

# XTB-IIR X10 Transmit Booster/Repeater Operation

## JV Digital Engineering

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The original XTB was a simple plug-in unit that boosted the output of any X10 transmitter plugged directly into it. The XTB-II combined the high-power XTB transmitter with two coupling networks to drive both 120V legs, eliminating the need for a passive coupler. It also added a digital port with TW523 emulation to provide an alternative to the X10 TW523/PSC05. The XTB-IIR is an enhanced repeater version of the now discontinued XTB-II.

The XTB-IIR is designed for split-phase 240V systems, but a single-output 240V 50Hz unit is available. Unless 3-phase operation is enabled, it blanks the superfluous X10 3-phase transmit bursts to concentrate all its energy in the zero-crossing X10 transmit burst. Depending on line characteristics, the XTB-IIR can inject 30Vpp or more of X10 signal onto the powerline.

Like the original XTB, the XTB-IIR has an AC receptacle on its cover to provide direct X10 Boost for any transmitter plugged into it. To prevent feedback, that receptacle is powered through a low-pass filter, and is limited to a 50-watt resistive load. Because they are reactive loads, no more than three X10 transmitters should be connected to that receptacle. An internal fuse will blow if the 50-watt limit is exceeded.

The XTB-IIR digital port will accept the same connector that would normally be plugged into the X10 TW523 or PSC05. The XTB-IIR opto-isolated digital interface is functionally identical to that of the TW523, but the XTB-IIR TW523 emulation differs from the actual TW523 in several regards. The XTB-IIR error checks all incoming data, and does not produce any output when a collision is detected. And since the XTB-IIR does not need a gap to separate X10 messages, it will recognize all commands in a bright/dim sequence. The XTB-IIR will transmit and receive extended messages, and it can also repeat "doublet" extended messages.

The XTB-IIR return signal amplifier has been significantly enhanced from that of the XTB-II, but line transients can still make it through the bandpass filter, and are amplified. Devices sensitive to powerline noise, such as the PowerLinc or CM15A, may not work well when plugged into XTB-IIR.

## ELECTRICAL CONNECTION

The XTB-IIR does not simply plug into a standard receptacle like the XTB. It should be installed adjacent to the electrical distribution panel where it can drive both phases directly. Connections to the distribution panel are made through one of the two internal terminal strips. The other terminal strip is normally connected to the X10 Input receptacle on the cover. To drive both phases, the XTB-IIR should be connected to neutral and both terminals of a 15A or 20A two-pole circuit breaker through an appropriate 240V plug and receptacle. For single-phase operation, a standard 120V power cord can be wired to just Phase I and Neutral in the XTB-IIR. Ground is not used internally, and is only required when using a grounded receptacle on the cover. **A solid connection to neutral is essential for proper operation.**

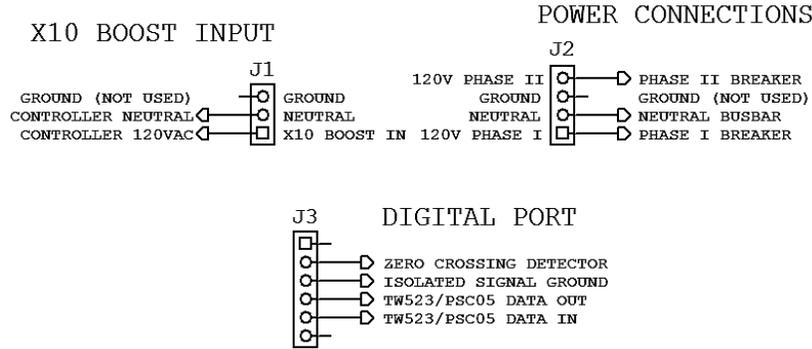
Since ground is not used internally, a 3-prong 240V plug & receptacle are adequate to connect the 2-phase unit. However, a standard 10 gauge dryer cord is too heavy to wire into the unit. The locking strain relief on the XTB-IIR will accept up to .4-inch diameter wire. 16 or 18 gauge wire is sufficient because the XTB-IIR is internally fused at 2 amps maximum. Check the electrical connections carefully before applying power. It is recommended that the terminal strip screws be re-torqued (with power switched off) to insure solid connections.

## XTB-IIR OPERATION

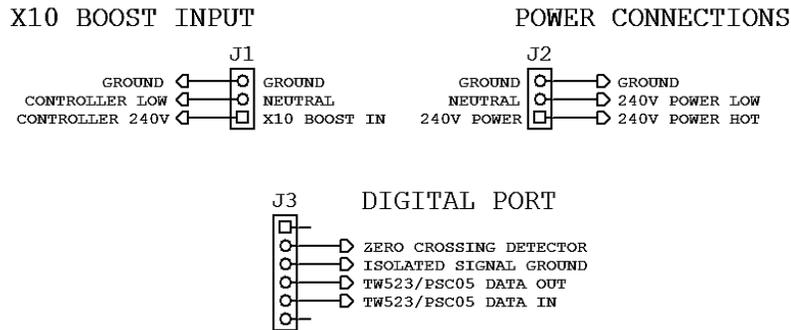
The XTB-IIR can act as the powerline interface for high-end controllers, boost X10 commands received via the X10 Input receptacle, and repeat X10 commands received over the powerline. No mode changes are required. The XTB-IIR also includes a smart bright/dim repeater mode, which is enabled by default. In this mode it will transmit all but the first bright or dim command received in a sequence. Should there be excessive X10 activity on the powerline, the XTB-IIR will inhibit its transmitter until the problem is corrected. Please refer to the XTB-II Mode Programmable Options for more information on how best to configure the unit for your particular installation.

The X10 transmitter in the XTB-IIR auto tunes itself to 120KHz using the powerline as a reference. The LED will glow dimly when lock is achieved. By default, the XTB-IIR only transmits the X10 burst following a zero crossing. If three-phase transmission is enabled, the transmitted power is reduced, and all bursts will be transmitted in the standard 3-phase windows.

## XTB-IIR CONNECTIONS



### XTB-IIR 120V 2-Phase Connections



### XTB-IIR 240V Single-Output Connections