

## Features

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- ⌘ Supports all CCI Modems and Radios
- ⌘ RS-232, TTL Digital Serial and USB Host Interfaces
- ⌘ On-board modem status indicators
- ⌘ Internal 3.3 and 5 volt modem power supply on PC Eval board
- ⌘ Two independent transceivers and interfaces – RS-232 Host Serial and USB Serial Communications
- ⌘ Wireless modem with RS-232 Eval board
- ⌘ Wireless modem with USB Eval board
- ⌘ Access to all IO signals
- ⌘ Integral or MMCX antennas
- ⌘ USB Radio module included

## Description

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The wireless modem evaluations kit allows for complete evaluation and field testing of the wireless modems, antennas and the users application. The kit also makes an ideal platform for application development and limited production. The wireless modem evaluation kit consists of two Copeland wireless modems, an RS-232 serial host evaluation board and a USB slave evaluation board. The evaluation kit is designed to allow the user to interface the wireless modems to a PC host or to embedded hardware. Since the wireless modems are all peer to peer, either end can act as the master and initiate communications.

The evaluation kit provides convenient connection and support for wireless modems modules. The kit comes complete with two wireless modems, either internal or MMCX antennas and serial and USB host communications.

## Block Diagram

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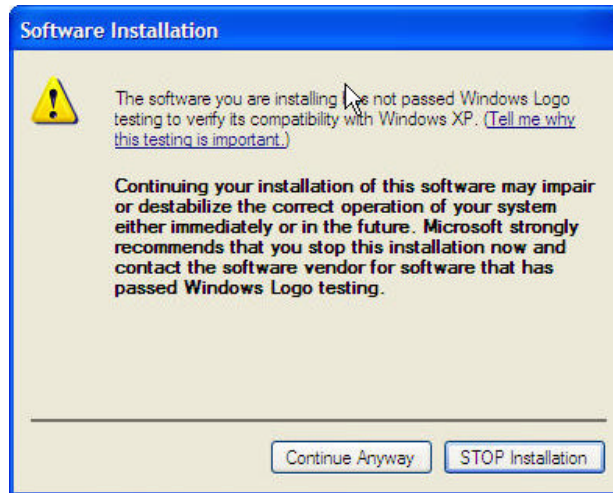
**Figure 1 Wireless Modem Evaluation Kit Block Diagram**

