, and the importance of water maintenance. To ensure that your facility is in compliance with all local regulations please check with your local health department.

CHAPTER 2

AT-8 SPECIFICATION



Inputs:	pH ORP	TEMPERATURE (10K probe) FLOW (switch only)	
Display Range:	pH ORP TEMP FLOW	0.1 – 9.9 450 – 999mV 15 – 150 ON / OFF	+/- 0.1 +/- 2 +/- 1
Calibration Range:	pH ORP TEMP	+/- 0.9 +/- 125 +/- 50	
Output Relays:	pH ORP	110/220 VAC 6A 110/220 VAC 6A, DRY, 24VAC 0.5A	
Power Input:	120 VAC, 10A, 50/60 Hz		
Control:	ORP/pH Feed Auto/Proportional/Manual		
	pH Selection	Acid/Base	
	pH Delay	For suction side sanitizer feeders	
	Expansion	Up to 8 bodies of water	
	Data Log	2048 lines of data at timed intervals	
Safety:	Feed Safety Alarms Password ORP Lockout No Flow Lockout	Prevents overfeed High/Low 6 digit password If pH greater than No feed with loss of flow	

CHAPTER 3

INSTALLATION

3.1 Installation Preparation

Receipt Inspection: Upon receiving the controller from shipping, check the carton carefully. Report any damaged items directly to the shipping company. Examine the shipping list and verify that all items are present. Please contact your local Acu-Trol dealer if any items are missing or have been damaged. Use care when unpacking equipment to avoid damage or loss of small parts.

3.2 Installation Summary

The following steps are required to completely install an AT-8:

1. Identify new and existing equipment to be connected.
2. Decide if the sensors will be in-line, in a separate by-pass line, or if the AK1200 flow cell will be used.
Caution: If the AK1200 is used, the input water maximum pressure is 25 PSI.
3. Determine the supply voltage, 110 VAC or 220 VAC, and set the supply voltage switch as necessary.
4. Determine if the control to the equipment uses the same voltage as the supply voltage. All controlled equipment must be compatible.
5. Determine the water-tap points for the flow cell bypass inlet and outlet.
6. Mount the AT-8 away from direct sunlight and on a flat vertical surface.
7. Connect the supply voltage with main breaker off (Must be a separate dedicated circuit GFCI).
8. If using an AK1200 flow cell install the bypass now.
9. Connect the sensors.
10. Test the plumbing for leaks.
11. Turn on/plug in the AT-8 for the first time.
12. Test the equipment, using the AT-8 manual relay mode.
13. Calibrate the probes, then recalibrate as the probes acclimate to the system. Acclimation can take as little as two hours or as long as 24 hours.
14. Program the AT-8.
15. Call or visit the controller over the next few days to insure the system is balanced and in control. Fine-tune the setup if necessary.

3.3 AK1200 Flow Cell Installation

3.3.1 Tools & Supplies Needed

In order to install the AK1200 flow Cell, you will need

- A Phillips screwdriver
- A drill
- A 1/4" drill bit
- A 1/4" NPT tap
- A small flat head screwdriver
- A 1/2" poly tubing

Remove flow cell from shipping carton and make sure all parts are included with AK1200 flow cell.

- 1 – AK1200 Lid
- 1 – Flow switch magnet
- 1 -Sample barb fitting
- 1 - Filter assembly with O-Ring
- 1 - Flow switch with O-Ring, 2' and 10' wire lengths available.
- 2 - Mounting screws
- 1 – AK1200 Jar with O-Ring
- 3 - 1/4" Valves.
- 4 - 1/4" NPT by 1/2" flex fittings.
- 2 - 1/4" plugs.
- 1 - 1/4" Close Nipple
- 1 - Teflon Tape
- 1 – Pressure gauge*

Note that 1/2" flexible tubing is not included and is supplied by the installer or may be ordered from Acu-Trol.

* Use of Pressure Gauge is Optional

3.3.2 Flow Cell Assembly

WARNING: DO NOT OVER TIGHTEN FITTINGS ON FLOW CELL TOP AS THIS MAY BREAK OR CRACK FLOW CELL TOP.

1. Wrap all four flex fittings with Teflon tape. Install two flex fittings into two ball valves.
2. Wrap barb fitting with Teflon tape. Install barb into remaining ball valve.
3. Wrap both ends of the close-nipple with Teflon tape. Install into the filter assembly using (either end OK). Hand-tighten only.
4. Install one ball valve into the filter.
5. Install the filter and remaining ball valves as shown in the figure.
6. Verify that the flow switch magnet is in the flow cell tube with the large, or hat end pointing down.

NOTE: Wrap fittings only twice around with Teflon tape.

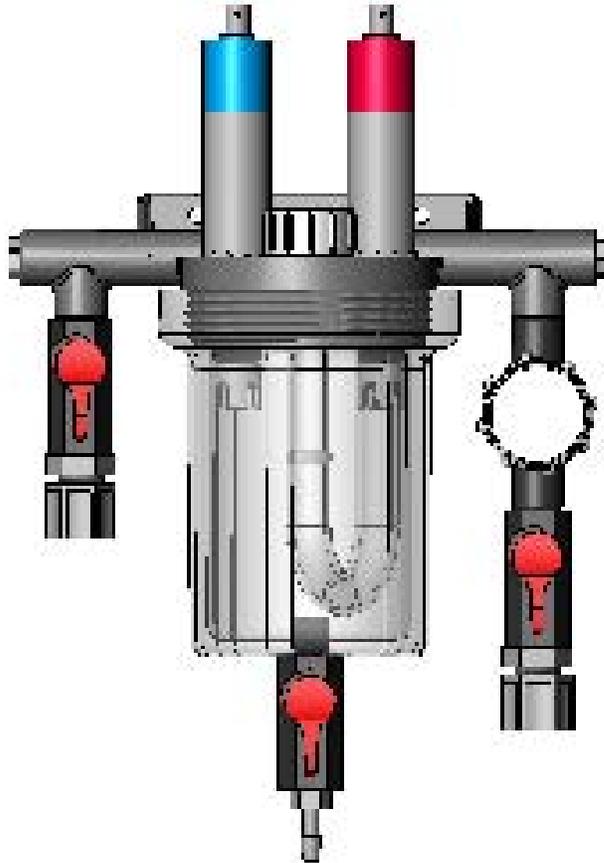
3.3.3 Selecting the Flow Cell Mounting Location

- Mount the flow cell in an area away from direct sunlight.
- Mount the flow cell away from electrical panels.
- Mount the flow cell within 6ft of intended mounting place of the AT-8
- Mounting surface must be flat and level.

3.3.4 Mounting the Flow Cell

Select a suitable location for the flow cell meeting the following recommendations:

- The sensors should be away from direct sunlight, as this may affect the readings.
- The location should be where some water spillage will not damage anything. Preferably below the level of the controller.
- Securely mount the bracket to wall using the two supplied screws.



3.3.5 Plumbing the Flow Cell

Make sure pumps are OFF before drilling into pipes. Never turn chemical feed pumps ON when both flow cell valves are closed. If injecting more than one chemical into the AK1200 make sure they will not be on at the same time.

- It is essential that the supply line be at a higher pressure than the discharge line so the water will flow through the cell at a steady rate in the right direction. Installing a ball valve in the main circulation line may be required if the pressure is too low.
- Inlet should be installed after filter and before heater.
- Exit should be installed after heater and as far away from any equipment as possible.
- Drill and tap at above locations with 7/32" drill and 1/4" NPT tap. Choose a location on a fitting where the pipe enters so you are drilling through both the pipe and fitting to get maximum depth of thread.
- Install 1/4" NPT by 1/2" flex fittings then route inlet and exit lines.

WARNING
Securely fasten all electrical, water, and chemical lines.
Locate chemical feed pumps and chemical storage tanks in a safe and secure area.

WARNING
Check filter daily for debris buildup and clean as needed.
To clean filter, turn the flow cell inlet and exit valves OFF, remove filter cover and filter, being careful not to lose seal. Clean stainless steel filter and return to housing being careful to seat it properly.
The filter screen can be easily damaged if seated improperly when the cap is installed.

WARNING
Maximum operating pressure is 25lbs. Extreme pressure variations may affect sensor readings.

