Datasheet

PLT – M1501

SmartMeter Powerline Tester

1. Characteristics

- measurement and testing of physical level of PLC communication
- designed for G3-PLC or PRIME communication technology (within Cenelec A-band) and FCC band performing spectral analysis in either 20kHz-110kHz, 20kHz-500kHz (option) or 20kHz-27MHz broadband (option) frequency bands
- a web browser used for data monitoring and data logging operations on a PC or mobile device
- time based roll-oscilloscope analysis (option) available for much easier immediate transmit/receive PLC signal recognition
- data logging made inside the device through a triggering mechanism either on-demand or based on a timer
- data logs done in csv or animated gif format at configurable time intervals either on-board as data logger (no supervision required) or as in-browser downloading
- remote operation via LTE modem enabling operation from the office
- used for specific outdoor and high voltage environment
- solid construction and design with ABS plastic enclosure in robust rubber or textile casing
- power related issues:
  - 230V AC LINE input voltage, power supply included
  - Embedded rechargeable Li-Ion battery
  - over 12h standalone battery operation
- communication capabilities:
  - WiFi operating in access point mode
  - LTE USB modem option enabling remote device access from the office - via a self established VPN connection (modem can be provided)

2. General

The PowerLine Tester PLT-M1501 represents the diagnostic instrumental equipment in the form of a spectrum analyzer and/or oscilloscope enabling the observation of communication signal levels through measuring PLC signal communication directly on-site where the problem has been detected. PLT-M1501 is a key part of the comprehensive power line solution solving concept which enables a 100% successful daily energy meter readout rate. The PLT-M1501 is predominately intended to be used by utility companies dealing with PLC smart meter deployments. It is a well known fact at utility companies that PLC communication which is used for transferring predominately energy readout data once per month (but also other power quality related data if necessary) is many times subject to either interference or impedance related disturbances in the 10-100kHz or 10-500kHz frequency ranges.

Through the OpenVPN server one or multiple PLT devices can be directly managed remotely via LTE or ethernet connection. Through an automatic VPN connection the PLT-M1501 can be accessed directly via web browser on any mobile or static device.

It is therefore crucial for the utility to have an effective system in place which can remove these disturbances. The PLT-M1501 offers all the necessary means to any utility company dealing with PLC meter rollouts to observe the communication issues at the physical level by performing spectral analysis as well as time based oscilloscope monitoring in the 10kHz-110kHz/500kHz frequency bands. This enables the utility specialists to find out the reason which is causing the undesired disturbances in a very economic manner.

3. Device functionality

Main features:

- measurement and testing of physical level of PLC communication
- designed for G3-PLC or PRIME communication technology (within Cenelec A-band) and FCC band performing spectral analysis in either 20kHz-110kHz or 20kHz-500kHz or 20kHz-27MHz (option) frequency bands
- a web browser used for data monitoring and data logging operations on a PC or mobile device
- time based roll-oscilloscope analysis (option) available for much easier immediate transmit/receive PLC signal recognition
- data logging made inside the device through a triggering mechanism either on-demand or based on a timer
- data logs done in csv or animated gif format at configurable time intervals either on-board as data logger (no supervision required) or as in-browser downloading
- remote operation via LTE modem enabling operation from the office
- used for specific outdoor and high voltage (up to 250VAC) environment
- solid construction and design with ABS plastic enclosure in robust rubber or textile casing
- dimensions: 29cm x 20cm x 6cm
- power related issues:
    - 230V AC LINE input voltage, power supply included
    - Embedded rechargeable Li-Ion battery
    - over 8h standalone battery operation

- communication capabilities:
  - WiFi operating in access point mode
  - LTE USB modem option enabling remote device access from the office - via a self established VPN connection (modem can be provided)

System components:

- FPGA signal processor based processing unit with the following accessible interfaces:
  - 1 USB port (USB OTG) which is used for either WiFi dongle or LTE modem
  - Ethernet 1Gb/s – RJ-45 connector
- Galvanic decoupling and 10kHz-110kHz/500kHz bandpass filter unit (inside the device)
- Li-Po battery pack with 10Ah capacity (allows up to 8 hour operation)
- Measurement connection slots at front of device
- 2m Measurement cables
- Connection probes type FLUKE TP175E – CATIV or CAT III compatible
- ON/OFF switch with LED indicator
- 4 LED battery charge indicator with button

4. Compliance with standards

The PLT-M1501 unit complies with the following international standards:

Standard EN	Description
EN 61010-1:2010	*Safety requirements for electrical equipment for measurement, control, and laboratory use. General requirements*
CAT IV 300 compatible	*Device is suitable for origin of installation or utility level measurements on primary over-current protection devices and on ripple control units*

Table 1: List of applicable standards

MEASUREMENT INPUT
Input: CAT IV 300V
Input impedance: 31 – 482 Ohm
Frequency: 50, 60 Hz (measured 10 – 500kHz)
Connection type: phase-to-neutral

MAINS POWER SUPPLY
Input: 100-240VAC, 50-60Hz
Output: 3.6-6.5VDC, min. 1.2A
Maximum rated power: 20W