



INSTRUCTION MANUAL
FOR
MODEL 2873-ETH
SNMP MANAGEMENT MODULE

TABLE OF CONTENTS

CHAPTER I OVERVIEW	1
1. OVERVIEW	1
CHAPTER II SPECIFICATIONS	2
2 SPECIFICATIONS.....	2
CHAPTER III INSTALLATION	3
3. INSTALLATION.....	3
CHAPTER IV REMOTE CONTROL OVERVIEW	4
4. REMOTE CONTROL OVERVIEW	4
4.1 <i>Compatible Clients</i>	4
4.1.1 Windows Clients.....	4
4.1.2 Linux/Unix Clients	4
4.2 <i>User Created Software</i>	5
4.3 <i>Connecting to the Servers</i>	5
4.3.1 Port Numbers	5
4.3.2 Default User names and Passwords	5
4.4 <i>SSH and Telnet Interface</i>	5
4.4.1 Read Commands.....	6
4.4.2 Set Commands.....	6
4.4.3 <i>Slot and List Slots Commands</i>	6
4.4.4 Help Command.....	7
4.5 <i>SNMP Interface</i>	7
4.5.1 <i>SNMP Traps</i>	8
4.6 <i>HTML Interface</i>	9
4.6.1 <i>Status Web Page</i>	10
4.6.2 <i>IP Setup Web Page</i>	11
4.6.3 <i>SNMP Setup Web Page</i>	12
4.6.4 <i>User Setup Web Page</i>	13
4.6.5 <i>Misc Setup Web Page</i>	14
CHAPTER V REMOTE CONTROL PARAMETERS.....	15
5 REMOTE CONTROL PARAMETERS	15
5.1 <i>IP Setup Parameters</i>	16
5.1.1 IP Address	16
5.1.2 Netmask.....	16
5.1.3 Gateway.....	16
5.1.4 PHY Status	16
5.1.5 Ethernet Bytes Sent.....	17
5.1.6 Ethernet Bytes Received.....	17
5.1.7 Dropped Packets	17
5.1.8 Commit.....	17
5.1.9 Clear	17
5.2 <i>User Configuration Parameters</i>	19
5.2.1 User Add.....	19
5.2.2 User Remove	19
5.2.3 User Password	19
5.2.4 User Password Commit	20
5.2.5 User Level	20
5.2.6 User List	20
5.3 <i>User Interface Parameters</i>	22
5.3.1 Current Control Connections	22
5.3.2 Maximum Control Connections.....	22
5.3.3 SSH Port	22

- 5.3.4 Telnet 22
- 5.3.5 Telnet Port 23
- 5.3.6 SNMP 23
- 5.3.7 SNMP Port..... 23
- 5.3.8 SNMP RO Community 23
- 5.3.9 SNMP RW Community 24
- 5.3.10 SNMP SYS Location 24
- 5.3.11 SNMP SYS Contact..... 24
- 5.3.12 SNMP Trap Port 24
- 5.3.13 SNMP Trap Host 24
- 5.3.14 SNMP Trap Timeout 25
- 5.4 *Miscellaneous Parameters* 26
 - 5.4.1 Version 26
 - 5.4.2 Modules Version..... 26
 - 5.4.3 Slot#..... 26

CHAPTER VI TROUBLESHOOTING..... 27

- 6. TROUBLESHOOTING..... 27
 - 6.1 *Cannot login as admin to the 2873-ETH*..... 27
 - 6.2 *Finding Port Numbers*..... 27

TABLE OF FIGURES

- Figure 1 – 2873-ETH Navigation 9
- Figure 2 – Status Web Page 10
- Figure 3 – IP Setup Web Page 11
- Figure 4 – SNMP Setup Web Page 12
- Figure 5 – Admin User Setup Web Page 13
- Figure 6 – Misc Setup Web Page 14

CHAPTER I OVERVIEW

1. OVERVIEW

The 2873-ETH SNMP Management Module for the AL2873 Chassis provides 10/100/1000 Ethernet remote control over the chassis and all installed modules. All commands and parameters that are available through our standard remote control interface are available to the 2873-ETH. The SNMP Management Module provides secure remote control interactions between the AL2873 Chassis and the user via SSH and SNMPv3. Also available as a remote control interface is a Telnet server that is disabled by default. The 2873-ETH provides the ability to add and remove users, as well as set different permissions for specific users.

The SNMP functionality of the 2873-ETH supports versions 1, 2c and 3 as they are defined by the Internet Engineering Task Force (IETF). The Management Information Bases (MIBs) for the AL2873 chassis and all modules supported by the AL2873 are available to the user on the CD that accompanies the 2873-ETH. The MIBs describe the structure of the management data of each device and also contain the Object Identifiers (OIDs) for easy integration into your Network Management System (NMS).

For more information about SNMP, MIBs, and OIDs visit: www.ietf.org.

