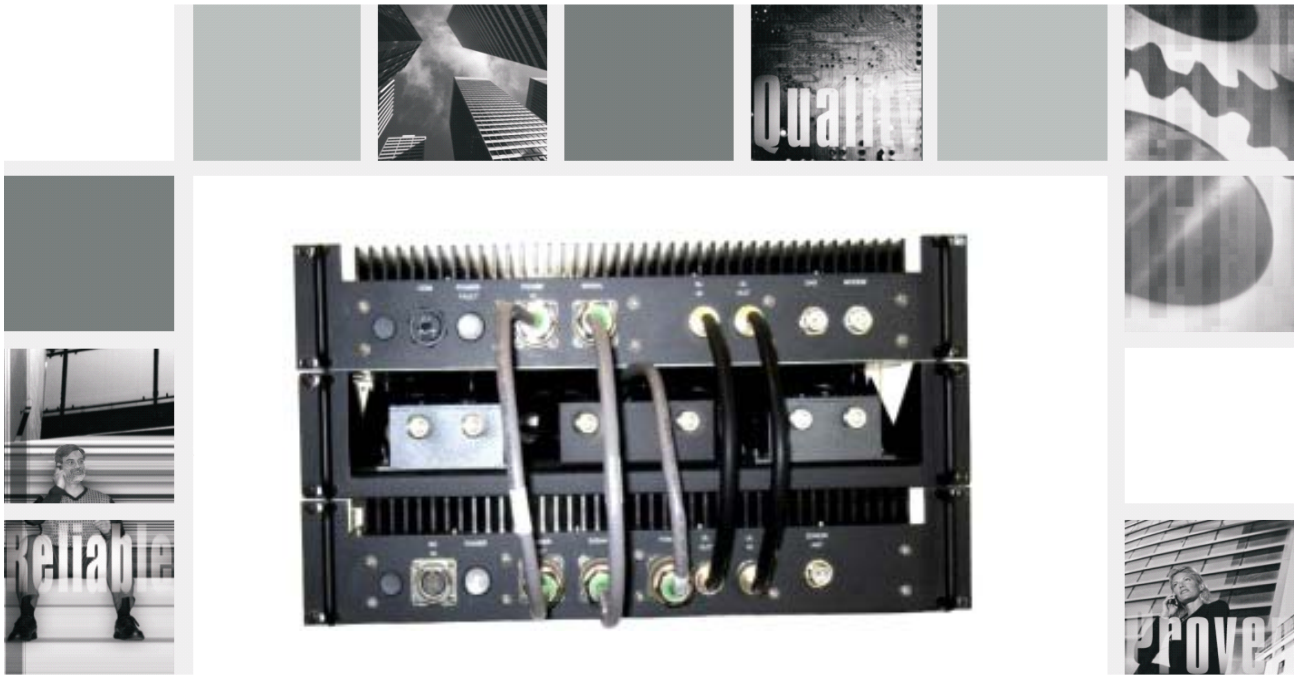# Product Manual

CS12-557-437
User Manual

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) This devices must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class A digital devices, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential areas is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Important Safety Information

Antennas used for the purpose of radiating signals indoors are limited to a *maximum* gain of 3 dBi. The outdoor antenna used for the purpose of communicating to the wireless infrastructure is limited to 3dBi gain, or any combination of gain and loss that equates to 3dB at input. 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.

OUTDOOR antenna must be positioned such that, under normal conditions, personnel cannot approach closer than 120 cm. (~4 ft.). A non- directional antenna having a maximum gain of 3 dBi is used, precautions should be taken to prevent personnel from routinely passing closer than specified.

Table Of Contents

Section 1

Hardware Configuration

This CSI repeater system is comprised of three modules and the cable assemblies that interconnect them.

The **Filter Module** provides frequency selection and filtering. It also houses the system computer. The **Power Module** provides amplification and power distribution. The **CBC/Fan Module** (Cross Band Coupler/Fan Module) is the interface between the train's existing Cellular and PCS repeater systems.
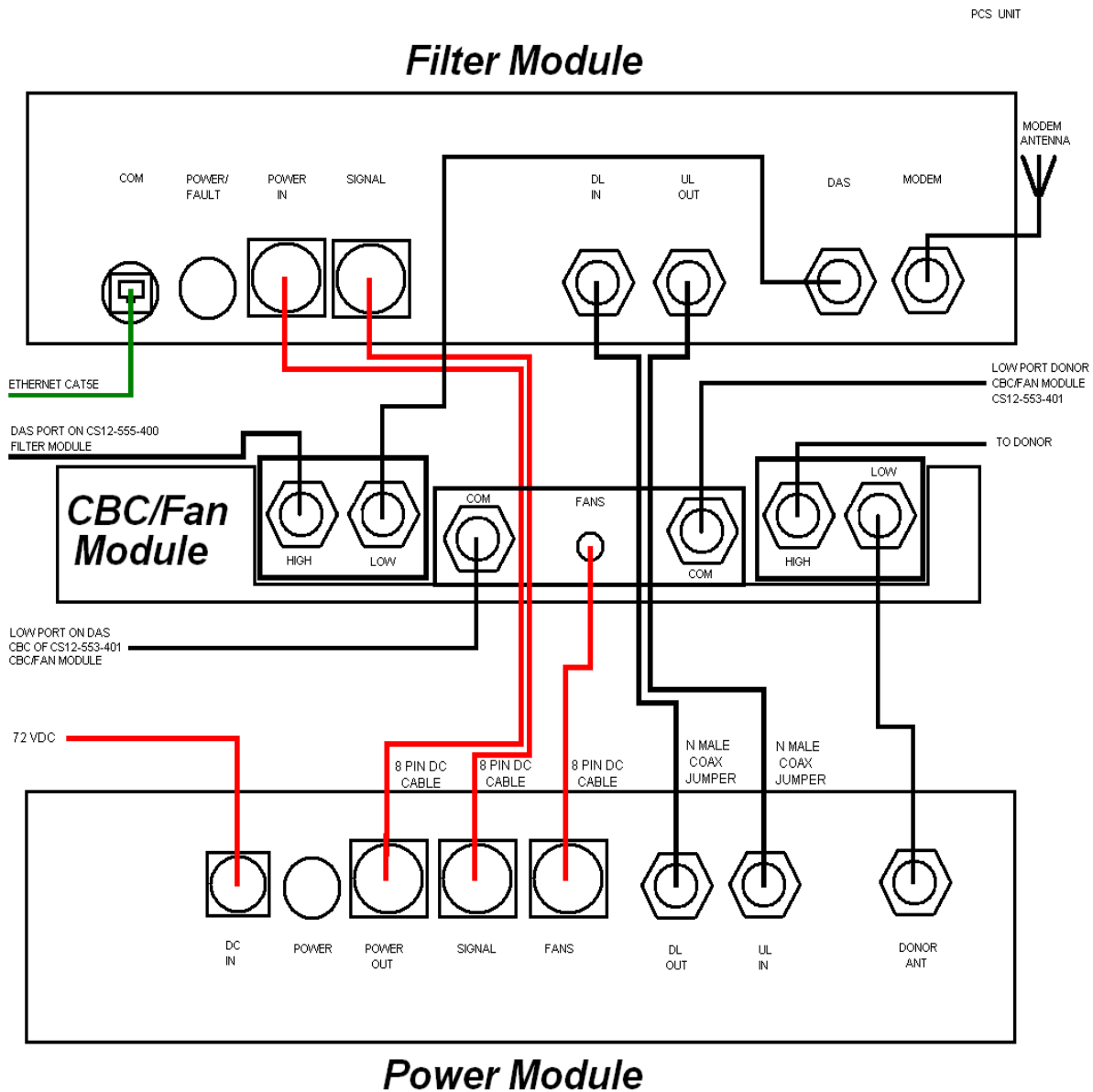
System Level Block Diagram

Hardware Configuration

To PCS / Cell-700 CBCs

Fan & Cell / 700 CBC Module

To Cell-Band repeater

+72 V

Green LED

PA

DC-DC 12V

LNA

Power Module

+72 V

Green / Red LED

DC-DC 5V

DC-DC 28V

Ethernet

DIO1

LCDIO

Scan Receiver

USB

Modem

SBC

COM

Analog
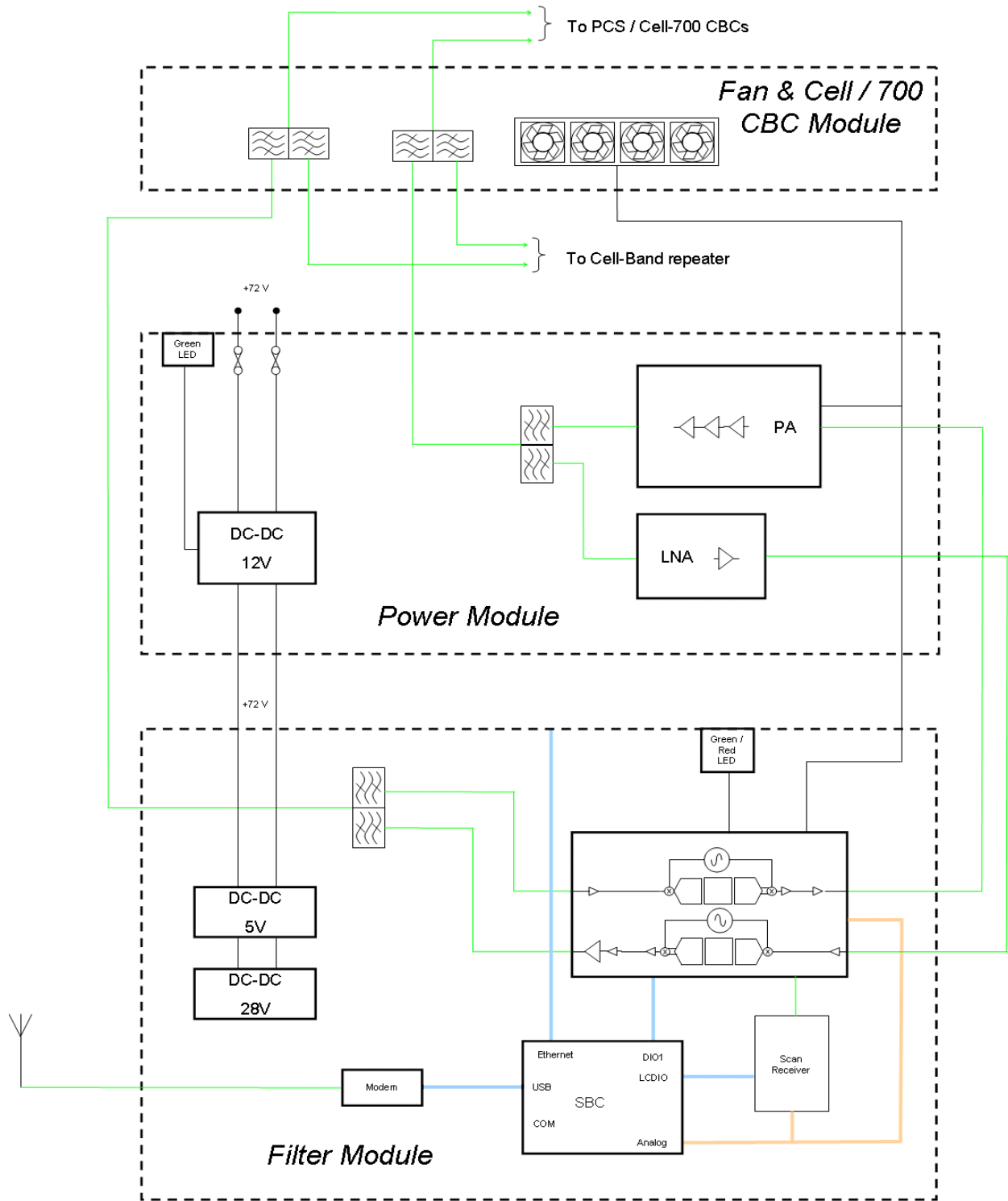
Filter Module

Block Diagram of the Major Components

Section 1

Hardware Configuration

Filter Module

One Way Vent | RJ45 CONN | POWER/ FAULT LED | 8 PIN DC CONN | 8 PIN DC CONN | N Type RF CONN

CBC/Fan Module

N TYPE FEMALE RF CONN | 8 PIN DC CONN | N TYPE FEMALE RF CONN

Power Module

One Way Vent | 2 PIN DC CONN | POWER LED | 8 PIN DC CONN | 8 PIN DC CONN | 8 PIN DC CONN | N TYPE FEMALE RF CONN
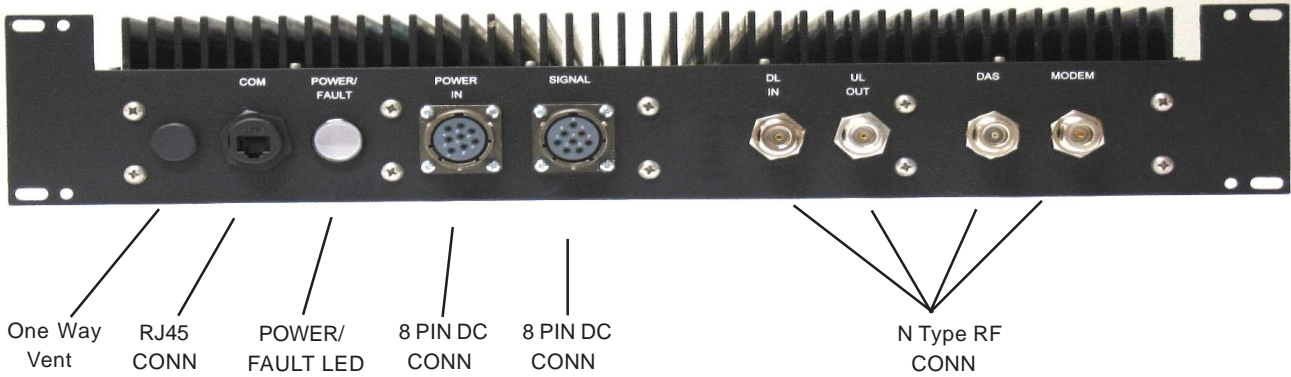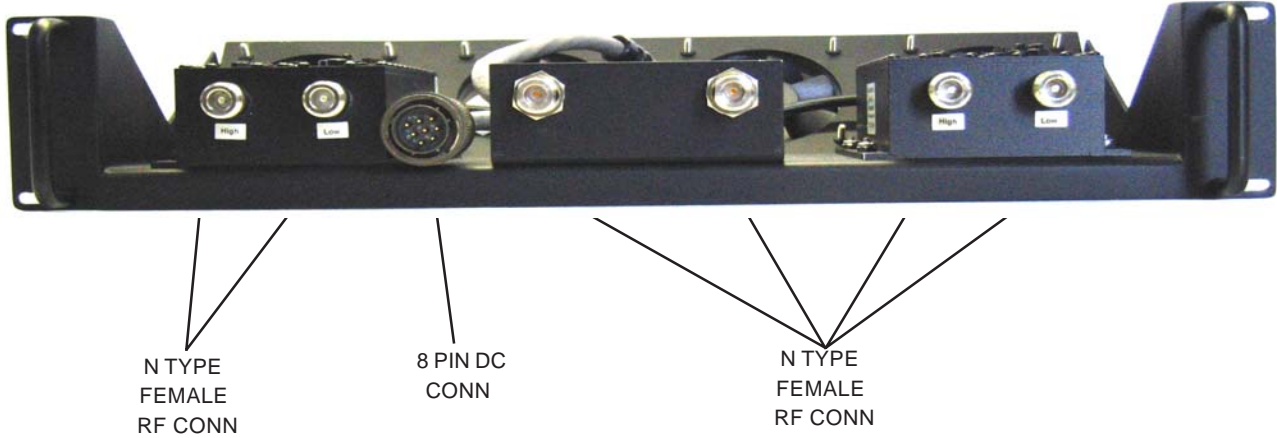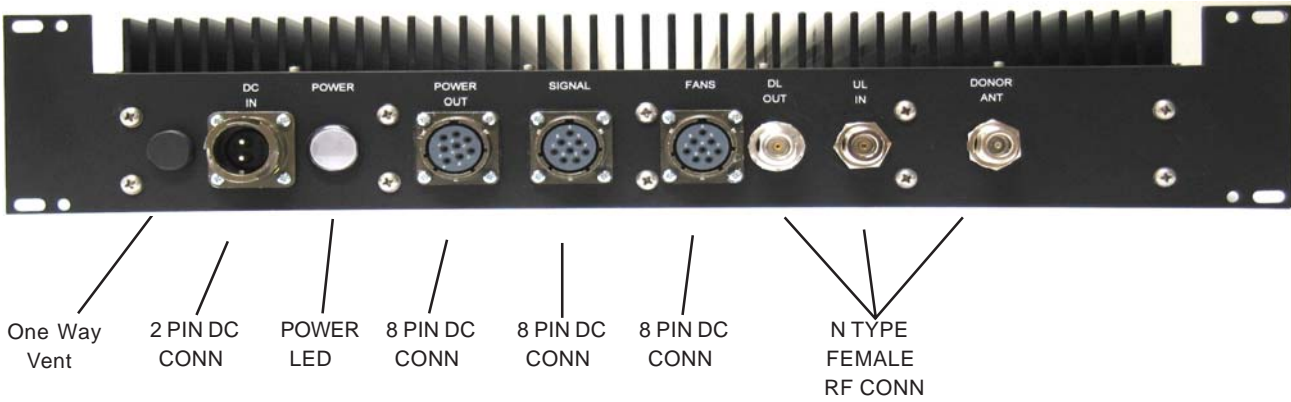
Module Face Plate Configuration

