

MS5100SE Tech Sheet

Customer: Master Spas
Part Number: 56123-01
Custom Box Overlay
Box Overlay Part Number _____

System Model: GL2-MS5100SE-RCA-3.0K
Software Version (SSID): 100 119 40
File Name: 10011940_MS5100SE.hex
Software Configured
Configuration Signature: D8D2FBF8

Eng. Project Number: 3776

Base PCBA: 56124-01
Bare Board: 22898 Rev B, C, or D



Control Panels Listed on Last Page.

System Revision History

Part #	EPN	Date	Originator	Changes Made
56123	3493	11-04-10	Customer	Update MS5000E to use Configuration Settings with Minimal Filtration
56123	3493	05-12-11	Customer	Update to release software version 40 (which includes Heater Disable via J82 "VAC"). Update to default to 1 hr cleanup cycle.
56123	3776	01-12-12	Customer	Fix wiring diagram mistakes and set DIP Switch A2 to OFF

Manufactured under one or more of these patents. U.S. Patents: 5332944, 5361215, 5550753, 5559720, 5,883,459, 6253227, 6282370, 6590188, 6976052, 6965815, 7030343, 7,417,834 b2, Canadian Patent: 2342614, Australian patent: 2373248 other patents both foreign and domestic applied for and pending. © Copyright 2009 Balboa Water Group.



Basic Functions

Electrical Service Requirements:

Single Service [3 wires (line, neutral, ground)]

230VAC, 50Hz, 1p, 32A, (Circuit Breaker rating = 40A max.)

Dual Service [5 wires (line 1, neutral 1, line 2, neutral 2, ground)]

230VAC, 50Hz, 1p, 2x 16A, (Circuit Breaker rating = 20A max each service.)

3-Service [5 wires (line 1, line 2, line 3, neutral, ground)]

400VAC, 50Hz, 3Np, 16A, (Circuit Breaker rating = 20A max each phase line.)

IMPORTANT - Service must include a neutral wire, with a line to neutral voltage of 230VAC.

System Outputs – Setup 1 (As Manufactured):

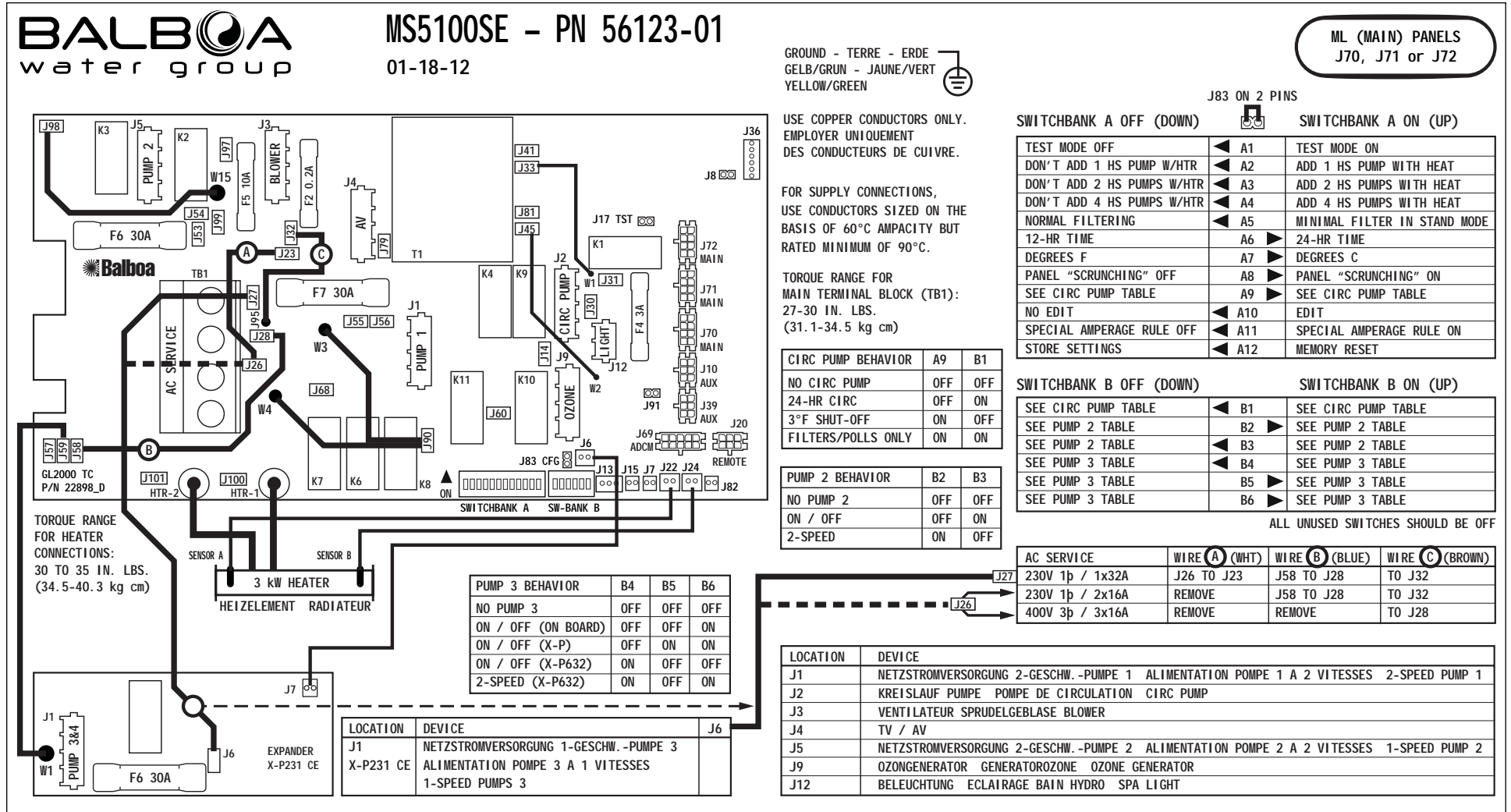
Pump 1	12A max	<input checked="" type="checkbox"/> 230 VAC	<input checked="" type="checkbox"/> 2-Speed	<input type="checkbox"/> 1-Speed	<input type="checkbox"/> Disabled
		2-hour timer for Low Speed, 15 minutes for High Speed			
Pump 2	12A max	<input checked="" type="checkbox"/> 230 VAC	<input checked="" type="checkbox"/> 2-Speed	<input type="checkbox"/> 1-Speed	<input type="checkbox"/> Disabled
		15-minute timer			
Pump 3	12A max	<input checked="" type="checkbox"/> 230 VAC	<input type="checkbox"/> 2-Speed	<input checked="" type="checkbox"/> 1-Speed	<input type="checkbox"/> Disabled
		15-minute timer			
Blower	8A max	<input type="checkbox"/> 230 VAC		<input type="checkbox"/> 1-Speed	<input checked="" type="checkbox"/> Disabled
		15-minute timer			
Circ Pump	2A max	<input checked="" type="checkbox"/> 230 VAC			<input type="checkbox"/> Disabled
Ozone	1A max	<input checked="" type="checkbox"/> 230 VAC			<input type="checkbox"/> Disabled
Spa Light	1A max	<input checked="" type="checkbox"/> 10 VAC			<input type="checkbox"/> Disabled
		4-hour timer			
Light 2	4A max	<input type="checkbox"/> 230 VAC	<input type="checkbox"/> 10 VAC		<input checked="" type="checkbox"/> Disabled
		4-hour timer			
A/V Stereo	6A max	<input checked="" type="checkbox"/> 230 VAC			<input type="checkbox"/> Disabled
		Hot output. Fused equipment or in-line fuse required.			
Heater	23A max	<input checked="" type="checkbox"/> 230 VAC	<input checked="" type="checkbox"/> 3.0 kW		<input type="checkbox"/> _____kW

