

# **XTBR X10 Transmit Booster/Repeater Operation**

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The original XTBR developed in 2006 was a simple plug-in unit that boosted the output of any X10 transmitter plugged directly into it. The XTBR added the ability to repeat commands received over the powerline. While the new version of the XTBR no longer has the X10 Boost input, it can still provide that capability for an X10 transmitter plugged into a nearby AC outlet.

The XTBR does not waste energy on the superfluous 2nd and 3rd bursts of a 3-phase transmission, which are blanked by default. Depending on line characteristics, the XTBR can output over 20Vpp at 120KHz onto the AC line. Since the XTBR only drives the phase it is plugged into, a good passive coupler is still required to propagate its strong signal to the opposite phase. A coupler may also be necessary to receive signals from other transmitters on the opposite phase.

The XTBR error checks all incoming data, and can cancel its transmission when a collision is detected. Like its bigger brother, XTBR includes the ability to repeat a series of sequential dims to avoid their being recognized by some dimmers as micro-dim commands. The XTBR will also repeat the "doublet" extended commands produced by controllers such as the CM15A, HomeVision, and some other controllers.

## **ELECTRICAL CONNECTION**

Unlike the XTBR-IIR, the XTBR will plug into any standard AC outlet. For best performance, an AC outlet near the distribution panel is preferred to minimize signal loss in the run to the panel. A good tuned-circuit passive coupler like the XPCP should be installed near the panel to propagate the strong XTBR signal to the opposite phase when X10 devices are on both phases. An active coupler/repeater like the XPCR will not do that. Because X10 signal strength falls off as it propagates down the wire, a coupler that plugs into a dryer outlet may not work well if the run between the dryer outlet and the distribution panel is too long. Twenty feet should be fine, but a lot of signal can be lost a round trip for a run of fifty feet or longer.

## **XTBR OPERATION**

The XTBR will repeat any valid X10 commands received over the powerline. Normal X10 commands are a "doublet" comprised of two identical halves. The XTBR receives and error checks the first half, and then retransmits that same bit pattern overlaid in bit sync with the second half. The LED flashes bright green as the first half is received, and then bright red during the transmission.

The XTBR will also directly boost X10 commands sent by a transmitter plugged into a nearby outlet on the same circuit. Because these commands are boosted bit-by-bit as received without error checking, the real-time boost function uses a high detection threshold to minimize the possibility of noise triggering this function. The LED flashes bright red during the entire command for real-time boost to differentiate this function from normal repeater operation.

The XTBR 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 to prevent standard dim commands from being recognized as micro-dim commands.

The XTBR will shut off its transmitter when it detects continuous X10 traffic on the powerline. The XTBR will normally pass a burst of about 120 X10 commands, or 20 per minute continuous. The high threshold increases this to a burst of about 200 commands, or 30 per minute continuous. The lower limit should be adequate for most

installations. Either turning power off for 10 seconds or 10 seconds of clear line will recover from a shutdown. It may take over a minute of clear line for operation to be restored when a second shutdown occurs soon after recovery to allow the transmitter to cool.

The X10 transmitter in the XTBR auto tunes itself to 120KHz using the powerline as a reference. This may be a something to consider when using the XTBR in an installation powered by a generator. The LED will glow dimly when lock is achieved.

By default, the XTBR only transmits the X10 burst following a zero crossing. If three-phase transmission is enabled, all three signal bursts are transmitted, and the transmit power is reduced.

Please refer to the XTBR Mode Options document for more information on how best to configure the unit for your installation.

### **LED Error Indications:**

- 2 red flashes:** A command was received on a disabled housecode.
- 3 red flashes:** A receive error occurred due to noise or missing bits.
- 4 red flashes:** A transmission error occurred due to a collision.
- 5 red flashes:** The mode programming was not completed before timeout.
- Continuous:** The XTBR is in command storm shutdown