Section 1

Hardware Configuration

FRONT VIEW

RIGHT SIDE VIEW
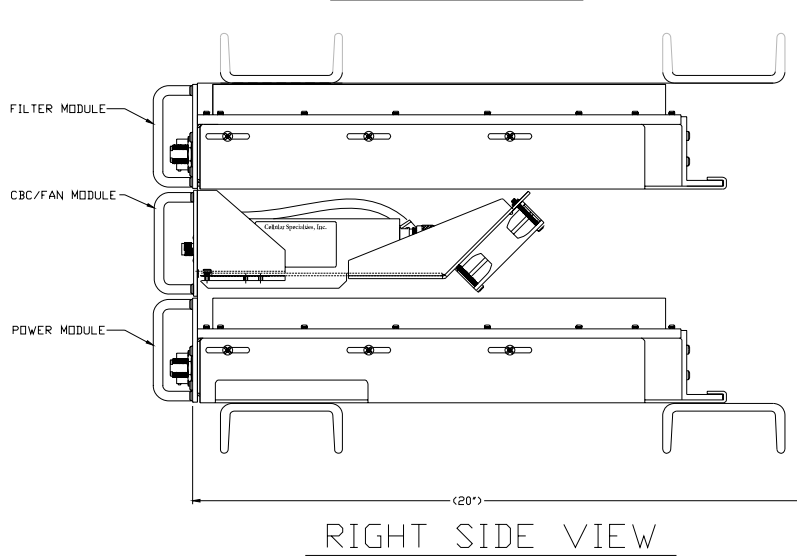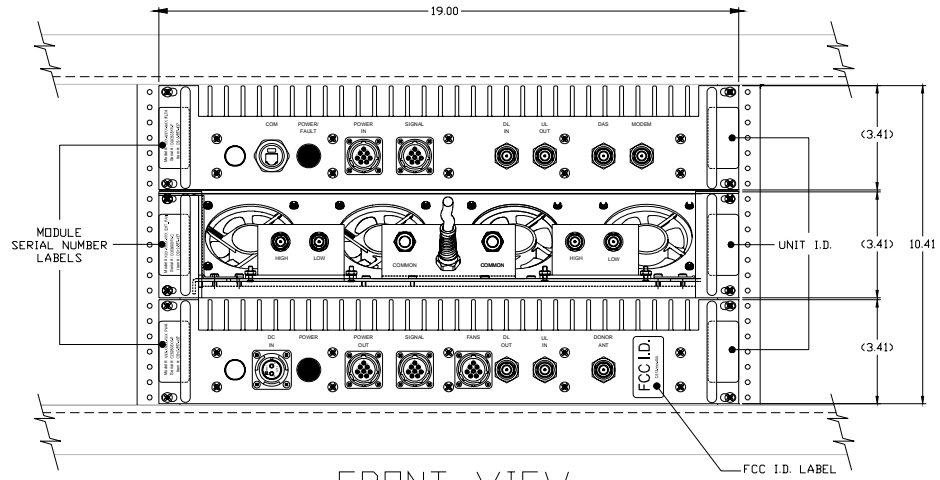
Module Label Locations

Section 2

Installation

1. Unpack each of the three boxes that make up the CSI repeater system for the Acela train. The first box contains the **Filter Module** and associated components. The second box contains the **Power Module** and associated components. Lastly, the third box contains the **CBC/Fan Module** and associated components.

2. After unpacking, the major components should include one **Filter Module,** one **Power Module,** one **CBC/Fan Module** and two **Repeater Mounting Brackets**. The minor components are 20 #8-32 Phillips Head Machine Screws and cabling for interconnection of the modules, which will be detailed on the next page. If any parts are discovered to be missing contact Cellular Specialties, Inc. at 1-877-844-4274 to arrange for replacements to be sent.

3. Install the **Repeater Mounting Brackets**, one in the rack's bottom slot and one in the rack's top slot using 4 #8-32 Phillips Head Machine Screws for each.

4. Install the **Power Module** in the rack's **bottom** slot as shown and secure with 4 #8-32 Phillips Head Machine Screws.

5. Install the **CBC/Fan Module** in the rack's **middle** slot as shown and secure with 4 #8-32 Phillips Head Machine Screws.

6. Install the **Filter Module** in the rack's **top** slot as shown and secure with 4 #8-32 Phillips Head Machine Screws.

CS12-553-401
(Shown already installed)

CS12-555-400
(Shown already installed)

Mounting Braket

CBC/Fan Module

Mounting Braket

Power Module

Filter Module
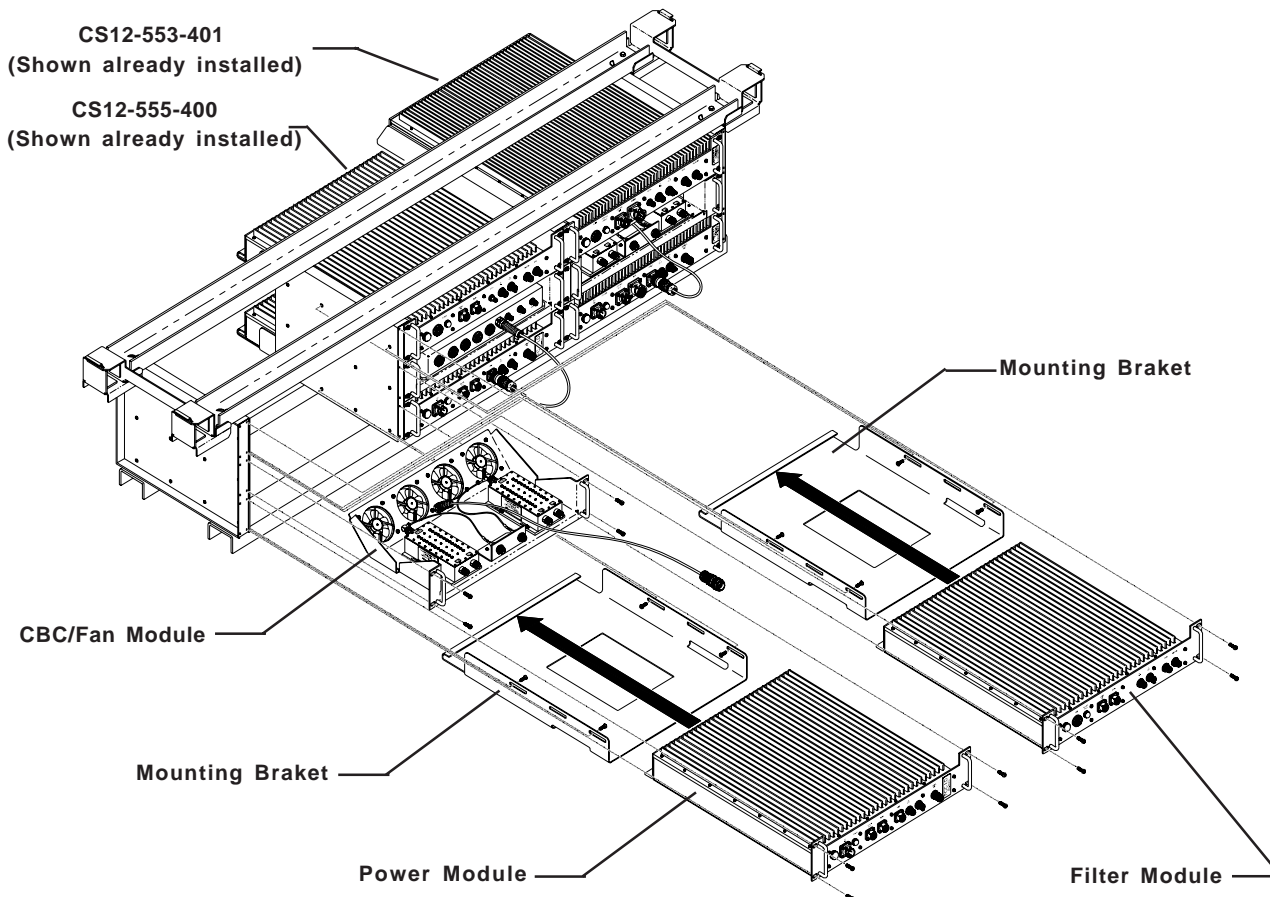
Physical Installation Into The Train

1. With each of the three modules in place, DC and RF cables can be installed. Locate the DC cable with a 8 pin bayonet type connector at each end (**820-2117-002**) and connect one end from the **POWER IN** port on the Filter Module to the **POWER OUT** port of the Power Module. Twist each connector clockwise until locked.

2. Locate the DC cable with an 8 pin bayonet type connector at each end (**820-2156-002**) and connect one end from the **SIGNAL** port on the Filter Module to the **SIGNAL** port of the Power Module. Twist each connector clockwise until locked.

3. Connect the DC pigtail from the Ethernet/Fan Module to the port labeled **FANS** on the Power Module. Twist the connector clockwise until locked.

4. Locate two 1' N male to N male coax jumpers (**820-2064-001**). One is installed from the **DL IN** port on the Filter Module to the **DL OUT** port on the Power Module. The other jumper connects between the **UL OUT** port on the Filter Module to the **UL IN** port on the POWER Module. **Note: hand tighten only. Do not use tools to tighten ANY N type connectors as damage to the jumper and/or equipment may occur.**

5. The next N male to N male coax connection is installed from the **DAS** port on the Filter Module to the **700 uplink** port on the left side cross band coupler on the CBC/Fan Module. The final coax jumper is connected from the port labelled **DONOR ANT** on the Power Module to the **700 downlink** port on the right side cross band coupler on the CBC/Fan Module.

6. Connect the Modem antenna to the port on the Filter Module labelled **MODEM**.

7. Connect the CAT 5E cable from the Ethernet/Fan Module of the CSI-DR-ACELA-PROD8 systemto the port on the filter module labelled **COM**   .

8. Connect the train's 72VDC power to the 2 pin bayonet type connector on the Power Module labelled **DC IN**. Twist the connector clockwise until locked.
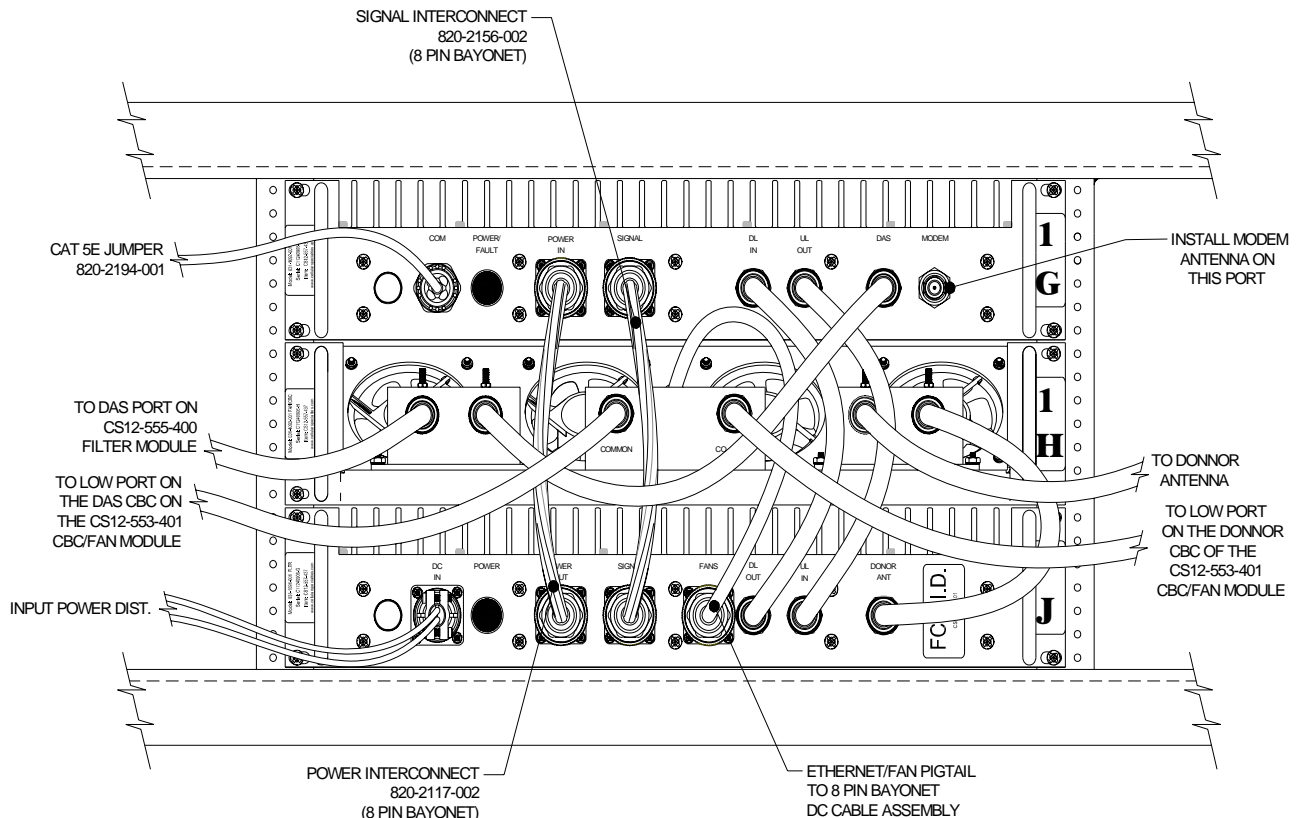
9. Connect the leads from the train's other repeater system's in accordane with the diagram shown on the next page.

