

XTBM X10 Signal Meter

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Those of you who have read my X10 troubleshooting guides have seen my recommendation for using the ESM1 X10 signal meter to aid the process. Unfortunately, the ESM1 has been discontinued along with another unit in that price range. That left only the simple X10 XPTR (and its Leviton clone), and units costing several hundred dollars. Since they are clearly beyond the means of many X10 users, I developed the XTBM X10 signal meter to fill the gap.



The XTBM displays X10 signal voltage, carrier frequency, and last decoded X10 command. It also displays powerline noise, and will indicate various types of errors that plague X10 communication, including the ubiquitous “bad start code”. The average frequency of sufficiently strong “in band” noise is also displayed.

Some of you have installations containing a repeater, such as the X10 XPCR or XTB-IIR. Unlike other signal meters, the XTBM contains its own transmitter. Whenever it is plugged into a receptacle, it will briefly check for a repeater, and display the signal voltage received back if one is active in the installation. This feature allows signal levels to be quickly checked throughout a home by merely plugging the XTBM into each receptacle for just a few seconds.

While it is relatively easy to measure X10 signal levels, noise can be a difficult problem. The XTBM samples noise in three windows: just before, during, and just after the X10 transmission window. It maintains an average of the background noise in the X10 reception window to adjust its detection threshold just above the noise level. It discriminates between short-term switching transients and the longer noise bursts generated by switching power supplies. It maintains an average of the peak noise seen in all three windows that is of sufficient length to possibly corrupt X10 communication. That peak noise value is displayed in the readout, and also used as the input to a noise warning system.

When enabled, the noise warning system will utilize the internal transmitter to send a “P1 ON” whenever there is a significant increase in noise level. “P1 OFF” is transmitted when the noise level returns to a safe level. This option can be enabled or disabled by sending “P ON” or “P OFF” from a manual controller in the first second after the XTBM is plugged into a receptacle. The mode is stored in non-volatile flash memory.

Some of you also have combined X10 / Insteon systems. Insteon commands look like noise to X10 meters. The XTBM will try to distinguish stronger Insteon commands as different from normal background noise. Since it will also identify “in band” noise that straddles the zero crossing as Insteon, that may be helpful tracking down noise that can interfere with Insteon communication.

Complete instructions for the XTBM are available here: http://jvde.us/xtb/xtbm_instructions.pdf