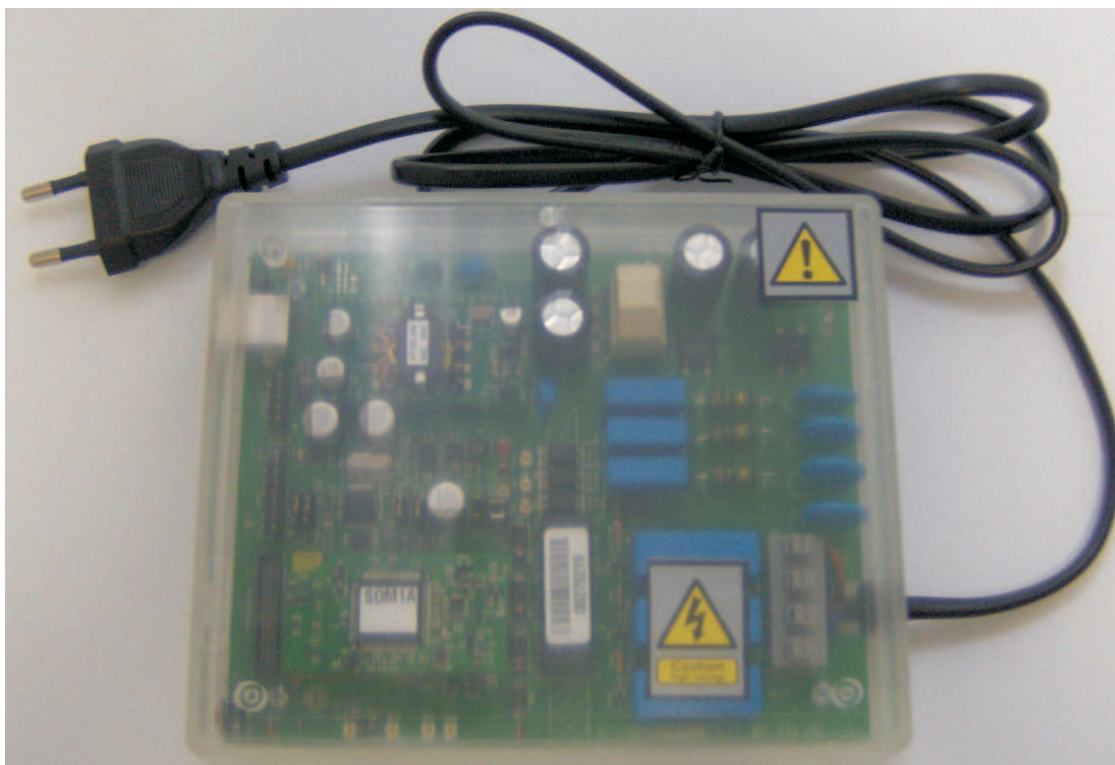


Power Line Communication (PLC) Modem Developer's Kit Overview

1 Developer's Kit Overview



This document describes the PLC Modem Developer's Kit evaluation board designed to work with Texas Instrument's C2000™ microcontrollers. For more information, see www.ti.com/c2000. This kit is designed to give customers an opportunity to quickly evaluate TI C2000 products for Power Line Communication with a software programmable robust narrowband communication over low-voltage power line.

Features of the PLC Modem Developer's Kit include:

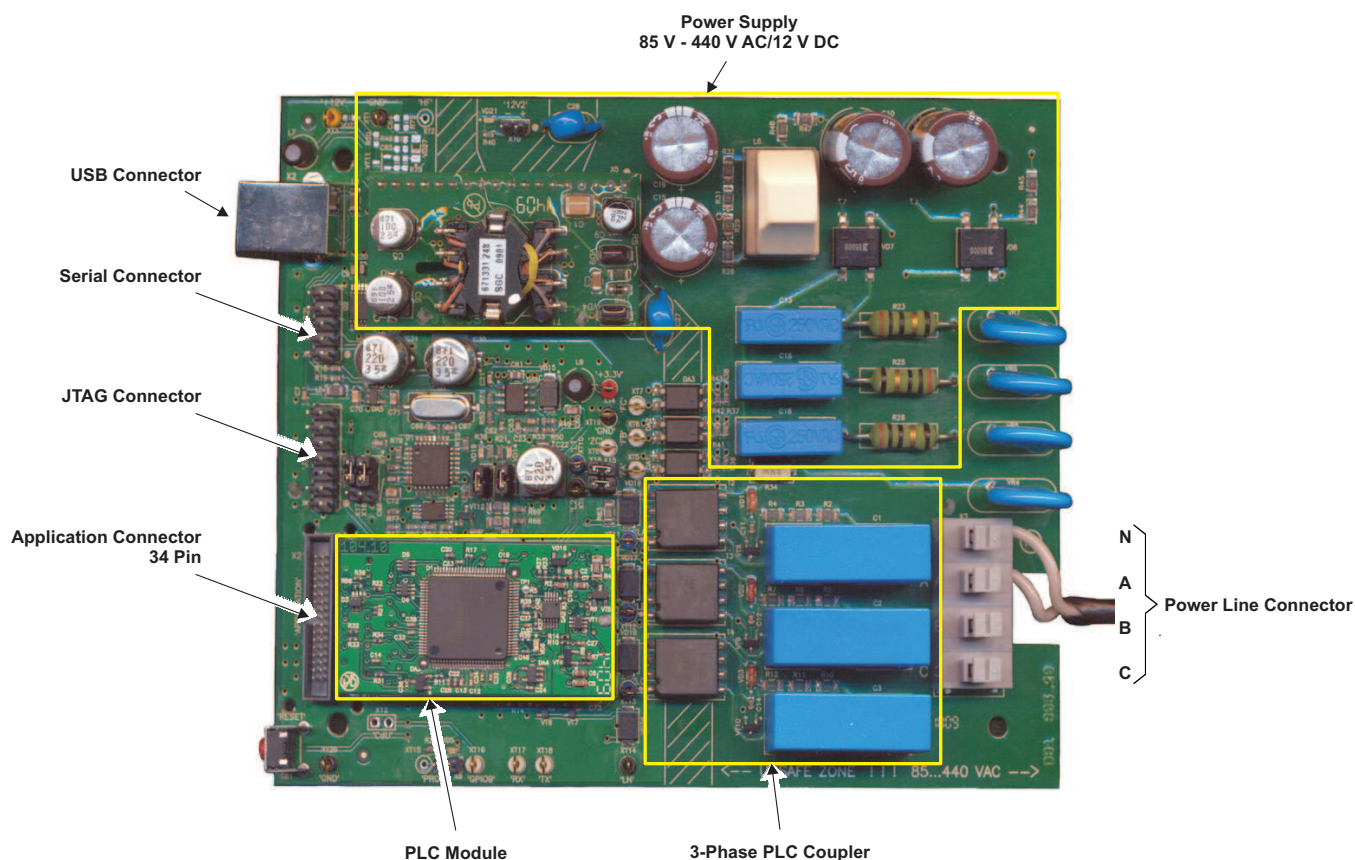
- OFDM and S-FSK modulation scheme
- Data rates up to 76.8kbps for one phase (phase selection is provided)
- PLC System-on-Module (SoM) with interface to host controller (I2C, SPI, SCI)
- Compatible to standards EN50065 (Cenelec), IEC 6100-3
- Operating frequency range 24-94.5 kHz (Cenelec A band)

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2 Developer's Kit Components

- Hardware
 - Two development boards
 - Two System-on-Module (SoM) (installed on the two boards)
 - Two power cables
 - Two USB interface cable
 - A TMS320C2000™ Experimenter Kit to develop embedded target Host interface communicating with the PLC Modem is provide, which is optional. For more information, see <http://focus.ti.com/docs/toolsw/folders/print/tmdxdock28027.html>.
- Software
 - Drivers for USB support (Windows® based)
 - The PLTerminal3 application for configuring the SoM and testing the power line communications, and as reference for implementing the SoM host-interface in final applications.

