

User's Manual

For NPC Series

Part # 1140 V4

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Synaccess Networks, Inc.

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1 System Description

1.1 System Key Features:

Model	Ethernet (10 based-T) Port	Local Master RS232 Port	Modem Interface (Interfacing AT command string to external Modem unit)	Controlled Power Outlets	User RS232 Port	Simultaneous Active Telnet Sessions
NPC-48	1	1	Yes	4	8	1
NPC-22	1	1	Yes	2	2	3 (note)
NPC-88(G2)	1	1	Yes	8	8	1

Note: Port # 2001 for the 1st serial port. Port # 2002 for the 2nd serial port. Port # 23 (changeable) for the main system.

Figure 1 - List of System Interface Ports and Power Outlet Ports

The NPC systems provide secure and versatile console port and power reboot management access for communication equipment such as routers, switches, and network devices. They are also the ideal assistant devices for engineering development and test applications. Key features include:

- Data traffic from all user serial ports is serviced by a single TCP/IP session or the local Master serial port. At any given time, only one user serial port is active for exchanging data with the TCP/IP session or a local Master serial port. Data traffic on inactive ports is not buffered and data is lost.
- **Local console port access:** offers data rates from 2400 to 115200 bits/seconds and optional hardware handshaking (CTS/RTS).
- **Local Master Port access:** offers data rates from 2400 to 115200 bits/second and optional hardware handshaking (CTS/RTS). There are two operation modes for the port: Console Transparent Mode and System Control Mode.
- **Three user privilege login levels:** The Administration level manages system configuration and unconditional access to all power outlets and all serial ports. The User level allows each user to reserve and manage his/her own ports, as well as to change most of system configuration settings. Anonymous users are able to view all settings and operate unreserved power outlets and serial console ports.
- **User name and password for each port:** Each port is user name and password protected.
- **Line commands or menu configuration controls:** Menu table operation offers user-friendly operation methods that are used for changing system configurations,

viewing run time statuses, and issuing controls. Line commands provide quick and easy operations.

- **AutoPing and Power Reboot:** The system uses internal generated auto “ping” commands, continuously detecting equipment network connectivity. The device executes a power reboot if the connection is lost.
- **Network Access Filtering and Blocking:** When the system connection is established through a TCP/IP network, you can setup up the system to block or permit an IP address or a group of IP addresses. This is done by filling an ACL (Access Control List) data entry table. The default setting is ACL off, which means all IP accesses are welcome.
- **Telnet access:** Remote access the system over a TCP/IP network for configuration and control of the systems. For NPC-22, there are three simultaneous active telnet sessions. TCP port # 2001 and 2002 are for accessing user serial port 1 and 2.
- **Out of band Modem access interfacing:** Control and configure the system via a telephone line. Optional custom Modem AT command string to the Modem.
- **HTTP web access:** Embedded web server provides secured user name and password authentication. The operations are easy and friendly, utilizing tables and graphical icons. Download SNMP MIB files for convenience, or view an online help manual.
- **SNMP MIB capability:** An *SNMP (Simple Network Management Protocol)* agent is integrated in the system for an exchange of management information between the system and network devices.
- **POP/SMTP Emailing capability:** A user can send control commands such as reboot power outlet, send user data to user console port or capture user console port data via emails. Command execution reports are replied for each command email received. SMTP user name and password are protected through authentication process.
- **SNMP Trap for sending logging message:** The **Trap** is used to asynchronously report events to the NMS. It forwards power reboot command execution information to the remote Trap logging receiver.

1.2 What you can do with the system:

- ***Exchange user data transparently*** between one of the user serial console ports and the Local Master serial console port, a remote Telnet terminal, or via an external Modem device.
- ***Remote equipment power source management over TCP/IP networks***, including rebooting user equipment, and permanently turning on/off user power source. Schedule power reboots or power source on/off events monthly, weekly, daily or at any time an application requires. Reboot power source to equipment when a network connection is lost.

- **Remote control and interact with user equipment anywhere beyond LAN.** Via emails, you are able to manage NPC systems or user communication equipment power sources when LAN access is impossible. Via emails, you can send control commands to NPC-systems, such as rebooting user power source, or forward user data to communication equipment. Reply emails are sent after the system intercepts incoming emails so that you are informed with the operation status. Reply emails may also contains captured user equipment console data (20 seconds aperture and up to 4 k bytes buffer) so that you can interact with your systems.
- **AutoPing and reboot user equipment.** Connect your system to a power outlet and assign the system network IP address or URL. The NPC system will ping the user equipment periodically (in every 15 seconds). If the user equipment stops responding the ping request, the equipment will be power rebooted.