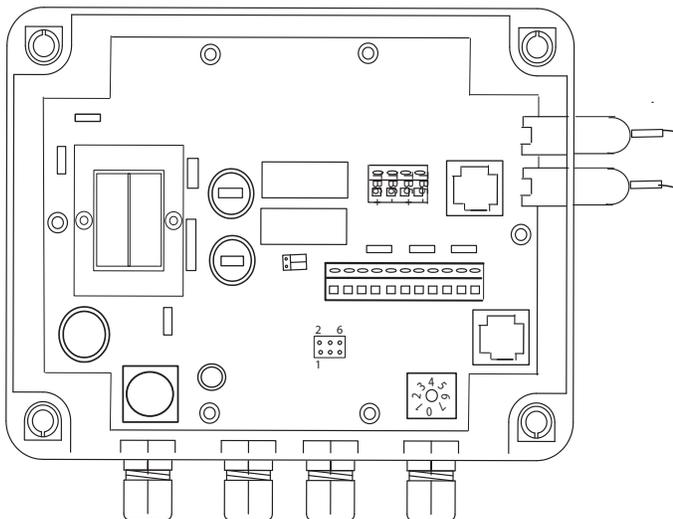
WARNING
Avoid installing the outlet before the main pump as a vacuum may damage chemical sensors.

WARNING
Inject chemicals only on the outlet side of the AK1200 flow cell.

WARNING
Do not overtighten fitting on flow cell top.

3.3.6 Sensor Installation

- Keep pH and ORP sensors wet at all times, install the sensors into the flow cell. Hand-tighten only and save caps for future use, fill flow cell with water. The sensors have O-Rings and don't require Teflon tape.
- Route a 10K temperature sensor wires into the controller through the strain relief and connect to the controller. One wire (either one) to connector TB5 T- and the other wire to TB5 T+.



- Route the flow switch wires into the controller through the strain relief and connect to the controller. One wire (either one) to connector TB6 ground and one wire to TB6 F+.
- Connect the chemical sensors to the controller BNC connectors found on the right side of the enclosure. The sensor wires and BNC connections are labeled and color coded for easy installation.
- Turn the main pump on and open the valves to test for leaks and the free movement of magnet. Magnet must be all the way up in order to close the flow switch. 1/4 GPM will push the magnet all the way up.

CAUTION
The Flow Switch is a dry contact only. (No current)
Use with any other brand flow switch
VOIDS WARRANTY.

3.4 AT-8 Installation

3.4.1 Mounting Location

Select a location for mounting the AT-8, meeting the following conditions

1. At least ten (10) feet from open water.
2. Close enough for the supplied power cord to reach the supply voltage.
The controller will not operate properly without a solid earth ground connection.
3. Supply power must be routed to the AT-8 in accordance to applicable codes in the area; the supplied power cord is not code in some areas.
4. The installation surface must be solid and vertical. Do not mount the controller in a horizontal position.
5. Maintain adequate clearance for opening the enclosure.
6. The environment should be free of chemical fumes and excessive heat.
The maximum room temperature is 110 °F.

WARNING

Proper and safe operation requires an earth ground connection.

WARNING

Keep the AT-8 out of direct sunlight and inside a room if possible. A shade screen should be used for outdoor installations.

3.4.2 Mounting the AT-8

1. Install the 4 mounting feet as desired to the AT-8 back.
2. Hold the controller against the mounting surface with the lid closed and mark the location of the mounting bracket located on the top of the controller next to the wall. Prepare holes as necessary and secure controller using hardware provided.
3. Make sure the controller box is not distorted by an uneven mounting surface.
4. Drill the four holes and insert the four mounting anchors.
5. Secure the AT-8 to the mounting surface with the four screws.

CAUTION

Do not over tighten the four mounting screws. Damage to the enclosure will occur.

3.5 Electrical Wiring Connections

WARNING

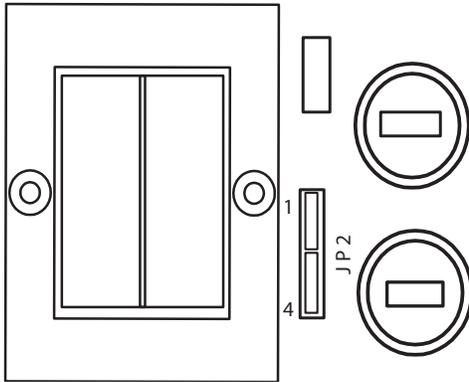
DO NOT OPEN AT-8 COVER WHEN POWER IS APPLIED.

Always follow local electrical codes and if you are not sure, have a licensed electrician install all electrical wiring.

3.5.1 Internal Wiring Connections

3.5.1.1 110 VAC Feed System Set Up

The AT-8 comes from the factory set for 110 VAC. Before applying power to unit make sure unit is still set for 110vac. Inspect JP2 (located between fuses and transformer) and ensure the two black jumpers are connected between 1-2 and 3-4.



The AT-8 is available with color coded pigtails for use with 110VAC feed systems for an additional charge.

RED = Sanitizer, ORP, Chlorine
BLUE = Ph, Acid or Base

For 110VAC chemical feed systems simply plug your feed system into the color-coded pigtail.

3.5.1.2 Hardwiring the Chemical Feed System

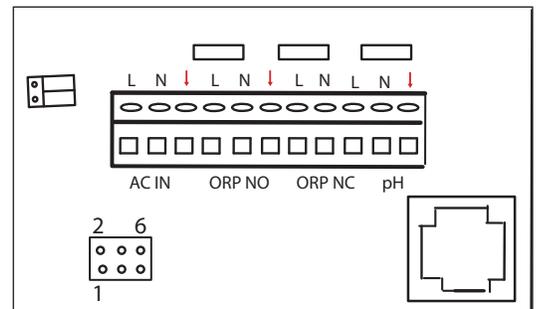
To wire a feeder directly to the AT-8 cut and strip the wires 1/4" back and either tin the ends or attach a crimp on terminal.

WARNING

The connectors inside the AT-8 are close together. Failure to properly terminate wires could lead to shorts between wires and is not covered by warranty.

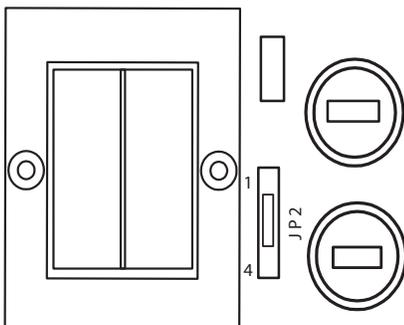
The connections to the terminal block are designated on the circuit board above and below the terminal block.

- BELOW Terminal Block
 - o AC IN = plug or power to AT-8
 - o ORP NO = Sanitizer relay output with normally open relay
 - o ORP NC = sanitizer relay output with normally closed relay
 - o pH = Acid or Base relay output with normally open relay
- ABOVE Terminal Block
 - o L = line voltage, Black Wire
 - o N = line neutral, White Wire
 - o ↓ = line ground, Green Wire



3.5.1.3 220 VAC Feed System Set Up

The AT-8 comes from the factory set for 110 VAC. Before applying power to unit make sure unit is set for 220vac. Inspect JP2 (located between fuses and transformer) and remove the two black jumpers. Reinsert one of the black jumpers between pins 2 and 3.



WARNING

Power should be off to the AT-8 before moving JP2 jumpers.

The AT-8 is now configured to run on 220vac and will output 220vac to your chemical feed system.

3.5.1.4 Installing 220 VAC Feeders

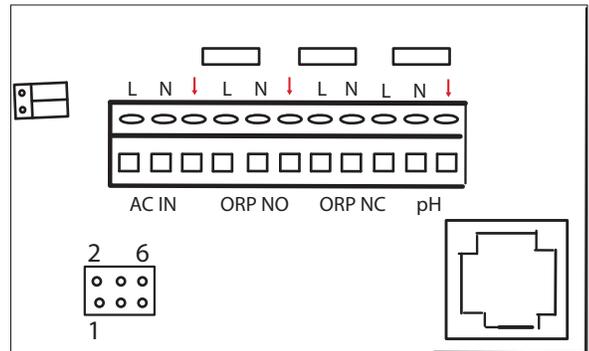
To wire your 220vac feeder directly to the AT-8 cut and strip the wires 1/4" back and either tin the ends or attach a wire ferrule.

- BELOW Terminal Block
 - AC IN = plug or power to AT-8
 - ORP NO = Sanitizer relay output with normally open relay (no power until relay turned on)
 - ORP NC = sanitizer relay output with normally closed relay (power is on until relay turned on)- commonly used for Salt Chlorine Generators.
 - pH = Acid or Base relay output with normally open relay (no power until relay turned on)

- ABOVE terminal Block
 - L = line voltage, one leg of 220vac
 - N = line neutral, one leg of 220vac
 - ↓ = line ground, Green Wire

WARNING

The connectors inside the AT-8 are close together. Failure to properly terminate wires could lead to shorts between wires and is not covered by warranty.

