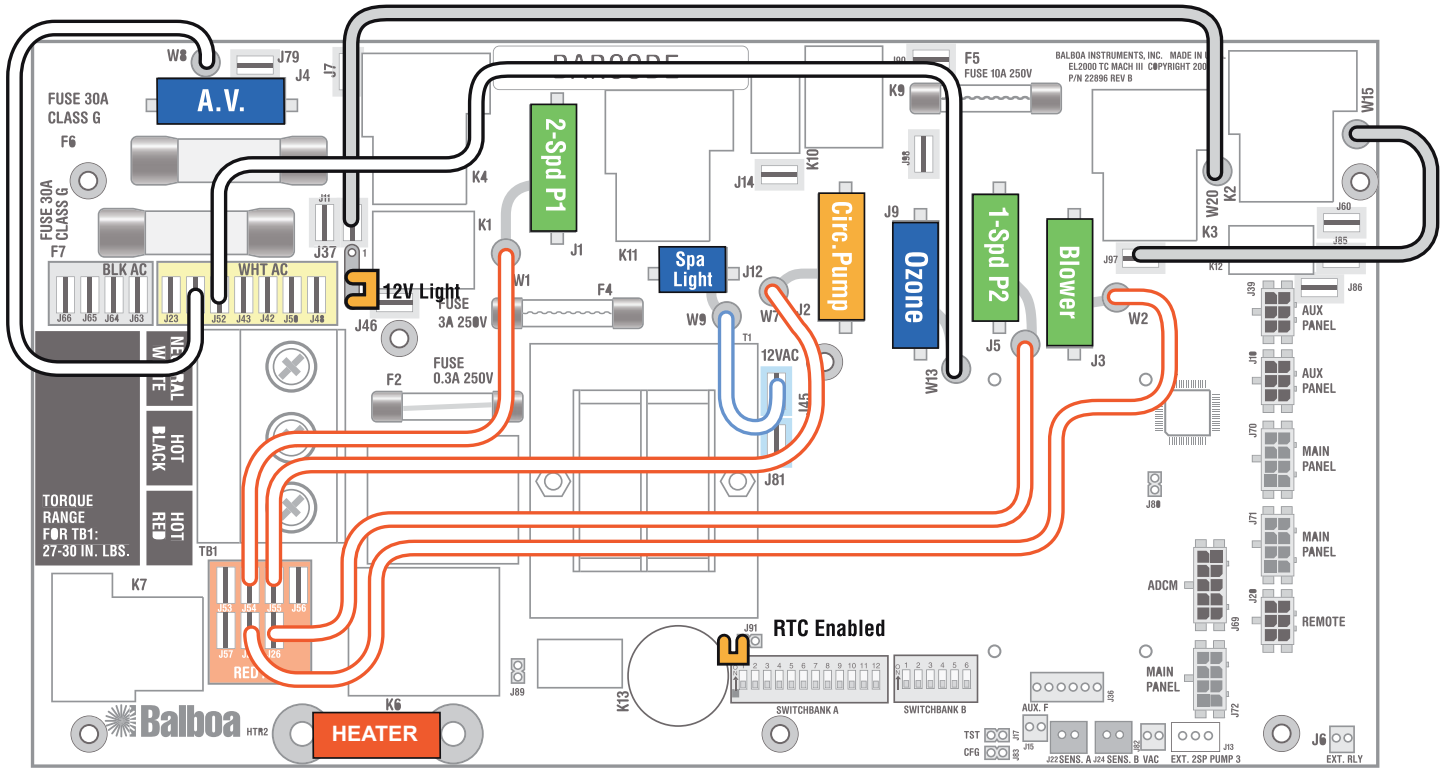
EL2000 M3 Wiring Configuration and DIP Settings

Setup (As Shipped)

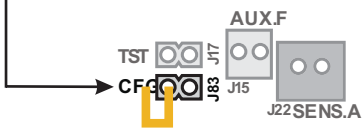
- 240V Pump 1, 2-Speed
- 240V Pump 2, 2-Speed
- 240V Blower
- 120V Ozone
- 12V Spa Light
- 120V A/V (Stereo)
- 240V Heater
- 120V Circ Pump (Optional)
- Support “ML” Series Panels



J83 NOTE: IF JUMPED DIP SWITCHES WILL NOT WORK.