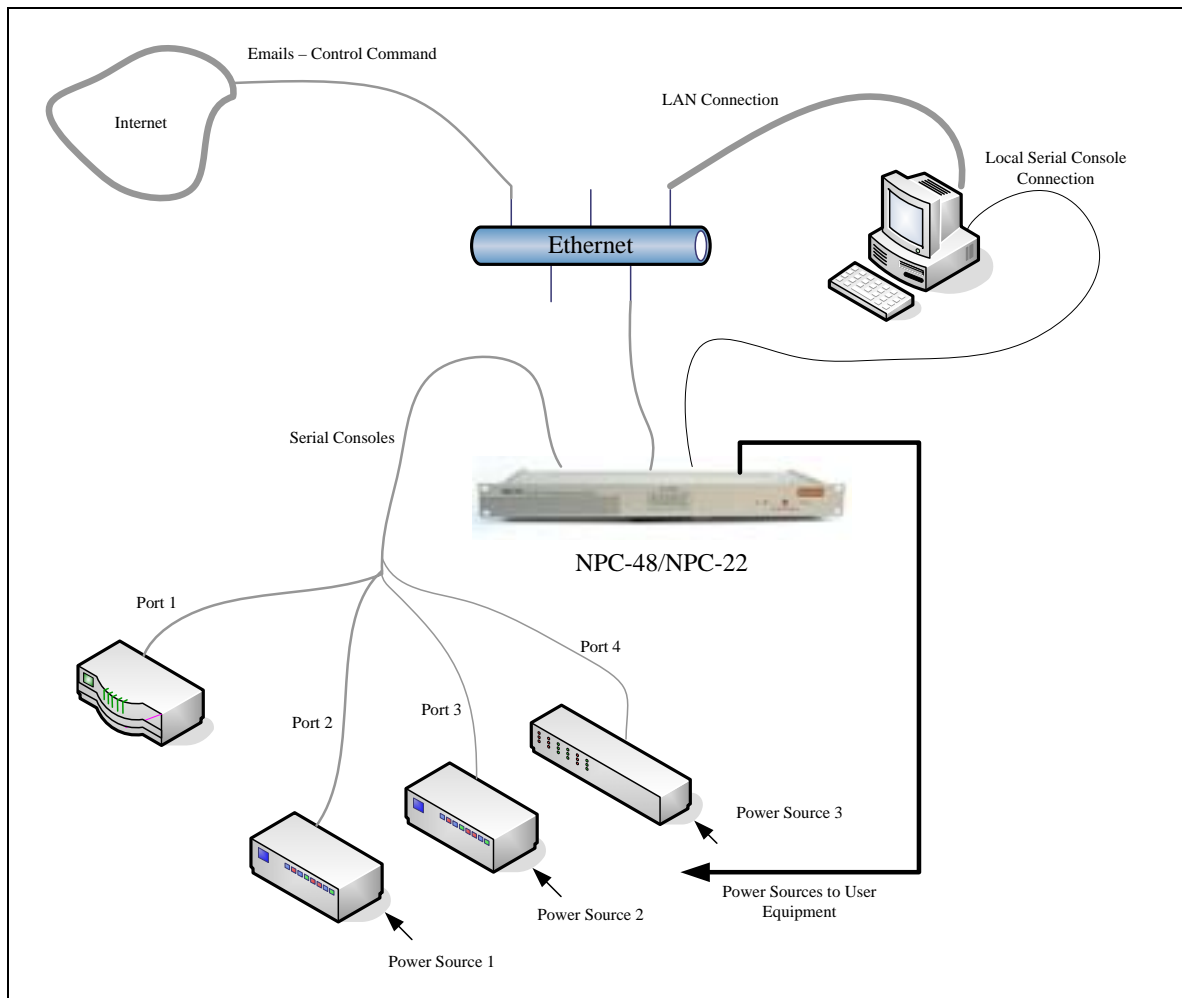


Figure 2 - Illustration of Typical Application

1.3 Front and Back Panel:

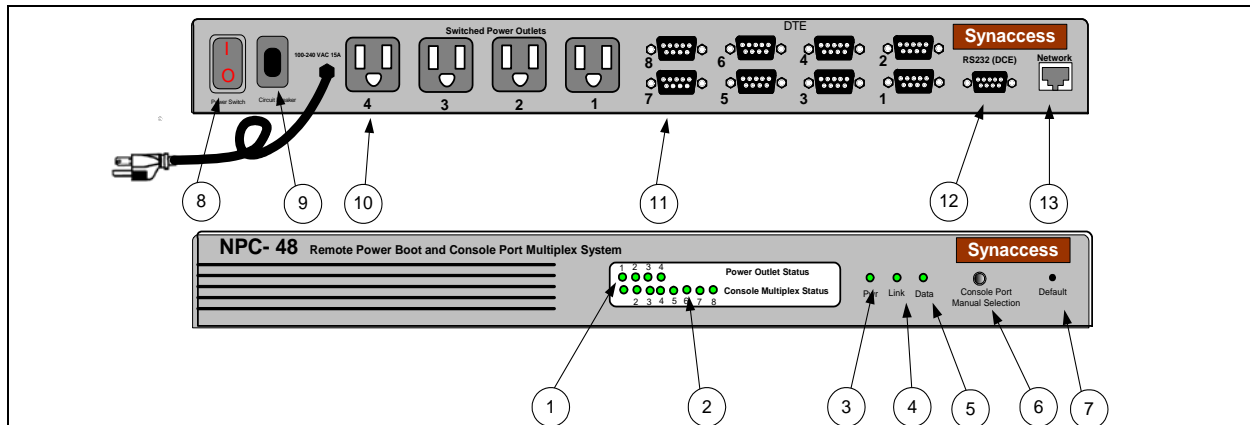


Figure 3 - NPC-48 Front and Back panel Illustration

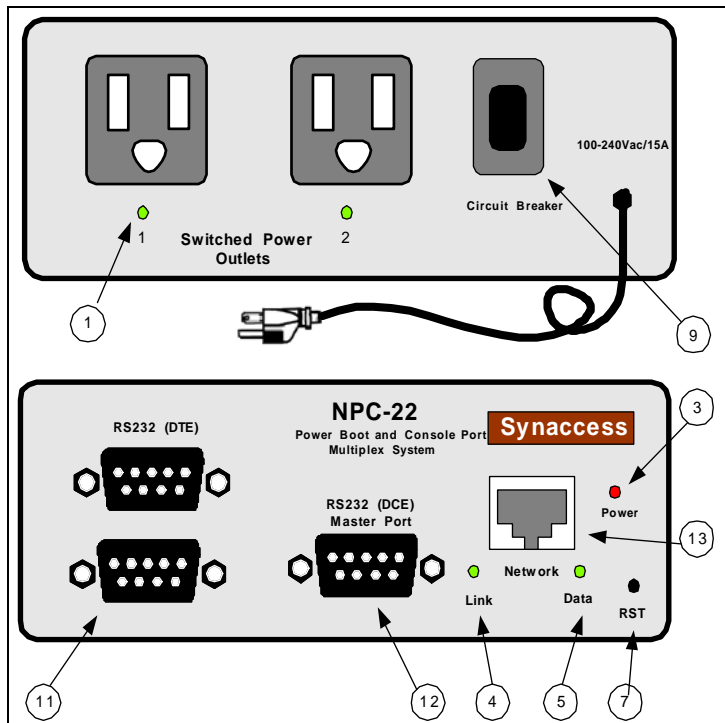


Figure 4 - NPC-22 Front and Back panel Illustration

1. Power Outlet status LEDs:
Visual indication of user power outlet On/Off status.
2. User Console Port status LEDs:
Indication of current active user console port. One LED out of eight is illuminated at the time.
3. NPC system Power On/Off status LED:

Indication of system power On/Off status.

4. Ethernet Link status LED:
When the LED is illuminated, Ethernet port and a LAN connection are established.
5. Ethernet Active data status LED:
When there is data traffic on the LAN, the LED is illuminated.
6. User Console Port Manual Selection Switch.
The push button switch offers alternative console port switching methods, besides port selection switch via software (commands, setup menu, etc.).
7. Factory Default Reset switch:
Allow a user to reset the system to factory default settings. The switch is located behind the small front panel opening.
8. Power source switch:
Power switch for the system.
9. Circuit Breaker Reset Push Button:
If the system is overloaded, the circuit breaker is triggered. Press the push button to recover the power source to the system.
10. Power Outlet sockets:
Power outlets for user applications.
11. User Console Ports (DTE, 9 pin DB, male):
RS232 console ports for user's applications. User ports do not interpret the system control commands.

Some systems are equipped with RJ-45 connectors. RJ-45 to DB-9 (Female, DCE, Part # C-RJ45-DB9F-4) conversion cables are shipped with systems.
12. Local Master Port (DCE, 9 pin DB, female):
This port is transparent to an active user port. This is also a service port for the user to configure and change system operation settings.

Some systems are equipped with RJ-45 connectors. RJ-45 to DB-9 (Male, DTE, Part # C-RJ45-DB9M-4) conversion cables are shipped with systems.
13. Ethernet Port (RJ45, 10 base-T):
10 based-T Ethernet port for connection to LAN.

2 Access to the System

2.1 Factory Default Settings:

The system is shipped with Factory Default settings. The default settings for the Local Master serial port are: **9600, 8 data bits, no parity, 1 stop bit, and no hardware handshaking (Flow Control)**. The default Administrator's login name "**admin**" and the default password is "**admin**". All existing user accounts are erased if the system is recovered to the default settings. All user console ports are set to the same parameters as the Local Master Port.

There are two ways to restore the system to the Factory Default settings. The first method is to press a push-button switch located on the front panel for 1 second. The second method is to select "Reload Factory Defaults" from the Main Menu. The Main Menu can be viewed by running a terminal emulation program such as Window's Hyper Terminal or Telnet.

Upon the system startup, the terminal screen displays the following screen, as shown in the Figure 5.

If you do not see the screen as shown in the Figure 5, it is likely that the system is not in the default state. Otherwise, your connection to the Local Master port is established.

```
*****
*
*
* Synaccess Networks Inc., Carlsbad, CA, USA. Copyright(c) *
*
*           System NPC-48
*
*
*****

HW:3.1 SW:4.1.1
>>DHCP is enabled (DHCP timeout is 8 sec).
>IP address fallback is enabled
>Network initialization...
    Network Interface is now UP

>DHCP OK
    Timezone (fallback only) = 0h

    IP Address: 192.168.0.109
    Netmask:    255.255.255.0
    Gateway:    192.168.0.1
>
>
>. !!! Important: a control command must proceed with the symbol "/"
>    at the beginning of a command line input. To change it, type "/setup".
>
>Type "/help" for a list of commands.
>
```

Figure 5 - System Startup Screen

2.2 User Privileges and Port Reservations:

All user levels, including anonymous (visitor), are able to access the system via a serial connection from your work station to the Local Master port, or via a Telnet session from your work station.

- **Administration Login:**
There is only one Administration account on the system. The default name is “admin” and default password is also “admin”. The default name and password may be changed. If you login at Administration level, you are able to remove or change existing user accounts, take over power outlets or user serial console ports and change system settings.
- **User Login:**
At user login level, you are able to reserve power or console ports for your applications if they are “open”, as well as make system configuration changes. At this login level, you are not able to access other user reserved console ports or change operation status for other reserved power outlets.
- **Anonymous(Visitor) Access:**
If you have no account established on the system (as an anonymous user), you are only able to view the system configuration settings and operate unreserved serial console ports or power outlets.

2.3 Local Master Port Access:

The Local Master Port operates in two modes:

- 1) **Console Port Transparent Mode:** The Local Master Port and an active user port exchange user data, as if the master port were directly connected to a user serial console port.
- 2) **System Control Mode.** A NPC system enters control mode if the first letter for a line entry at the terminal is a predefined command prefix symbol, such as “/” (the default prefix letter). In control mode, a user typed message at the master port terminal will not be forwarded to a user port. You do not need to do anything to terminate the control mode because as soon as there is a new line feed at the terminal, the system comes back to the User Port Transparent mode. However, if the system enters the system configuration menu operation, no typed message will be sent to a user console port until the menu operation is ended.

Note:

*If the system is in **Console Port Transparent Mode**, there are no local echo characters on your terminal because they are forwarded to user equipment that is connected to a user console port. It is up to the connected user equipment how to respond to the messages you enter.*

To access and configure the system from the master port, you need to connect a RS232 port from your work station to the Local Master Serial Port. Then run a terminal emulation program (such as Window's Hyper Terminal) on your computer.

