

## 5.4.4 DHCP Clients

The screen displays information about any **DHCP Leases** and information such as **Address Resolution Protocol Cache**.

**Phocus Array™**  
by Fidelity Comtech, Inc.

Phocus Array v2.1 beta  
Host: phocusarray  
Uptime: 2:22  
Load: 0.00, 0.02, 0.00

Info Graphs **Status** Log System Network PhocusArray - Logout

System Processes Interfaces **DHCP Clients** Netstat Iptables

### DHCP Leases

MAC Address IP Address Name Expires in

There are no known DHCP leases.

**DHCP Leases:** DHCP leases are assigned to network clients that request an IP address from the DHCP server of the router. Clients that requested their IP lease before this router was last rebooted may not be listed until they request a renewal of their lease.

### Additional information

#### Address Resolution Protocol Cache (ARP)

MAC Address	IP Address	HW Type	Flags	Mask
00:19:B9:57:E5:91	192.168.1.2	ETHER	C (completed)	*

grep: /etc/dnsmasq.conf: No such file or directory

<http://www.fidelity-comtech.com>

Apply Changes <<  
Clear Changes <<  
Review Changes <<

Figure 35 – DHCP Clients

### 5.4.5 Netstat

The screen displays **Ethernet/Wireless Physical Connections**, **Routing Table**, **Router Listening Ports**, and **Connections to the Router**.

**Phocus Array™**  
by Fidelity Comtech, Inc.

Phocus Array v2.1 beta  
Host: phocusarray  
Uptime: 2:23  
Load: 0.00, 0.02, 0.00

Info Graphs **Status** Log System Network PhocusArray - Logout

System Processes Interfaces DHCP Clients **Netstat** Iptables

#### Netstat

**Ethernet/Wireless Physical Connections**

IP address	HW type	Flags	HW address	Mask	Device
192.168.1.2	0x1	0x2	00:19:B9:57:E5:91	*	br-lan

**Routing Table**

Kernel IP routing table

Destination	Gateway	Genmask	Flags	MSS Window	irtt	Iface
192.168.1.0	0.0.0.0	255.255.255.0	U	0 0	0	br-lan
0.0.0.0	192.168.1.1	0.0.0.0	UG	0 0	0	br-lan

**Router Listening Ports**

Active Internet connections (only servers)

Proto	Recv-Q	Send-Q	Local Address	Foreign Address	State
tcp	0	0	0.0.0.0:80	0.0.0.0:*	LISTEN
tcp	0	0	0.0.0.0:22	0.0.0.0:*	LISTEN
udp	0	0	0.0.0.0:161	0.0.0.0:*	

**Connections to the Router**

Active Internet connections (w/o servers)

Proto	Recv-Q	Send-Q	Local Address	Foreign Address	State
tcp	0	0	192.168.1.1:80	192.168.1.2:49856	TIME_WAIT
tcp	0	359	192.168.1.1:80	192.168.1.2:49860	ESTABLISHED

<http://www.fidelity-comtech.com>

Apply Changes <<  
Clear Changes >>

Figure 36 – Netstat

## 5.4.6 Iptables

The screen displays the status for each **Iptable**, including **Target filter**, **Target NAT**, and **Target Mangle**.

**Phocus Array™**  
by Fidelity Comtech, Inc.

Phocus Array v2.1 beta  
Host: phocusarray  
Uptime: 2:23  
Load: 0.00, 0.02, 0.00

Info Graphs **Status** Log System Network PhocusArray - Logout

System Processes Interfaces DHCP Clients Netstat **Iptables**

### Iptables status

☐ ☐ ☐ ☐ ☐ ☐

#### Target Filter

**Chain INPUT (policy ACCEPT 1781 packets, 207K bytes)**

num	pkts	bytes	target	prot	opt	in	out	source	destination	options

**Chain FORWARD (policy ACCEPT 0 packets, 0 bytes)**

num	pkts	bytes	target	prot	opt	in	out	source	destination	options

**Chain OUTPUT (policy ACCEPT 1907 packets, 979K bytes)**

num	pkts	bytes	target	prot	opt	in	out	source	destination	options

#### Target NAT

**Chain PREROUTING (policy ACCEPT 565 packets, 57184 bytes)**

num	pkts	bytes	target	prot	opt	in	out	source	destination	options

**Chain POSTROUTING (policy ACCEPT 0 packets, 0 bytes)**

num	pkts	bytes	target	prot	opt	in	out	source	destination	options
1	0	0	0 MASQUERADE	all	--	*	eth0	0.0.0.0/0	0.0.0.0/0	
2	0	0	0 MASQUERADE	all	--	*	ath0	0.0.0.0/0	0.0.0.0/0	

**Chain OUTPUT (policy ACCEPT 0 packets, 0 bytes)**

num	pkts	bytes	target	prot	opt	in	out	source	destination	options

#### Target Mangle

**Chain PREROUTING (policy ACCEPT 2094 packets, 243K bytes)**

num	pkts	bytes	target	prot	opt	in	out	source	destination	options

Figure 37 – Iptables

## 5.5 Log Tab

The **Log** menu contains the following tabs:

- **Syslog Settings** – remote syslog, syslog marks, local log
- **Syslog** – syslog view
- **Kernel** – kernel ring buffer

### 5.5.1 Syslog Settings

This screen allows the system administrator to set up “syslogs”. It permits administrators to direct the system’s syslog to be routed to a remote system. This permits archiving of historical system activity.

Enter the **Server IP Address** and **Server Port** into the appropriate fields. The remote server receives a continuous stream of log entries. The **Local Log** controls affect the entries that are views under the **Syslog** tab.

The screenshot shows the Phocus Array v2.1 beta web interface. The top navigation bar includes links for Info, Graphs, Status, Log, System, Network, PhocusArray, and Logout. Below this, a sub-navigation bar highlights Syslog Settings, Syslog, and Kernel. The main content area is titled 'syslog Settings' and contains three sections: Remote Syslog, Syslog Marks, and Local Log. Each section has input fields and explanatory text.

**Phocus Array™**  
by Fidelity Comtech, Inc.

Phocus Array v2.1 beta  
Host: phocusarray  
Uptime: 2:24  
Load: 0.05, 0.03, 0.00

Info Graphs Status **Log** System Network PhocusArray - Logout

Syslog Settings Syslog Kernel

**syslog Settings**

**Remote Syslog**

Server IP Address   
Server Port

**Remote Syslog:**  
IP address and port of the remote logging host. Leave this address blank for no remote logging. The port is set to 514 by default

**Syslog Marks**

Minutes Between Marks

**Syslog Marks:**  
Periodic marks in your log. This parameter sets the time in minutes between the marks. A value of 0 means no mark. Default value: 0.