Additional Options:

- Full-featured Dolphin Remote
- Spa-only Dolphin Remote
- Infrared Dolphin IR Receiver Modules –
Connect to Remote plug on circuit board: **J20**

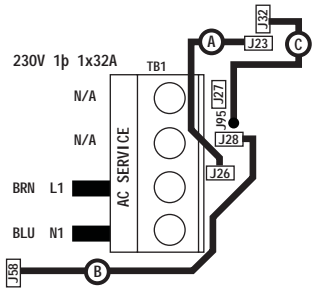
Hardware Setup

Settings (Software Configured)

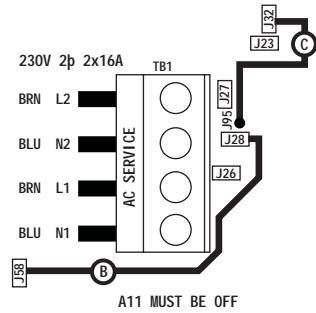


GL2000 Electrical Service Configuration Options

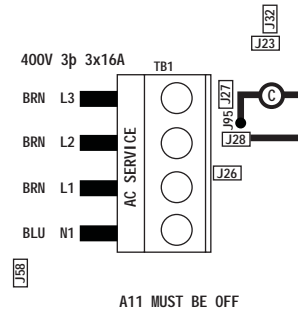
Single Service (1x32A)



Dual Service (2x16A)

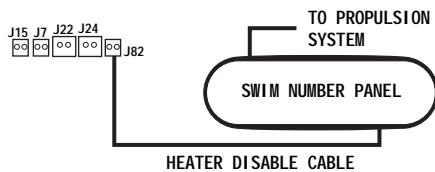


3-Service (3x16A)



AC SERVICE	WIRE (A) (WHT)	WIRE (B) (BLUE)	WIRE (C) (BROWN)
230V 1p / 1x32A	J26 TO J23	J58 TO J28	TO J32
230V 1p / 2x16A	REMOVE	J58 TO J28	TO J32
400V 3p / 3x16A	REMOVE	REMOVE	TO J28

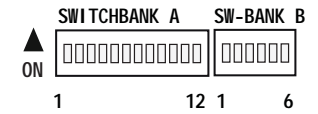
Swim Number Panel Connections



DIP Switch Functions (CFG J83 ON)

Fixed-function DIP Switches

- A1 Test Mode (normally Off).
- A2 In "ON" position, add one high-speed pump (or blower) with Heater.
- A3 In "ON" position, add two high-speed pumps (or 1 HS Pump and Blower) with Heater.
- A4 In "ON" position, add four high-speed pumps (or 3 HS Pumps and Blower) with Heater.
- A10 When switched ON when spa is on, system will enter the Edit Menu for Configuration Setting.
Do not start spa with A10 turned on or CFE error will occur.
*CFE errors are illegal configurations such as: a pump and a blower set to run on the same output.
 The configuration must be corrected before the spa will operate.*
- A11 In "ON" position, enables Special Amperage Rule, see "SA" in Software Configuration section for functionality with your system.
 In "OFF" position, disables Special Amperage Rule.
- A12 Persistent memory reset (Used when the spa is powering up to restore factory settings as determined by software configuration).



A2, A3, and A4 work in combination to determine the number of high-speed devices and blowers that can run before the heat is disabled. i.e. A2 and A3 in the ON position and A4 in the OFF position will allow the heater to operate with up to 3 high-speed pumps (or two HS Pumps and Blower) running at the same time. Heat is disabled when the fourth high-speed pump or blower is turned on.

Note: A2/A3/A4 all off = No heat with any high-speed pump or blower.

Assignable DIP Switches

- A5 In "ON" position, Minimal Filtration
 In "OFF" position, Normal Filtration
- A6 In "ON" position, Panel Scrunching
- A9 & B1 See Table 1, Circ Pump Behavior
- B2 & B3 See Table 2, Pump 2 Behavior
- B4, B5, B6 See Table 3, Pump 3 Behavior





Table #1		Circ Pump Behavior
A9	B1	
OFF	OFF	No Circ Pump
OFF	ON	24 Hr
ON	OFF	24 Hr w/3° Shutoff
ON	ON	Acts like P1 Low (Filter Cycles, Polls)

Table #2		Pump 2 Behavior
B2	B3	
OFF	OFF	No Pump 2
OFF	ON	1-Speed
ON	OFF	2-Speed

Table #3			Pump 3 Behavior
B4	B5	B6	
OFF	OFF	OFF	No Pump 3
OFF	OFF	ON	1-Speed (Main Board)
OFF	ON	ON	1-Speed (X-P231 or X-P)
ON	OFF	OFF	1-Speed (X-P632 Board)
ON	OFF	ON	2-Speed (X-P632 Board)

Undesignated switches are not assigned a function.

Jumper Definitions


J8	Jumper on Pins 1 only allows use of a 2.0kW heater. Jumper on Pins 1 and 2 will allow use of a 3.0 kW heater.	J8 
J91	Jumper on 1 Pin only enables Real Time Clock function, for use with time-capable panels. Jumper on Pins 1 and 2 will disable RTC function, for use with non-time-capable panels.	J91 
J17	Test Jumper - Do Not Use	J17 
J15	Aux Temp Sensor (Freeze Sensor) connection	J15 

Warning!

