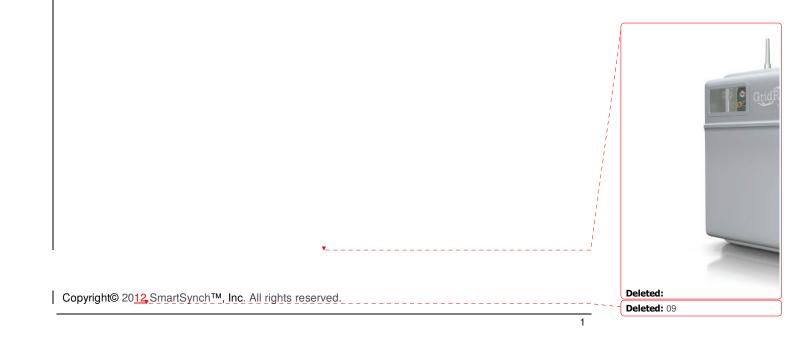


SmartSynch GridRouter <u>CWZ</u> User Guide

Version P01

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The information in this guide should not be considered as all-inclusive or covering all cases for events that may occur. If further information is required, consult your technical support representative.

See the License Agreement contained in the product for complete license information.

Revision History

Guide Version	Firmware Version	Description of Changes
P03	660-200003-P01	Initial Release.
P04	660-200003-P01	• Added part number information.
	660-200004-P01	• Updated SGR support information.
		Added Unit Information section.
P05	660-200003-P01	Added FRU specific LED information
	660-200004-P01	

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1 About This Guide

This document is a manual designed to help guide you through the testing, installation and activation of your GridRouter.

1.1 Contacting SmartSynch

1.1.1 Technical Support

SmartSynch's technical support staff is ready to answer your technical questions.

Contact your technical support representative for information about the latest SmartSynch products, upgrade options, and more. Contact your technical support representative directly, use our Online Customer Support Center at <u>www.smartsynch.com</u>, or email us at <u>sqrsupport@smartsynch.com</u>.

Note: You must be a registered user to access SmartSynch, Inc. online support services.

Help us help you

When contacting technical support via telephone, email, or fax, please provide the following information for the fastest possible service:

- Your name, company name, and contact number
- GridRouter serial number (refer to Section 3.1)
- Firmware version (refer to Section 3.1)
- Cellular IP address (refer to Section 3.1)
- Sales order number (refer to Section 3.1)
- Full and Tail System Log files (refer to Section 6.2.3.2)
- Complete description of the issue, including steps to reproduce it
- Any messages displayed when the issue was encountered
- Any actions taken to resolve or workaround the problem

1.1.2 Documentation Feedback

SmartSynch, Inc. strives to produce quality documentation products and welcomes your feedback. If you have comments or recommendations about our online help or guides, you can email us. Please send email messages to sgrsupport@smartsynch.com.



2 Getting Started

Please review the reference documentation before you begin the installation and use of the supporting software.

2.1 Operations

The GridRouter is a system that provides flexibility by implementing a card system that uses Field Replaceable Units (FRUs) to implement a variety of network solutions that can be replaced as technology changes. Wide Area Network (WAN) cards allow for a link to the Internet and ultimately to the back office. Local Area Network (LAN) cards allow for aggregating or meshing of multiple meters on a WAN connection. One of the popular use-cases establishes a connection between a conventional RS232 serial interface and a TCP socket over a wireless protocol – CDMA or GPRS. It is intended for use by commercial and industrial utility customers.

The GridRouter offers secure over-the-air transfer of data between the RS232/RS485 interfaces on the GridRouter and any front-end system capable of TCP/IP communication.

2.2 Precaution

WARNING! Use authorized utility procedures for installing, maintaining, and removing a GridRouter. Equipment damage, personal injury, or death can result if devices are not used properly.

2.3 Prerequisites

To perform the installation of your GridRouter, you must have access to the following supporting software and should have reviewed relevant documentation.

2.3.1 DNS Server Setup

The GridRouter supports dynamic DNS updates for modems that have dynamic IP addresses. A DNS server must be set up and installed to use this feature. The GridRouter also supports and encourages the use of transaction signatures (TSIG) as a mechanism to secure DNS messages to provide protected server-to-server communication. TSIG uses shared secrets and one-way hash functions to authenticate DNS messages and provide data integrity.

Berkeley Internet Name Domain (BIND) is the most commonly used DNS server on the Internet. The newest version of BIND (BIND 9) supports the TSIG protocol. Microsoft DNS is the DNS server provided with Windows Server and it, too, supports the TSIG protocol.

2.3.2 SNMP Server Setup

The GridRouter is a Simple Network Management Protocol (SNMP) agent capable of responding to requests from SNMP management software. The GridRouter uses the SNMP TRAP operation to send information to the network manager regarding events such as power outage and overheating alarms. To make use of the SNMP functionality on the GridRouter, an SNMP management application must be installed on a server and accessible from the GridRouter.

3 Product Overview

3.1 Unit Information

3.1.1 Serial Number

The unit serial number can be found using several different methods. It can be found on the Web Interface in the top right hand corner as **"Host**". The number will be in the form of **"1234f56789**" with an **"sgr**" prefix, where the numbers can be any digit.

If the Web Interface is not accessible, the serial number can also be obtained from a label on the main system board. The label is located to the left of the large black processor heat sink as a 2D barcode with serial number.

The serial number can be found in the ship file included with the unit. The ship file should have been provided either in paper form with the GridRouter package, or as an email attachment.

If command line access to the GridRouter is easily obtained, the serial number can be found by executing "**fw_printenv serial#**". Refer to the Advanced User Guide for more information on command line access.

3.1.2 Firmware Version

The firmware version can be found on the Web Interface in the top right hand corner or on the Info->System page. The version number will be in the form of "20####-P##", where the "#" symbol can be any digit.

The firmware version can also be found in the ship file included with the unit. The ship file should have been provided either in paper form with the GridRouter package, or as an email attachment.

If command line access to the GridRouter is easily obtained, the firmware version can be found by executing "**uci show system.firmware.version**". Refer to the Advanced User Guide for more information on command line access.

3.1.3 Cellular IP Address

The cellular IP address can be found on the Web Interface on the Status->Interfaces page under WAN.

The IP address could also possibly be found in the ship file included with the unit. The ship file should have been provided either in paper form with the GridRouter package, or as an email attachment.

If command line access to the GridRouter is easily obtained, the IP address can be found by executing "uci show -P /var/state network.wan.ipaddr". Refer to the Advanced User Guide for more information on command line access.

3.1.4 Sales Order Number

The sales order number can be found in the ship file included with the unit. The ship file should have been provided either in paper form with the GridRouter package, or as an email attachment.

If command line access to the GridRouter is easily obtained, the sales order number can be found by executing "**fw_printenv dir**". Refer to the Advanced User Guide for more information on command line access.

3.2 LED Array



Figure 3-1: LED Array

3.2.1 Generic LEDs

State (Green/Red/Orange)

- Solid orange for low-level bootup (approx. 60 seconds)
- Blinking orange for high-level bootup (approx. 20 seconds)
- Blinking green when system bootup is complete
- Blinking red when alarm occurs (temperature or reset button press)
- · Alternating green and red indicates that a factory reset is being initiated

DDNS (Green)

- Solid green when DNS registration successful
- · Off when DNS registration unsuccessful or has not been attempted

Ethernet (Eth1/Eth2) (Green)

• Eth1 = Link, Eth2 = Activity

Serial (UART2/UART3) (Green)

• Blink green when activity (RX or TX) occurs. UART2 refers to the RJ45 port labeled 'Port 0' on the silkscreen. UART3 refers to 'Port 1'.

FRU (Green)

 All FRU LEDs are controlled independently by the PCIe mini card itself. A description of the LED functionality should be obtained by contacting the FRU manufacturer. Refer to Section 3.2.2 for further information on officially supported FRUs.

Battery / Backup Power (Green)

- If power switch is in OFF position (to the right), LED is off
- If power switch is in ON position (to the left), LED is solid green when backup power has charged enough to boot the system.



3.2.2 Device Specific FRU LEDs

Sierra Wireless MC5727 / MC8790 cellular modem

- WAN LED will blink green when connected or attempting to connect to a tower.
- WAN LED will be solid green when powered on and disconnected from a tower.

Lite-On WN6601A Wi-Fi

• LAN LED will be solid green when the interface has enabled.

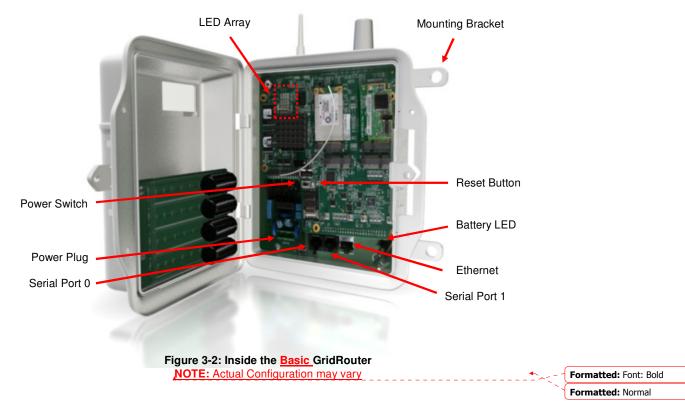
SmartSynch 802.15.4 Zigbee Endpoint

- LAN LED will blink green when serial communication occurs.
- PAN LED will blink green when searching for a network.
- PAN LED will be solid green when a network has been joined.

Bplus MR-04 SD Card Reader

• No LED activity is enabled.

3.3 Ports & Switches



3.3.1 Power

The GridRouter power board is available in either an AC or DC configuration. For the AC configuration the power plug should be connected to a 120VAC supply. The DC configuration should be connected to a 9-30VDC supply capable of at least 20 watts. The power switch is ON when pushed to the left, OFF when pushed to the right. When first powered up the status LED will be solid orange for roughly 60 seconds before it starts to blink. While the status LED is blinking orange during low-level boot up, holding down the reset button for 6 seconds will result in a factory reset. The status LED will alternate between green and red to designate this event. While the status LED is blinking green during normal operation, holding down the reset button will turn the status LED red and result in a clean reboot of the GridRouter if held for more than 6 seconds.

To cleanly power off the GridRouter, the reset button should be held until the status LED stops blinking. Directly after the status LED turns solid orange again, the device should be powered off.

Failure to cleanly power off the GridRouter can result in data loss and possible corruption on the system.

3.3.2 Ethernet

This Ethernet port connects the GridRouter to another Ethernet network device on a wired network. The Eth1 and Eth2 LEDs represent Ethernet Link and Activity respectively.

3.3.3 Serial

There are two serial interfaces on the GridRouter and they have RJ45 connectors referred to as Port 0 and Port 1. A mezzanine board attached to the power supply board defines whether the ports are RS232 or RS485. The RS232 board makes both Port 0 and Port 1 communicate via RS232. The RS485 board turns Port 0 into an RS485 port and Port 1 into an RS232 port. The RS485 board has 3 jumpers which control whether the card is half-duplex or full-duplex. If all of the jumpers are installed then the board is in half-duplex mode. If none of the jumpers are installed then the board is in full-duplex mode. The pin definitions for both RS232 and RS485 ports are shown below.



RJ45 Pin No.	Signal Description	Abbr.	DTE (GridRouter)	DCE
1	DCE Ready	DSR	In	Out
2	Received Line Signal Detector	DCD	In	Out
3	DTE Ready	DTR	Out	In
4	Signal Ground	SG		
5	Received Data	RxD	In	Out
6	Transmitted Data	TxD	Out	In
7	Clear To Send	CTS	In	Out
8	Request To Send	RTS	Out	In

Table 3-1: RS232 Port Pinout

RJ45 Pin No.	Signal Description	Abbr.
1	VISO PWR	
2	N/C	
3	N/C	
4	Shield Ground	GND
5	Transmit + (TXP)	RxD
6	Receive – (RXN)	TxD
7	Transmit – (TXN)	CTS
8	Receive + (RXP)	RTS

Table 3-2: RS485 Port Pinout

3.4 Mounting Options

The GridRouter has several different mounting options for a variety of environments. Contact your SmartSynch sales representative for information on available mounting hardware.

