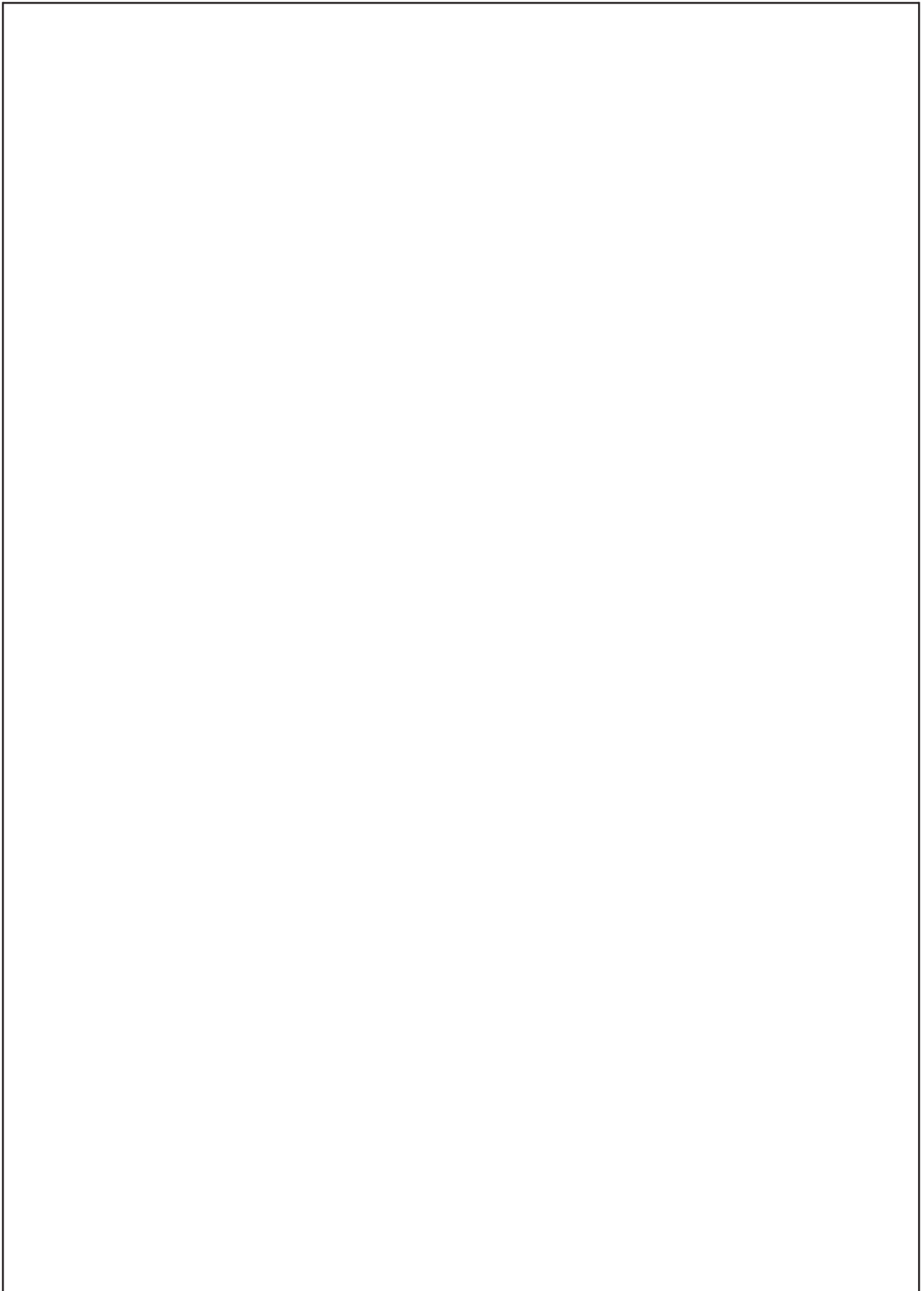


# csi

## Product Manual



**CSI-CPBRW-C, CSI-CPBRW-P,  
CSI-CPBRW-AW, CSI-CPBRW-C/P**



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## Product Registration Information

The serial number may be found on the label on the bottom panel near the power connectors. Note this number below. Retain this manual, along with proof of purchase, to serve as a permanent record of your purchase.

MODEL NUMBER	SERIAL NUMBER	PURCHASE DATE
<input type="text"/>	<input type="text"/>	<input type="text"/>
POINT OF SALE COMPANY		
<input type="text"/>		

DISCLAIMER: All information and statements contained herein are accurate to the best of the knowledge of Cellular Specialties, Inc. (CSI), but Cellular Specialties makes no warranty with respect thereto, including without limitation any results that may be obtained from the products described herein or the infringement by such products of any proprietary rights of any persons. Use or application of such information or statements is at the users sole risk, without any liability on the part of Cellular Specialties, Inc. Nothing herein shall be construed as licence or recommendation for use, which infringes upon any proprietary rights of any person. Product material and specifications are subject to change without notice. Cellular Specialties' standard terms of sale and the specific terms of any particular sale apply.

## Document Purpose / Intended Users

The purpose of this document is to provide a step-by-step procedure to help the experienced technician/engineer install and commission an in-building wireless enhancement pilot beacon system. Following the procedures outlined will minimize risks associated with modifying a live system and prevent service interruptions. This document assumes the technician/engineer understands the basic principles and functionality involved with the system. It is geared to the practical concerns of the installer.

## Radio and Television Interference

Changes and Modifications not expressly approved by Cellular Specialties Inc. can void your authority to operate this equipment under Federal Communications Commission's rules.

## Application

This guide should be applied whenever a need exists to add pilot beacon capability to an existing system or when this capability is being included with a new installation.

## Safety Guidelines

The general safety information in this guideline applies to both operating and service personnel. Specific warnings and cautions will be found in other parts of this manual where they apply, but may not appear in this summary. Failure to comply with these precautions or specific warnings elsewhere in the manual violates safety standards of design, manufacture, and intended use of equipment. Cellular Specialties, Inc. assumes no liability for the customer's failure to comply with these requirements:

### *Grounding*

\_\_\_\_ This pilot beacon system is designed to operate from 100-240 VAC and should always be operated with the ground wire properly connected. Do not remove or otherwise alter the grounding lug on the power cord.

### *Explosive Atmospheres*

To avoid explosion or fire, do not operate this product in the presence of flammable gases or fumes.

### *Lightning Danger*

Do not install or make adjustments to this unit during an electrical storm. Use of a suitable lightning arrester, such as CSI's model number CSI-CAP, is very strongly recommended.

### *No User Serviceable Parts Inside*

**HAZARDOUS VOLTAGES ARE PRESENT WHEN THE COVER IS REMOVED.** Opening the chassis will void your warranty. If you suspect a malfunction with this product, call your dealer or the Cellular Specialties Support Line at: **(603) 626-6677, Toll Free (USA) 1-877-844-4274.**

## Important Safety Information

Antennas used for the purpose of radiating signals indoors are limited to a *maximum* gain of 3 dBi. Each antenna must be positioned to observe minimum separation requirements from all users and bystanders. The following guidelines should be used when considering separation distances.

**INDOOR** antennas must be placed such that, under normal conditions, personnel cannot come within 20 cm (~8.0 in.) from any inside antenna. Adhering to this minimum separation will ensure that the employee or bystander cannot exceed RF exposures beyond the maximum permissible limit as defined by section 1.1310 i.e. limits for General Population/Uncontrolled Exposure.

## Acronyms and Definitions

<b>3GPP2</b>	The standards body comprised of representatives of interested companies that is responsible for the development and maintenance of the operational standards for the CDMA2000 system. <a href="http://www.3gpp2.org">Http://www.3gpp2.org</a>
<b>AGC</b>	Automatic Gain Control
<b>CDMA</b>	Code Division (or, Domain) Multiple Access: The general term for the technology used in the CDMA2000 system as well as others. Also a shorthand reference to the CDMA2000 system and its derivatives such as 1xEV-DO
<b>Chip</b>	A single element, a '1' or a '0', of the PN Sequence in a CDMA system. The chip rate for the CDMA2000 system is 1.2288 Mchips/second.
<b>CSI</b>	Cellular Specialties Incorporated
<b>DAS</b>	Distributed Antenna System
<b>ERP</b>	Effective Radiated Power
<b>EST</b>	Even Second Tick: In the CDMA2000 cellular system all time values are referenced to the start of the even seconds of time as indicated by GPS.
<b>FCC</b>	Federal Communications Commission
<b>FPGA</b>	Field Programmable Gate Array
<b>GPS</b>	Global Positioning System
<b>IF</b>	Intermediate Frequency
<b>LED</b>	Light Emitting Diode
<b>NEMA</b>	National Electrical Manufacturers Association
<b>PA</b>	Power Amplifier
<b>PN</b>	Pseudo random Number: A number chosen by some algorithm that approximates a random process. Can be short for "PN Sequence", "PN Number", or "PN Offset" when discussing the CDMA2000 system.
<b>PN Number</b>	In the CDMA2000 system only a subset of the possible PN Offsets are used for base station identification. Each of these allowed offsets is given a unique number from 0 to 511.
<b>PN Offset</b>	In the CDMA2000 System each base station is identified by the offset in time from the EST at which the start of the Pilot PN Sequence occurs. The offset is specified in terms of number of chips.
<b>PN Sequence</b>	A sequence of pseudo random numbers. In the CDMA2000 system several such sequences are used. The one relevant to ICEBreaker is the Pilot, or Short, sequence which is a $2^{15}$ element long sequence of ones and zeros.
<b>PPS</b>	Pulse per Second: Refers the pulse repetition rate of the timing signal used as a time reference.
<b>RF</b>	Radio Frequency
<b>SBC</b>	Single Board Computer
<b>Tau</b>	Timing Offset or Delay Adjustment: In the CDMA2000 system the timing of the downlink signal is required to be aligned with the EST as it is transmitted from the antenna. Tau allows the timing of the internal PN Sequence to be adjusted to compensate for the delays of the base station hardware such that the timing will be correct at the antenna
<b>USB</b>	Universal Serial Bus

## Product Introduction

The pilot beacon generator facilitates E911 and other location based services (LBS) for in building and/or DAS based installations of CDMA2000/1xEV-DO cellular networks. In these situations the normal methods based for location determination, direct reception of GPS by the mobile station or triangulation using the signals from multiple base stations, do not work. Signals from the GPS system are sufficiently weak that even if the mobile station's GPS receiver might ultimately be able to lock on to the satellites, the acquisition time will be too long. And since indoor service is typically provided either by a single strong local cell or by using a repeater, there aren't multiple signals on which to triangulate while DAS based deployments result in too many signals with indeterminate timing. By placing a pilot signal at a known PN offset the LBS algorithm can quickly and reliably be made aware that it is within a specific building or other location where normal location determining solutions are ineffective. This information can be used to aid the GPS receiver in acquiring signals if they are present or be used as a position report directly until more accurate information becomes available.