Setting DIP switches or jumpers 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.

GL2000 Configuration Settings

Filtration Features

Fd	Program Filter Cycles by Duration	<input type="checkbox"/> n <input checked="" type="checkbox"/> Y <input type="checkbox"/> _ (J91 Must be set accordingly. See page 7) n = Start and stop times – for time capable panels; Y = Duration – for non-time capable panels; _ = 1 DIP Switch	→ J91 
Fi	Pump 1 in Filter (w/Circ Pump)	<input type="checkbox"/> n <input checked="" type="checkbox"/> Y (This feature is used in Circ Mode only.) <i>Allows Pump 1 Low to operate in Filter Cycles and Cleanup Cycles to add extra filtration.</i> n = Normal; Y = Pump 1 with Circ	
FQ	Minimal Filtering	<input type="checkbox"/> n <input checked="" type="checkbox"/> Y <input type="checkbox"/> _ <i>Use only with a uniquely dedicated filter system/pump, or if depending on Cleanup Cycles for filtration.</i> n = Normal Filtering; Y = Minimal filtering in Standard Mode; _ = 1 DIP Switch	

General Features

24	24-Hour Time	<input type="checkbox"/> n <input checked="" type="checkbox"/> Y <input type="checkbox"/> _ <i>Sets default for user preferences - only applies when persistent memory is reset (A12 On) during power-up.</i> n = 12-hour (am/pm); Y = 24-hour (military\European); _ = 1 DIP Switch	
tC	Celsius	<input type="checkbox"/> n <input checked="" type="checkbox"/> Y <input type="checkbox"/> _ <i>Sets default for user preferences - only applies when persistent memory is reset (A12 On) during power-up</i> n = Fahrenheit; Y = Celsius; _ = 1 DIP Switch	
tO	Timeouts	1 <input checked="" type="checkbox"/> F 2 3 4 5 6 1-6 = 10, 20, 30, 40, 50, 60 minutes; F = 15 minutes	
1t	Pump 1 Low Timeout	d 1 <input checked="" type="checkbox"/> 2 3 4 _ d = Use "Timeouts" value above; 1-4 = number of hours; _ = 3 DIP Switch Combination	
Lt	Light Timeout	d 1 2 3 <input checked="" type="checkbox"/> 4 d = Use "Timeouts" value above; 1-4 = number of hours	
Sc	Alternate Panel Layout (Scrunch)	<input type="checkbox"/> n <input checked="" type="checkbox"/> Y <input type="checkbox"/> _ n = Normal panel layout; Y = Alternate panel layout (ML900 scrunching enabled - ML550/700 Jets 3 replaces Blower); _ = 1 DIP Switch	

GL2000 Configuration Settings

Circ Pump, Jet Pumps and Blower

CL	Circ Type (behavior)	n A 3 P <input type="checkbox"/>	n = Non circ or circ pump not plumbed with heater; A = 24-hour; 3 = 24-hour with 3°F shutoff outside filter; P = Acts like Pump 1 Low (filter cycles, polls, etc.); <input type="checkbox"/> = 2 DIP Switch Combination
P1	Pump 1 Speeds	1 <input type="checkbox"/> 2 <input type="checkbox"/>	1 = 1 speed; 2 = 2 speed; <input type="checkbox"/> = 1 DIP Switch
P2	Pump 2 Speeds	0 1 2 <input type="checkbox"/>	0 = Disabled; 1 = On/Off on; 2 = 2 speed; <input type="checkbox"/> = 2 DIP Switch
P3	Pump 3 Speeds	0 1 E H L <input type="checkbox"/>	0 = Disabled; 1 = On/Off on board; E = External X-P or X-P231 board H = On/Off on pin 1 of X-P632 board; L = 2 speed on X-P632 board; <input type="checkbox"/> = 3 DIP Switch
P4	Pump 4 Speeds	<input type="checkbox"/> 1 H L <input type="checkbox"/>	0 = Disabled; 1 = On/Off on External X-P or X-P231 board; H = On/Off on pin 1 of X-P632 board; L = 2 speed on X-P632 board; <input type="checkbox"/> = 3 DIP Switch
P5	Pump 5 Speeds	<input type="checkbox"/> L <input type="checkbox"/>	0 = Disabled; L = On/Off on pin 2 of X-P632 board; <input type="checkbox"/> = 2 DIP Switch
BL	Blower Speeds	<input type="checkbox"/> 1 2 3 <input type="checkbox"/>	Note: Options 2 and 3 required X-TB board. 0 = Disabled; 1 = On/Off; 2 = 2 speeds; 3 = 3 speeds; <input type="checkbox"/> = 2 DIP Switch combination

GL2000 Configuration Settings

Lighting Control

F0 **Fiber Optics / Light 2** n Y o _
 n = Disabled; Y = Light and Wheel Enabled; o = On/Off only. Light 2 enabled on J7 (*see note below);
 _ = 2 DIP Switch combination

*When **F0** is set to **Y** and **ck** is set to **n**, then Fiber uses the J2 connector on the main PCBA.

*When **F0** is set to **Y** and **ck** is NOT set to **n**, then Fiber requires X-FOW Kit to be installed.

Mist/Water Features

15 **Mister 1** n Y _
 n = Mister Disabled; Y = Mister Enabled on J9; _ = 1 DIP Switch

12 **Mister 2** n Y _
 n = Mister Disabled; Y = Mister Enabled on pin 1 of X-P632 board; _ = 1 DIP Switch

13 **Mister 3** n Y _
 n = Mister Disabled; Y = Mister Enabled on pin 2 of X-P632 board; _ = 1 DIP Switch

14 **Mister 4** n Y _
 n = Mister Disabled; Y = Mister Enabled on J3; _ = 1 DIP Switch

Misc (Non-Water, Non-Lighting) Feature

02 **Option 2*** n Y P _
 n = Disabled; Y/P = Enabled on "alarm" relay; _ = 2 DIP Switch Combination

03 **Option 3*** n Y P _
 n = Disabled; Y/P = Enabled on pin 1 of X-P632 board; _ = 2 DIP Switch Combination

04 **Option 4*** n Y P _
 n = Disabled; Y/P = Enabled on pin 2 of X-P632 board; _ = 2 DIP Switch Combination

*Note: Options 2-4: Y = On/Off w/no timeout (toggle) mode; P = Pulse (momentary) mode