3 Board Overview



4 System Requirements

To install and use the Development Kit, your computer must meet the following minimum requirements:

- Microsoft® Windows® XP (SP2) or Windows 2000 (SP4)
- Pentium® IV 1-GHz processor
- 128 MB RAM (256 MB RAM recommended)
- USB 2.0 interface
- CD-ROM drive
- Screen resolution 1024x768 (or better)
- 1 MB of free space on the HDD for the applications and more for LOG files

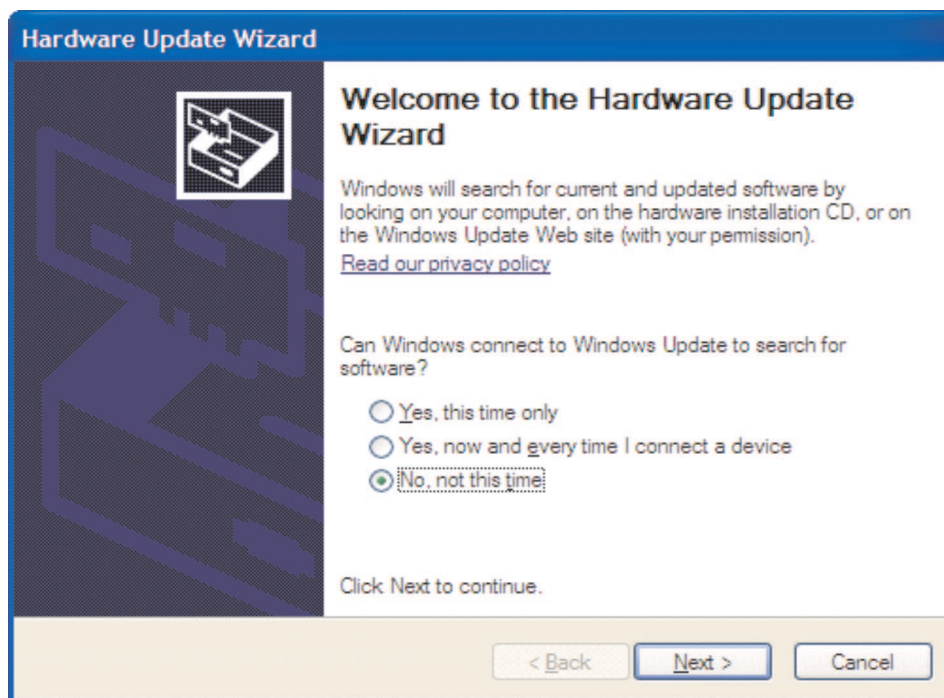
5 Getting Started

Follow these steps to connect the board before starting the operation.

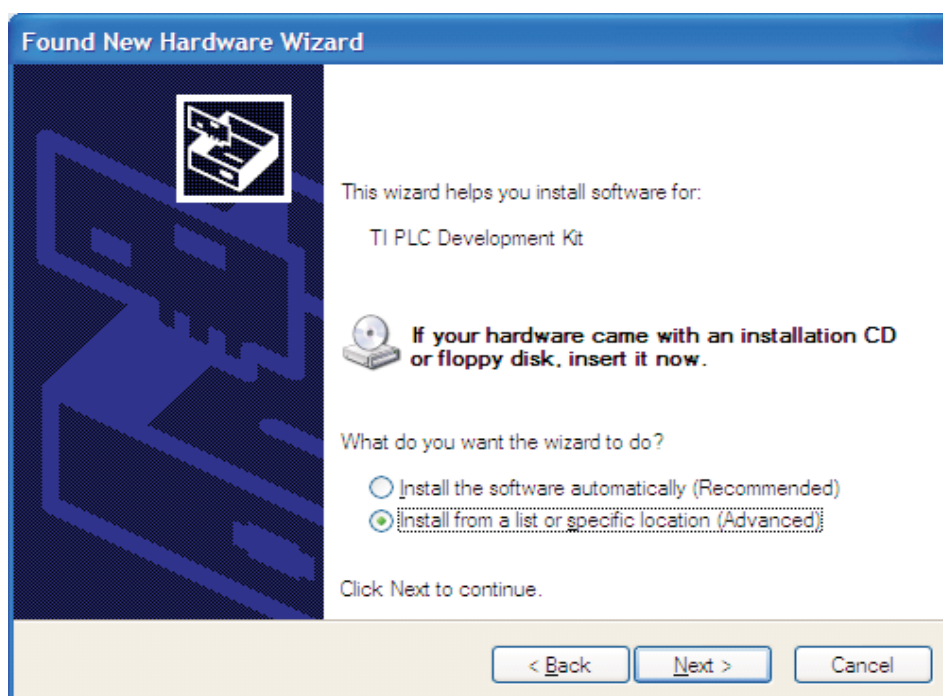
1. Connect ONLY the USB cable of the PLC-DK board to the PC. Windows will ask for the driver to be installed as shown in the *Hardware Update Wizard* shown below.