## Quick Start

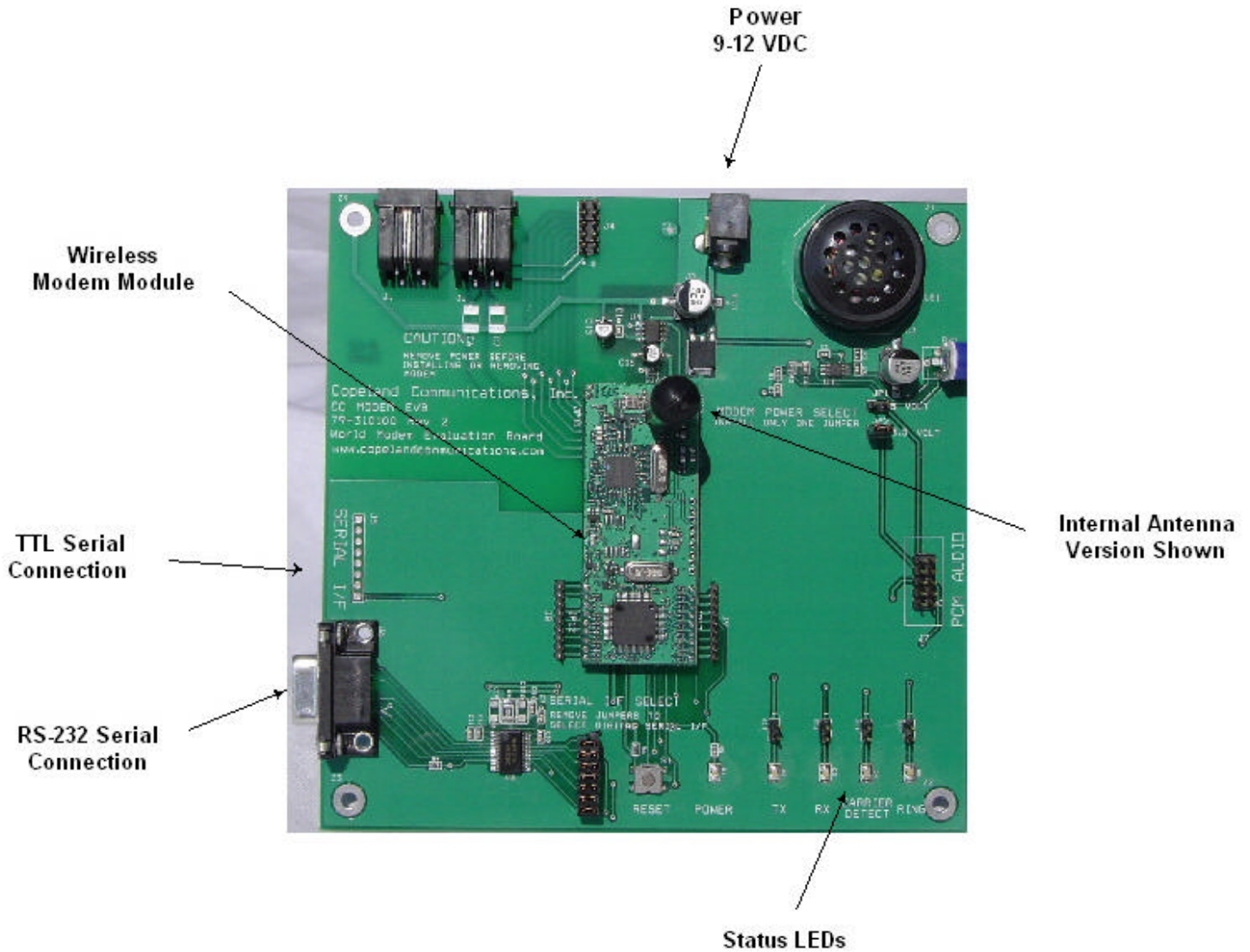
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The following steps will describe how to setup the Evaluation Kit and connect the wireless modems.

**STEP 1:** Install the USB drivers from the enclosed CDROM. When you see the warning below, simply click "Continue anyway". The installer is intended for Windows 2000, NT and XP. Contact CCI for Windows 98, Linux or Macintosh drivers.



**STEP 2:** Connect the RS-232 Serial Cable to the Evaluation Board and then the PC serial port.



**Figure 2 Serial Connection to PC**

**STEP 3:** Connect the USB Adapter Board with attached wireless modem to the remote PC using a standard USB cable. The USB interface and wireless module are powered by the USB interface. The CC-USB adapter allows you to connect any 3.3V Copeland Communications module to a USB port.