**Local Log**

Log type   
Log Size

**Log Type:**  
Whether your log will be stored in a memory circular buffer or in a file. Beware that files are stored in a memory filesystem which will be lost if you reboot your router. Default value: circular.

**Log File:**  
The path and name of your log file. It can be set on any writable filesystem. CAUTION: DO NOT USE A JFFS filesystem because syslog will write A LOT to it. You can use /tmp or any filesystem on an external storage unit. Default value: /var/log/messages.

**Log Size:**  
The size of your log in kilo-bytes. Be carefull with the size of the circular buffer as it is taken from your main memory. Default value: 16 kB.

Figure 38 – Syslog Settings

## 5.5.2 Syslo

This screen provides a view of the historical syslog.

**Phocus Array™**  
by Fidelity Comtech, Inc.

Phocus Array v2.1 beta  
Host: phocusarray  
Uptime: 2:24  
Load: 0.03, 0.02, 0.00

Info Graphs Status **Log** System Network PhocusArray - Logout

Syslog Settings Syslog Kernel

### Syslog View

Message Prefix:

```

Jan 1 02:15:46 (none) user.info syslog: Received: A0703-238
Jan 1 02:15:45 (none) user.info syslog: Received: A0703-239
Jan 1 02:15:45 (none) user.info syslog: Received: 0507ABCD-137
Jan 1 02:15:45 (none) user.info syslog: Received: 0507ABCD-138
Jan 1 02:15:45 (none) user.info syslog: Received: 0507ABCD-134
Jan 1 02:15:45 (none) user.info syslog: Received: 0507ABCD-133
Jan 1 02:15:45 (none) user.info syslog: Received: 0507ABCD-132
Jan 1 02:15:45 (none) user.info syslog: Received: 0507ABCD-130
Jan 1 02:15:45 (none) user.info syslog: Received: TR7: V2.9, Date 02/23/07, Time 13:27:01
Jan 1 02:15:44 (none) user.info syslog: Received: TR6: V2.9, Date 02/23/07, Time 13:27:01
Jan 1 02:15:44 (none) user.info syslog: Received: TR5: V2.9, Date 02/23/07, Time 13:27:01
Jan 1 02:15:44 (none) user.info syslog: Received: TR4: V2.9, Date 02/23/07, Time 13:27:01
Jan 1 02:15:44 (none) user.info syslog: Received: TR3: V2.9, Date 02/23/07, Time 13:27:01
Jan 1 02:15:44 (none) user.info syslog: Received: TR2: V2.9, Date 02/23/07, Time 13:27:01
Jan 1 02:15:44 (none) user.info syslog: Received: TR1: V2.9, Date 02/23/07, Time 13:27:01
Jan 1 02:15:44 (none) user.info syslog: Received: TR0: V2.9, Date 02/23/07, Time 13:27:01
Jan 1 02:12:13 (none) user.info syslog: Received: A0703-238
Jan 1 02:12:13 (none) user.info syslog: Received: A0703-238
  
```

<http://www.fidelity-comtech.com>

Apply Changes <<  
Clear Changes <<  
Review Changes <<

Figure 39 – Syslog View

### 5.5.3 Kernel

This screen displays a record of the **Kernel Ring Buffer**.

The screenshot shows the Phocus Array v2.1 beta web interface. The top navigation bar includes links for Info, Graphs, Status, Log, System, Network, PhocusArray, and Logout. The 'Log' tab is selected, and the 'Kernel' sub-tab is active. The main content area is titled 'Kernel Ring Buffer' and displays a scrollable log of system boot and configuration messages. The log text includes:

```
Linux version 2.6.19.2 (alan@panther) (gcc version 4.1.2) #1 Tue Jun 26 13:00:23 MDT 2007
CPU: XScale-IXP42x Family [690541c1] revision 1 (ARMv5TE), cr=000039ff
Machine: FCI Merlin
Warning: bad configuration page, trying to continue
Memory policy: ECC disabled, Data cache writeback
On node 0 totalpages: 32768
  DMA zone: 128 pages used for memmap
  DMA zone: 0 pages reserved
  DMA zone: 16256 pages, LIFO batch:3
  Normal zone: 128 pages used for memmap
  Normal zone: 16256 pages, LIFO batch:3
CPU0: D VIVT undefined 5 cache
CPU0: I cache: 32768 bytes, associativity 32, 32 byte lines, 32 sets
CPU0: D cache: 32768 bytes, associativity 32, 32 byte lines, 32 sets
Built 1 zonelists. Total pages: 32512
Kernel command line: console=ttyS0,115200 mem=128M@0x00000000 init=/sbin/preinit root=/dev/mtdblock1 noinit
PID hash table entries: 512 (order: 9, 2048 bytes)
```

At the bottom of the interface, there are three buttons: 'Apply Changes <', 'Clear Changes <', and 'Review Changes <'. The URL 'http://www.fidelity-comtech.com' is visible in the footer.

Figure 40 – Kernel Ring Buffer

## 5.6 System Tab

The **System** menu contains the following tabs:

- **Settings** – system settings, time settings, Webif<sup>2</sup> settings
- **Password** – password change
- **Backup and Restore** – options to backup or restore configuration and entire flash
- **Upgrade** – UpGrade Phocus Array System firmware
- **Reboot**

### 5.6.1 Settings

Use this screen to enter a **Host Name** for the Phocus Array System, set the **Timezone** and **NTP Servers**, and select **Webif<sup>2</sup> Settings**.

**Limits/caution:** Only letters and numerals may be used for the **Host Name** (a-z, A-Z and 0-9).  
No spaces or special characters may be used.

Phocus Array™  
by Fidelity Comtech, Inc.

Phocus Array v2.1 beta  
Host: phocusarray  
Uptime: 2:26  
Load: 0.16, 0.04, 0.01

Info Graphs Status Log **System** Network PhocusArray - Logout

Settings Password Backup & Restore Upgrade Reboot

### System Settings

**System Settings**

Host Name

**Time Settings**

Timezone  **Timezone:** Set up your time zone according to the nearest city of your region from the predefined list.

