Xingtera Ethernet over Power Line Adapter User Manual

Revision History

Rev	Date	Originator	Comment
1.0	2019-10-28	Yan Han	Initial Version
1.1	2021-03-16	Jimmy Zhang	Optimize the related description of AC plug

This document describes the user manual of Xingtera PLC product.

Table of Contents

1. Objectives

This document presents how to use this device to setup a power line communication environment.

2. Product Brief

XTV3031 uses Xingtera high-speed PLC chipset. The device can be used for charging station, street lighting and other applications. It is applicable in multi-hop, high-bandwidth scenarios.

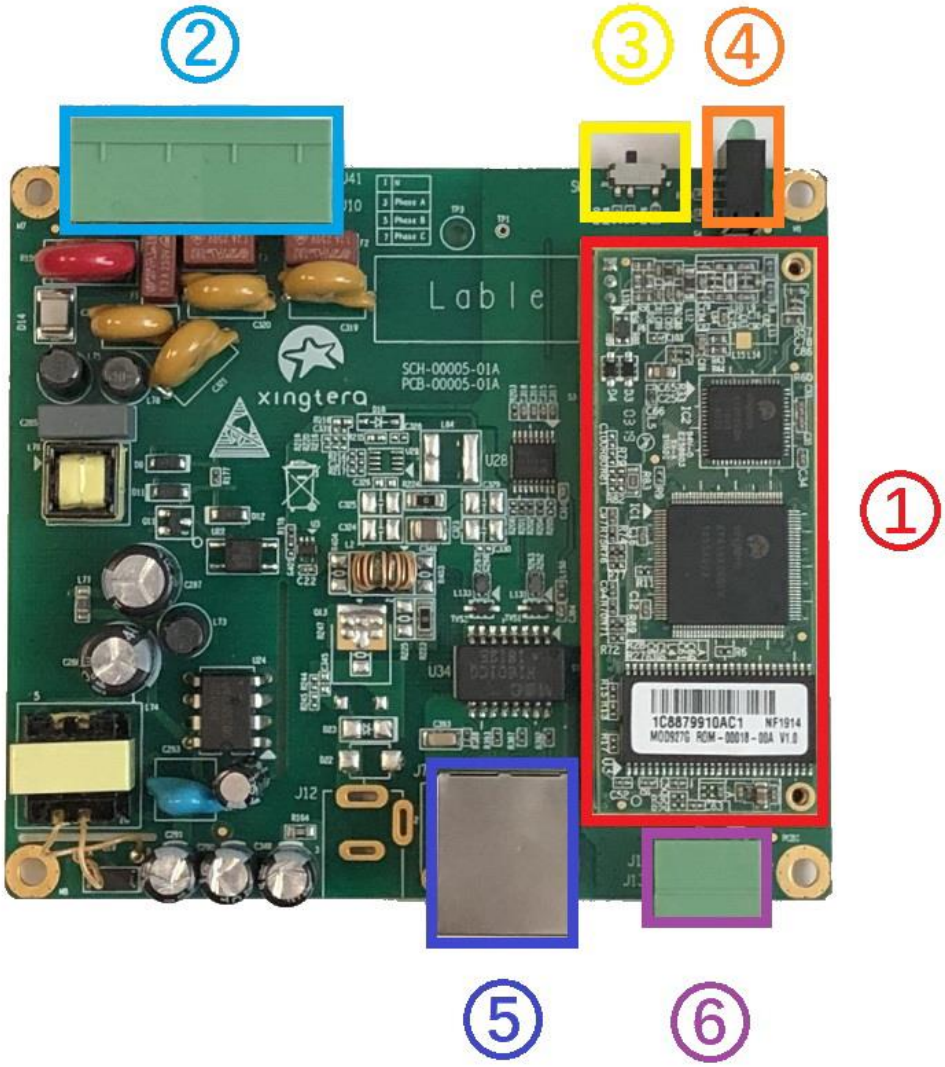
XTV3031 can support up to 1024 nodes with maximum data rate at 40Mbps. XTV3031 can be used as either master or slave device, and communicate with each other through power line. The communication between the master and slave devices can be done via existing power lines or through twisted pair/two wire lines.