PLEASE ASSURE J83 IS NOT JUMPED

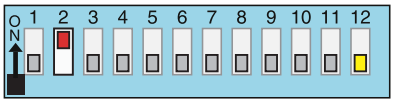
WARNING: *Main Power to system should be turned OFF BEFORE adjusting DIP switches.*
WARNING: *Persistent Memory (A12) must be RESET to allow new DIP switch settings to take effect. (See Persistent Memory page)*



When the Logic Jumper is not installed on J83 (CFG), DIP Switch Settings are enabled. DIP Switches will then operate as shown below.

SSID #
100
114
32

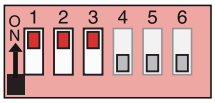
Switchbank A



A1, Test Mode OFF
A2, High Amp
A3, Filter by Time
A4, 12 Hr Time
A5, Degrees F
A6, Short Timeouts

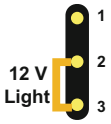
A7, Cleanup Cycle OFF
A8, 1Hr O_3 Supress OFF
A9/A10, No Circ Pump
A11, O_3 w/ P1 Low and P1 is 2-Spd
A12, Memory Retained

Switchbank B



B1, Pump 2 1-Speed
B2, Pump 2 Enabled
B3, Blower Enabled
B4, No Fiber/Wheel
B5, Pump 3 Disabled
B6, Panel Scrunching OFF

J37

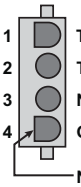


J91

Wiring Color Key

- 120 Volt Connections
- 240 Volt Connections
- Black AC Jumpers
- 12 Volt Connections
- Relay Control Wires

Board Connector Key



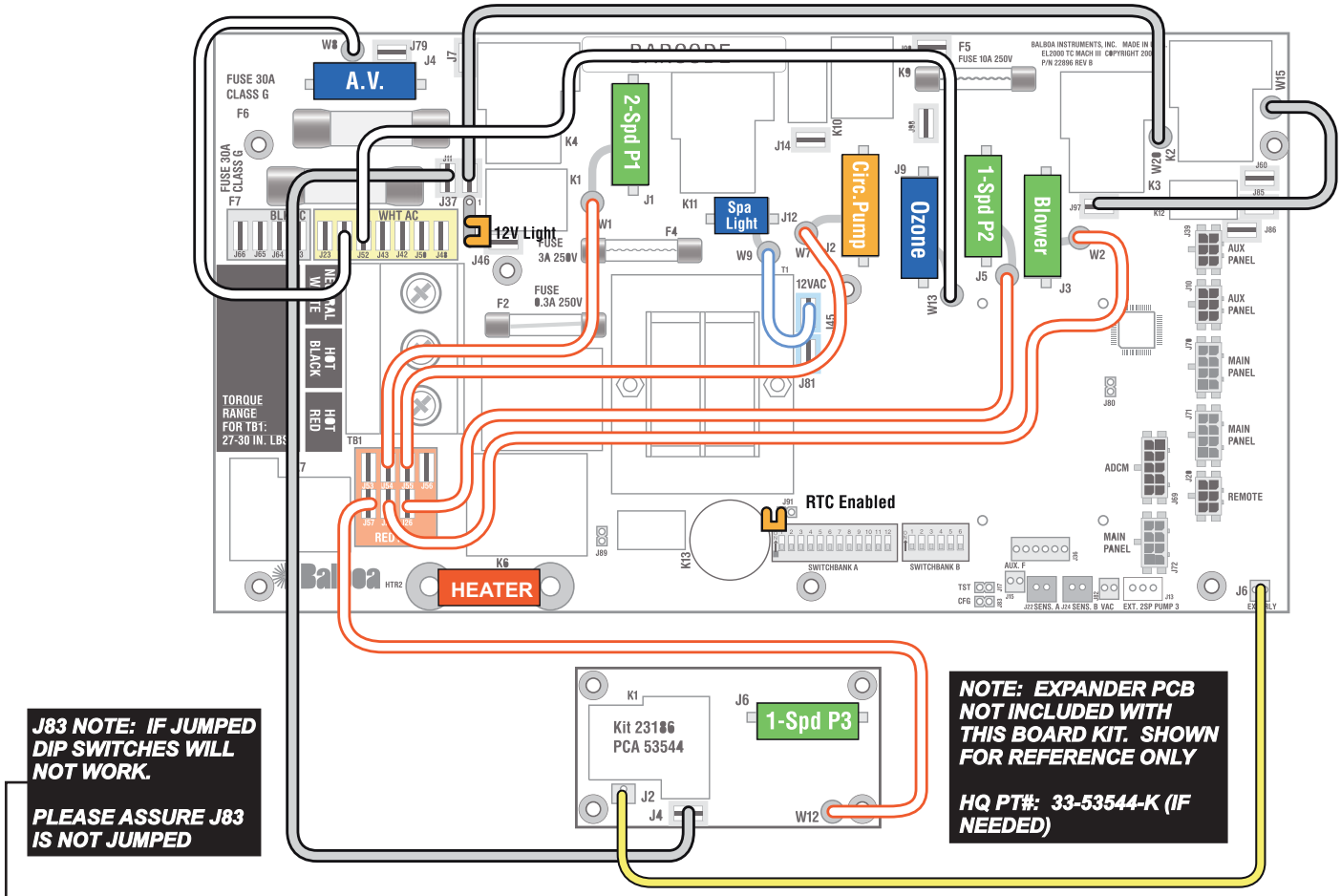
1 Typically Line voltage
2 Typically Line voltage for 2-speed pumps
3 Neutral (Common)
4 Ground