Note: SmartSynch is not responsible for damages incurred by unsecured mounting hardware.

4 Installing

4.1 Preliminary Inspections

The GridRouter is calibrated and tested at the factory and is ready for installation. Before installing and applying power to the product, a quick inspection of the GridRouter is recommended to ensure there is no damage to the GridRouter, which could possibly occur during shipping. Physical damage to the GridRouter indicates potential damage to the inside of the GridRouter. Do not connect power to a GridRouter that is suspected of having internal damage. Contact your SmartSynch technical support representative if you suspect your GridRouter is damaged.

4.2 Installation Process

The SmartSynch GridRouter contains a cellular communications device. When the device is powered up for the first time it will try to configure itself. The configuration process includes provisioning the modem on the network, updating its hostname on the DNS server, and sending traps to an SNMP server.

4.2.1 Typical Installation Scenarios

On average, a technician will need 10 minutes to verify if a device has coverage. The GridRouter first needs to be mounted correctly. Next, make sure that the power switch is in the OFF position (right) and then attach the power connector. Wait until the battery LED illuminates before flipping the power switch to the ON position (left). This could take up to 5 minutes.

The status LED will turn solid orange for approximately 120 seconds while the system is performing lowlevel setup for the first time. Once the high-level setup begins, the status LED will begin blinking orange for approximately 60 seconds until the system is done with setup at which time the status LED will begin blinking green.

The WAN LED for the modem will turn solid green when power is applied to the modem and it will begin blinking green once the modem begins dialing out. If the modem is not provisioned, it will first try and download the preferred roaming list (PRL) from the carrier before connecting to the internet. Once the PRL successfully updates, the SGR will try and connect the modem to the internet and then try and update its DNS entry in the specified DNS server. The DDNS LED will turn solid green once the DDNS successfully completes. At this point, the GridRouter is fully operational.

4.2.1.1 Serial Device

Connect the serial cable between the end device and one of the serial ports on the GridRouter.

4.2.1.2 Ethernet Device

Connect an Ethernet cable between the end device and the GridRouter.

5 Provisioning the GridRouter

The provisioning processes must complete to ensure that the GridRouter can receive remote communication.

5.1 Cellular Modem

GSM modems have SIM cards and can be activated and provisioned through the cellular carrier without any interaction from the GridRouter. CDMA modems must be activated by the carrier and then provisioned by the GridRouter, done by dialing a phone number. This provisioning process for CDMA modems is necessary for downloading and updating the Preferred Roaming List (PRL). The GridRouter queries the modem routinely and updates the PRL when necessary.

5.2 Dynamic DNS (optional)

If the GridRouter modem has a dynamic IP address, it is recommended to setup dynamic DNS so that communication can be initiated remotely. The default hostname for the GridRouter is based upon its 10-digit serial number: sgr{serial#}. An example hostname is sgr3509f00001. The default DNS server hostname is **dyndns.org**.

An example DNS setup with <u>www.dyndns.com</u> uses a hostname of "**sgr3509f00001.dyndns.org**" and a DNS server address of "**update.dyndns.org**".

6 Configuration

6.1 Explanation of the UCI

The UCI (Universal Configuration Interface) is a collection of text files that contains the configuration for the processes on the GridRouter. These settings can be altered through the web-based utility (HTTPS), SSH, and the serial console.

6.2 Web Interface

ATTENTION – Windows XP and Internet Explorer users

The default GridRouter SSL cipher is set to AES with 128-bit encryption. This level of security is not supported by Internet Explorer (IE) when used on Windows XP. It is recommended to use Firefox or Opera when using Windows XP or to use Windows Vista/7. The GridRouter is capable of being configured (pre-deployment or over SSH) to use a lesser form of encryption so that IE can be used on Windows XP.

The web-based utility provides the ability to change the configuration settings on the GridRouter. You can access the utility via a web browser on a computer connected to the GridRouter's Ethernet port with the default IP address, "https://192.168.0.254", or over-the-air using the hostname or modem IP address. The first time you open the web-based utility use the default user name "SGR_admin" and the default password "admin_SGR". (You can set a new password on the System > Password screen.) Click "OK" to continue.

The server sgr2 username and	810f00242.dyndns. password.	org at sgr28	310f00242 requi	res a
	SGR_admin	ny credentia	ıls	
			ОК	Cancel

Figure 6-1: Password Screen

The first time that you open the web-based utility on a given browser you will be forced to accept the security banner by clicking "Enter".



Figure 6-2: Security Banner

It is also worth noting that every screen in the web-based utility contains a common header and footer. The header contains the firmware version, host name, uptime, date, time, and load. The footer contains three links: "Apply Changes & Reboot", "Clear Changes", and "Review Changes".

Pages that alter the GridRouter's configuration all have a "**Save**" button. The save button must be clicked to temporarily write the files into RAM. The changes to the configuration can be reviewed by clicking the "**Review Changes**" button and they can be committed to flash by pressing the "**Apply Changes & Reboot**" button.



Smart Synch	Gittlanter ¹² 20001-001 West prof.000570 Uprimer 3 2 and Data 2000-00-02 Tumer 11-103
	Time: 21:10:50 Lowd: 0.05, 0.01, 0.00
fo Status Log System Network	
Current configuration changes: serpass	
serpass.serpass8.effective_baudrate=115200 serpass.serpass8.trp_port=9005	
	Apply Changes + Clear Changes + Review Changes (2) +
Figure 6-3:	Review Changes

The following sections detail each page in the web-based utility.

6.2.1 Info

6.2.1.1 System

The first screen that appears is the System information screen. The firmware version, Ethernet MAC address, and username are all displayed here.



Figure 6-4: Info > System

6.2.1.2 Devices

The Info > Devices screen will display information about the devices directly connected to the system.

Devices connected to each of the four FRU slots, the USB header, and the Ethernet connector will be displayed. In addition, the settings of the serial ports and whether Serial Passthrough or Serial PPP is running on each port will be displayed.

mart	nch [.]	Goldbard ** 249931-24 Hont: pyr404 (1903) Uprime 12 # Data: 2010-15 Time 12 463 Lands 610, 0.05, 12
Status Log System	n Network	
Devices WAN Statistics		
Discovered Development		
RU 1 No Supported Devic	es Found	
No Supported Device	es Found MCB790	
No Supported Devic		
No Supported Device RU 2 Name	MC8790	
No Supported Device RU 2 Name Description	MC8790 Sierra Wireless MC8790 HSDPA Modern	
No Supported Device RU 2 Name Description Type	MCB790 Sierra Wireless MCB790 HSDPA Modem usb	
No Supported Device RU 2 Name Description Type Driver	MC2790 Sierra Wireless MC2790 HSDPA Modem uzb Sierra	
RU 2 Name Description Type Driver Vendor	MC3790 Serra Wireless MCS790 HSDPA Modem urb sierra 1199	
No Supported Device RU 2 Name Description Type Driver Vendor Product	MC32790 Sirtra Wireless MC32730 HSDPA Modem usb sierra 11999 68%:	
No Supported Device RU 2 Name Description Type Driver Vendor Product Status	MCB790 Sierra Wickess MCB790 HSDPA Modem usb sierra 1199 68% Connected	
No Supported Device RU 2 Name Description Type Driver Vendor Product Status Interface	MCG700 Serra Woless MCG730 HG0PA Modem usb serra 1199 68% Connected ppp0	

6.2.1.3 WAN Statistics

The Info > WAN Statistics screen will display information queried from the cellular modem. Typical information found here includes received signal strength (dbm and bars), modem temperature, and network status.

This page will display slightly different information depending on the type of modem type; whether HSPA or EVDO.

Status Log System Netw	vork	
Devices WAN Statistics		
WAN Statistics		
Current WAN Statistics		
Modem Name	MC5727	8551:
RSS	-80 dbm	Received Signal Strength in dbm.
PSSI Bars		Electronic Serial Number:
RSSI Bars Electronic Serial Number	0x608b267d	Serial number of the modem.
Base Station Information	0x608b267d	Base Station Information:
Object Version	1	information from the connected base station.
Info State	Not Stale	Frame Error Rate:
Base Station ID	5027	Number of bad frames during IS-95 data calls.
System ID	205	Band Class:
Network ID	5	Current Band of the modern. PCS: 1850-MHz to 1990-MHz. Cellular 824-MHz to
Base Latitude	32.358333	694 Heriz
Base Longitude	-90.150000	Roaming Status:
Frame Error Rate	0	Indicates current roaming status.
Band Class	Cellular	PRL:
Roaming Status	Not Roaming	Preferred scaming list vertice.
PRL	65148	Activation Status:
Activation Status	Activated	Current activation status of the modern.
Temperature	38°C	Temperature:
EC/lo	-18	Current hardware temperature read from the modern
		EC/Io:
		Ec/to in 0.5 dBn units. The usable portion of the Rf signal.
		the second se

Figure 6-6: Info > WAN Statistics

6.2.2 Status

6.2.2.1 System

The Status > System screen shows RAM usage, number of tracked connections, and space available on mounted file systems.

Smart	/nch ⁻	Gathows ⁴⁴ 190000 DM Here and 200400001 Uptions 11-an Ows 1905-11-91 Team 12, 05 -12, 14, 6, 31
Info Graphs Status	Log System Network	
System Interfaces DHCP Clients	Netstat Herdware Diagnostics	
Device Status RAM Usage		
Total: 60680 Ki8	29% Used: 17480 Ki8 (29%)	RAM Usage: This is the current DAM usage. The amount fire represents how much applications have available.
Tracked Connectio	ns	
Maximum: 4096	2%. Used: 73 (2%)	Tracked Connections: This is the number of connections in your router's constract table. <u>Vice</u> <u>Construct</u> , Table
Mount Usage		
l rootfs l	13% 11264KiB of 90112KiB 13%	Mount Usage: This is the annuant of space total and used on the filesystems mounted to your matter.
/dev/root /tmp tmpfs	11264Ki8 of 90112Ki8 0% 148Ki8 of 30340Ki8	
/dev tmpfs	ек. 20Кі8 of 512Ків	
		Apply Changes « Clear Changes « Review Changes «

Figure 6-7: Status > System

RAM Usage

This is the current RAM usage. The amount free represents how much the applications have available.

Tracked Connections

This is the number of connections in the GridRouter conntrack table.

Mount Usage

This is the amount of space total and used on the file systems mounted on the GridRouter.