GL2000 Configuration Settings

Cleanup Cycles

- CC Cleanup Cycles** 0 2 3 4 _
Sets default for user preferences - only applies when persistent memory is reset (A12 On) during power-up.
 0 = Disabled; 1-4 = Number of hours; _ = 3 DIP Switch Combination
-
- CU Cleanup Cycles as User Preference** n
 n = Only in Configuration Settings; Y = End user may over-ride via User Preferences

Ozone

- o3 Ozone Operation** F _
 A= Operates with Heater Pump (Pump 1 Low or Circ Pump);
 F = Operates in Filter and Cleanup Cycles only; _ = 1 DIP Switch
-
- o5 Ozone Suppression** n _
 n = No Suppress; Y = 1-hour suppress on button press; _ = 1 DIP Switch
-
- oI Ozone Icon** n Y
 n = Disabled; Y = Enabled ; U = Controlled by UV input

Divide and Stir

- dI Divide** 2 3 _
Divides pumps between Spa Pumps and Swim Pumps. A button press turning on any Swim Pump, at any speed, shuts off the heater and all Spa Pumps (including circ pump, if used).
 n = No Divide; 2 = Pumps 2 and above are swim pumps; 3 = Pumps 3 and above are swim pumps; _ = 2 DIP Switches
-
- SP Stir Pump Group** 2 3 4 _
Determines what group of pumps the Stir Button turns on (at high-speed).
 A = All Pumps; 2 = Pumps 2 and up; 3 = Pumps 3 and up; 4 = Pumps 4 and up; _ = 2 DIP Switches
-
- SD Stir Duration** 1 F 2 3 4 5 6 t
Determines the timeout for the Stir Button.
 1 = 10 minutes; F = 15 minutes; 2 = 20 minutes; 3 = 30 minutes;
 4 = 40 minutes; 5 = 50 minutes; 6 = 60 minutes; E = 5 minutes; t = 2 minutes

GL2000 Configuration Settings

Auxiliary Button Mapping

A1	Aux Button 1 – Configuration A	1	2	3	4	5	6	b	g	F	E	o	t	d	P	n	A	U	r	0	H	9	L	8	7
A2	Aux Button 2 – Configuration A	1	2	3	4	5	6	b	g	F	E	o	t	d	P	n	A	U	r	0	H	9	L	8	7
A3	Aux Button 3 – Configuration A	1	2	3	4	5	6	b	g	F	E	o	t	d	P	n	A	U	r	0	H	9	L	8	7
A4	Aux Button 4 – Configuration A	1	2	3	4	5	6	b	g	F	E	o	t	d	P	n	A	U	r	0	H	9	L	8	7

1-6 = Assigns Pump (Pump 1, Pump 2, etc); b = Blower; g = Spa Light; F = Fiber-Optic / Light 2; E = EitherLight; o = Option 1; t = Mister 1; d = Mister 2/Cool; P = Mister 3/Elec Heat; n = Ext Heat; A = Sound Mode Select; U = Button Disabled; r = Air Valve; 0 = Option 2; H = Option 3; 9 = Invert; L = Option 4; 8 = Stir; 7 = Option 5

b1	Aux Button 1 – Configuration B	1	2	3	4	5	6	b	g	F	E	o	t	d	P	n	A	U	r	0	H	9	L	8	7
b2	Aux Button 2 – Configuration B	1	2	3	4	5	6	b	g	F	E	o	t	d	P	n	A	U	r	0	H	9	L	8	7
b3	Aux Button 3 – Configuration B	1	2	3	4	5	6	b	g	F	E	o	t	d	P	n	A	U	r	0	H	9	L	8	7
b4	Aux Button 4 – Configuration B	1	2	3	4	5	6	b	g	F	E	o	t	d	P	n	A	U	r	0	H	9	L	8	7

1-6 = Assigns Pump (Pump 1, Pump 2, etc); b = Blower; g = Spa Light; F = Fiber-Optic / Light 2; E = EitherLight; o = Option 1; t = Mister 1; d = Mister 2/Cool; P = Mister 3/Elec Heat; n = Ext Heat; A = Sound Mode Select; U = Button Disabled; r = Air Valve; 0 = Option 2; H = Option 3; 9 = Invert; L = Option 4; 8 = Stir; 7 = Option 5

AU	Aux Button Configuration Select	A	b	_																				
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A = Configuration A; b = Configuration B; _ = 1 DIP Switch

GL2000 Configuration Settings

Reminder Messages

Sr Suppress all Reminders n **Y** _
 n = Display Reminders; Y = Suppress all Reminders; _ = 1 DIP Switch

rP	Check pH Reminder Period	0	1	2	3	4	5	6	7	8	9	t
rS	Check Sanitizer Reminder Period	0	1	2	3	4	5	6	7	8	9	t
rF	Clean Filter Reminder Period	0	1	2	3	4	5	6	7	8	9	t
rG	Test GFCI Reminder Period	0	1	2	3	4	5	6	7	8	9	t
rd	Drain Water Reminder Period	0	1	2	3	4	5	6	7	8	9	t
rA	Change Mineral Cartridge	0	1	2	3	4	5	6	7	8	9	t
rC	Clean Cover Reminder Period	0	1	2	3	4	5	6	7	8	9	t
ro	Treat Wood Reminder Period	0	1	2	3	4	5	6	7	8	9	t
re	Change Filter Reminder Period	0	1	2	3	4	5	6	7	8	9	t

0 = Off; 1 = 7 days; 2 = 14 days; 3 = 30 days; 4 = 45 days; 5 = 60 days; 6 = 90 days; 7 = 120 days;
 8 = 180 days; 9 = 365 days; t = 21 days

GL2000 Configuration Settings

Temperature Parameters

LS	Lowest Set Temperature*	8 7 6 8 = 80°F/26.0°C; 7 = 70°F/21.0°C; 6 = 60°F/15.5°C
SE	Default Set Temperature**	5 6 7 8 9 0 1 2 3 4 E F n 5 = 95°F/35.0°C; 6 = 96°F/35.5°C; 7 = 97°F/36.0°C; 8 = 98°F/36.5°C; 9 = 99°F/37.0°C; 0 = 100°F/38.0°C; 1 = 101°F/38.5°C; 2 = 102°F/39.0°C; 3 = 103°F/39.5°C; 4 = 104°F/40.0°C; E = 80°F/26.5°C; F = 85°F/29.5°C n = 90°F/32.0°C
UE	Uppermost Set Temperature	5 6 7 8 9 0 1 2 3 4 E F n 5 = 95°F/35.0°C; 6 = 96°F/35.5°C; 7 = 97°F/36.0°C; 8 = 98°F/36.5°C; 9 = 99°F/37.0°C; 0 = 100°F/38.0°C; 1 = 101°F/38.5°C; 2 = 102°F/39.0°C; 3 = 103°F/39.5°C; 4 = 104°F/40.0°C; E = 80°F/26.5°C; F = 85°F/29.5°C n = 90°F/32.0°C
Fr	Freeze Temperature Threshold*	3 4 9 5 3 = 39°F/3.9°C; 4 = 44°F/6.7°C; 9 = 49°F/9.4°C; 5 = 54°F/12.2°C;
tL	Set Temperature Lock	t S t = Temp Lock Only; S = Temp + Settings Lock

*Setting LS at 7 and Fr at 5 will cause a CFE error. Setting LS at 6 and Fr at 4, 5, or 9 will cause a CFE error.