Note flat sides in connector

EL2001 M3 Wiring Configuration and DIP Settings

Setup (As Shipped)

- 240V Pump 1, 2-Speed
- 240V Pump 2, 2-Speed
- 240V Pump 3, 1-Speed
- 240V Blower
- 120V Ozone
- 12V Spa Light
- 120V A/V (Stereo)
- 240V Heater
- 120V Circ Pump (Optional)
- Support “ML” Series Panels



J83 NOTE: IF JUMPED DIP SWITCHES WILL NOT WORK.

PLEASE ASSURE J83 IS NOT JUMPED

NOTE: EXPANDER PCB NOT INCLUDED WITH THIS BOARD KIT. SHOWN FOR REFERENCE ONLY

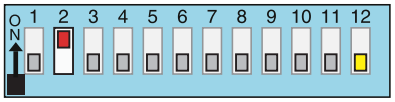
HQ PT#: 33-53544-K (IF NEEDED)

WARNING: *Main Power to system should be turned OFF BEFORE adjusting DIP switches.*
WARNING: *Persistent Memory (A12) must be RESET to allow new DIP switch settings to take effect. (See Persistent Memory page)*

When the Logic Jumper is not installed on J83 (CFG), DIP Switch Settings are enabled.
DIP Switches will then operate as shown below.

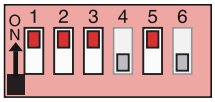
SSID #
100
114
32

Switchbank A



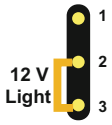
A1, Test Mode OFF
A2, High Amp
A3, Filter by Time
A4, 12 Hr Time
A5, Degrees F
A6, Short Timeouts
A7, Cleanup Cycle OFF
A8, 1Hr O_3 Supress OFF
A9/A10, No Circ Pump
A11, O_3 w/ P1 Low and P1 is 2-Spd
A12, Memory Retained

Switchbank B



B1, Pump 2 1-Speed
B2, Pump 2 Enabled
B3, Blower Enabled
B4, No Fiber/Wheel
B5, Pump 3 Enabled
B6, Panel Scrunching OFF

J37

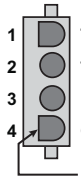


J91

Wiring Color Key

- 120 Volt Connections
- 240 Volt Connections
- Black AC Jumpers
- 12 Volt Connections
- Relay Control Wires

Board Connector Key



1 Typically Line voltage
2 Typically Line voltage for 2-speed pumps
3 Neutral (Common)
4 Ground

Note flat sides in connector

DIP Switches and Jumpers Definitions

WARNING:
- Setting DIP switches incorrectly may cause abnormal system behavior and/or damage to system components.
- Refer to Switchbank illustration on Wiring Configuration page for correct settings for this system.
- Contact Balboa if you require additional configuration pages added to this tech sheet.

