The Powerline Signal Analyzer has five modes of operation. A brief description is provided.

The MODE button on the front panel is used to switch between modes. After pressing the button the prescribed number of times, the PLSA will switch to that mode.

MODE 1 - X10 Signal Identifier and Signal Strength Indicator

When the PLSA is plugged into any 120VAC outlet, the display should show "X-10 Code:" and "Signal Strength:." If not, press the mode button once. Any X10 code now received will be displayed on the top line and its signal strength in volts or millivolts displayed directly underneath. As each code is received, the entire LCD display shifts from right to left. The top line will show the house code, the device code, and the function code. The bottom line will show peak-to-peak signal strength in volts. It is an auto-ranging measurement from 0 millivolts to 4.1 volts. An indication of "m" (for millivolts) in the display means the signal is less than .1 volts (100 millivolts).

The following error codes are displayed when a received X10 code is corrupted or noise is present.

BSC - Bad Start Code. This often occurs when a noise spike on the power line is strong enough to translate as a binary 1 at one zero-crossing, but is absent at the next. It can also occur when weak signals are on the threshold of being translated as either a binary 1 or 0, or when two codes are transmitted at the same time, causing a code collision.

BBK - Bad Block. Code is displayed when an X10 code with a good start code is received, but either the two 11 cycle blocks of the code are not identical or a true bit and its complimentary bit in a block are not opposite.

BCY - Bad Cycle Gap. This code is displayed when there are less than 3 complete cycles of gap, or "silent period," between two different X10 codes. X10 transmission calls out for at least three "silent" AC power cycles between each code transmitted.

Lower Case House Code Letter - A lower case house code letter will appear if only one good start code and one good block (of two identical blocks) are received from an X10 transmision.

MODE 2 - Displaying AC Power Line Noise

Press the Mode button twice, and the display will show noise levels on the AC power line within the first millisecond after zero-crossing. The peak voltage or highest amplitude of noise with frequencies 110 KHz or greater, that occurred during the previous second, is displayed.

MODE 3 - Dissecting X10 Codes
All signal strengths of the 22 cycles of the last X10 code received (while in MODE 1) are permanently stored in memory for review later. Press the mode button one time. After an X10 code is received and displayed, press the mode button three times to examine in detail (dissect) the last code received. Each code can be dissected to display the information of both code bits of each cycle. The true bit is displayed first followed by its complimentary bit with their signal strengths displayed directly below.

MODES 4 & 5 - X10 History Recorder

The PLSA is able to record in permanent memory up to 190 incoming X10 codes along with their signal strength and an offset time (in hours) from when they occurred. Pressing the mode button 5 times resets the history recorder to the beginning by clearing all past recorded X10 events and the internal timer. As X10 codes are received, they are displayed in order along with their signal strength and the time (in hours) from when the history recorder was reset.