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

Light Cycle

LC	Light Cycle Programming	n Y n = Disabled; Y = Enabled
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GL2000 Configuration Settings

Filter Cycles

1r	Filter 1 Start Hour (Set 1)*	<input type="checkbox"/>	0	1	2	3	4	5	6	7	8	9	A	b	C	d	E	F	g	H	J	L	n	o	P	r
1d	Filter 1 Duration (Set 1)*	<input type="checkbox"/>	0	1	2	3	4	5	6	7	8	9	A	b	C	d	E	F	g	H	J	L	n	o	P	r
2r	Filter 2 Start Hour (Set 1)*	<input type="checkbox"/>	0	1	2	3	4	5	6	7	8	9	A	b	C	d	E	F	g	H	J	L	n	o	P	r
2d	Filter 2 Duration (Set 1)*	<input type="checkbox"/>	0	1	2	3	4	5	6	7	8	9	A	b	C	d	E	F	g	H	J	L	n	o	P	r

These settings allow customization of the filter defaults. If any of these four settings is "-", the standard filter defaults are used. 1d and 2d cannot both be set to 0.

- = Standard Defaults; 0 = 0 (12 am, 24); 1-9 = 1-9; A = 10; b = 11; C = 12; d = 13 (1 pm); E = 14 (2 pm); F = 15 (3 pm); g = 16 (4 pm); H = 17 (5 pm); J = 18 (6 pm); L = 19 (7 pm); n = 20 (8 pm); o = 21 (9 pm); P = 22 (10 pm); r = 23 (11 pm)

When Fd.n (See page 10 for Filter Cycle Duration Setting) is selected, 1d and 2d are Filter 1 and Filter 2 Duration specifically.

When Fd.y is selected:

If 1d is set to 0, 2d is the duration; otherwise 1d is the duration. If 1d is set to 0, only the Night cycle runs.

If 2d is set to 0, only the Day cycle runs. If neither 1d nor 2d is set to 0, both the Day and Night cycles run.

3r	Filter 1 Start Hour (Set 2)*	<input type="checkbox"/>	0	1	2	3	4	5	6	7	8	9	A	b	C	d	E	F	g	H	J	L	n	o	P	r
3d	Filter 1 Duration (Set 2)*	<input type="checkbox"/>	0	1	2	3	4	5	6	7	8	9	A	b	C	d	E	F	g	H	J	L	n	o	P	r
4r	Filter 2 Start Hour (Set 2)*	<input type="checkbox"/>	0	1	2	3	4	5	6	7	8	9	A	b	C	d	E	F	g	H	J	L	n	o	P	r
4d	Filter 2 Duration (Set 2)*	<input type="checkbox"/>	0	1	2	3	4	5	6	7	8	9	A	b	C	d	E	F	g	H	J	L	n	o	P	r

These settings allow customization of the filter defaults. If any of these four settings is "-", the standard filter defaults are used. 3d and 4d cannot both be set to 0.

- = Standard Defaults; 0 = 0 (12 am, 24); 1-9 = 1-9; A = 10; b = 11; C = 12; d = 13 (1 pm); E = 14 (2 pm); F = 15 (3 pm); g = 16 (4 pm); H = 17 (5 pm); J = 18 (6 pm); L = 19 (7 pm); n = 20 (8 pm); o = 21 (9 pm); P = 22 (10 pm); r = 23 (11 pm)

When Fd.n (See page 10 for Filter Cycle Duration Setting) is selected, 3d and 4d are Filter 1 and Filter 2 Duration specifically.

When Fd.y is selected:

If 3d is set to 0, 4d is the duration; otherwise 3d is the duration. If 3d is set to 0, only the Night cycle runs.

If 4d is set to 0, only the Day cycle runs. If neither 3d nor 4d is set to 0, both the Day and Night cycles run.

FS	Filter Default Start Time Set*	<input checked="" type="checkbox"/>	1	2	_
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1 = Set 1; 2 = Set 2; _ = 1 DIP Switch

FP	Filter Default Duration Set*	<input checked="" type="checkbox"/>	1	2	_
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1 = Set 1; 2 = Set 2; _ = 1 DIP Switch

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

GL2000 Configuration Settings

Purge Timers

<i>PP</i>	Pump Purge Duration	3 1 2 5 t 3 = 30 seconds; 1 - 5 = 1 - 5 minutes; t = 10 minutes
<i>BP</i>	Blower Purge Duration	5 1 2 3 4 6 t F 5 = 5 seconds; 1 = 10 seconds; 2 = 20 seconds; 3 = 30 seconds; 4 = 45 seconds; 6 = 60 seconds (1 minute); t = 2 minutes; F = 5 minutes
<i>MP</i>	Mister Purge Duration	5 1 2 3 4 6 t F 5 = 5 seconds; 1 = 10 seconds; 2 = 20 seconds; 3 = 30 seconds; 4 = 45 seconds; 6 = 60 seconds (1 minute); t = 2 minutes; F = 5 minutes

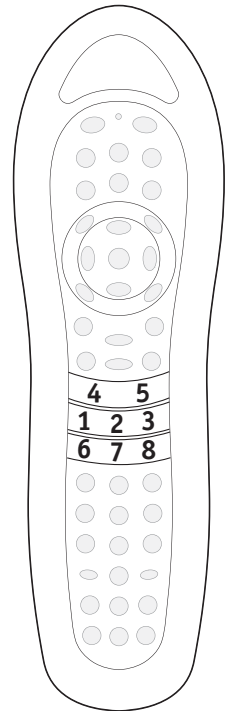
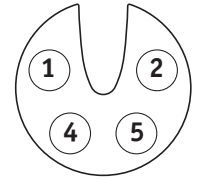
Air Valve