- 1) Connect the system's Local Master Port (DCE) with a straight DB-9 type cable, if your work station is equipped with a DTE part.
- 2) Connect the system's Ethernet port to your LAN, if you intend to use the network port.
- 3) Turn the system power on.
- 4) At the terminal emulation program, type the "/setup" command to start the system setup process. Type "/help" for help information.
- 5) The system has DHCP enabled, as a default setting. Network connectivity parameters are displayed at the startup screen. If the system does not get a DHCP offer, the system falls back to default static network settings. You can alter the default network settings to fit your need.
- 6) Use the command "/ping" to verify your connection. If a network connection is established, you are able to use Telnet, Web Browsing, Emailing and SMNP.

2.4 External Modem Access:

With this access method, an RS232 port on an external Modem device is connected to the Local Master Port. Typically, a Modem device is equipped with a DCE (Data Communication Equipment) terminal connector. Since the system's Local Master Port and Modem device ports are not complementary (both are DCE ports); you need to use a NULL Modem cable with both male connectors.

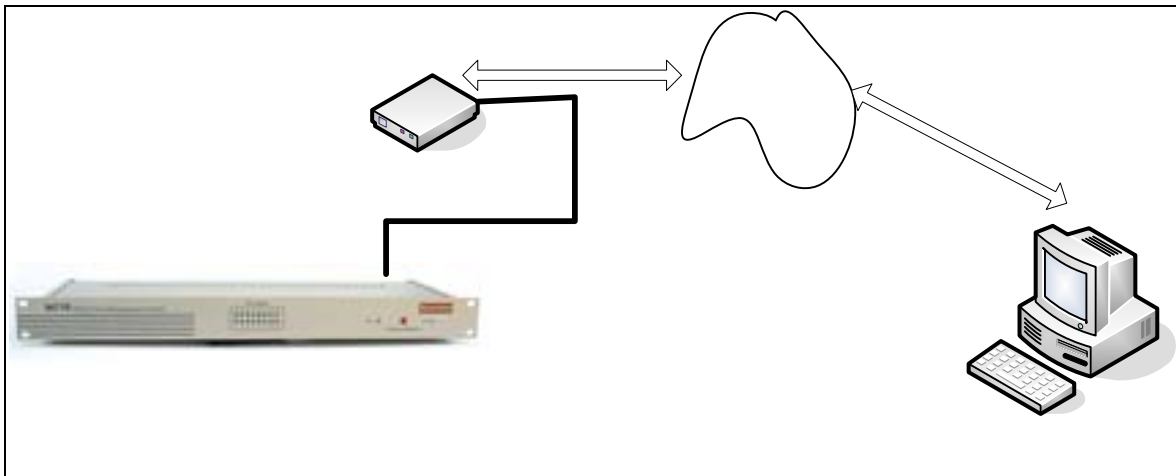


Figure 6 - External Modem Connection

2.5 Network Access Control List (ACL):

ACL feature is used for controlling client IP addresses to access the system. You can block or permit an IP or a group of IP addresses by filling the ACL data entry table. The default setting for ACL is off, which means all IP accesses are welcome.

The filtering scheme is as followings:

- 1) A client IP is filtered through 6 masks: from 1 to 6.
- 2) Higher mask number has higher priority. If an IP is blocked by Mask 3 and then enabled by Mask 4, the result is the IP is permissible.
- 3) A dotted value in a Mask is either 255 (which Permits or Blocks a whole range of the byte) or a specific value from 0 to 254 (which Permits or Blocks that specific value).
- 4) If you enter the ACL data with unintended values that block your current access to the system, you must use local RS-232 connection to disable the ACL, and then re-establish the network connection.

Examples:

Only Permit 192.168.5.100 & 192.168.5.105. Block all other IPs.

Define Mask 1 to Block mode: 255.255.255.255. // Block all

Define Mask 2 to Permit mode: 192.168.5.100.

Define Mask 3 to Permit mode: 192.168.5.105.

Define all other Mask to Don't Care mode.

Only Permit 192.168.x.x.

Define Mask 1 to Block mode: 255.255.255.255. // Block all IPs

Define Mask 2 to Permit mode: 192.168.255.255.

Define all other Mask to Don't Care mode.

Only Block 192.168.5.100 and block 10.10.x.x.

Define Mask 1 to Block mode: 192.168.5.100.

Define Mask 2 to Block mode: 10.10.255.255.

Define all other Mask to Don't Care mode.

2.6 Telnet Access:

With Telnet access, you are able to communicate with an active user serial console port and exchange user data as if you were directly connected to the port. You are also able to send control commands to the system when the first letter of a line entry at Tenet terminal is a predefined command prefix letter, such as “/” (as the default symbol). Operation of on a Telnet terminal is almost identical to the access method via Local Master Serial Port. You need to make sure that Telnet access is enabled, as a default setting. If the access is not enabled, please refer to Section “Using Configuration Menu” to change the setting.

Before you start the Telnet application, you need to obtain the actual IP address for the system. The system displays network connectivity information at system startup terminal when your work station is connected to the system's Local Master Serial Port. Please refer to “TCP/IP Network Configuration” section of this document for information on how to setup the network parameters.

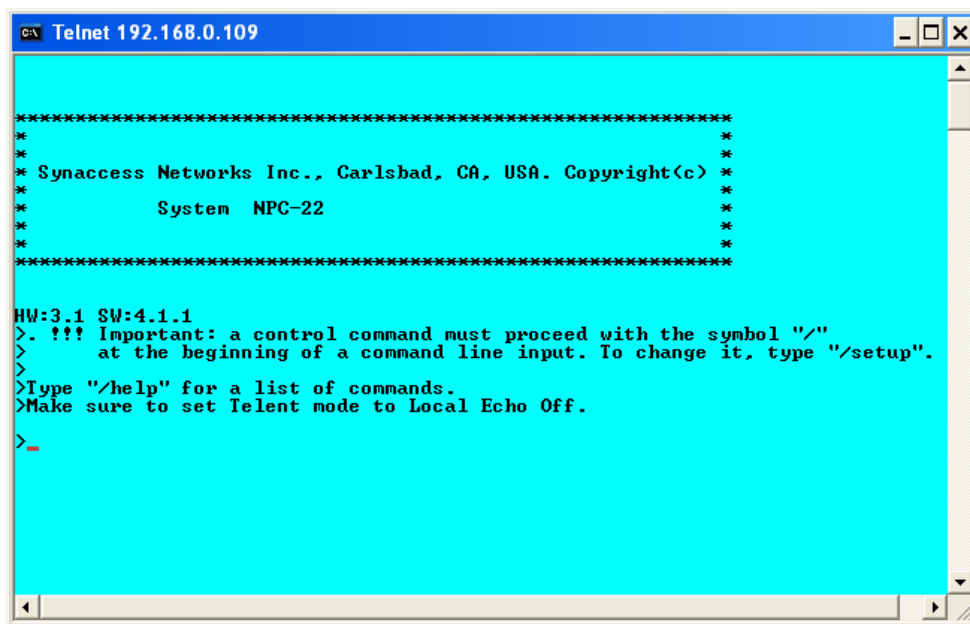
Once the network connection is established, at your work station prompt, you need to enter:

telnet ip_addr

The telnet terminal screen will display the following message once it starts, shown in Figure 7. You need to set a Telnet session on your work station to Local Echo Off mode. NP system does not echo user data locally on the Telnet session. It is up to the connected user communication equipment, which usually sends responses while receiving data from its serial console port. However, once the system is in System Control Command mode, the system starts to echo user's typing on the Telnet terminal.

Telnet session permits an anonymous user who may only to view the system settings and operate unreserved power outlets and user serial console ports. Please refer to section 2.2 "User privileges and Port Reservations" for further information.

- Only one Telnet session may be active at the time. Telnet sessions will be refused by the system if it already has a Telnet session active.
- A Telnet session remains active for 10 minutes if it is in idle state.
- Telnet access methods can be enabled or disabled using the System Access Setup Menu.
- To terminate an active Telnet session, use the command "/logout" at the terminal. If you are at a serial port terminal and notice that the terminal is disabled because it is taken over by a remote Telnet session, use the command "/telnetend" at the serial console terminal to terminate the Telnet if you need to do so.



```
GA Telnet 192.168.0.109
*****
*
* Synaccess Networks Inc., Carlsbad, CA, USA. Copyright(c) *
*
*      System NPC-22
*
*
*****

HW:3.1 SW:4.1.1
>. !!! Important: a control command must proceed with the symbol "/"
>      at the beginning of a command line input. To change it, type "/setup".
>
>Type "/help" for a list of commands.
>Make sure to set Telnet mode to Local Echo Off.
>
>
```

Figure 7 - Telnet Session Startup screen

2.7 Web Access:

You need to obtain the system IP address before starting web access to the system. Please refer to the Telnet Access section for methods to get the system IP address. You also need to make sure that web access is enabled, as a default setting. If the access is not enabled, please refer to Section "Using Configuration Menu" to change the setting. Start a Web browsing application program such as Window's Explorer and enter "http://ip_address" in the address field.