## Functional Overview

### Electrical Characteristics

CHARACTERISTIC	PERFORMANCE LIMIT
Number of Bands per Beacon	1
CDMA Band Class	0 (Cell), 1 (PCS) and 15 (AWS)
Max # Simultaneous Channels/Beacon:	8 (Cell) 11 (PCS and AWS)
Number of Unique PN Offsets/Beacon:	1
Composite TX Power:	+20 dBm
Spurious Emissions Limits:	< -45 dBc $\Delta f$ .75 to 1.98 MHz < -60 dBc $\Delta f$ 1.98 to 4.0 MHz < -65 dBc $\Delta f$ 4.0 to 16 MHz < -75 dBc $\Delta f$ >16 MHz
Carrier Frequency Accuracy:	20 Hz (.2 ppm) Cell Band 40 Hz (.2 ppm) PCS Band 45 Hz (.2 ppm) AWS Band When locked to GPS
Pilot Timing Jitter	< 10 nsec rms, <50 nsec peak
Rho:	> 0.98
Tau Adjustment Range	-166.7 to + 166.7 $\mu$ sec ( $\pm$ 25.6 CDMA chips)
Tau Adjustment Resolution	20 nsec (one 40 <sup>th</sup> of a CDMA chip)

### Mechanical Specifications

Parameter	Specification	Notes
<b>Pilot Beacon Size</b>		
Height	1.73 in.	
Width	19.00 in.	
Depth	18.02 in.	
<b>Weight</b>	8.4lbs / 3.8kg	
<b>Thermal Management</b>	Fan Cooled	
<b>Surface Coating</b>	Powder Coat	
<b>Color</b>	Satin Black	

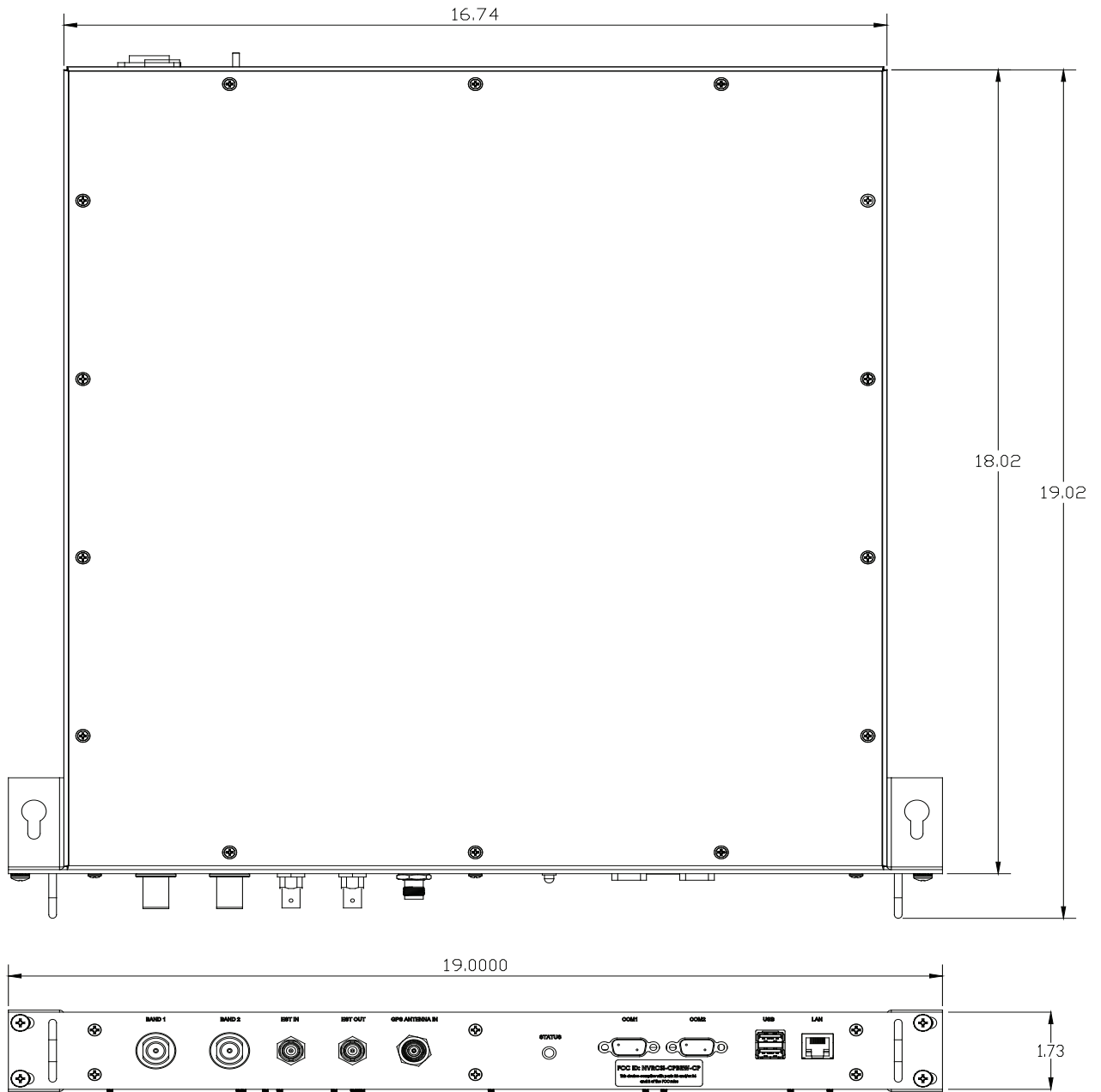
### AC Power Specifications

Parameter	Specification	Notes
<b>AC Voltage</b>	100 - 240 VAC	External Power Supply
<b>AC Current</b>	1.7 Amps 0.9 Amps	@ 120 VAC @ 230 VAC
<b>AC Power Frequency</b>	47 - 63 Hz	
<b>Heat Output</b>	500 BTU/Hr	

### Environmental Requirements

Parameter	Specification	Notes
<b>Temperature Range</b>	-30° to +48°C (-22° to +118°F)	
<b>Relative Humidity</b>	5% to 95%	Non-condensing
<b>Industrial Dust</b>	<15mg/m3	Telcordia GR-63-CORE

# Mechanical Drawing



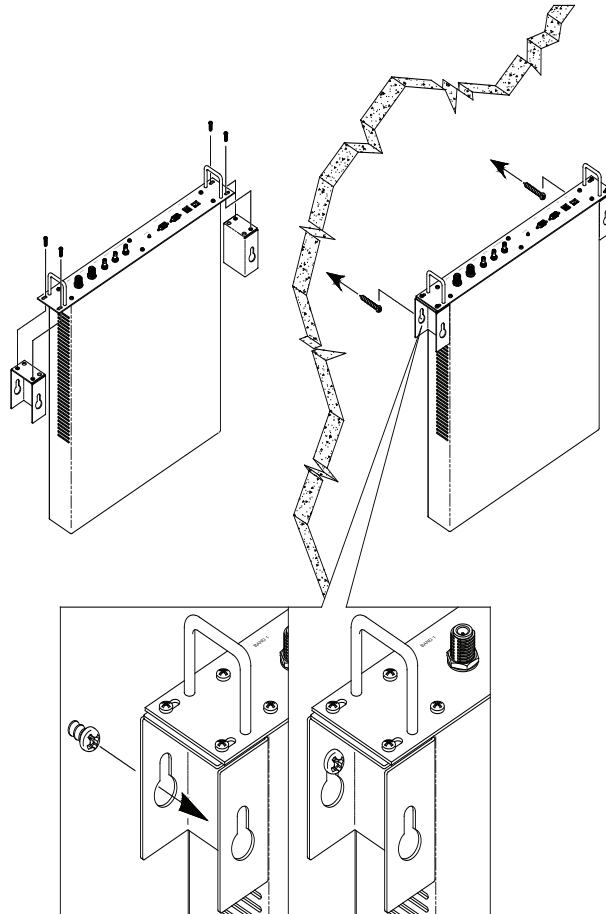
## System Set-Up Considerations

All cables should be checked for shorts and opens. Also verify that there are no cables with loose or poor connections. It is critical that the installer contact the service provider before the system is turned on.

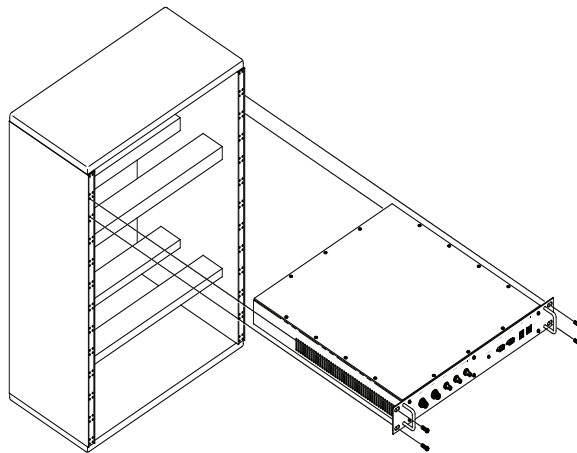
## Mounting the Pilot Beacon

The following diagram illustrates the best method for mounting the pilot beacon to a wall in an typical installation.

### Wall Mounting



### Rack Mounting

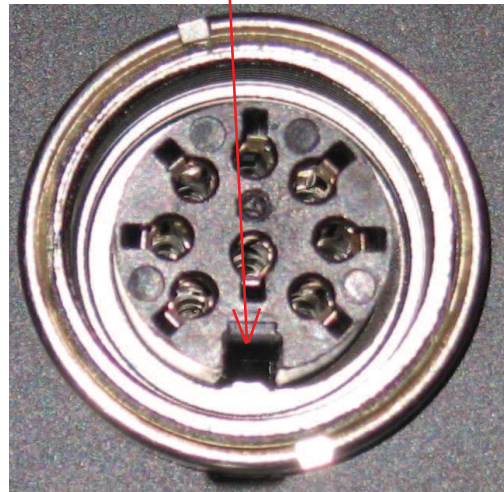




**Warning:** Power supply cable connector is keyed for proper orientation and is designed to lock into place.



**Keyed for proper alignment, do not force connector into place.**



## Optional Accessories

A complete line of accessories is available from Cellular Specialties, Inc. Check with your CSI distributor for any additional items needed. Below are just a few examples suitable for most in-building needs.