6.2.2.2 Processes

The System > Processes screen displays all programs and processes currently running on the GridRouter. This page also contains the ability to send signals to a running process which can terminate or alter the behavior of the process. Refreshing must be stopped before a signal can be sent to a process. Sending a signal to a running process can result in a loss of communication or system malfunction.

mart	Syn	ch [.]	Goldbauter**20000 Beets spriktio Uptimes Dates 2010 Times 2+ Loode 0.03, 0.0
Status Lo	g System	Network	
n Processes late	rfaces OHCPS	Sents Data Usage Netstat Hardware SiteSawey Diagnostics	
unning Pro			
Auto Refresh	Interval:	20 💌 in seconds	
		WARNING: Sending a signal to the application n malfunction! You should be pretty sure what you an	
		button. See the most us	
Processes St			
	VSZ STAT 1292 S	COMMAND	Signal
2 root	1292 S	init [kthreadd]	
S root	0.54	[ksoftigd/0]	
4 root	0.544	[events/0]	
S root	0 SW	[khelper]	
8 root	0 SW	[async/mgr]	
170 root	0 SW	[sync_supers]	
172 root 174 root	0 SW 0 SW	[bdi=dafault] [kbiccld/0]	
174 root 179 root	0 SW		
175 root 184 root	0.5W	[khubd] [khubd]	
200 root	0 SW		
224 root	0 SW	[kswapd0]	
225 root	0 SW	[aio/0]	
226 root	0 SW	[nfsicd]	
227 root 279 root	0 SW	[crypto/0] [mtdblockd]	
61/ 100t		flues"8ca"weart	
622 root	1292 S	logger -s -p 6 -t sysinit	
623 root	1308 S	45	SIGHUP (1)
025 foot	1308.5	mcLe ^m	Ser
643 mot	740 S	/sbin/hotplug2overridepersistentmax-children 1no-coldplug	SIGHUP (1)
			Ser
830 root	0 SW	[cfg80211]	
874 root	0 SW	[phy0]	00000
996 root	1288 S	/sbin/syslogd -s 9999 -O /syslog -S	SIGHUP (1)
1005 root	1284 S	/sbin/klogd -c 2	SIGHUP (1)
			SIGHUP (1)
1074 root	756 S	< udevd	Sidnor (1)
			SIGHUP (1)
1612 root	992 S	/usr/local/ssi/bin/sysmanager -d false -s true -l 5	Ser
			SIGHUP (1)
2126 root	1312 S	/bin/sh/etc/ppp/pppdLoop	Ser
		/usr/sbin/dnsmasq -K -D -y -b -E-s lan -S/lan/ -l /tmp/dhqp.leases -r	_
2288 nobody	952 5	/tmp/wsolv.conf.autodhcp-hostsfile /tmp/dhcp.hostslog-facility/dev/nulldhcp-	SIGHUP (1)
1100 hobody	002.0	range=lan, 192.168.0.1, 192.168.0.11, 255.255.255.0, 720m -2 ppp0dhcp-	Ser
		range=wifi, 192.168.10.1, 192.168.10.11, 255.255.255.0, 360m	
2302 root	1292 S	/usr/sbin/httpd -p 80 -h /www -r sgr0410f05978	SIGHUP (1)
			SIGHUP (1)
2313 root	1176 S	pure-ftpd (SERVER)	
			SIGHUP (1)
2340 root	2184 S	/usr/sbin/snmpd =Lf /dev/null =p /var/run/snmpd.pid	
			SIGHUP (1)
2380 root	2588 S	/usr/sbin/sshd -p 2222	SIGHUP (1)
			SIGHUP (1)
2399 nobody	2528 S	stunnel	SIGHOP (1)
			SIGHUP (1)
2433 root	1300 S	crond -c /etc/crontabs -l 99	

Figure 6-8: Status > Processes

6.2.2.3 Interfaces

The Status > Interfaces screen displays all GridRouter interfaces and information about each one; including MAC address, IP address, maximum transmission unit (MTU), amount of data transmitted and received during the current session, and a list of DNS servers.

Smart Sync	:h [,]	Goldfaetter ¹⁷ 24493 - 044 Honey 244100279 Official 2013 Bank 2123 - 6-0 Tank 2113 - 6-0 Land 6.0, 053 - 80 Land 6.0, 053 - 80
fo Status Log System	Network	
nem Processes Interfaces DINCP Cile	onto Data Usage Netstat Hardware Site Sarvey Dis	agenestics
Interfaces		
WAN		
MAC Address		WAN
IP Address	10.22.0.151	WAN stands for Wide Area Network and is usually the apstream
Received	388 pkts (49.4 KiB)	connection to the internet.
Transmitted	493 pkts (36.1 KiB)	
MTU	1500	
DNS Servers (WAN)		
DNS Server 1	192.168.1.7	
LAN		
MAC Address	00:08:A2:07:5F:7C	LAN
IP Address	192.168.0.254	LANK Long for Long Arms Networks
Received	0 pkts (0.0 B)	Contrast of Line Streamont.
Transmitted	0 pkts (0.0 B)	
MTU	1500	
DNS Servers (LAN)		
DNS Server 1	127.0.0.1	
LOOPBACK		
MAC Address		LOOPBACK
IP Address	127.0.0.1	A loopback interface is a type of "circuitiess IP address or 'virtual IP'
Received	295 pkts (18.7 KiB)	address, as the IP address is not associated with any one particular
Transmitted	295 pkts (18.7 KiB)	interface (or circuit) on the hart or router. Any traffic that a computer
MTU	16436	program sends on the longback network is addressed to the same computer.
Raw Information		
Show rew statistics		
		Apply Changes « Clear Changes « Review Changes

Figure 6-9: Status > Interfaces

6.2.2.4 DHCP Clients

The Status > DHCP Clients screen displays information about the DHCP clients and their leases. The time left on the lease is displayed along with the name of the device, MAC address, and the IP address assigned to the client.



Figure 6-10: Status > DHCP Clients

6.2.2.5 Data Usage

The Status > Data Usage screen shows data traffic information for each interface configured in Network > vnStat screen. The information here can be viewed over different periods of time with each button.

Smar	Syncl	n.	GridBontor ¹⁴⁷ 200001-000 Heart spr0410005270 Uptimer 2:14 Data 2010-06-07 Timer 15:43:42 Lendt 0:00, 0:80, 0:00
Info Status	Log System N	etwork	
System Processes	Interfaces DHCP Client	Data Urage Netstat Hardwaw Site Survey Diagnostics	
		fic monitor. It keeps a log of hourly, daily and morthly network traffic for the selected interface(s). However, it is	n't a packet sniffer. The
button shows		; proc and sys filesystems depending on availability, virible will update each time it is queried from any of the bu overs shown are UTC. See Network->+nStartor configuration. Usage	ttons below The query
vnStat -	today's stats. All times/P	lours shown are UTC. See Network-Swishartor configuration.	nons below The query

Figure 6-11: Status > Data Usage

Query: Shows today's connection traffic.

Hours: Shows data traffic by hour over the last 24 hours.

Days: Shows data traffic by day over the last week.

Weeks: Shows data traffic by week over the last month.

Months: Shows data traffic by month over the last year.

Note: While this is a very good estimate, the traffic amount displayed can be lower than the actual if the GridRouter is not power-cycled cleanly. The traffic can be off by the amount of traffic since the last clean reboot or power cycle in this case. To avoid this problem, use the clean power off method described in section 3.3.1, of this document.

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6.2.2.6 Netstat

The Status > Netstat screen shows networking information for the GridRouter including physical connections, the main routing table, listening ports, and active connections.

Sma	rt	Synch						Galdhoutur ²² 20000 1-00 Heitz op/141 00255 Uprime 22 Enter 131 1-06- Timer 13 5-00 Jandi 1, 83, 0, 81, 0, 0
Status	Log	System Network						
m Precesse	is interface	DHCP Clients Data Us	nge Netstat Har	leare SteSurvey Diagnost	161			
l etstat								
themet	Wireles	ss Physical Com	ections					
p addr		HM type	Flags	HM address	Mag	Device		
192.168	.10.8	0x1	0.x2	00:14:92:42:1	6: a7 *	wlanD		
outing	Table							
ternel :	IP rout	ing table						
	tion	Gateray	Germani	R Flags	MRS Window	irtt Iface		
10.64.6	4.64	0.0.0.0	255.255	5.255.255 UM	0 0	0 ppp0		
192.168	.0.0	0.0.0.0	255.251	5.255.0 U	0.0	0 eth0		
192.168	.10.0	0.0.0.0	235.255	5.255.0 U	0 0	0 wlanD		
0.0.0.0		10,22.0,151	0.0.0.1) 100	0.0	0 0000		
						o pppo		
Active :		t connections						
Active : Proto R	Interne eov-Q 3	t connections end-Q Local Ad	dress	Foreign Ad		State		
Active : Proto R top	Interne eov-Q 3 0	t connections end-Q Local Ad 0 0.0.0.0:	dress 2121	Foreign Ad 0.0.0.0:*		State		
Netive : Proto R top top	Interne eov-Q 3 0 0	t connections end-Q local Ad 0 0.0.0.0: 0 0.0.0.0:	dress 2121 2222	Foreign Ad 0.0.0.0:* 0.0.0.0:*		State LISTEN LISTEN		
Active : Proto R top top top	Interne eov-Q 3 0 0	t connections end-Q local Ad 0 0.0.0.0; 0 0.0.0.0; 0 0.0.0.0;	dress 2121 2222 80	Foreign Ad 0.0.0.0:* 0.0.0.0:* 0.0.0.0:*		State LISTEN LISTEN LISTEN		
ketive : Proto R top top top	Interne eov-Q 8 0 0 0 0	t connections end-Q local Ad 0 0.0.0.0.0 0 0.0.0.0.0 0 0.0.0.0.0 0 0.0.0.0.	dress 2121 2222 80 53	Poreign Ad 0.0.0.0:* 0.0.0.0:* 0.0.0.0:* 0.0.0.0:*		State LISTEN LISTEN LISTEN LISTEN		
Active : Proto R top top top top	Interne eov-Q 3 0 0 0 0 0	t connections end-Q Local Ad 0 0.0.0.0: 0 0.0.0.0: 0 0.0.0.0: 0 0.0.0.0: 0 0.0.0.0:	dress 2121 2222 80 53 443	Foreign Ad 0.0.0.0:* 0.0.0.0:* 0.0.0.0:* 0.0.0.0:* 0.0.0.0:*		State LISTEN LISTEN LISTEN		
Active : Proto R top top top top top	Interne eov-Q 8 0 0 0 0 0 0	t connections end-Q local Ad 0 0.0.0.0: 0 0.0.0.0: 0 0.0.0.0: 0 0.0.0.0: 0 0.0.0.0: 0 0.0.0.0:	diress 2121 2222 00 53 443 44178	Poreign Ad 0.0.0.01* 0.0.0.01* 0.0.0.01* 0.0.0.01* 0.0.0.01*		State LISTEN LISTEN LISTEN LISTEN		
Active : Froto R top top top top adp	Interne eov-Q 8 0 0 0 0 0 0 0 0	t connections end-Q local Ad 0 0.0.0.0: 0 0.0.0.0: 0 0.0.0.0: 0 0.0.0.0: 0 0.0.0.0: 0 0.0.0.0: 0 0.0.0.0:	diress 2121 2222 00 53 443 44178 161	Foreign Ad 0.0.0.01* 0.0.0.01* 0.0.0.01* 0.0.0.01* 0.0.0.01* 0.0.0.01*		State LISTEN LISTEN LISTEN LISTEN		
Active : Proto R top top top top adp adp	Interne eov-Q 8 0 0 0 0 0 0 0 0 0 0 0	t connections end-Q local Ad 0 0.0.0.0: 0 0.0.0.0: 0 0.0.0.0: 0 0.0.0.0: 0 0.0.0.0: 0 0.0.0.0: 0 0.0.0.0: 0 0.0.0.0:	dress 2121 2222 00 53 443 44178 161 53	Foreign Ad 0.0.0.01* 0.0.0.01* 0.0.0.01* 0.0.0.01* 0.0.0.01* 0.0.0.01* 0.0.0.01* 0.0.0.01*		State LISTEN LISTEN LISTEN LISTEN		
Active :	Interne eov-Q 8 0 0 0 0 0 0 0 0	t connections end-Q local Ad 0 0.0.0.0: 0 0.0.0.0: 0 0.0.0.0: 0 0.0.0.0: 0 0.0.0.0: 0 0.0.0.0: 0 0.0.0.0:	dress 2121 2222 00 53 443 44178 161 53	Foreign Ad 0.0.0.01* 0.0.0.01* 0.0.0.01* 0.0.0.01* 0.0.0.01* 0.0.0.01*		State LISTEN LISTEN LISTEN LISTEN		
Active : Aroto R top top top adp adp adp	Interne eov-Q 8 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	t connections end-Q local Ad 0 0.0.0.01 0 0.0.0.01 0 0.0.0.01 0 0.0.0.01 0 0.0.0.01 0 0.0.0.01 0 0.0.0.01 0 0.0.0.01 0 0.0.0.01 0 0.0.0.01	dress 2121 2222 00 53 443 44178 161 53	Foreign Ad 0.0.0.01* 0.0.0.01* 0.0.0.01* 0.0.0.01* 0.0.0.01* 0.0.0.01* 0.0.0.01* 0.0.0.01*		State LISTEN LISTEN LISTEN LISTEN		
Active : Proto R top top top adp adp adp adp Connect	Interne eov-0 3 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	t connections end-2 Local Ad 0 0.0.0.07 0 0.0.0.07 0 0.0.0.07 0 0.0.0.07 0 0.0.0.07 0 0.0.0.07 0 0.0.0.07 0 0.0.0.07 0 0.0.0.07 0 0.0.0.07 the Router	drees 2121 2222 00 53 443 44178 161 53 67	Poreign Ad 0.0.0.01* 0.0.0.001* 0.0.0.001* 0.0.0.01* 0.0.0.01* 0.0.0.01* 0.0.0.01* 0.0.0.01*		State LISTEN LISTEN LISTEN LISTEN		
Active : Proto R top top top adp adp adp adp Connect	Interne eov-0 3 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	t connections end-Q local Ad 0 0.0.0.01 0 0.0.0.01 0 0.0.0.01 0 0.0.0.01 0 0.0.0.01 0 0.0.0.01 0 0.0.0.01 0 0.0.0.01 0 0.0.0.01 0 0.0.0.01	drees 2121 2222 00 53 443 44178 161 53 67	Poreign Ad 0.0.0.01* 0.0.0.001* 0.0.0.001* 0.0.0.01* 0.0.0.01* 0.0.0.01* 0.0.0.01* 0.0.0.01*		State LISTEN LISTEN LISTEN LISTEN		
Active : Proto R top top top adp adp adp adp Adp Adp Adp Adp	Interne eov-Q 3 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	C connections end -2 Local Ad 0 0.0.0.0 0 0 0.0.0 0 0 0	drees 2121 2222 00 443 44178 161 53 67 (m/o pervent drees	Foreign Ad 0.0.0.01* 0.0.0.01* 0.0.0.01* 0.0.0.01* 0.0.0.01* 0.0.0.01* 0.0.0.01* 0.0.0.01* 0.0.0.01*	dress	State LISTEN LISTEN LISTEN LISTEN		
Active : Proto R top top top adp adp adp adp Adp Adp Adp Adp	Interne eov-0 3 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	t connections end-Q Local Ad 0 0.0.000; 0 0.0.00; 0 0.00; 0 0; 0	drees 2121 2222 00 443 44178 161 53 67 (m/o pervent drees	Poreign Ad 0.0.0.01* 0.0.0.01* 0.0.0.01* 0.0.0.01* 0.0.0.01* 0.0.0.01* 0.0.0.01* 0.0.0.01* 0.0.0.01* 0.0.0.01*	dress	State Ligten Ligten Ligten Ligten		
Active : Froto R top top top top adp adp adp adp Adp Active : Froto R	Interne eov-Q 3 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	C connections end -2 Local Ad 0 0.0.0.0 0 0 0.0.0 0 0 0	drees 2121 2222 00 443 44178 161 53 67 (m/o pervent drees	Foreign Ad 0.0.0.01* 0.0.0.01* 0.0.0.01* 0.0.0.01* 0.0.0.01* 0.0.0.01* 0.0.0.01* 0.0.0.01* 0.0.0.01*	dress	State LISTER LISTER LISTER LISTER LISTER		