RF and Power Cabling

Installation

Note: located on the left side of the Filter Module is a standard RJ45 connector port designed to accept CAT-5E cable, the connector is labelled **COM**.   This port is used to provide a computer interface. Refer to the diagram below for a graphical representation of the connections for this, the GPS cabling and the RF cabling between the other train repeater systems.

RF, Communications and
GPS Inter-Repeater Cabling
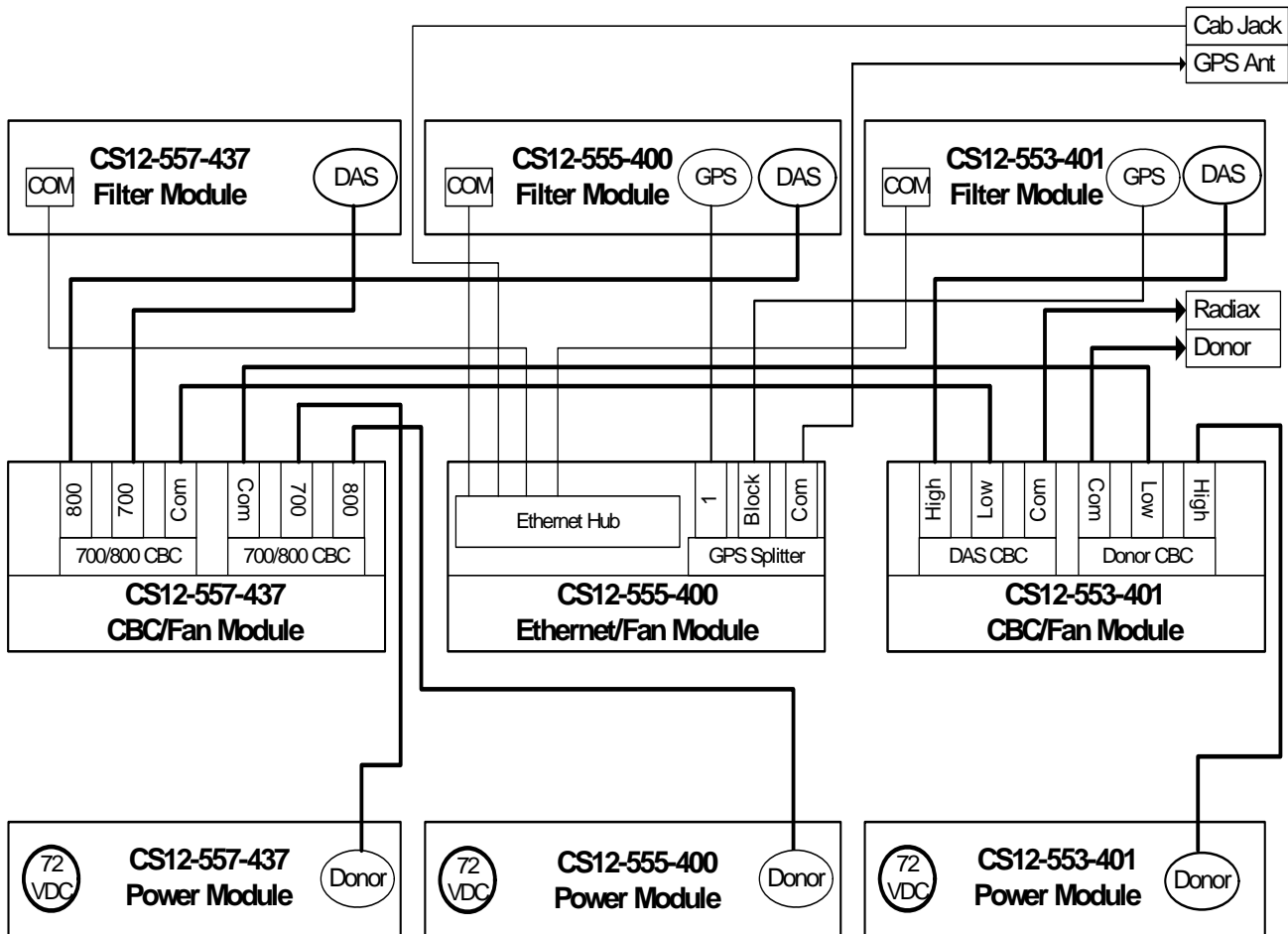
RF and Power Cabling

Section 2

Installation

Power Up

To power up the CSI repeater simply connect the 72 VDC power cable from the train to the DC IN port on the Power Module. When powered up, the repeater will begin in the Operational Mode, using the "Band Switching Algorithm". The repeater will not key until boot up is complete, a GPS location fix is obtained and the unit is within an " Area Definition".

Normal Operation

After boot up and a GPS position fix is obtain the repeater will begin operation based on the Area Definitions, "Channel Power Measurement and Keying Decision" and "Low Isolation Detection and Protection" algorithms. The operational software will continuously monitor the repeater's environment and make the necessary adjustments to keep the product operating within specifications and FCC Type Certification.

System Status

The Software provides real time status data reporting the state of the repeater. This status contains:

Timestamp	Modem Band Type	Satellite Count
System Up Time	Active Filer	NoBox Count
Software Version	In-band input	Searching Count
System Serial Number	Measured Output	Scan RX Run State
Model Number	Composite Input	DeKey Limit
Item Number	AGC Mode	Scan RX Filter ID
Location	AGC Attenuation	# of Channels
Modem Signal Strength	GPS RunState	1 -10 Channel Freq's & SSI
Modem Registration Status	Latitude	
Modem Phone Number	Longitude	
Modem Current Band	Filter ID	
Modem System ID	Filter Name	
Modem Network ID	Location	
Modem Temperature	BTA	

RF Alarms:
Over Range
Oscillation
VSWR
Out of Band Overdrive
Low Signal
No Signal

System Alarms:
Synthesizer Lock
Voltage
Temperature
Software
Hardware

Alarms

The Operating Software will monitor the repeater for conditions that are out of normal operation, triggering an alarm event. The Operating software in conjunction with the Communications Subsystem when so configured will send alarm messages via E-mail or SMS texting to a User Provisioned account.

Each Alarm has these User Provisioned Capabilities.:

- Disable the System: The Operating software can disable the System (prohibit Keying) until the alarm condition is cleared if provisioned
- Alarm Filter Conditions: A Filter Condition (such as X number of occurrences per hour) to the alarm to prevent false or un-useful notifications if provisioned.
- Send an Alarm Message: The Operating Software can send a notification via message E-mail or SMS through the Communications Subsystem if provisioned.
- Alarm Clear Message: The Operating Software can send an alarm clear message when an alarm condition clears if provisioned.

Alarm Notification Message

The alarm messages consists of the Systems Identification Tag, a summary of the current alarms, and a short English message describing the alarm condition(s). Below is a list of the alarms that will trigger an alarm message to be sent.:

Downlink Over Range	Downlink High Temperature	Scan Receiver Low	Uncalibration
Uplink Over Range	Downlink Low Temperature	Scan Receiver High	AGC Disabled
Synthesizer Error	Uplink High VSWR	No GPS Data	Property File Error
DAC Error	Uplink Low VSWR	No GPS Lock	DAS Failure
DC Current High	Uplink Filter Load	No GPS Fix	Watchdog Timer
DC Current Low	Uplink Over Current	GPS Antenna Current	Modem Not Responding
Downlink High VSWR	Uplink Under Current	GPS Fix Filter Not Present	User Login
Downlink Low VSWR	Oscillation	Chassis Overheat	Password Changed
Downlink Filter Load	Uplink High Temperature	Chassis Under Temp	CPU Boot
Downlink Over Current	Uplink Low Temperature	Software Abort	Placed in Disabled Condition
Downlink Under Current	Fan Failure	Software Error	In Maintenance Mode

Powerup and System Check Out Procedures

Section 3

Test Point Locations and Values

The CSI repeater, CS12-557-437, by design, has no external test points. The Power and Filter modules are sealed with no user serviceable parts inside. The Ethernet/FAN Module had no user serviceable parts, if fans are observed to fail the module can be sent back to CSI for evaluation. Testing and configuration is done exclusively by interfacing the repeater with a laptop or desktop computer and using the Web based GUI or the TMI. Both user interfaces will provide a complete status of the repeater. In most cases if all other components of the system prove to be working properly and the repeater is not, the user will need to return the unit to CSI for inspection and repair. See the Warranty and Repair Procedures in Section 3 of this manual.

If the covers for the Power and or Filter modules are removed by the user the warranty will be void and the cost of any needed repair will be the responsibility of the user.

Indicator Lights

This repeater was designed with only two external indicator lights. Both are approximately 3/4" diameter LEDs. The first is located on the Filter Module face plate, between the COM and POWER IN ports, and is labeled POWER/FAULT. This LED glows red as the repeater is powered up. When the unit completes all of it's bootup procedures the LED will change color and glow green to indicate the system is operating normally. If the LED remains red it's an indication of a problem and the user will need to check the system status using the Web based GUI or the TMI.

The second LED is located on the faceplate of the Power Module, between the DC IN and POWER OUT connector ports. This light is designed only to show that the unit has DC current and will glow green when the unit is powered.

Troubleshooting

All cables should be checked for shorts and opens.

The rooftop antenna (Donor Antenna), should be checked for damage.

The DAS antennas should be checked for damage.

If cables and antennas are acceptable and the problem persists, check repeater status using the Web based GUI or the TMI. See Alarm/Action Matrix on the next page.

Should the repeater fail, or if service is lost and the cause can not be determined from the steps above, the user should contact CSI Technical Support @ 1.877.844.4274. CSI will remotely access the repeater and advise the respondent of next step(s).

Subsystem	Alarm Name	Alarm Type	Send E-mail	Shutdown Op Mode?	Disable Unit?
Downlink Power	Over Range	Critical	Yes	Yes	No
	Low Signal	Routine	No	No	No
	No Signal	Routine	No	No	No
	Out of Band Signal	Routine	No	No	No
Uplink Power	Over Range	Critical	Yes	Yes	No
	Out of Band Signal	Routine	No	No	No
Common Hardware Alarms	Synthesizer Error	Critical	Yes	Yes	Yes
	Dac Error	Critical	Yes	Yes	Yes
	DC Current High	Severe	Yes	Yes	No
	DC Current Low	Severe	Yes	Yes	No
Downlink PA	Oscillation	Routine	No	No	No
	Input Power High	Routine	No	No	No
	High VSWR	Severe	Yes	No	No
	Low VSWR	Severe	Yes	No	No
	FilterLoad	Critical	Yes	Yes	No
	Overcurrent	Severe	Yes	No	No
	Undercurrent	Severe	Yes	No	No
	Low Isolation	Routine	No	No	No
	High Temperature	Severe	Yes	Yes	No
	Low Temperature	Severe	Yes	No	No
Uplink PA	HighVSWR	Severe	Yes	No	No
	Low VSWR	Severe	Yes	No	No
	FilterLoad	Critical	Yes	Yes	No
	Overcurrent	Severe	Yes	No	No
	Undercurrent	Severe	Yes	No	No
	Oscillation	Routine	No	No	No
	Low Isolation	Routine	No	No	No
	High Temperature	Severe	Yes	Yes	No
	Low Temperature	Severe	Yes	No	No
	Fan Activation	Routine	No	No	No
	Fan Failure	Severe	Yes	No	No
Scanning Receiver Alarms	ScanRcvrLow	Severe	Yes	Yes	No
	ScanRcvrHigh	Severe	Yes	Yes	No
GPS Receiver Alarms	No GPS Data	Critical	Yes	Yes	Yes
	No GPS Lock	Severe	Yes	No	No
	No GSP Fix	Critical	Yes	Yes	No
	Gps Antenna Current	Severe	Yes	No	No
	Gps Fix Filter Not Present	Severe	Yes	Yes	Yes
Software Alarm Types	Overheat	Severe	Yes	No	No
	Undertemp	Severe	Yes	No	No
	Software Abort	Critical	Yes	Yes	??
	Software Error	Severe	Yes	Yes	No
	Uncalibration	Critical	Yes	Yes	Yes
	Agc Disabled	Critical	Yes	Yes	Yes
	Property File Error	Critical	Yes	Yes	No
	Das Failure	Critical	Yes	Yes	No
	Watchdog Timer	Critical	Yes	Yes	No
	Heartbeat	Informational	No	Yes	No
Communications	Modem Not Responding	Severe	Yes	No	No
	Modem Not Connected	Routine	No	No	No

1 Scope

The warranty period for this product shall be 18 months (548 calendar days) from the date of the Purchaser's Acceptance, plus any extended maintenance periods as specified in the order. During said period(s), CSI warrants that each repeater will be free of defects in material and workmanship.

CSI's sole obligation and the Purchaser's exclusive remedy for any breach of warranty is limited to adjustments, repairs, or at the Purchaser's option, replacement of a System or parts of a System thereof at no cost to the CSI. All exchanged Systems or System parts will become the property of the CSI. Servicing hereunder will be furnished by the CSI's nearest service location. CSI shall perform this service at a time agreed to by the Purchaser. This warranty will not apply to a particular item if:

(a) Adjustment, repair or replacement is required because of accident, neglect, misuse, failure of electric power, environmental controls, transportation or causes other than ordinary use, except that such adjustment, repair, or replacement is required due to actions caused by or the responsibility of CSI's employees or CSI's authorized agents;

(b) The Purchaser fails to operate a System or follow operator-level maintenance procedures in accordance with the CSI's recommendations;

(c) Any person other than the CSI's engineer or an authorized agent of the CSI modifies, adjusts, or repairs the product or performs any maintenance service other than routine operator-level maintenance without the CSI's prior written consent.

The warranty hereunder does not include:
(a) Any furnished consumable supplies,
(b) Painting or refinishing the product,
(c) Electrical work external to the product,
(d) Installation, maintenance or removal of alterations or attachments to the product except as provided by the original system design.

CSI's liability for breach of the above warranty will in no event exceed the purchase price of the Product(s) that has been paid by the Purchaser.