3. Common Features

- Embedded with Xingtera High-speed PLC chipset;
- The XTV3031 can be powered by 100V~240V AC (DC 12V power supply is also an option);
- Comes with a 10/100M Ethernet port;
- Comes with a RS232 port with default baud rate 115200 (bps);
- One master device supports up to 1024 slave devices;
- Support for cloud server configuration and online upgrades;

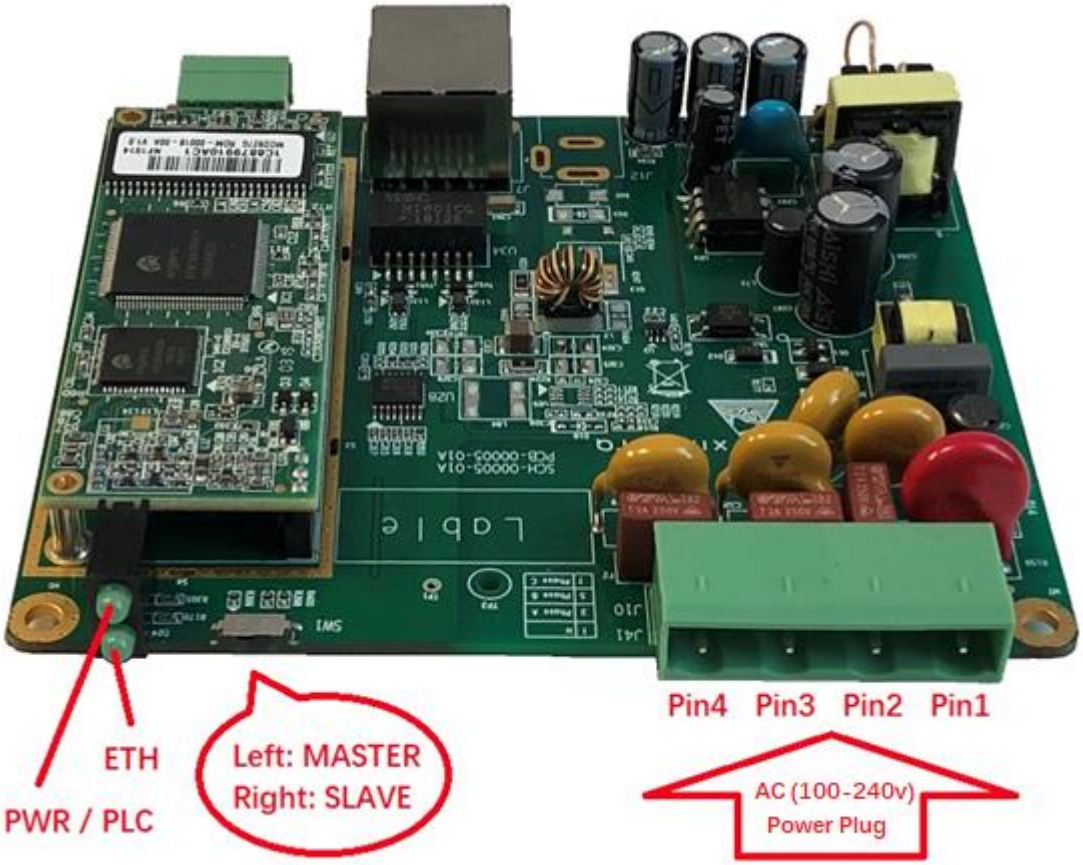
4. Hardware Overview

● Product Appearance



① Xingtera PLC Module (support MOD923 series and MOD927 series)
② AC Power Plug
③ MASTER/SLAVE Role Switch
④ LED Indicator
⑤ RJ45 Ethernet Port
⑥ RS232 Interface