<i>AV</i>	Air Valve	n Y n = Disabled; Y = Enabled on "alarm" relay
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GL2000 Configuration Settings

Wireless Remote Button Mapping

R1	Remote Button 1 (Mapping A)	1	2	3	4	5	6	b	g	F	E	o	t	d	P	n	A	U	r	0	H	9	L	8	7
R2	Remote Button 2 (Mapping A)	1	2	3	4	5	6	b	g	F	E	o	t	d	P	n	A	U	r	0	H	9	L	8	7
R3	Remote Button 3 (Mapping A)	1	2	3	4	5	6	b	g	F	E	o	t	d	P	n	A	U	r	0	H	9	L	8	7
R4	Remote Button 4 (Mapping A)	1	2	3	4	5	6	b	g	F	E	o	t	d	P	n	A	U	r	0	H	9	L	8	7
R5	Remote Button 5 (Mapping A)	1	2	3	4	5	6	b	g	F	E	o	t	d	P	n	A	U	r	0	H	9	L	8	7
R6	Remote Button 6 (Mapping A)	1	2	3	4	5	6	b	g	F	E	o	t	d	P	n	A	U	r	0	H	9	L	8	7
R7	Remote Button 7 (Mapping A)	1	2	3	4	5	6	b	g	F	E	o	t	d	P	n	A	U	r	0	H	9	L	8	7
R8	Remote Button 8 (Mapping A)	1	2	3	4	5	6	b	g	F	E	o	t	d	P	n	A	U	r	0	H	9	L	8	7
H1	Remote Button 1 (Mapping B)	1	2	3	4	5	6	b	g	F	E	o	t	d	P	n	A	U	r	0	H	9	L	8	7
H2	Remote Button 2 (Mapping B)	1	2	3	4	5	6	b	g	F	E	o	t	d	P	n	A	U	r	0	H	9	L	8	7
H3	Remote Button 3 (Mapping B)	1	2	3	4	5	6	b	g	F	E	o	t	d	P	n	A	U	r	0	H	9	L	8	7
H4	Remote Button 4 (Mapping B)	1	2	3	4	5	6	b	g	F	E	o	t	d	P	n	A	U	r	0	H	9	L	8	7
H5	Remote Button 5 (Mapping B)	1	2	3	4	5	6	b	g	F	E	o	t	d	P	n	A	U	r	0	H	9	L	8	7
H6	Remote Button 6 (Mapping B)	1	2	3	4	5	6	b	g	F	E	o	t	d	P	n	A	U	r	0	H	9	L	8	7
H7	Remote Button 7 (Mapping B)	1	2	3	4	5	6	b	g	F	E	o	t	d	P	n	A	U	r	0	H	9	L	8	7
H8	Remote Button 8 (Mapping B)	1	2	3	4	5	6	b	g	F	E	o	t	d	P	n	A	U	r	0	H	9	L	8	7



Mapping Options for A and B

1-6 = Assigns Pump Number (Pump 1, Pump 2, etc); b = Blower; g = Spa Light;
 F = Fiber-Optic / Light 2; E = EitherLight; o = Option 1; t = Mister 1; d = Mister 2/Cool;
 P = Mister 3/Elec Heat; n = Ext Heat; A = Sound Mode Select; U = Button Disabled;
 r = Air Valve; 0 = Option 2; H = Option 3; 9 = Invert; L = Option 4; 8 = Stir; 7 = Option 5

DO Remote Button Set Select

A b _
 A = Button Mapping A; b = Button Mapping B; _ = 1 DIP Switch

GL2000 Configuration Settings

ML90x Custom Button Mapping Options

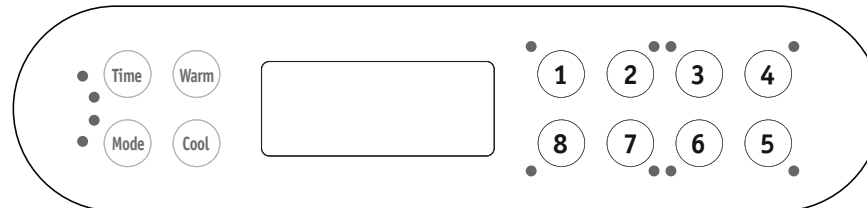
81	ML90x Custom Button 1	1	2	3	4	5	6	b	g	F	E	o	t	d	P	n	A	U	r	0	H	9	L	8	7
82	ML90x Custom Button 2	1	2	3	4	5	6	b	g	F	E	o	t	d	P	n	A	U	r	0	H	9	L	8	7
83	ML90x Custom Button 3	1	2	3	4	5	6	b	g	F	E	o	t	d	P	n	A	U	r	0	H	9	L	8	7
84	ML90x Custom Button 4	1	2	3	4	5	6	b	g	F	E	o	t	d	P	n	A	U	r	0	H	9	L	8	7
85	ML90x Custom Button 5	1	2	3	4	5	6	b	g	F	E	o	t	d	P	n	A	U	r	0	H	9	L	8	7
86	ML90x Custom Button 6	1	2	3	4	5	6	b	g	F	E	o	t	d	P	n	A	U	r	0	H	9	L	8	7
87	ML90x Custom Button 7	1	2	3	4	5	6	b	g	F	E	o	t	d	P	n	A	U	r	0	H	9	L	8	7
88	ML90x Custom Button 8	1	2	3	4	5	6	b	g	F	E	o	t	d	P	n	A	U	r	0	H	9	L	8	7

Custom Mapping Options

1-6 = Assigns Pump Number (Pump 1, Pump 2, etc); b = Blower; g = Spa Light; F = Fiber-Optic / Light 2; E = EitherLight; o = Option 1; t = Mister 1; d = Mister 2/Cool; P = Mister 3/Elec Heat; n = Ext Heat; A = Sound Mode Select; U = Button Disabled; r = Air Valve; 0 = Option 2; H = Option 3; 9 = Invert; L = Option 4; 8 = Stir; 7 = Option 5

8C ML90x Custom Buttons Enable

n Y _
n = Disabled; Y = Enabled; _ = 1 DIP Switch



GL2000 Configuration Settings

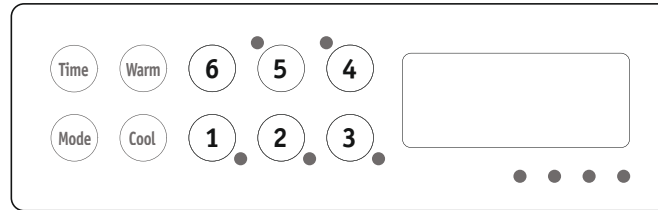
ML75x and MX75x Custom Button Mapping Options