NOTE: For increased stability of the serial port connections, do not connect the Power Grid before connecting the USB.

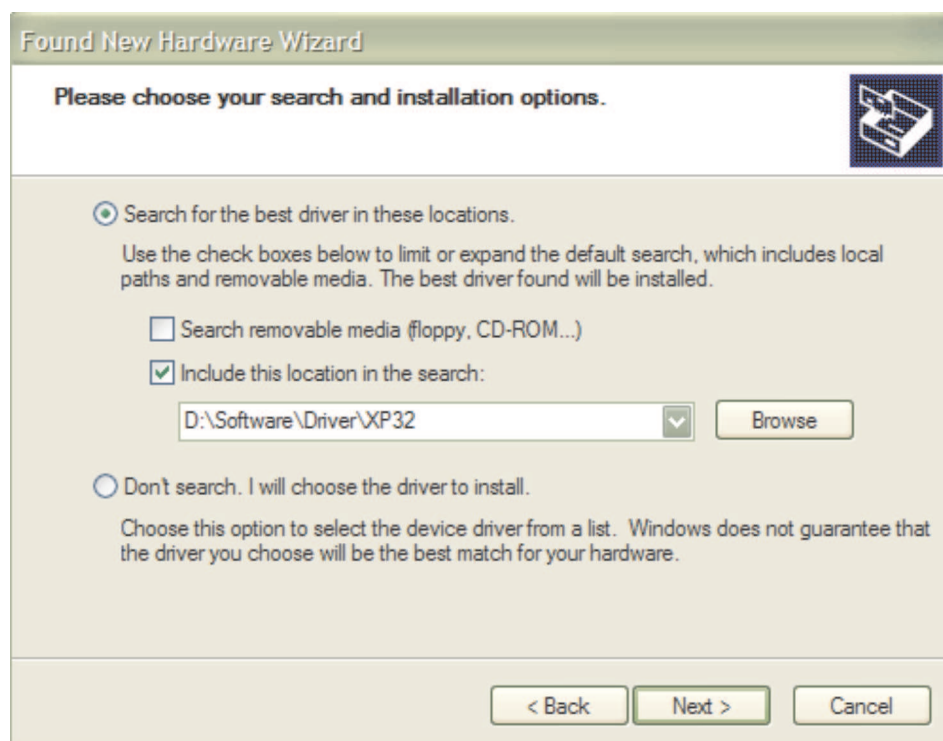
2. Select *No, not at this time* and click *Next* to continue.



3. Insert included CD.

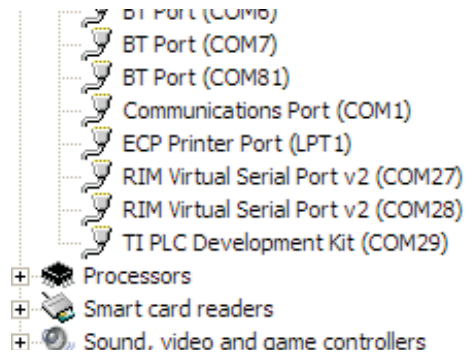


4. Browse to the folder shown below (example shown is for 32bit Windows XP and the CD is mapped to the PC's d: drive. Click *Next* to continue.