- **Inside Omnidirectional Antenna**

- Quad-band - model number: **CSI-AO/700/2.7K/3**

- **Directional Couplers**

- 6dB - model number: **CSI-DC6/700-2.7K/N**
  - 10dB - model number: **CSI-DC10/700-2.7K/N**
  - 15dB - model number: **CSI-DC15/700-2.7K/N**
  - 20dB - model number: **CSI-DC20/700-2.7K/N**
  - 30dB - model number: **CSI-DC30/700-2.7K/N**

- Battery backup, 4 hr Single band

- 2 hour dual band - model number: **CS48-985-601**

- **Power Dividers**

- 2:1 - model number: **CSI-SPD2/700-2.7K/N**

- 3:1 - model number: **CSI-SPD3/700-2.7K/N**

- 4:1 - model number: **CSI-SPD4/700-2.7K/N**

- **Grounding Kit** - model number: **CSI-GKIT**

- **Lightning Arrestor** - model number: **CSI-CAP**

## Important Installation Notes

- The installer should refer to the Safety Guidelines section and the Important Safety Information section for proper antenna selection and installation. To avoid serious injury or death and damage to the pilot beacon, do not install server antennas near overhead power lines or high power components. Allow enough distance so that if antennas should fall they will not come in contact with those components.
- Close proximity to the server antennas with the pilot beacon in operation may expose the user or installer to RF fields that exceed FCC limits for human exposure.

**WARNING!** PILOT BEACON AND/OR HANDSET DAMAGE **MAY** OCCUR IF A HANDSET IS CONNECTED DIRECTLY TO THE PILOT BEACON OR THE COAX THAT LEADS TO THE PILOT BEACON.

## Powering Up the Unit

During Power up, the pilot beacon will require approximately three minutes for the internal computer to boot up. During this time the LED on the front panel may light and go out several times. When boot is complete and no alarm conditions exist, the LED indicators will be illuminated green.

**Do not unplug the unit while it is in the boot up process!**

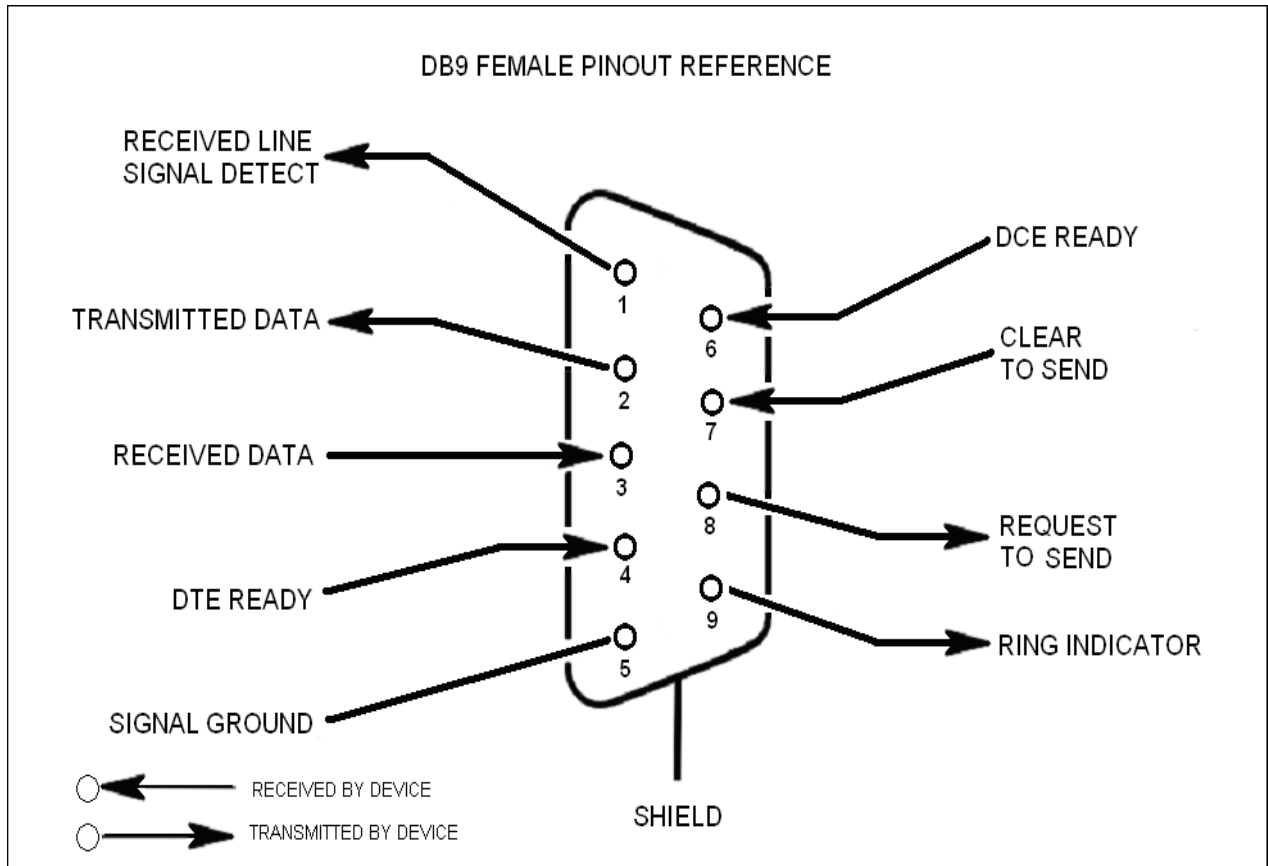
## Local Communication Interface Ports

To allow monitoring and control, the pilot beacon is equipped with four ports that provide external communication access (1 Ethernet CAT-5, 2 DB-9 serial, and 1 USB). The Ethernet, CAT-5 port is provided as a primary communications port to the PC. One serial interface, COM 1, provides communications to local PC. The USB interface provides a means to download files from a memory device. The DB-9 pin assignments of COM 1 conform to the standard Electronic Industries Association (EIA232) specification. A diagram of the pin descriptions is provided on this page for reference.

Connecting a null modem cable to the COM 1 port and using a terminal emulation program with a PC will allow communication to the control processor's Text Menu Interface (TMI). See Text Menu Interface section for further detail.

The proprietary external GPS receiver connection is made at the port labeled "GPS". **Do not connect other devices or non-straight-through serial extension cables to this port.** Place the GPS receiver in a location with the best view of the unobstructed sky that is possible, although a 100% open view of the sky is not necessary to achieve a stable time lock.

## EIA232 Pin Specifications



The diagram above is for reference only, it's intended to provide a quick source for pinout information in the event it should be necessary to adapt your serial cable because of an unusual connector configuration. In the vast majority of cases this information will not be needed.

## USB Interface

The Universal Serial Bus (USB) interface conforms to Intel's Universal Host Controller Interface (UHCI) version 1.1 dated March 21, 1996. This interface will support data transfer rates up to 12 Mbps and can be used for software updates.

## Ethernet

The Ethernet AUI conforms to IEEE 802.3 and is capable of supporting 10/100 Mbps communications speeds. This port is used to provide access to the UI.

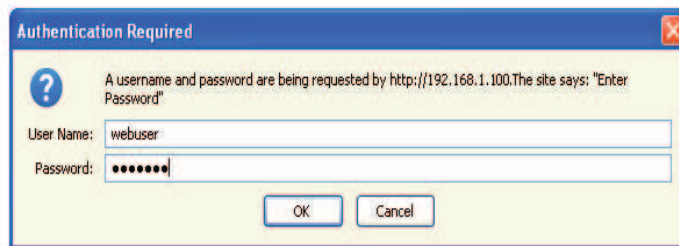
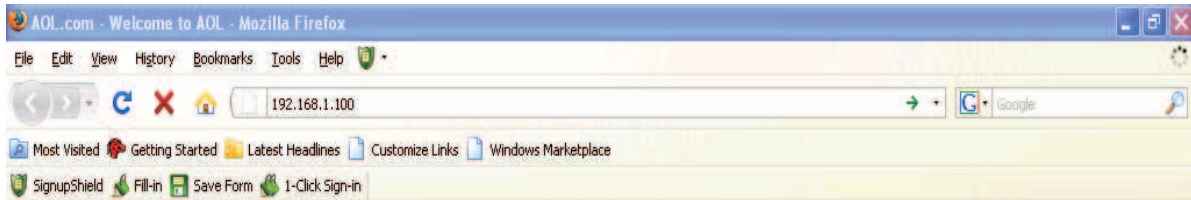
## Monitoring & Alarms

There are no physical connections provided to specifically communicate system or alarm status. This information is embedded in the information accessible via the communication ports described earlier.

## Web based GUI Session

Primary access to the unit is gained using a LAN connection and a web browser program such as Firefox by Mozilla, or Internet Explorer from Microsoft. The beacon ships with the default IP address of 192.168.1.100, but it can be changed later if required.

If connecting directly to the unit from a laptop or PC **with a crossover CAT-5E cable** or over a LAN the user types the IP address of the unit into the browser address line to connect. (Note: Most users will need to update the TCP/IP settings on their computer to enable connection to a host that has a static IP. Select "Use the following IP Address" and enter the IP Address as follows: 192.168.1.x, where "x" = any number from 2 to 254 inclusive other than 100. The subnet mask is 255.255.255.0. Questions pertaining to these settings should be referred to the user's IT department or you may refer to the Additional Tips section at the end of this manual.) When connection is made the user will be prompted for a user name and password. For the purpose of the GUI session, the default user name is **webuser** and the password is **csi1234**. This can also be changed as required. Internet access is not required to use the GUI. (Note: If you are connecting using a laptop, verify that your Ethernet port is powered. Some laptops will not allow Ethernet connection when on battery power. If this is the case with the laptop you are using you will need to plug it in or update the power settings.)



## System Status

When login is complete the user is brought to the system status page. The links shown in the navigation box on the left are activated by clicking on them.

**System Status**

**Timestamp** 2010-05-20 - 16:28:21  
**System Uptime** 0 days 2 hours 54 minutes  
**Software Version** 2.5.0 nightly20100513  
**Serial Number** CSI9XXXXX  
**Model Number** CSI-CPBN-C  
**Item Number** CSI6-560-221

**Transmitter Location**  
 Street Address 1 670 N Commercial Street  
 Street Address 2  
 City Manchester  
 State, Zip Code NH 03101  
 Latitude 0.0  
 Longitude 0.0

**Pilot Beacon Transmitter** ON

**Pilot Beacon Settings**  
 PN Offset 1  
 Tau 5.2 usec

**Band Type** CELL  
 Composite TX Power 10.0 dBm  
 Per Channel TX Power 10.0 dBm

Channel Number	CDMA Channel	Status
Channel-1	384	Enabled
Channel-2	425	Enabled
Channel-3	466	Enabled
Channel-4	507	Enabled
Channel-5	548	Enabled
Channel-6	589	Enabled
Channel-7	770	Enabled
Channel-8	729	Enabled
Channel-9	0	Disabled
Channel-10	0	Disabled
Channel-11	0	Disabled

**Pilot Beacon Alarms**  
 Time Sync OK  
 GPS Receiver OK

**System Alarms**  
 Hardware OK  
 Power Supplies OK  
 Temperature OK  
 Software OK

## Local Network

If the user selects Local Network from the System Status page, the following screen is displayed and from here network configuration can be modified as required. The default is set to Static. Check with your IT department for explanation and approval of the DHCP and DHCP Server options you plan to use before you select them.