Figure 6-12: Status > Netstat

6.2.2.7 Hardware

The Status > Hardware screen shows the current detected temperature at each FRU slot, temperature limit information per device, and the ambient temperature of the power board. The system voltages at various points on the board are also displayed along with all USB devices connected to the system and any mounted memory devices.

	Log :	System N	stwork									
Priceise	is interface	DBCP Client	Outa Esape Netstar	Hardware Ste San	wy Diagnostka							
ardwar	re											
Tempe	ratures	and Limit										
These			when temperatures sta						and the bird	the shall be a second		
			Sormal temperature ra		in a second second	est et angel,	an esc an pro	in in the order of		101418-00 815-00	CON HIGH	
15yh	Link: The	upper tempers	dure at which the FRUs	will be powered off	until the tempe	rehare drops	to High Limit - H	ligh Hyst.				
Heats	er Linuit: The	etemperature	at which the heater will	start warming the	FRU until the te	mperature in	creases to Heate	r Limit + Heater H	127.			
			are at which the FRU wi					Low Hyst.				
Carro	out Status: C	arrent State o	f the system represent	ed by: 💙 FRU i	c an. 🙆 FRG	is off. 🛆	Heater is on.					
	Lecati		Device	Current	High	High	Heater	Heater	Low	Lew	Current	
			Name	T emp.	Limit	Hyst.	Limit	Hyst.	Limit	Hyst.	Status	
	Power B	bard	Power Board	84 °C	N/A	N/A	N/A	N/A	N/A	N/A	0	
	FRU	1	WN06601	44 °C	75 °C	5 °C	30 °C	5 °C	0 °C	5 °C	0	
	FRU	2	MC8790	45 °C	100 °C	5 °C	-15 °C	5 °C	-40 *0	5 °C	•	
	FRU:	3	EMPTY	85 °C	256 °C	5 °C	-129 °C	5 °C	-129 *	C 5 °C	0	
	FRU-	6	SSI_Zigbee	86 °C	100°C	s °c	-15 °C	s °c	-40 *0	5 °C	0	
All con	nected a	devices (e	xcluding system	hubs)								
Du	Device	Preduct			Manufa	turner .		VenderDP	dibe	USB version	Speed	
01		DWC OFG	Controller			5.32.7 dwc.	ota hod	1462-0002		2.00	480 Mbos	
	2		Acrosystems Corp.		Direc Li	A de la dese,	0.9.00	0424:2517		2.00	480 Mbps	
		Mai Card	actorytomic cup.		Cinera We	reless, Inco	incented.	1199.683c		2.00	12 Mbes	
	4		8 to UART Bridge C	oatroller	Silicon L			10c4cm60		1.10	12 Mbps	
01		Evar Corp.						04+21412		2.00	12 Mbps	
01		corp.										
01 01	0											
01 01	0											

Figure 6-13: Status > Hardware

Temperatures and Limits

The hysteresis values are used when FRUs start to return to the normal temperature range. The high limit represents the upper temperature at which the FRU will be powered off until the temperature drops to (High Limit - High Hysteresis). The heater limit represents the temperature at which the heater will start warming the FRU until the temperature increases to (Heater Limit + Heater Hysteresis). The low limit is the lower temperature at which the FRU will be powered off until the temperature increases to (Low Limit + Low Hysteresis).

Power board: Sensor located on the power board and represents the ambient temperature inside the box.

FRU#: Sensor located beneath the FRU slot and represents an estimation of the FRU temperature.

System Voltages

The voltages at various points along the board are displayed including system voltage, USB voltage, and voltages across multiple super capacitors.

6.2.2.8 Diagnostics

The Status > Diagnostics screen contains several tools that may be useful when troubleshooting.

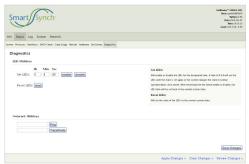


Figure 6-14: Status > Diagnostics

LED Utilities

Allows all LEDs on the GridRouter to be enabled/disabled remotely or set for a specific amount of time. *Note: A system event such as a door open event will override the settings here.* After the timed command completes or a system event occurs the LEDs will return to the default system state.

Network Utilities

The ping tool is used to test whether a particular host is reachable across an IP network from the GridRouter. The traceroute tool is used to determine the route taken by packets across an IP network.



6.2.3 Log

The GridRouter contains a logging application that all processes can direct their messages towards. These messages can be configured to either be temporarily stored in RAM or persist in nonvolatile memory. Along with storing informational messages, the GridRouter has the ability to capture all data across a given interface to help with troubleshooting connectivity issues.

6.2.3.1 System Settings

The Log > System Settings screen provides the ability to view/change the system logging configuration values.



Figure 6-15: Log > System Settings

Remote Syslog

The Syslog remote logging functionality can be enabled by entering a server IP address.

Server IP Address: Specifies the IP Address for the remote logs to reside.

Server Port: Specifies the port on Server IP Address that has the syslog application listening.

Local Log

The local log file is used by all of the GridRouter's applications and is known as the main log file.

Log Type: Specifies whether your log file will be stored in a memory circular buffer ("**Circular**") or in a file (**File**). If you require that your log persist across reboots, select "**File**", but constantly writing data could reduce the life of the onboard flash chip. It is highly recommended that the File log type only be used to temporarily aid in diagnosing issues.

Log File: Specifies the path and name of your log file.

Log Size: Specifies the size of your log in kilobytes. Be careful with the size of the circular buffer as it is taken from your main memory.

Save Tail of Syslog on Reboot: Enables the tail end of the syslog to be saved before shutdown. This is useful for determining the cause of unexpected reboots.

Save Tail Length: Specifies the number of lines of the syslog to save on shutdown.

Save Tail File: Specifies the file location to write the tail of syslog.

Kernel Log

Message Priority: Logs messages up to the defined priority.

Ring Buffer Size: Specifies the size of space the kernel will reserve for messages in memory.

Boot Time Log

This log file contains messages that occur on boot-up.

Backup Boot Time Messages: Specifies whether your boot time messages will be saved to a file for later reference.

Backup File: Specifies the path and name of your boot time log file.

Compress Backup: Specifies whether the boot time log file will be compressed.

6.2.3.2 System Downloads

The Log > System Downloads screen provides the ability to download the system log files in zip (Windows) or gzip (Unix) format. Regardless of where the system messages are stored (memory or flash), they can be compressed and downloaded. The estimated compressed file size is shown so the user can be aware of the data burden that will be incurred by clicking to download. In addition to the full system log, the tail section of the system log from the last shutdown can also be downloaded.

mart Synch		Non 2014 (M 1996) Dec 2014 Ten 2014 Lands 6.8,8, 500
Status Log System Netwo	ark enings: Secial PPP Doventisads: Secial Pauritinsugh Secials	Setal Passtrough Dormlands
ystem Log Downloads Full Systeg		
Download Zip (~ 98k) Download Gzip (~ 98k)	(gyslog M.dp) (gyslog M.gilp)	(s) stragtist,trigg (eff Soling comparison from Dip comparisons, ex stragtists,triggtper (eff Soling comparison from Citig comparisons, eff Soling comparison from Citig comparisons.
Saved Tail of Syslog Download 2ip (~ 2k) Download Gzip (~ 2k)	gyslog_taiM.cp gyslog_taiM.grg	sy shap, satisfy.chipe for a fait for component in the component. The other was competed as the hand with an advance on the other of maintain 4 king formage. States, satisfies, satisfy for any fait for component with Gar component in Table one compate a site in such and water or should "maintain a contemponent.
		Apply Changes + Clear Changes + Review Chan

Figure 6-36: Log > System Downloads

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6.2.3.3 Serial PPP Settings

The Log > Serial PPP Settings screen allows the data from a serial PPP session to be logged. Enabling logging on an instance of Serial PPP will make a log available for download.



Deleted: 1

serppp Log: Specifies whether logging is enabled or disabled.

serppp Log File: Specifies the path and name of the log file.

6.2.3.4 Serial PPP Downloads

The Log > Serial PPP Downloads screen provides two download formats for each instance's log. The text format is a standard text document that can be opened in any editor. The pcap format is a packet capture file that can be opened with most packet sniffing programs including Wireshark. This page also contains a link to clear out the old log files.