POSIX TZ String

NTP

Primary NTP Server

Secondary NTP Server

**Webif<sup>2</sup> Settings**

☐ Enable visual effects

Language

<http://www.fidelity-comtech.com> **Apply Changes <**  
**Clear Changes <**

Figure 41 – System Settings

## 5.6.2 Password

Use this screen to change the password.

Password guidelines include using:

- Eight (8) or more characters including letters, numerals and non-alphanumeric characters.
- Uppercase on more than the first letter. Passwords are case sensitive.
- The first letter from each word in a phrase (e.g., C\$200wpG, represents "Collect \$200 when passing Go").

Phocus Array™  
by Fidelity Comtech, Inc.

Phocus Array v2.1 beta  
Host: phocusarray  
Uptime: 2:27  
Load: 0.06, 0.03, 0.00

Info Graphs Status Log System Network PhocusArray - Logout

Settings Password Backup & Restore Upgrade Reboot

### Password

**Password Change**

New Password:

Confirm Password:

<http://www.fidelity-comtech.com>

Save Changes

Apply Changes <<  
Clear Changes <<  
Review Changes <<

Figure 42 – Password Change

### 5.6.3 Backup and Restore

Use this screen to perform routine backup of files and to restore previous configurations. Most users should **only** backup their **Configuration**.

Caution: Do **not** backup or restore the **Entire Flash**. This is for development use only

The screenshot shows the 'Backup and Restore' page of the Phocus Array v2.1 beta web interface. The page has a dark blue header with the title 'Phocus Array™ by Fidelity Comtech, Inc.' and system status information: 'Host: phocusarray', 'Uptime: 2:28', and 'Load: 0.03, 0.03, 0.00'. A navigation bar includes links for 'Info', 'Graphs', 'Status', 'Log', 'System', 'Network', 'PhocusArray', and 'Logout'. Below this is a secondary bar with 'Settings', 'Password', 'Backup & Restore' (the active tab), 'Upgrade', and 'Reboot'. The main content area is titled 'Backup and Restore' and features two radio buttons: 'Configuration' (selected) and 'Entire Flash'. Under the 'Configuration' section, there is a form to 'Name this configuration:' with a text input containing 'phocusarray' and a 'Backup' button. The 'Restore Configuration' section shows 'Saved config.tgz' and a 'file:' input with a 'Browse...' button and a 'Restore' button. At the bottom, there is a footer with the URL 'http://www.fidelity-comtech.com' and three buttons: 'Apply Changes <<', 'Clear Changes <<', and 'Review Changes <<'. A large, faint watermark 'V2.1' is visible in the background of the page.

Figure 43 – Backup and Restore

### 5.6.4 Uploading Firmware UpDates or UpGrades

Use this screen to upload Phocus Array System firmware UpDates or UpGrades when provided by Fidelity Comtech, Inc. or an FCI Authorized Channel Partner.

The screenshot shows the Phocus Array web interface for the Firmware Upgrade section. The header includes the Phocus Array logo and version (v2.1 beta), host name (phocusarray), uptime (2:28), and load (0.02, 0.02, 0.00). The navigation bar contains links for Info, Graphs, Status, Log, System, Network, PhocusArray, and Logout. Below the navigation bar, there are tabs for Settings, Password, Backup & Restore, Upgrade, and Reboot. The main content area is titled "Firmware Upgrade" and features a "Keep current config" checkbox. Below this, there is a label "Firmware image to upload:" followed by a text input field, a "Browse..." button, and an "Upgrade" button. At the bottom of the interface, there are links for "Apply Changes <<", "Clear Changes <<", and "Review Changes <<".

Phocus Array™  
by Fidelity Comtech, Inc.

Phocus Array v2.1 beta  
Host: phocusarray  
Uptime: 2:28  
Load: 0.02, 0.02, 0.00

Info Graphs Status Log System Network PhocusArray - Logout

Settings Password Backup & Restore Upgrade Reboot

**Firmware Upgrade**

Options:  
Firmware image to upload:

☐ Keep current config

<http://www.fidelity-comtech.com>

Apply Changes <<  
Clear Changes <<  
Review Changes <<

Figure 44 – Firmware Uploads

### 5.6.5 Reboot

Use this screen to reboot the Phocus Array System. The system will be taken out of service for about two minutes when rebooted. It boots to the last saved/applied configuration.