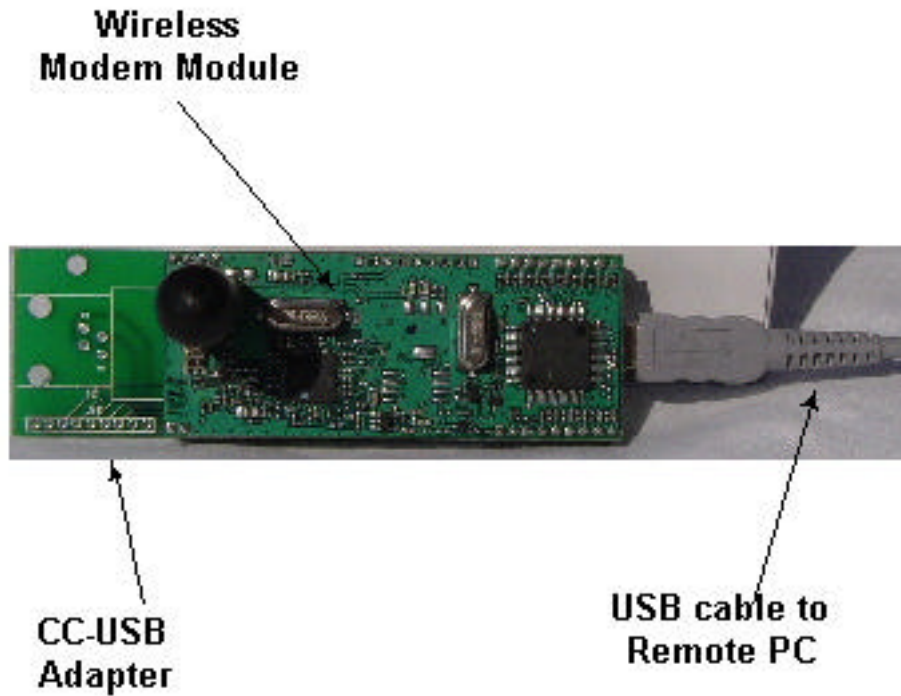
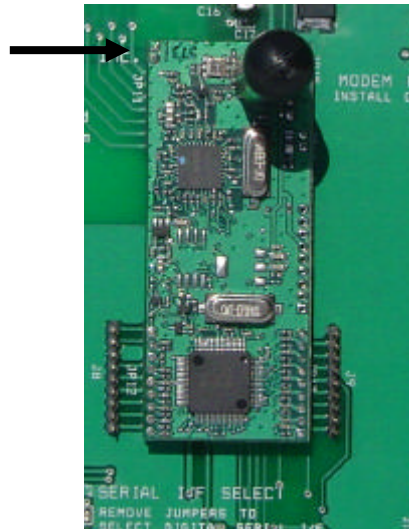


Figure 3 USB connection to remote PC

## Wireless Modem Evaluation Board User's Guide

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**STEP 4:** Copeland Communications ships all evaluation kits with the modems populated on the board already. To reinsert a removed modem or to exchange for another, be sure to connect pin 1 of the module to pin 1 of the Evaluation Board. (Pin 1 is located on the JP11 connector, shown by the arrow in Figure 4).



**Figure 4 Pin 1 location**

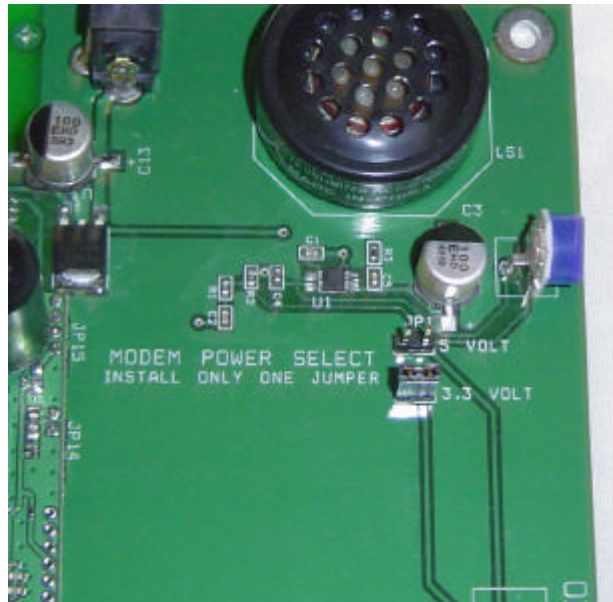
**STEP 5:** Set the power jumper to 3.3V. The wireless modem supplied with the eval kit is a **3.3 volt ONLY** device.