2 Product Hardware Warranty (Non-Software)

(a) CSI represents and warrants to the Purchaser that upon delivery of a repeater to the Purchaser, all right, title and interest in the unit will pass to the Purchaser free of all liens, imperfections in title, claims, charges, restrictions, or other encumbrances. The CSI represents and warrants a repeater's Hardware (specifically excluding the Product Software) as furnished shall be new, merchantable, free from defects in material and workmanship, fit for the ordinary purpose for which the product is used, shall not infringe on any U.S. Patent, and for the period specified in this document from the date a repeater is delivered and shall conform to this documents specifications. Should a unit not conform to the foregoing warranties, CSI shall repair or replace defective or nonconforming product.

(b) During the warranty period, a defective repeater shall be either repaired on-site by the CSI or returned to the CSI for repair or replacement at no charge or cost to the Purchaser. The Purchaser shall bear the risk of loss or damage until a unit is placed in the possession of the carrier. Unless otherwise agreed to by the CSI and the Purchaser, for a product that is returned to the CSI for repair, CSI shall complete repairs and return repaired the product, or ship a replacement product, within three (3) days of receipt of defective repeater at CSI's designated repair location. CSI shall bear the cost of transportation charges for shipment to CSI (FOB origin freight collect) of the product to be repaired or replaced. For return shipments from CSI to the Purchaser, CSI shall bear the risk of loss or damage during transit and shall prepay and bear the cost of transportation charges for shipment of the product that has been repaired or replaced. If a repeater returned is not defective, CSI shall promptly advise the Purchaser in writing of the determination and in such cases, CSI shall return product to the Purchaser at the Purchaser's expense and risk in its "as received" condition. If a repeater is returned and is not in warranty, CSI shall promptly advise the Purchaser in writing of this determination and the charge to repair the product. In such cases, CSI shall repair the product if so instructed by the Purchaser in writing and charge the Purchaser for labor, parts, and shipping.

(c) During the warranty period, if the Purchaser's technical personnel attempt to determine whether or not a CSI repeater is the cause of service interruption and cannot identify and resolve the problem causing the interruption after communicating with CSI's technical personnel via telephone or other suitable means, and the service interruption still exists, then the Purchaser may request that CSI begin on-site repairs as soon as possible, but in no event later than one (1) business day plus reasonable travel time after receiving the Purchaser's request. If the problem is with CSI's product, (software or hardware), such on-site repairs by CSI shall be at no charge to the Purchaser.

Hardware Operations

(d) During the Warranty period, if the service interruption still exists after compliance with (c) above, and the service interruption is caused by either CSI's defective repeater(s) and/or CSI's product that does not confirm to specification and the CSI has been given a reasonable time frame, as determined by the Purchaser, to correct the service interruption, the Purchaser may return the product to CSI and receive a credit for the total purchase price of the Product or a completely new repeater, at the Purchaser's option,.

(e) Any replacement, repair, modification, installation or other service performed by CSI shall be warranted, commencing with the date upon which repaired product is returned to the Purchaser, for the remainder of the unexpired period of the warranty.

(f) The warranties do not extend to a repeater to the extent that such repeater has been subjected to misuse, neglect, abuse, accident caused by the Purchaser or by a third party subsequent to the delivery of the unit, and such action is the cause of the damage or malfunction.

3 *Product Software Warranty*

(a) CSI warrants that the Purchaser shall have quiet enjoyment of the Product Software and that the Product Software and the Purchaser's use shall be free from claims of infringement, misuse or misappropriation of any intellectual property right during the term of the Purchaser license to Use the Software. As to Product Software which the CSI does not have title, CSI warrants that has rights in the Software sufficient to permit the license of the Software to and that CSI has full right, power and authority to license the Software and other rights granted hereunder to Verizon Wireless.

(b) CSI also warrants that the media containing the Software will be free from defects in material and workmanship and that all related services provided by CSI shall be rendered by qualified personnel who will perform the tasks assigned consistent with good professional practice and the state of the art involved.

(c) CSI also warrants that there does not exists an copy protection or similar mechanisms within the Product Software, which will, either now or in the future, interfere with the operation of the Product. Furthermore, CSI warrants unless requested in writing by the Purchaser and the Purchaser approves response, or CSI advises the Purchaser in writing that it is necessary to perform valid duties under this attachment and authorized in writing by the Purchaser, any Product Software provided to the Purchaser by CSI for Use by the CSI or the Purchaser shall:

Hardware Operations

- contain no hidden files;
- not replicate, transmit or activate itself without control of an of an authorized person operating computer equipment on which it resides;
- not alter, damage or erase any data or computer programs without control of an authorized person operating computer equipment on which it resides;
- contain no encrypted imbedded key, node lock, time-out or other function, whether implemented by electronic, mechanical or other means, which restricts or may restrict Use or access to any programs or data developed under this Agreement, based on residency on a specific hardware configuration, frequency of duration of Use, or other limiting criteria ("Illicit Code").

(d) Where the Product Software is intended to be used in transaction processing or in the public switched network, CSI represents that nothing in the Product Software precludes the Purchaser form integrating a network management solution (including transaction processing and network monitoring) with the Product Software.

(e) For the period specified beginning with the effective date of license of the Software, CSI represents and warrants that the Product Software will perform in accordance with specifications. If within one year (365 days) subsequent to the expiration of the warranty period CSI has not repaired the Product Software to perform in accordance with specification for any exception communicated in writing by the Purchaser to CSI during the warranty period, the Purchaser may order and CSI shall refund to the Purchaser the amount paid to it for the nonconforming Product Software.

(f) CSI represents and warrants that if any portion of the Product Software is or becomes unusable, totally or in any respect, the Supplier will correct errors, defects and nonconformity and restore the Product Software to conforming condition without additional charge to the Purchaser.

4 Continuing Availability of Service and Parts

(a) CSI shall, if requested by the Purchaser, provide the Purchaser with maintenance service, repair service and parts for the Product and Software, for a period of seven (7) years after extended Product and Service agreements have been discontinued by the Purchaser. If CSI is unable to supply such services and/or parts or CSI is unable to obtain an alternative source to provide such services and/or parts for the Purchaser, then the CSI shall, without obligation or charge to the Purchaser, provide the Purchaser with drawings or other documents required to either manufacture or buy such parts and the technical information or any other rights necessary for the Purchaser to manufacture or purchase such parts for the purpose of supporting the Purchaser's customer base.

(b) The technical information shall include, by example and not by way of limitation:
- Manufacturing drawings and specifications of materials and parts comprising the replacement and repair parts and components;
- Manufacturing drawings and specifications covering special tooling and operation;
- A detailed list of all commercially available Continuing Availability of Service and Partsble parts and components purchased by CSI on the open market, disclosing the part number, name and location of the Company and price lists for the purchase; and
- One complete copy of the source code used in the preparation of any software licensed or otherwise acquired by the Purchaser from CSI, provided however, that such source code shall remain the property of CSI and shall be separately licensed to the Purchaser for use by the Purchaser to support the Product.

(c) In the event that CSI either (i) does not own the source code or (ii) does not have the rights to disclose such source code, then CSI shall disclose its licensor or owner of said source code and shall get the rights on behalf of the Purchaser.

(d) Certain parts of the Product Software is subject to a licensing agreement and is sublicensed to the Purchaser. In the event of the inability to provide updates or continuing support of the application software at a reasonable cost, CSI shall assist the Purchaser in locating an alternative source.

5 Product Returns

Please call 1.877.844.4274 to obtain a Return Material Authorization (RMA) number for product assessment and repair.

Section 4

Software Operations

Web based GUI Session

Primary access to the repeater is gained using a LAN connection and a web browser program such as Firefox by Mozilla, or Internet Explorer from Microsoft. The repeater ships by default with a DHCP static IP address 192.168.1.102. *

If connecting directly to the repeater from a laptop or PC with a crossover CAT-5E cable or over a LAN the user types the IP address of the repeater into the browser address line to connect.   When connection is made the user will be prompted for a user name and password. For the purpose of the GUI session, the <u>default user name</u> 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.)
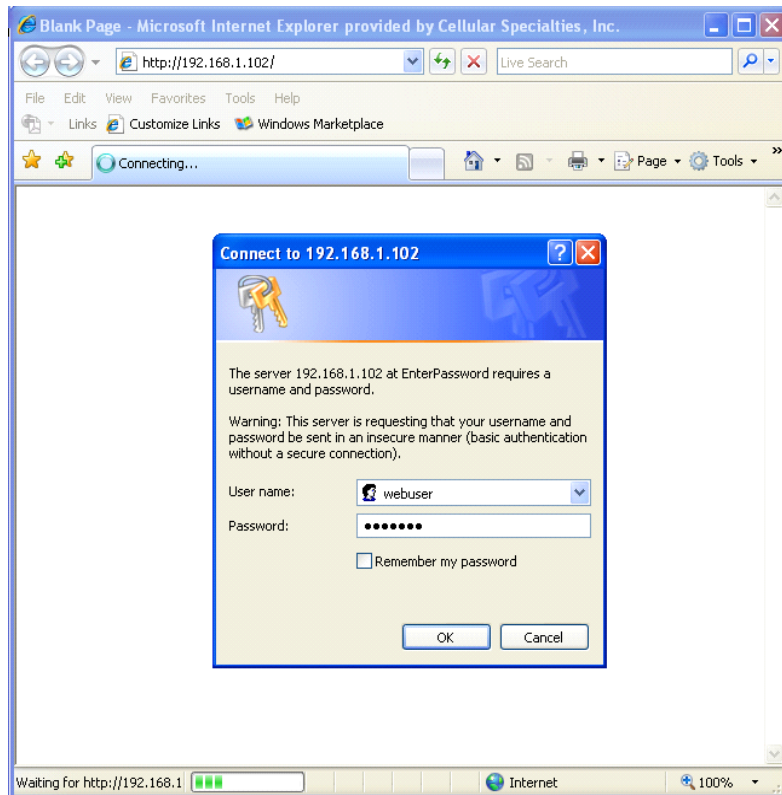
*DHCP is a protocol that allows computers on a network to be automatically configured appropriately for that network. Networks provide DHCP service by maintaining one or more servers that listen for special broadcasts on the network, called DHCP requests. These requests are made by computers when they first join a particular network. The DHCP server replies with configuration information that the requester uses to join the network.

In the case of this repeater, the unit is configured to with a static address by default. This means it will not request or issue DHCP address and is unlike the PCS verion which is configures as a DHCP Server. This means that a computer configured to make a DHCP request on joining a network (most laptops are set up this way) will automatically receive a configuration from the PCS repeater when it is connected to it via the local network port. This connection is made with either a crossover cable or an Ethernet switch or hub.

General Operation Overview

Section 4

Software Operations

System Status:

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

General Operation Overview

Section 4

Software Operations

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 DHCP Server. It is recommended you check with your IT department for explanation of the options and approval before you connect this repeater to your network or change the options.
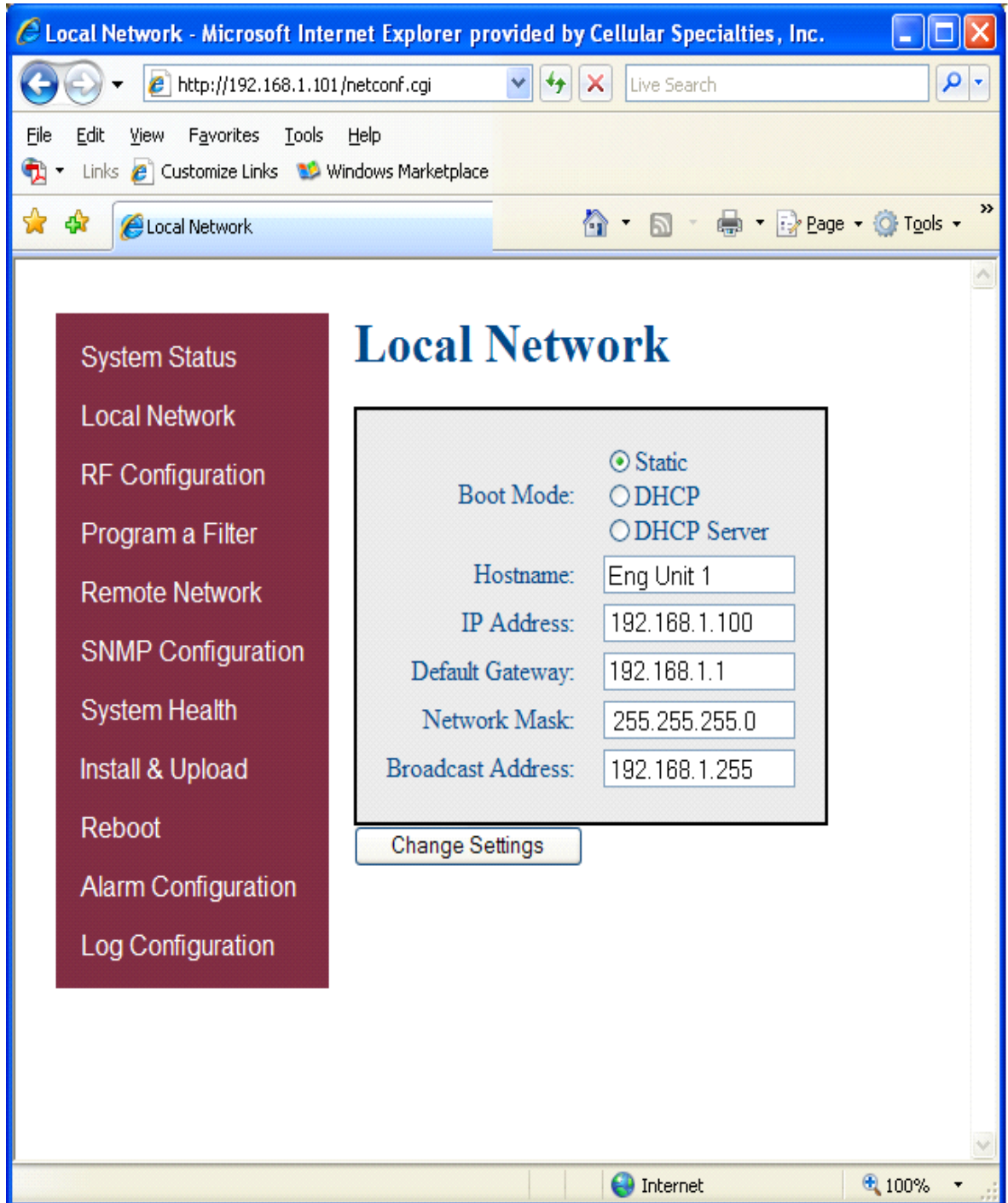
Software Operations

RF Configuration:

From here the user may return to the System Status screen or click on the other options. If the user would like to modify RF configuration click on the words RF Configuration in the brown navigation box and the screen below is displayed.
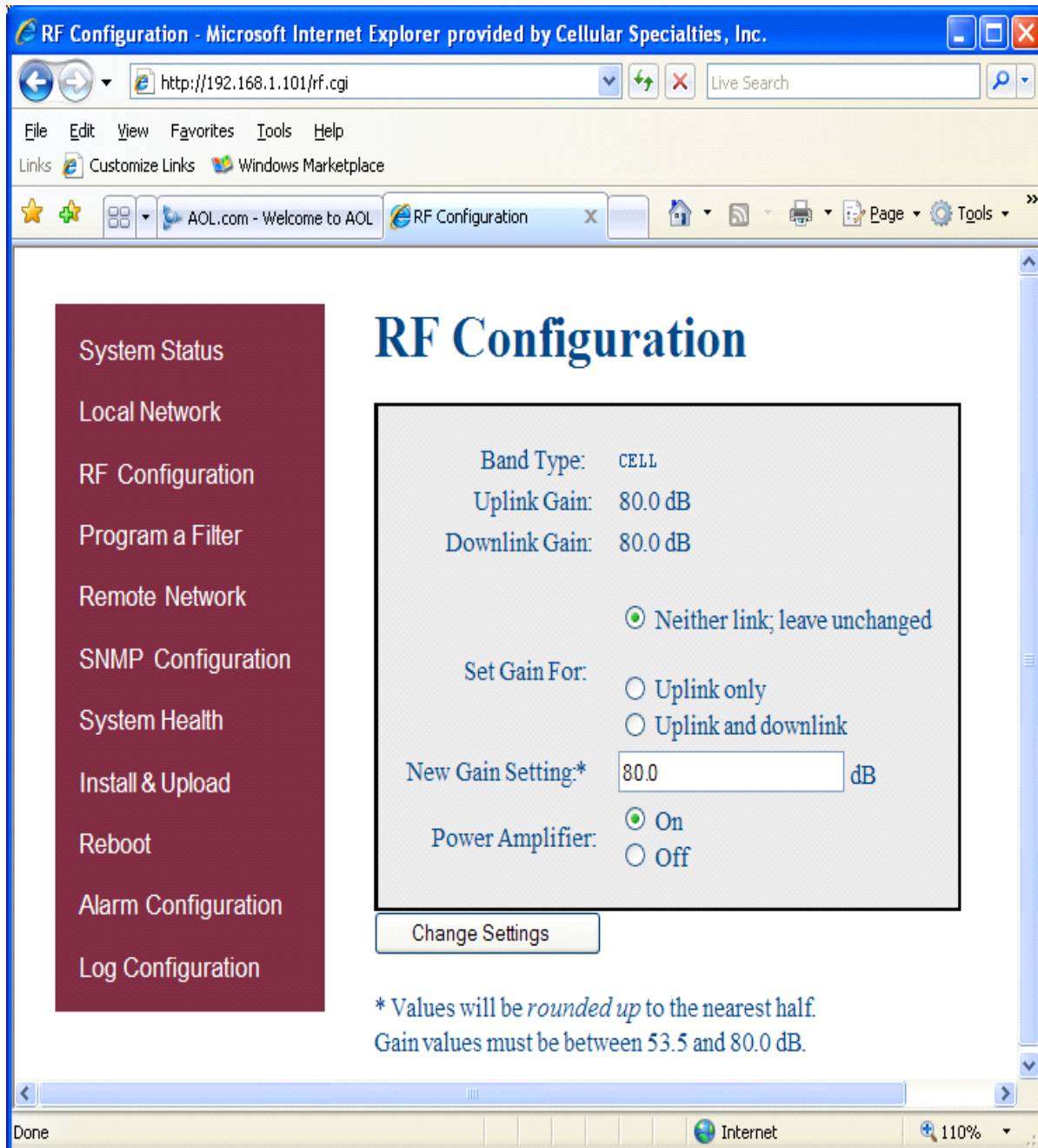
To change gain settings the user will select the Uplink only or Uplink and Downlink radio buttons. The user then inputs the gain value desired. Gain values from 53.5 dB to 80.0 dB may be selected. The repeater will not allow the user to set values outside this range. By pressing the Change Settings button the gain change is implemented. When a new filter set is required, it may be selected by clicking Program a Filter in the navigation box.

Section 4

Software Operations

Program a Filter:

The user may select the desired filter by pressing the band/sub-band and modulation selection buttons. Undesired bands/sub-bands if lit will require the user to manually "deselect" them before programming. Pressing the Program button will complete the selection and load the desired filter. The time required to complete this process will take just a few moments. Note: If the filter desired is not currently in the unit, additional filters along with instructions on how to load them are available by contacting CSI.
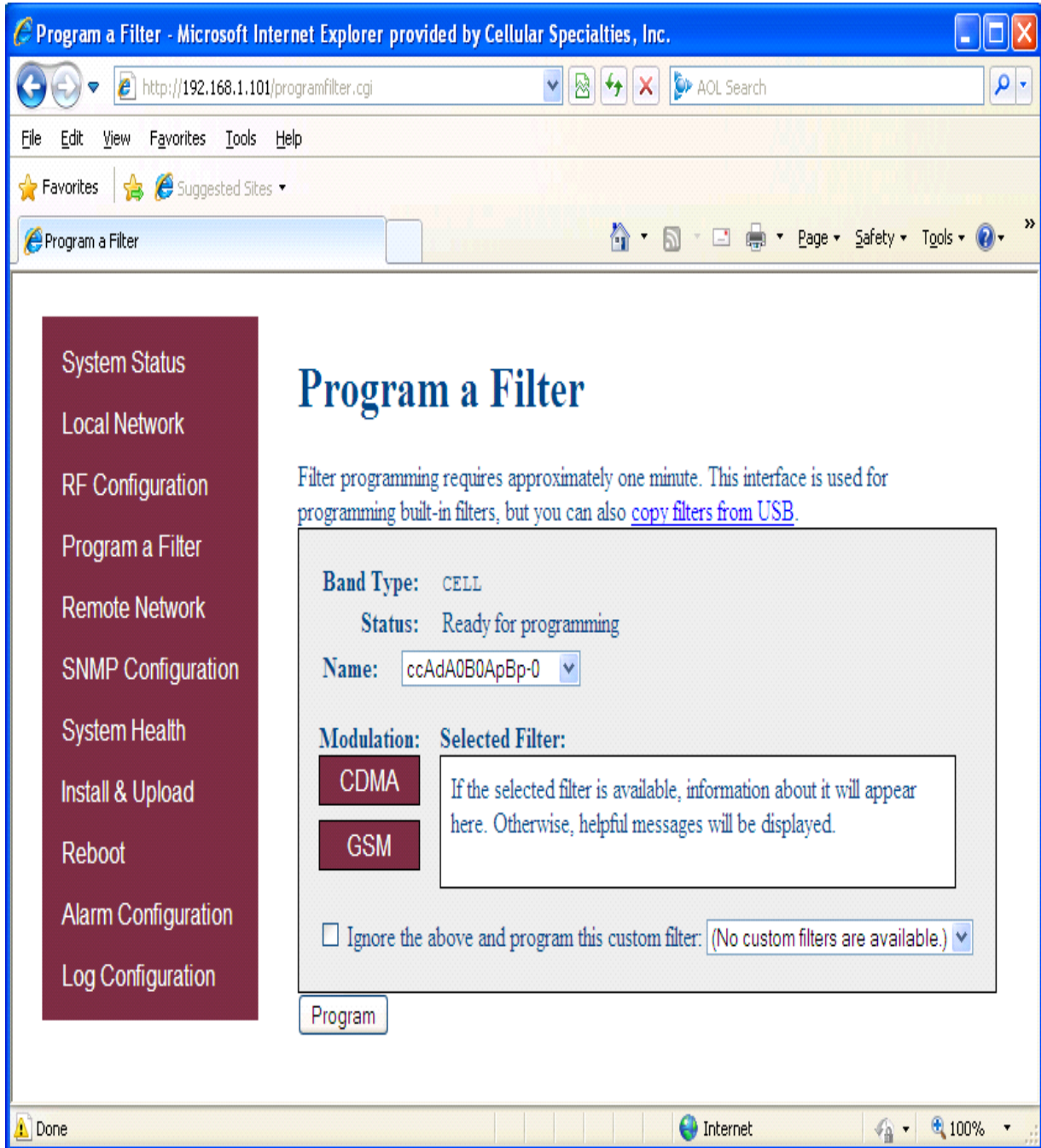
Software Operations

Remote Network:

Highlight the carrier on whose network the repeater and modem will be configured and click the Change Settings button. Note: the system will require restart for the change to take effect.

Section 4

SNMP Configuration:

To change SNMP settings click SNMP Configuration in the navigation box, the screen below 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.
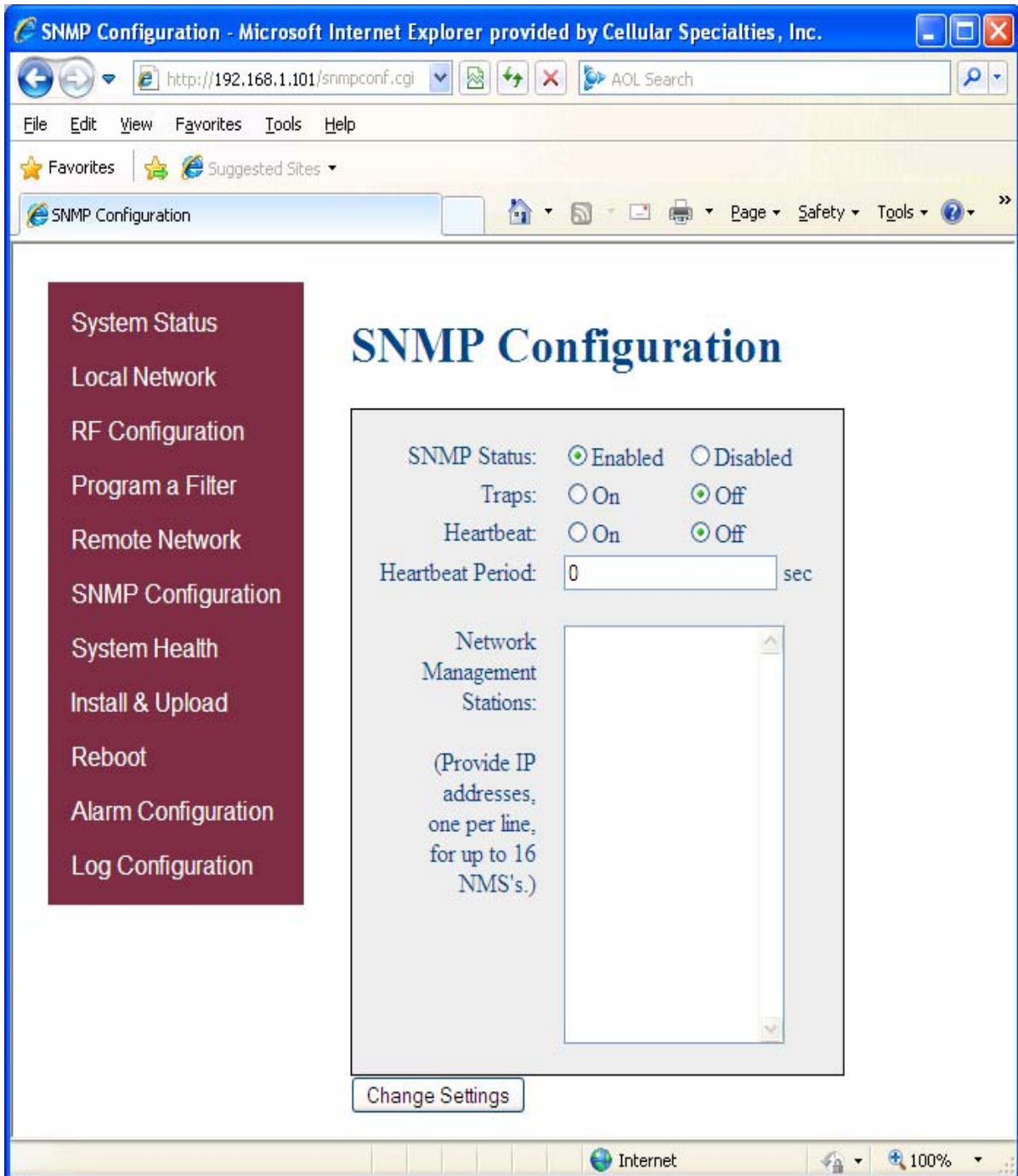
Section 4

Software Operations

System Health:

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

***The user may clear alarms and the Event Log by clicking the Clear Log button.

Section 4

Software Operations

Install & Upload:

Should a software install or upgrade be needed it can be done from the Install & Upload screen shown below. As with the other screens it can be reached by clicking the words in the navigation box.

Software Operations

Reboot:

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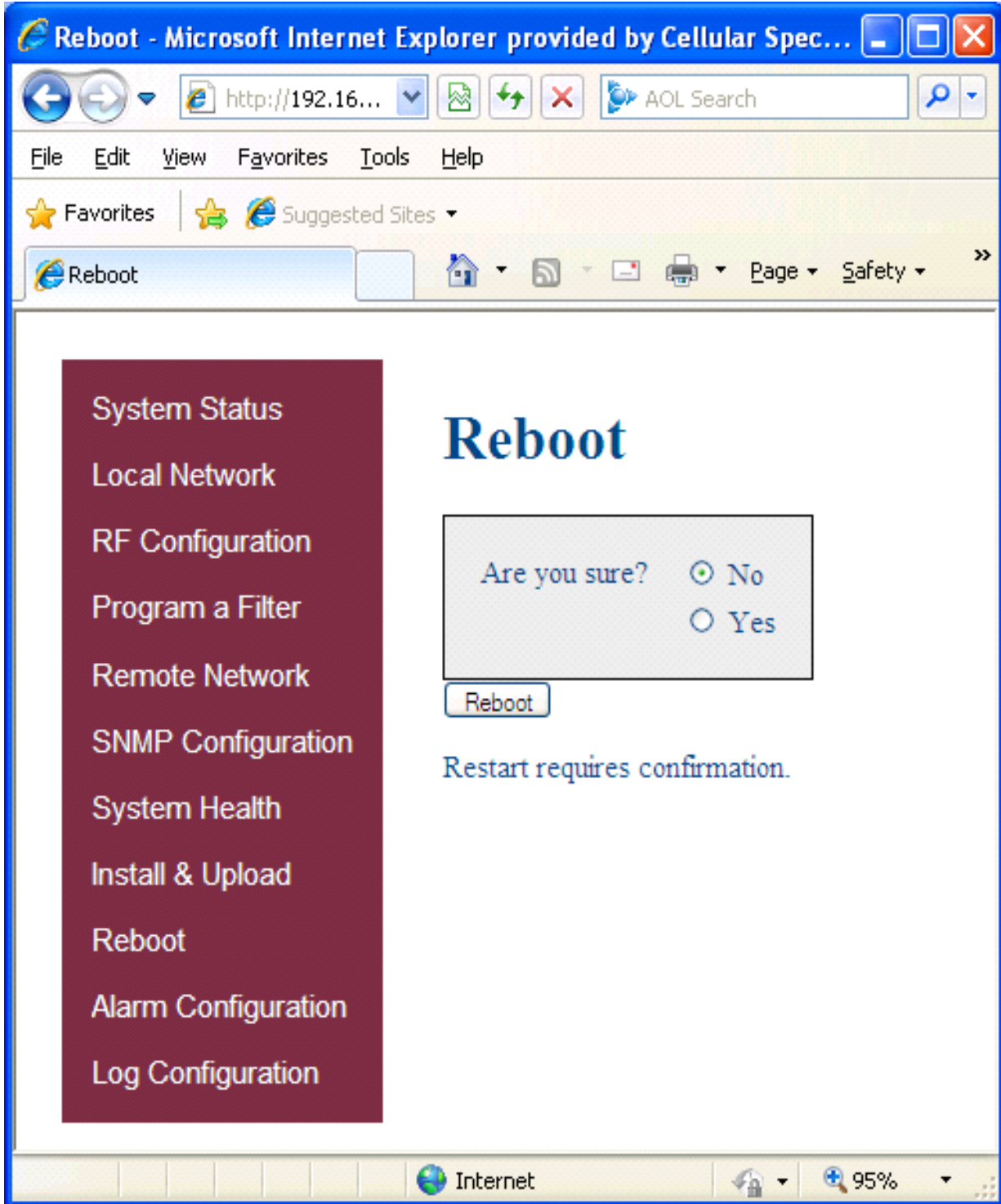
General Operation Overview

Section 4

Software Operations

Alarm Configuration:

In order to review and configure the system's alarms click on the Alarm Configuration line in the navigation box and page shown below is displayed.