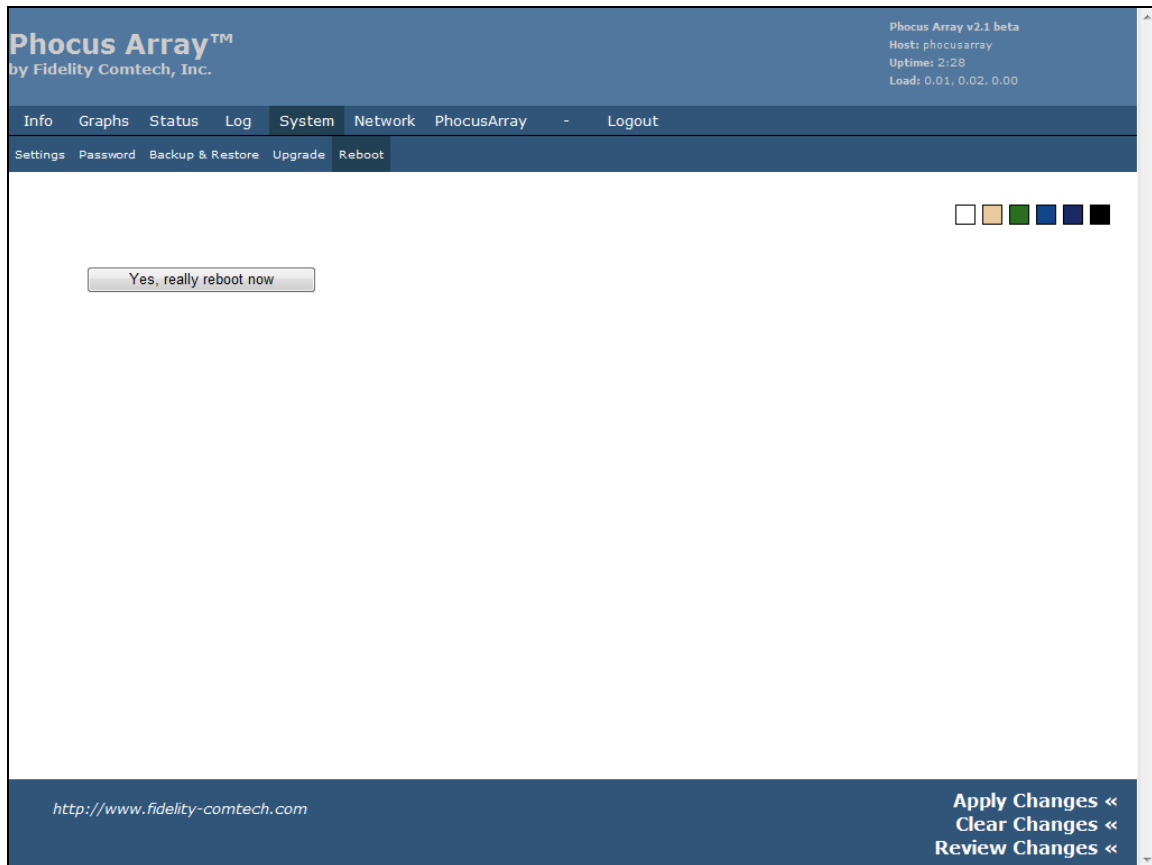


Figure 45 – Reboot

## 5.7 Network Tab

The **Network** menu contains the following tabs:

- **Configuration** – system configuration, wired and wireless configuration, gateway, and DNS server
- **Wireless** – wireless adapter wifi0 configuration, wireless virtual adapter configuration for wireless card wifi0
- **DHCP Server** – configuration of DHCP server for LAN
- **Hosts** – host names, static IP addresses (for DHCP)
- **Tweaks** – networking tweaks, conntrack settings

### 5.7.1 Configuration

Use this screen to configure the overall function of the Phocus Array System as an **AP Bridge**, **AP Router**, **Client Router**, or **Ad Hoc Router**. Once a system function is selected, the appropriate fields in the lower parts of the screen can be completed with information for your application. The **Wired** and **Wireless** interfaces can be configured with static IP addresses.

**Phocus Array™**  
by Fidelity Comtech, Inc.

Phocus Array v2.1 beta  
Host: phocusarray  
Uptime: 2:29  
Load: 0.01, 0.02, 0.00

Info Graphs Status Log System **Network** PhocusArray - Logout

Configuration Wireless DHCP Server Hosts Tweaks

### System Configuration

System Configuration AP Bridge

**Instructions to Modify Configuration:**  
 1) Select System Configuration, IP addresses, etc.  
 2) Press "Save Changes"  
 3) **PRESS "APPLY CHANGES" TO MAKE CHANGES TAKE EFFECT**  
 4) Turn on the radio by modifying settings on the Network: Wireless page.  
[Popup System Configurations Examples.](#)

### Interface 1 Configuration

**Wired/Wireless**

IP Address

Netmask

**IP Address:**  
This is the IP address for this interface

**Netmask:**  
This bitmask indicates what addresses are included on this interface. (e.g. 255.255.255.0)

### Gateway

Default Gateway

### DNS Servers

**Note:**  
You need save your settings on this page before adding/removing DNS servers

Figure 46 – System Configuration

## 5.7.2 Wireless

Use this screen to configure **Wireless Adapter wifi0** or **Wireless Virtual adapter for Wireless Card wifi0**.

**Caution:** Modification of the **Encryption Type** requires the Phocus Array System to be rebooted. After saving and applying changes, you must reboot the system for the new encryption settings to take effect.

**Phocus Array™**  
by Fidelity Comtech, Inc.

Phocus Array v2.1 beta  
Host: phocusarray  
Uptime: 2:22  
Load: 0.00, 0.00, 0.00

Info Graphs Status Log System Network PhocusArray - Logout

Configuration Wireless DHCP Server Hosts Tweaks

### Wireless Configuration

#### Wireless Adapter wifi0 Configuration

Radio: On

Mode: 802.11B

Channel: 9

Wireless Distance (In Meters): 10000

Monitor Wired Connection: Off

**Atheros Wireless Configuration:**

**Wireless Distance:**  
You must enter a number that is the distance of your longest link.

**Monitor Wired Interface:**  
Enabling this option provides periodic monitoring of the wired interface. Should the wired interface become non-functional, the wireless interface will become disabled.

#### Wireless Virtual Adaptor Configuration for Wireless Card wifi0

ESSID Broadcast: Show

ESSID: FCI\_THUNDER

Encryption Type: WEP

Passphrase: thequickbrownfox

Generate 40bit Keys Generate 128bit Key

WEP Key 1: 5f6d7f3595ffc1ab9d6

WEP Key 2:

WEP Key 3:

WEP Key 4:

**Background Client Scanning:**  
Enables or disables the ability of a virtual interface to scan for other access points while in client mode. Disabling this allows for higher throughput but keeps your card from roaming to other access points with a higher signal strength.

**Encryption Type:**  
To use WEP (open mode): (1) Select WEP from Encryption Type.  
2) Enter Passphrase text.  
3) Press "Generate 40bit Keys" or "Generate 128bit Key".  
4) Select one of Key 1 to Key 4 -- Optionally you may enter a custom **hex** key in the the selected text box but please ensure it is the correct length. i.e. 128bit keys are 26 characters long with values of 0-9,a-f. e.g. 11223344556677889900aabbcc, 40bit keys are 10 characters (note you still have to do steps 2) and 3).  
5) Press Save Changes.

**6) Press Apply Changes**  
Note: WPA/WPA2 (PSK) is not available in Ad-Hoc mode.

Save Changes

Figure 47 – Wireless Configuration

### 5.7.3 DHCP Server

The **DHCP Server** is enabled and disabled from this page. When enabled, it hands out IP addresses using the parameters from this page.

The DHCP server serves:

- The **wireless** interface when the system configuration is **AP Router** or **AP Bridge**.
- The **wired** interface when the system configuration is **Client Router**.

The screenshot shows the Phocus Array web interface. The top header includes the logo 'Phocus Array™ by Fidelity Comtech, Inc.' and system status: 'Phocus Array v2.1 beta', 'Host: phocusarray', 'Uptime: 2:35', and 'Load: 0.00, 0.00, 0.00'. A navigation bar contains links: Info, Graphs, Status, Log, System, Network, PhocusArray, -, and Logout. Below this is a sub-navigation bar with Configuration, Wireless, DHCP Server, Hosts, and Tweaks. The main content area is titled 'DHCP Server Configuration' and features a 'DHCP Server For LAN' section. This section contains five configuration items: 'DHCP Service' (a dropdown menu set to 'Disabled'), 'DHCP Range Start' (input field with '150'), 'DHCP Range End' (input field with '199'), 'DHCP Default Lease Minutes' (input field with '600'), and 'DHCP Max Lease Minutes' (input field with '7200'). On the right side of the configuration area are five colored squares (white, yellow, green, blue, black). At the bottom right, there is a 'Save Changes' button and three links: 'Apply Changes <<', 'Clear Changes <<', and 'Review Changes <<'. The footer on the left shows the URL 'http://www.fidelity-comtech.com'.