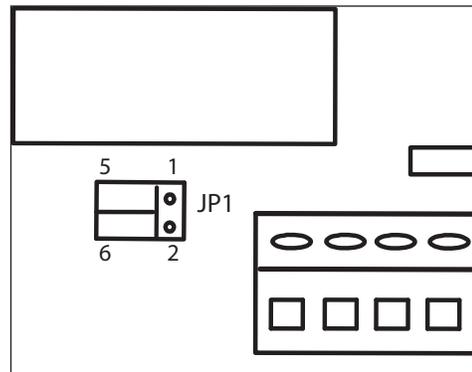


3.5.1.5 24 VAC Sanitizer Set Up

Changing the sanitizer output voltage from the input voltage to 24vac is as follows:

- Remove the jumpers from JP1.
- Set one of the jumpers on JP1 between 3-5,
- Set the other jumper on JP1 between 4-6.

Note: The pH relay output voltage is always the input voltage.



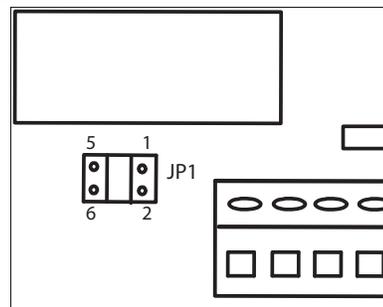
3.5.1.6 Dry Contact (No Voltage) Sanitizer Output Voltage

Changing the sanitizer output voltage from the input voltage to a dry contact is as follows:

- Remove the jumpers from JP1.
- Replace one of the jumpers on JP1 between 3-4
- The AT-8 will now have a dry contact sanitizer output voltage.

WARNING

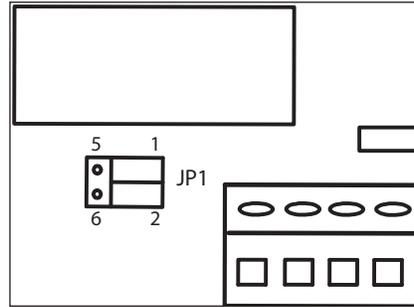
Power should be off to the AT-8 before moving JP1 jumpers.



3.5.1.7 Line Voltage (Input Voltage) Sanitizer Output Voltage

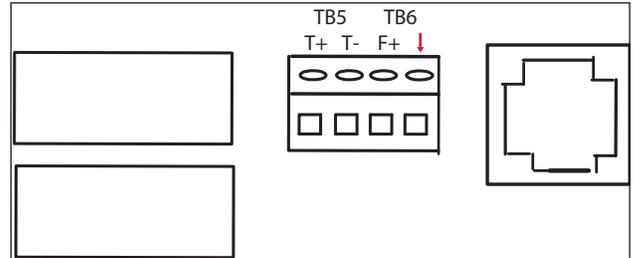
- Remove all jumpers on JP1.
- Place a jumper between pins 1 and 3.
- Place a second jumper between pins 2 and 4.
- JP1 is now configured for line voltage.

WARNING
Power should be off to the AT-8 before removing JP1 jumpers.



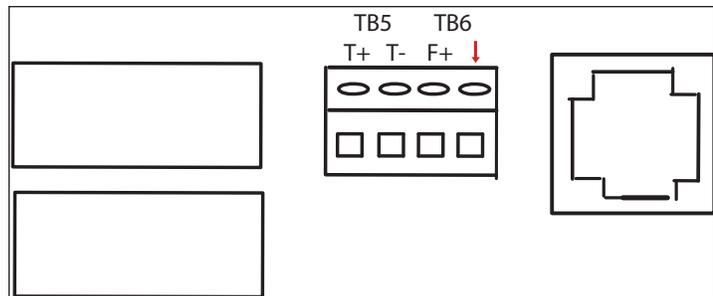
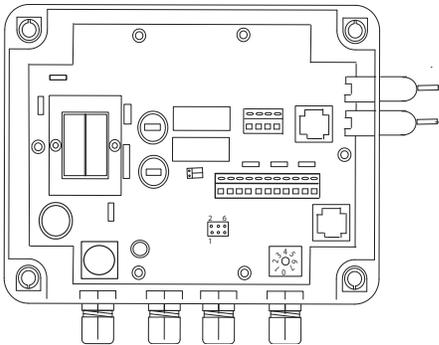
3.5.1.8 Flow Switch

- Insert the flow switch through the small strain relief in the bottom of the AT-8.
- Connect the flow switch wires into TB6 located on the circuit board.
- Place one wire in to the F+ slot, and one wire in to the slot.
- Polarity does not matter on these connections.



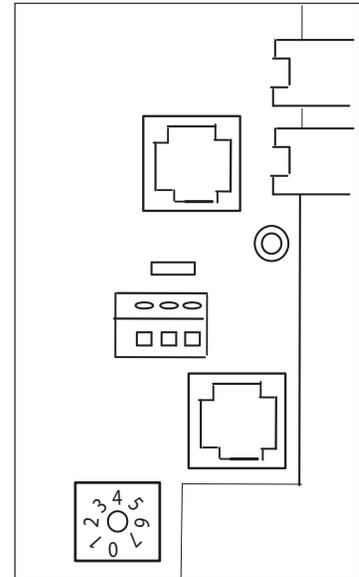
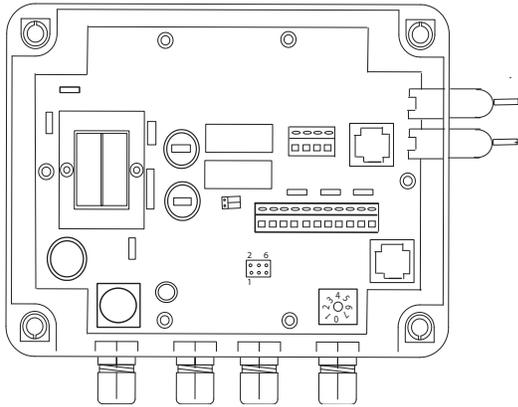
3.5.1.9 Temperature Sensor

- Run the temperature sensor through the small strain relief on the bottom of the controller.
- Connect the temperature wires to TB5 located on the circuit board.
- Place one wire in the T+ slot and one wire in the T- slot.
- Polarity does not matter on these connections.



3.5.1.10 Bus Connection

- Run the Ethernet wire through the large strain reliefs on the bottom of the AT-8.
- The strain relief must be unassembled before inserting the bus wire
- Connect the Ethernet wire to either of the connectors.



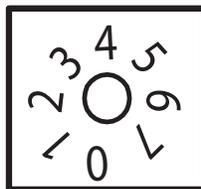
3.6 Multiple AT-8 Setup

- Mount and hookup all electrical connections as stated above.
- The AT-8's will be daisy chained together using the Ethernet wires.
- Run another Ethernet wire through the large strain relief on the bottom of the controller.
- Connect to the remaining Ethernet connector.
- AT-8 must either be the first or last unit in the bus.

3.6.1 Address Setup

To set up multiple AT-8's each unit must have a different address. This is accomplished by the white rotary switch on the bottom of the circuit board. Use a small flat head screw driver and the table below to assign addresses. Addresses must be assigned in numerical order or the system will not function properly.

- Position 0 = Master Unit 1 (use this setting for single system applications)
- Position 1 = Unit 2
- Position 2 = Unit 3
- Position 3 = Unit 4
- Position 4 = Unit 5
- Position 5 = Unit 6
- Position 6 = Unit 7
- Position 7 = Unit 8



The AT-8 enclosure can now be closed and the lid screws tightened.

CHAPTER 4 SENSORS

The AT-8 can accept readings from a wide variety of sensors. Each sensor has its own unique circuitry that is connected directly to the micro-controller for measurement. Isolation of each sensor ensures more accurate measurements.

The AT-8 measures the following sensor measurements with the listed characteristics:

pH

Range: 4.22 to 9.78, ± 0.02 .

This measurement is temperature compensated.

WARNING: Sensors are shipped with a plastic case covering the electrode tip. Sensors should be kept in the protective cap until time of installation. If the sponge in the cover becomes dry, wet it with tap water.

ORP

Range: 0 to 999 mV, ± 1 mV.

WARNING: Sensors are shipped with a plastic case covering the electrode tip. Sensors should be kept in the protective cap until time of installation. If the sponge in the cover becomes dry, wet it with tap water.

Flow Switch

This input measures if a switch is open or closed.