Software Operations

Log Configuration:

In order to review and update the system's log configuration, click on the Log Configuration line in the navigation box and page shown below is displayed.

Section 4

Software Operations

Text Menu Interface:

A Text Menu Interface (TMI) is provided as an alternate means of access and control of the repeater. To use the TMI, also known as the console interface, connect a CAT -5E cable to the RJ45 connector port labeled **COM** and a computer making use of a standard terminal emulation program.

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:

<div align="center">

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

</div>

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. ttpro313.zip

When the program is started, the following screen is displayed.
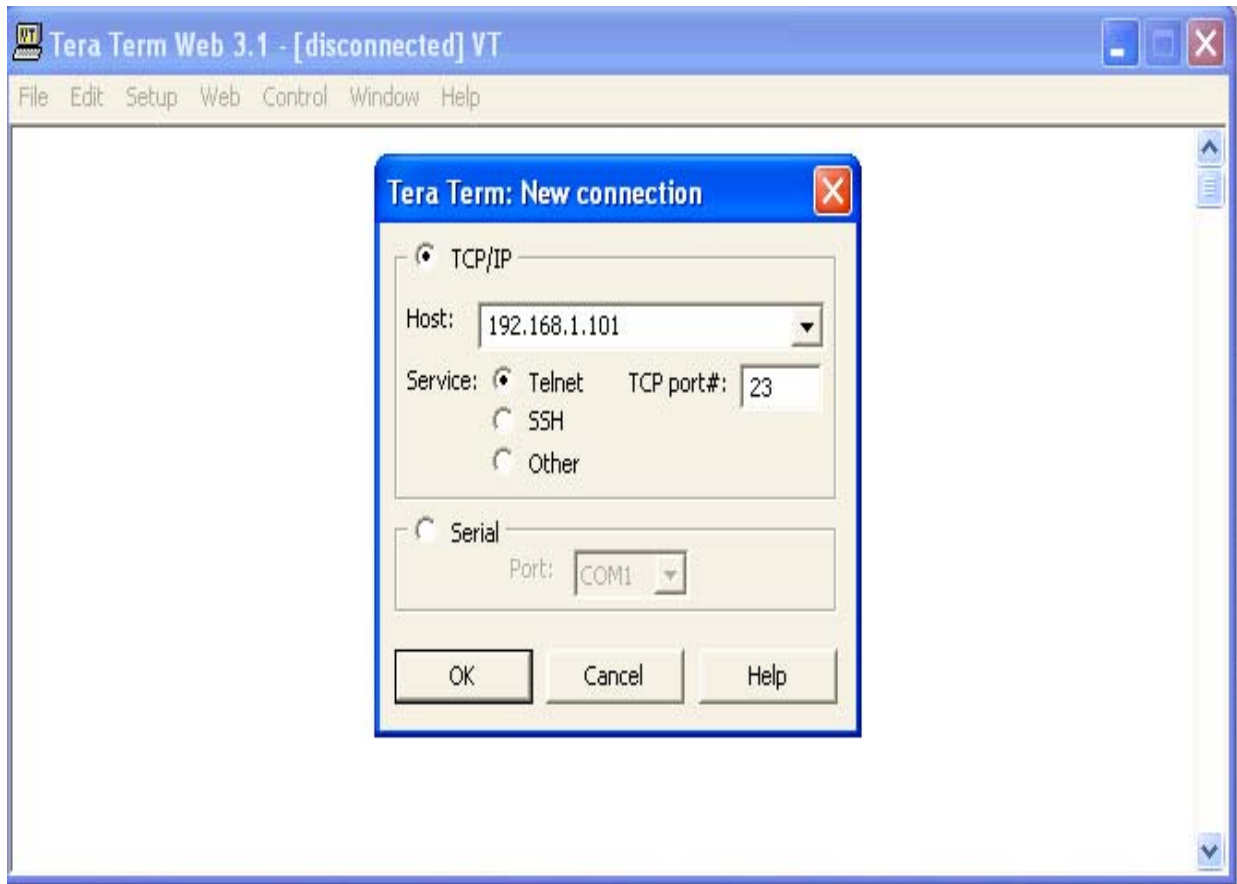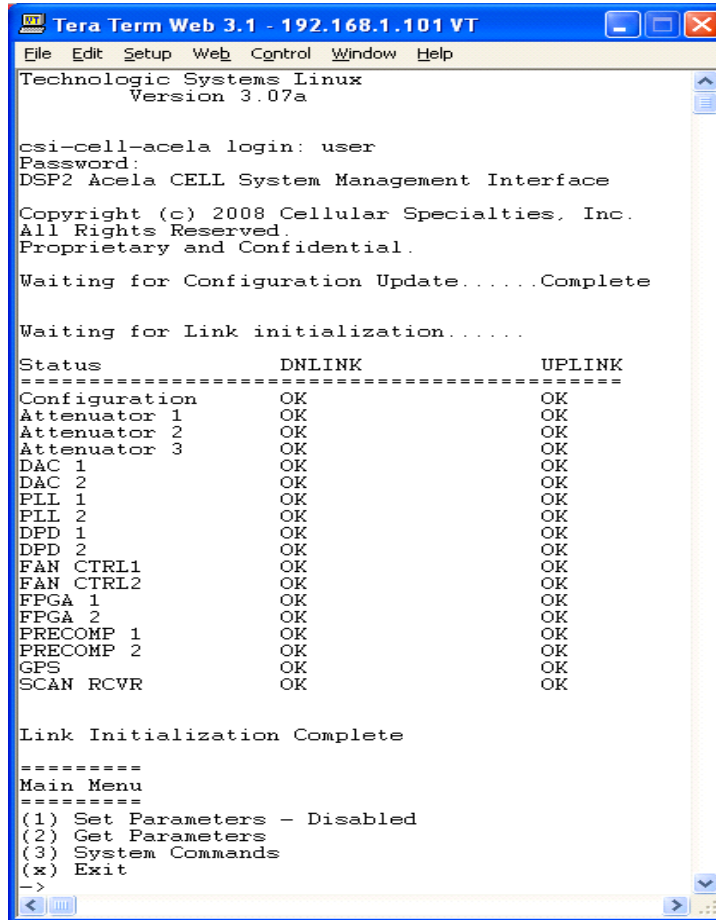
In the box labeled Host type the repeaters IP address and click OK. The user will then be prompted for a user name and password. The default user name is **"user"** and the password **"csi1234"**.   After entering the password and pressing return the TMI main menu will appear.

Software Operations

Upon logging the user is presented with a summary of the initialization status. The data represents a top level list of the major components that must be operating properly in order to have a function system. The display will "block" until a particular component is finished being initialized.

```
Tera Term Web 3.1 - 192.168.1.101 VT

File  Edit  Setup  Web  Control  Window  Help

Technologic Systems Linux
        Version 3.07a


csi-cell-acela login: user
Password:
DSP2 Acela CELL System Management Interface

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

Waiting for Configuration Update......Complete


Waiting for Link initialization......

Status               DNLINK               UPLINK
==================================================
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
FAN CTRL1            OK                   OK
FAN CTRL2            OK                   OK
FPGA 1               OK                   OK
FPGA 2               OK                   OK
PRECOMP 1            OK                   OK
PRECOMP 2            OK                   OK
GPS                  OK                   OK
SCAN RCVR            OK                   OK


Link Initialization Complete

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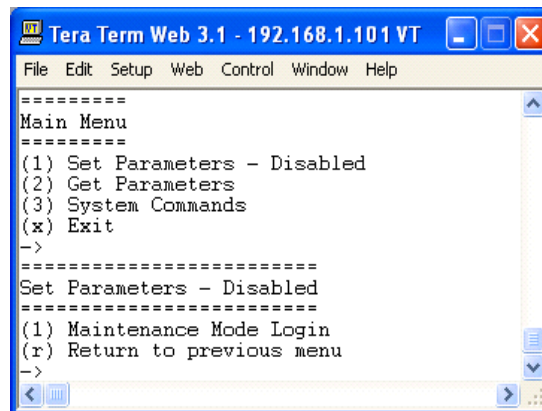
Link Initialization Complete

Once the initialization sequence is complete, the user is presented a top level menu used to access all of the systems operating parameters. The top level menu is organized into three main sections, settable parameters, status parameters, and system functions.

```
Tera Term Web 3.1 - 192.168.1.101 VT

File  Edit  Setup  Web  Control  Window  Help

=========
Main Menu
=========
(1) Set Parameters - Disabled
(2) Get Parameters
(3) System Commands
(x) Exit
->
=========================
Set Parameters - Disabled
=========================
(1) Maintenance Mode Login
(r) Return to previous menu
->
```

The "Set Parameters" menu is password protected (user definable) in order to prevent erroneous configurations being made by non-qualified users. The user will be prompted to enter the correct login and password on a per-session basis. Once the user has entered the correct values, subsequent access is not inhibited.Enter The defalt Username is: csi The defalt Password is: csi1234

General Operation Overview

Software Operations

```
Tera Term Web 3.1 - 192.168.1.101 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
->
```

```
Tera Term Web 3.1 - 192.168.1.101 VT
File  Edit  Setup  Web  Control  Window  Help
==============
Set Parameters
==============
(1) Link Configuration
(2) Alarm Configuration
(3) Networking Configuration
(4) Log File Configuration
(5) GPS Configuration
(6) Scan Receiver Configuration
(r) Return to previous menu
->
```

```
Tera Term Web 3.1 - 192.168.1.101 VT
File  Edit  Setup  Web  Control  Window  Help
==================
Link Configuration
==================
(1) Adjust Gain
(2) Select Active Filter
(3) Filter Programming
(4) PA Output Control
(5) PA Oscillation Control
(r) Return to previous menu
->
```

```
Tera Term Web 3.1 - 192.168.1.101 VT
File  Edit  Setup  Web  Control  Window  Help
===================
Alarm Configuration
===================
(1) Alarm Masking
(2) Alarm Notification
(3) Watchdog Timer Configuration
(r) Return to previous menu
->
```

```
Tera Term Web 3.1 - 192.168.1.101 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
(r) Return to previous menu
->
```

```
Tera Term Web 3.1 - 192.168.1.101 VT
File  Edit  Setup  Web  Control  Window  Help
======================
Log File Configuration
======================
(1) Display Log Rotate Settings
(2) Change Log Rotation Period
(3) Change Minimum Log Size
(4) Change Number of Logs Rotated
(5) Remove Log Files
(6) Configure Log to File
(r) Return to previous menu
->
```

```
Tera Term Web 3.1 - 192.168.1.101 VT
File  Edit  Setup  Web  Control  Window  Help
=================
GPS Configuration
=================
(1) Set GPS Mode
(2) Set Time Interval
(3) Set Programming Distance
(4) Set Maximum Count
(5) Set Test Location
(6) Read GPS Parameters
(7) Set Debug Message Level
(r) Return to previous menu
->
```