For more information about the AL2873 and available modules visit: www.apogeelabs.com.

CHAPTER II SPECIFICATIONS

2 SPECIFICATIONS

Ethernet Interfaces:

- 10/100/1000 Mbps Ethernet Connectivity
- Protocols Supported
 - SNMP v1, v2c, v3
 - SSH
 - Telnet
 - TCP/IP
 - ARP

Remote Control:

- SNMP – versions 1, 2c, and 3
- SSH – Secure Shell
- Telnet – Unix/Linux Telnet and Microsoft Telnet Supported (Subset of functionality)
- NNAT Compatible
- User Level Access Control

Environment:

- Operating Temperature: 0° C to +50° C
- Storage Temperature: -40° C to +70° C
- Relative Humidity: up to 95% non-condensing

Mechanical:

- Single Slot Module (6" x 3" x 0.9")

CHAPTER III INSTALLATION

3. INSTALLATION

To install the 2873-ETH SNMP Management Module, remove power from the AL2873 chassis and install the 2873-ETH into slot 14. (NOTE: The 2873-ETH **must** be installed in slot 14, if the module is installed in any other slot, it will not be able to control any other installed modules) Attach the 2873-ETH to a switch or router and reconnect power to the AL2873.

To setup the IP configuration of the 2873-ETH, go to the setup page for the module on the front panel of the AL2873. To access slot 14, press the exit button, then press 1, then press 4. The IP configuration settings take effect as soon as they are entered.

CHAPTER IV REMOTE CONTROL OVERVIEW

4. REMOTE CONTROL OVERVIEW

All control interfaces have the same set of commands and parameters. These commands and parameters will be shown in the next chapters. The interface used to show the commands and parameters is Mozilla Firefox, followed by descriptions of each parameter. The commands, parameters, and values described in the next sections are valid through each interface. All commands in this document are denoted by **BOLD** font, all parameters in this document are denoted by ***BOLD ITALIC*** font, and all values in this document are denoted by ***BOLD ITALIC COURIER*** font.

The currently available remote control servers on the 2873-ETH are Telnet, SSH and SNMP. Please refer to the following sections for how to connect to each server with different clients.

4.1 Compatible Clients

4.1.1 Windows Clients

For Windows the following clients have been tested on the 2873-ETH:

- Telnet Clients
 - Command Line Telnet
 - Putty
- SSH Clients
 - Putty
- SNMP Clients
 - OpenNMS

4.1.2 Linux/Unix Clients

The following Linux/Unix Clients have been tested on the 2873-ETH:

- Telnet Clients
 - Command Line Telnet
- SSH Clients
 - OpenSSH Clients
- SNMP Clients
 - OpenNMS
 - Net-SNMP Clients, snmpget, snmpset, snmpwalk

4.2 User Created Software

For information on how to create compatible software, please see Application Note AP-30 on <http://www.apogeelabs.com/>. User created software is the sole responsibility of the creator, of said software, and Apogee Labs is not responsible for the support of non-Apogee Labs software.

4.3 Connecting to the Servers

4.3.1 Port Numbers

The following port numbers are user configurable, for more information see section 5.

Port Name	Default Port Number
SSH Port	22
Telnet Port	23
SNMP Server Port	161
SNMP Trap Port	162

4.3.2 Default User names and Passwords

The default user name is “admin” with the default password of “password”. See section 5.2 for more on user names, user levels and passwords.

4.4 SSH and Telnet Interface

After logging in, both the SSH and Telnet interfaces are virtually identical to the user. The following sections will further explain how to communicate to the unit using these two protocols. All remote controls are sent as simple ASCII packets. The format of these packets are:

COMMAND\r\n

COMMAND PARAMETER\r\n

COMMAND PARAMETER=VALUE\r\n

All packets should end with either a \r\n or \n, both are accepted. Both commands and parameters are case-insensitive and most values are also case-insensitive, with the exception of user parameters. All server responses will end with either an ACK (>) or NACK (?).

4.4.1 Read Commands

Read commands, combined with the parameter will return the current value of the parameter, i.e.:

```
Client – read PCM Input Rate\nServer – PCM Input Rate=999,997\r\n>
```

4.4.2 Set Commands

Set commands require both the parameter and the new value. The server response will return the parameter, value and ACK if correct or the error response and a NACK.

```
Client – set interface=TTL\nServer – Interface=TTL\r\n>
```

```
Client – set PCM Input Rate=10,000,000\nServer – Unknown Parameter for Set\r\n?
```

4.4.3 Slot and List Slots Commands

In order to navigate between modules, the user must use the slot command to change the current number of the slot which is being controlled. To find the currently controlled slot, type slot\r\n, this will return the current slot number:

```
slot\r\nSlot=14\r\n>
```

To change slots, type slot=NN\r\n, where NN is 0-16. The response, if valid is the same as the response to any set command. If the slot number is not valid, the response will report an error, i.e.:

```
Client – Slot=1\r\nServer – Invalid slot\r\n?
```

To list the populated slots, use the list slots command, i.e.:

```
Client – list slots\r\nServer – Slots\r\n06 – IOC502TX, IOC502TX, A\r\n07 – IOC504RX, IOC504RX, A\r\n08 – IOC561TX, IOC561TX, A\r\n09 – IOC561RX, IOC561RX, A\r\n10 – IOC597TX, IOC597TX, A\r\n11 – IOC597RX, IOC597RX, A\r\n14 – 2873-ETH, 2873-ETH, 1.0.0\r\n>
```

Each of these commands are available regardless of which module is being controlled.

