

USING PRESET DIM WITH THE LynX-10 AND LynX-PORT X-10 INTERFACES

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INTRODUCTION

This applications note will discuss how preset dim works and how to use it properly with the LynX-10 family of X-10 interfaces.

WHAT IS PRESET DIM

Preset DIM is a code sequence that provides the ability to set an X-10 light switch to any 1 of 32 possible levels. The functionality was defined in the original X-10 protocol specification, but was rarely implemented. However, several manufacturers are now supporting PRESET DIM codes in their products (see the list at the end of the application note). The PRESET DIM function enables a controller to set any specific light switch to any 1 of 32 levels directly without the knowledge of the current state. That is, it does not matter if the light is on, off, or dimmed to another level. This ability can be used to overcome the current limitation of requiring a computer or controller to keep track of the current level of a light switch. Since many X-10 devices only receive, a homeowner can manually changes the state or level of a light via the switch without the computer or controller's knowledge. With PRESET DIM, this no longer matters. Here's how it works.

THE PROTOCOL

The normal X-10 protocol is made up of 3 groups of bits transmitted onto the power line. These groups include a start field (2 bits), a house code (4 bits), and a command or unit code (5 bits). This makes for a grand total of 11 bits. The bits are formed by a 1mS burst of a 120-kilohertz (kHz or 1000 cycles per second) signal that occurs immediately following the zero crossing of the power line. The zero crossing is the period when the AC voltage goes to zero. These bits are encoded with a technique called Manchester Encoding. That is, a bit and its complement are transmitted to help detect errors. The exception is the start field. The start field violates the Manchester Encoding, which indicates to the receiver the beginning of the packet. The packet is transmitted twice with 3 cycles of the AC power between them to ensure that the command gets through.

What does all this mean? If we examine the above protocol, and look at the specification, you will notice that there is no room left to send data to a switch to force it to a desired level. The X-10 authors also noticed this and defined the two PRESET DIM codes to solve the problem. They placed the DIM level into the house code field. This can be done since the house code is actually transmitted twice during a normal command. Why are their two PRESET DIM commands? Well, there are only 16 house codes and 32 levels were desired. Therefore the levels were broken up between two separate commands. One for levels 1 through 16 and the other for levels 17 through 32.

USING THE CODES

The method for using these PRESET DIM codes is quite simple. Since the house code is transmitted once with the address, it can be used during the command to hold the DIM data. First, a unit that supports PRESET DIM must receive an ADDRESS command. That is, the house code and unit code of the device must be sent before the PRESET DIM command. This is normal for all X-10 commands. The LynX-10 code for this is 'X0hu' where the 'h' is the house code (0,1,2,3...F) and the 'u' is the unit code (0,1,2,3...F). The next command is either a PRESET DIM 0 (X1dA) or a PRESET DIM 1 (X1dB). The 'd' is the level (0,1,2,3...F). The level value must be encoded as if it were a house code. *This coding does not follow a linear binary (0,1,2...) order.* It uses a modified order to help prevent single bit errors. Table 1 shows the correct command for each of the 32 possible levels.

Table 1 – LynX-10 / LynX-PORT Preset DIM commands

Level	LynX-10 Code	Level	LynX-10 Code
1	X1CA	17	X1CB
2	X1DA	18	X1DB
3	X1EA	19	X1EB
4	X1FA	20	X1FB
5	X12A	21	X12B
6	X13A	22	X13B
7	X10A	23	X10B
8	X11A	24	X11B
9	X14A	25	X14B
10	X15A	26	X15B
11	X16A	27	X16B
12	X17A	28	X17B
13	X1AA	29	X1AB
14	X1BA	30	X1BB
15	X18A	31	X18B
16	X19A	32	X19B

Let's look at an example using table 1. We wish to preset dim unit B5 to level 26. First unit B5 must be addressed. This is done by sending the LynX-10 or LynX-PORT the string 'X014'. This addresses the unit and prepares it to receive the preset dim code. Next look up level 26 and look to the right for the command string. We find 'X15B'. This string is then sent to the LynX-10 or LynX-PORT and the device should immediately change its level to 26 (or 81%).

CONCLUSION

Using PRESET DIM will allow you to create much more sophisticated scenes and effects using X-10. A high-end look can be achieved with little effort in programming when using PRESET DIM commands.

SUPPLIERS OF PRESET DIM CAPABLE UNITS

Powerline Control Systems	(818) 701-9831
Leviton Corporation	(718) 229-4040
X-10 Power House	(800) 675-3044