**WARNING:** A 5V power input on the Radio **WILL** cause permanent damage.




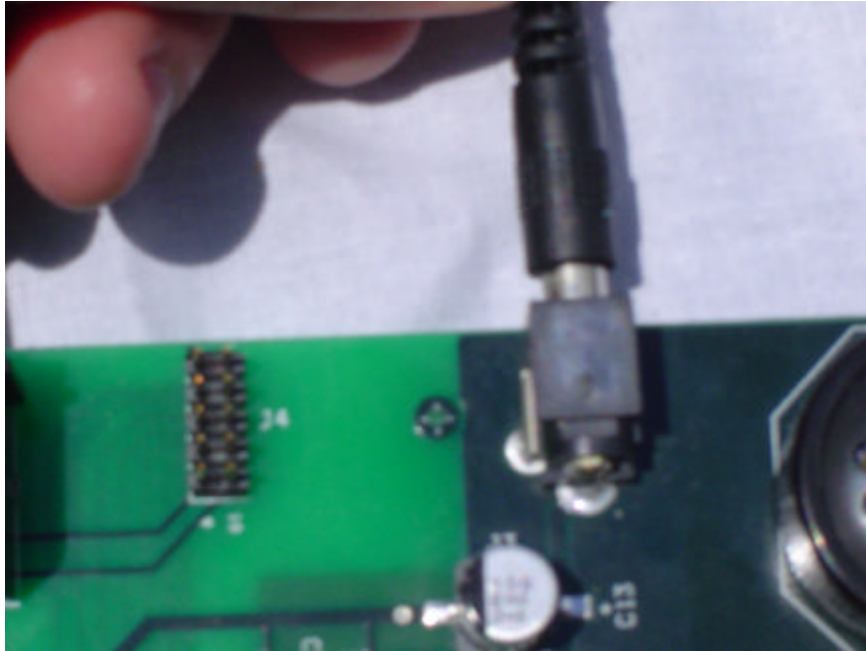
**WARNING:** Only place **ONE** jumper for power selection. Placing a jumper on both connections will damage the Modem and/or the evaluation kit.



**Figure 5 Power selection**

**STEP 6:** Connect the power supply to the board and to the wall outlet. At this point you should see the POWER LED lit. Note that there is no power switch on the Evaluation Board.

 **WARNING:** Be sure to **remove power by unplugging** the power connector **before** plugging or unplugging any connector or module



**Figure 6 Power Supply Connection**



# Wireless Modem Evaluation Board User's Guide

**STEP 7:** In Windows™, start HyperTerminal. (Start->Accessories->HyperTerminal). Create a new connection. Name the connection and select the COM port connected to the Evaluation Kit. If you have both Radios connected to the same computer, start a new session of HyperTerminal and repeat the process for the second Radio (you will have two HyperTerminal sessions going at the same time when your done). To determine the COM port for the USB Radio, look under USB in the Device Manager.