**Local Network**

**Boot Mode:**  Static  
 DHCP  
 DHCP Server

**Hostname:** cprw-c

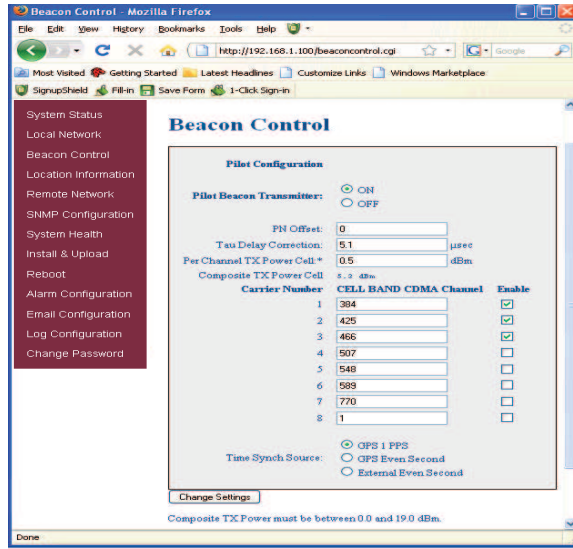
**IP Address:** 192.168.1.100

**Default Gateway:** 192.168.1.1

**Network Mask:** 255.255.0.0

**Broadcast Address:** 192.168.1.255

# Beacon Control



The Pilot Beacon can transmit up to eight simultaneous CDMA2000 signals for a Cell band unit and eleven for a PCS band unit. The carrier frequency for each signal is set by entering the desired CDMA channel number for that signal.

Thus, there are eight or eleven Channel Number fields, one for each of the possible signals.

The CDMA channel number is a unitless integer value with a split range of 1 to 799 and then 991 to 1023 for cell band, 1 to 1199 for PCS band and 1-899 for AWS band. Duplicate channel numbers are not allowed.

The default values for the Cell Band are:      The default values for the PCS Band are:      The default values for the AWS Band are:

- Signal 1: CDMA Channel 384
- Signal 2: CDMA Channel 425
- Signal 3: CDMA Channel 466
- Signal 4: CDMA Channel 507
- Signal 5: CDMA Channel 548
- Signal 6: CDMA Channel 589
- Signal 7: CDMA Channel 770
- Signal 8: CDMA Channel 729

- Signal 1: CDMA Channel 1
- Signal 2: CDMA Channel 2
- Signal 3: CDMA Channel 3
- Signal 4: CDMA Channel 4
- Signal 5: CDMA Channel 5
- Signal 6: CDMA Channel 6
- Signal 7: CDMA Channel 7
- Signal 8: CDMA Channel 8
- Signal 9: CDMA Channel 9
- Signal 10: CDMA Channel 10
- Signal 11: CDMA Channel 11

- Signal 1: CDMA Channel 1
- Signal 2: CDMA Channel 2
- Signal 3: CDMA Channel 3
- Signal 4: CDMA Channel 4
- Signal 5: CDMA Channel 5
- Signal 6: CDMA Channel 6
- Signal 7: CDMA Channel 7
- Signal 8: CDMA Channel 8
- Signal 9: CDMA Channel 9
- Signal 10: CDMA Channel 10
- Signal 11: CDMA Channel 11

## Signal Transmit Enables

Each of the eight or eleven signals can be individually turned on or off. There is one transmit enable field for each signal.

### PN Offset

The PN Offset is a unitless integer value with a range of 0 to 511. The default value is zero.

### Tau (Delay Correction)

Tau is a real value in units of microseconds with a range of 0 to 5.2 μsec and two decimal places of precision. Internally the value will be rounded to the nearest 1/40<sup>th</sup> of a CDMA chip. The test equipment reads "Tau" as follows: Positive tau means the signal is late. Negative is opposite. The tau "setting" on the unit works as follows: Positive tau is "back to the future" which means it creates the RF signal at a sooner time than zero tau. Negative tau is opposite. When one sees a positive tau on the test equipment, and wishes to "zero" it, the value of tau in the UI must be reduced to "zero it".

### Pilot Beacon Per Channel Transmit Power

This setting controls the CDMA Channel Power output by the Pilot Beacon for each carrier. All enabled carriers are transmitted at the same power level. The total transmit power will be the sum of the power of all enable carriers. The user must set this power level such that the total transmit power does not exceed the specified maximum transmit power for the Pilot Beacon.

The Output Power is specified in dBm with a range of 0.5 to 19.0 and a resolution of 0.5.

### Composite Transmit Power

Composite output power is a display only field. The value is calculated from the Per Channel Tx Power and the number of channels that are enabled.

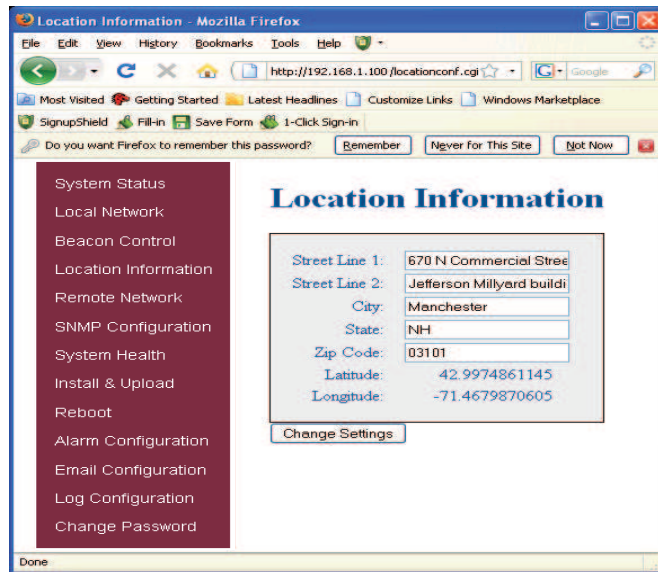
### Timing Reference Selection

There are three alternatives for the timing reference source.

- GPS 1 Pulse Per second (default)
- GPS Even Second Sync<sup>1</sup>
- External Even Second Sync

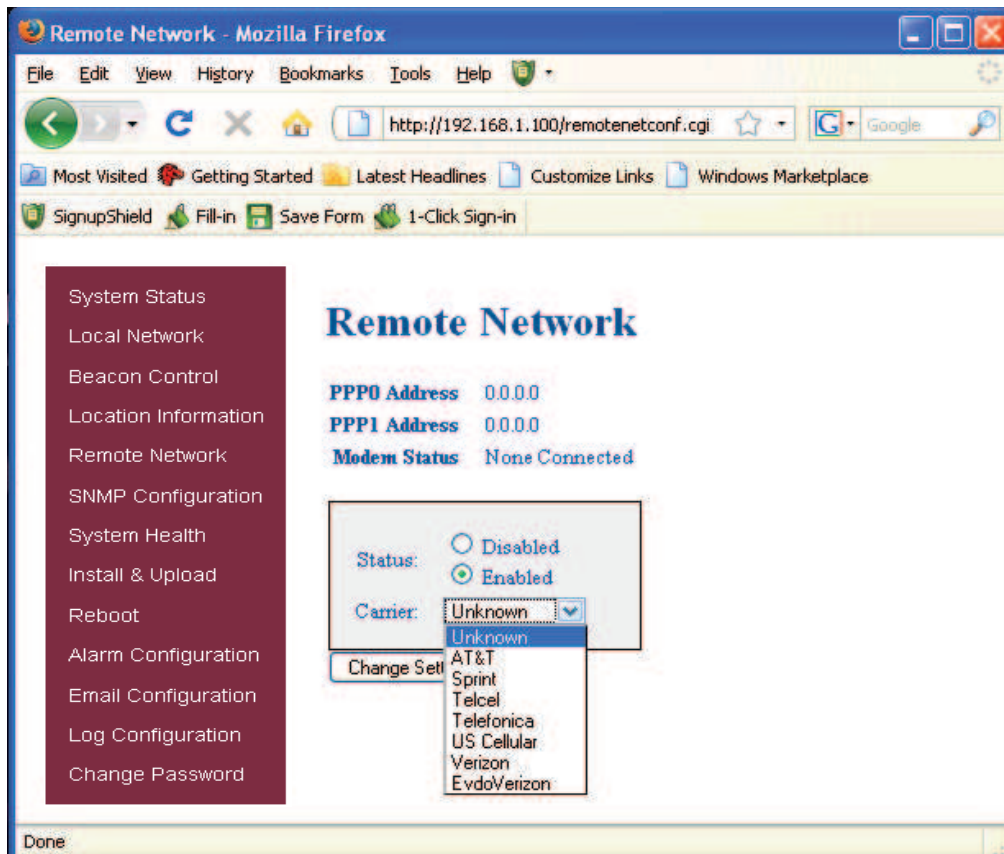


## Location Information



This page will allow the user to enter address information for the beacon and will display GPS coordinates.