You must have an account on the system in order to access the system via this method. Without a valid account, you are only able to view the following web page and get a copy of the Help text message.



Figure 8 - Web Access Startup Page (NPC-22)

Upon clicking the Login button, a secured login table is displayed at your workstation, shown as in the Figure 9. Factory default setting for user name is “admin”. The default password is “admin”.



Figure 9 - Web Access Login Entry Table

2.8 Email Access:

To establish this access method, the system's network connection is already established. There are two tasks that email access is capable of handling: executing NPC system controlling commands, and forwarding user's data to an active user console port. The system sends a reply email with command process status or/and captured user equipment console port data (20 seconds aperture and up to 4 k bytes buffer) if an email is intercepted. See Section 4.4 for more information about how to setup email accounts.

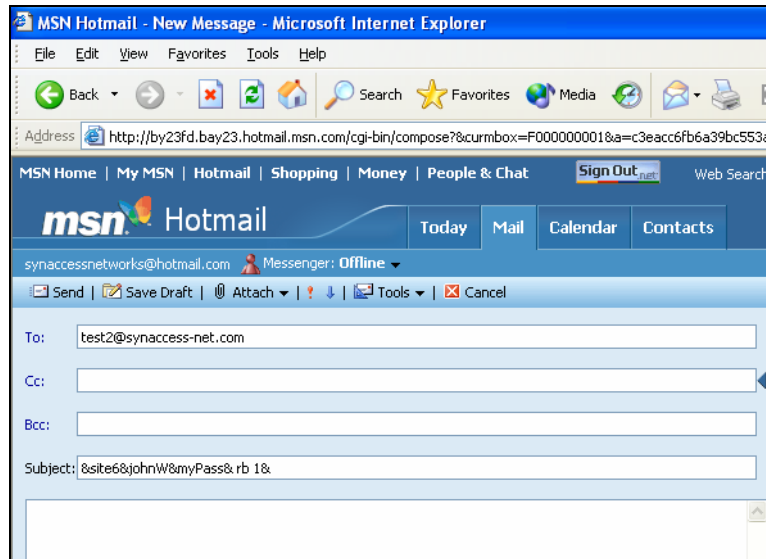


Figure 10 - Email Access - Sending Command from Hotmail Web Site

2.9 SNMP Information:

Applications such as an NMS (Network Management System) or an SNMP browser can exchange information with NPC systems. SNMP is disabled with the default setting.

The information managed by an SNMP daemon on the system can be obtained using SNMP requests from a remote work station. An SNMP Get/Get Next request fetches the value of a single variable or a set of variables. An SNMP Set request modifies the value of a variable.

You need to know the name of a variable before your can fetch or modify a variable's value. A variable's symbolic name is mapped to a numeric name, which is referred as OID.

The MIB (Management Information Base) is a text file describing the internal objects the SNMP agent can display, monitor, and/or modify. Each MIB object is the system variable that has name and an OID, as shown in Figure 11. You need the MIB file to properly configure the SNMP client ("manager") for server monitoring. To get a copy of the MIB file, please use a web browser to access NPC systems. Open the TCP/IP Network Configuration Menu and then click the button "Get SNMP MIB File" to download the MIB file that is stored in the system's memory.

Figure 11 - Implemented MIB Description

Enterprise OID: 1.3.6.1.4.1.21728

Definition	OID	Returned message
devName	.3.1.1	String. READ ONLY. Identification of the system.
productModelType	.3.1.2	String. READ ONLY. Model information of the system
powerOutletNum	.3.1.3	Number of power outlets. SHORT INTEGER. READ ONLY
ConsolePortNum	.3.1.4	number of Console Ports. SHORT INTEGER. READ ONLY
systemUpTime	.3.1.5	Seconds since the system in operation. LONG INTEGER. READ ONLY
powerOutletOpStatus	.3.2.1.0	Short Integer. Applicable to NPC/NP systems. Read/Write. Value "1" power outlet is on. Value "2" power outlet is off.
powerOutlet1OpStatus	.3.2.2.0	Read/Write. Applicable to NPC/NP systems.
powerOutlet2OpStatus	.3.2.3.0	Read/Write. Applicable to NPC/NP systems.
powerOutlet3OpStatus	.3.2.4.0	Read/Write. Applicable to NPC/NP systems.
powerOutlet4OpStatus	.3.2.5.0	Read/Write. Applicable to NPC/NP systems.
powerOutlet5OpStatus	.3.2.6.0	Read/Write. Applicable to NPC/NP systems.
powerOutlet6OpStatus	.3.2.7.0	Read/Write. Applicable to NPC/NP systems.
powerOutlet7OpStatus	.3.2.8.0	Read/Write. Applicable to NPC/NP systems.
consolePortActiveStatus	.3.2.2.0	Short Integer. Applicable to NPC/NC systems. Read/Write. The value indicates which console port is switched (active) to communicate with the local service port or the network interface. The valid value range is 1 to "ConsolePortNum". Value

		"0" means no console port is available for this system.
consolePortForwardType	.3.2.3.0	Short Integer. Applicable to NPC/NC systems. Read Only. Value "1": User console port captured data is forwarded to Local Service Port (a RS232 port. Equipped on the system). Value "2": User console port captured data is forwarded to Telnet.
powerOutletRebootAction	.3.4.1.0	Short Integer. Applicable to NPC/NP systems. Read/Write. To start rebooting a power outlet, set (Write) the object value to the power outlet port number (from 1 to "powerOutletNum"). The reboot parameter is defined by MIB object "powerOutletRebootTime" Note: if the power outlet is in off state before starting reboot, the reboot process will simply toggle the power outlet from "off" state to "on" state, and then to back to "off" state.
powerOutletRebootTime	.3.4.2.0	Short Integer. Applicable to NPC/NP systems in seconds. Read/Write. Power outlet toggle duration during rebooting. Typical value is 5 or 10. Note: if the power outlet is in off state before starting reboot, the reboot process will simply toggle the power outlet from "off" state to "on" state, and then to back to "off" state.
trapSend	.3.5.1.0	Short Integer. Read/Write. Value "1" means enabling forwarding captured console port data. "2" means disable.
trapSendInterval	.3.5.2.0	Short Integer. Read/Write. In seconds. Trap sending interval.
trapMsg	.3.6	String. Trap message: Power reboot event Format: &systemName &reboot command&

Figure 11 - List of MIB object

2.10 AutoPing and Power Reboot:

Each power outlet has optional settings that NPC system uses to ping network equipment. The pinged equipment is attached to a specific power outlet. It reboots user equipment power source if a network connection is not detected any more. However, user equipment never gets power reboot if the equipment never replies ping reply to a NP system.

A power outlet has the optional settings (Power Outlet Setup Menu) that specify the destination IP address that the system will ping periodically, and maximum network downtime allowed. In addition, to avoid unwanted reboots, a NPC system also pings the gateway IP address (as default) to make sure a NP system has a network connection that is still active. Otherwise, AutoPing will be in off mode if a NP system lost network connection. To change the default gateway IP address as ping destination, use TCP/IP Configuration Menu to enter your desired destination address.

3 Using Control Command

A NPC system provides command line options for viewing or changing system configuration and operation status. In addition, by using the control command option, users are able to create script files for equipment test and control automation.

Control commands are applicable to the connections between your work station and Local Master Serial Port or a Telnet session.

Some of the control commands are also applicable to for Emails. Besides sending commands using Emails, user data can be forwarded to a user console port. See related sections for more detailed information about how to setup email accounts.

Once the system starts or a Telnet session is open, you are ready to send control command to the system. Type command “/help” to have a complete list of available commands, as shown in Figure 12.

All login levels including anonymous users are able to use the command line option. However, the actual command executions are based on your login level. For example, if you are an anonymous user, you are not able to reserve or un-reserve serial console ports or power outlets. If you login at Administration level, you are able to operate any serial ports and power outlets, reserve or unreserved any ports or outlets even if they are reserved by other users. See Section 2.2 for a complete description of user privileges.