WARNING

Sensors are shipped with a protective cap covering the electrode tip to protect the sensing element. Sensors should be kept in the protective cap until ready for installation, if the sponge in the boot becomes dry, wet it with tap water. During shipment, air bubbles may have entered the electrode, carefully shake the electrode downward (like a thermometer) to dispel the air from the sensing elements inside the electrode. Before using the sensor, remove the cap.

4.1 pH and ORP Sensors

pH electrodes sense the acidity of the water and work with any acid or base. The blue bands on the cables identify the pH sensors. Each sensor is also identified on the sensor body. ORP electrodes are used to monitor the Oxidation-Reduction Potential (sanitization quality of the water) of a given solution. The sensing element of the ORP electrode is made of a precious metal such as platinum or gold. The red bands on the cables identify ORP sensors.

4.2 Temperature Sensor

The AK10K sensor can be installed to measure/display temperature. The sensor should be installed as close as possible to where the water comes from the pool. If temperature probe is installed in the AK1200 flow cell there will be a temperature variation due to the long tubes and the temperature in the pump room. A common place to install it is in the small plugged hole in the bottom of the main pump strainer basket.

The sensor uses a special $\frac{1}{4}$ " NPT fitting to hold the stainless steel sensor. A hole should be drilled ($\frac{7}{32}$ ") and tapped ($\frac{1}{4}$ ") where the water enters the pump room through a fitting to get double the depth to hold the sensor. If installed outdoors make sure to keep it out of direct sunlight. Route the wires into the controller through a strain relief and connect to the temperature input. The red wire goes to T and the black wire to GND.

4.3 Flow Sensors

The **AT-8** is able to receive information from one flow switch, provided with the Ak1200 flow cell. This flow switch is used to indicate flow through the flow cell and determines when it is OK to feed chemicals in to the system. The AT-8 will not allow chemicals to feed if there is no flow in the system.

4.4 Sensor Care

Contamination of the sensing elements often results in slow response and inaccurate readings. Clean the elements by the following procedures:

pH and ORP sensors

- Wash electrode tip in a liquid detergent and water. Carefully use a soft bristled toothbrush to wash the electrode tip and white sensing ring.
- Rinse after cleaning. To install, place in flow cell according to the diagram and hand tighten.
- Make sure the O-ring is installed on sensor.
- If the cable is longer than needed, it should be coiled neatly and attached under the cabinet.

pH Sensors Only

- Attempt to clean the sensor with liquid detergent first.
- If this is not successful, swirl the tip of the sensor in a 5 parts water 1 part muriatic acid solution for 10 - 20 seconds.
- Rinse again and reinstall.

WARNING

Do not rub hard on the glass element in the sensor or use sand paper or other polishing material to clean. Handle electrode carefully. Sensors contain external and internal glass elements. Do not drop or otherwise subject the sensor to vibration, physical impact, or freezing conditions. Any type of breakage is not covered under warranty.

CHAPTER 5 OPERATION AND PROGRAMMING

Overview: The AT-8 system controller is designed to accommodate any size water system. Once the controller is installed it is ready to be programmed. The system comes from the factory with default programming and should only require a small amount of adjustments to work with the size of body of water and chemical feeder of your system.

5.1 Reading Screen

The reading screen is the normally visible or default screen. From this screen you can see the system number, sensor readings, alarms, indication of feed, indication of flow and allow manual

1	pH	ORP	TMP	F
A	7.0	750	78 X	

5.1.1 System Number

- If you have multiple bodies of water being monitored each unit will have it's information displayed for 5 seconds. If you have 4 bodies of water then every 20seconds all bodies of water will have been viewed once.
- The number of the currently displayed unit is in the upper left corner.

1	pH	ORP	TMP	F
A	7.0	750	78 X	

- Pressing the SELECT button will lock onto the currently displayed system for 1 minute. Pressing SELECT again will select the next system for viewing. After 1 minute has elapsed with no presses on the SELECT key the 5 second rotation will resume

5.1.2 Sensor Readings

- pH is displayed from 0.1 to 9.9.
- ORP is displayed from 450 to 999mV.
- Temperature is displayed for 15 to 150 and can have units of Celsius or Fahrenheit.

1	pH	ORP	TMP	F
A	7.0	750	78	X

5.1.3 Alarms

- pH reading flashes if reading is outside of pH alarm set points.
- ORP reading flashes if reading is outside of ORP alarm set points.
- TEMPERATURE reading flashes if reading is outside of TEMP alarm

1	pH	ORP	TMP	F
A	7.0	750	78	X

5.1.4 Indication of Feed

- "pH" flashes during feed of pH.
- "ORP" flashes during feed of sanitizer

1	pH	ORP	TMP	F
A	7.0	750	78	X

5.1.5 Flow

- An “X” is displayed under the “F” on the right side when there is flow.

NOTE: if there is no “X” (no flow) then the feed relays are locked out.

1	pH	ORP	TMP	F
A	7.0	750	78	X

5.1.6 Indication of Safety Lockout

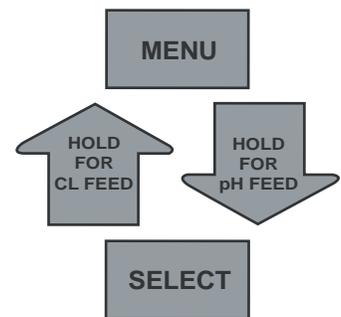
- If the pH reading has an asterisk “*” in front of it, then pH is in safety lockout mode. See pH FEED SAFETY section for information.
- If the ORP reading has an asterisk “*” in front of it, then ORP is in safety lockout mode. See ORP FEED SAFETY section for information.

1	pH*	ORP	TMP	F
A	7.0	750	78	X

1	pH	ORP*	TMP	F
A	7.0	750	78	X

5.1.7 Manual Feed

- Press and hold the DOWN arrow to manually feed pH for the programmed feed time. The word “pH” flashes during feed of pH.
- Press and hold the UP arrow to manually feed sanitizer for the programmed feed time. The word “ORP” flashes during feed of sanitizer.



5.1.8 Display Backlight

The display backlight is dimmed during normal operation to conserve life. It never goes out completely to allow for viewing in normally dark environments, such as, pump rooms. When any key is pressed it will brighten for a few minutes.

5.2 AT-8 Set Up

Before you begin programming your AT-8, you will want to set up the basic system in the set up menu. The set up menu will allow you to program the date and time in to the AT-8, program and or enter your password to access the controller, as well as view the serial number and software version specific to your controller.

Starting from the reading screen. Press the MENU button to scroll through the available sub-menus.

1	pH	ORP*	TMP	F
A	7.0	750	78	X

Press the MENU Button Again

10-May-06	14:48
PROGRAM SUBMENU	

Press the MENU Button Again

10-May-06	14:48
DATA SUBMENU	

Press SELECT to enter the AT-8 Setup submenu.

10-May-06	14:48
SETUP	

5.2.1 Set Date

When setting the date, a cursor will appear under the value (month, day or year) you are currently setting. To move the cursor between values, use the select key. Once you have placed the cursor under the value you wish to change, you are ready to set the date.

SET DATE	
M/D/Y	<u>05</u> /10/06

- To set the month, use the up and down arrows scroll through the numbers until the correct month is displayed. Press SELECT.
- To set the day, use the up and down arrows scroll through the numbers until the correct day is displayed. Press SELECT.
- To set the year, use the up and down arrows scroll through the numbers until the correct year is shown. Press the SELECT button to save your changes and advance to the next setup sub-menu: Set Time.

5.2.2 Set Time

When setting the time, a cursor will appear under the value (hour or minute) you are currently setting. To move the cursor between values, use the select key. Once you have placed the cursor under the value you wish to change, you are ready to set the time.

SET TIME	
HH:MM	1 <u>0</u> :34

- Using the up and down arrows scroll through the numbers until the correct hour (24hr) is displayed. Press SELECT.
- Using the up and down arrows scroll through the numbers until the correct minutes is displayed. Press SELECT.

5.2.3 Reset All Safety

This screen will allow you to reset all the safety or overfeed timers in your AT-8 units.

RESET ALL SAFETY NO
--

- Press SELECT.
- Use the up and down arrows to select either “yes” or “no”.
- YES will clear all system SAFETY LOCKOUT conditions and displayed “*”.
- Press SELECT to complete reset or go on.

5.2.4 Set # to Default

This screen will allow you to reset all of the settings in the current selected system back to factory default settings.