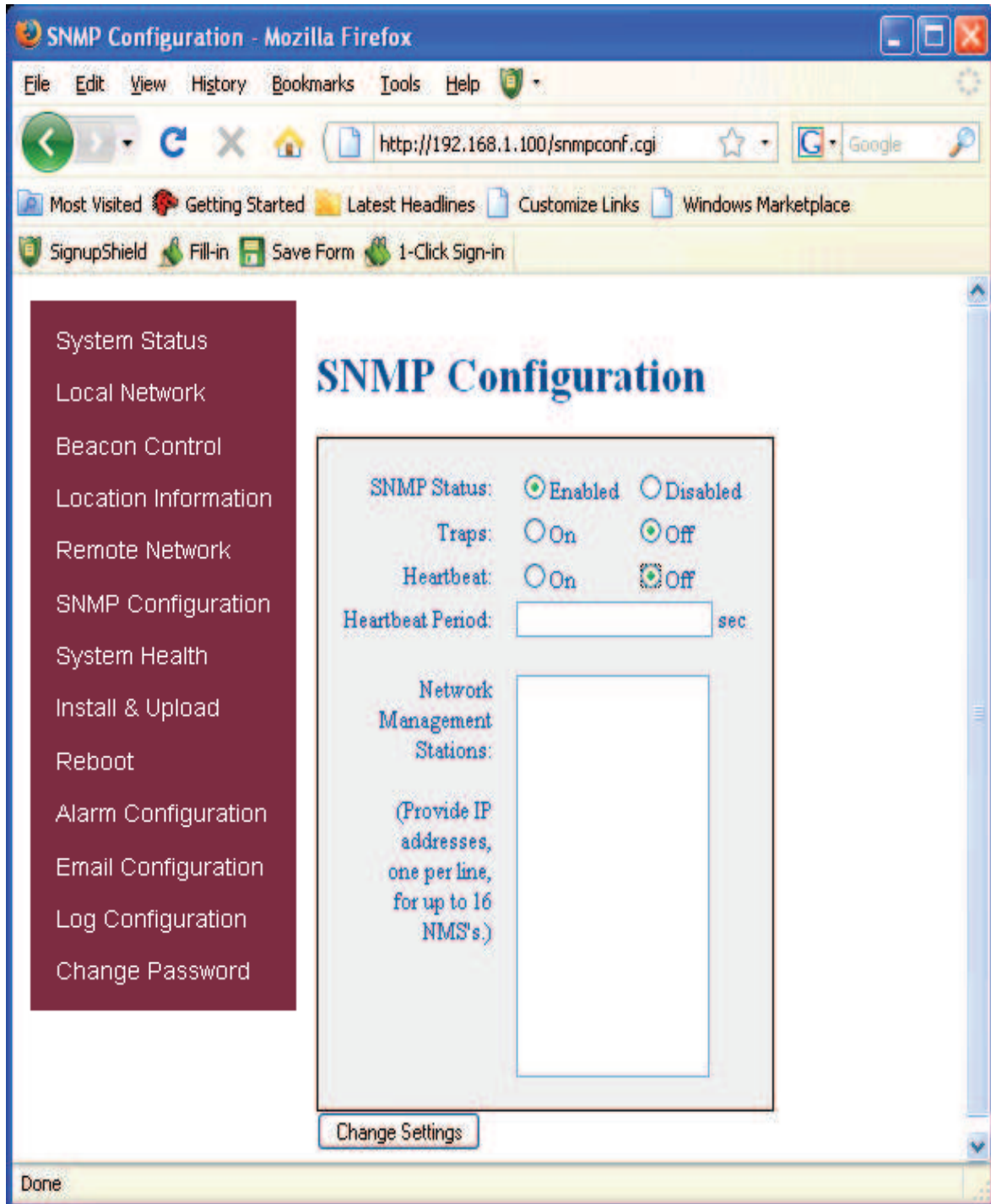
## Remote Network



If the beacon includes a modem kit, click on Remote Network in the navigation box and the screen above is displayed.

Highlight the carrier on whose network the repeater and modem will be configured and click the Change Settings button. Refer to the documentation included with the modem kit for additional information on configuring the modem.

## SNMP Configuration



To change SNMP settings click SNMP Configuration in the navigation box, the screen above will be displayed. If the user is not well versed in Simple Network Management Protocol he or she should check with their IT professional for proper setting requirements.



## System Health

By clicking System Health the current state of the repeater can be reviewed.

The screenshot shows a web browser window titled "System Health - Mozilla Firefox" displaying the "System Health" page. The browser's address bar shows the URL "http://192.168.1.100/status". The page features a dark red navigation menu on the left with the following items: System Status, Local Network, Beacon Control, Location Information, Remote Network, SNMP Configuration, System Health (highlighted), Install & Upload, Reboot, Alarm Configuration, Email Configuration, Log Configuration, and Change Password. The main content area is titled "System Health" and displays the following information:

<b>Band Type</b>	PILOT
<b>Temperature (Celsius)</b>	53.2
<b>Current (Amps)</b>	1.0
<b>Power Amplifier</b>	
Status	On
Current (Amps)	0.8
<b>Alarms</b>	
PLL Lock	OK
FPGA	OK

Below the system health data is an "Event Log" section. It contains two buttons: "Clear Log" and "Trigger Test Alarm". There are three asterisks (\*\*\*) to the left of the "Clear Log" button and four asterisks (\*\*\*\*) to the right of the "Trigger Test Alarm" button. The browser's status bar at the bottom shows "Done".

\*\*\*The user may clear LED indicators, alarms and the Event Log by clicking the Clear Log button.

\*\*\*\* If required, the user may visit the "System Health" screen and click on "Trigger Test Alarm" and wait for confirmation that the Service Provider representative that is responsible for monitoring the unit has been notified of the alarm. Be sure to "Clear All Logs" prior to logging out of the Web Interface.

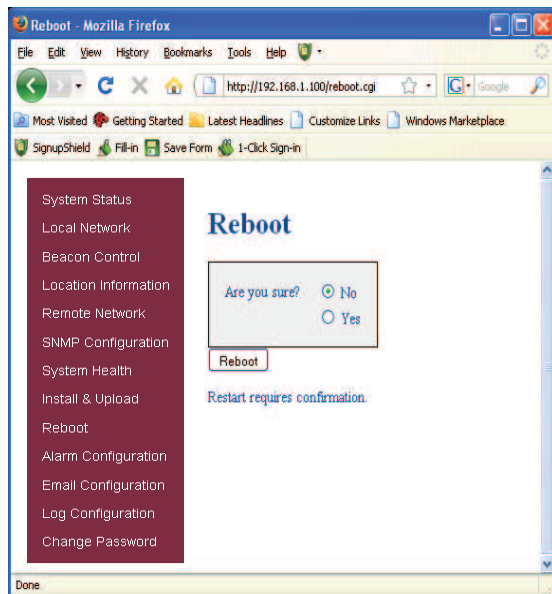
## Install & Upload



Should a software install or upgrade be needed it can be done from the Install & Upload screen shown above. As with the other screens it can be reached by clicking the words in the navigation box. Contact CSI for updates and instructions.

## Reboot

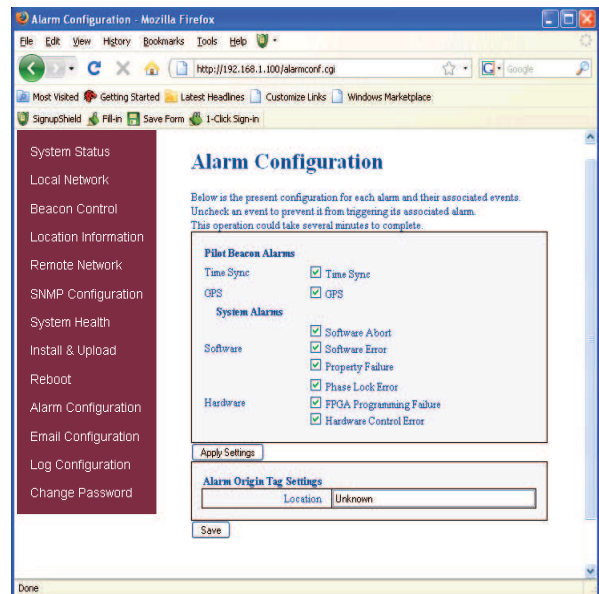
If a reboot of the repeater becomes necessary click on the Reboot option in the navigation box and the Reboot page is displayed.



## Alarm Configuration

The Alarm Configuration page allows the user to specify what events will trigger an alarm.

**\*NOTE: Letters, numbers & hyphens** are the only acceptable nomenclature for the Location field and hyphens may not be used as the first or last character.



## User Maskable Alarms

### Time Synch Alarm

The Time Synch Alarm is issued when the specified timing synchronization signal is lost. The alarm is disabled during the power up sequence of the pilot beacon, which includes a wait time for the signal to become available, to prevent extraneous alarms.

### GPS Alarm

The GPS Alarm is issued when the Pilot Beacon is not receiving the expected GPS NMEA sentences. This alarm is automatically disabled when the selected Time Synch Source is any choice other than "GPS 1PPS".

### Software Abort Alarm

The Software Abort is generated when there is an error with the software resources like the shared memory, message queues, semaphores, file mounting and un-mounting, menu interface configuration.

### Software Error Alarm

The Software Error is generated when there is an error in getting or setting parameters like getting PA status, temperature or setting filters.

### Property Failure Alarm

The Property Failure Alarm is generated when there is an error in checking the file properties or opening a file.

### Phase Lock Alarm

The Phase Lock Alarm is generated whenever any of the phase locked loops that generate the local oscillator for the upconverter, the clocks for the DACs, or the FPGA clock are unable to lock.

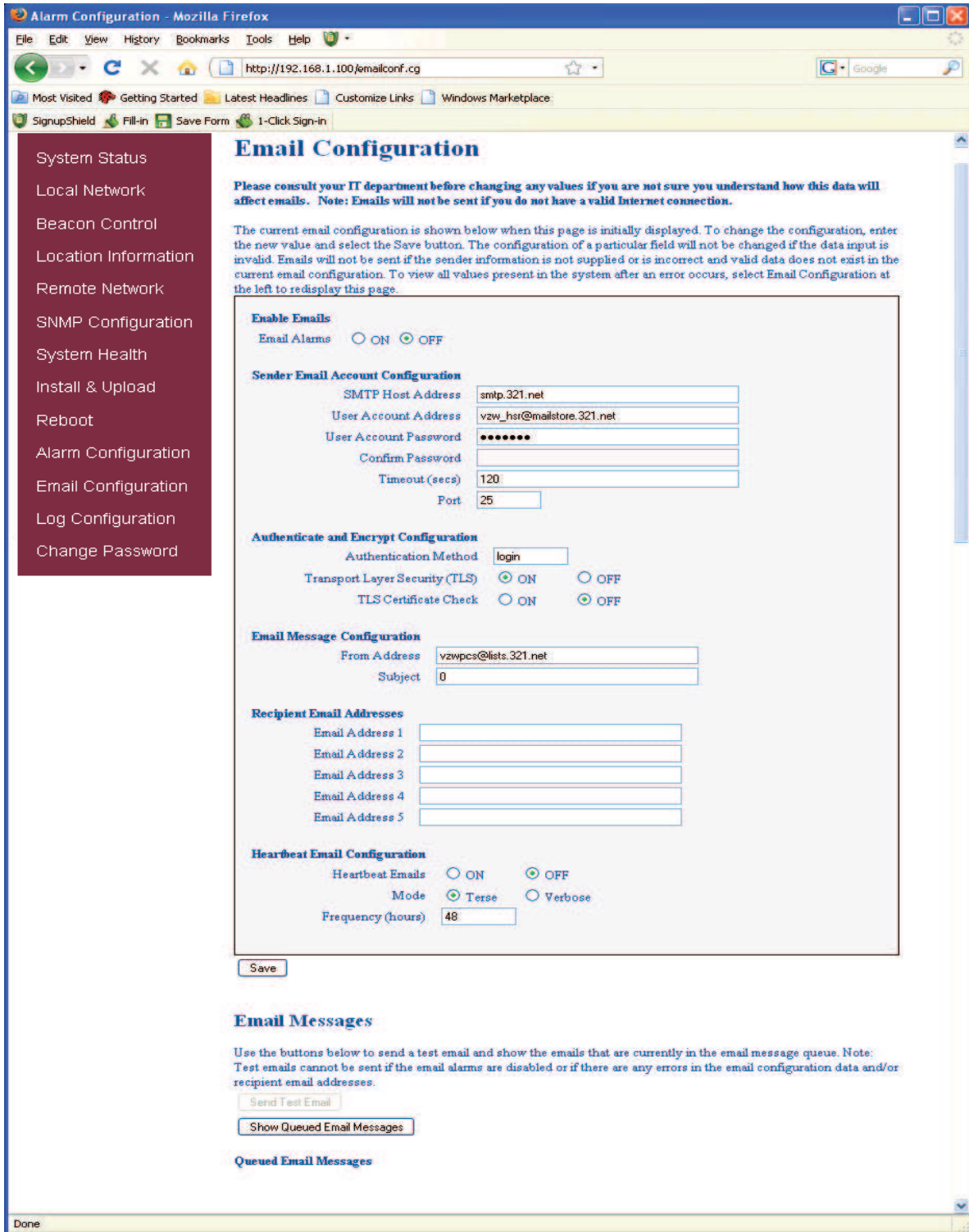
### FPGA Programming Alarm

The FPGA Programming Error is issued when the software is unable to correctly program the FPGA that performs the real time signal processing. This error could result from either a hardware fault or a corrupted programming file.