DHCP Server For LAN	
DHCP Service	Disabled ▼
DHCP Range Start	150
DHCP Range End	199
DHCP Default Lease Minutes	600
DHCP Max Lease Minutes	7200

Figure 48 – DHCP Server Configuration

## 5.7.4 Hosts

Use this screen to enter the **IP Address** and **Host Name**, and **Static IP addresses (for DHCP)** during system setup. See Section 4.1 *Performing Initial Configuration*.

**Phocus Array™**  
by Fidelity Comtech, Inc.

Phocus Array v2.1 beta  
Host: phocusarray  
Uptime: 2:36  
Load: 0.00, 0.00, 0.00

Info Graphs Status Log System Network PhocusArray - Logout

Configuration Wireless DHCP Server Hosts Tweaks

### Configured Hosts

**Host Names**

IP Address	Host Name	
127.0.0.1	localhost.	<a href="#">Remove</a>

**Host Names:**  
The file /etc/hosts is used to look up the IP address of a device connected to a computer network. The hosts file describes a many-to-one mapping of device names to IP addresses. When accessing a device by name, the networking system attempts to locate the name within the hosts file before accessing the Internet domain name system.

**Static IP addresses (for DHCP)**

MAC Address	IP Address	
<input type="text"/>	<input type="text"/>	<input type="button" value="Add"/>

**Static IP addresses:**  
The file /etc/ethers contains database information regarding known 48-bit ethernet addresses of hosts on an Internetwork. 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.

**Active DHCP Leases**

MAC Address	IP Address	Name	Expires in
There are no known DHCP leases.			

<http://www.fidelity-comtech.com>

[Apply Changes <<](#)  
[Clear Changes <<](#)  
[Review Changes <<](#)

Figure 49 – Host Configuration

## 5.7.5 Tweaks

Enter networking tweaks to improve performance.

**Phocus Array™**  
by Fidelity Comtech, Inc.

Phocus Array v2.1 beta  
Host: phocusarray  
Uptime: 2:36  
Load: 0.14, 0.03, 0.01

Info Graphs Status Log System Network PhocusArray - Logout

Configuration Wireless DHCP Server Hosts Tweaks

### Networking Tweaks

#### Conntrack Settings

Maximum Connections	<input type="text" value="8192"/>
Generic Timeout	<input type="text" value="600"/>
ICMP Timeout	<input type="text" value="30"/>
TCP Established Timeout	<input type="text" value="432000"/>
UDP Timeout	<input type="text" value="30"/>
UDP Stream Timeout	<input type="text" value="180"/>

**Maximum Connections:**  
This is the maximum number of simultaneous connections your router can track. A larger number means more RAM use and higher CPU utilization if that many connections actually end up used. It is usually best to leave this at its default value.

**TCP Established Timeout:**  
This is the number of seconds that a established connection can be idle before it is forcibly closed. Sometimes connections are not properly closed and can fill up your conntrack table if these values are too high. If they are too low, then connections can be disconnected simply because they are idle.

**WARNING:** Your default TCP established timeout value is very high (5 days). Most peer-2-peer users should lower it. A safe setting is probably 1 day (86400), though some users prefer 1 hour (3600).

<http://www.fidelity-comtech.com>

Save Changes

Apply Changes <<  
Clear Changes <<  
Review Changes <<

Figure 50 – Networking Tweaks

## 5.8 PhocusArray Tab

The **PhocusArray** menu contains the following tabs:

- **Configure Antenna** – set beamsteering mode, set sweep interval
- **Monitor Stations** – monitor associated client stations and their direction
- **Manage Stations** – assign nicknames to associated client stations
- **Upload Patterns** – upload antenna pattern files, view loaded patterns

### 5.8.1 Configure Antenna

Use this screen to configure an antenna's Beamsteering Mode and Sweep Interval.

- **Set Beamsteering Mode** is used to enable either a static antenna pattern (e.g. **Omnidirectional**, **Co-Phase 0 deg**, etc.) or a **Dynamic** mode.
- **Set Sweep Interval** is used to set the number of seconds between sweeps.

Phocus Array™  
by Fidelity Comtech, Inc.

Phocus Array v2.1 beta  
Host: phocusarray  
Uptime: 2:37  
Load: 0.09, 0.02, 0.00

Info Graphs Status Log System Network **PhocusArray** - Logout

Configure Antenna Monitor Stations Manage Stations Upload Patterns

### Configure Antenna

**Set Beamsteering Mode**

Antenna Mode

**Phocus Array Antenna Modes:**  
The "Dynamic" mode causes the Phocus Array to point the antenna toward the station to which it is transmitting the current packet. All other modes are static and are described in the pull down menu.

**Set Sweep Interval**

Sweep Interval

**Sweep Interval:**  
In order to work in Dynamic mode, the Phocus Array must keep track of the direction of each station. The Sweep Interval is how often (in seconds) this check is made.

Save Changes

Apply Changes <<  
Clear Changes <<  
Review Changes <<

<http://www.fidelity-comtech.com>

Figure 51 – Configure Antenna

### Set Beamsteering Mode

Select the antenna system configuration with the **Set Beamsteering Mode** control:

- A static state selection such as **Co-Phase 0 deg** configures the antenna to a particular pattern and leaves it that way until administered differently. Both transmitted and received radio communications use the designated pattern.

- **Dynamic** mode allows the Phocus Array System to determine approximately where the client radios are located, and sends any transmissions to a client radio using one of the system patterns for that client (receives are done with an omni-directional pattern).

Defining custom patterns may improve your performance depending on your application. See Section 2.5 for more on custom patterns.

### Static States Selections

A user can select a static state, and thereby disable scanning of client radios and fix the antenna in a predetermined pattern or azimuth.

- **Omnidirectional** is **0 Phase** which is preset to the Omnidirectional pattern for the factory configured patterns. All communications (transmit and receive) are performed with this Omnidirectional pattern
- **Co-Phase 0 deg** to **Co-Phase 337.5 deg** creates an antenna pattern that optimizes transmissions and receives in one direction. “0” degrees is indicated on the Phocus Array System by the orientation tab that is stamped on the bottom of the housing (see Figure 10). If you look down on the antenna from above as if it were a clock face, 90 degrees is at 9 o’clock, 180 degrees is at 6 o’clock and 270 degrees is at 3 o’clock.