DIP Switchbank A Key

A1 . . . . . T est Mode (normally Off)

A2 . . . . . In "ON" position, heater can run while any/all high-speed pumps or blowers are running (High amperage)

. . . . . In "OFF" position, heater is disabled while any high-speed pump or blower is running (Low amperage)

A3 . . . . . In "ON" position, filter cycles are programmed by duration for non-time capable panels

. . . . . In "OFF" position, filter cycles are programmed to start and end times for time capable panels

A4* . . . . . In "ON" position, displays time in 24 hours (military\European time)

. . . . . In "OFF" position, displays 12 hour time

A5* . . . . . In "ON" position, displays temperature in Celsius

. . . . . In "OFF" position, displays temperature in Fahrenheit

* Sets default for user preferences - only applies when persistent memory is reset (A12 On) during power-up

A6 . . . . . In "ON" position, Equipment timeout 30 minutes (4 hours for Pump 1-Low)

. . . . . In "OFF" position, Equipment timeout 15 minutes (2 hours for Pump 1-Low)

A7 . . . . . In "ON" position, Cleanup Cycle – 30 minutes after spa use/timeout, Pump 1-Low & Ozone or Circ Pump and Ozone run for 1 hour

. . . . . In "OFF" position, no Cleanup Cycle

A8 . . . . . In "ON" position, Ozone suppression for one hour after pump/blower button press

A9 and A10. . . . . See **Table** for Circ Pump Behavior settings

A11 . . . . . In "ON" position
(non-circ mode operation) Pump 1 is two-speed, Ozone is ON in Filter & Cleanup Cycles only
(in any circ mode) Pump 1 is one-speed, Ozone is ON with circ pump

. . . . . In "OFF" position
(non-circ mode operation) Pump 1 is two-speed, Ozone is ON with Pump 1-Low
(in any circ mode) Pump 1 is two-speed, Ozone is ON with circ pump

A12 . . . . . Persistent memory reset (normally off) (used when spa is powering up)

A9	A10	Circ Pump Behavior
OFF	OFF	No Circ Pump or Circ Pump not plumbed w/heater
ON	OFF	24 Hours
OFF	ON	24 Hr w/3°F Shut-Off
ON	ON	Acts like Pump 1-Low (Filter Cycles, Polls)

DIP Switchbank B Key

B1 . . . . . In "ON" position, single-speed Pump 2

. . . . . In "OFF" position, two-speed Pump 2

B2 . . . . . In "ON" position, Pump 2 enabled

. . . . . In "OFF" position, Pump 2 disabled

B3 . . . . . In "ON" position, Blower enabled

. . . . . In "OFF" position, Blower disabled

B4 . . . . . In "ON" position, Fiber and Wheel instead of Spa Light
(if A9 & A10 are both OFF, Fiber uses J2 connector; if either A9 or A10 is ON, X-FOW Kit required to run Fiber)

. . . . . In "OFF" position, Spa light enabled

B5 . . . . . In "ON" position, Pump 3 enabled (Jets 3 replaces Blower on Aux panel)

. . . . . In "OFF" position, Pump 3 disabled

B6 . . . . . In "ON" position, Alternate Panel layout (ML900 scrunching enabled - ML550 / 700 Jets 3 replaces Blower)

. . . . . In "OFF" position, Normal Panel layout

Jumpers

J37 Jumper on Pins 1 and 2 will power one leg of J12 (Spa Light) at 120 Volts AC.
Jumper on Pins 2 and 3 will power one leg of J12 (Spa Light) at 12 Volts AC.
Note: W9 controls voltage on the other leg of J12 and must be set for the same voltage.

J91 Jumper on 1 Pin only enables Real Time Clock function; use with time capable panels.
Jumper on Pins 1 and 2 disables RTC function; use with non-time capable panels.

Temp Set (80°F - 104°F / 26.0°C - 40.0°C)

The last measured temperature is constantly displayed on the LCD. Your spa's set temperature range may vary from range shown above depending on your manufacturer's settings.

Note that the last measured spa temperature displayed is current only when the pump has been running for at least 1 minute.

Cool/Warm  

Press the "Cool" or "Warm" button once to display the set temperature. Each time either button is pressed again, the set temperature will increase or decrease depending on which button is pressed. After three seconds, the LCD will automatically display the last measured spa temperature.