SET # TO DEFAULT NO
--

- Press SELECT.
- Use the up and down arrows to select either “yes” or “no”.
- YES will return the current selected systems system times, set points, alarms, and setup to the factory default settings.
- Press SELECT to complete reset or go on.

5.2.5 Serial Number

This displays the serial number of your AT-8 controller press SELECT to go on.

SERIAL NUMBER 0100 0001

5.2.6 AT-8 Software Version

This displays the software version used in your AT-8 controller, Press SELECT to go on.

SOFTWARE VERSION 1.6

5.2.7 Enter Password

ENTER PASSWORD

To enter a password in your AT-8 controller:

- Using the up and down arrows scroll through the numbers until the current password is displayed (factory default is "A"). Press SELECT to choose the character and move on to the next character in the sequence. Press SELECT again when your entire password is showing to enter the password in the controller.

To change the password in your AT-8 controller:

- Using the up and down arrows scroll through the numbers until the first letter, number or character of your new password appears. Press - SELECT to select the character and move on to the next character in the password sequence.
- Using the up and down arrows scroll through the numbers until the second letter, number or character of your new password appears. Press - SELECT to choose the character and move on to the next character in the password sequence.
- Repeat until your new password appears in full, you can use up to 6 numbers/letters. To finish press SELECT, to save your new password. The AT-8 will then return you to the readings screen.

5.3 pH Programming

To program your AT-8, you will need to enter the program sub menu.

Starting from the reading screen. Press the MENU button to scroll through the available sub-menus.

1	pH	ORP	TMP	F
A	7.0	750	78	X

Press the MENU Button again.

10-May-06	14:48
PROGRAM SUBMENU	

Press SELECT to enter the AT-8 Setup submenu.

You will need to enter your password before the AT-8 will allow you to enter the programming menu. For more information on passwords please see p. 24

Once you are in the programming menu, the AT-8 will ask you to select the system you wish to program.

SELECT SYSTEM #
1

- Using the UP and DOWN arrows to select system you would like to program, then press SELECT.

You will then need to select the control you wish to program. In this case, we are programming pH.

- Using the up and down arrows select pH, then press SELECT.

SELCT CONTROL 1
CONTROL: pH

5.3.1 Reading/ CAL # pH

Reading / CAL 1

pH : 2.5

- Displays the current calibrated reading of the pH
- If the reading needs to be corrected, use the up and down arrows to add or subtract the amount of calibration. For example, if your controller is reading 7.4 and your hand check is reading 7.5 press the up arrow one time to change the reading to 7.5

5.3.2 pH Sensor # Offset

pH SENSOR	1
-----------	---

Offset	0.0
--------	-----

- This shows you how much calibration you have on the probe. In the above example an uncalibrated probe that read 7.4, but was changed to read 7.5 will have an offset of 0.1. If the offset value gets to high it may be an indication of aged or malfunctioning probe.

NOTE: pH probes can only be calibrated +/- 0.9 units.

- Press – SELECT to save and go on or press MENU to not save and return to reading screen.

5.3.3 pH Setpoint #

pH SETPOINT	1
-------------	---

pH:	7.5	ACID
-----	-----	------

- Using the up and down arrows select the pH set point. This is the pH that your system will control to.
- Press – SELECT to save and go on or press MENU to not save and return to reading screen.

5.3.4 pH Acid/Base #

pH ACID/BASE	1
--------------	---

CHEMICAL: ACID

- Using the up and down arrows select the type of pH chemical that you will be feeding for pH control. Acid or Base.
- Press – SELECT to save and go on or press MENU to not save and return to reading screen.

5.3.5 pH Feed Cycle

pH FEED CYCLE	1
MINUTES :	2:00

- This is the total amount of time in minutes and seconds of your feed and mix cycle. Use the up and down arrows to adjust this time to accommodate your system. See FEED LIMIT below for example.
- Press – SELECT to save and go on or press MENU to not save and return to reading screen.

5.3.6 pH Feed Limit

pH FEED LIMIT	1
SECONDS :	15

- This is the amount of time in minutes and seconds that your feeder on time will be limited to during your FEED CYCLE #.
 - Using this command forces an off time during a feed cycle allowing for a mixing of the newly feed chemicals before the unit will feed again.
 - Using this feature is highly recommended.
 - For example: If you have a FEED CYCLE of 2:00 and a FEED LIMIT of 0:15.
 - You will feed for 15 seconds and then stay off for 1 minute and 45 seconds.
- Press – SELECT to save and go on or press MENU to not save and return to reading screen.

5.3.7 pH/ORP Delay

pH ORP DELAY	1
MINUTES:	1

- This feature was specifically designed for suction side sanitizer feeders. Setting a time in minutes here will keep the controller from feeding pH chemical directly after the sanitizer chemical has been fed, thus allowing time for the pH sensor to settle to a normal reading.

5.3.8 pH Feed Safety

pH FEED SAFETY	1
MINUTES:*	30

- This is the overfeed safety feature of the system. Determine the total amount of time you want your pH feeder to come on in a 24 hr period and enter it here. The 24 hr period starts when you power up your controller.
- If there is an asterisk "*" present then the safety has tripped and the relay will stay off until the 24 hour period has passed. If you press the up arrow and then the down arrow, the overfeed will be reset, and the asterisk will be removed.
- Press – SELECT to save and go on or press MENU to not save and return to reading

5.3.9 pH Low Alarm

pH LOW ALARM	1
pH :	7.2

- Use the up and down arrows to adjust the alarm for the low end of your desired pH range. This alarm will turn on the alarm light and make the pH reading flash.
- Alarm will clear within a minute of reading going back in range.
- Press – SELECT to save and go on or press MENU to not save and return to reading

5.3.10 pH High Alarm

pH HIGH ALARM	1
pH :	7.8

- Use the up and down arrows to adjust the alarm for the high end of your desired pH range.

This alarm will turn on the alarm light and make the pH reading flash.

- Alarm will clear within a minute of reading going back in range.
- Press – SELECT to save and go on or press MENU to not save and return to reading

5.3.11 pH Prop Feed

pH PROP FEED	1
PROP FEED:	ON

- Use the up and down button to turn this feature ON or OFF. Turning the proportional feed on will proportionately feed the pH chemical within a 0.3 pH range.

5.3.12 Serial Number

SERIAL NUMBER # 1
0200 0002

- This shows serial number of the relay board.
- Press – SELECT to go on or press MENU to return to reading screen.

5.3.13 SW Version

SW VERSION #1
1.2

- This shows software version of the relay board.
- Press – SELECT or MENU to return to reading screen.

5.4 ORP Programming

To program your AT-8, you will need to enter the program sub menu.

Starting from the reading screen. Press the MENU button to scroll through the available sub-menus.

1	pH	ORP	TMP	F
A	7.0	750	78	X

Press the MENU Button Again

10-May-06	14:48
PROGRAM SUBMENU	

press SELECT to enter the AT-8 Setup submenu.

You will need to enter your password before the AT-8 will allow you to enter the programming menu. For more information on passwords please see p. 24

Once you are in the programming menu, the AT-8 will ask you to select the system you wish to program.

SELECT SYSTEM # 1

- Using the UP and DOWN arrows to select system you would like to program, then press SELECT.

You will then need to select the control you wish to program. In this case, we are programming ORP.

- Using the up and down arrows to select control you wish to program. CT.

SELECT CONTROL 1 CONTROL: ORP

5.4.1 Reading/ CAL # ORP

- Displays the current calibrated reading of the ORP
- If the reading needs to be corrected, use the up and down arrows to add or subtract the amount of calibration. For example, if your controller is reading 690 and your hand check is reading 700 press the up arrow one time to change the reading to 700.

NOTE: ORP probes can only be calibrated +/- 125 units.

- Press – SELECT to save and go on or

5.4.2 ORP Sensor # Offset

ORP SENSOR	1
Offset	0.0

- This shows you how much calibration you have on the probe. In the above example an uncalibrated probe that read 690, but was changed to read 700 will have an offset of 10. If the offset value gets too high it may be an indication of aged or malfunctioning probe.

5.4.3 ORP Setpoint

ORP SETPOINT	1
ORP:	650

- Using the up and down arrows select the ORP set point. This is the ORP that your system will control to.