You must click the **Save Changes** button and then click **Apply Changes** for the new antenna pattern to take effect. This setting will take effect immediately and remain effective even through system power cycles.

**Phocus Array™**  
by Fidelity Comtech, Inc.

Phocus Array v2.1 beta  
Host: phocusarray  
Uptime: 2:37  
Load: 0.03, 0.02, 0.00

Info Graphs Status Log System Network PhocusArray - Logout

Configure Antenna Monitor Stations Manage Stations Upload Patterns

### Configure Antenna

**Set Beamsteering Mode**

Antenna Mode: **Dynamic** (selected)  
 Dynamic  
 Omni, 0 Phase  
 Cophase 0 deg  
 Cophase 22.5 deg  
 Cophase 45 deg  
 Cophase 67.5 deg  
 Cophase 90 deg  
 Cophase 112.5 deg  
 Cophase 135 deg  
 Cophase 157.5 deg  
 Cophase 180 deg  
 Cophase 202.5 deg  
 Cophase 225 deg  
 Cophase 247.5 deg  
 Cophase 270 deg  
 Cophase 292.5 deg  
 Cophase 315 deg  
 Cophase 337.5 deg

**Phocus Array Antenna Modes:**  
The "Dynamic" mode causes the Phocus Array to point the antenna toward the station to which it is transmitting the current packet. All other modes are static and are described in the pull down menu.

**Set Sweep Interval**

Sweep Interval: [ ]

**Sweep Interval:**  
In order to work in Dynamic mode, the Phocus Array must keep track of the direction of each station. The Sweep Interval is how often (in seconds) this check is made.

<http://www.fidelity-comtech.com>

[Save Changes](#)

[Apply Changes <<](#)  
[Clear Changes <<](#)  
[Review Changes <<](#)

Figure 52 – Set Beamsteering Mode

Generally you'll get the best reception using the Phocus Array System in the following modes (best first) and adhering to the installations recommendations in Section 3.1.3.

- Custom Pattern (designed for your application).
- **Co-Phase 0 deg to Co-Phase 337.5 deg** Patterns – The factory pre-defined patterns Co-Phase have high efficiency, generate less interference, provide better spectral reuse, and afford more privacy than a omni pattern.
- **Dynamic Mode**
  - In **Dynamic** mode, the Phocus Array System periodically “sweeps” (every **Sweep Interval**) using all stored directional beam patterns (States) to determine which pattern results in the best signal from the particular client's radio. All signal values are stored, and the best signal value determines the beam pattern that will be used for transmitting data to that specific station.
  - If **Dynamic** mode is selected, you should select the **Sweep Interval**. Essentially, the **Sweep Interval** tells the Phocus Array System how often to stop and recompute the directional optimization for each associated wireless client. The **Sweep Interval** can be set to anywhere from 5 to 300 seconds.
- Default Pattern (**Omnidirectional** mode).

Consult with Fidelity Comtech if you have special requirements for scanning.

### 5.8.2 Monitor Stations

When in **Dynamic** mode the Phocus Array System periodically scans through all antenna patterns (except the Default state) searching for the strongest RSSI value of associated client stations and determines their approximate direction (or more precisely the “angle of arrival” of its packets). Utilizing **Phocus Array – Monitor Stations**, you can view the results of the most recent antenna system scan in **Dynamic** mode.

After clicking the **Monitor Stations** button, you may be asked to accept and download a Java component from the Phocus Array System. This Fidelity Comtech authored component is a graphic that allows you to “see” a radar-like display of the direction of 802.11-associated clients. Click **Yes** to accept the download of the component.

See Figure 53 for an example of the screen, in this case, illustrating two client stations associated with the system. By clicking the **Plot** checkbox in the first column, the radar display will draw a line illustrating the “angle of arrival” (i.e. the approximate direction) of the station with relationship to the Phocus Array System.

Note: The green orientation mark at 0 degrees at the top of the radar display – it represents the orientation mark on the Phocus Array System base, as if you are looking down on the top of the system.

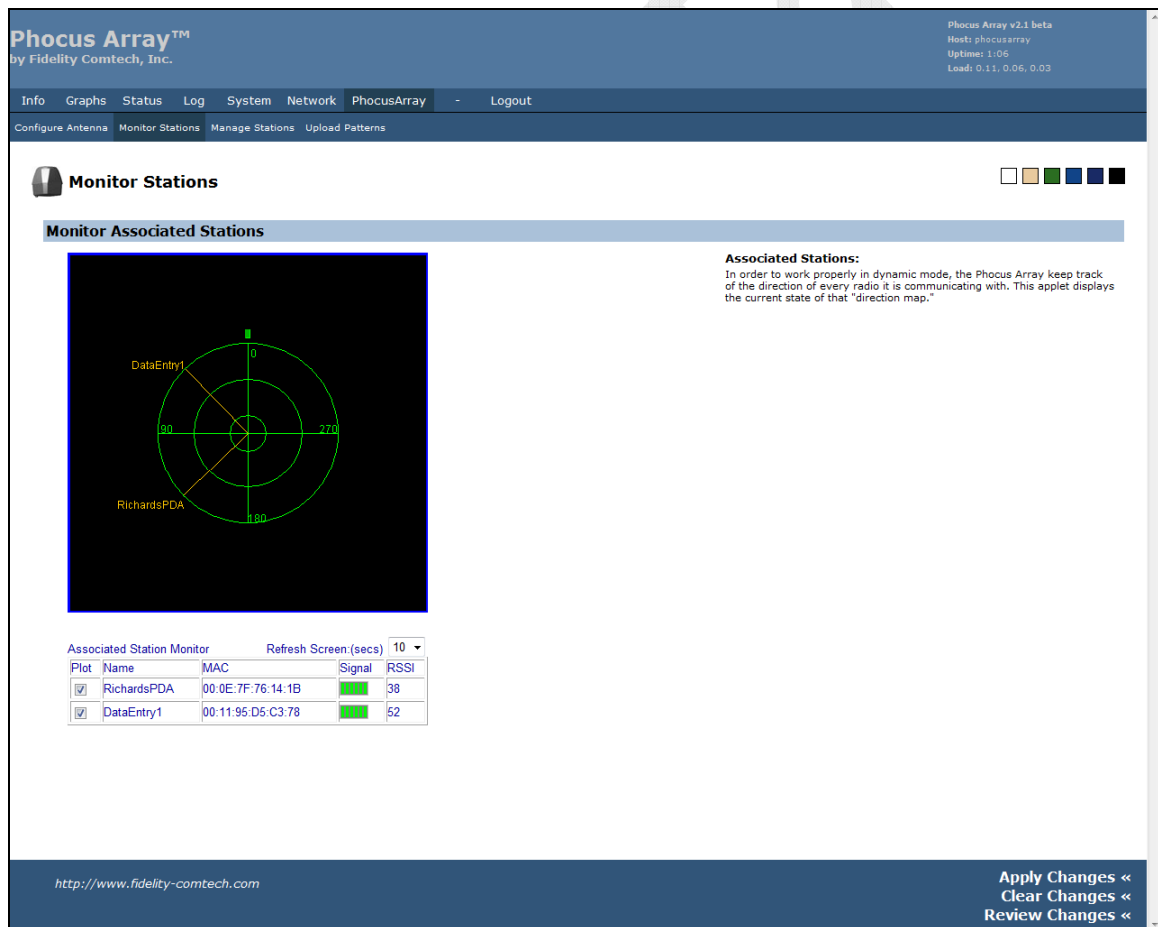
The **Refresh Screen** control sets the rate at which the browser asks the Phocus Array System for data to display, and thus updates the radar display. (This is different than