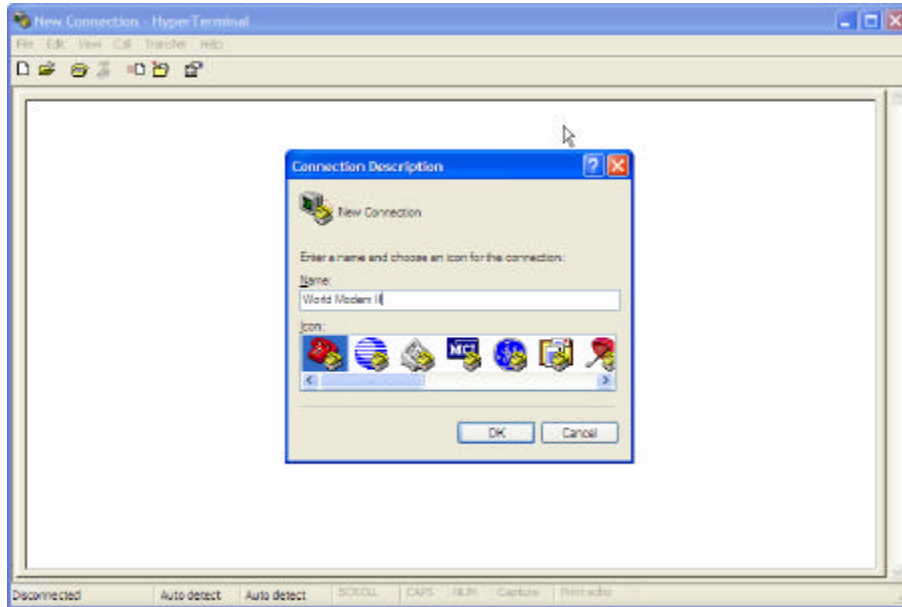


Figure 7

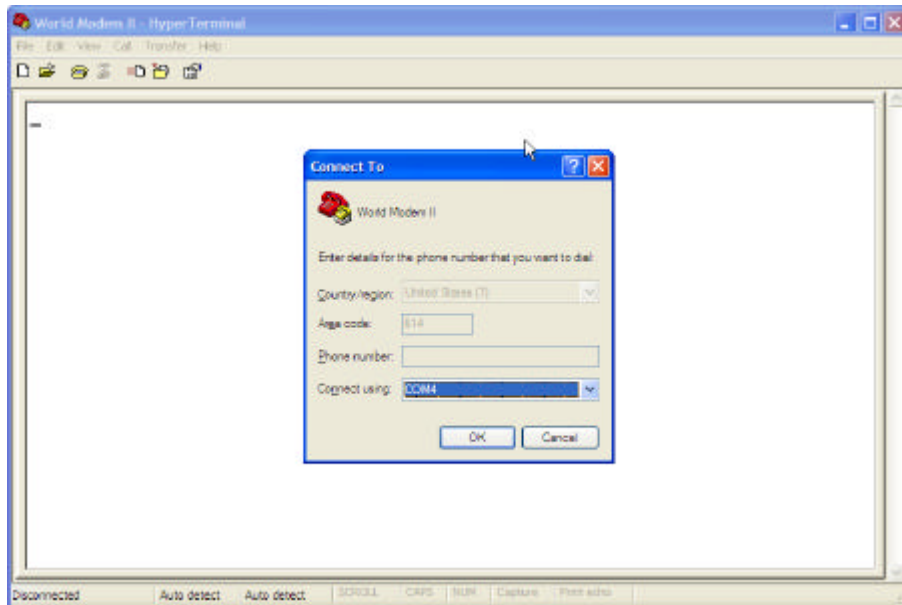
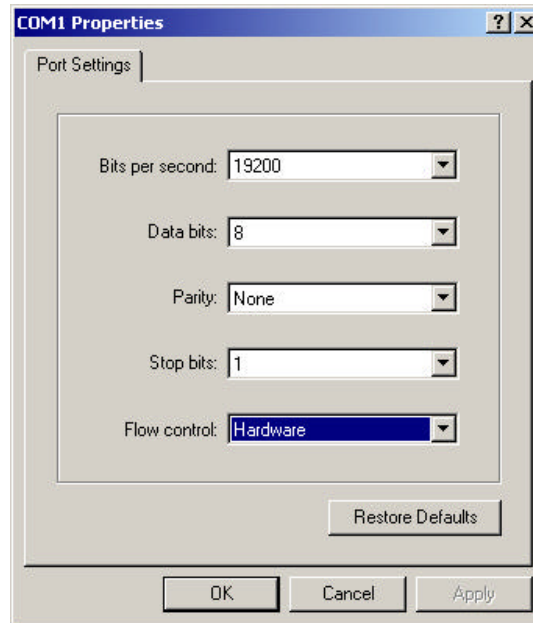


Figure 8



**STEP 8:** Set the parameters for the serial port as shown below. The Radios default to 19200 baud on reset. Set flow control to "Hardware" (RTS/CTS).



**Figure 9**

## Connecting to another Radio

Step 1: Determine or set the ID of both nodes. To determine the ID of the local Radio, use the

```
at.id?
```

To set the ID:

```
at.id=000002 (this must be exactly 6 hexadecimal characters long)
```

The ID command is set in flash and is stored permanently until changed by the user. These ID's are treated like phone numbers and must be unique to a single modem.

Step 2: Set the channels on both Radios so they match:

```
at.cl=00 (set group ID)
```

Step 3: Dial the other modem using the ATDT command

```
Atdt000002
```

If the command is successful, you will get "CONNECT" as the response.