5.4.4 ORP Feed Cycle

ORP FEED CYCLE	1
MINUTES :	2:00

- This is the total amount of time in minutes and seconds of your feed and mix cycle. Use the up and down arrows to adjust this time to accommodate your system. See FEED LIMIT below for example.
- Press – SELECT to save and go on or press MENU to not save and return to reading

5.4.5 ORP Feed Limit

ORP FEED LIMIT	1
SECONDS :	15

- This is the amount of time in minutes and seconds that your feeder on time will be limited to during your FEED CYCLE #. Using this command forces an off time during a feed cycle allowing for a mixing of the newly feed chemicals before the unit will feed again. Using this feature is highly recommended. For example: If you have a FEED CYCLE of 2:00 and a FEED LIMIT of 0:15. You will feed for 15 seconds and then stay off for 1 minute and

5.4.6 ORP Feed Safety

ORP FEED SAFETY	1
MINUTES:*	30

- This is the overfeed safety feature of the system. Determine the total amount of time you want your ORP feeder to come on in a 24 hr period and enter it here. The 24 hr period starts when you power up your controller.
- If there is an asterisk "*" present then the safety has tripped and the relay will stay off until the 24 hour period has passed. If you press the up arrow and then the down arrow, the overfeed will be reset, and the asterisk will be removed.

5.4.7 ORP Off if pH

ORP OFF IF pH	1
Above:	7.5

- ORP is affected by the pH of the water. This allows the controller to disable the ORP feed if the pH of the water hits or goes above this pH value.
- Press – SELECT to save and go on or press MENU to not save and return to reading screen.

5.4.8 ORP Low Alarm

ORP LOW ALARM	1
ORP :	600

- Use the up and down arrows to adjust the alarm for the low end of your desired pH range. This alarm will turn on the alarm light and make the ORP reading flash.
- Alarm will clear within a minute of reading going back in range.
- Press – SELECT to save and go on or press MENU to not save and return to reading

5.4.9 ORP High Alarm

ORP HIGH ALARM	1
ORP :	850

- Use the up and down arrows to adjust the alarm for the high end of your desired pH range. This alarm will turn on the alarm light and make the ORP reading flash.
- Alarm will clear within a minute of reading going back in range.
- Press – SELECT to save and go on or

5.4.10 ORP Prop Feed

ORP PROP FEED	1
PROP FEED:	ON

- Use the up and down button to turn this feature ON or OFF.
Turning the proportional feed on will proportionately feed the pH chemical within a 30 ORP range.
- Press – SELECT to save and go on or press MENU to not save and return to reading screen.

5.4.11 Serial Number

SERIAL NUMBER # 1
0200 0002

- This shows serial number of the relay board.
- Press – SELECT to go on or press MENU to return to reading screen.

5.4.12 SW Version

SW VERSION #1
1.2

- This shows software version of the relay board.
- Press – SELECT or MENU to return to reading screen.

5.5 Temperature Programming

To program your AT-8, you will need to enter the program sub menu.

Starting from the reading screen. Press the MENU button to scroll through the available sub-menus.

1	pH	ORP	TMP	F
A	7.0	750	78	X

Press the MENU Button Again

10-May-06	14:48
PROGRAM SUBMENU	

press SELECT to enter the AT-8 Setup submenu.

You will need to enter your password before the AT-8 will allow you to enter the programming menu. For more information on passwords please see p. 24

Once you are in the programming menu, the AT-8 will ask you to select the system you wish to program.

SELECT SYSTEM #
1

- Using the UP and DOWN arrows to select system you would like to program, then press SELECT.

You will then need to select the control you wish to program. In this case, we are programming ORP.

- Using the up and down arrows to select control you would like to program, then press SELECT.

SELECT CONTROL 1
CONTROL: TEMP

5.5.1 Reading/ CAL # Temperature

Reading / CAL 1
TEMP : 18

- Displays the current calibrated reading of the ORP
- If the reading needs to be corrected, use the up and down arrows to add or subtract the amount of calibration. For example, if your controller is reading 68 and your hand check

is

NOTE: pH probes can only be calibrated +/- 50 units.

- Press – SELECT to save and go on or press MENU to not save and return to reading screen.

5.5.2 Temperature Sensor # Offset

TEMP SENSOR	1
Offset	0.0

- the
- This shows you how much calibration you have on the probe. In the above example an uncalibrated probe that read 68, but was changed to read 70 will have an offset of 2. If the offset value gets to high it may be an indication of aged or malfunctioning probe.
 - Press – SELECT to go on or

5.5.3 Temperature Units

TEMP UNITS	1
FAHRENHEIT	

- Use the up and down arrows to toggle between CELSIUS and FAHRENHEIT.
- Press – SELECT to save and go on or press MENU to not save and return to reading screen.

5.5.4 Temperature Low Alarm

TEMP LOW ALARM	1
TEMP :	15

- range.
flash.
- Use the up and down arrows to adjust the alarm for the low end of your desired pH range. This alarm will turn on the alarm light and make the TEMP reading flash.
 - Alarm will clear within a minute of reading going back in range.
 - Press – SELECT to save and go on or

5.5.5 Temperature High Alarm

TEMP HIGH ALARM	1
TEMP :	40

- Use the up and down arrows to adjust the alarm for the high end of your desired pH range.
This alarm will turn on the alarm light and make the TEMP reading flash.
- Alarm will clear within a minute of reading going back in range.
- Press – SELECT to save and go on or press MENU to not save and return to reading screen.

5.5.6 Serial Number

SERIAL NUMBER # 1
0200 0002

- This shows serial number of the relay board.
- Press – SELECT to go on or press MENU to return to reading screen.

5.5.7 SW Version

SW VERSION #1
1.2

- This shows software version of the relay board.
- Press – SELECT or MENU to return to reading screen.

5.6 Data Submenu

Before you begin programming your AT-8, you will want to set up the basic system in the set up menu. The set up menu will allow you to program the date and time in to the AT-8, program and or enter your password to access the controller, as well as view the serial number and software ver-

Starting from the reading screen. Press the MENU button to scroll through the available sub-menus.

1	pH	ORP	TMP	F
A	7.0	750	78	X

Press the MENU Button Again

10-May-06	14:48
PROGRAM SUBMENU	

press SELECT to enter the AT-8 Data submenu.

10-May-06	14:48
DATA SUBMENU	

5.6.1 Data Logging - Rate

DATA LOGGING
RATE : 5 MIN

- Using the up and down arrows to select the rate at which to collect data. The choices are 1 minutes, 5 minutes, 15 minutes, 30 minutes, 1 hour, and 12 hours.
- Press – SELECT to save and go on or press MENU to not save and return to reading screen.

5.6.2 Current Log Size

CURRENT LOG SIZE
8419 OF 2048

- Displays the number of lines of data that have been recorded and the total amount available. This screen is helpful to know when the data is full and starting to scroll around.

5.6.3 Log Contents

This allows viewing of the stored data.

LOG CONTENTS ARROWS TO REVIEW

Use the UP arrow to scroll from the oldest to the newest record and DOWN arrow to scroll from the newest to the oldest.

- FORMAT

TOP LINE: # MMDDYY HH:MM C

= unit number for this record.

MM = month, DD = day, YY = Year, date for record.

HH = hour, MM = minute, time of record.

C = appears if a configuration change occurred.

BOTTOM LINE: FOPT ORP pH Temp

F = appears if there was flow.

O = appears if there was an ORP alarm.

P = appears if there was a pH alarm.

T = appears if there was a Temperature alarm.

ORP = the ORP reading.

pH = the pH reading.

Temp = the temperature reading.

- When you reach the end of the log you will go on to the next screen.
- Press – SELECT to go on or press MENU to return to reading screen.

5.6.4 Reset Data Log

RESET LOG NO

- Use the up and down arrows to select either “yes” or “no”. YES will clear all data from the log when you press SELECT.
- Press – SELECT or press MENU to return to reading screen.
- If the data log is not reset, the data will continue to write over the existing data, oldest entry first.

CHAPTER 6 MAINTENANCE

5.1 Calibration Maintenance

Periodically a hand check of the systems water must be performed to compare against the readings of the controller. Use an AcuCheck 3 or a professional test kit and if needed perform a calibration.

5.2 Sensor Cleaning

Important:

AT-8 Sensors are a precision instrument and must be clean to perform to specification. Periodically the sensors should be cleaned with a soft towel or a toothbrush using a mild liquid soap. The use of chemicals to clean the sensor can damage sensors and is not covered under warranty.

CHAPTER 7 TROUBLESHOOTING

6.1.1 Readings are Fluctuating

- Check the flow in the flow cell. The flow sensor magnet should be just making contact with the flow sensor. Too much flow can cause inaccurate readings and decrease sensor life.

- Check the pressure in the flow cell. The flow Cell should always have a positive pressure

6.1.2 Feeders Won't Turn On

- Check for asterisk "*" in front of reading.
- "*" means feed safety limits are activated and maybe set to low.
- Increase the Feed Safety limits on the AT-8.
- Check to make sure the Flow is on in the flow cell and it is being displayed as "on" in the AT- 8.