the **Sweep Interval** described on the **Antenna Configuration** screen, which is how often the antenna system scans the for station position.) Ideally the **Refresh Screen** setting should be the same or larger than the **Sweep Interval**.

If a station is moving (e.g. a laptop PC or handheld pocket computer) the radar display will up automatically update changes in apparent direction of the client. Note, even if a client station is stationary, the display may occasionally show different directions for the client. This is normal and reflects the changing conditions of the RF environment, including reflections, obstructions, and possibly movement of other objects in the environment or the fact that a client may be aligned between two antenna states.

**Note:** Display of direction and RSSI values only is relevant to **Dynamic** mode. Even though Station **MAC** addresses are listed in the **Associated Station Monitor** table when Static mode is selected; the radar plot produced is only relevant to the Dynamic mode scans.

**Note:** If a new station associates, its MAC will automatically appear in the **Associated Station Monitor** table.



**Figure 53 – Monitor Associated Stations**

If you download new antenna patterns with a greater or less number of states, the display will adapt to however many states are loaded in the Phocus Array System.

If a new client station associates with the Phocus Array System, its MAC will automatically appear in the **Associated Station Monitor** table with a name of **unnamed**. The Phocus Array System then attempts to scan the new client station and if successful, a direction will be established it. To display the direction, click the **Plot** checkbox adjacent to the MAC. If the client station cannot be successfully scanned, its MAC address still appears in the **Associated Station Monitor** table, but with a **0** RSSI value.

**Note:** With the antenna in **DYNAMIC** mode an associated client station with an incomplete/indeterminate scan will appear as a MAC address or name in the center of the radar display.

**Note:** With the antenna in **STATIC** mode an associated client station MAC/name will appear in the center of the radar display.

An incomplete **Dynamic** mode scan can be the result of a client station being turned off or moving out of range or aggressive radio power management by the client.

### 5.8.3 Manage Stations

By utilizing the **Manage Stations** screen in the **PhocusArray** menu, as shown below, you can give a **Nickname** (name) to a client station. This name is local to the Phocus Array System and is not related to 802.11 broadcast nickname.

Until a client station is given a name using this screen, the **Associated Station Monitor** described in Section 5.8.2 only displays MAC addresses in the radar plot. Naming stations allows you to assign meaningful names to clients in your network. It also makes it easy to see when a new (perhaps unwelcome) station arrives in the network.


To assign a name, type a character string into the text box to the right of MAC address. It can be anything you feel descriptive of the client such as “Ricks Laptop” or “Node in Room 6”. After entering the desired names, click the **Apply** button to have the Phocus Array System memorize the MAC/Name pair. This name will remain in the system associated with the MAC through power cycles, and even if the client station becomes disassociated. The next time station associates, the system will automatically display the name on this screen as well as the **PhocusArray – Monitor Stations** screen.


Phocus Array™  
by Fidelity Comtech, Inc.

Phocus Array v2.1 beta  
Host: phocusarray  
Uptime: 1:07  
Load: 0.02, 0.04, 0.03

InfoGraphsStatusLogSystemNetworkPhocusArrayLogout

Configure AntennaMonitor StationsManage StationsUpload Patterns

Manage Stations



Manage Associated Stations

MAC	Nickname
00:0E:7F:76:14:1B	RichardsPDA
00:11:95:D5:C3:78	DataEntry1

**Nicknames for Stations:**  
To make it easier to visualize what is happening, the interface makes it possible to create a nickname that is associated with a particular MAC address.

Save Changes

Apply Changes «  
Clear Changes «  
Review Changes «

<http://www.fidelity-comtech.com>

Figure 54 – Manage Associated Stations

Note: After clicking the **Apply** button, the names will be stored, but the screen may not refresh correctly on this screen. Click your browser's **Refresh** button to see the newly assigned names.

### 5.8.4 Upload Patterns

Use this screen to upload custom antenna pattern files, and to view pre-loaded patterns. Fidelity Comtech can design antenna patterns for your facility upon request.

You can review a graphic of each of the currently loaded patterns in the Phocus Array System by clicking the **Next State** or **Previous State** buttons. Clicking these buttons does not change the state or operation of the system. Keep in mind the orientation mark illustrated in these graphics and their relationship to the actual orientation of the mark on the Phocus Array System case. Dynamic mode is not illustrated in this pane.