## Using Local IO pins

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There are three commands to control the local IO pins. Direction (ATLD), Read (ATLI) and Write (ATLO). To set the direction of a pin, simply send the ATLD<pin number>=[0,1]:

- ATLD2=1 - Sets IO pin 2 up as an output
- ATLO2=0 - Sets IO pin 2 low
- ATLO2=1 - Sets IO pin 2 high
- ATLO2? - Reads the status of IO pin 2 (will return "1" in this case)

## Using Remote IO pins

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Using the IO pins on a remote Radio is about as simple. This does require an active connection between two Radios. If you haven't already dailed up another Radio, see "Connecting to Another Radio" above before continuing. The commands are just as straight forward as for local IO. Read Remote Input (ATRI), Write Remote Output (ATRO) and Set IO Remote Direction (ATRD):

- ATRD3=0 - Sets Remote IO pin 3 as an input
- ATRI3? - Returns the value of Remote IO pin 3 (be sure to pull it high or low first)
- ATRD5=1 - Sets Remote IO pin 5 as an output
- ATRO5=0 - Sets Remote IO pin 5 low

## Host Interface

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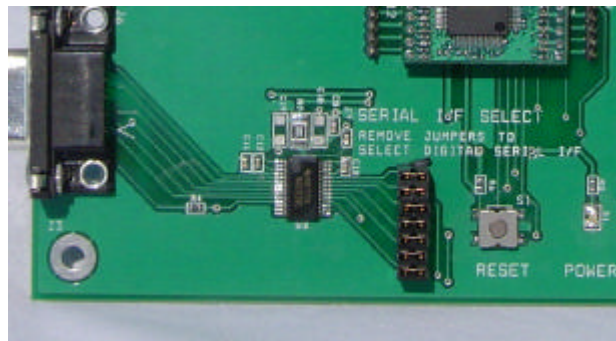
The evaluation board supports RS-232 serial and TTL serial interfaces with hardware flow control. Parallel interfaces are not supported by this evaluation platform.

Note: There are no buffers or drivers between the Socket Module and the evaluation board connectors. This provides the user direct electrical access to all the signals on the Socket Module.

### RS-232 Interface

The user can select the RS-232 by installing the RS-232 Select Jumpers on JP3 (Labeled '**SERIAL I/F SELECT**' on Rev 1 of the PCB). This connects the socket module serial interface signals to the on-board RS-232 interface. The output of the RS-232 interface IC connects to the DB-9F connector. The RS-232 interface is fully voltage compliant and is configured as DCE (Data Communication Equipment).

Note: The RS-232 and digital serial interfaces **cannot** be used at the same time.



**Figure 10**

### DIGITAL SERIAL INTERFACE

The serial interface consists of serial receive and transmit data, flow control signals plus power and ground. These are digital CMOS versions of the RS-232 interface signals. The voltage level is set by the voltage selection on the evaluation board or module installed.



**WARNING:** Note that these signals are connected directly to the Socket Module. They can be used as monitor points for the RS-232 interface. If using the digital serial interface, be sure to remove the RS-232 select jumpers.

## QUICK STATE GUIDE

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Your evaluation board is delivered configured for RS-232 serial operation.

	Option	Setting
Modem (Default configuration – RS-232 19.2KBPS N81)		
RS-232 mode selected	Serial I/F Select	Installed
Target Voltage set to 3.3 volts	Module Power Selector	3.3 volt position only
Modem Settings	Default host speed	19.2kbps default

