Digital Lighting Systems, Inc

Protocol Dimming System

PROTOCOL

Lighting control system

USER MANUAL APPENDICES

UMA
Rev. C - 08/08

Appendix A - Decimal to Hexadecimal Conversion Chart

00 INVALID ADDRESS	32 set S2,S1 to 2,0	64 set S2,S1 to 4,0	96 set S2,SI to 6,0
01 set S2,S1 to 0,1	33 set S2,S1 to 2,1	65 set S2,S1 to 4,1	97 set S2,SI to 6,1
02 set S2,S1 to 0,2	34 set S2,S1 to 2,2	66 set S2,S1 to 4,2	98 set S2,SI to 6,2
03 set S2,S1 to 0,3	35 set S2,S1 to 2,3	67 set S2,S1 to 4,3	99 set S2,SI to 6,3
04 set S2,S1 to 0,4	36 set S2,S1 to 2,4	68 set S2,S1 to 4,4	
05 set S2,S1 to 0,5	37 set S2,S1 to 2,5	69 set S2,S1 to 4,5	
06 set S2,S1 to 0,6	38 set S2,S1 to 2,6	70 set S2,S1 to 4,6	
07 set S2,S1 to 0,7	39 set S2,S1 to 2,7	71 set S2,S1 to 4,7	
08 set S2,S1 to 0,8	40 set S2,S1 to 2,8	72 set S2,S1 to 4,8	
09 set S2,S1 to 0,9	41 set S2,S1 to 2,9	73 set S2,S1 to 4,9	
10 set S2,S1 to 0,A	42 set S2,S1 to 2,A	74 set S2,S1 to 4,A	
11 set S2,S1 to 0,B	43 set S2,S1 to 2,B	75 set S2,S1 to 4,B	
12 set S2,S1 to 0,C	44 set S2,S1 to 2,C	76 set S2,S1 to 4,C	
13 set S2,S1 to 0,D	45 set S2,S1 to 2,D	77 set S2,S1 to 4,D	
14 set S2,S1 to 0,E	46 set S2 S1 to 2,E	78 set S2,S1 to 4,E	
15 set S2,S1 to 0,F	47 set S2,S1 to 2,F	79 set S2,S1 to 4,F	
16 set S2,S1 to 1,0	48 set S2,S1 to 3,0	80 set S2,S1 to 5,0	
17 set S2,S1 to 1,1	49 set S2,S1 to 3,1	81 set S2,S1 to 5,1	
18 set S2,S1 to 1,2	50 set S2,S1 to 3,2	82 set S2,S1 to 5,2	
19 set S2,S1 to 1,3	51 set S2,S1 to 3,3	83 set S2,S1 to 5,3	
20 set S2,S1 to 1,4	52 set S2,S1 to 3,4	84 set S2,S1 to 5,4	
21 set S2,S1 to 1,5	53 set S2,S1 to 3,5	85 set S2,S1 to 5,5	
22 set S2,S1 to 1,6	54 set S2,S1 to 3,6	86 set S2,S1 to 5,6	
23 set S2,S1 to 1,7	55 set S2,S1 to 3,7	87 set S2,S1 to 5,7	
24 set S2,S1 to 1,8	56 set S2,S1 to 3,8	88 set S2,S1 to 5,8	
25 set S2,S1 to 1,9	57 set S2,S1 to 3,9	89 set S2,S1 to 5,9	
26 set S2,S1 to 1,A	58 set S2,S1 to 3,A	90 set S2,S1 to 5,A	
27 set S2,S1 to 1,B	59 set S2,S1 to 3,B	91 set S2,S1 to 5,B	
28 set S2,S1 to 1,C	60 set S2,S1 to 3,C	92 set S2,S1 to 5,C	
29 set S2,S1 to 1,D	61 set S2,S1 to 3,D	93 set S2,S1 to 5,D	
30 set S2,S1 to 1,E	62 set S2,S1 to 3,E	94 set S2,S1 to 5,E	
31 set S2,S1 to 1,F	63 set S2,S1 to 3,F	95 set S2,S1 to 5,F	

NOTES:

00 Decimal (S2,SI = 0,0)
is not Used on any device.

Max Pd4xx, DC04 Address:
63 Decimal (S2,S1 = 3,F)

Max. Psxx Wall Station,
DCI16 Address:
99 Decimal (S2,S1 = 6,3)

Max. PTxx Patcher Address:
07 Decimal (S2,S1 = 0,7)

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Appendix B - PD SERIES DIMMER LOAD SCHEDULE

Job Name:

Date: Page Of

Item #	Circuit Reference Number	PD Dimmer Address S2 S1	Box #	Output #	Dimmable Load Y or N	Circuit Load Watts	Feed Panel Number	Breaker # PD408/216	Breaker # PD804	Breaker Phase A, B, or C PD408/216	Breaker Phase A, B, or C PD804	Load Description/ Comments	PRIMARY CONTROL STA#	PRIMARY CONTROL SW#
				1										
				2										
		__ , __		3										
				4										
				1										
				2										
		__ , __		3										
				4										
				1										
				2										
		__ , __		3										
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		__ , __		3										
				4										
				1										
				2										
		__ , __		3										
				4										
				1										
				2										
		__ , __		3										
				4										

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Appendix B - PD SERIES DIMMER LOAD SCHEDULE Explanation

In order to keep a count of circuits within the system, enter an item # in order from 1 upwards.

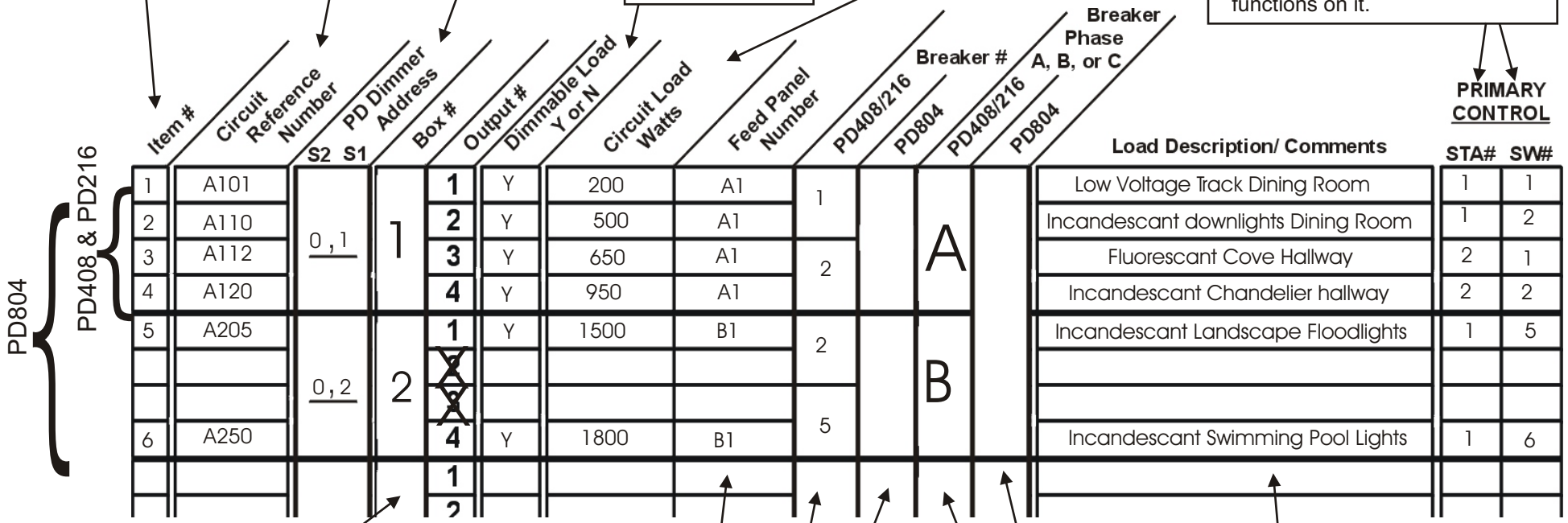
Here enter any other circuit reference number there may be.

Every set of four circuits has an address, starting from 1 to 63 which must be set on each dimmer pack. The system recognizes a hexadecimal expression of these numbers. Appendix A has a conversion chart for these numbers.

Indicate here if the load is dimmable or not, **Y** for yes, **N** for no.

Enter total wattage for the circuit here.

In these columns, the primary control station and switch control each load should be entered. This will normally be the main station that controls this load by Dimmer, On, Off, Raise, Lower, Toggle or Momentary. Every load must have at least one switch to perform one or more of these functions on it.



The decimal number of the box is entered here (1 to 63). The **PD804**, whilst in one enclosure is considered as two boxes, each with four ouputs which are addressed differently.

The **PD216** utilizes outputs 1 and 4 in each box, 2 and 3 shall remain blank. **PD408** utlizes 1, 2, 3 & 4. **PD804** uses 1, 2, 3 & 4 from the first box and 1, 2, 3 & 4 from the second box.