4.4.4 Help Command

The **Help** command lists all the available commands for the module, showing which are READ/WRITE (RW) and which are READ-ONLY (RO). The **Help** response will have the following header:

```
<Module name> Ver. <Version Number><CR>>
```

The format of the following lines is:

```
<parameter name>: <parameter type>, <parameter attributes>, <parameter append>,  
<parameter value1>,..., <parameter valueN><CR>>
```

The <parameter type> is one of the following:

- DEC – Decimal
- TXT – Text
- STR – String
- HEX – Hex
- FLO – Float
- IP – IP address

The <parameter attributes> is one of the following:

- RO – read only
- RW – read write

The <parameter append> is a maximum of 10 characters long, this can be any value, i.e. ms, Mbps, kbps.

The <parameter values> is one of the following:

- <min>, <max> – for numerical ranges
- <value1>, <value2>,..., <valueN> – for text fields

Since all of the lines are returned in multiple buffers, the lines may be broken up into multiple lines. The second line always begins with a space.

4.5 SNMP Interface

The SNMP OID for the AL2873 is .1.3.6.1.4.1.29609.2873 and the SNMP OID for the 2873-ETH is .1.3.6.1.4.1.29609.2873.1051795. Each module which can be installed in the AL2873 has a module-specific OID. The MIBs for modules will be supplied on a CD when receiving new systems or modules.

4.5.1 SNMP Traps

The 2873-ETH automatically creates traps for Read-Only parameters for all modules installed in the AL2873 Chassis.

4.6 HTML Interface

The HTML interface is accessed according to section 4.1 and 4.3. The darker blue fields are read-only fields and the lighter blue fields are read-write. Once logged in, the 2873-ETH can be navigated according to the following image.

