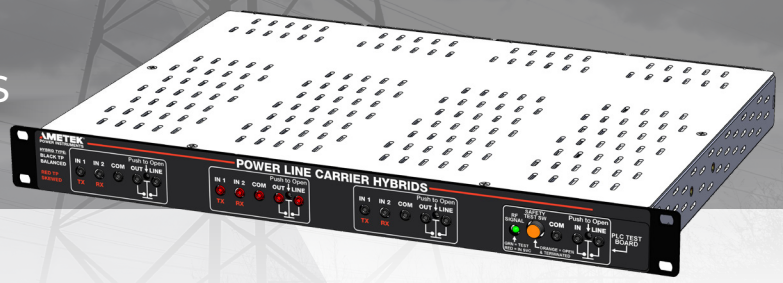
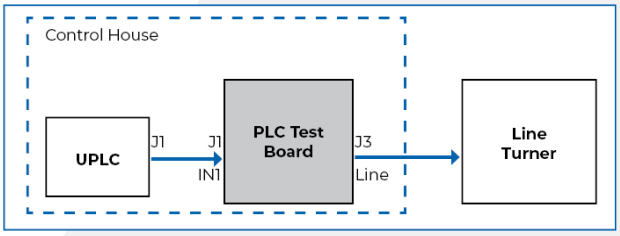


PLC Test Board

For Power Line Carrier Communications

The PLC Test Board is designed to be conveniently placed into an empty slot in the 1-RU PLC Hybrid chassis, saving panel space and giving front and rear test access to carrier signals leaving and entering the panel. Its primary purpose is two-fold by providing testing functionality and replacing the carrier grounding knife switch that may be used in the panel.



The unit is electrically inserted between the panel's final coax input/output going to the line tuner in the substation yard, as shown in the diagram above. If there are hybrids, then it is placed at the end of the hybrid chain going to the line tuner. It can be located inside the same chassis with the 1-RU PLC Hybrids if there is an empty slot. This does require a one-slot PLC Test Board front label overlay to be put on the slot it uses in the chassis.

For 1-RU PLC Hybrid chassis units that shipped before March 2023, please request the correct upgrade kit depending on the number of PLC Test Boards needed and whether the unit is a flush mount or projection mount type in order to retrofit an older chassis. This is because the front panel must be changed on the chassis to fit the larger hole required for the safety test switch.

FEATURES AND BENEFITS

1. Compatible with 1-RU PLC Hybrid chassis
2. Easy replacement for coax grounding knife switch
3. Simple transmitter calibration with built-in 50 Ω load
4. Fast responding RF signal indicator
5. Convenient front panel test points/rear coax ports

The intended application is to use one PLC Test Board per coax going out into the yard. See the table below for typical cases.

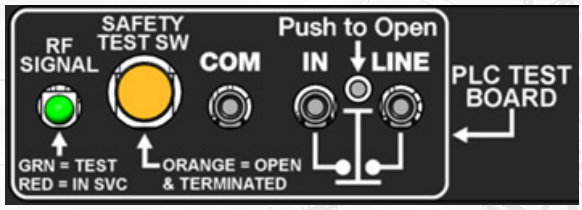
Application	Quantity of PLC Test Boards
Single coax line tuner	1
2-frequency line tuner	2
Phase-to-phase coupling	2
3-phase coupling	3

AMETEK®
POWER INSTRUMENTS

SPECIFICATIONS

PLC Test Board part number	CH20-TSTMN-001
Frequency range	30 - 535 kHz
Max power for IN (in test mode)	20 W
Max power for LINE (in test mode)	10 W
Max insertion loss (when in service)	0.2 dB
Min. isolation from IN to LINE (in test mode)	50 dB
TX reflected power (in test mode)	<0.5%
TX reflected power (when in service with a 50 Ω 1% load tied to LINE port)	<0.5%
RF signal LED turn-on threshold (normal LED jumper setting)	+23 dBm (0.2 W) signal level
RF signal LED turn-on threshold (bright LED jumper setting)	+20 dBm (0.1 W) signal level
Temperature range	-20 to 60 °C

PLC Test Board Front View



PLC Test Board Rear View

Saftey Switch Test Feature

A front panel latching safety test switch replaces the panel carrier grounding knife switch, providing not only safety in the test mode but allowing performance testing. When pressed in, the safety test switch turns orange and opens the coax path while simultaneously terminating either side of the opening with an appropriate wattage non-inductive 50 Ω resistor. You can then easily calibrate or verify the PLC transmitter's output power level into this 50 Ω load. Also, a proper 50 Ω load is provided to the line tuner so as not to disturb the impedance of the opposite end of the line. Using this switch to isolate the line tuner provides a quick way to verify if the line tuner is affecting the transmit level and reflected power.

Test Functionality/Jumpers

Front test points are provided for the input "IN" and the output "LINE" with a shared ground "COM". A momentary "Push to Open" recessed pushbutton switch between these two test points allows for inserting an external forward/reflected power meter into the circuit without needing to take the system out of service. This is a significant benefit when not wanting to disturb the system during maintenance testing.

The rear has three BNC coax ports, one for "IN1", one for "LINE" and a third bridging port "IN2", which is in parallel with "IN1" for connecting a piece of test equipment when needed. This third port also allows for bypassing the whole PLC Test Board by moving the "LINE" coax cable over to the "IN2" port if, in the rare case, an issue ever arose with the PLC Test Board.

There is a RF signal bi-color LED on the front that lights up green when the board is in test and red when in service. The LED is powered by the carrier signal itself, and its intensity varies with the carrier signal level. It lights brightly for a 10 watt level and dimly for a one watt level. This is handy for a quick visual verification that the expected carrier signal is being sent. It's fast responding so that it shows checkback test coded pulsing when this is used.

There are a few customer-selectable jumper options. The LED brightness can be changed with a jumper on the board. Additionally, there is a jumper option for the application with receiver-only DTT units where the 50 Ω load can be permanently connected as a termination for the receivers rather than switched in and out with the safety test switch.

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