Note:

- *A control command to the system proceeds with a prefix letter. The prefix letter must be the first letter on a line entry. If both conditions are not met, the letters being typed are forwarded to an active user serial port without local terminal echo. The default prefix letter is "/". It may be changed if the prefix has a conflict with your applications.*
- *If your entry at the terminal is not a control command, your entry will be simply forwarded to a current active user serial console port. Local Master Port and the user console port is transparently sending or receiving user data. Your entry (typing) is not echoed on the terminal screen. If you do NOT have access to a user serial port, an unauthorized access error message is displayed while you are typing at the terminal.*
- *If you use Emailing access method, all commands list in Figure 12 are email-able. However, some of commands do not have actual meanings such as the command “help” or “date”. Via Emailing, command executions are subject to the same privilege rules discussed in Section 2.1.1. Reply emails will be sent for indication of command execution.*

```

*****
*
*
*   Help Menu
*
*
*****
> /apVbs    n  Displays AutoPing run-time info(0-disable,1-enable).
> /date     Displays current date.
> /emailVbs n  Displays Emailing run time info(0-disable,1-basic,2-detailed).
> /emailGet  Starts email reading immediately.
> /emailSend Sends a test email message immediately
> /eCmd     Sets email command delimiter(Select: &,-,+,~,,$,*,>,|,<, or ?).
> /login    Enters user login.
> /logout   Exits current login.
> /mac      Displays Ethernet Port Mac address.
> /nwset    Restarts Ethernet network interface.
> /nwshow   Displays network Status.
> /ping     Pings a host. E.g.: ping 192.168.0.1, or ping yahoo.com.
> /prsv n   Reserves power outlet #n for current login user.
> /pset n v  Sets power outlet #n to v(value 1-on, 0-off).
> /pshow    Displays power outlet status.
> /ps v     Sets all power outlets to v(value 1-on, 0-off).
> /pTmShow  Displays power outlet timer information.
> /punrsv n Unreserved power outlet #n from current login user.
> /rb n     Reboots power outlet #n.
> /setup    Starts system configuration menu.
> /srsv n   Reserves console port #n to current login user.
> /sset n   Sets active user serial port #n.
> /sshow    Displays console ports configuration status.
> /sunrsv n Unreserves console port from the current login user.
> /sysshow  Displays system information.
> /time     Displays current time.
> /userShow Displays all users.
> /whoami   Displays current login user.
> /ver      Displays hardware and software versions
> /!       Repeats previous command
>
Other help info:
> . Reload system factory default setting by pressing default button
>   on front panel for 1 seconds.
> . !!! Important: a control command must proceed with the symbol "/"
>   at the beginning of a command line input. To change it, type "/setup".

```

Figure 12 - Control Command Help Menu

4 Using Configuration Menu

4.1 Starting Configuration Menu:

There are four ways to start the Configuration Menu:

- 1) Local Master Port access method. Run a terminal program from a work station via serial connections between a serial port from your work station and the Local Master Port of the system.
- 2) External Modem device access method. Run a terminal program from a remote work state and establish the connection via a telephone line.
- 3) Telnet access method. Your work station and the system are connected to LAN.
- 4) Web access method. Your work station and the system are connected to LAN.

If you have already logged on to the system, enter the command “/setup” and you will see “Main Menu” table as shown in Figure 14. Without login to the system, if you enter command “/setup” you will see the following screen:

```
*****
*
*
*      Login Menu
*
*
*****
>
>      1) Anonymous (Visitor) login
>      2) Login
>      3) New or existing login setup
>      4) Help
>      5) Quit
>Enter your selection:
```

Figure 13 - Menu Configuration – Login Menu

Menu selection 1:

When you enter the system as an anonymous user, you can start operate serial console ports or power outlets as far as they are not reserved by other users. However, you can only view system configuration parameters and are not able to make system configuration changes.

Menu selection 2:

If you already have accounts established and want to start configuring the system or to change serial console port and power outlet operation status, choose this menu option.

Menu selection 3:

If you do not have an account on the system or if you have an account already and want to modify your account or delete an account, select option 3.

Menu selection 4:

Lists help information.

Menu selection 5:

Exit menu operation.

4.2 System Main Menu:

This is a top level system main configuration menu, as shown in Figure 14 and 15.

```
*****
*
*
*   Main Menu
*
*
*****
>
>   1) Reboot Power Outlet
>   2) Change Command Prefix Symbol
>   3) Select an Active Serial Console Port
>   4) Setup System
>   5) Setup TCP/IP Network
>   6) Configure Serial Console Port
>   7) Configure Power Outlet
>   8) Setup New or Existing Accounts
>   9) Reload Factory Defaults
>  10) Save Settings
>  11) Quit
>Please enter your selection:
```

Figure 14 - System Main Menu (Terminal Program Screen)

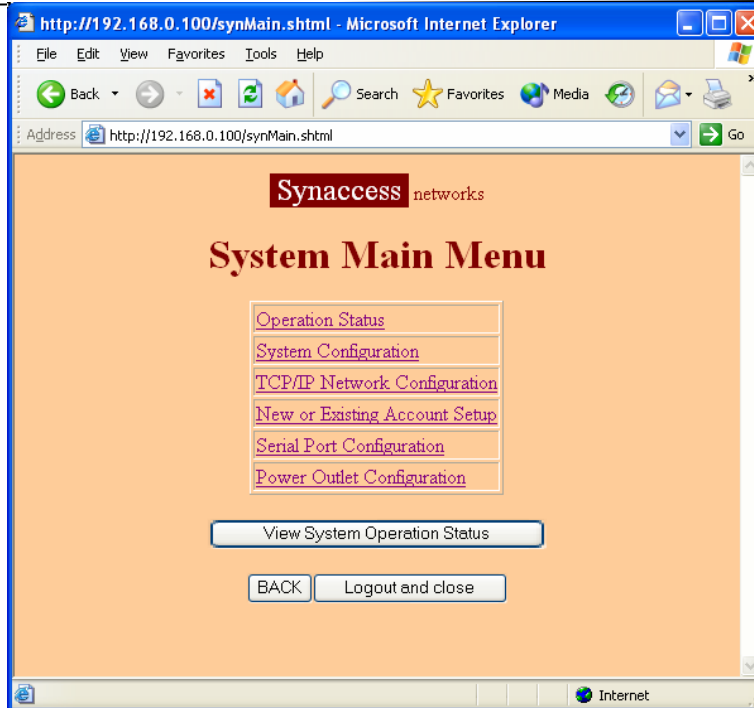


Figure 15 - System Main Menu (Web Page)

From Figure 14, System Main Menu (Terminal Screen):

Option 1 - Reboot a power outlet:

Reboots a power outlet. Rebooting executes if the outlet is unreserved (“open”) or it is reserved under your account. However, if you logged in at Administration level; you are able to operate any power outlets even if they are reserved by other users.

Helpful info:

control command “/rb n” executes the same function as the option 1.

Option 2 – Change Command Prefix Symbol:

Enters a prefix symbol that works for you, if the current defined prefix has a conflict with your application.

Option 3 – Select an Active Serial Console Port:

Selects an active serial port so that the Local Master Port becomes transparent to the active port. Even if an active port is selected; you may or may not able to communicate with the user port. You are only be able to operate the active serial port if the port is unreserved (“open”), or reserved by you. However, if you logged in at Administration level, you are able to overwrite user level privileges and operate the port.

Helpful info: control command “/sset n” executes the same function as the option 3.

Option 4 – Setup System:

Enters System Access Setup submenu.

Helpful info: control command “/sysshow” displays system access configuration settings.

Option 5 – Setup TCP/IP Network:

Enter TCP/IP Network Configuration submenu.

Helpful info: control command “/nwshow” displays network connectivity information..

Option 6 - Configure Serial Console Port:

Enter Serial Console Port Configuration submenu.

Helpful info: control command “/sshow” displays all serial console port settings..

Option 7 - Configure Power Outlet:

Enter Power Outlet Setup submenu.

*Helpful info: control command “/pshow” displays all power outlet current status.
control command “/ptmshow” displays all power outlet timer settings.*

Option 8 - Setup new or existing accounts:

Enter User Account Setup submenu. Select this option if you need to create new account, change existing account, and delete existing account and reserve power outlets and serial console ports.

Helpful info: control command “/userlist” displays all account names.

Option 9 – Reload Factory Defaults:

Reload to factory default settings. You must login at Administration level.

Option 10 – Save settings:

Save current system configuration parameters.

Option 11 – Quit:

Return to previous menu.