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6.2.3.5 Serial Passthrough Settings

The Log > Serial Passthrough Settings screen allows debug logging of serial passthrough to be configured on the system. TCP data, serial data, or both can be logged for each instance of serial passthrough. Both types of data will be logged to the same file.

mart Synch		Marta gobielandia Maghama 14 a Mara 21 a d Mara 21 a d Mara 21 a d
 Status Log System Net in Sering: System Downloads Sectal PP erial Passthrough Log Se serpassA Log 	9 Settings: Secial PAP Downloads: Secial Pacificanaya Settings: Se	na Pernanga Bawenan
Log Serial Packets Log TCP Packets Log File	Disabled in Disabled in Amp/log/separaA	Log File: The path of some of your segments log file. It can be use an unvertaint decourse, if samplies into discour, the log set an particular some onlines.
serpassB Log Log Serial Packets Log TCP Packets Log File	Disabled w Disabled w /http/togtospose8	Log File: The path of some of your respectiling file. It can be not no anywritadio receptors. If wang the charge descarg, the log will are possible across relation.
		Sour Dearge Apply Changes = Dear Changes = Review Changes

Figure 6-196: Log > Serial Passthrough Settings

Log Serial Packets: Specifies whether logging serial data is enabled or disabled.

Log TCP Packets: Specifies whether logging TCP data is enabled or disabled.

Log File: Specifies the path and name of the log file.

6.2.3.6 Serial Passthrough Downloads

The Log > Serial Passthrough Downloads screen provides a means to download the text-based log file outputted by the serpass application. Depending on the settings this file may contain serial data, TCP data, or both. This page also contains a link to clear out the old log file.

No Davi Davi Davi Davi Davi Davi Davi Davi	
Serial Parsthrough Log Dewnleads separat Log Dewnlast Log Core Log Internet. Anno Sand Parsthrough Log Core Log Internet.	
serpash Log ImposiAne Senial Prostoreup Log Download Log ImposiAne Senial Prostoreup Log Cree Log Imposia	
Clear Log Serial Pacificação Log in text format, Back line I	
	time/camped and marked with
serpassE Log	
Download Log Seaton Senta Pacateoph Log Crear Log Central Pacateoph Log Crear Log Central Central Pacateoph Log Sent Pacateoph	

Figure 6-20: Log > Serial Passthrough Downloads

6.2.3.7 Interface Settings

The Log > Interface Settings screen allows debug logging of each interface to be configured on the system.



Figure 6-21: Log > Interface Settings

Logging Status

Displays the current status of the logging processes for each interface. Possible values are "**Disabled**", "**Enabled**", and "**Not Running**". "**Not Running**" implies that the logging has been enabled but is stopped.

Logging Controls

Controls: The "**Start Logging**" button starts all enabled interface logging processes. The new logs will clear the previous logs. The "**Stop Logging**" button will stop all currently running interface logging processes and save the backup of the current logs if enabled.

{interface} Log

{interface} Log: Specifies whether or not the interface is to be logged.

Log Level: Specifies the amount of information to display in the log. Possible values include "Quiet", "Normal", "Verbose", "Very Verbose", and "Very Verbose".

Log File: Specifies the path of the log file to be saved. If using the /tmp or /var directories, the log will not persist across reboots.

Max Log Size (MB): Specifies the maximum size of the log file. Once the file reaches this size, the current file will be closed and a new one will be opened.

Number of Logs to Create: Specifies the limit of new log files to be created once one reaches the maximum size. Once this limit is reached, the oldest file is removed creating a rotating buffer.

Enable Backup of Logs: Specifies whether or not the log files should be saved elsewhere in the event of a reboot or an interface restart.

Backup Location: Specifies the directory where the current log files should be placed in the event of a reboot or an interface restart.

6.2.3.8 Interface Downloads

The Log > Interface Downloads screen provides the ability to download log files that captured all data from a specific interface (wan, lan, etc.).

Smart Synch		Cellence: 2009 1 Net 9431105 Vene 22 Net 21005 Net 21005 Vene 21005 Vene 21005
nfo Status Log System Network		
Interface Log Downloads	ings Serial HM Downloads Serial Hissobrough Settings Serial Resolu-	ligh Dowloads interface tertings interface Dowloads
Select Log Format		
Log Download Pomat	PacketCoptum -	Packet Capitone: Read in divide homologi as a supposed for "his calls or acqued and impand any another all other parts in paper program. Text: Non-analytic sector as composed for "his cas is a capital and quence with a nod when "his his carbor a capitaries income and distinguing on the basis.
Download wan Log		
Current Log Backup Log	wan,log,backup	Cumment (op: The lag that is non-particular to cumment). Backings (op: A same of the last lag file when lagging was respect.
Download lan Log		
Current Log Backup Log	len.log len.log.backap	Current Long The Lig Bell is long writins to currently. Beckge Long A same of the Long Lig Die waters togging was strapped.
		Apply Changes & Reboot < Clear Changes < Review Cl

Figure 6-22: Log > Interface Downloads

Select Log Format

Log Download Format: Specifies the format of all downloads on the page. Packet Capture formatting will create a file that can be opened by Wireshark. Text formatting is in a human readable form that can be opened with any standard text editor.

Download {interface} Log

Current Log: Button to download the log that is currently being written.

Backup Log: Button to download the last log file saved when logging was stopped.

6.2.4 System

6.2.4.1 Settings

The System > Settings screen allows for configuration of GridRouter's time zone and NTP servers.

Smart Synch		ColdTarton - 20000 1600 - 2004 200 0 (general 1 and 2016 - 0 2006 - 2006
Info Status Log System Network Letting: Pacience Pachages (BMP Jackage) System Settings Time Settings		
Timezone POSIX TZ String Primary NTP Server	User defined (or cut of defe)	Time 2006 Set up your time zone asserding to the nearest city of your region from the predefined lot.

Figure 6-23: System > Settings

Time Settings

Timezone: Specifies the time zone for the GridRouter which is mainly used for accurate time stamps in the log files. The drop down box includes all time zones.

POSIX TZ String: [Read-only] Specifies the POSIX TZ string for reference.

Primary NTP Server: Specifies the URL to the primary NTP server.

Secondary NTP Server: Specifies the URL to the secondary NTP server.

6.2.4.2 Access Control

The System > Access Control screen allows the administrator to create new users on the system and set up which web interface pages that they may view.

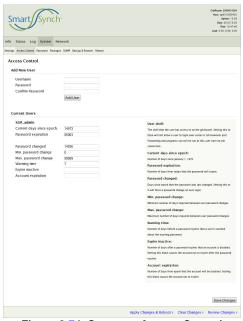


Figure 6-74: System > Access Control

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Add New User

A generic user can be created in this form. Once created the specific settings can be altered on the subsequent forms.

Username: Specifies a user's name.

Password: Specifies the user's password.

Current Users

A list of the current users on the system along with various configuration settings.

User shell: Specifies whether or not the user is permitted to login to the shell over serial or SSH.

Current days since epoch: Specifies the number of days since January 1, 1970.

Password expiration: Specifies the number of days from today that the password will expire.

Password changed: Specifies the days since epoch that the password was last changed. Setting this to 0 will force a password change on next login.

Min. password change: Specifies the minimum number of days required between user password changes.

Max. password change: Specifies the maximum number of days required between user password changes.

Warning time: Specifies the number of days before a password expires that a user is warned about the expiring password.

Expire inactive: Specifies the number of days after a password expires that an account is disabled. Setting this blank causes the account not to expire after the password expires.

Account expiration: Specifies the number of days from epoch that the account will be disabled. Setting this blank causes the account not to expire.

Web Interface Permissions

A list of all users and all web pages and whether or not a user is allowed to access that page. *Note: The users will currently have write access to any page that they are allowed to view.*

6.2.4.3 Password

The System > Password screen allows you to change the user password. The default administration password is "admin_SGR".

	California 20002-004
Smart Synch	Host: ser0310/05423
Smart (Synch	Uptime: 13:27
Sinary Synch	Date: 2010-12-30
	Tene: 10.45:29
	Level: 0.05, 0.01, 0.00
fo Status Log System Network	
ttings AccessControl Password Packages SNMP Backup&Restore Reboot	
Password Password Change	
User: SGR_admin	
New Password:	
Confirm Password:	
	Save Changes
	Apply Changes & Reboot « Clear Changes « Review Changes «
Eigung 6 9E. Cu	stem > Password
	stem > Password

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6.2.4.4 Packages

The System > Packages screen provides the means to view, install, and uninstall packages from the GridRouter.

A GridRouter package is computer software packaged in an archive format (*.ipk) to be installed by the package management system (opkg). Each package generally contains a specific application or service. Most GridRouter firmware upgrades will be presented in package form.

Smart	Synch			theore points Upper Date 2010 Theore Lands 0.15, 0.2
o Status Log	System Network			
ngi Pacamaré Pack	apes SMP Backup & Rentare Upgrad	ie Reboot		
🔗 Packag	pes			
Add Reposit	ory			
Repo. Nam				Add Repository:
Repo. URL				A repository is a server that contains a list of packages that can be installed on
	Add P	Nepository		your OpenWitt device. Adding a new one allows you to list packages here that are
Current Expenits	edant			not shown by default.
				Eadsports Tip:
				For a much larger accortment of packages, see if there is a backports repository
				available for your firmware.
Install Packs	age From URL			
URL of Pac				Install Package
Install Pack	vage From URL			Normally one installs a package by clicking on the install link in the list of
				packapes below. However, you can install a packape not listed in the leaven repeat aries been.
				reportances new.
Packages Av		te package lists		
	Updat	te package lists		
Installed Pag	Upder		Description	
Installed Pao	Updat	Version	Description	
Installed Pag	Upder dkages Fackage		Description	
Installed Pac Action	Upder dkages Package bar-filosportis	Version 14.1-(1505	Description	
Installed Pao Action Used	Updat deages Package hare-fino-poetix bi	Version 14.1-05609 1.00.94-0	Description	
Installed Pao Action Distal Distal	Lipda dkages Fackage NaceTresports NaceTres NaceTres NaceTres	Version 14.1-0560 1.0034-4 3.5.0-0-1 3.5.0-0-1 3.5.0-0-1	Description	
Installed Pac Action Dised Dised Dised	chages Package Bate-Steepgestix Ki Modelike	Version 14.1-05009 1.0034-0 1.50-01-1 1.50-01-1 1.6-1	Description	
Installed Pao Action Unional Unional Unional Unional Unional Unional	Lipdo Scages Facture base-Recognetite to the state table scale to the scale to the scale to the scale	Version 14.1-(500) 2.8-8-4 3.5-9-1-1 3.5-9-1-1 3.5-9-1-1 1.5-2-1 1.1.3-2-1	Description	
Installed Pac Action Dissel Dissel Dissel Dissel Dissel Dissel Dissel	Lipida ckages Package bar-filospotte Ma- ma-man Ma-bar Ma	Version (4.1-0509 1.663-4 3.53-91-4 3.53-91-4 3.53-91-4 1.63-7 1.63-7 1.12-51 2.63-16	Description	
Installed Pac Action Distant Distant Distant Distant Distant Distant Distant Distant Distant	Lipped chapes Factors Back-Back-Back Back-Back-Back Back-Back-Back Back-Back-Back-Back Back-Back-Back-Back-Back-Back-Back-Back-	Version 14.1-1500 1.83.9-4.4 3.8.8-9.4 3.8.8-9.4 1.4.1 1.13.2-51 2.4.3-30 3.8.8-4	Description	
Installed Pao Actien Dissol Dissol Dissol Dissol Dissol Dissol Dissol Dissol Dissol	Lipcon Schager Pachage bareflor-poolse bareflor-poolse bareflor- b	Version 143 of 3409 1.86.844 3.56.944 3.56.944 1.13.641 1.13.641 2.43.141 2.43.141 2.55.64	Description	
Installed Pac Actien Distant Distant Distant Distant Distant Distant Distant Distant Distant Distant Distant Distant Distant Distant Distant Distant	Lucion dicages Participan International Inte	Version 14.1-45949 1.85.8-4 3.85.9-4 3.85.9-4 1.4.3 1.4.3 1.4.3 2.4.3.4 8.3.18-1 2.3.8-4 2.3.6-1 2.4.6-1	Description	
Installed Pac Action Distant Distant Distant Distant Distant Distant Distant Distant Distant Distant Distant	Cuoded desages Fact Age Bare-floroporte Bare-floroporte Bare Bare Bare Bare Bare Bare Bare Bar	Version (4.1-0500) 1.85.8-4 3.85.8-4,4 3.85.8-4,4 3.85.8-4,5 4.81.8-1 2.85.	Description	
Installed Pac Actien Distant Distant Distant Distant Distant Distant Distant Distant Distant Distant Distant Distant Distant Distant Distant Distant	Lucion delages Part Age Bart-Ros-guella Bart estas Barte das Barte	Version 14.1-45949 1.85.8-4 3.85.9-4 3.85.9-4 1.4.3 1.4.3 1.4.3 2.4.3.4 8.3.18-1 2.3.8-4 2.3.6-1 2.4.6-1	Description	
Installed Pac Action Distant Distant Distant Distant Distant Distant Distant Distant Distant Distant Distant	constant consta	Version (4.1-0500) 1.85.8-4 3.85.8-4,4 3.85.8-4,4 3.85.8-4,5 4.81.8-1 2.85.	Description	
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Installed Pac Action Distant Distant Distant Distant Distant Distant Distant Distant Distant Distant Distant Distant Distant Available pa	close stage Friday Norman	Version 14.3-3500 14.8-3500 8.5-8-4 8.5-8-4 8.5-8-4 14.5-24 2.5,5-4 2.5,5-4 2.6,5-4 2.6,5-4 2.6,5-4		201
Installed Pac Action Distant Distant Distant Distant Distant Distant Distant Distant Distant Distant Distant Distant Distant Available pa	close stage Friday Norman	Version 14.3-3500 14.8-3500 8.5-8-4 8.5-8-4 8.5-8-4 14.5-24 2.5,5-4 2.5,5-4 2.6,5-4 2.6,5-4 2.6,5-4		Jan Ora Apply Danges 4 Orar Danges 8 Forew Dan