5. Repeat the previous steps for the second PLC-DK board. The second board can be connected to the same PC as the first.

6. Open the device manager and make note of the COM port that the PLD-DK was installed to. See the example below:

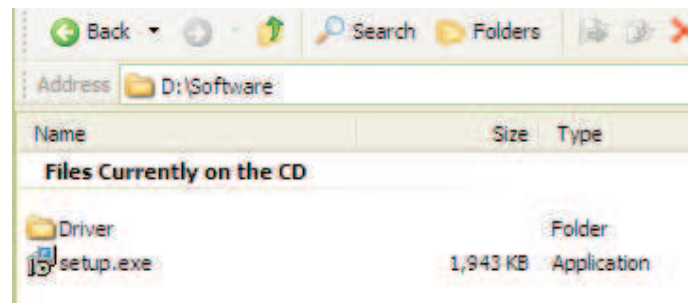


7. Connect each PLC-DK modem to the power grid.
 - Connect the mains cable to connectors N and A shown in the Board Overview.
 - Make sure that both boards are on the same electrical phase. You should first try communicating on the same electrical circuit to ensure that the installation was successful.

WARNING

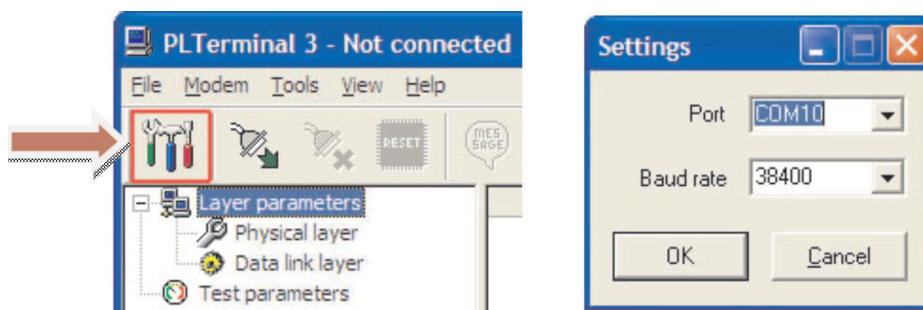
The Power Grid is HIGH VOLTAGE. Please use necessary precautions when working with HIGH VOLTAGE.

8. Install the PLC application from the CD.
 - Execute the setup Utility from the CD.
 - Application should install by default under C:\Program Files\PLC-DK.

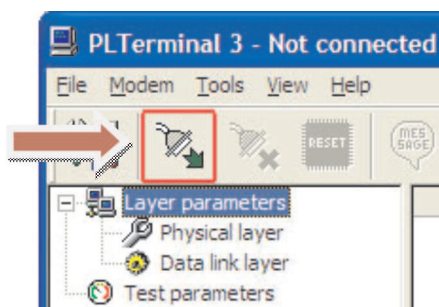


9. Launch the included PLC GUI application from the Windows Start Menu.
 - One GUI application is needed for each PLC-DK.
 - The PLC GUI executable is PLTerminal3.exe.