Interface Description A

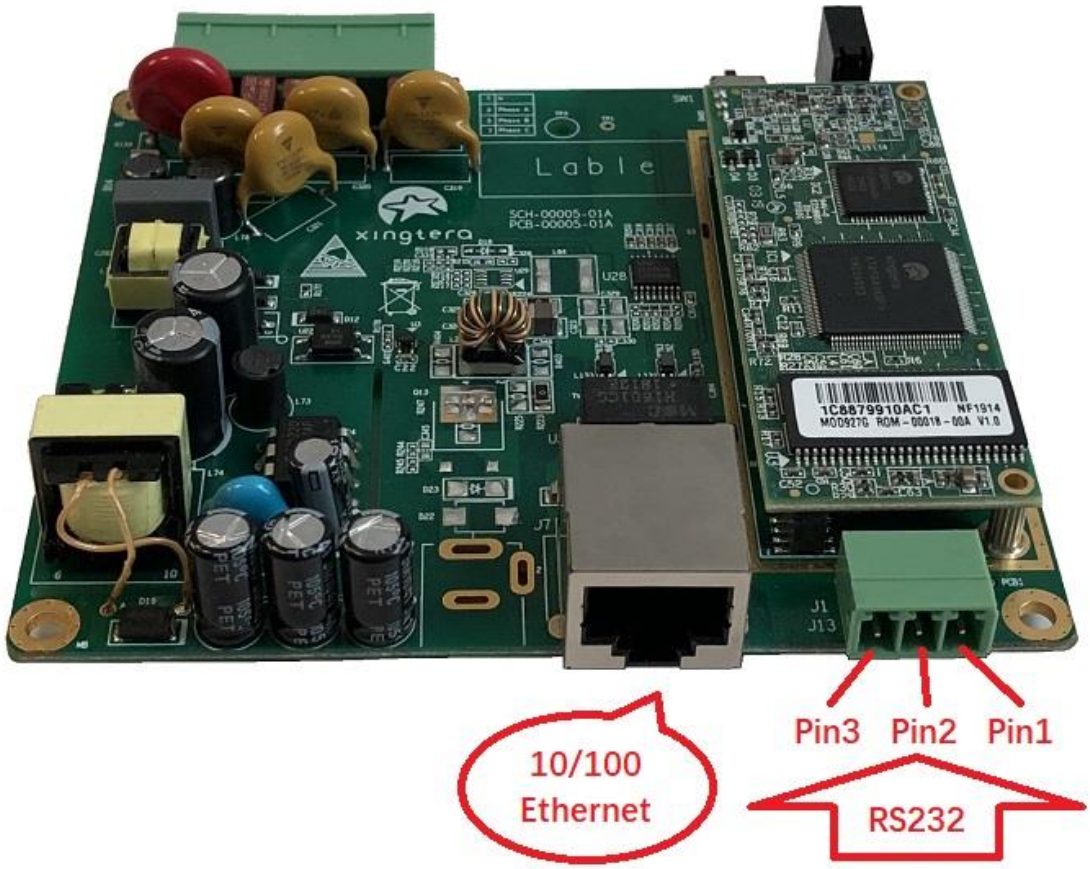


Type	Description
PLC LED	Green: PLC is link up; Light Off: Device is power off or no PLC connection.
ETH LED	Green: Ethernet is link up; Green blink: Data transmits through Ethernet; Light Off: Device is power off or no Ethernet connection.

Type	Description
Role Switch	Turn Left and reset, device will running as MASTER role; Turn Right and reset, device will running as SLAVE role.

Type	Description
AC Power Plug	Pin1 is connected to the Neutral wire. Pins2, 3, 4 connected to each phase of the three-phase power respectively. AC power supply use pin1 and pin2. Pin1 and any of three Pin2, 3, 4 are used for PLC signal transmission.

Interface Description B



Type	Description
RJ45 Ethernet Port	10/100BASE-TX; Auto Negotiation, Auto MDI/MDI-X;

Type	Description
RS232 Serial Port	Pin1 is RX; Pin2 is TX; Pin3 is GND.