Mode 

This button is used to switch between Standard, Economy, and Sleep modes. Press "Mode" to enter mode programming, press "Cool" to cycle through to desired mode (LCD flashes until confirmed), then press "Mode" to confirm selection.

Standard mode maintains the desired temperature. Note that the last measured spa temperature displayed is current only when the pump has been running for at least 1 minute. " Std" will appear on the display momentarily when you switch into Standard Mode.

Economy mode heats the spa to the set temperature only during filter cycles. " Ecn" will appear solid when the temperature is not current a nd will alternate with the temperature when the temperature is current.

Pressing "Jets 1" while in Economy mode puts the spa in Standard-In-Economy mode, ("SE") which operates the same as Standard Mode, then reverts to Economy Mode automatically after 1 hour. During this time, pressing "Cool" or "Warm" followed by "Light" will revert the mode to Economy immediately.

Sleep mode heats the spa to within 20°F (11°C) of the set temperature only during filter cycles. " SLP" will appear on the display until mode is changed.

Standby Mode

Pressing "Cool" or "Warm" followed by "Blower" or "Jets 2" or "Aux" will turn off all spa functions temporarily. This is helpful when changing a filter. Pressing any button exits Standby mode. On some systems the "Jets 1" button will control the pump in Standby Mode ("Drain Mode"). In this case, press any other button to exit. System will revert to previous mode after 1 hour.

Jets 1 

Press the "Jets 1" button once to turn pump 1 on or off, and to shift between low and high speeds if equipped. If left running, the pump will turn off after a timeout period. The pump 1 low speed timeout on some systems may be as long as 4 hours.

On non-circ systems, the low speed of pump 1 runs when the blower or any other pump is on. It may also activate for at least 1 minute every 30 minutes to detect the spa temperature (polling) and then to heat to the set temperature if needed, depending upon mode. When the low speed turns on automatically, it cannot be deactivated from the panel; however, the high speed may be started.

Jets 2  (optional on some systems)

Press the "Jets 2" button once to turn pump 2 on or off, and to shift between low and high speeds if it is a two-speed pump. If left running, the pump will turn off after a timeout period.

Blower 

1-speed operation: on/off;
2-speed operation: med/hi/off; or
3-speed operation: lo/med/hi/off.
If left on, the blower will automatically turn off after a timeout period.

Note: If your system does not have a "Blower" button, and is labeled as "Jets 3" instead, please see page 9 "Jets 3".

Light 

Some systems are equipped with both a spa light and a fiber optic light; however, only one can be accessed by this panel. (Larger panels may be purchased so that both the spa light and fiber optic light can be utilized.) Depending upon how your spa is equipped and configured, the "Light" button will operate in one of three ways:

1) Press the "Light" button to turn the spa light on and off, and to shift between dim and bright settings if your light is dimmable.

2) If a fiber-optic light with wheel is installed, press the "Light" button once to start the light and wheel, press it again to stop the wheel, and then again to turn the light off.

3) If a fiber-optic light without a separate wheel stop is installed, press the "Light" button to turn it on and off.

Again, both a spa light and a fiber optic light may be used simultaneously on the EL8000 and EL5000 systems with a different panel.

If any light is left on, it will automatically turn off after a factory programmed time period.

Preset Filter Cycles

On all systems, the pump and the ozone generator will run during filtration. At the start of each filter cycle, the blower will run briefly on its highest speed to purge the air channels. The lowest speed of any other pumps and the mister will also run briefly. On some circ systems, pump 1 may also run for the duration of the filter.

(Note: This panel cannot be used to program filter cycles for systems that are programmed by time rather than by duration. For these systems, a larger panel is needed and the following description does not apply.)

The first filter cycle ("day") begins 6 minutes after the spa is powered up. The second filter cycle ("night") begins 12 hours later. Filter duration is programmable for 1-12 hours ("F 1"-"F 12"). The default filter duration can vary from system to system. To program, press "Cool" or "Warm," then "Jets 1." Press "Cool" or "Warm" to select the filter duration. Press "Jets 1" to select the number of filter cycles. The display will show " dn" (both "day" and "night" cycles); " d" (day cycle only); or " n" ("night" cycle only). Press "Cool" or "Warm" to adjust, then press "Jets 1" to exit the prog ramming mode. For continuous filtration, use "F 12" and "dn".