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Add Repository

A repository is a server that contains a list of packages that can be installed on your GridRouter. Adding a new server allows you to list packages here that are not shown by default.

Repo. Name: Specifies a descriptive name for the repository.

Repo. URL: Specifies the URL that points to the directory in the repository that contains the Packages file. The Packages file lists all the available packages, their dependencies, descriptions, and md5 sums. An example value here is **ftp:**//user:password@192.168.10.100/.

Install Package from URL

Normally you install a package by clicking the install link in the list of packages below. However, you can install a package not listed in the known repositories here.

URL of Package: The URL that points to the package to be installed.

Installed Packages

This is a list of packages that are currently installed on the GridRouter. The "**uninstall**" link can be used to uninstall an individual package.

Available Packages

This is a list of packages that are not currently installed on the GridRouter. The "**install**" link can be used to install an individual package.

6.2.4.5 SNMP

The System > SNMP screen allows for configuration of the GridRouter's SNMP settings. The GridRouter sends in SNMP traps when certain conditions occur and they are sent to the server specified on this page.

Smart Synch		Galilleviter" 200001 Hermitter" 200001
Smart //Synch		Options
Sind g Synch		Dates 2010-1
		Time (4) Louis 0.42, 0.43,
nfo Status Log System Netw	ork	
rtings Personant Pachages 33MP Bachage	Renore Upprote Reboot	
SNMP Settings		
SNMP Trap Settings		
Server	sgranmp.smartsynch.o	Adaptiveleter
Port	162	Evolutional the center to used as accelere it receives the true, oriect Tec.
Protocol	UDP O TOP	
Acknowledge	Yes O No	
Community	public	
		Save Orena
		[pave crian]
		Apply Changes « Clear Changes « Review Change
Ci.	MUNA 6 107. C	System > SNMP
E I	gure o-iu/: a	bystern > Sinivir

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SNMP Trap Settings

The SNMP trap server settings on the GridRouter.

Server: Specifies the IP address or host name of the SNMP trap server.

Port: Specifies the port number on the server that the trap will be sent to.

Protocol: Select the protocol used for this rule, either "TCP" or "UDP".

Acknowledge: Specifies whether the GridRouter requires an acknowledgement from the server. Trap acknowledgements ensure that the server correctly receives traps. If set to "**no**", the trap will still be sent to the server but failures cannot be detected. If set to "**yes**", any unacknowledged traps will be queued and retried later.

Community: Specifies the community string.

6.2.4.6 Backup & Restore

The System > Backup & Restore screen provides the ability to download current GridRouter configuration and upload new configuration.

Smart Synch	Gailliant "2008 Look Here geleichtetst Bydens 15 Door 2015 Here Lank 630, 500, 50
fo Status Log System Network	
ingo Pacaminel Pachages 20MP Bachage & Restore Tagende Rebort	
Backup and Restore	
Backup Configuration	
Name this configuration: Badug	
Restore Configuration	
Saved config.zip file:Bastas	
	Apply Changes « Clear Changes « Review Changes -

Figure 6-118: System > Backup & Restore

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Backup Configuration

The GridRouter's entire configuration is stored in text files. These files can be compressed into a single file and downloaded here.

Name this configuration: Specifies the name of the configuration. This is not the filename of the zip file, but rather, it is the value that will be displayed when restoring the configuration.

Restore Configuration

A previously downloaded configuration file can be uploaded to the GridRouter to restore the configuration.

Saved config.zip file: Specifies the path on the remote computer to the previously downloaded configuration file (e.g. C:\Users\Administrator\Desktop\config.zip).

6.2.4.7 Reboot

The System > Reboot screen is used to safely reboot the GridRouter remotely.

6.2.5 Network

6.2.5.1 Networks

The Network > Networks screen allows you to configure the GridRouter's network settings such as IP address, netmask, and gateway.

smart Syn	ich [.]	Celliforum 700000-C Heat Jay 15 Stored Uptime: 4 Date: 005-11- Time: 14-3 Lowe: 0.32, 0.00, 0
Status Log System		
	utes DynDNS Tweaks Serial PPP Serial Passthrough	
etwork Configuratio	n	
Connection Type	Static IP M	
Type MAC Address	None M	Connection Type: Static IP: IP address of the interface is statically set. DHCP: The interface will relation its IP address from a shcp server. MAC Address: Dioto to enter a MAC address buildes the default one.
IP Address Netmask Default Gateway	192 168.0.254 255 255 255 0 192 168.0.254	IP Settings: IP Settings are optional for DHCP. They are used as defaults in case the GHCP server is unavailable.
	Remove Add	
wan Configuration	Add	
		Connection Type Some P all advess of an another a balanchi yet DCP The mandprace will be in pl advess from a data parent. McC Address S Data I are not All advess the data for a deduct an
wan Configuration Connection Type Type	Add DHCP v	Static IP: IP address of the interface is statically set. DHCP: The interface will fetch its IP address from a dhcp server.
wan Configuration Connection Type Type	Add DHCP v	Static IP. IP address of the interface is statically set. DHCP. The interface will fetch its IP address from a dhcp server. MAC Address:
wan Configuration Connection Type Type MAC Address IP Address	Add DHCP M Nose M	Static PJ P address of the wandwale in spacelyking CDCP. The interface will fields in it P address from a decy server. NMC Address: Used to enter a NMC address besides the default serv. P Settings: IP Settings are explored for DICP. They are used as defaults in
wan Configuration Connection Type Type MAC Address IP Address Netmask	Add DHCP x Notes x 70 197 92 18	Static P /F address of the searchash is according to CDC The interface will fitch the Phademis from a dirty searcer. NMC Address : Und to enter a NMC address besides the default see. If Settings IP Settings are egisted for DIC7. They are used as defaults in

Figure 6-2912: Network > Networks

Network Configuration

Specific options for each network interface.

Connection Type: Specifies the type of connection; "Disabled", "DHCP", or "Static IP".

Type: Select whether the network is bridged or not.

MAC Address: Specifies the MAC address of the network.

IP Address: Specifies the IP address of the network.

Netmask: Specifies the mask used to divide an IP address into subnets.

Default Gateway: Specifies the IP address of the router that network traffic should be sent when the traffic is not on the same subnet as the sending device.

Add Network: Specifies the name of the interface to be created when the "Add Network" button is pressed.

6.2.5.2 Interfaces

The Network > Interfaces screen allows interfaces (i.e. eth0, ppp0, wlan0) to be mapped to networks (i.e. lan, wan, wlan) on the system. By default, eth0 is the lan and ppp0 is the wan.

Smart Synch		Galiffunite" 24449 - 4493 Henry 19462003507 Optimus 15.25 Optimus 15.25 Tumor 121.04-54
		Hand (913) 47 Lands 0.81, 0.04, 0.81
o Status Log System Netw	24K	
oris Interfaces Wreless Firewall video	DHCP Hors Routes DynDMG Trendes Secial PRP Secial Parstheough	
nterfaces		
Interface Configuration		
Interface eth0	lan M	
Interface ppp0	lan w won w None w	
Interface mon.wlan0	None M	
	wifi w	
Interface wianO		
Interface wian0		
Interface wian0		
Interface wianO		Save Dianges
Interface wian0		Save Changes Apply Changes « Char Changes « Review Changes «

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6.2.5.3 Wi-Fi

Formatted: Bullets and Numbering

6.3 The Network > Wi-Fi screen allows a supported 802.11 wireless card to be configured. Detailed instructions on how to enable the Wi-Fi card can be found in the "Examples" section under "

Enable as Wi-Fi Access Point".

<text>

Figure 6-141: Network > Interfaces

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Point

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Wireless Adapter radio Configuration

To change the physical aspects of the wireless card, edit these options.

Radio: Turns broadcasting on or off for the device.

Channel: Specifies the physical channel the radio is broadcasting on.

Wireless Distance: Used to set the transmit power of the device. [Unused]

Wireless Virtual Adaptor Configuration

To change the software settings for the wireless card, edit these options.

Network: Affiliates a wireless card with a network on the system. This value will often be set to "**wlan**" or "**wifi**" depending on the name of the interface that was added.

Mode: Sets the wireless card to be an "Access Point", "Client", or "Ad Hoc". Currently only "Access Point" is supported.

AP Isolation: This isolates all wireless devices on the GridRouter network from each other. [Unused].

RTS: Request to send threshold.

Fragmentation: Fragmentation threshold.

ESSID: Specifies the broadcasted name of the Access Point.

Encryption Type: Encryption type used.

6.3.1.1 Firewall

The Network > Firewall screen allows you to customize port services for common applications. When users send these types of requests to your network via the Internet, the GridRouter will deny or allow those requests and, if enabled, forward them to the appropriate devices. Before using forwarding you should assign static IP address to the designated devices. Refer to the DHCP page, section 6.2.5.6, for more information on assigning static IP addresses.

o Status Log System	Network				
vorks Rinewall OHCP Hosts Roats	n DynDits	Tweaks Secial PPP Secial Pass	through		
Firewall					
Incoming Ports					
Name		Source IP	Destination IP	Port	
Name	TCP v		Destination IP	Port 443	Accept w Remove Rale
sabut		0000	0000	2222	Accept M Sempre Rate
samp_rw		0000	0000	161	Accept M Remove Rate
simp trap acknowledge		sgrsnmp.smartsynch.co		101	Accept M Bernove Rate
dismasq		0000	0000	53	Accept M Remove Rate
on smaller	TCP ¥		0000	10	Accept M
Port Forwarding	101 12				Product in
Name		Source IP	Destination Port	To IP Address	To Port
	TCP ¥				
Ping					
Allow Ping	¥			Allow Ping:	
					s means that this GridRouter will respond to pino
				requests	

Figure 6-152: Network > Firewall

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Incoming Ports

Incoming ports are used to allow access to the GridRouter itself, not devices connected to the GridRouter. An example would be querying SNMP information from the GridRouter. To allow/deny a single port, enter the information on each line for the criteria required. The IP address "0.0.0.0" can be used to denote any address.