61	ML/MX 750x Custom Button 1	1	2	3	4	5	6	b	g	F	E	o	t	d	P	n	A	U	r	O	H	9	L	8	7
62	ML/MX 750x Custom Button 2	1	2	3	4	5	6	b	g	F	E	o	t	d	P	n	A	U	r	O	H	9	L	8	7
63	ML/MX 750x Custom Button 3	1	2	3	4	5	6	b	g	F	E	o	t	d	P	n	A	U	r	O	H	9	L	8	7
64	ML/MX 750x Custom Button 4	1	2	3	4	5	6	b	g	F	E	o	t	d	P	n	A	U	r	O	H	9	L	8	7
65	ML/MX 750x Custom Button 5	1	2	3	4	5	6	b	g	F	E	o	t	d	P	n	A	U	r	O	H	9	L	8	7
66	ML/MX 750x Custom Button 6	1	2	3	4	5	6	b	g	F	E	o	t	d	P	n	A	U	r	O	H	9	L	8	7

Custom Button Mapping Options

1-6 = Assigns Pump Number (Pump 1, Pump 2, etc); b = Blower; g = Spa Light; F = Fiber-Optic / Light 2; E = EitherLight; o = Option 1; t = Mister 1; d = Mister 2/Cool; P = Mister 3/Elec Heat; n = Ext Heat; A = Sound Mode Select; U = Button Disabled; r = Air Valve; O = Option 2; H = Option 3; 9 = Invert; L = Option 4; 8 = Stir; 7 = Option 5

6C ML/MX 750x Custom Buttons Enable **n** Y _
n = Disabled; Y = Enabled; _ = 1 DIP Switch



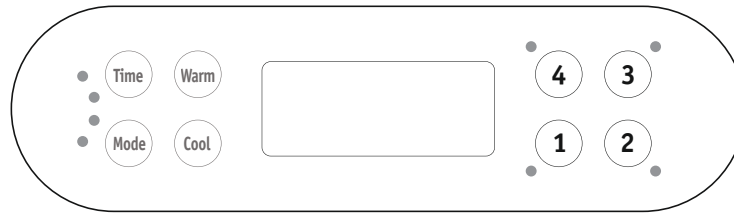
GL2000 Configuration Settings

ML70x Custom Button Mapping Options

41	ML70x Custom Button 1	<input type="checkbox"/>	2	3	4	5	6	b	g	F	E	o	t	d	P	n	A	U	r	0	H	9	L	8	7
42	ML70x Custom Button 2	<input type="checkbox"/>	2	3	4	5	6	b	g	F	E	o	t	d	P	n	A	U	r	0	H	9	L	8	7
43	ML70x Custom Button 3	<input type="checkbox"/>	2	3	4	5	6	b	g	F	E	o	t	d	P	n	A	U	r	0	H	9	L	8	7
44	ML70x Custom Button 4	<input type="checkbox"/>	2	3	4	5	6	b	g	F	E	o	t	d	P	n	A	U	r	0	H	9	L	8	7

Custom Button Mapping Options 1-6 = Assigns Pump Number (Pump 1, Pump 2, etc); b = Blower; g = Spa Light; F = Fiber-Optic / Light 2; E = EitherLight; o = Option 1; t = Mister 1; d = Mister 2/Cool; P = Mister 3/Elec Heat; n = Ext Heat; A = Sound Mode Select; U = Button Disabled; r = Air Valve; 0 = Option 2; H = Option 3; 9 = Invert; L = Option 4; 8 = Stir; 7 = Option 5

45 ML70x Custom Buttons Enable Y _
 n = Disabled; Y = Enabled; _ = 1 DIP Switch



GL2000 Configuration Settings

ML55x Custom Button Mapping Options

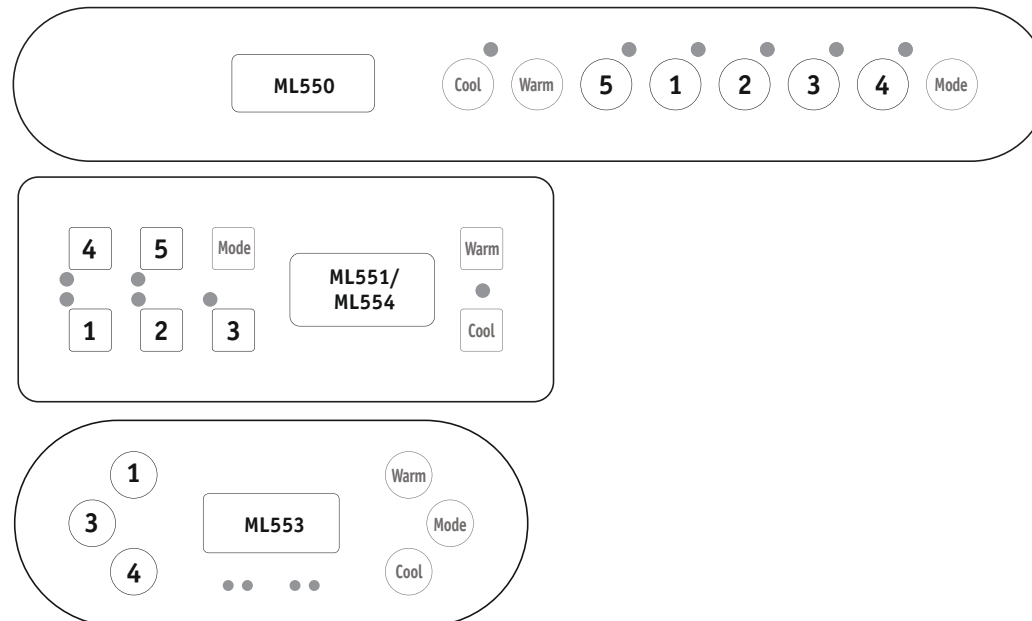
51	ML55x Custom Button 1	1	2	3	4	5	6	b	g	F	E	o	t	d	P	n	A	U	r	0	H	9	L	8	7
52	ML55x Custom Button 2	1	2	3	4	5	6	b	g	F	E	o	t	d	P	n	A	U	r	0	H	9	L	8	7
53	ML55x Custom Button 3	1	2	3	4	5	6	b	g	F	E	o	t	d	P	n	A	U	r	0	H	9	L	8	7
54	ML55x Custom Button 4	1	2	3	4	5	6	b	g	F	E	o	t	d	P	n	A	U	r	0	H	9	L	8	7
55	ML55x Custom Button 5	1	2	3	4	5	6	b	g	F	E	o	t	d	P	n	A	U	r	0	H	9	L	8	7