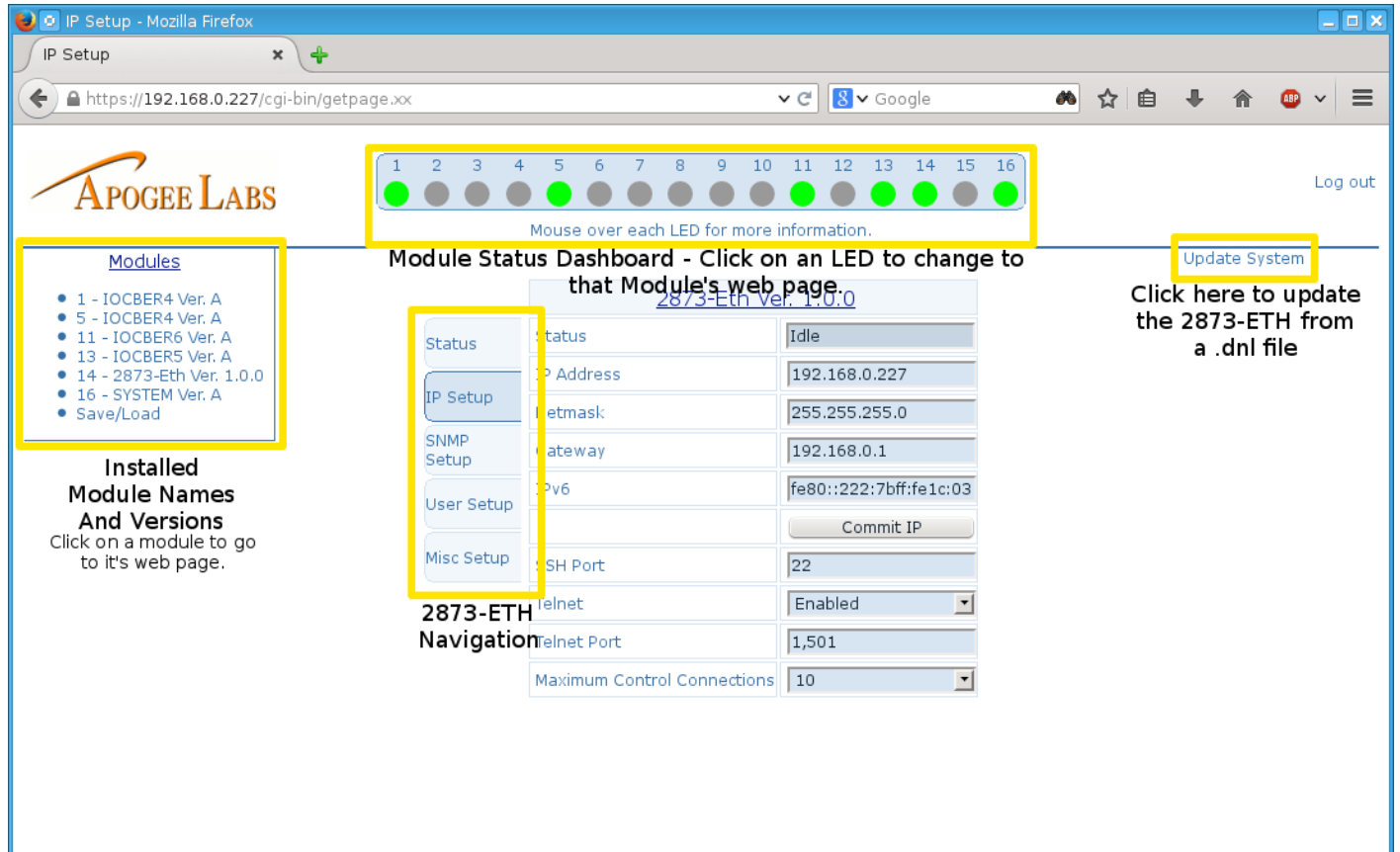


Figure 1 – 2873-ETH Navigation

4.6.1 Status Web Page

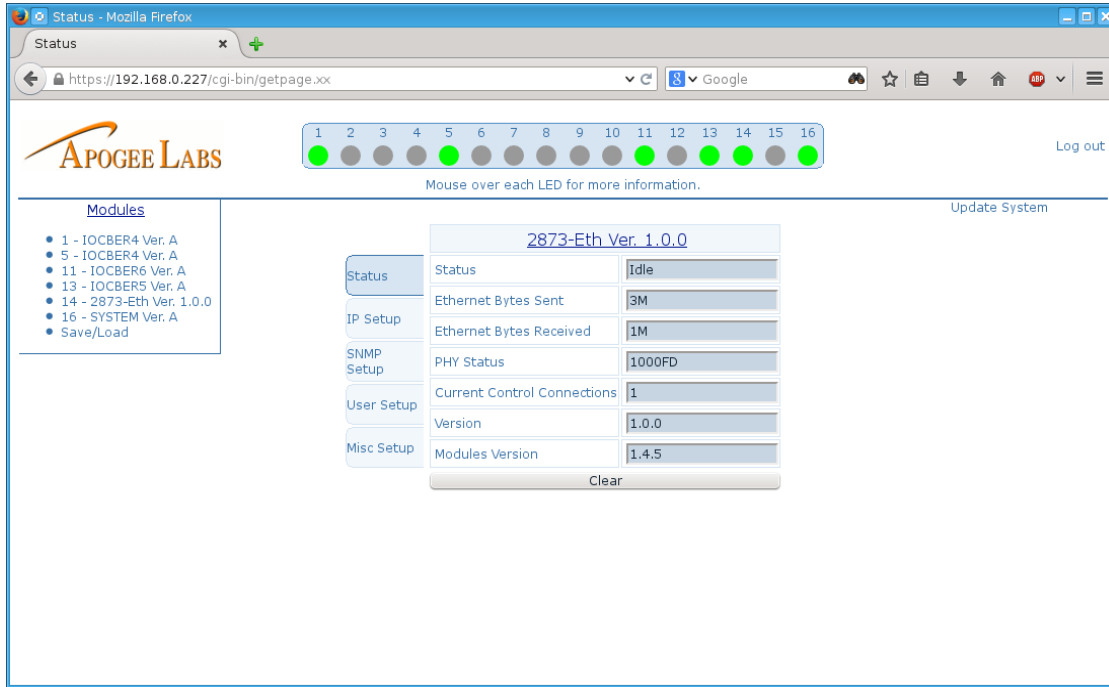


Figure 2 – Status Web Page

The status web page shows the Ethernet status and versions for the 2873-ETH. Refer to sections 5.1.4 PHY Status - 5.1.7 Dropped Packets, 5.3.1 Current Control Connections, and 5.4.1 Version - 5.4.2 Modules Version.

4.6.2 IP Setup Web Page



Figure 3 – IP Setup Web Page

The IP setup web page has settings for the IP address(both IPv4 and IPv6), the SSH and telnet port, enabling Telnet, and the maximum number of users connected to the 2873-ETH. Refer to sections 5.1.1 IP Address - 5.1.3 Gateway, 5.1.8 Commit, 5.3.3 SSH Port, 5.3.4 Telnet, 5.3.5 Telnet Port and 5.3.2 Maximum Control Connections.