### Hardware Control Alarm

The Hardware Control Error is issued whenever the software is unable to set the hardware to the correct configuration.

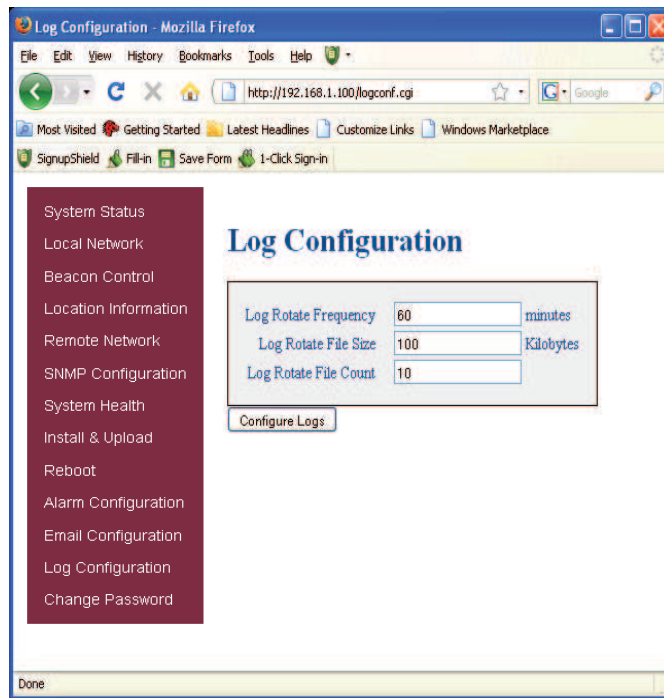
# Email Configuration



Email Configuration page allows the user to enter up to five Email addresses to which the repeater can send specified alarm messages when Email Alarm Notification and Remote Networking are enabled, and the repeater is equipped with an active wireless modem. \*NOTE: In all fields the software will not allow the user to enter invalid characters.

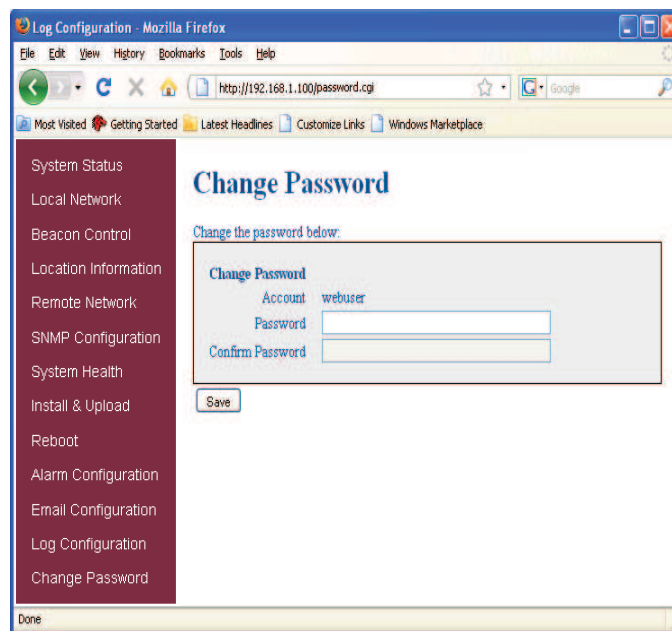
## Log Configuration

The Log Configuration page provides the user with the means to modify three aspects of how log files are created and stored as shown below.



## Change Password

By clicking on the Change Password link the user is brought to the Change Password page. From here he or she can quickly and easily reset the password for the unit. A word of warning here be careful when setting the new password. If you forget what you set your password to you'll need to contact CSI at 1-877-844-4274 for assistance.



To end the session exit the browser, the user will be automatically logged out.



## Text Menu Interface (Local Access)

Local access to the pilot beacon TMI, also known as the console interface, is made by connecting a serial cable (optional), as shown in figure 1, from the serial connector of the laptop to the serial port on the bottom end panel of the pilot beacon. This connector is labeled COM . In some cases, if the gender of the connector is not the same as shown in figure 1, a null modem adapter (optional) as shown in figure 2 may also be required.



Figure 1



Figure 2

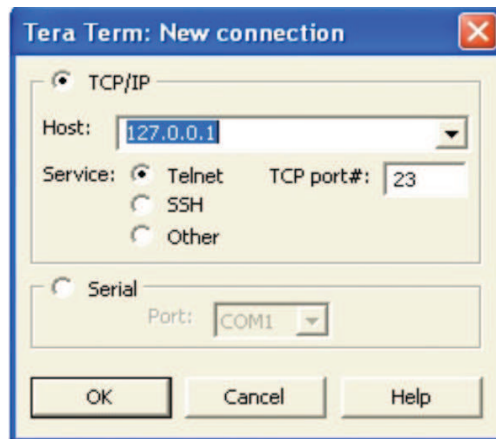
Many terminal emulation programs will work if properly configured. In the following description, "TeraTerm" is used to establish the TMI session. This program is readily available via the Internet and is free from Ayera Technologies at:

<http://www.ayera.com/teraterm/>

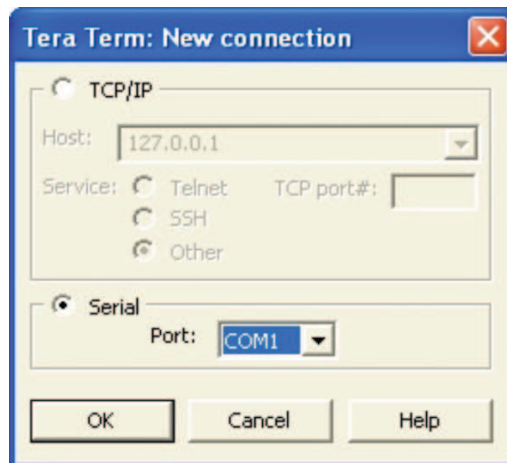
TeraTerm Pro Web works on Windows 95/98, 2000, XP. Here is the latest TeraTerm Pro Web release:

Version 3.1.3, October 8, 2002. tpro313.zip

When the program is started, the following screen is displayed.

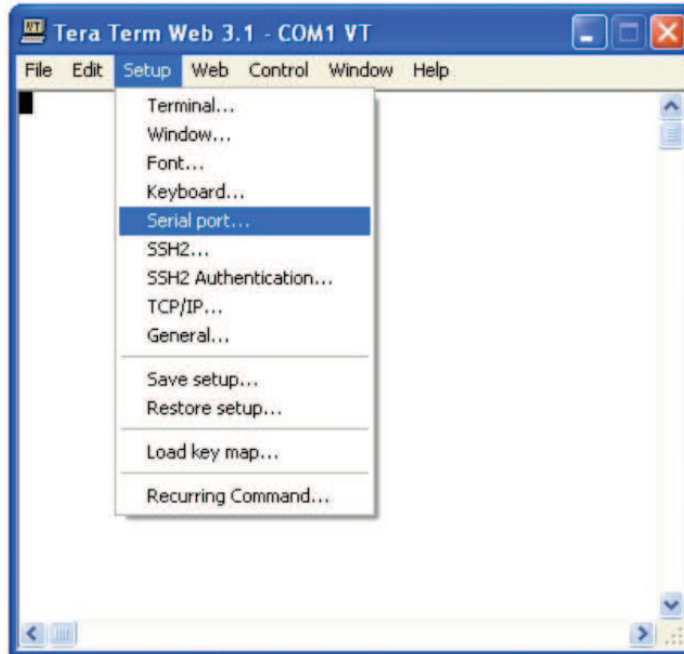


Select the Serial radio button and press OK as shown below.

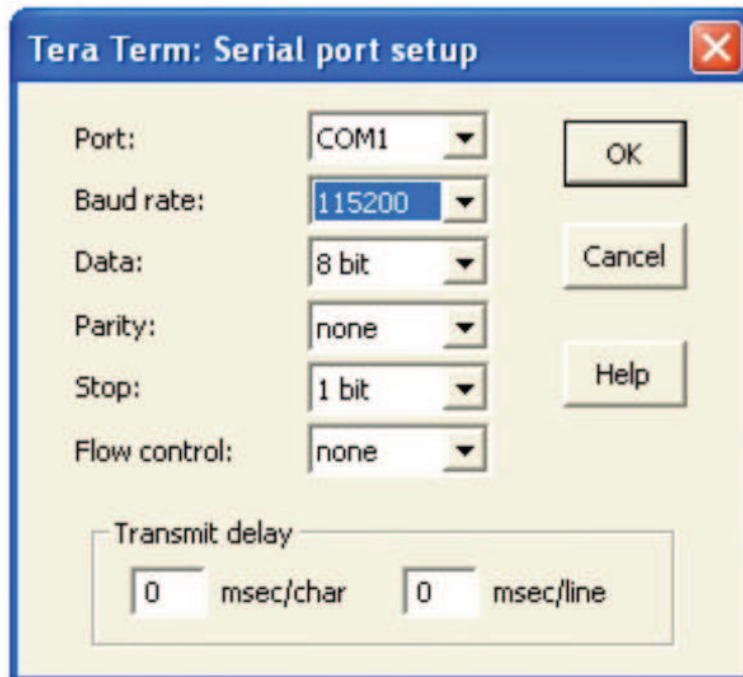


Note: It may be necessary, in the System Properties section of the control panel; using Device Manager to determine what COM port your computer uses for the communications port. In this case it is COM 1. This is not to be confused with the serial port on the bottom panel of the repeater labeled COM 1.