4.3 System Access Setup Menu:

This is a submenu of System Main Menu.

```

*****
*
*
*   System Access Setup
*
*
*****
>
>   1) System(Device) name.....Undefined
>   2) Date(mm/dd/yyyy).....01/11/1980
>   3) Time(hh:mm:ss).....23:52:26
>   4) Serial port mode.....Console
>   5) MODEM startup string.....ATEOS0=2
>   6) Web access (Y/N).....Y
>   7) TELNET enable (Y/N).....Y
>   8) Command control via email(Y/N)..N
>   9) SNMP agent enable(Y/N).....N
>  10) SNMP Trap (1-on 0-off).....0
>  11) SNMP Trap Receiver IP Address...0.0.0.0
>  12) Save.
>  13) Quit.
>Please enter your selection:

```

Figure 16 - System Access Setup Menu (Terminal Screen)

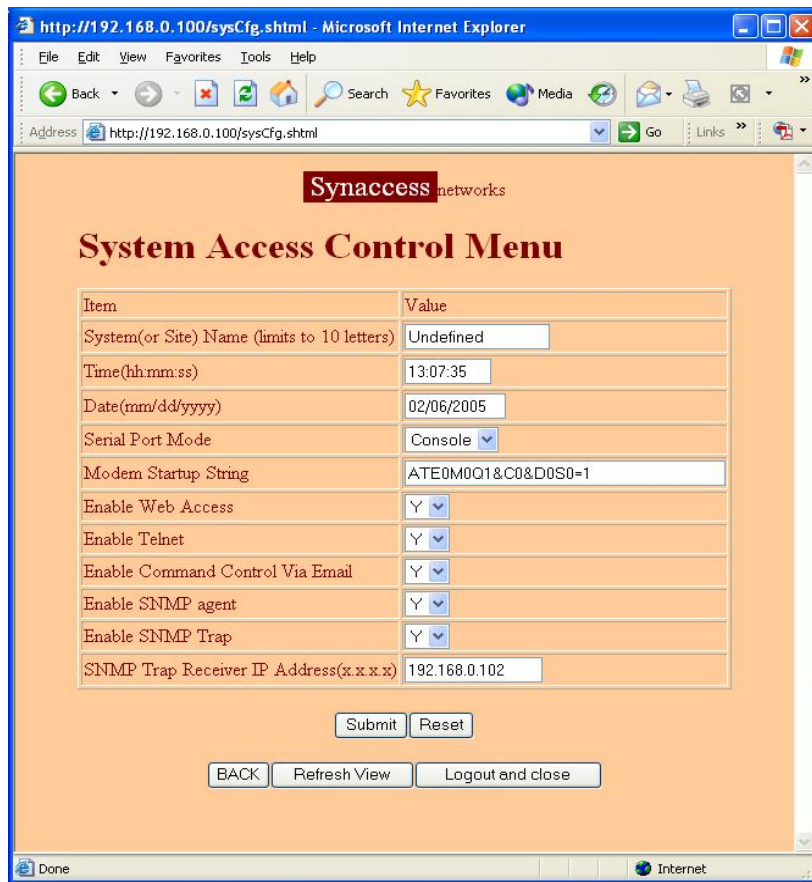


Figure 17 - System Access Control Menu (Web Page)

- **System(Device) name:**
Assign a system name, sometimes referred as site or device name.
 - **Date and Time:**
Enter calendar date and real-time clock.
 - **Serial Port Mode:**
Configure the Local Master Port to interface type: either to a serial RS-232 port on your work station or an external Modem device. An external Modem device is typically equipped with a DCE (Data Communication Equipment) terminal connector. Since the system's Local Master Port and Modem device ports are not complementary, you need to use a NULL Modem cable with both male connectors. For information about connector pin assignment, please see Appendix A.
 - **Modem Startup String:**
Define an external Modem control command string that is sent from the system to an external modem device periodically (in every 15 minutes). If you do not need to define the control string, leave the entry field empty.
 - **Web Access:**
Enable or disable web access to the system. Default to enable.
 - **Telnet Access:**
Enable or disable Telnet access to the system. Default to enable. Only one active Telnet session is permissible.
 - **Control command via Emails:**
Enable or disable this access method. When it is enabled, you need to make sure you also have completed POP/SMTP server and email receiving and sending addresses. See "TCP/IP Network Configuration" setup menu for detailed information how to setup email accounts. Default to disable.
 - **SNMP Agent Enabling:**
Enable or disable SNMP agent on the system. If the system SNMP Agent is enabled, it collects and stores management information and makes this information available to NMS using SNMP. Please see Section 2.5 for a list available MIB objects that the system supports. Default to disable.
 - **SNMP Trap Enabling:**
Enable or disable Trap sending. If this option is enabled, Traps are sent if there is a power reboot command execution on the system. Default to disable.
- Note: you must enable the above *SNMP Agent* setting. Otherwise, enabling Trap setting will not take effect.
- **SNMP Trap Receiver IP Address:**
Enter Trap Monitoring receiver IP address.

- **Save and Quit:**
Save current configuration data and return to previous configuration menu.

4.4 TCP/IP Network Configuration Menu:

This is a submenu of System Main Menu.

```

*****
*
*
*   Network Configuration Menu
*
*
*****
>1) Obtain IP using DHCP.....Y
 2) Fallback to static IP (if DHCP server no offer).Y
 3) Static IP Address.....192.168.1.100
 4) Subnet Mask.....255.255.255.0
 5) Gateway IP Address.....192.168.1.1
 6) HTTP Port Number (default 80).....80
 7) Telnet Port Number (default 23).....23
 8) POP3 Port Number (default 110).....110
 9) SMTP Port Number (default 25).....25
10) POP3 Email Server.....Undefined
11) SMTP Email Server.....Undefined
12) Incoming Email Account Name.....Undefined
13) Incoming Email Password.....*****
14) 2nd outgoing(replying) Email Address....
15) Outgoing Email Authentication.....Y
16) Checking Email Interval(Minute).....2
17) Access Control List(ACL) Enable (Y/N)...N
18) Network Connection Check Using This IP..
    [Leave 17) blank if Gateway IP is used. Applicable to AutoPing Mode.]
19) Save.
20) Quit.

Please enter your selection:

```

Figure 18 - Network Configuration Menu (Terminal Screen)

- **Obtain IP using DHCP:**
Enable or disable DHCP. The purpose of using DHCP (*Dynamic Host Configuration Protocol*) is to assign dynamic IP addresses to a computer or a network device on a network. There must be a DHCP server on a network running and the server must permit an assigned computer or network device to be on the LAN. If this option is disabled on NPC system, the system will not send DHCP requests to a network.
- **Fallback to static IP (if DHCP server no offer):**
Define a static IP address. If DHCP is disabled on the system, there is no DHCP server running on a network, or a DHCP server refuses IP offering, you have the option to whether either allow the system to use a static IP address or not.
- **Static IP Address:**
A static IP Address is an IP address that never changes. This IP address will be used if a DHCP server IP has no IP offered or DHCP automatic IP address is disabled.