4.6.3 SNMP Setup Web Page

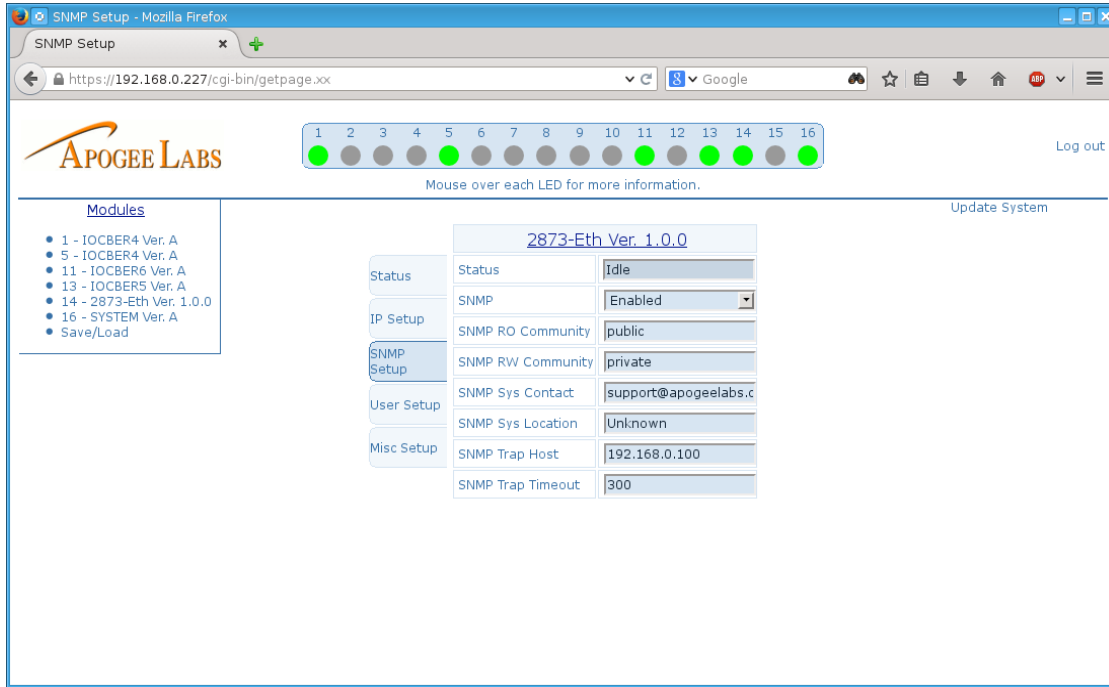


Figure 4 – SNMP Setup Web Page

The SNMP setup web page has settings to enable/disable SNMP(v2c and v3), setup the v2 read-only and read-write communities, the system contact, system location, trap host IP address and trap timeout. Refer to sections 5.3.6 SNMP - 5.3.14 SNMP Trap Timeout for these parameters.

4.6.4 User Setup Web Page

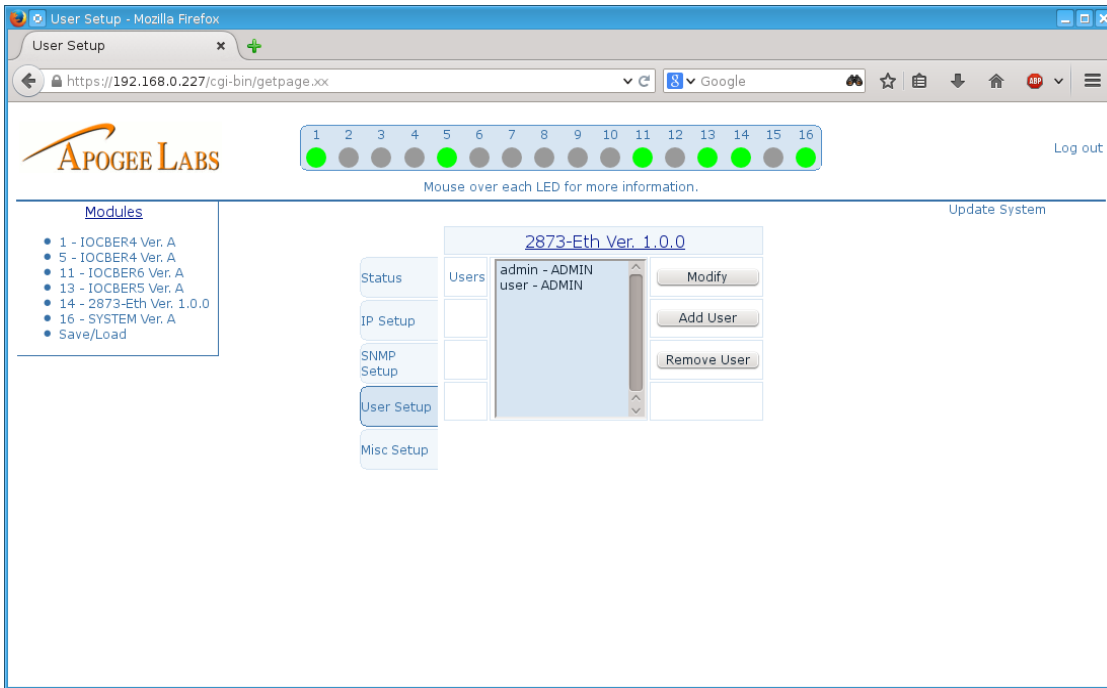


Figure 5 – Admin User Setup Web Page

The user setup page has two different looks, one for the admin user and one for the other users. The admin page shows the different users and allows the modification, addition, and removal of non-admin users. The other users page allows the user to change their own password. Refer to section 5.2 User Configuration Parameters.