Pressing "OK" will open up a blank dialog screen. Go to the setup dropdown menu and select Serial port to make changes to the serial port setup.



Configure the terminal program for the correct COM port, in this case COM 1 and 115200 baud rate as shown below.





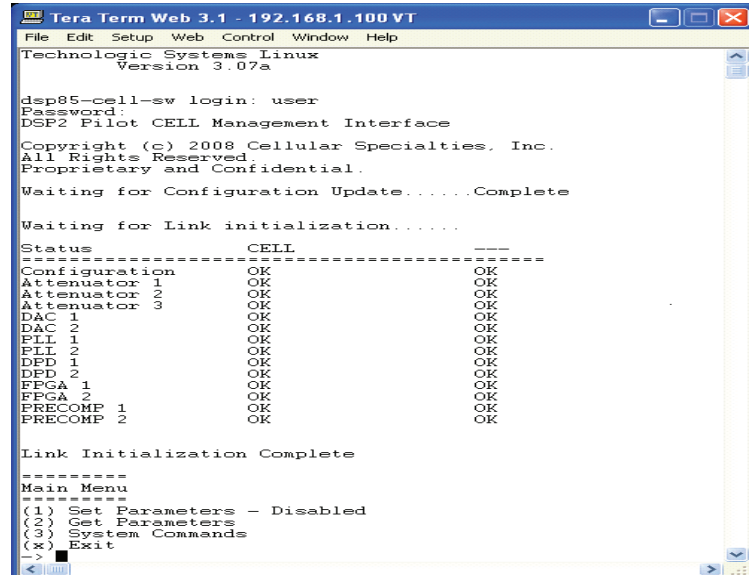
## User Interface

### Login

Once the unit has completed its boot up and link initialization phases it will display the login prompt. The username is "user" and the password is "csi1234".

### Main Menu

Upon successful login the unit displays the main menu.



```
Tera Term Web 3.1 - 192.168.1.100 VT
File Edit Setup Web Control Window Help
Technologic Systems Linux
Version 3.07a

dsp85-cell-sw login: user
Password:
DSP2 Pilot CELL Management Interface

Copyright (c) 2008 Cellular Specialties, Inc.
All Rights Reserved
Proprietary and Confidential.

Waiting for Configuration Update.....Complete

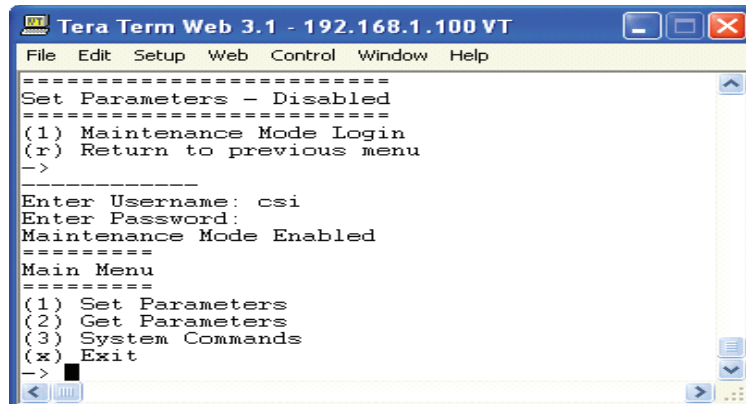
Waiting for Link initialization.....

Status          CELL          ---
=====
Configuration   OK              OK
Attenuator 1    OK              OK
Attenuator 2    OK              OK
Attenuator 3    OK              OK
DAC 1           OK              OK
DAC 2           OK              OK
PLL 1           OK              OK
PLL 2           OK              OK
DPD 1           OK              OK
DPD 2           OK              OK
FPGA 1         OK              OK
FPGA 2         OK              OK
PRECOMP 1      OK              OK
PRECOMP 2      OK              OK

Link Initialization Complete

Main Menu
=====
(1) Set Parameters - Disabled
(2) Get Parameters
(3) System Commands
(x) Exit
->
```

When "Set Parameters" is first selected the unit will ask for the maintenance mode login. (The default username for the maintenance mode is "csi" and the password is "csi1234".)



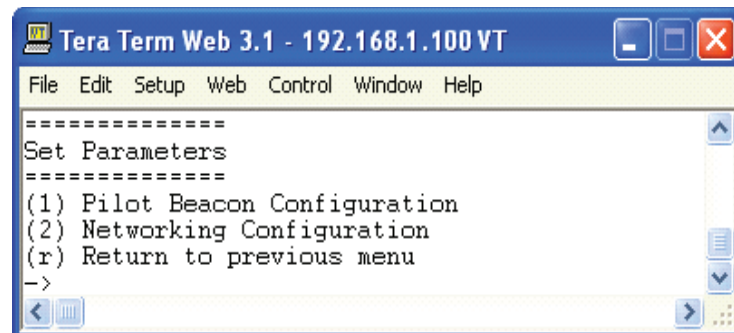
```
Tera Term Web 3.1 - 192.168.1.100 VT
File Edit Setup Web Control Window Help

Set Parameters - Disabled
=====
(1) Maintenance Mode Login
(r) Return to previous menu
->

Enter Username: csi
Enter Password:
Maintenance Mode Enabled
=====
Main Menu
=====
(1) Set Parameters
(2) Get Parameters
(3) System Commands
(x) Exit
->
```

Once the maintenance mode login is performed successfully the main menu will be displayed again but without the "(Disabled)" qualifier on the "Set Parameters" choice.

### Set Parameters Menu



```
Tera Term Web 3.1 - 192.168.1.100 VT
File Edit Setup Web Control Window Help

Set Parameters
=====
(1) Pilot Beacon Configuration
(2) Networking Configuration
(r) Return to previous menu
->
```

## Pilot Beacon Configuration Menu

The screenshots show the following sequence of screens:

- Pilot Beacon Configuration Menu:**
  - (1) Pilot Beacon Control
  - (2) Channel Frequency Control
  - (3) Set PN Offset Index
  - (4) Set Tau Adjustment
  - (5) Set Channel Enable Mask
  - (6) Set GPS Timing Reference
  - (7) Set Pilot Beacon Per Channel Tx Power
  - (8) Pilot Beacon Transmitter Location
  - (9) Read Pilot Beacon Configuration
  - (r) Return to previous menu
- Pilot Beacon Control Menu:**
  - (1) Enable Pilot Beacon
  - (2) Disable Pilot Beacon
  - (r) Return to previous menu
- Channel Frequency Control Menu:**
  - Enter Channel Number (1-8): 1
  - CDMA Channel Number for Channel 1 (384)
  - Enter CDMA Channel Number ((1-799) or (991-1023)):
- Set PN Offset Index Menu:**
  - PN Offset Index (1):
  - Enter PN Offset Index (0-511):
- Set Tau Adjustment Menu:**
  - Tau Adjustable(3.2 usec):
  - Enter Tau Adjustable(0.0 - 5.2):
- Set GPS Timing Reference Menu:**
  - (1) GPS 1 PPS
  - (2) GPS EST
  - (3) External EST
  - (r) Return to previous menu
- Set Pilot Beacon Per Channel Tx Power Menu:**
  - Enter Pilot Beacon Per Channel Power(0.0 - 19.0):
- Pilot Beacon Transmitter Location Menu:**
  - (1) Set Transmitter Location Addr1
  - (2) Set Transmitter Location Addr2
  - (3) Set Transmitter Location City
  - (4) Set Transmitter Location State
  - (5) Set Transmitter Location Zip
  - (r) Return to previous menu
- ICE Breaker Configuration Parameters Summary:**
  - Run State: Enabled
  - Channel Frequency: CDMA Channel No.
  - Channel-1: 384
  - Channel-2: 425
  - Channel-3: 466
  - Channel-4: 507
  - Channel-5: 548
  - Channel-6: 589
  - Channel-7: 770
  - Channel-8: 729
  - PN Offset Index: 1
  - Tau: 3.2
  - Channel Mask: 0x3
  - Composite Power: 7.01
  - Timing Reference: GPS 1 PPS
  - Transmitter Location:
    - Addr1: 670 N Commercial St
    - Addr2:
    - City: Manchester
    - State: NH
    - Zip: 03101
    - Latitude: 42.997005
    - Longitude: -71.467484

Pilot Beacon Configuration is entered by pressing the number 1 from the Set Parameters menu and the above screen is displayed. The same level of control is available as with that described for the GUI. Examples of each selection screen is shown to the left.

## Networking Configuration Menu

```
Tera Term Web 3.1 - 192.168.1.100 VT
File Edit Setup Web Control Window Help
=====
Local Network Configuration
=====
(1) enable
(2) disable
(3) set default static IP (192.168.1.100)
(x) Return to previous menu
->
```

```
Tera Term Web 3.1 - 192.168.1.100 VT
File Edit Setup Web Control Window Help
=====
Remote Network Configuration
=====
(1) enable modem
(2) Disable Modem
(3) Set DNS Address
(4) Set Modem HeartBeat IpAddress
(5) Maximum PPP Start Count
(6) PPP Restart Interval
(x) Return to previous menu
->
```

```
Tera Term Web 3.1 - 192.168.1.100 VT
File Edit Setup Web Control Window Help
=====
Network Protocol Configuration
=====
(1) Show Network Protocol Config
(2) Configure All Network Protocols
(3) Configure PING Network Protocol
(4) Configure TELNET Network Protocol
(5) Configure FTP Network Protocol
(6) Configure FTP Upgrade Server
(x) Return to previous menu
->
```

```
Tera Term Web 3.1 - 192.168.1.100 VT
File Edit Setup Web Control Window Help
=====
SNMP Configuration
=====
(1) Show SNMP Config
(2) enable SNMP
(3) disable SNMP
(x) Return to previous menu
->
```

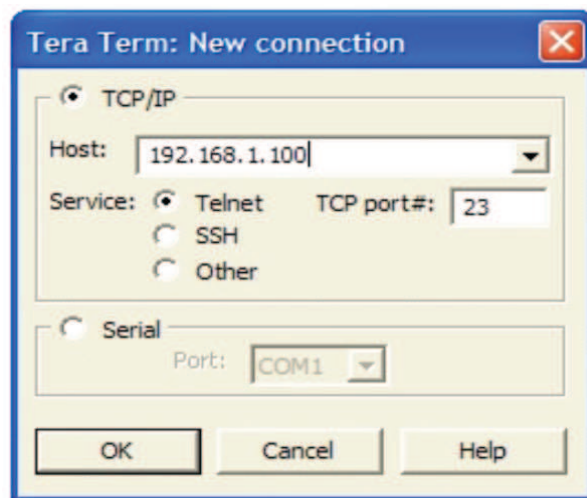
```
Tera Term Web 3.1 - 192.168.1.100 VT
File Edit Setup Web Control Window Help
=====
Networking Configuration
=====
(1) Local Network Configuration
(2) Remote Network Configuration
(3) Network Protocol Configuration
(4) SNMP Configuration
(x) Return to previous menu
->
```

The Networking configuration menu is entered by pressing the number 2 from the Set Parameters menu and the above screen is displayed. The same level of control is available as with that described for the GUI. Examples of each selection screen is shown to the left.