Name: Specifies the name to give the rule. The name should not have any spaces.

Protocol: Select the protocol used for this rule, either "TCP", "UDP", "Both", or "ICMP".

Source IP: Specifies the IP address the request is coming from.

Destination IP: Specifies the IP address that the request is going to.

Port: Specifies the external port number. Multiple ports can be specified by using a hyphen and commas: "9000-9009,9011,9014-9016".

Port Forwarding

Port forwarding is used to allow access to devices connected to the GridRouter. An example would be accessing a device connected to the Ethernet of the GridRouter. To forward a single port, enter the information on each line for the criteria required. The IP address "0.0.0.0" can be used to denote any address.

Name: Specifies the name to give the rule. The name should not have any spaces.

Protocol: Select the protocol used for this rule, either "TCP" or "UDP", or "Both".

Source IP: Specifies the IP address the request is coming from.

Destination Port: Specifies the external port number. Multiple ports can be specified using a hyphen and commas: "9000-9009,9011,9014-9016".

To IP Address: Specifies the local IP address that should receive the requests.

To Port: Specifies the internal port number. This value should normally be blank so that a 1 to 1 port forward can occur. If, however, a value is specified here then any port(s) listed under "**Destination Port**" will be redirected to this single port. There is currently not a way to forward ports 1-9 to 21-29 in a single rule.

MAC Address Filtering

Name: Specifies the name of the firewall rule.

MAC Address: Specifies the address to explicitly allow. All other MAC address on the selected interface will be rejected.

Interface: Specifies the name of the interface on which to allow the MAC address.

6.3.1.2 vnStat

The Network > vnStat screen is used to monitor network traffic burdens for the selected interface(s).



Figure 6-163: Network > vnStat

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vnStat Settings

Polling delay in minutes: Specifies the number of minutes between successive polls. This value should be selected low enough as to not be able to transfer 4GB of data between polls. If the wrap around occurs the results will not be accurate.

Database save directory: Specifies the directory to save the logs in the event of a reset. This value should be in non-volatile memory.

Monitored Interfaces

Interface: Specifies the interface to be monitored.

Nickname: Specifies the user friendly name to display when presenting data usage reports.

Enabled: Specifies whether or not to monitor the selected interface.

6.3.1.3 DHCP

The Network > DHCP screen allows you to configure the GridRouter's Dynamic Host Configuration Protocol (DHCP) server function. The GridRouter can be used as a DHCP server which automatically assigns an IP address to each device on your network.



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LAN DHCP

The DHCP settings for devices connected to the GridRouter through the Ethernet connector.

DHCP: DHCP is enabled by factory default. If a DHCP server is not desired, then select "Off".

Start: Specifies the 4th octet of the IP address to start issuing IP addresses. For example, the default IP address is **"192.168.0.254**", so this start value must be less than 253 (192.168.0.253). The default Start value is **"1**" (192.168.0.1).

Limit: Specifies the maximum number of devices that the DHCP server will assign IP addresses to.

Lease Time: Specifies the number minutes a network user will be allowed connection to the GridRouter with their current dynamic IP address.

Static IP Addresses

The DHCP server uses the matching IP address instead of allocating a new one from the pool for any MAC address listed in this file.

Name: Specifies the name of the rule or end device.

MAC Address: Specifies the MAC address of the device that will be receiving the static IP address.

IP Address: Specifies the IP Address to assign to device with the specified MAC Address.

Device Type: Specifies the type of device receiving an IP address. This value should be "**Generic**" unless connected to an Echelon Ethernet Data Concentrator (DC).

The Echelon DC requires that its local IP address changes when the GridRouter's WAN address changes to ensure that the DC will call back into the NES server. The least time should be around 5 minutes to ensure that the DC will call back within 5 minutes of the WAN address changing. The local IP address assigned to the DC will cycle through the range of address specified by the Start and End IP Addresses each time that the WAN address changes. The suggested range is 10 addresses and 2 is the minimum. Port forwarding firewall rules that have a "**Static IP Rule**" set to something other than "**None**" will automatically be adjusted to match the DC's address.

Echelon DC - Start IP Address: Specifies the beginning of the IP address range to assign to the DC.

Echelon DC - End IP Address: Specifies the end of the IP address range to assign to the DC.

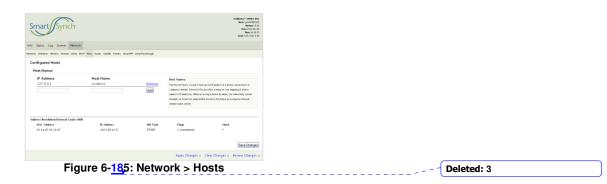
Echelon DC – Lease Time: Specifies the number of minutes the DC will be allowed to use that local IP address.

Active DHCP Leases

A list of the currently active DHCP leases.

6.3.1.4 Hosts

The Network > Hosts screen is used to configure the hosts file on the GridRouter. When accessing a device by name, the GridRouter's networking system attempts to locate the name within the hosts file before accessing the DNS server.



Host Names

Host Name: Specifies the name of the device.

IP Address: Specifies the IP address of the device with the specified host name.

6.3.1.5 Routes

The Network > Routes screen allows you to configure the routing tables on the GridRouter. IP Routing is an umbrella term for the set of protocols that determine the path that data follows to travel across multiple networks from its source to its destination. These protocols enable the GridRouter to build up a forwarding table that correlates the final destinations with the next hop addresses.

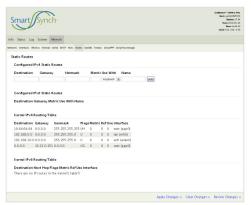


Figure 6-196: Network > Routes

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Configured IPv4 Static Routes

Destination: Specifies either an IP address or host name for the network or host.

Gateway: Specifies either an IP address or host name for the gateway or GridRouter to use when forwarding.

Netmask: Specifies a subnet mask to be associated with this route entry.

Metric: Assigns an integer cost metric (range from 1 through 9,999) to be used in calculating the fastest, most reliable, and/or least expensive routes.

Use With: Specifies the interface to be used for the route.

Name: Specifies the name of the route.

6.3.1.6 DynDNS

The Network > DynDNS screen allows you to configure the Dynamic Domain Name System (DDNS) feature that allows you to assign a fixed host and domain name to a dynamic Internet IP Address. If the onboard modem has a static IP address then this feature can be disabled.



Figure 6-207: Network > DynDNS

Deleted: 3

DynDNS

Dynamic DNS Update: Default value is "Enable".

Host Name: Specifies the DDNS URL assigned by the DDNS service. Default value is "sgr{serial#}.dyndns.org".

Server: Specifies the IP address or host name of the nameserver. Default value is "update.dyndns.com".

Port: Default value is "53".

Zone: Specifies the DNS domain to be updated. Default value is "sgr{serial#}.dyndns.org".

Key Name: Specifies the name of the key used in the TSIG protocol. This value will need to be provided by the DNS server.

Key HMAC: Specifies the base64 encoded shared secret used in the TSIG protocol. This value will need to be provided by the DNS server.

Delete Previous Entry: Some DNS servers only allow updates (select "**No**"), but others allow you to delete an entry and re-add it (select "**Yes**").

6.3.1.7 Tweaks

The Network > Tweaks screen allows you to set default timeout and connection values for the system.

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		Save Changes

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6.3.1.8 IPSEC

Configuration of IPSEC is beyond the scope of this document. Please refer to the GridRouter IPSEC Configuration User Guide for information on how to use and configure the IPSEC functionality of the GridRouter.

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	Sar e Charges
	tpply Changes & Reboot < Clear Changes < Review Changes <
Figure 6-39: Netv	vork > IPSEC

6.3.1.9 Serial PPP

Serial PPP is an application that acts as a modem emulator and provides a PPP connection to a device connected serially to the GridRouter. Any device that would connect directly to a modem and issue AT commands should be able to connect to the GridRouter and access the same network as the GridRouter (whether public to the Internet or a private network). Some serial devices alert a head-end server whenever their IP address changes, so the GridRouter has the capability to reset the serial PPP connection whenever its WAN IP address changes. The GridRouter toggles between a primary and a secondary local IP address when assigning one to the serial PPP device.

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		vork ONS Tuvaka Secial PPP Secial Pas	shrough		
serpppA Configura	ition				
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	rotocol FCP ¥	Source IP	Destination Port	To Port	
				Save Ch	

Figure 6-220: Network > Serial PPP

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Configuration

Enabled: Default value is "Disable".

Baudrate: Specifies the number of symbols per second transferred.

Data bits: Specifies the actual number of data bits sent in a character frame.

Parity: Additional error checking on serial data transfer.

Stop bits: Specifies the number of stop bits in a serial character frame.

Device: Specifies the physical RJ45 serial connector on the GridRouter. "**Serial0**" represents "Port 0" on the board's silk screen. "Serial1" represents "Port 1".

Primary Local IP Address: Specifies the primary IP address to be given to the device connected serially to the GridRouter.

Update Local IP: Specifies whether or not to force the GridRouter to toggle the local IP address between primary and secondary each time the WAN IP address changes.

Secondary Local IP Address: Specifies the secondary IP address to be given to the device connected serially to the GridRouter.

Verify Update Ack: Specifies whether or not to toggle the local IP address if incoming traffic on the port is not seen within the 'Update Ack Timeout' period.

Update Ack Timeout: Specifies the amount of time in seconds to wait for acknowledgement traffic before

reverting to the alternate local IP address.

Port Forwarding

To forward a single port, enter the information on each line for the criteria required. It is important to make the serial PPP firewall changes in this form because the rules are auto named and will change the destination IP address based upon which (primary or secondary) local IP address is currently being used for the PPP session.

Name: Specifies the name to give the rule. This is auto generated.

Protocol: Select the protocol used for this rule, either "TCP" or "UDP", or "Both".

Source IP: Specifies the IP address the request is coming from.

Destination Port: Specifies the external port number.

To Port: Specifies the internal port number.

6.3.1.10 Serial Passthrough

The Network > Serial Passthough screen allows you to change the configuration for the passthrough application that provides a gateway between a conventional RS232/RS485 serial interface and a TCP socket.

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rial Passthrough Configur	DHCP Hoto Routes Dyn3NG Twesks Serial PPP Serial	Ruthnigh
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		Apply Changes « Citer Changes « Review Cha

Figure 6-231: Network > Serial Passthrough

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Enabled: Default value is "Disable".

Physical: Specifies the physical interface as either "**RS232**" or "**RS485**". This value does not change the physical interface but rather, it defines the actual hardware configuration that is present. You must be certain of the hardware configuration before making this change. *Note: 'serial0' is the only device capable of RS485 currently.*

Duplex: Specifies the RS485 duplex as either "**Half**" or "**Full**". This value does not change the physical interface but rather, it defines the actual hardware configuration that is present. There is a jumper on the RS485 daughterboard that is responsible for this value. Refer to section 3.2.3 for more information.

Baudrate: Specifies the number of symbols per second transferred.

Effective Baudrate: Disabled by default ("0") but can be used to slow the transmission of data as the receiver cannot keep up with the speed of the transmitter.

Data bits: Specifies the actual number of data bits sent in a character frame.

Parity: Additional error checking on serial data transfer.