4.6.5 Misc Setup Web Page

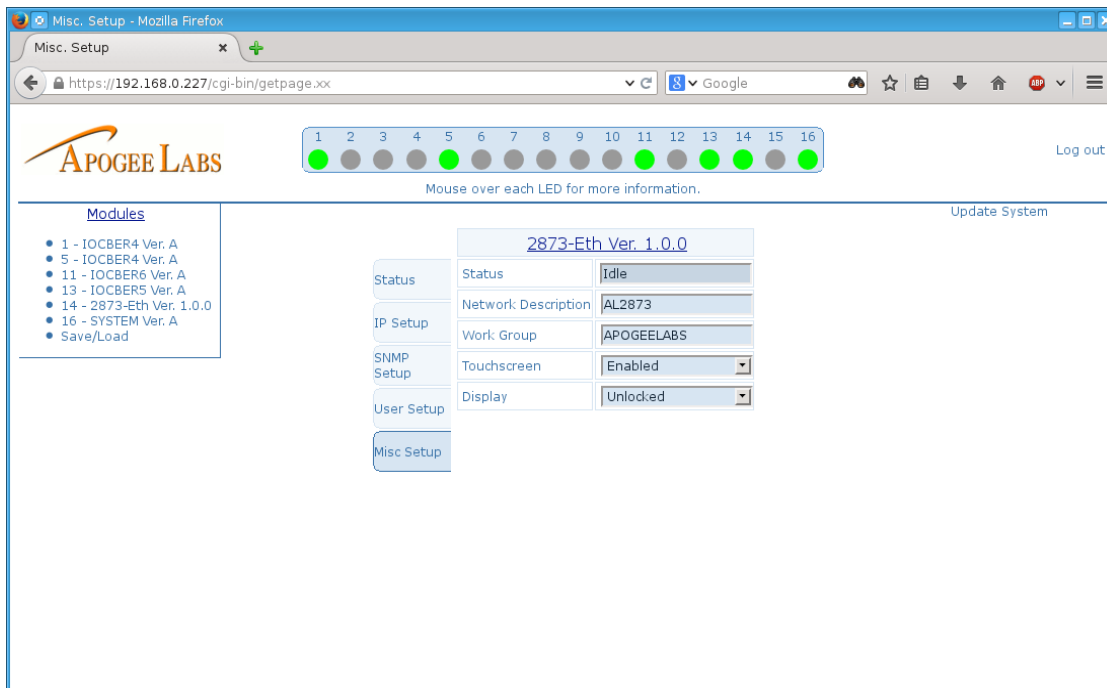


Figure 6 – Misc Setup Web Page

The Misc Setup page contains parameters pertaining to the Samba settings. Refer to section 5.4 Miscellaneous Parameters.

CHAPTER V REMOTE CONTROL PARAMETERS

5 REMOTE CONTROL PARAMETERS

The following remote control parameters are specific to the 2873-ETH module. The heading for each is the SSH and Telnet parameter name for each parameter. Under each section the following information is defined: the SNMP Name (according to the MIB), the attributes (Read-only or Read/Write), possible values for the parameter, its default value, and a description of the parameter.

5.1 IP Setup Parameters

5.1.1 IP Address

SNMP Name: al2873EthIpAddr

Attributes: Read/Write

Values: 0.0.0.1 – 255.255.255.255

Default: 192.168.0.5

Description:

Valid IP addresses are in the form of xxx.xxx.xxx.xxx, where xxx is a number from 0-255. Invalid addresses include 0.0.0.0, 127.0.0.1 and 255.255.255.255

5.1.2 Netmask

SNMP Name: al2873EthNetmask

Attributes: Read/Write

Values: 0.0.0.1 – 255.255.255.255

Default: 255.255.255.0

Description:

A valid netmask is in the form of xxx.xxx.xxx.xxx, where xxx is a number from 0-255. Common netmasks are 255.255.255.0, 255.255.254.0, and 255.255.255.224.

5.1.3 Gateway

SNMP Name: al2873EthGateway

Attributes: Read/Write

Values: 0.0.0.1 – 255.255.255.255

Default: 192.168.0.1

Description:

The gateway address is the address the node uses to reach another network. This address is typically the first address in the range of available IP addresses on the network. For example, if the network is setup to support 192.168.0.1 to 192.168.0.255, the gateway will usually be found at 192.168.0.1.