Freeze Protection

If the temperature sensors within the heater detect a low enough temperature, then the pump(s) and the blower automatically activate to provide freeze protection. The pump(s) and blower will run either continuously or periodically depending on conditions.

In colder climates, an optional additional freeze sensor may be added to protect against freeze conditions that may not be sensed by the standard sensors. Auxiliary freeze sensor protection acts similarly except with the temperature thresholds determined by the switch. See your dealer for details.

Locking Features

If this panel is used as the main panel, locking features will not be available.

If this panel is used as a remote or additional panel, it will lock when the main panel is locked. To unlock this panel, unlock the main panel.

In the same way, the set temperature can be locked and unlocked by a main panel. When the set temperature is locked, it cannot be changed from either panel.

Clean-up Cycle (optional)

When a pump or blower is turned on by a button press, a clean-up cycle begins 30 minutes after the pump or blower is turned off or times out. The pump and the ozone generator will run for one to four hours, depending on the system (on some systems, you can change this setting; see User Preferences section.)

Circ Pump (optional)

If your system is equipped with a circ pump, it may be configured to work in on e of three different ways:

1) The circ pump operates continuously (24 hours) with the exception of turning off for 30 minutes at a time when the water temperature reaches 3°F (1.5°C) above the set temperature (most likely to happen in very hot climates).

2) The circ pump stays on continuously, regardless of water temperature.

3) The circ pump will come on when the system is checking temperature (polling), during filter cycles, during freeze conditions, or when another pump is on.

Ozone (optional)

On most systems, the ozone generator (if installed) runs during filter cycles (except when pump 1 is operating at high speed on a non-circ system) and during clean-up cycles. On some systems, the ozone generator operates whenever the pump runs.

If your system is configured with the optional ozone suppress feature, the ozone generator will turn off for 1 hour any time a function button (Jets 1, Jets 2, Blower, etc.) is pressed.

Note: If your spa has additional functions not listed here, please refer to the section Optional Auxiliary Panels as listed in the Table of Contents.

Displaying Information About Your Spa

There are several pieces of information about your spa that can be called up from the panel, but are only needed in special cases.

To access this information, press "Cool" or "Warm" then "Jets 1", then "Light". (Each press must be within 3 seconds of the previous press.) Then press "Cool" until you see "SSID" on the display. Press "Jets 1" to see the SSID (a series of 3 numbers, such as 100 133 10, which indicates the precise revision of the software in your spa), followed by the Mach software version number (such as 2.1), followed by "CSN" and then your spa's network ID number (consisting of both letters and digits displayed in 5 steps).

If you need to see this series of numbers again, and "SSID" is once again on the display, just press "Jets 1" again.

When done, press the "Light" button (more than once if necessary) until you see the normal temperature display.

User Preferences

There are several aspects of spa operation that you can customize using the User Preferences submenu.

Press "Cool" or "Warm" then "Jets 1", then "Light". (Each press must be within 3 seconds of the previous press.) At this point, if "USR" is not showing on the display, press "Cool" until you see "USR" on the display. Then press "Jets 1" to enter the User Preferences submenu.

Once in the User Preferences submenu, press "Cool" or "Warm" to cycle between these settings:

SR – Suppress Reminders
When set to "SR.Y", reminders are never displayed on the panel. When set to "SR.N", reminders are displayed on the panel periodically.

tC – Temperature in Celsius
When set to "tC.Y", temperatures are displayed on the panel in degrees Celsius. When set to "tC.N", temperatures are displayed in Fahrenheit.

24 – 24-hour Time Display
When set to "24.Y", time is displayed in 24-hour (military) format (00:00 is midnight, 23:00 is one hour before midnight). When set to "24.N", time is displayed in 12-hour (am/pm) format (12:00 is midnight, 11:00 pm is one hour before midnight).

CC – Clean-up Cycle Duration (some systems only)
When set to "CC.0", Clean-up Cycles are disabled. When set to "CC. 1" through "CC.4", the number indicates how many hours each Clean-up Cycle will run.

