Power Line Communication (PLC) Troubleshooting

TED communicates over the existing power lines in your home using technology known as Power Line Carrier Technology (PLC).

The most ideal data-signal will be transmitted on the following circuit: The circuit breaker that the MTU is connected to is the same circuit powering the Gateway. Obviously, you will know this is the case when you turn off the breaker powering the MTU and the Gateway powers off. Ideally, this circuit will have no noise-producing electronic devices on it, such as transformers, UPS backups, microwaves, treadmills, etc.

DO NOT plug the Gateway into a power strip. The Gateway should be plugged directly into a wall outlet, preferably isolated from any other electronic devices in the room. If you have equipment in the room on a UPS backup power supply, temporarily remove the UPS. Plug the Gateway in. If your TED system begins to function correctly, read further on using Plug-in Filters.

The blinking LED on the MTU (component in the panel), indicates a signal is being transmitted. There is an LED on the right side of the Gateway (plugged into the wall outlet) that flashes when data from the MTU has been received. This LED will flash quickly when the Gateway is initially plugged into an outlet, then it should begin blinking steadily every couple of seconds. A steady blink indicates the Gateway is receiving the data-signal from the MTU.

To locate the data-signal LED on the Gateway: With the TED logo facing towards you, the data-signal LED is on the right side, near the seam of the plastic case. If the LED is not blinking, temporarily unplug the Ethernet cable from the Gateway and plug the Gateway into an outlet in another room. You may need to try several outlets. If you have located an outlet where the LED begins to blink properly, you have proven that there is a "PLC issue." Now we want to plug the Gateway back in to the original, preferred outlet…but we know there is something interfering with the signal that we'll have to deal with.

There are several things that can cause communication problems:

a) Noise on the power line. Today's homes usually contain numerous devices capable of producing noise on the power line. These include fluorescent lights and ballasts, halogen lights, UPS backup power supplies, unfiltered dimmer switches, and fan speed controls and A/C–D/C power supplies for fax machines, computers, televisions, printers, WiFi devices, and numerous other electronic products.

b) Faulty wiring can cause large resistance in the power lines between the Gateway and MTU. This problem is frequent in older homes, homes with aluminum wiring, and homes where the wiring path from the MTU to the Gateway is long.

c) Devices on the power line that absorb communication signals. These include surge-protecting plug strips, TVSS devices, power factor correction capacitors, and power supplies containing large capacitors.

Another diagnostic tool you can use to check the PLC health of your system is the Statistics Page. You can access this 'background' page either by typing in the address of your Gateway followed by "/stats. htm" or by opening the TED Dashboard and going to HELP, then clicking "TED 5000 Statistics Page."

On this page you will see a grid of information. Look for "MTU REC" and "MTU SKP" on the left-hand column. MTU REC indicates the number of data-packets received by your Gateway. MTU SKP is the number of data-packets that have been skipped or lost. These two numbers indicate how well the PLC is operating. As long as the REC is greater than 75% of the total REC-to-SKP ratio, your TED system will present accurate data. Obviously, the higher the REC ratio the better. A low REC-to-SKP ratio will indicate line noise and/or interference on the PLC line between your MTU and gateway.

There are two types of electrical line-noise filters: in-line filters, and plug-in filters. The plug-in filter is the easiest to use IF you have located a specific device that is causing the line noise problems; you simply plug the filter into the wall-outlet and plug the offending device into the filter. The filter will take care of any noise being emitted by that device. The in-line filter is installed in the electric panel, and filters the circuit that the MTU and Gateway are connected to. Obviously this is a more complex solution simply because it is installed in the electrical panel.

Sources for noise filters: You may find filters locally at a RadioShack, or other electronic and home improvement retailers. Or you may order them online from from smarthome.com, or us directly by going to: http://www.theenergydetective.com/ted5000store.html#access