5.1.4 PHY Status

SNMP Name: al2873EthPhyStatus

Attributes: Read-Only

Values: 1000FD, 100FD, 100HD, 10FD, 10HD

Default: 1000FD

Description:

The PHY Status reports the current negotiated link speed between the module and the network.

5.1.5 Ethernet Bytes Sent

SNMP Name: al2873EthTxBytes

Attributes: Read Only

Values: 0 – 2,147,483,647

Default: 0

Description:

The *Ethernet Bytes Sent* is the total number of bytes sent across the network, including the bytes in the PCM data packets and any communication bytes.

5.1.6 Ethernet Bytes Received

SNMP Name: al2873EthRxBytes

Attributes: Read Only

Values: 0 – 2,147,483,647

Default: 0

Description:

The *Ethernet Bytes Received* is the total number of bytes received from the network, including the bytes in the PCM data packets and any communication bytes.

5.1.7 Dropped Packets

SNMP Name: al2873EthDroppedPackets

Attributes: Read Only

Values: 0 – 2,147,483,647

Default: 0

Description:

The **Dropped Packets** parameter shows the number of packets that have been dropped during transmission over the network. If dropped packets are seen, contact an IT expert to evaluate the network infrastructure to ensure there are no problems.

5.1.8 Commit

SNMP Name: This parameter is not available via SNMP

Attributes: Command

Values: None

Default: None

Description:

Commit is a command which will restart all network interfaces and make any changes to the IP configuration take place.

5.1.9 Clear

SNMP Name: This parameter is not available via SNMP

Attributes: Command

Values: None

Default: None

Description:

Clear is a command which will clear all IP statuses, specifically Ethernet Bytes Sent, Ethernet Bytes Received, and Dropped Packets.

5.2 User Configuration Parameters

5.2.1 User Add

SNMP Name: This parameter is not available via SNMP

Attributes: Write-Only

Values: 8 – 16 ASCII Characters for user name and password

Default: None

Description:

This parameter is used to add a user. When adding a user, both the user name and password must be specified with a comma between the user name and password. For example, set user add=username,password. The default User Level for the user is Read-Only. Modify this by using the User Level parameter, if required. After a user is added, the user will have access to all of the enabled user interfaces.

5.2.2 User Remove

SNMP Name: This parameter is not available via SNMP

Attributes: Write-Only

Values: 8 – 16 ASCII Characters

Default: None

Description:

This parameter is used to remove a user and can only be called by a user with a User Level of Admin. To insure the correct user is being removed, the User Remove Commit parameter must be called with the same user name. The format for this command is set user remove=username. The only user which cannot be removed from the system is the admin user.

5.2.3 User Password

SNMP Name: This parameter is not available via SNMP

Attributes: Write-Only

Values: 8 – 16 ASCII Characters

Default: None

Description:

This parameter is used to modify a user's password. To modify the currently logged in client's password, type set user password=newpassword. In order to modify a different user's password, the currently logged in user must have an admin User Level. The format for this is set user password=username,newpassword. After calling this parameter, the user must then use the User Password Commit parameter in order for the password to be changed. The password on all user interfaces is the same for each user.

5.2.4 User Password Commit

SNMP Name: This parameter is not available via SNMP

Attributes: Write-Only

Values: 8 – 16 ASCII Characters

Default: None

Description:

This parameter is used to commit modifying the user password. The User Password parameter must be called before this parameter.

5.2.5 User Level

SNMP Name: This parameter is not available via SNMP

Attributes: Write-Only

Values: Read-Only, Read-Write, Admin

Default: None

Description:

This parameter is used to change the User Level for a user. The User Level is the same on all user interfaces. The format for this is:

```
set user level=username,<userlevel>
```

The Read-Only User Level is to allow for a user to read the current configuration and status of the installed modules.

The Read-Write User Level allows the reading of the configuration and status as well as being able to modify the configuration.

The Admin User Level has the same rights as the previous levels, but also allows for adding and removing users and modifying other users passwords and levels.

5.2.6 User List

SNMP Name: This parameter is not available via SNMP

Attributes: Read-Only

Values: List of users

Default: None

Description:

This parameter lists all users which are currently configured on the unit along with the corresponding User Level. The first response line is User: Level followed by each user and level. All users which are not the last in the list will have a comma after the line. An example response is:

User: Level
admin: Admin,
username: Read-Only
>

5.3 User Interface Parameters

5.3.1 Current Control Connections

SNMP Name: al2873EthCurrentNumUsers

Attributes: Read-Only

Values: 0 - 10

Default: 0

Description:

The Current Control Connections is the total number of users connected to the 2873-ETH.