- If there is no flow indicated check the circulation system and that the wires are securely fastened in the AT-8.

- Unplug to reset the controller.

- If controller starts feeding the feed safety limits are set to low.

6.1.3 Controller is Overfeeding

- Double check readings with hand check and calibrate if necessary.

- Check feeders to make sure they are not stuck on

- Turn the feed limit down on the AT-8.

6.1.3 Controller is Underfeeding

- Check feeders to make sure they are in proper operation

- Check and make sure feeders have chemicals

- Increase feed limit on the AT-8.

6.1.4 The System is not Recognizing all the AT-A8's on the Bus

- Check the address settings on each AT-8. See Address Setup section

- Check all cables between units.

6.1.5 Green Power LED is Flashing

- This indicates a loss of bus communication

- Check all cables between units, replace any damaged cables.

- If there was a shorted or damaged cable the bus fuse maybe blown and need replace-

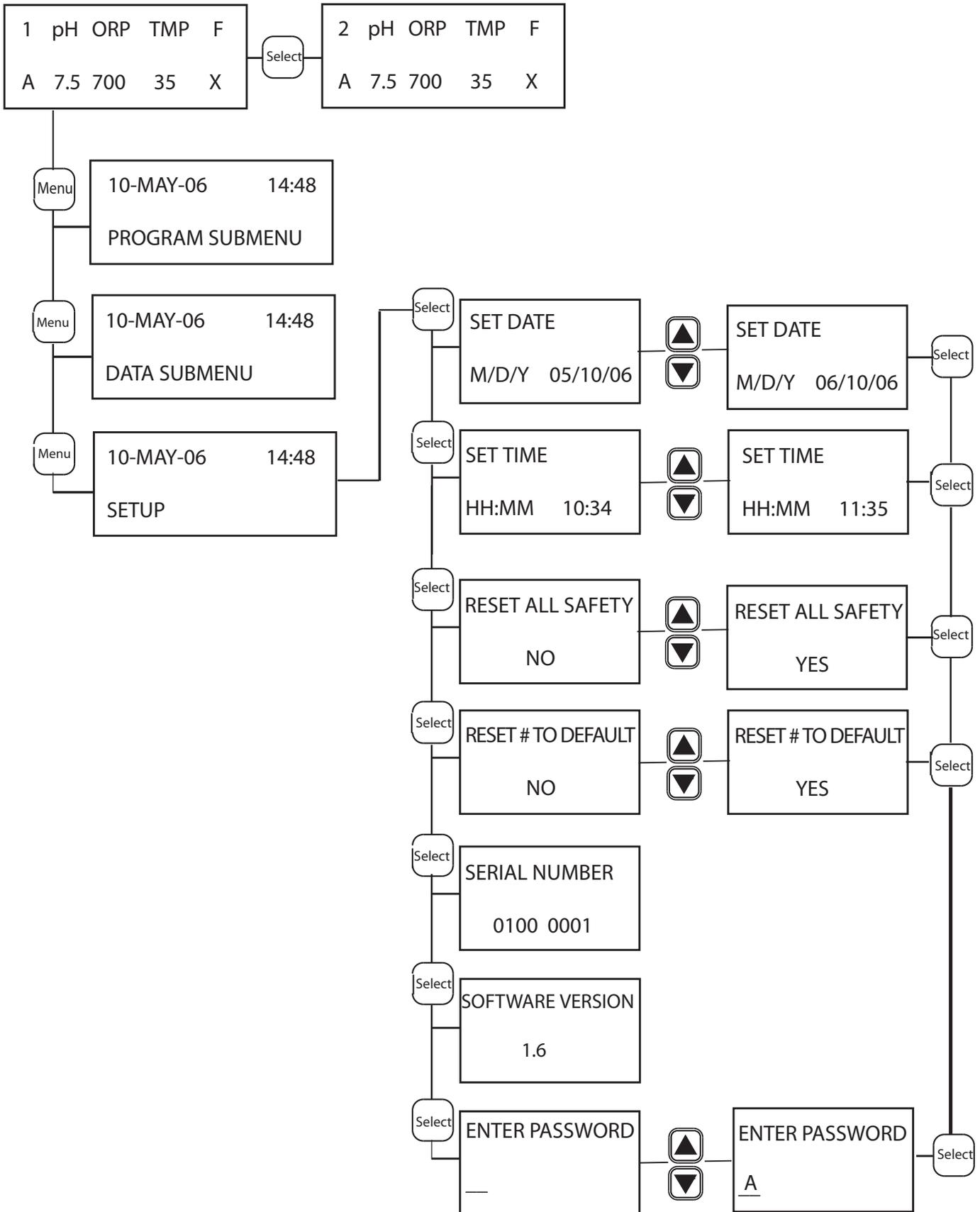
6.1.6 Red LED Light is Flashing

- This indicates pH, ORP, or TEMP past alarm set point. It will stop flashing when sensor reading is back in range.

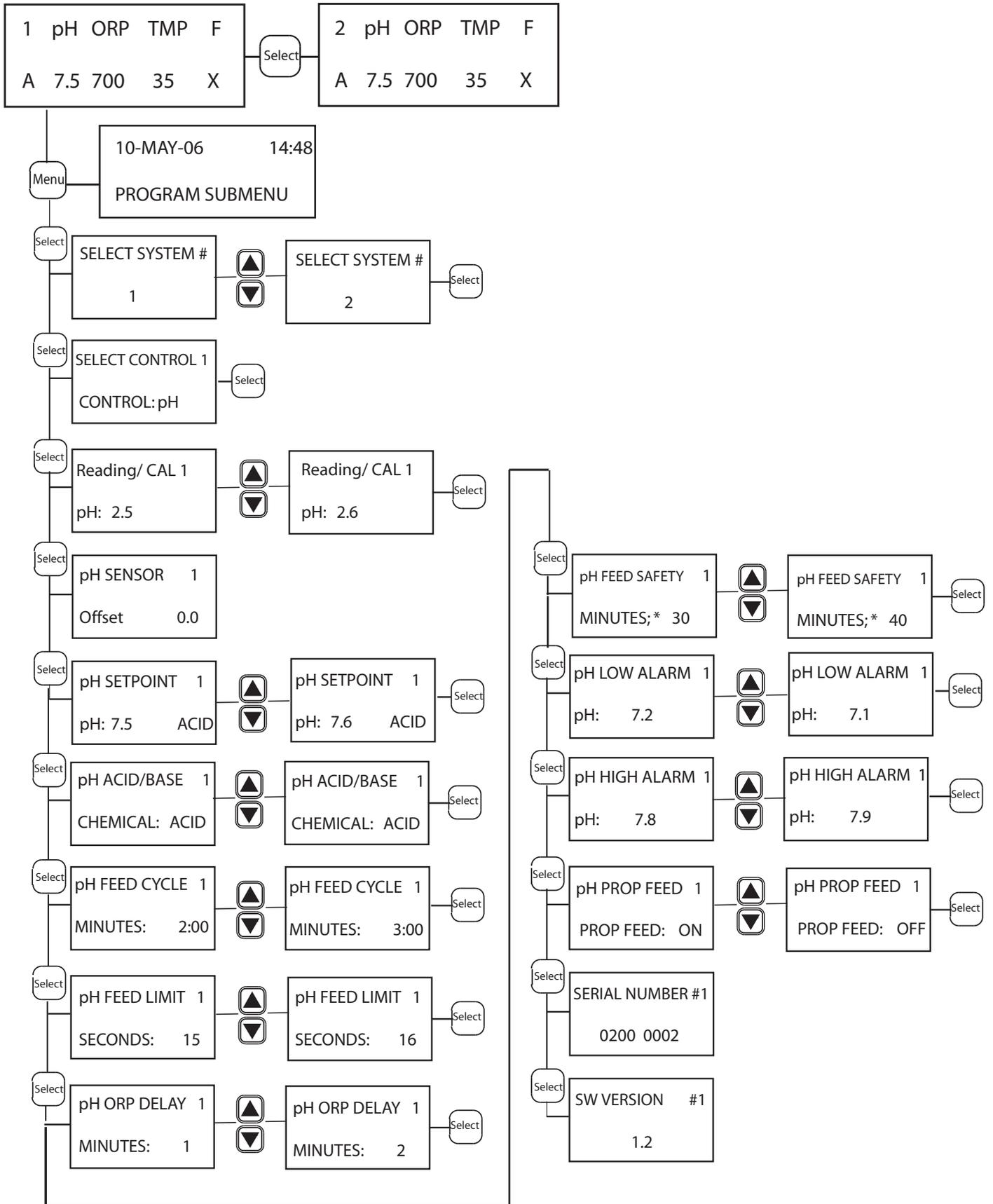
- This also indicates a pH or ORP Feed Safety Limit violation has occurred. This will only stop after the 24 hour period has passed or the power to the control unit is turn off and then on again.