```
Tera Term Web 3.1 - 192.168.1.101 VT
File  Edit  Setup  Web  Control  Window  Help
==========================
Scan Receiver Configuration
==========================
(1) Scan Receiver Operation
(2) Read Scan Receiver Parameters
(3) Channel Sample Count
(4) Key/De-key Threshold
(5) PA Recovery Time
(6) De-key Sample Count
(7) Short/Fast Key Sample Count
(8) Long/Slow Key Sample Count
(9) Fast/Slow Key Delta Value
(r) Return to previous menu
->
```

1. The **"Link Configuration"** menu is a collection of menu options that control the RF operating characteristics of the system.

2. The **"Alarm Configuration"** menu provides options that control the alarm operating characteristics of the repeater.

3. The **"Networking Configuration"** menu contains four configuration menus. The "Local Network Configuration" provides access to the network connection that is made to the system via the Ethernet port located on the front panel of the unit. The "Remote Network Configuration" is used to configure the wireless modem(s). The "Network Protocol Configuration" allows access protocols to be toggled on or off. The "SNMP Configuration" option is not used or supported in this version of product.

4. **"Log File Configuration"** menu. The system is capable of storing its log files persistently on a periodic basis so that post mortem analysis can take place. The log files will be placed in the "/log" directory on the compact flash. The service personnel can then use off the shelf applications to extract the information to their laptop for review. This menu allows the user to define aspect of the log file such as rotation period, size and number of logs retained.

5. The **"GPS Configuration"** menu controls the operational state of the GPS receiver. The system is designed to run with a GPS emulator connected to COM3 (internal) for use s a test/debug mode. Additional menu items can be used to assist in the diagnosis of GPS related issues.

6. **"Scan Receiver Confiuration"** menu. The scan receiver hardware is used to monitor the power levels of a set of frequencies for a given filter set. If the scanned power level is above the maximum threshold value, the task will de-key the unit until such a condition no longer exists.

General Operation Overview

Software Operations
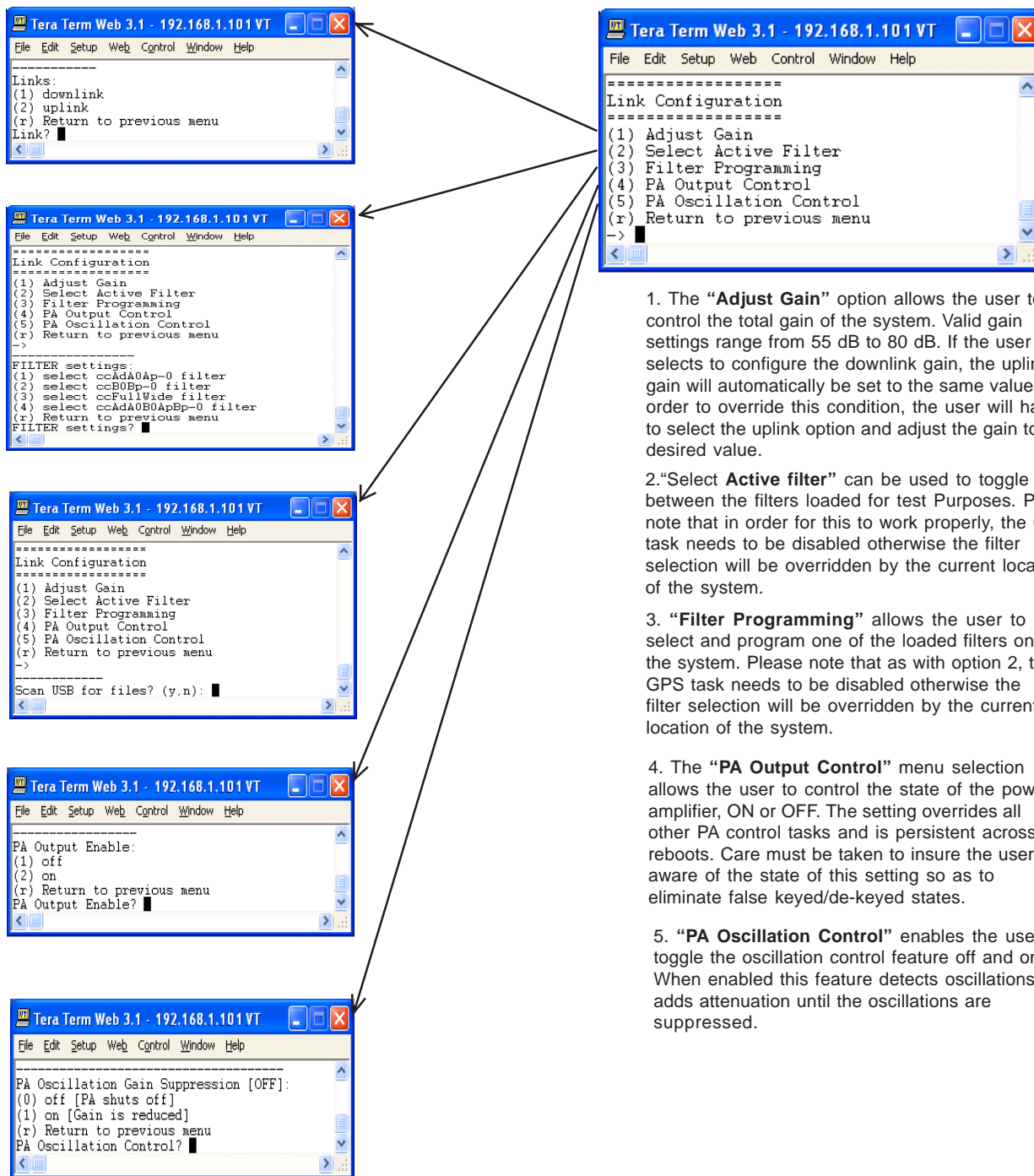
1. The **"Adjust Gain"** option allows the user to control the total gain of the system. Valid gain settings range from 55 dB to 80 dB. If the user selects to configure the downlink gain, the uplink gain will automatically be set to the same value. In order to override this condition, the user will have to select the uplink option and adjust the gain to the desired value.

2. "Select **Active filter"** can be used to toggle between the filters loaded for test Purposes. Please note that in order for this to work properly, the GPS task needs to be disabled otherwise the filter selection will be overridden by the current location of the system.

3. **"Filter Programming"** allows the user to select and program one of the loaded filters on the system. Please note that as with option 2, the GPS task needs to be disabled otherwise the filter selection will be overridden by the current location of the system.

4. The **"PA Output Control"** menu selection allows the user to control the state of the power amplifier, ON or OFF. The setting overrides all other PA control tasks and is persistent across reboots. Care must be taken to insure the user is aware of the state of this setting so as to eliminate false keyed/de-keyed states.

5. **"PA Oscillation Control"** enables the user to toggle the oscillation control feature off and on. When enabled this feature detects oscillations and adds attenuation until the oscillations are suppressed.

General Operation Overview

```
Tera Term Web 3.1 - 192.168.1.101 VT
File  Edit  Setup  Web  Control  Window  Help
===================
Alarm Configuration
===================
(1) Alarm Masking
(2) Alarm Notification
(3) Watchdog Timer Configuration
(r) Return to previous menu
->
```

```
Tera Term Web 3.1 - 192.168.1.101 VT
File  Edit  Setup  Web  Control  Window  Help
=============
Alarm Masking
=============
(1) Show Alarm Configuration
(2) Set Duplicate Alarm Interval
(3) All Alarms
(4) Link Alarms
(5) HW/SW Alarm Configuration
(6) Miscellaneous Alarms
(r) Return to previous menu
->
```

1. **"Alarm Masking"** provides the user an ability to mask or unmask individual alarms based on the known operating characteristics of the environment that the unit is place in. Certain alarms will occur that do not directly affect the proper operation of the system and can therefore be masked. All alarms are still registered with the system regardless of the alarm state, user notification only takes placed on unmasked alarms.

```
Tera Term Web 3.1 - 192.168.1.101 VT
File  Edit  Setup  Web  Control  Window  Help
==================
Alarm Notification
==================
(1) Alarm Origin Tag
(2) E-mail Alarm Configuration
(3) SMS Message Configuration
(r) Return to previous menu
->
```

2. The **"Alarm Notification"** option provides the user the ability to configure the system to externally notify service personnel of alarm events.

3. The **"Watchdog Timer Configuration"** selection configures a hardware based watchdog timer. Once enable, the software will periodically write to the watchdog timer thus preventing an unscheduled reboot. Certain alarms can be configured to inhibit this periodic write which in turn will reboot the system when they occur.

```
Tera Term Web 3.1 - 192.168.1.101 VT
File  Edit  Setup  Web  Control  Window  Help
===========================
Watchdog Timer Configuration
===========================
(1) ON
(2) OFF
(3) Reset Reboot Counter
(r) Return to previous menu
->
```

General Operation Overview

Tera Term Web 3.1 - 192.168.1.101 VT

```
==========================
Local Network Configuration
==========================
(1) enable
(2) disable
(3) set default static IP (192.168.1.100)
(4) set labview calibration IP (192.168.4.69)
(5) set labview calibration IP (192.168.4.68)
(r) Return to previous menu
->
```


Tera Term Web 3.1 - 192.168.1.101 VT

```
==========================
Remote Network Configuration
==========================
(1) enable modem
(2) Disable Modem
(3) Set Modem HeartBeat IpAddress
(4) Maximum PPP Start Count
(5) PPP Restart Interval
(r) Return to previous menu
->
```


Tera Term Web 3.1 - 192.168.1.101 VT

```
==========================
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
(r) Return to previous menu
->
```


Tera Term Web 3.1 - 192.168.1.101 VT

```
==========================
Networking Configuration
==========================
(1) Local Network Configuration
(2) Remote Network Configuration
(3) Network Protocol Configuration
(4) SNMP Configuration
(r) Return to previous menu
->
```

1. The **"Local Networking Configuration"** menu allows the user to configure the Ethernet port to operate in one of three modes once enabled. If the unit is configured to have a static IP address, then the user must know what the characteristics of the network are that the unit will be connected to. In DHCP client mode, the unit will broadcast a request for an IP address from a properly configured DHCP server on the network. In DHCP server mode the unit will assign itself an IP address of 192.168.1.100 and it will also listen for DHCP IP address requests. If the user connects a device (laptop) directly to the Ethernet port (cabling requirements may differ) the unit will issue an IP address of 192.168.1.90. The unit is currently capable of issuing one client address. This is done to limit cataclysmic events should the unit be connected to a network that already has a DHCP server.

2. The menu for **"Remote Networking Configuration"** provides the user with a method to configure the modem connected to the internal USB port of the SBC. This version of software is preconfigured to enable the default modem type installed in the unit and no user selection is necessary.

3. The **"Network Protocol Configuration"** menu is used to toggle off and on each of the available protocols.

4. The **"SNMP Configuration"** menu is not supported for this revision of the product.

Tera Term Web 3.1 - 192.168.1.101 VT

```
==================
SNMP Configuration
==================
(1) Show SNMP Config
(2) enable SNMP
(3) disable SNMP
(r) Return to previous menu
->
```

```
Tera Term Web 3.1 - 192.168.1.101 VT
File  Edit  Setup  Web  Control  Window  Help
->
Log Rotate Frequency - 5 minutes
Log Rotate File Size - 512 Kbytes
Log Rotate File Count - 25 files
=====================
```

```
Tera Term Web 3.1 - 192.168.1.101 VT
File  Edit  Setup  Web  Control  Window  Help
=====================
Log File Configuration
=====================
(1) Display Log Rotate Settings
(2) Change Log Rotation Period
(3) Change Minimum Log Size
(4) Change Number of Logs Rotated
(5) Remove Log Files
(6) Configure Log to File
(r) Return to previous menu
->
Enter the time [1-60 minutes] between log rotates (5) ->
```

```
Tera Term Web 3.1 - 192.168.1.101 VT
File  Edit  Setup  Web  Control  Window  Help
=====================
Log File Configuration
=====================
(1) Display Log Rotate Settings
(2) Change Log Rotation Period
(3) Change Minimum Log Size
(4) Change Number of Logs Rotated
(5) Remove Log Files
(6) Configure Log to File
(r) Return to previous menu
->
Enter the maximum size [5-512 Kbytes] of a log file (512) ->
```

```
Tera Term Web 3.1 - 192.168.1.101 VT
File  Edit  Setup  Web  Control  Window  Help
=====================
Log File Configuration
=====================
(1) Display Log Rotate Settings
(2) Change Log Rotation Period
(3) Change Minimum Log Size
(4) Change Number of Logs Rotated
(5) Remove Log Files
(6) Configure Log to File
(r) Return to previous menu
->
Enter the number [1-25] of backup logs to keep (25) ->
```

```
Tera Term Web 3.1 - 192.168.1.101 VT
File  Edit  Setup  Web  Control  Window  Help
=====================
Log File Configuration
=====================
(1) Display Log Rotate Settings
(2) Change Log Rotation Period
(3) Change Minimum Log Size
(4) Change Number of Logs Rotated
(5) Remove Log Files
(6) Configure Log to File
(r) Return to previous menu
->
Removing Log files...Complete
```

```
Tera Term Web 3.1 - 192.168.7.22 VT
File  Edit  Setup  Web  Control  Window  Help
=====================
Log File Configuration
=====================
(1) Display Log Rotate Settings
(2) Change Log Rotation Period
(3) Change Minimum Log Size
(4) Change Number of Logs Rotated
(5) Remove Log Files
(6) Configure Log to File
(r) Return to previous menu
->
Periodic Logging (0 = off, 1 = on) [state OFF] ->
```

```
Tera Term Web 3.1 - 192.168.1.101 VT
File  Edit  Setup  Web  Control  Window  Help
=====================
Log File Configuration
=====================
(1) Display Log Rotate Settings
(2) Change Log Rotation Period
(3) Change Minimum Log Size
(4) Change Number of Logs Rotated
(5) Remove Log Files
(6) Configure Log to File
(r) Return to previous menu
->
```

The system is capable of storing its log files persistently on a periodic basis so that post mortem analysis can take place. The log files will be placed in the "/log" directory on the compact flash. The service personnel can then use off the shelf applications to extract the information to their laptop for review. This set of menus allows the user to define aspects of the log files such as rotation period, size and number of logs retained. With each selection the minimum and maximum allowable value as well as the current value is displayed.

Software Operations

```
============
Set GPS Mode
============
(1) Enable GPS Receiver
(2) Enable GPS Emulator
(3) Disable GPS Receiver
(4) Enable/Disable Amplifier
(5) Set No Box Shutdown Mode
(6) Set No Satellites Shutdown Mode
(r) Return to previous menu
->
```

```
==================
Set Time Interval
==================
(1) Set Test Delay
(2) Set GPS Receive Update Interval
(3) Set Program Filter Interval
(4) Set No Data Timeout Interval
(5) Set Polling Interval
(6) Set Emulator Update Interval
(r) Return to previous menu
->
```

```
=======================
Set Programming Distance
=======================
(1) Set Distance To Program Filter
(2) Set Maximum Distance To Program Filter
(r) Return to previous menu
->
```

```
=================
Set Maximum Count
=================
(1) Set Maximum No Box Count
(2) Set Maximum No Satellite Count
(r) Return to previous menu
->
```

```
=================
Set Test Location
=================
(1) Set Default Test Location
(2) Set Box For Test Location
(r) Return to previous menu
->
```

```
==================
GPS Configuration
==================
(1) Set GPS Mode
(2) Set Time Interval
(3) Set Programming Distance
(4) Set Maximum Count
(5) Set Test Location
(6) Read GPS Parameters
(7) Set Debug Message Level
(r) Return to previous menu
->
```

The GPS sub-system is an integral part of the control of the DSP based system. During normal operating mode, the GPS receiver controls the selection of filters and the key state of the unit. The unit must first receive a valid GPS string from the satellites before the unit will perform properly. The following menu allows the user to examine and configure the GPS operating parameters of the unit.

The GPS mode menu controls the operational state of the GPS receiver. The system is designed to run with a GPS emulator connected to COM3 (internal) for use s a test/ debug mode. Additional menu items can be used to assist in the diagnosis of GPS related issues.