10. Connect to the PLC-DK.



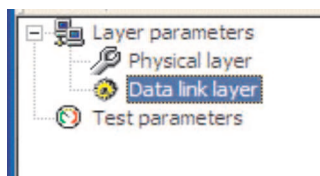
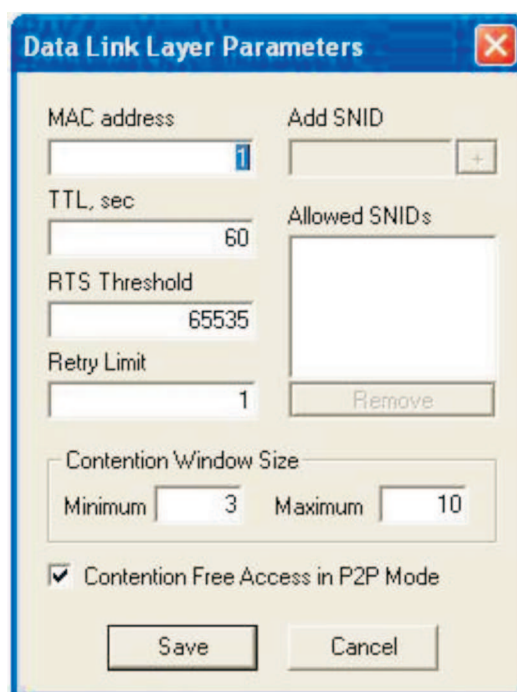
Click on the Connect icon. You should see modem information in the message window.



Time	Message
13:38:35	COM29 opened.
13:38:35	Modem found:
	• Type = 7001
	• Serial Number = 874910
	• Software version = 1.2.2.22
	• Hardware revision = 1
	• Supported baudrates: 4800,9600,19200,38400,57600,115200
	• DL max frame size = 200
	• Supported layers: LLC Type 1
	• Supported modes: P2P, Spy
	• Interfaces: UART, I2C, SPI
	• Other features: none
13:38:35	Baudrate 115200 configured successfully
13:38:35	P2P mode configured successfully
13:38:35	Physical layer MIB variables are successfully received
	Modulation = 1bit(s), FEC = On, Phase = A, Carriers number = 40, TX gain = 94%, RX gain = Automatic, ZC offset = 0us
13:38:36	Start receiving test frames...

11. Repeat steps 9 and 10 for the second PLC-DK board.

12. Change the MAC address on at least one of the PLC-DK boards by selecting the *Data Link Layer* and modifying the MAC Address setting. This number must be unique for each board.

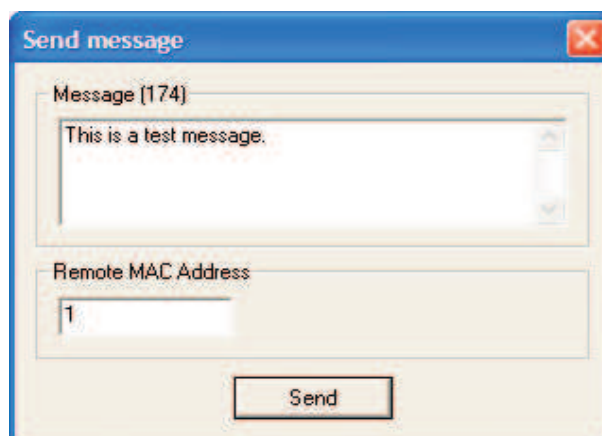



The 'Data Link Layer Parameters' dialog box contains the following fields and controls:

- MAC address:** A text field with the value '1'.
- Add SNID:** A text field with a '+' button.
- TTL, sec:** A text field with the value '60'.
- RTS Threshold:** A text field with the value '65535'.
- Retry Limit:** A text field with the value '1'.
- Allowed SNIDs:** An empty list box with a 'Remove' button below it.
- Contention Window Size:** A section containing 'Minimum' (text field with '3') and 'Maximum' (text field with '10').
- Contention Free Access in P2P Mode:** A checked checkbox.
- Buttons:** 'Save' and 'Cancel' buttons at the bottom.

13. Send a message to the other modem.

- In the GUI of the modem of your choosing select the *Send Message* button.
- Enter a message and the MAC address of the PLC-DK you would like to communicate with and press *Send*.



- View the message in the info window of the target PLC-DK GUI.

```
12:21:42 Please wait... Sending message for [19]: "Test "
```

```
12:21:42 Message was sent successfully!
```

```
12:21:42 Received message from [99]: "Test"
```

6 References

- For more details and applications, see the *PLC Development Kit User's Guide* ([SPRUG09](#)).
- For customer support please go to www.ti.com/support.

This product developed in cooperation with ADD GRUP[®] Company.