CHAPTER 8 MENU TREE

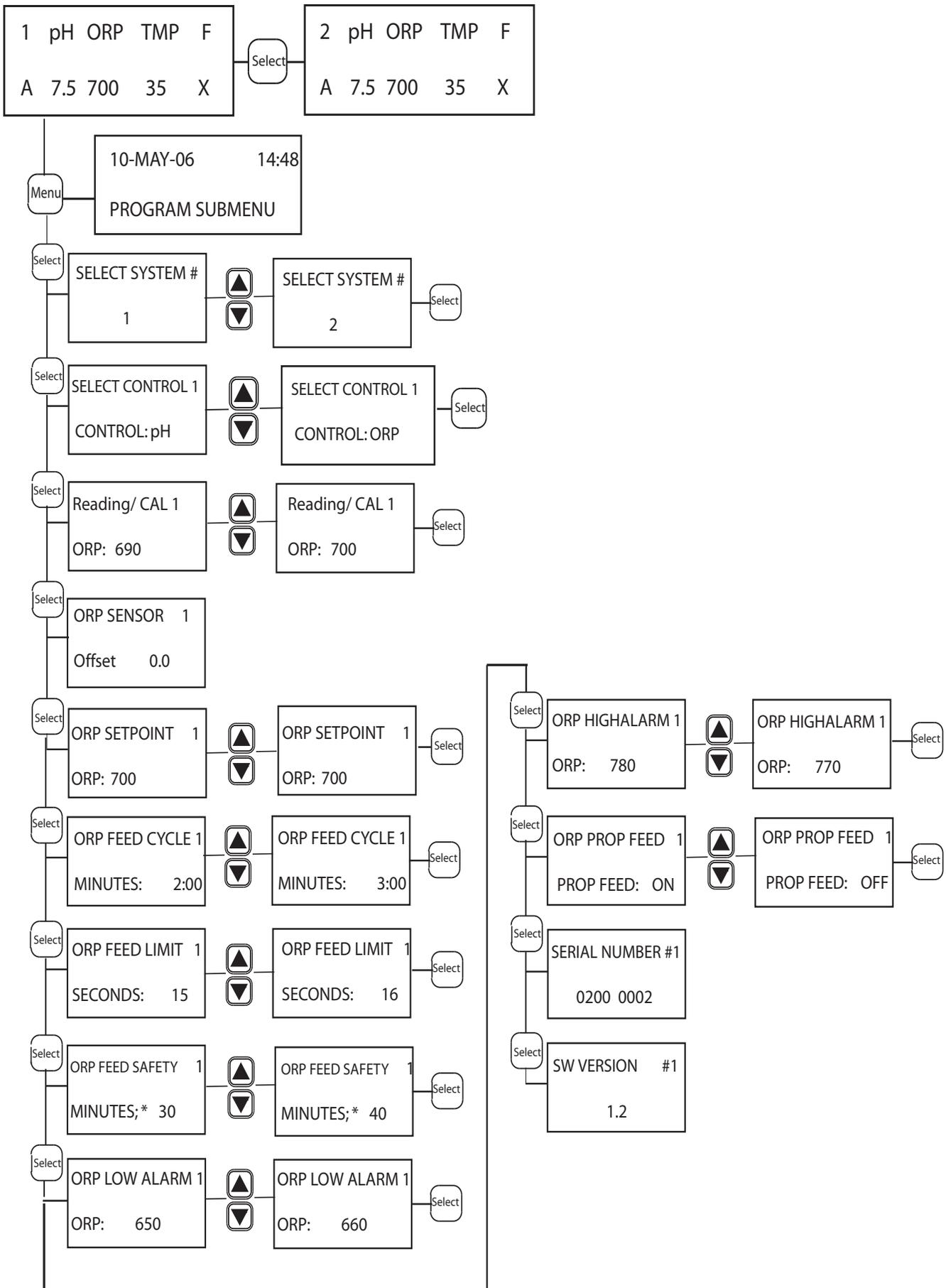
AT-8 and AT-8S Menu Tree- SET UP



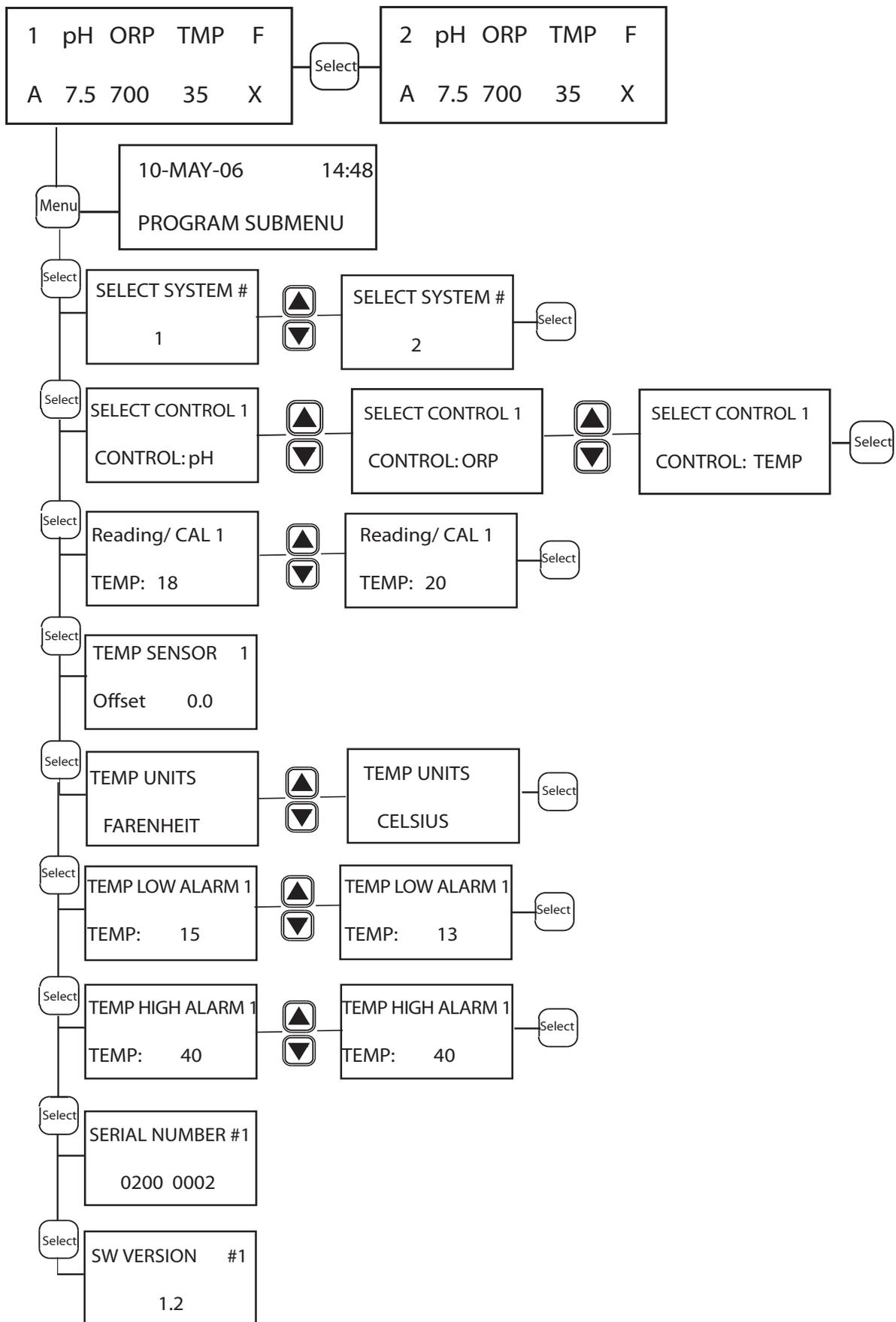
AT-8 and AT-8S Menu Tree- pH Programming



AT-8 and AT-8S Menu Tree- pH Programming



AT-8 and AT-8S Menu Tree- Temperature Programming



AT-8 and AT-8S Menu Tree- Data Log Programming