Enter Feed Panel Number here.

Each **PD** Unit requires maximum 2 x 20 amp breaker feeds on the same phase. **PD216** uses one feed for each of two outputs. **PD408** uses one feed for each two of four outputs. **PD804** uses one feed for each four of eight outputs.

Each **PD** series Dimmer pack takes 2 x 20 amp feeds to provide power for the outputs and the internal logic of the unit.
These two feeds must be on the same phase in order for the logic to work correctly. Failure in doing this will cause the system to cease operation in a normal manner.

In this column, details about the load should be enetered, sych as the type of load, its location and a brief description.

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Appendix C - PS SERIES Switch Assignment Schedule

Job Name:

Station #	S2 , S1 setting	Field Label	Part no.	Plate Color	Button Color	Frame Color

Date: Page Of

Station Physical Location

Please refer to Page 2 for instructions on how to fill out this form correctly.

Switch # (1-16)	Switch Type Function	Rate	Level 0-100 (Applies to Switch Type "ON")	Global:G/Exclusive:XG	Loads (circuits) controlled by Switch Up to 24 circuits may be listed here per switch .	Switch Label	Comments
					, , , , , , , ,		
					, , , , , , , ,		
					, , , , , , , ,		
					, , , , , , , ,		
					, , , , , , , ,		
					, , , , , , , ,		
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Appendix C - PS SERIES Switch Assignment Schedule Explanation

This page is designed to show an example of how to fill in a switch assignment sheet. More information is provided in the PROTOCOL SOFTWARE MANUAL and the PROTOCOL HARDWARE MANUAL.

First, the general station information must be filled in, and then the information for each switch, including the switch function and the loads that it will affect.

Numeric number of station.

Hexidecimal number of station, Refer to Appendix A.

A space for any other name you may want to label station.

DLS part number for station

Color of Face Plate

Color of Buttons

Color of Frame if one is used.

Station Location Information.

Station #	S2,S1 Setting	Field Label	Part No.	Plate Color	Button Color	Frame Color
23	1,7		PSC08	Black	White	None

Station Physical Location
Living Room West Wall

Enter switch number here, refer to Appendix D for correct numbering of switches.

Description of switch function or any other information about that switch such as a different color from others etc.

Switch # (1-16)	Switch Type	Rate	Level 0-100 (Applies to Switch Type "ON")	Global:G/Exclusive:XG	Loads (circuits) controlled by Switch Up to 24 circuits may be listed here per switch.								Switch Label	Comments
1	DI M-S	9			1,1	1,2							Dim Sconces	Sconce Dimmer Control
2	DI M	9			1.3	1.4							Dim Chand.	Chandelier Dimmer Control
3	PST 1	12 sec			1,1	1,2	1,3	1,4					Lunch	Lunch Scene for living room Black butt.
4	PST 2	15 sec			1,1	1,2	1,3	1,4					Dinner	Dinner Scene for living room
5	ON		80	G									All On	Global on for whole house
6	OFF			XG	1,1	1,2							All Off	Global off for whole house except living room sconces

Enter the switch type here. There are several functions that may be selected.

Dimmer =	**DIM**	Toggle =	**TOG**
On =	**ON**	Off =	**OFF**
Raise =	**RSE**	Lower =	**LWR**
Preset =	**PST(#)**	Momentary =	**MOM**
Unassigned = **NONE**			

Note: i.) Every Preset has a number from1-254 that must be assigned to it. ii.) When Soft Switch is selected indicate with a "-S" after the Type. Please see Protocol Software Manual for more information.

Selecting **G** (Global) will cause switch to affect every load on the system. Indicating **XG** (Exclusive Global) will show that all loads on system are affected except for those that have been excluded (up to 24 circuits may be excluded from a Global switch). Excluded circuits must be indicated in Loads Affected by Switch columns.

When **ON** function is selected, the level may be determined. 0 is off, 100 is full on. Any value in between may be selected.

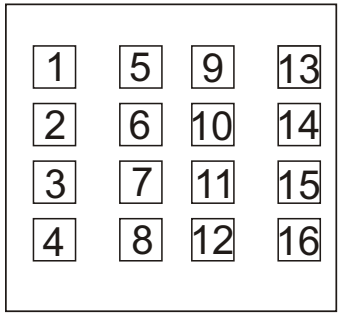
Enter the rate of cross-fade between scenes if switch is a **PST.** Rate is 2-59 Seconds (sec) or 1-59 minutes (min).
Enter rate of dimming if a switch is **DIM**, **ON**, **OFF**, **MOM**, **RSE** or **LWR**. Rate is 1-10. 1 is slowest, 10 is fastest. 9 is the default setting.