Ad – Dolphin II Address
When set to "Ad.0", no addressing is used. Use this setting for a Dolphin I, or for a Dolphin II which is set for no address (which is the Dolphin II factory default). When set to "Ad. 1" through "Ad.7", the number is the address (see your Dolphin II manual for details).

Editing User Preferences

View the setting.

The left two characters (before the decimal point) tell you what setting you're viewing or editing, the right most character (after the decimal point) tells you the value of that setting (for example, ".Y" for Yes or ".h" for No).

If the value is flashing, you're editing it. If the value is not flashing, you're just viewing it.

Press "Jets 1" to switch edit ing of the value on (flashing) or off (not flashing).

Once you're editing the value (it's flashing), use the "Cool" or "Warm" buttons to change the value to the one you want.

After you change the value, you must press "Jets 1" again to stop the flashing before the change will register, and before you can view or edit another setting.

If you don't interact with the menu for more than 30 seconds, it may time out.

If you press "Light" to back out of the menu, or pause long enough for it to time out, while a value was flashing, the changes you we re making to that setting are not remembered. But c hanges you previously made to other settings will be in effect.

Any User Preferences that you change will stay in effect "forever" or until you change them again (unless the spa's "persistent memory" is reset by a service technician), and will override the factory defaults for those settings.

Diagnostic Messages

Message	Meaning	Action Required
	No message on display. Power has been cut of to the spa.	The control panel will be disabled until power returns. Time of day will be preserved for 30 days with a battery back-up on EL8000 and EL5000 systems. EL1000 and some EL2000 systems reset the time of day on each power-up. Spa settings are preserved on all systems.
OHH	"Overheat" - The spa has shut down. [1] On some systems, an alarm may sound. One of the sensors has detected 118°F (approximately 47.8°C) at the heater.	DO NOT ENTER THE WATER. Remove the spa cover and allow water to cool. Once the heater has cooled, reset by pushing any button. If spa does not reset, shut of the power to the spa and call your dealer or service organization.
OHS	"Overheat" - The spa has shut down. [1] One of the sensors has detected that the spa water is 110°F (approximately 43.3°C).	DO NOT ENTER THE WATER. Remove the spa cover and allow water to cool. At 107°F (approximately 41.7°C), the spa should automatically reset. If spa does not reset, shut of the power to the spa and call your dealer or service organization.
ICE	"Ice" - Potential freeze condition detected.	No action required. The pumps and the blower will automatically activate regardless of spa status.
SnA	Spa is shut down. [1] The sensor that is plugged into the Sensor "A" jack is not working.	If the problem persists, contact your dealer or service organization. (May appear temporarily in an overheat situation and disappear when the heater cools.)
Snb	Spa is shut down. [1] The sensor that is plugged into the Sensor "B" jack is not working.	If the problem persists, contact your dealer or service organization. (May appear temporarily in an overheat situation and disappear when the heater cools.)
SnS	Sensors are out of balance. If this is alternating with the temperature, it may just be a temporary condition. If the display shows only this message (periodically blinking), the spa is shut down. [1]	If the problem persists, contact your dealer or service organization.
HFL	A substantial diference between the temperature sensors was detected. This could indicate a low problem.	Check water level in spa. Reill if necessary. If the water level is okay, make sure the pumps have been primed. Press any button to reset.
LF	Persistent low low problems. (Displays on the ifth occurrence of the "HFL" message within 24 hours.) Heater is shut down, but other spa functions continue to run normally.	Follow action required for "HFL" message. Heating capacity of the spa will not reset automatically; you may press any button to reset.
dr	Inadequate water detected in heater.	Check water level in spa. Reill if necessary. If the water level is okay, make sure the pumps have been primed. Press any button to reset.
drY	Inadequate water detected in heater. (Displays on third occurrence of "dr" message.) Spa is shut down. [1]	Follow action required for "dr" message. Spa will not automatically reset; you may press any button to reset.
Pr	When your spa is irst actuated, it will go into Priming mode.	See the M-7 Installation Instruction Manual for complete instructions on Power-up and Pump Priming. The Priming mode will last for up to 4 minutes and then the spa will begin to heat and maintain the water temperature in the Standard mode.

[1] On some systems even when spa is shut down, some equipment may occasionally turn on to continue monitoring temperature or if freeze protection is needed.