Custom Mapping Options

1-6 = Assigns Pump Number (Pump 1, Pump 2, etc); b = Blower; g = Spa Light; F = Fiber-Optic / Light 2; E = EitherLight; o = Option 1; t = Mister 1; d = Mister 2/Cool; P = Mister 3/Elec Heat; n = Ext Heat; A = Sound Mode Select; U = Button Disabled; r = Air Valve; 0 = Option 2; H = Option 3; 9 = Invert; L = Option 4; 8 = Stir; 7 = Option 5

ML55x Custom Buttons Enable

n Y _
n = Disabled; Y = Enabled; _ = 1 DIP Switch



GL2000 Configuration Settings

ML40x/ML2xx Custom Button Mapping Options

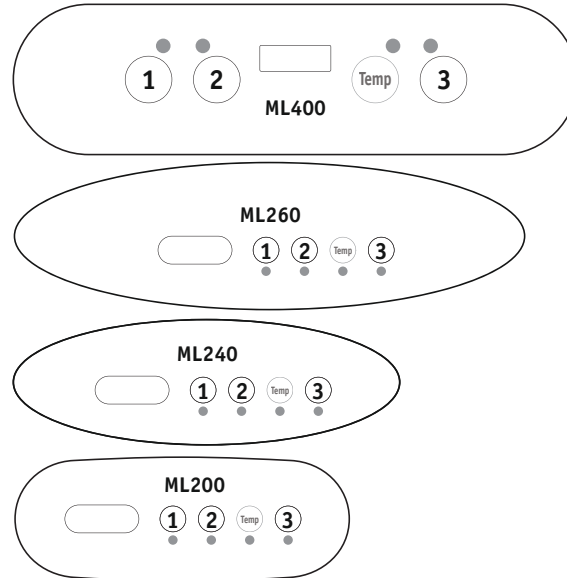
31	ML40x/ML2xx Custom Button 1	1	2	3	4	5	6	b	g	F	E	o	t	d	P	n	A	U	r	0	H	9	L	8	7
32	ML40x/ML2xx Custom Button 2	1	2	3	4	5	6	b	g	F	E	o	t	d	P	n	A	U	r	0	H	9	L	8	7
33	ML40x/ML2xx Custom Button 3	1	2	3	4	5	6	b	g	F	E	o	t	d	P	n	A	U	r	0	H	9	L	8	7

Custom Button Mapping Options

1-6 = Assigns Pump Number (Pump 1, Pump 2, etc); b = Blower; g = Spa Light; F = Fiber-Optic / Light 2; E = EitherLight; o = Option 1; t = Mister 1; d = Mister 2/Cool; P = Mister 3/Elec Heat; n = Ext Heat; A = Sound Mode Select; **U = Button Disabled - Do Not Use**; r = Air Valve; 0 = Option 2; H = Option 3; 9 = Invert; L = Option 4; 8 = Stir; 7 = Option 5

3C	ML40x/2xx Custom Buttons Enable	n	Y	_
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n = Disabled; Y = Enabled; _ = 1 DIP Switch



GL2000 Configuration Settings

Spa Monitor Custom Button Mapping Options

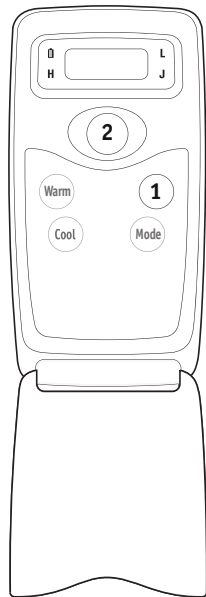
21	Spa Monitor Custom Button 1	1	2	3	4	5	6	b	g	F	E	o	t	d	P	n	A	U	r	0	H	9	L	8	7
22	Spa Monitor Custom Button 2	1	2	3	4	5	6	b	g	F	E	o	t	d	P	n	A	U	r	0	H	9	L	8	7

Custom Button Mapping Options

1-6 = Assigns Pump Number (Pump 1, Pump 2, etc); b = Blower; g = Spa Light; F = Fiber-Optic / Light 2; E = EitherLight; o = Option 1; t = Mister 1; d = Mister 2/Cool; P = Mister 3/Elec Heat; n = Ext Heat; A = Sound Mode Select; **U = Button Disabled - Do Not Use**; r = Air Valve; 0 = Option 2; H = Option 3; 9 = Invert; L = Option 4; 8 = Stir; 7 = Option 5

2C	Spa Monitor Custom Buttons Enable	n	Y	_
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n = Disabled; Y = Enabled; _ = 1 DIP Switch



The Spa Monitor always shows Jets 1 status on the "J" LED even if Button 1 (normally Jets 1) is mapped to a different device.

GL2000 Configuration Settings

Misc Features

SA	Special Amperage Rule	1 2 3 4 5 6
	<i>DIP A11 must be ON to use Special Amperage Rule.</i>	
	1 = Blower off when 2nd high-speed pump on; 2 = Max 1 high-speed pump; 3 = Max 2 high-speed pumps; 4 = Max 2 high-speed pumps + Blower off when 2nd high-speed pump on; 5 = Max 3 high-speed pumps; 6 = Max 4 high-speed pumps	
HC	Heat Cool Feature	n Y _ n = Disabled; Y = Enabled; _ = 1 DIP Switch
dr	DR Mode	n Y n = Disabled; Y = Enabled
dE	Demo Mode	n Y n = Disabled; Y = Enabled
gc	Graphic Clock	n Y n = Disabled; Y = Enabled (<i>Panel must be able to support this feature</i>)
SO	Sound Mode Select Enable	n Y _ (Requires correct version of sound hardware) <i>Enables panel/aux/remote button access, if properly configured and User Preference access.</i> <i>Example: To select Sound Modes (see "So" below) by pressing Aux Button 1, configure setting "A1" to code assignment "A"</i> n = No; Y = User Preference; _ = 1 DIP Switch
So	Sound Mode Select	A b c n (Values dependent on sound hardware used) A = Sound choice 1; b = Sound choice 2; c = Sound choice 3; n = No sounds

Control Panel Configurations

Time-Capable Panels

RTC Jumper (J91) on the main circuit board must be OFF (jumper installed on one pin only).

This enables the real-time clock.

J91 

MP700 PN 53251-01 with no overlay (Customer to apply overlay(s) as required)

Connects to J70, J71, J72 or J73 on the main circuit board.