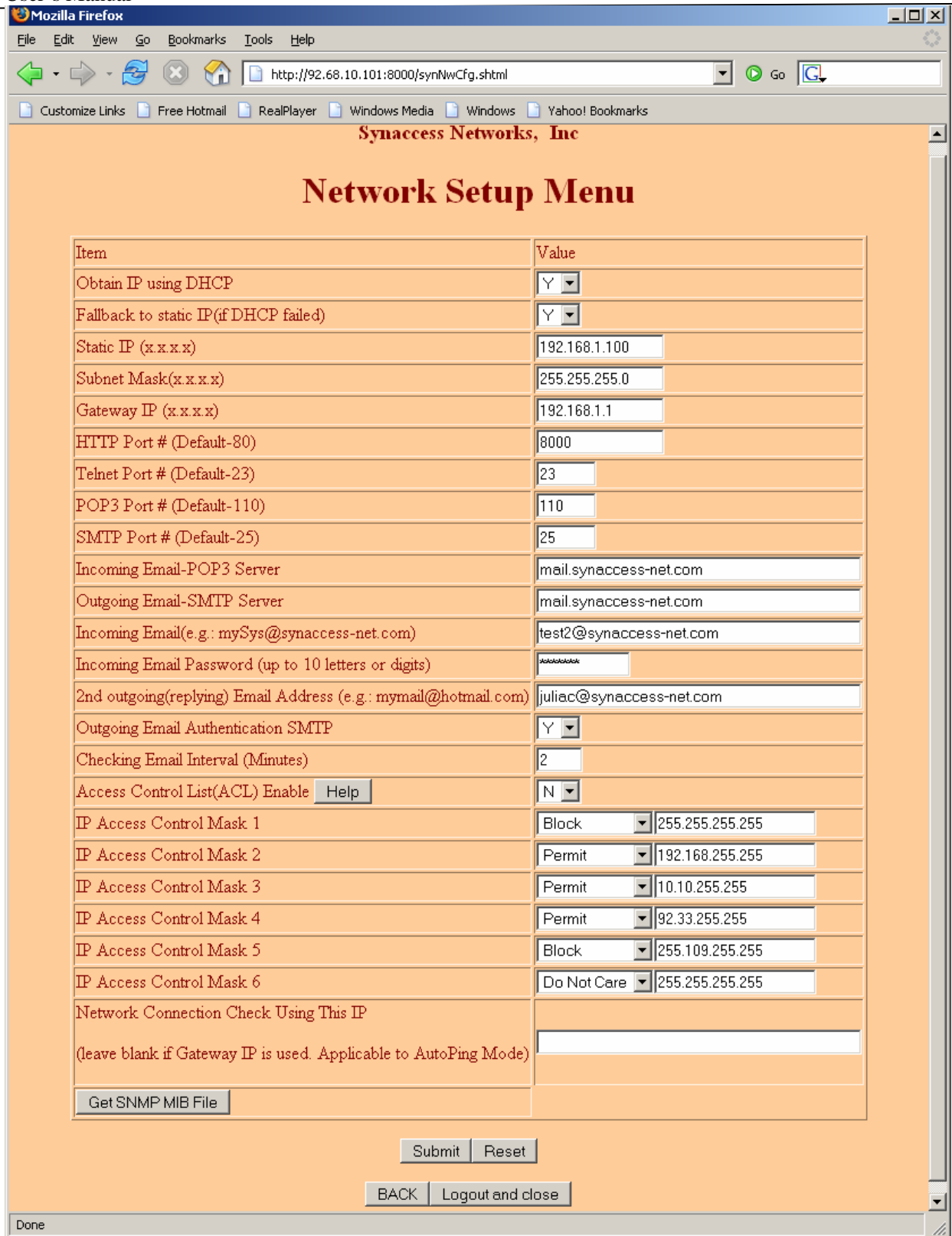


Figure 19 - TCP/IP Network Configuration Menu (Web Page)

- **Subnet Mask:**

Defines a static subnet mask that is a part of your static network address settings. This entry is for your IP network class, which is distinguished by using a subnet mask.

- **Gateway IP address:**
Defines a gateway IP address that is a part of your static network address settings. This is your router's IP address.
- **HTTP Port Number:**
Specifies a HTTP port number. Default value is 80.
- **Telnet Port Number:**
Specifies a Telnet port number. Default value is 23.
- **POP3 Email Server:**
Specifies POP (incoming Email) server address. The system supports POP3 Internet Email Protocols, not web based Email services. "mail.synaccess-net.com" and "pop.tom.com" are examples of POP Email servers. Make sure that the POP server you use does not require log on secure password authentication.
- **SMTP Email Server:**
Specifies SMTP (outgoing Email) server address. This server will be used for you to send outgoing (reply) Emails. "mail.synaccess-net.com" and "smtp.tom.com" are examples of SMTP Email servers. NPC systems support SMTP log on secure password authentication option.

Helpful Info: use the command "/emailget" to immediately check incoming emails.

- **Incoming Email Account Name:**
Specifies email address that the system receives. This email account name is also used for outgoing (replying) emails.
- **Incoming Email Account Password:**
The Email account password is specified in this entry. This password is also used for outgoing (replying) emails.
- **2nd Outgoing (Replying) Email Address:**
This is an additional outgoing reply email address. The system always send replying email to the sender. There is no limitation of types of destination email servers, whether a web based emailing system or SMTP. Examples of destination addresses are myMail@hotmail.com and yourMail@aol.com.

Helpful Info: use the command "/emailsend" to immediately send an outgoing test email.

- **Reply (Outgoing) Email Authentication:**
If an SMTP (outgoing) email requires a user name and password authentication, enter "Y" for this entry.

Helpful Info: use command "/emailget" to immediately check incoming emails.

- **Check Email Interval:**
This entry specifies how often the system checks incoming emails. The minimum interval is one minute.
- **Access Control List (ACL) Enable:**
To enable or disable the feature. Click “Help” button to see help information.
- **IP Access Control Mask 1 to 6:**
These entries define Mask Mode and IP filtering requirements. Mask Mode includes Block, Permit and Don't Care. See section 2.5 for a complete description of the feature. You can also click “Help” button for further information about how to setup the filtering and blocking requirements.
- **Network Connection Check Using This IP:**
This entry specifies an IP address or a URL site that NPC system will ping periodically for verification of network connectivity. If the network connection is down or inactive, AutoPing is in off mode. If this entry leaves blank, network gateway IP address will be used.

4.4 More about Emailing Access:

4.4.1 Sending Control command to the system:

There are two tasks the system executes using the Emailing access method. The first task is to send control commands such as controlling the power outlet. The second task is to send data to the user serial ports. Control commands are placed in the email subject field, while user data to a user serial port is placed in the email body.

A control command in the subject field has the following format:

&SysName&userName&password&Command&,

where “&” is a command delimiter; “SystemName” is a user defined system or device name; “username” and “password” are valid user account name and password; and “command” is the actual system control command.

Command delimiters are special characters or spaces that identify the beginning or end of a group of characters in a command. Delimiters are used to separate a character string into the individual parts that form a command: command label, command name, parameter keywords, and parameter values. The default **delimiter** character is “&” symbol. To change it, use command “eCmd X” at terminal program or telnet session. Use command “/Help” is view available command delimiter symbols.

For example, sending email subject “&mySite3&johnW&123456&rb 2&” will reboot power outlet 2 on a NPC system, named as “mySite3”. The user name is “johnW” and password is

“123456”. Figure 10 shows an example of sending a control command email from Microsoft Hotmail to a POP email recipient. test2@synaccess-net.com.

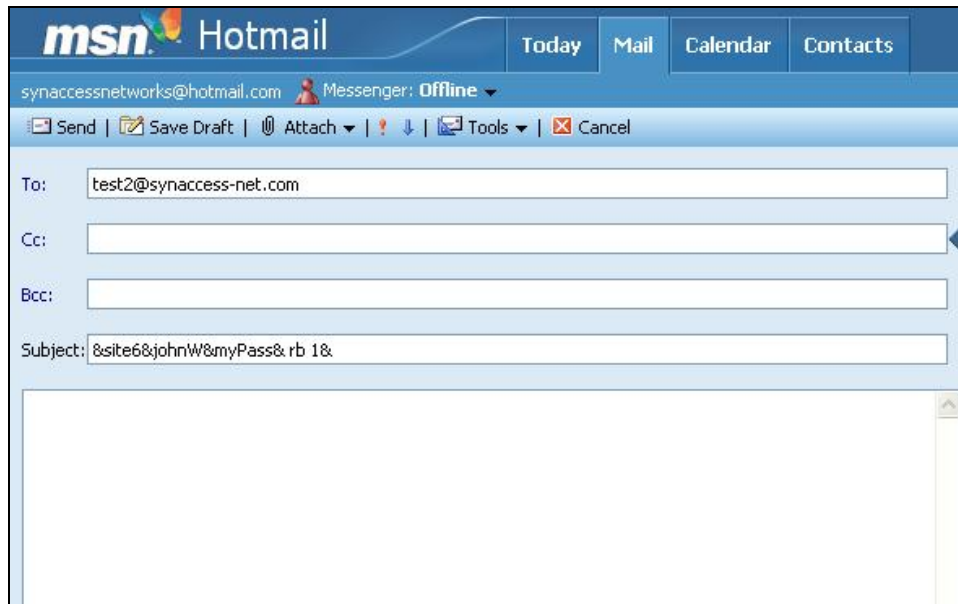


Figure 20 - Sending a Control Command “rb 1” From “hotmail” Web Page

Before a command is executed, a confirmation reply email is sent. The destination of the replying email address is already defined in the Network Configuration Table. Figure 21 shows a reply email is received and displayed at “hotmail” web site.

Figure 21 – Reply Email Before a Control Command Is Executed

A control command is not executed if the system name does not match, user name does not exist, or the name does not have the privilege to operate the designated serial console port or power outlet port, or if there is a command syntax error. If this happens, a reply email is sent to indicate the problem of the command, as shown in the Figure 22.