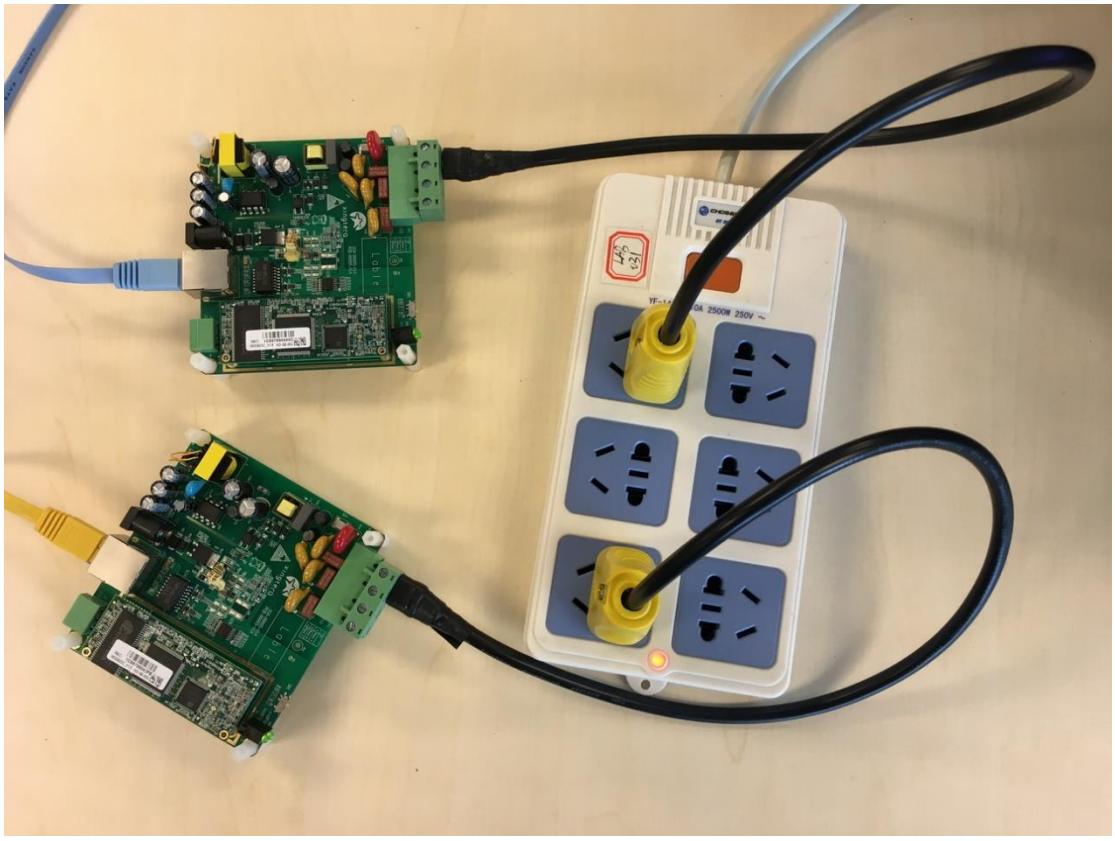
5. Simple Test System Setup

● Typical Back to Back Scene

In general, setup a simple back-to-back test environment that can use existing utility power.

However, due to the complexity of the power line environment, various noises may seriously affect the communication quality of PLC equipment. So it is necessary to separate the test power strip with U-PLC splitter or other type of filter. Or setup the system in an isolated power environment.

Set the switch of one of the devices as the MASTER role and the other as SLAVE role. Power up them both, and then confirm registration by the lighting status of each PLC LED. Green light-on means the registration is successful.

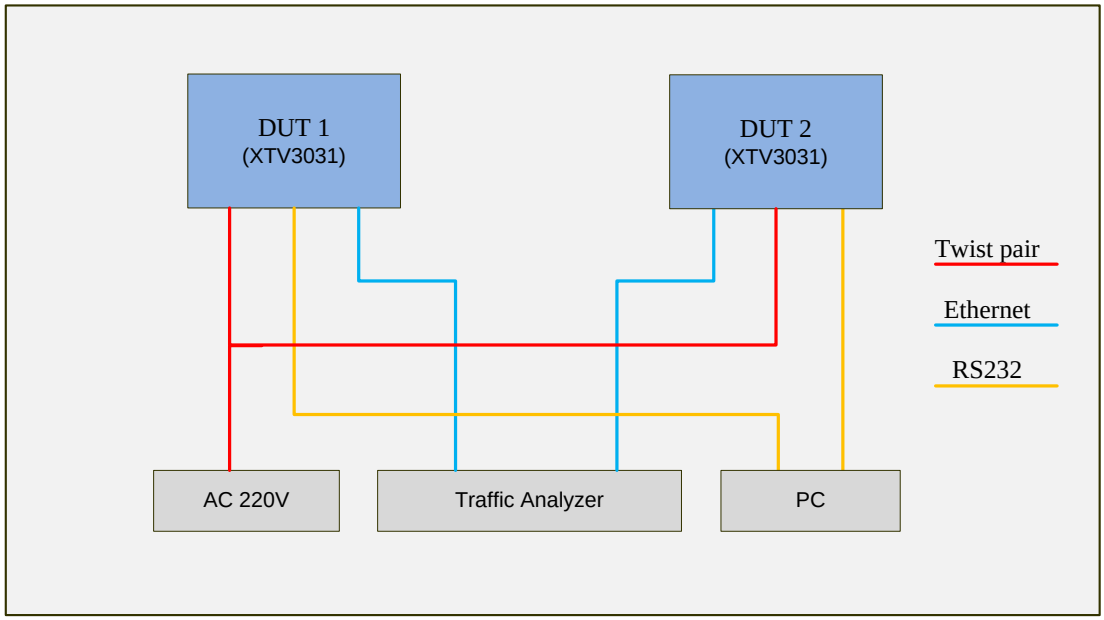


Topology Diagram

Following diagram shows detail connection between test unit and other auxiliary equipment.

Traffic analyzer also could be instead by PC, you can choose commonly used packet testing tools on computer, just like Ostinato, iPerf, etc.

RS232 serial bridge feature use 115200 bps as default baud rate.



Note:

1. Serial communication on Xingtera device is only used for some of management requirements with small amount of data transmission. It cannot be used for high-speed data forwarding. Transmission rate is not promised. Please refer to the actual test results.

2. XTV3031 device also supports another Serial-to-TCP data transfer mode, which need to run a special software version to enable this feature. If necessary, you can contact Xingtera sales for related specific information.

Multi-Node Scene

XTV3031 supports the maximum number of 1024 slave devices. The amount of specific support is related to the quality of communication in the field power line environment.

The following figure shows a typical multi-node scenario and related applications.

Topology Diagram 2

Note that only one MASTER role device is allowed in the same network environment, and all others should be SLAVE roles.

For power line environments with multiple phases, it is necessary to pay attention to the situation of cross-phase connection. In general, cross-phase connection will seriously reduce the communication quality of PLC device, which is not recommended. Please try to use single-phase connection, or multiphase connection.