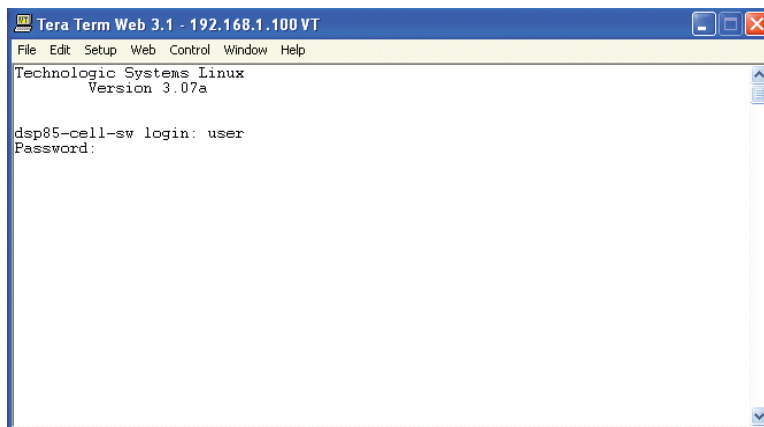
## Telnet Session (Remote Access)

Remote access to the pilot beacon may be gained through a LAN connection and a terminal emulation program for TCP/IP. As with the serial connection, many terminal emulation programs will work, if properly configured. In the following description, "TeraTerm" is used to establish the Telnet session. Also, it will be required that the network configuration of the computer and the pilot beacon being controlled be set up with the same Sub Net and Sub Net Mask in order to establish a link. In other words, the IP addresses of both the computer used and the pilot beacon must use the same group of IP address number sets. For example, the pilot beacon ships with the default IP address of 192.168.1.100 and a Sub Net Mask of 255.255.255.0. In order to connect, the computer to be used for the link would normally need an IP address of something like 192.168.1.12 with a Sub Net Mask of 255.255.255.0, the same Sub Net Mask as the pilot beacon. In this example note: the last digit of the IP address may be any number except 1,100 and 255. Configuring your PC is normally fairly straight forward but it does vary somewhat with the operating system involved. If you require assistance, contact your IT department and they will be able to set up your PC for you or you may review the Additional Tips Section at the end of the manual.

When the TeraTerm program is started, the following screen is displayed. Change the default host IP address to the IP address of the pilot beacon to be controlled. In the case of a new install, the default address is 192.168.1.100 and has been assigned at the factory. Select the service Telnet. The TCP Port must be 23.



Pressing the "OK" button will bring the user to the following screen, which will require the user to log in. The default user name is "user". The default password is "csi1234".



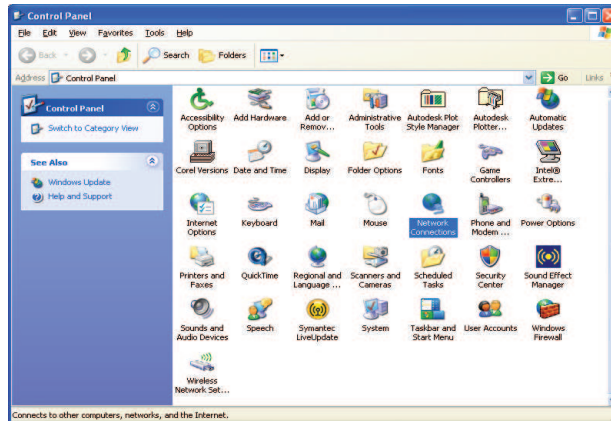
In the field after the prompt "DSP85-cell-X login;" type the user name and password. After typing the password press the enter key and the main menu will be displayed as shown in the text menu section.

Telnet and serial sessions both provide access to the same Text Menu Interface. We have already shown many of the options available and all are self explanatory, so they will not be repeated.

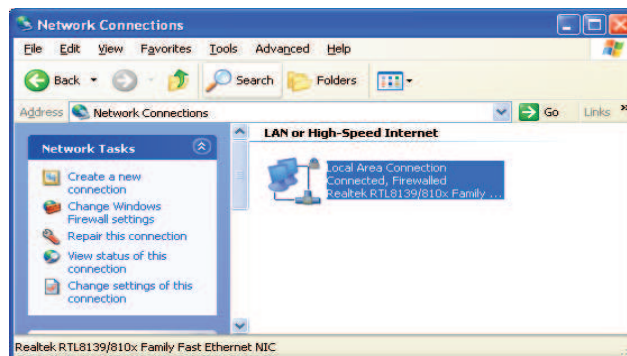
## Additional Tips

Instructions to change TCP/IP settings on your Windows computer.

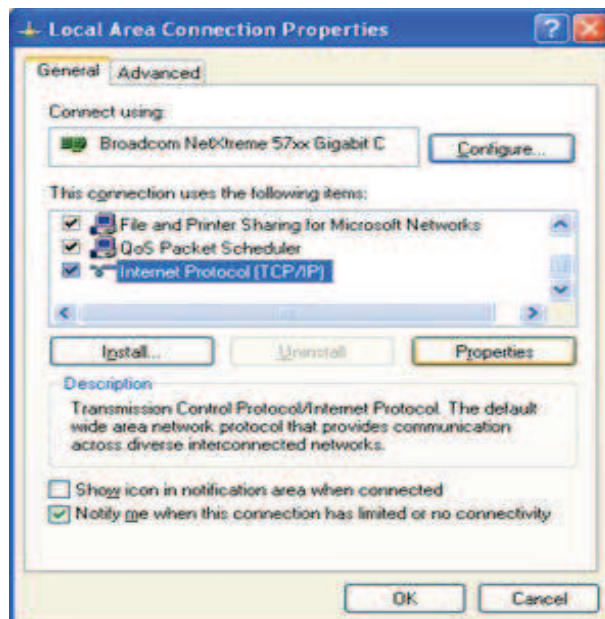
Click in the Network Connections Icon in the Control Panel. See below.



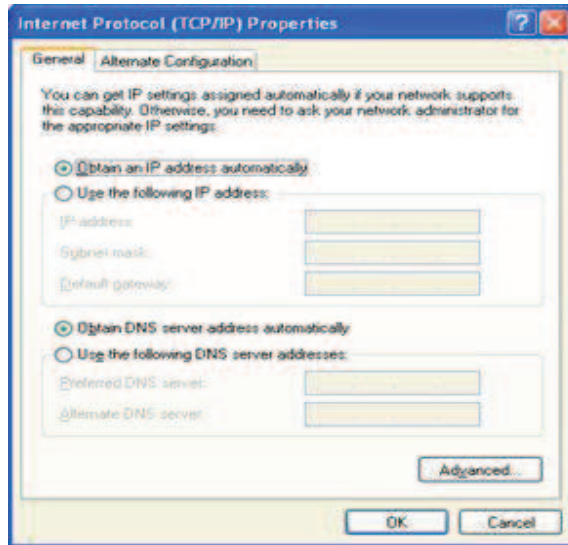
Right click on Local Area Connection - and select "Properties".



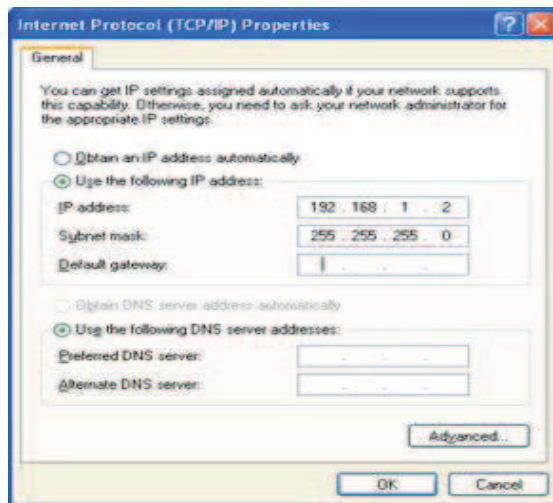
Scroll down to "Internet Protocol (TCP/IP)" and click on the "Properties" button.



If you are set up to use DHCP, the window shown below will be displayed.



Select "Use the following IP address:" and enter "192.168.1.2." The subnet mask should automatically populate to "255.255.255.0".



Nothing else will need to be chosen or entered. Click "OK", then "OK again and retry connection.

A crossover Ethernet cable (supplied) must be used for Web Interface access. As a reminder, you must verify the Ethernet port on your laptop is powered. If your laptop is on battery power, the Ethernet port may be inactive by default. If this is the case simply plug in the laptop to a 110vac source or change the power settings to enable the Ethernet port when the laptop is using battery power.

### **One Year Limited Warranty**

Seller warrants that its products are transferred rightfully and with good title; that its products are free from any lawful security interest or other lien or encumbrance unknown to Buyer; and that for a period of one year from the date of installation or fifteen months from the date of original shipment, whichever period expires first, such products will be free from defects in material and workmanship which arise under proper and normal use and service. Buyer's exclusive remedy hereunder is limited to Seller's correction (either at its plant or at such other place as may be agreed upon between Seller and Buyer) of such defects by repair or replacement at no cost to Buyer. Transportation costs in connection with the return of products to Seller's plant or designated facility shall be paid by Buyer. The provisions of this warranty shall be applicable with respect to any product which Seller replaces pursuant to it. SELLER MAKES NO WARRANTY, EXPRESS OR IMPLIED, OTHER THAN AS SPECIFICALLY STATED ABOVE. EXPRESSLY EXCLUDED ARE THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR PURPOSE. THE FOREGOING SHALL CONSTITUTE ALL OF SELLER'S LIABILITY (EXCEPT AS TO PATENT INFRINGEMENT) WITH RESPECT TO THE PRODUCTS. IN NO EVENT SHALL SELLER BE LIABLE FOR SPECIAL, CONSEQUENTIAL OR INCIDENTAL DAMAGES, INSTALLATION COSTS, LOST REVENUE OR PROFITS, OR ANY OTHER COSTS OF ANY NATURE AS A RESULT OF THE USE OF PRODUCTS MANUFACTURED BY THE SELLER, WHETHER USED IN ACCORDANCE WITH INSTRUCTIONS OR NOT. UNDER NO CIRCUMSTANCES SHALL SELLER'S LIABILITY TO BUYER EXCEED THE ACTUAL SALES PRICE OF THE PRODUCTS PROVIDED HEREUNDER. No representative is authorized to assume for Seller any other liability in connection with the products.

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## Notes

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## Notes

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## Notes

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