Stop bits: Specifies the number of stop bits in a serial character frame.

Device: Specifies the physical RJ45 serial connector on the GridRouter.

TCP Port: Specifies the TCP/IP port number.

TCP Buffer Timeout MS: Specifies the timeout in milliseconds for the TCP buffer to output flush.

TCP Buffer Size: Specifies the buffer size for TCP transmission.

TCP Idle Timeout: Specifies the number of seconds a TCP connection is allowed to remain idle before the port is closed.

7 Examples

7.1 Serial Passthrough to a Serial Device

The GridRouter can provide network connectivity to a device that only talks over serial (RS232/RS485). A single TCP port can be mapped to a serial port such that all traffic sent or received from either one is passed through to the other. For instance, a software application that traditionally connects to a serial port (i.e. COM5), could connect to an IP address and a TCP port and communicate to the end device.

The steps required to enable serial passthrough on the GridRouter are as follows:

- 1. Attach a serial cable (generally null modem) between one of the GridRouter's serial ports and the device's serial port.
- 2. Visit the web-based utility's Network > Serial Passthrough screen.
- 3. Click the "Enable" button on an instance of the serpass process (i.e. serpassA).
- 4. Enter the correct serial port settings (baudrate, data bits, parity, stop bits).
- 5. Enter the correct TCP settings (port and timeouts).
- 6. Click Save Changes and wait for the page to refresh.
- 7. Verify configuration values.
- 8. Click Apply Changes & Reboot.

Once the GridRouter reboots, the serpass process will be running and passing data between the specified TCP port and the specified serial port.

Note: The GridRouter's firewall will automatically allow incoming traffic on the specified TCP port for serpass.

7.2 Serial Data Concentrator to NES

When a serial Echelon Data Concentrator (DC) is connected directly to a modem it dials a number with an AT command (i.e. "ATDT10001"). The modem will respond with "CONNECT" and then the Point-to-Point Protocol (PPP) will be used to establish a direct connection between the DC and the Internet service provider (ISP). The GridRouter acts as a modem emulator and will listen for the "ATDT" command before responding with "CONNECT" and then initiating the PPP connection.

The DC will natively try and alert the head-end server (NES) whenever its IP address changes. Since the DC is on the GridRouter's local network (192.168.*.*), the DC's IP address will normally stay the same, so that the firewall rules can be the same. Therefore, the DC will never alert the NES server when the WAN address of the GridRouter changes, leaving the DC without communication.

The GridRouter has the ability to change the local IP address of the DC when the WAN address changes to force the DC to alert NES. A primary and a secondary IP address are toggled and assigned to the DC and the firewall rules are automatically altered to match the DC's address. To ensure that this toggling of addresses is used on the DC, make sure to enable the 'Update Local IP' rule on the web interface.

The steps required to set up the GridRouter to connect to a Data Concentrator are as follows:

- 1. Attach a null modem serial cable between the Data Concentrator and a GridRouter serial port.
- 2. Visit the web-based utility's Network > Serial PPP screen.
- 3. Click the Enable button on an instance of the serppp process.
- 4. Enter the correct serial port settings.
- 5. Enter both a primary and secondary local IP address to assign to the Data Concentrator.
- 6. Disable 'Update Local IP' if your GridRouter has a static IP address.
- 7. Add port forwarding rules so that the NES software can reach the Data Concentrator through the GridRouter's firewall.

rpppA Port Forwarding					
Name	Protocol	Source IP	Destination Port	To Port	
serpppA_1	TCP 💌	0.0.0.0	65432	65432	Remove Rule
serpppA_2	TCP 🛰	0.0.0.0	65400	65400	Remove Rule
serpppA_3	TCP 🗸				

Figure 7-1: Example Port Forwarding Rules for a DC

- 8. Click Save Changes. Wait for page refresh.
- 9. Verify configuration values.
- 10. Click Apply Changes & Reboot.

Once the GridRouter reboots, the serppp process will be running and the Data Concentrator will be ready to go.

Note: Common communication ports for the Echelon Data Concentrator are 65432, 65400, and 22 (SSH).



7.3 Ethernet Data Concentrator to NES

The Ethernet Data Concentrator (EDC) is slightly different than a "normal" Ethernet device. As with the serial Data Concentrator, the EDC alerts the head-end server when its IP address changes. If the GridRouter has a static WAN address then a static local address can be assigned to the EDC and everything will work like a "normal" Ethernet device. If the GridRouter has a dynamic IP WAN IP address then the GridRouter has to routinely alter the local IP address assigned to the EDC so that it will call into the head-end server. The EDC *must* be set up for DHCP, else this will not work.

The GridRouter will statically assign an IP address to the EDC based upon its MAC address. The leasetime is set to 5m so the EDC will request an IP frequently. If the GridRouter WAN address changes, it will change the IP address assigned to the EDC.

The steps required to set up the GridRouter to connect to an EDC are as follows:

- 1. Attach an Ethernet cable (straight or crossover) between the EDC and the GridRouter's Ethernet port.
- 2. Visit the web-based utility's Network > DHCP screen.
- 3. Create a Static IP address rule
 - a. Set the name (no spaces)
 - b. Enter the MAC address in the form aa:bb:cc:dd:ee:ff
 - c. Select a local IP address to assign to the EDC. Make sure it is on the same subnet as the GridRouter.
 - d. Select "Echelon DC" as the Device Type.
 - e. Provide a Start IP Address. This should be the same as the IP address from above.
 - f. Provide an End IP Address that is roughly 10 addresses larger than the start. The range can be as small as 2 but is recommended at 10.
 - g. Set the leasetime to something around 5 minutes. This is essentially the maximum amount of time that the EDC will be waiting before it contacts the head-end server after a WAN IP change.
- 4. Click Save Changes. Wait for page refresh.
- 5. Visit the web-based utility's Network > Firewall screen.
- 6. Add Port Forwarding rules so that the NES software can reach the EDC through the GridRouter's firewall. Be sure to set the "Static IP Rule" equal to the name of the DHCP name provided earlier. This value is in a drop down.
- 7. Click Save Changes. Wait for page refresh.
- 8. Click Apply Changes & Reboot.



7.4 Enable as Wi-Fi Access Point

The Wi-Fi module must be installed before the GridRouter is powered up. The steps required to set up the GridRouter to act as a Wi-Fi access point are as follows:

- 1. Visit the web-based utility's Network > Networks screen.
- 2. At the bottom of the screen, enter "wlan" in the "Add Network" field and click the "Add Network"
 - button. The network name can be anything you want (i.e. "lan2", "wifi", etc.).
 - a. Change the wlan "Connection Type" to "Static IP".
 - b. Enter "192.168.x.254" as the "IP Address" where x is the FRU slot number the Wi-Fi card is located in.
 - c. Enter "255.255.255.0" in the "Netmask" field.
 - d. Click the "Save Changes" button.
- Visit the web-based utility's Network > DHCP screen, select "wlan" and click the "Add DHCP" button.
- 4. Click the "On" button for the "wlan DHCP" "DHCP" option
 - a. Add a "Start" value between 1 and 253 that will not overlap with an existing DHCP range
 - b. Add a "Limit" value that will not cause an overlap with an existing DHCP range
 - c. Add a "Lease Time" value
 - d. Click the "Save Changes" button.
- 5. Click the "Wi-Fi" submenu and select the "On" button for the "Radio"
 - a. Select the desired "Channel"
 - b. Ensure that "wlan" is selected for the "Network"
 - c. Ensure that "Access Point" is selected for the "Mode"
 - d. Set the "ESSID" field to the correct value
 - e. Set the "Encryption Type" to "WPA (PSK)"
 - f. Enter a valid password into the "WPA PSK" field
 - g. Click the "Save Changes" button.
- 6. Click the "Apply Changes & Reboot" link at the bottom of the page.
- After the reboot the Wi-Fi will be operational. To ensure that the data usage values are accurate please visit the web-based utility's Network > Interfaces screen and set "Interface wlan0" to "wlan". Keep "Interface mon.wlan0" as "None".
- 8. Click the "**Save Changes**" button.
- 9. Another reboot is required for data usage monitoring to be accurate but is not required for Wi-Fi functionality.

Note: With the WN6601A module, single antenna configurations must use the "1" or left connector.



8 Appendix A: Specifications

Ports	Power, Ethernet, USB, PCIe Mini Card x4	Deleted: Serial x2,
LEDs	Status, DDNS, Serial x2, Ethernet (Link, Activity),	
	Battery, PCIe Mini Card x4 (WWAN, WLAN, WPAN)	
Main Board		
Enclosure	Nema4x	
CPU Board (CPU)	PowerPC (405EXr, 333 MHz)	
Flash	Onboard: 128MB	
2244	Optional: SD card FRU storage	
DRAM	64MB or 256MB	
Operating System Capacitor Storage Bank	OpenWRT 8.09 (Linux kernel 2.6.32.14) Up to 60 seconds	
Capacitor Storage Bank	op to bo seconds	
External Antennas	Note: The WAN antenna can be configured as remote	
	with the purchase of the remote antenna kit. Contact	
	your SmartSynch sales representative for more	
WAN Antenna	GSM, CDMA: 806-960 Mhz @ 1.4 dBi, 1710-1990 Mhz @ 4 dBi	
LAN Antenna	ZigBee: 2.4-2.5 Ghz @ 2.5	
	WiFi: 2.4-2.5 GHz @ 2.5	
Electrical, Physical, and Environmental		
Input Voltage	85-305 V AC, 50/60 Hz	
Dimensions (approx.)	9-30 V DC, 20 Watts 8.74 in/22.2 cm length	
	9.13 in/23.2 cm width	
	3.9 in/10.0 cm depth	
Weight (approx.)	1.5 lbs/0.7 kg	
Operating Temp.	-40 to +85 ℃	
	Note: Optional FRU cards maybe have different	
Humidity Range	temperature specifications. 0% to 100% non-condensing	
number nange		
Regulatory & Industry Certifications		
FCC Part 15 Class B		
FCC Part 22		
FCC Part 24		
FCC Part 90		

FCC Part 90 PTCRB Certification ANSI C37.90.1 – 1989 ANSI C12.20 – 1998 AT&T Network Certification Verizon Network Certification

Specifications are subject to change without notice.

9 Appendix B: SNMP Traps

The Simple Network Management Protocol (SNMP) is used by network management systems to communicate with the GridRouter. An SNMP TRAP is a message that is initiated by the GridRouter and sent to the network management system, generally to indicate some sort of alarm (e.g. power failure). Refer to the "SNMP_MIB_OID_information" document for more information on GridRouter SNMP traps.

10 Appendix C: Requirements and Compliance

The Smart GridRouter is compliant with all applicable Federal Communications Commission (FCC) and Industry Canada (IC) requirements.

10.1 FCC Grant Statement

The antennas used for this transmitter must be installed to provide a minimum separation distance of 20 cm from all persons, and must not be co-located or operate in conjunction with any other antenna or transmitter.

10.2 Compliance Statement (Part 15.19)

The Smart GridRouter complies with Part 15 of the FCC Rules and with RSS-210 of Industry Canada. Operation is subject to the following two conditions:

- 1. This device may not cause harmful interference, and
- 2. This device must accept any interference received, including interference that may cause undesired operation.

10.3 Warning (Part 15.21)

Changes or modifications not expressly approved by SmartSynch, Inc. could void the user's authority to operate the equipment.

10.4 RF Radiation Safety Guidelines per Part 2 of FCC Rules and Regulations

The device should be installed in a location where there will be a separation greater than 20 cm (8 inches) from locations occupied by humans.

10.5 User Information (Part 15.105)

The Smart GridRouter has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Move the receiving equipment farther away from the GridRouter
- Consult the dealer or an experienced radio/TV technician for help.

10.6 Industry Canada Statement

The term "IC" before the certification/registration number only signifies that the Industry Canada technical specifications were met.