```
GPS Parameters
=====================================================
Run State                    Suspended
Debug Msg Level              0
PA Control Mode              Enabled
LookUp Table Size            4
Test Delay                   0
GpsRx Update Interval        1 secs:0 usecs
Program Filter Interval      18 secs
NoData Timeout Interval      25 secs
Polling Interval             50 secs
Emulator Update Interval     15 secs
Max NoBox Count              360
Max No Satellites Count      14400
NoBox Shutdown Mode          Enabled
No Satellites Shutdown Mo    Enabled
=====================================================
```

```
->
(0) Display No Msg
(1) Display Info Msg
(2) Display Debug Msg
(3) Display More Debug Msg
Enter GPS Debug Msg Level (0)->
```

Section 4

Software Operations

Tera Term Web 3.1 - 192.168.1.101 VT
File Edit Setup Web Control Window Help
```
==========================
Scan Receiver Operation
==========================
(1) Enable Scan Receiver
(2) Disable Scan Receiver
(r) Return to previous menu
->
```

Tera Term Web 3.1 - 192.168.1.101 VT
File Edit Setup Web Control Window Help
```
==========================
Scan Receiver Parameters
==========================
Run State            Enabled
Debug Msg Level      0
Samples/Channel      6
De-key Threshold     -65.000000
De-key Count         8
Short/Fast Count     4
Long/Slow Count      12
Key Delta            10.000000
Filter Set           2
==========================
```

Tera Term Web 3.1 - 192.168.1.101 VT
File Edit Setup Web Control Window Help
```
==========================
Scan Receiver Configuration
==========================
(1) Scan Receiver Operation
(2) Read Scan Receiver Parameters
(3) Channel Sample Count
(4) Key/De-key Threshold
(5) PA Recovery Time
(6) De-key Sample Count
(7) Short/Fast Key Sample Count
(8) Long/Slow Key Sample Count
(9) Fast/Slow Key Delta Value
(r) Return to previous menu
->
Samples per channel count [6]->
```

Tera Term Web 3.1 - 192.168.1.101 VT
File Edit Setup Web Control Window Help
```
(4) Key/De-key Threshold
(5) PA Recovery Time
(6) De-key Sample Count
(7) Short/Fast Key Sample Count
(8) Long/Slow Key Sample Count
(9) Fast/Slow Key Delta Value
(r) Return to previous menu
->
_____
Scan Receiver Input Power Limit:
Setting -65.00 dBm (-75.0 to -10.0)
Scan Receiver Input Power Limit?
```

Tera Term Web 3.1 - 192.168.1.101 VT
File Edit Setup Web Control Window Help
```
(5) PA Recovery Time
(6) De-key Sample Count
(7) Short/Fast Key Sample Count
(8) Long/Slow Key Sample Count
(9) Fast/Slow Key Delta Value
(r) Return to previous menu
->
_____
User System Recovery Timeout:
Setting 30 seconds (1-300)
User System Recovery Timeout?
```

Tera Term Web 3.1 - 192.168.1.101 VT
File Edit Setup Web Control Window Help
```
(6) De-key Sample Count
(7) Short/Fast Key Sample Count
(8) Long/Slow Key Sample Count
(9) Fast/Slow Key Delta Value
(r) Return to previous menu
->
De-key sample count [8]->
```

Tera Term Web 3.1 - 192.168.1.101 VT
File Edit Setup Web Control Window Help
```
(7) Short/Fast Key Sample Count
(8) Long/Slow Key Sample Count
(9) Fast/Slow Key Delta Value
(r) Return to previous menu
->
Fast key sample count [4]->
```

Tera Term Web 3.1 - 192.168.1.101 VT
File Edit Setup Web Control Window Help
```
(8) Long/Slow Key Sample Count
(9) Fast/Slow Key Delta Value
(r) Return to previous menu
->
Slow key sample count [12]->
```

Tera Term Web 3.1 - 192.168.1.101 VT
File Edit Setup Web Control Window Help
```
(9) Fast/Slow Key Delta Value
(r) Return to previous menu
->
Slow/Fast key delta value [10.00]->
```

Tera Term Web 3.1 - 192.168.1.101 VT
File Edit Setup Web Control Window Help
```
==========================
Scan Receiver Configuration
==========================
(1)  Scan Receiver Operation
(2)  Read Scan Receiver Parameters
(3)  Channel Sample Count
(4)  Key/De-key Threshold
(5)  PA Recovery Time
(6)  De-key Sample Count
(7)  Short/Fast Key Sample Count
(8)  Long/Slow Key Sample Count
(9)  Fast/Slow Key Delta Value
(r)  Return to previous menu
->
```

The scan receiver hardware is used to monitor the power levels of a set of frequencies for a given filter set. If the scanned power level is above the maximum threshold value, the task will de-key the unit until such a condition no longer exists. This set of menus allows the user to define behavior of the scan receiver. With each selection the minimum and maximum allowable value as well as the current value is displayed.

Software Operations

```
Tera Term Web 3.1 - 192.168.1.101 VT
File  Edit  Setup  Web  Control  Window  Help
=======================================================
Timestamp: 2009:10:15 — 12:22:20 UTC
=======================================================
Uptime   : 6 days 18 hours 42 minutes
=======================================================
Power (dBm)          DNLINK              UPLINK
=======================================================
IN-BAND INPUT        < -78.50            < -74.50
COMPOSITE INPUT        -61.64            < -70.00
MEASURED OUTPUT      <  0.00             <  0.00

CALIBRATED OUTPUT      27.00               27.00
MAXIMUM OUTPUT         30.00               30.00
VSWR                   -----               -----
=======================================================
AGC Control (dB)
=======================================================
MODE                 ON
---/---              0.00                0.00
=======================================================
Status
=======================================================
VOLTAGE              OK                  OK
TEMPERATURE          OK                  OK
SOFTWARE             OK                  OK
HARDWARE             OK                  OK
OSCILLATION          OK                  OK
OVERRANGE            OK                  OK
CALIBRATION          OK                  OK
=======================================================
DC Current
=======================================================
AMPERAGE             2.47
=======================================================
Temperature (Celsius)
=======================================================
FPGA                 47.75
=======================================================
Power Amplifier
=======================================================
STATUS               ON
AMPERAGE             0.82                1.40
TEMPERATURE          ----                54.43
=======================================================
Fan Configuration
=======================================================
STATE                OFF                 OFF
STATUS               OK                  OK
=======================================================
System Configuration
=======================================================
GAIN (dB)            70.00               70.00
FILTER               ccB0Bp-0            ccB0Bp-0
=======================================================
```

```
Tera Term Web 3.1 - 192.168.1.101 VT
File  Edit  Setup  Web  Control  Window  Help
=============
System Events
=============
(1) List
(2) Show Counts
(3) Clear
(r) Return to previous menu
->
```

```
Tera Term Web 3.1 - 192.168.1.101 VT
File  Edit  Setup  Web  Control  Window  Help
=======================================================
System Info: 2009:11:15 — 14:39:17 UTC
=======================================================
Location          Unknown
Model             CSI-DR-ACELA-PROD8
Board Type        CELL — Rev. B
Carrier           Verizon EVDO
SW Version        02.05.00 MJA-5
Serial Number     CSI-ACELA-CELL-001
Item Number       CSI12-555-400
Date Built        11/01/2009
Watchdog Timer    Enabled
=======================================================
Local Area Network:
=======================================================
Hostname          csi-cell-acela
Boot Protocol     static
IP Address        192.168.1.101
MAC Address       00:d0:69:13:49:11
=======================================================
Wide Area Network:
=======================================================
PPP Enabled       YES
Modem Type        CDMA
PPP0 Address      166.143.7.195
PPP1 Address      0.0.0.0
=======================================================
SNMP Configuration:
=======================================================
Enabled           YES
Traps/Informs     NO
Heartbeat         NO
=======================================================
MODEM Status Information
=======================================================

MODEM #1

RSSI (dBm)
Registration Sts
Phone Number
Current Band
System ID          0
Network ID         0
Temperature (C)    0
=======================================================
GPS Location Data
=======================================================
Run State         Enabled
Latitude          42.997093
Longitude         -71.467964
Filter ID         2
Filter Name       ccAdA0B0ApBp-0
Location          Manchester
BTA               500
Satellite Count   0
NoBox Count       0
Searching Count   0
=======================================================
Scan Receiver     MHz                 avg dBm
=======================================================
Run State         Enabled
Dekey Limit       -65.00
Filter ID         2
Channels          8

Channel-1         881.52              -86.34
Channel-2         882.75              -87.26
Channel-3         883.98              -87.98
Channel-4         885.21              -87.40
Channel-5         886.44              -88.32
Channel-6         887.67              -88.90
Channel-7         888.90              -89.14
Channel-8         893.31              -89.96
=======================================================
```

```
Tera Term Web 3.1 - 192.168.1.101 VT
File  Edit  Setup  Web  Control  Window  Help
(4) Link Status Loop
(r) Return to previous menu
->
Enter loop delay ->
```

```
Tera Term Web 3.1 - 192.168.1.101 VT
File  Edit  Setup  Web  Control  Window  Help
==============
Get Parameters
==============
(1) Link Status
(2) System Events
(3) System Information
(4) Link Status Loop
(r) Return to previous menu
->
```

The **"Get Parameters"** menu is available to all users in order to view system status information and diagnose alarm information.
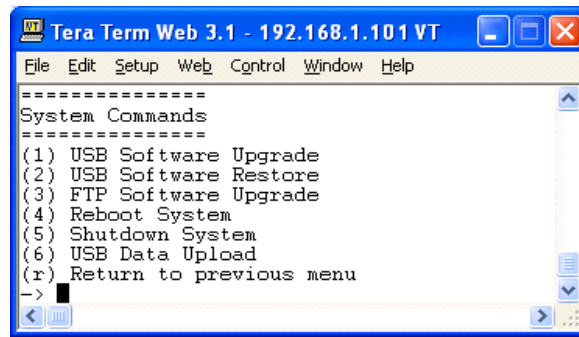
1. The **"Link Status"** option displays the current state of the system parameters. Information on this page is used to diagnose the health of the system.

2. The **"System Events"** option displays the current list of system alarms. Alarm statistics are maintained in the "Show Counts" option.

3. The **"System Information"** option displays the current state of the non-RF parameters.

4. The **"Link Status Loop"** option displays the current state of the system on a periodic basis in the form of a string that can be parsed.

    Enter loop delay
    Display Mode (0 = normal, 1 = BTA changes)

The **"System Commands"** menu is available to all users, however selections 1, 2, 3, and 6 are not supported in this version of the product. It should be noted when selecting option 4 the system will immediately reboot and the current TMI interface will be disconnected. When option 5 is selected the system will shut down and remain powered off until the power is toggled back on.

The repeater's operating software has two modes, an Operational mode and a Maintenance mode. These are described below.

Operational Mode:

Upon power up, the System will begin operation in the Operational Mode. Using a "Band Switching Algorithm" the repeater will not key until a GPS position fix is obtained and the unit is within an Area Definition.

Once GPS position fix is obtain the repeater will begin operation based on the Area Definitions "Channel Power Measurement and Keying Decision" and "Low Isolation Detection and Protection" algorithms. The operational software will continuously monitor the system's environment and make the necessary adjustments to keep the product operating with specifications and within the normal operating range of the Product and FCC Type Certification.

System Status

The Operating Software provides real time status data that reports the state of the repeater. This status contains:

Timestamp	Modem Band Type	Satellite Count
System Up Time	Active Filer	NoBox Count
Software Version	In-band input	Searching Count
System Serial Number	Measured Output	Scan RX Run State
Model Number	Composite Input	DeKey Limit
Item Number	AGC Mode	Scan RX Filter ID
Location	AGC Attenuation	# of Channels
Modem Signal Strength	GPS RunState	1 -10 Channel Freq's & SSI
Modem Registration Status	Latitude	
Modem Phone Number	Longitude	**RF Alarms:**	**System Alarms:**
Modem Current Band	Filter ID	Over Range	Synthesizer Lock
Modem System ID	Filter Name	Oscillation	Voltage
Modem Network ID	Location	VSWR	Temperature
Modem Temperature	BTA	Out of Band Overdrive	Software
		Low Signal	Hardware
		No Signal	

Currently System events are stored to a Log File. In future releases, with the exception of the System Serial Number and System Identifier, The Real Time Status of the Product will be saved to nonvolatile memory for retrieval. The nonvolatile memory will be able to store 48 hours of Status data, with up to 6 complete status records per minute. The interval that the status records are saved will be user defined.

The Operating Software will also record to nonvolatile memory and make available to a user in the Maintenance Mode:

- A count and time stamp each time the processor is booted.
- A count and time stamp of each time the operating software is placed into the Maintenance Mode, and the User ID of the operator that performed the action.
- A count and time stamp each time the Watchdog Timer is activated, and the associated debugging information available at the time of activation of the Watchdog Timer.
- The count and time stamp of any activation of the "Low Isolation Detection and Protection Algorithm" as defined in attachment C of this document.

Alarms

The Operating Software has the ability to monitor a System for conditions that are out of normal operation, triggering an alarm event. The Operating software in conjunction with the Communications Subsystem is capable of sending alarm messages via E-mail using standard SMTP and POP3 protocols to a User Provisioned e-mail account.

Each Alarm defined has these User Provisioned Capabilities.:

- **Disable the System**: The Operating software can disable the System (prohibit Keying) until the alarm condition is cleared.
- **Alarm Filter Conditions**: A Filter Condition (such as X number of occurrences per hour) to the alarm to prevent false or un-useful notifications if provisioned.
- **Send an Alarm Message:** The Operating Software can send a notification via message E-mail through the Communications Subsystem if provisioned.
- **Alarm Clear Message:** The Operating Software can send an alarm clear message when an alarm condition clears if provisioned.

Software Behavior Under Normal Conditions

Software Operations

Maintenance Mode:

The repeater has, in addition to it's normal "Operational Mode" a "Maintenance Mode". After system boot up this mode can be accessed in the TMI only by typing the user name and password of ***service.***
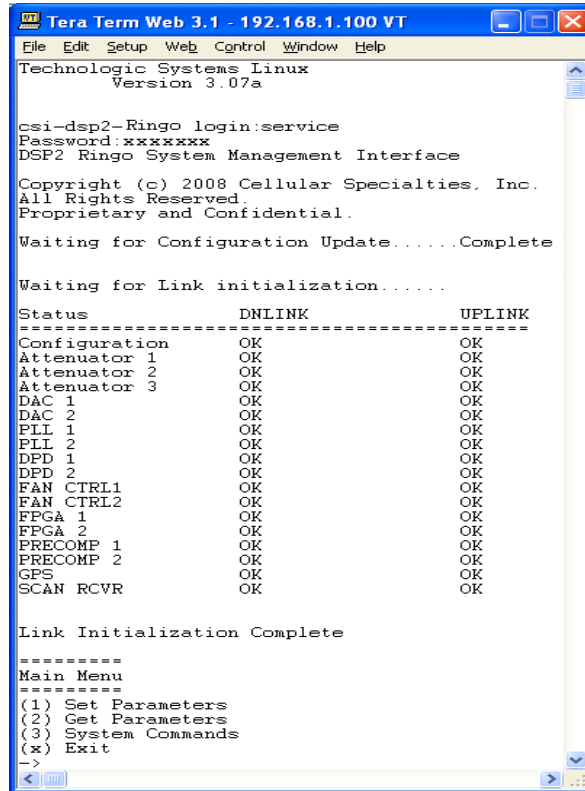
This mode of operation provides all the same menus and features as shown in the software overview on previous pages except that upon entering the Maintenance Mode, the product will de-key and await instructions from a connected user. During the Maintenance Mode of operation the Operating Software supports:

- Manual operation of the Key/De-Key function.

- Manual operation of the Area Definition Switching function.

- Manual Setting of the gain setting in both the Uplink and Downlink Directions

- Retrieval of all current User Provisioned Settings from the Product

- Retrieval of the Current Version of software in the Product

- Setting of all User Provisioned Settings

- Retrieval of logged Status data

- Retrieval of boot counts, Maintenance Mode entry counts, Watch Dog timer events with debugging data, and Low Isolation Detection and Protection events.

- The Ability to Disable and Enable the System.

- A Method to automatically place the System back into operation upon the discontinuance of the Maintenance session.

- A Method to automatically place the stem back into operation after a User Provisioned time limit of inactivity in the Maintenance Mode.

- Ability to load Operating Software into the repeater's processor.

- Ability to perform a "soft" reset of the processor.

Software Behavior Under Normal Conditions

Terms used in this manual

AGC= Automatic Gain Control
CBC= Cross Band Coupler
CSI= Cellular Specialties, Inc.
DAS= Distributed Antenna System
DC = Direct Current
DHCP= Dynamic Host Configuration Protocol
DL = Down Link
FCC = Federal Communications Commission
FPGA= Field Programmable Gate Array
GPS = Global Positioning System
GUI = Graphical User Interface
IP = Internet Protocol
IT = Information Technologies
LAN = Local Area Network
LED= Light Emitting Diode
LNA = Low Noise Amplifier
PCS = Personal Communications Service
RF= Radio Frequency
SBC= Single board Computer
SNMP= Simple Network Management Protocol
TMI= Text Menu Interface
UL = Up Link
USB = Universal Serial Bus
VSWR = Voltage Standing Wave Ratio

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