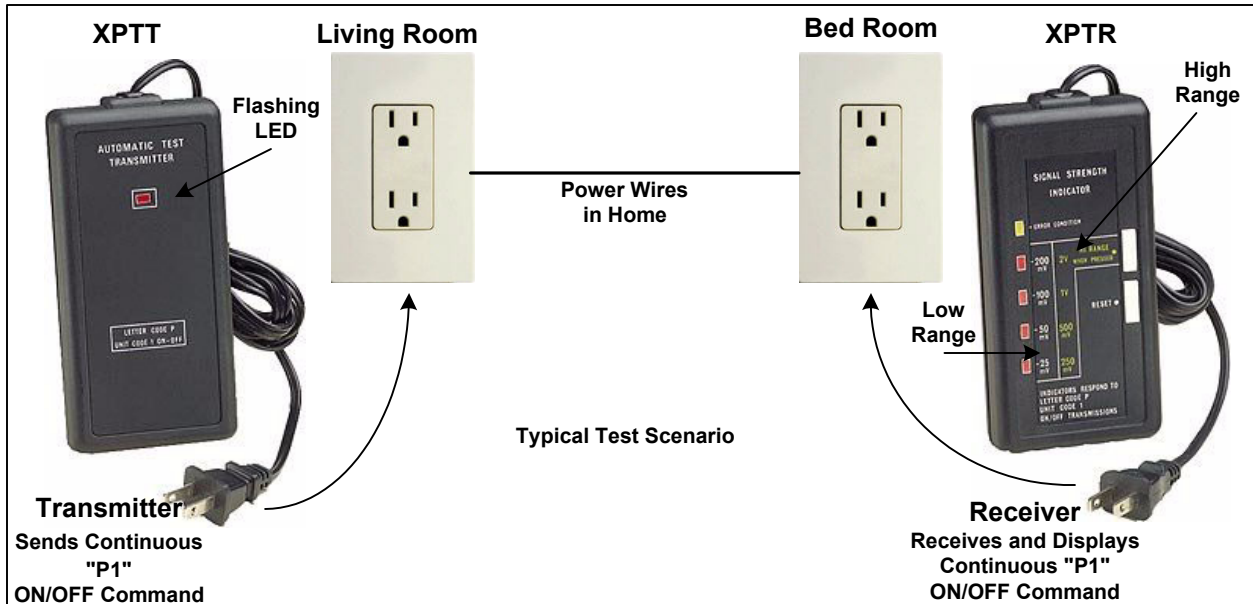


# Test Transmitter / Signal Strength Indicator **XPTT / XPTR**



## Description:

These devices provide help to installers to test the X10 Signal Integrity of any X10 System for optimum performance and reliability.

1. XPTT: Sends a continuous "P1" Addressed ON/OFF X10 Command Signal transmission from the location where it is plugged in.
  2. XPTR: Measures the strength of X10 Command Signals traveling throughout the home via the power wires.
- These devices simply plug-in and are recommended for testing all X10 PRO installations.

**Specific Requirements:** 120VAC.

## Optional / Supplementary Devices & Modules:

XPPF Plug-in Filter, XPF Wire-in Filter, XPNR Wire-in Noise Reducer, XPCP Passive Phase Coupler, XPCR Phase Coupler/Repeater.

## X10 Protocol:

**House Code Dial** - Letters A-P, Default "A"    **Unit Number Dial** - Numbers 1-16, Default "1"

Each X10 Receiver Module is set to a unique Unit Number or to an identical Unit Number as desired.

Each X10 Controller operating a specific set of Receiver Modules must be set to the same House Code as the Receivers they are controlling.

## Electrical Protocol:

Nearly all residential homes are wired SPLIT-PHASE. Each 120V Phase is NOT directly connected with the other 120V phase. If an X10 Receiver does not respond to a Remote Controller, then check to ensure that the breaker serving the X10 Receiver is on the same phase as the Controller. If not, the breaker can be changed to the opposite phase. An alternative solution is recommended, to install a Phase Coupler for improving remote communications throughout the home. See [www.x10pro.com](http://www.x10pro.com), then select Technical Support and PLC Troubleshooting.