Enter information for label to appear next to faceplate. No more than two lines of six characters per switch. Contact factory for more details.

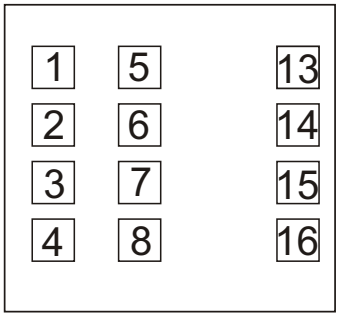
Every switch must affect at least one load on the system. The loads affected are entered in these columns. Each switch may affect up to 24 different loads or all loads with up to 24 being excluded. A load must be identified by the **Box #** then **Output #** as entered on the PD Series DIMMER LOAD SCHEDULE (APPENDIX B).

Appendix D - Protocol Stations Button Numbers Chart

Double-Gang
Button Arrangement choices

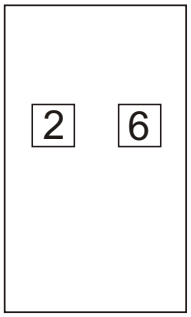


FPS16

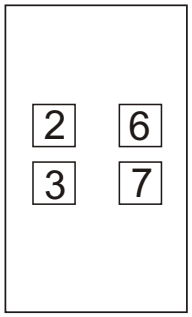


FPS12

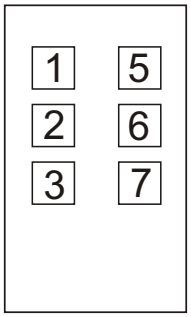
Single-Gang
Button Arrangement choices



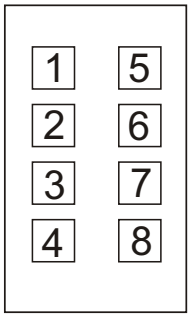
FPS-02



FPS-04



FPS-06



FPS-08

Appendix E - Protocol Stations Wire Gauge Chart

Recommended maximum number of PS Series stations (or other nodes such as DCI-16's, DCO-4's, PT Series Patch Panels and RAU-96's) per home run when using a 10 VOLT AC transformer. Computations are based on an even distribution of nodes along the 10 VAC power line.

Maximum Number Of Stations (Nodes) Versus Cable Length and Gauge

	Cable Length									
	50'	**100'**	**150'**	**200'**	**250'**	**300'**	**400'**	**500'**	**600'**	**800'**
Cable Gauge										
22 Gauge	23	11	8	6	5	4	3	2	2	1
20 Gauge	36	18	12	9	7	6	5	4	3	2
18 Gauge	**58**	**29**	**19**	**14**	**12**	**10**	**7**	**6**	**5**	**4**
16 Gauge	92	46	31	23	18	15	11	9	8	6
14 Gauge	145	73	48	36	29	24	18	15	12	9
12 Gauge	231	116	77	58	46	39	29	23	19	14

NOTE:

MAXIMUM LENGTH OF DATA TWISTED PAIR MUST NOT EXCEED 2000' PER HOME RUN.
Two 18 Gauge or thicker twisted pairs are recommended for the PROTOCOL System, one pair for Data, one pair for LV logic Power. A shielded cable may be used to provide a ground for all stations.

General Cable #C3362 *or Equivalent* 4-Wire (2 Twisted Pairs) Shielded Network Bus Cable may be used.

Appendix F: PSFxx wall keypad station Preset Lock and Unlock Procedure

The preset (scene) Lock feature ensures that the end-user cannot change the scenes by accident. The default setting of the station is to have the preset buttons **locked**. When preset buttons are **locked** scenes cannot be changed.

To "**unlock**" the presets in order to be able to set a lighting scene, the station will need to be reset. The station is reset by either unplugging it from its power supply or **pressing the reset button located under the faceplate between buttons 1 and 5.**

While the station is reseting (all LED's on station will be flashing for 10 seconds), **buttons 4 and 8 must be pressed simultaneously** (LED's will cease to flash). The presets are now **unlocked**. Scenes can now be set by the usual method (adjusting light levels and then pressing and holding a preset button for 4 seconds until all LED's flash).

Once all scenes have been stored, the station may now be **locked**. Locking the station is done by reseting the station by using the reset button or unplugging the station from its power supply. The station is now **locked**.

Individual light levels may still be changed whether station is **locked** or **unlocked**. Only presets buttons are affected by this procedure.