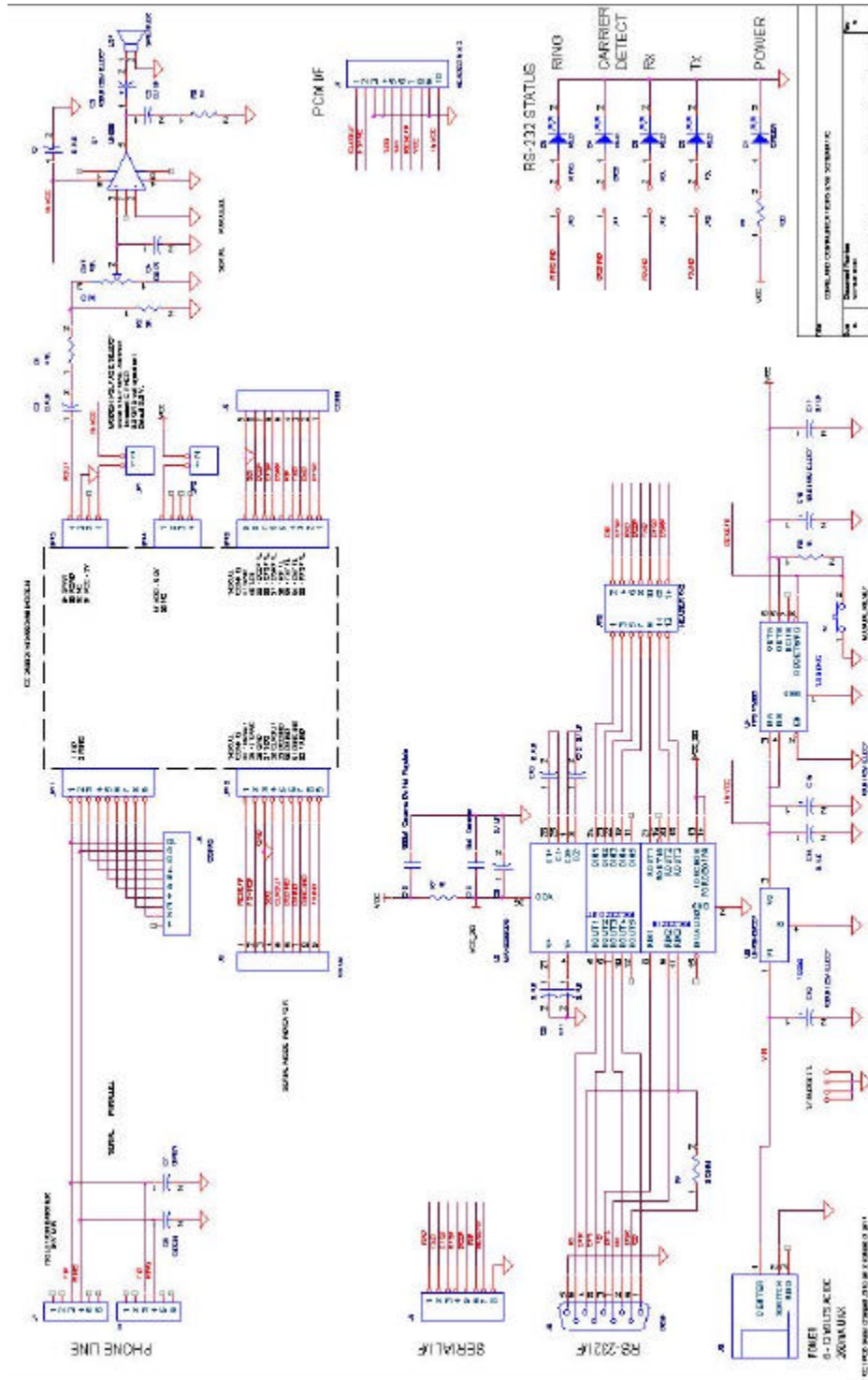
**Table 1**

## **Mechanical**

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The evaluation board is designed to support the entire family of Copeland Communications modules. These modules are designed on a dual in line package (DIP) configuration with 24mm row spacing and 2mm pin pitch.

## Schematic



## Ordering

	<b>CCI Order Number</b>
<b>Evaluation Kit</b>	<b>CC-900W-EVAL</b>
Eval kit contains the following:	
(2) Wireless Modem Module w/ internal antenna	<b>CC-900W-CA</b>
(1) Evaluation Board w/o module	<b>EVAL-None</b>
(1) USB adapter board	<b>CC-USB</b>
(1) RS-232 Cable	
(1) USB Cable	
(1) AC Adapter	
(1) User Guide	
<b>Options</b>	<b>Add suffix</b>
European/Asian Version (230 VAC)	<b>- 230 VAC</b>
Wireless modems w/ MMCX antennas Please call factory	<b>-MMCX</b>

**Table 2**