## Installation:

**Note:** For test purposes, you may want to change the address of any installed X10 Receiver Module that may be set up with the address "P1" (to prevent cycling caused by the XPTT). Conversely, you may set an X10 Receiver Module to "P1" and watch for it to respond, once Noise is eliminated.

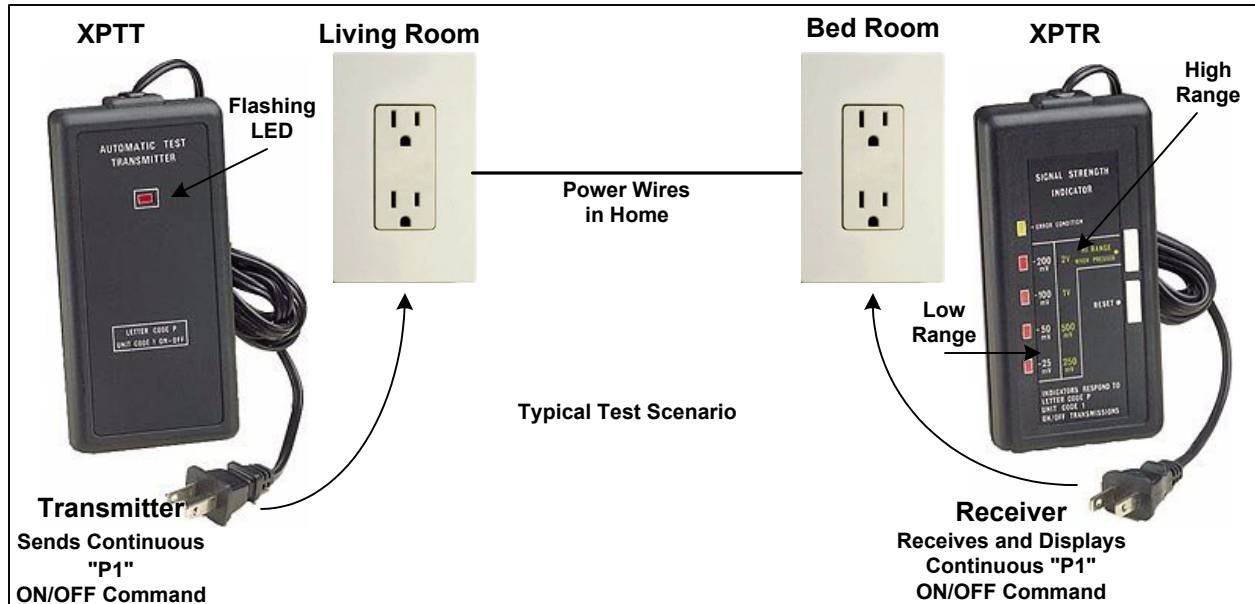
- 1) At the proposed or installed Transmitter/Controller location:
  - a) Plug the XPTT power cord into a 120VAC outlet, or
  - b) Using insulated test probes, alligator clips or a 120VAC receptacle pigtail, connect the XPTT power cord to 120VAC.
- 2) Once plugged in, the XPTT will transmit ON/OFF Codes continuously at the "P1" X10 Address. The flashing LED indicates command signals are being transmitted. Leave the Test Transmitter at this location and go to 3).
- 3) Test the Signal Strength:
  - a) Plug-in the XPTR then push and hold the reset button. 25MV LED illuminates showing you have power. Release the Reset Button. The **Low Range** Signal Strength is read from the white colored numbers. The **High Range** Signal Strength is read from the yellow colored numbers, **while pressing and holding the High Range Button.**

**Note:** The minimum signal strength required for X10 Receiver Module operation is 100mV. however, attempt to get as high a Signal in the High Range as possible. Do this by systematically pulling plugs on electronic devices that could be generating noise. This may also require shutting off breakers one at a time while you view the Signal Strength Indicator for Signal improvements.

- 4) If the **ERROR LED** flashes, there is excessive Noise or false/incorrect electronic signals on the transmission line power wires that is causing the X10 Signal to become un-intelligible. The source of this Noise or unwanted signal should be identified and corrected to prevent interference with X10 operation.

See Page 2 for detailed troubleshooting information.