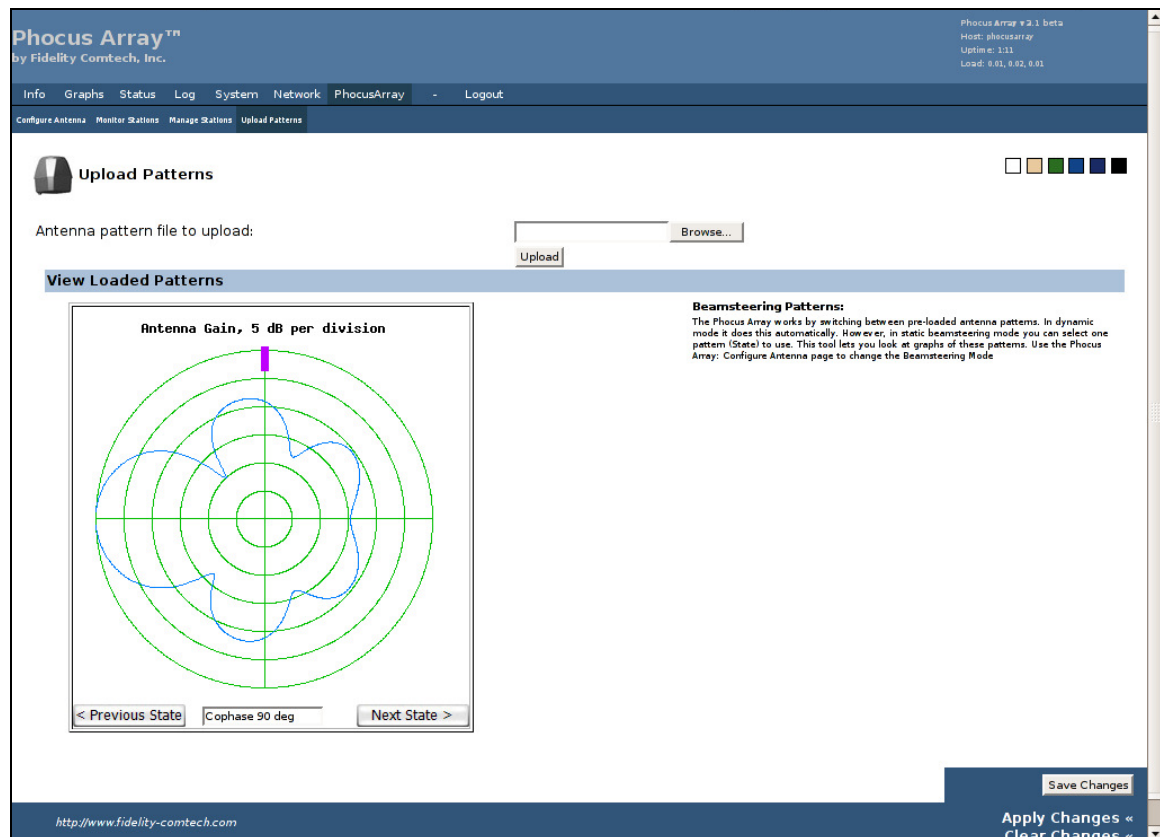


Figure 55 – View Loaded Patterns

**Caution:** Uploading a new set of patterns permanently overwrites the factory default patterns. Contact Fidelity Comtech for custom patterns such as those described in Section 2.3.

To upload a new patterns file:

1. Click the **Browse** button to navigate to the location of the file.
2. Select an appropriate file.
3. Click the **Upload** button.
4. The upload and programming of new patterns into the system takes about one minute, after which the antenna system will be in the *static* “Default” state.

5. Review the newly download patterns using the **View Loaded Patterns** control.
6. Click the **Configure Antenna** button and use the **Antenna Mode** drop-down list to select and activate a different static pattern or **Dynamic** mode.

## 5.9 Logout Tab

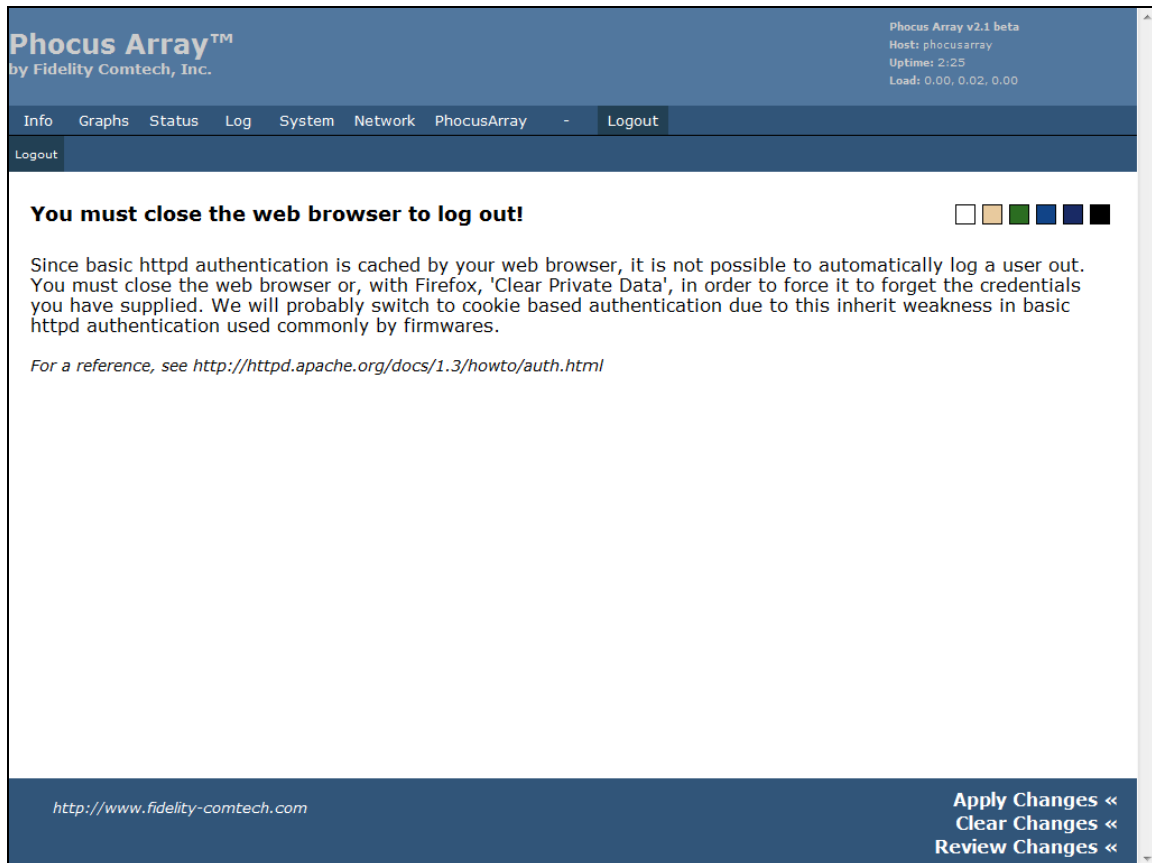


Figure 56 – Logout