5.3.2 Maximum Control Connections

SNMP Name: al2873EthMaxNumUsers

Attributes: Read-Write

Values: 1 - 10

Default: 1

Description:

The Maximum Control Connections specifies the total number of users which can connect to the 2873-ETH at the same time, regardless of user interface.

5.3.3 SSH Port

SNMP Name: al2873EthSshPort

Attributes: Read-Write

Values: 1 – 65535

Default: 22

Description:

The SSH server's default port can be changed using this parameter. This can only be modified by a user with the Admin User Level.

5.3.4 Telnet

SNMP Name: al2873EthTelnetEnable

Attributes: Read-Write

Values: Enable, Disable

Default: Enable

Description:

The Telnet server can be enabled and disabled using this parameter. This can only be modified by a user with the Admin User Level.

5.3.5 Telnet Port

SNMP Name: al2873EthTelnetPort

Attributes: Read-Write

Values: 1 – 65535

Default: 23

Description:

The Telnet server's default port can be changed using this parameter. This parameter can only be modified by a user with the Admin User Level.

5.3.6 SNMP

SNMP Name: al2873EthSnmpEnable

Attributes: Read-Only

Values: Enable, Disable

Default: Enable

Description:

This parameter reports the current status of the SNMP server.

5.3.7 SNMP Port

SNMP Name: al2873EthSnmpPort

Attributes: Read-Write

Values: 1 – 65535

Default: 161

Description:

The SNMP server's default port can be changed using this parameter. This parameter can only be modified by a user with the Admin User Level.

5.3.8 SNMP RO Community

SNMP Name: al2873EthSnmpRoCommunity

Attributes: Read-Write

Values: 8 – 32 ASCII characters

Default: public

Description:

This parameter specifies the SNMP version 2c read-only community.

5.3.9 SNMP RW Community

SNMP Name: al2873EthSnmpRwCommunity

Attributes: Read-Write

Values: 8 – 32 ASCII characters

Default: private

Description:

This parameter specifies the SNMP version 2c read-write community.

5.3.10 SNMP SYS Location

SNMP Name: al2873EthSnmpSysLocation

Attributes: Read-Write

Values: 8 – 32 ASCII characters

Default: unknown

Description:

This parameter specifies the SNMP sys location response.

5.3.11 SNMP SYS Contact

SNMP Name: al2873EthSnmpSysContact

Attributes: Read-Write

Values: 8 – 32 ASCII characters

Default: support@apogeelabs.com

Description:

This parameter specifies the SNMP sys contact response.

5.3.12 SNMP Trap Port

SNMP Name: al2873EthSnmpTrapPort

Attributes: Read-Write

Values: 1 – 65535

Default: 162

Description:

The SNMP server's default trap port can be changed using this parameter. This parameter can only be modified by a user with the Admin User Level.

5.3.13 SNMP Trap Host

SNMP Name: al2873EthSnmpTrapHost

Attributes: Read-Write

Values: 0.0.0.1 – 255.255.255.255

Default: 192.168.0.5

Description:

This parameter specifies the recipient of any SNMP traps.

5.3.14 SNMP Trap Timeout

SNMP Name: al2873EthSnmptTrapTimeout

Attributes: Read-Write

Values: 1 – 3600

Default: 60

Description:

This parameter specifies the timeout between SNMP Traps.

5.4 Miscellaneous Parameters

5.4.1 Version

SNMP Name: al2873EthCxVersion

Attributes: Read-Only

Values: 3 – 8 ASCII Characters

Default: None

Description:

This parameter specifies the current version of the 2873-ETH software.

5.4.2 Modules Version

SNMP Name: al2873EthModulesVersion

Attributes: Read-Only

Values: 3 – 8 ASCII Characters

Default: None

Description:

This parameter specifies the current version of the HTML interfaces for the modules installed in the chassis.

5.4.3 Slot#

SNMP Name: al2873EthSlot#Name (where # is 1 – 14)

Attributes: Read-Only

Values: 4 – 32 ASCII Characters

Default: None

Description:

This parameter returns the the module name and version of the card installed in slot #. If no module is installed in slot #, it will return “Unpopulated”.

CHAPTER VI TROUBLESHOOTING

6. TROUBLESHOOTING

If an issue cannot be resolved by any of these troubleshooting steps, please contact customer service whose number is found in the contact section of this manual.

6.1 Cannot login as admin to the 2873-ETH

If the admin password to the 2873-ETH is unknown, there is a reset button on the back panel of the module. Press this button for 5 seconds and the module will reset the admin password to factory default.

6.2 Finding Port Numbers

The 2873-ETH has one port open by default, the SSH port (default 22). The Telnet port can also be enabled (default 23). If the SSH port and/or Telnet port are changed to a port other than default and can not be found, a port sniffer such as nmap can be used to find the open ports. Nmap can be downloaded from <http://insecure.org/nmap/> for multiple operating systems. The command for nmap is:

```
nmap 192.168.0.5
```

Nmap will respond with a list of open ports.