# Test Transmitter / Signal Strength Indicator **XPTT / XPTR**



**Electrical devices** such as TV, VCR, Stereo, Low Voltage Power Supplies/Lights, Fluorescent Lights, Computers, LCD Monitors, Internet Modems and Power Strips with surge protection all have a tendency to "dump" electrical noise on the power lines as broad band frequencies. Many new electronic devices available to the public use circuitry to "clean" their power supplies before supplying the power to it's circuits. When this is done, the waste power or noise is dumped out of it's plug and directly on the power lines of the structure. Because Power Line Carrier (PLC) products, such as X10, use the power lines as a communications path, they are susceptible to electrical noise interference that **cannot** be noticed or detected without the proper X10 PRO Test Equipment.

When **noise** is placed on the power lines, it **can attenuate, corrupt and/or block the X10 Command Signals** being transmitted or received over the entire house. Typically, Noise will cause intermittent operation of the X10 Receiver Modules. An example would be if you can turn ON a light from an X10 Transmitter/Controller but cannot turn it OFF from the X10 Controller or you can turn OFF an X10 Receiver Module but cannot turn it ON. You may have a X10 Controller and an X10 Receiver Module seemingly only a few feet apart and not be able to get signal through because of power line noise being broadcast by an electronic device all the way on the other side of the house or in the same room. **The Offending Device does not even have to be turned on, because a TV or Computer still has their power supplies internally turned ON even when they are outwardly turned OFF.**

**Noise on the power line is solvable. The proper way to troubleshoot for Noise is to use an XPTT Test Transmitter and an XPTR Signal Strength Indicator.** The XPTT is plugged in at the transmission point where it will transmit a continuous Addressed "P1" ON/OFF command. Taking the XPTR, you go from outlet to outlet in the home and view a Signal Strength reading.

The XPTT transmits a 2V signal and the XPTR can detect from 2 Volts(V) down to 25 Millivolts (mV). The lowest possible signal that can make a module respond properly is 100mV. As you go around the structure (viewing readings) and you see a fluctuation in the signal you may have detected a noise-producing Offending Device. While leaving the XPTR plugged in, you can systematically unplug a device (TV, VCR, computer or low voltage lighting power supply) and see if you detect any change in the signal strength. You may have to shut off a breaker if the device is hard wired without a plug. If no change is seen go on to the next device. **When you see a signal increase, upon unplugging a device, then you have detected an Offending Device.** Now all that you have to do is purchase an **XPPF plug-in Filter**. The XPPF is plugged into the wall where the Offending Device was plugged-in and then plug the Offending Device into the XPPF. The X10 Signal will now pass freely through the electrical system without the noise interference (reduced by the XPPF Filter) passing onto the power line. If the Offending Device was a hard-wired device, then an **XPF Wired-in Filter** can be installed between the switch and close to the Offending Device.

**Sometimes low signal strength is directly related to the two 120V lines that are present in all Split-Phase home power systems supplying 240V for appliances.** You may have an outlet only a few feet from another but have one of the outlets on one side (or Phase) of the breaker panel and another outlet on the other side (or Phase) of the breaker panel. The two 120V lines are often referred to as Phase A and Phase B. The X10 Signal (on Phase A) has to travel through one side of the breaker panel, out thru the meter and back to the power-pole transformer on the street, then back thru the windings of the transformer to your meter and then to Phase B of your breaker panel, just to reach the rest of outlets in your structure. There is little signal strength remaining after this signal path is traversed by the X10 Command Signal.

To allow the X10 Signal to travel freely to both Phases an **XPCP Passive Phase Coupler** should be installed in the breaker panel across a 240V breaker and to the neutral bar allowing the two Phases to become one communications bus. In larger homes with long runs of electrical cable, an **XPCR Phase Coupling/Repeater** should be installed that will receive the signals from either Phase, Restoring them to full strength and repeating them throughout the home on the opposite Phase.

In rare cases when the noise is hard to locate or is intermittent; an **XPNR Noise Reducer** may be used either at the affected switch or on the circuit of the affected switch. The Noise Reducer is attached directly to the power leads of the troubled circuit. The characteristics of the XPNR make it invisible to the X10 Receiver Module. When Noise is detected on the circuit, the Noise Reducer will attenuate Noise Signals above and below the X10 operating frequency of 120KHz, on the power line.