Diagnostic Messages (continued)

Message	Meaning	Action Required
--F	Temperature unknown.	After the pump has been running for 1 minute, the temperature will be displayed.
---	Temperature not current in Economy or Sleep mode.	In Economy or Sleep mode, the pump may be of for hours outside a ilter. If you wish to see the current spa temperature, either switch to Standard mode or turn Jets 1 on for at least 1 minute.
Sby	Standby Mode has been activated by pressing a button combination on the user panel.	Press any button, except "Jets 1", to leave Standby Mode and return to normal operation.
Std	The spa is operating in Standard Mode.	Temperature display is current after pump has been running for at least 2 minutes.
Ecn	The spa is operating in Economy Mode.	"Ecn" will appear solid on the display when the temperature is not current. " Ecn" will alternate with the temperature when the te mperature is current.
SE	The spa is operating in Standard-in-Economy Mode.	Operates the same as Standard mode, then reverts to Economy mode after 1 hour. Press "Mode" to switch directly to Economy mode.
SLP	Sleep Mode has been activated by pressing a button combination on the user panel.	"SLP" will appear solid on the display when the temperature is not current. " SLP" will alternate with the temperature when the temperature is current.
PHL	pH is low.	Add pH increaser according to manufacturer's instructions.
PHH	pH is high.	Add pH reducer according to manufacturer's instructions.
SAL	Sanitizer is low.	Add sanitizer according to manufacturer's instructions.
SAH	Sanitizer is high.	Remove spa cover and allow sanitizer to dissipate.
drn	The pump is on during Standby Mode to assist in draining the spa.	Press "Jets 1" to turn of the pump when water has drained (or power of the spa.)
rtC	Hardware failure.	Contact your dealer or service organization.
PSt	Hardware failure.	Contact your dealer or service organization if message appears on more than one power up.
Cr C	Firmware install problem.	Contact your dealer or service organization if message appears on more than one power up.
CFE	Coniguration error. Spa cannot start up.	Contact your dealer or service organization.
GF 1	Spa could not trip GFCI.	Contact your dealer or service organization. Continued operation may be unsafe.
StU	A pump appears to be stuck on, causing the water temperature to creep up, possibly to hazardous levels.	POWER DOWN SPA IMMEDIATELY. DO NOT ENTER THE WATER. Contact your dealer or service organization.
HOt	A pump appears to have been stuck on the last time spa was powered.	POWER DOWN SPA IMMEDIATELY. DO NOT ENTER THE WATER. Contact your dealer or service organization.

Optional Auxiliary Panels

Note: Below is a partial list of optional auxiliary panels and their basic functions.
Please contact for local dealer for a complete list of options that will work with your spa.

Jets 3, Jets 4 (optional on some systems)

Press the "Jets 3" button once to turn pump 3 on or off, and to shift between low and high speeds if it is a two-speed pump. If left running, the pump will turn off after a timeout period. "Jets 4" operates the same way as "Jets 3".

Jets 5, Jets 6 (optional on some systems)

Press the "Jets 5" button once to turn pump 5 on or off. If left running, the pump will turn off after a timeout period. "Jets 6" operates the same way as "Jets 5".

Mister (optional)

Press the "Mister" button to turn the Mister on and off. If left on, the mister will automatically turn off after 15 minutes.

Option (optional)

Press the "Option" button to turn optional equipment (such as TV or Stereo) on and off (with no timeout).

TV Lift (optional)

Press the "TV Lift" button to raise and lower the TV Lift device. There is no timeout for this feature.

Fiber (optional on some systems)

If a fiber-optic light with wheel is installed, press the "Fiber" button once to start the light and wheel, press it again to stop the wheel, and then again to turn the light off. The fiber icon stands still when the fiber-optic light is on by itself, and rotates when the color wheel is also on.

Both spa light and fiber-optic light can be used simultaneously on systems that have both. If either light is left on, it will automatically turn off after a timeout period (on some systems this timeout can be as long as 4 hours.)

Use the "Light" button if your fiber-optic system is on/off only (no separate wheel stop).

Stir (optional on some systems)

Press the "Stir" button after adding new chemicals into the spa. This will turn all pumps on at high-speed for 5 minutes to thoroughly mix in the chemicals.