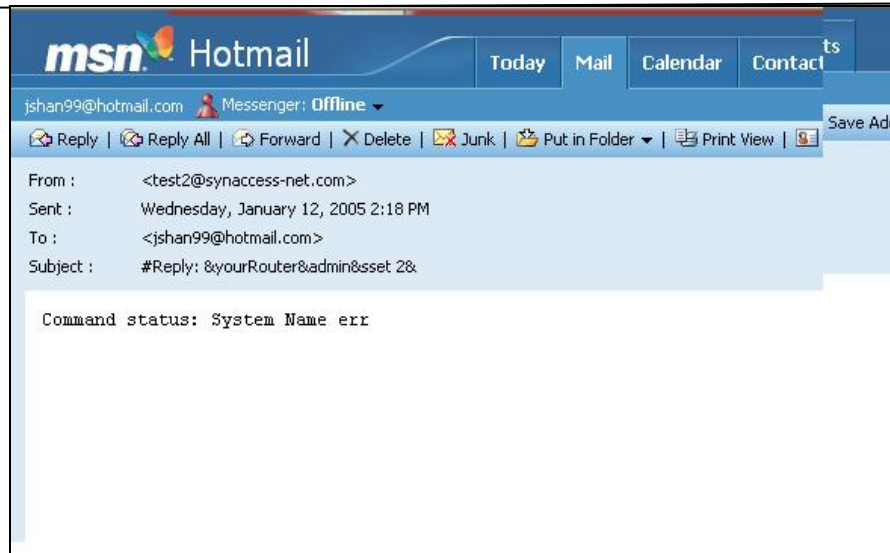


Figure 22 – Reply Email Indicating System Name Mismatch Error

Helpful Info:

- Use the command `“/emailvbs x”` to set to mail verbose mode. In verbose mode, the system displays detailed information while sending and receiving emails. It is helpful while you are setting up your email accounts.

“/emailvbs 0” turns the verbose mode off.

“/emailvbs 1” sets the system to level 1 verbose mode, in which high level emailing activities are displayed.

“/emailvbs 2” sets to the system to level 2 verbose mode, in which detailed emailing activities are displayed.

- Use command `“/emailget”` to check incoming emails immediately.
- Use command `“emailsend”` to send a test mail immediately

4.4.2 Sending Data to or Capturing User Equipment Data:

The user data is placed in the email text body. Each line of the user data entry is braced with the symbol “&”, such as: `&my line 1 message&`. The number of characters for each line is limited to 200 characters. The maximum number of message lines is limited to 50. Upon receiving a valid email, a NPC system starts capturing data from the active user console port for 20 seconds (aperture). The data buffer for user data storage is limited to 4K bytes.

For example, to send user data to serial port 2, enter the control command in an email subject field:

&mySysName&myName&myPassword&sset 2&

Note: To send data to a user console port via email, you must have the command “sset n” in the subject field

Then enter user data (often commands for user equipment) in an email body field:

&kill 45667 &
&lprint logfile &

Note: the leading letter “&” must be placed at the beginning of the each line. Any messages that are not braced within “&” are not forwarded to user serial console port.

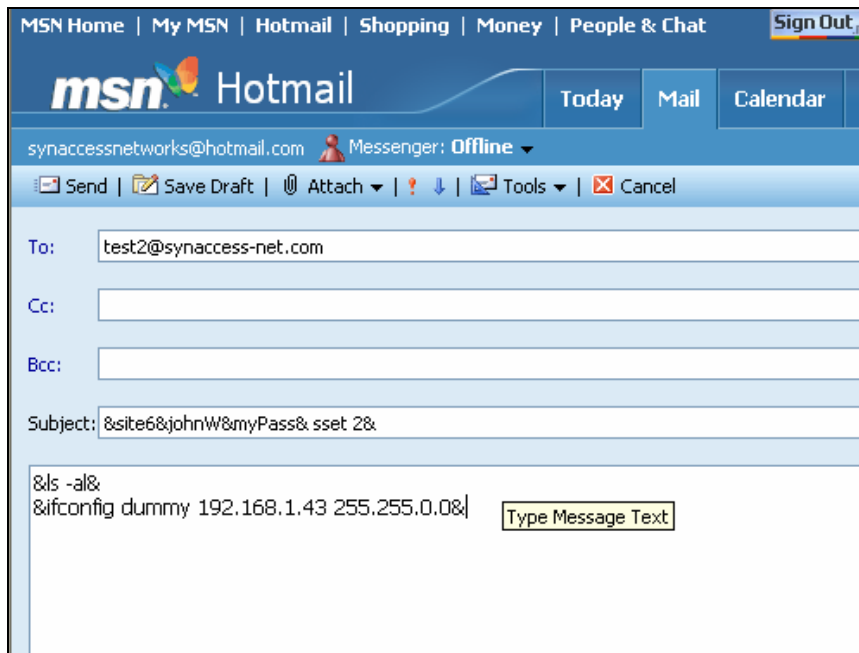


Figure 23 – Example of Sending Data to User Serial Console Port

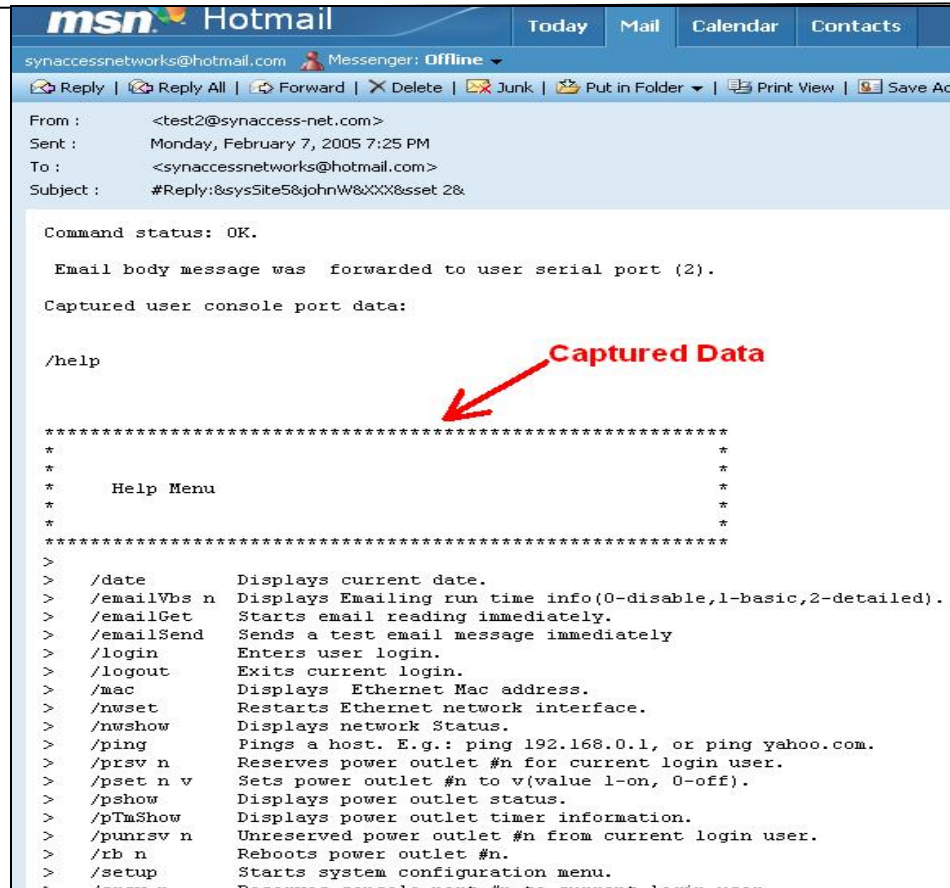


Figure 24 – Reply Email Indicating User Data Was Forwarded and Captured

4.5 Serial Console Port Configuration Menu:

This section describes serial console port configuration and operating settings:

Serial Console Port configuration starts with the following menu:

```

*****
*
*
*   Serial Console Port Configuration Menu
*
*
*****
>
>   1) Set active serial console port.
>   2) Change serial console parameters.
>   3) Show serial console port status.
>   4) Quit and go back to previous menu.
    
```

Figure 25 – Serial Console Port Setting (Terminal Screen)

- **Option 1 – Set Active Serial Console Port:**
Set a user serial port to active so that the Local Master Port becomes transparent to the active port. However, even the active port is selected; you may or may not be able to communicate with the user port. You are only able to operate the active serial port if the port is unreserved (“open”), or reserved by you. But, if you logged in at Administration level, you are able to overwrite user level privileges and communicate any ports you select.
- **Change Serial Console Port Parameters:**
Enter Serial Console port Configuration submenu.
- **Serial Console Port Status:**
Display all serial console port parameters.

```

>   Serial Console Port Configuration Status

Port | Name | Baud | DB | P | SB | FlowCtrl | Owner | Status
-----+-----+-----+-----+-----+-----+-----+-----+-----
M | Master | 9600 | 8 | N | 1 | none | Admin | On
1 | Undefined | 9600 | 8 | N | 1 | none | Open | Off
2 | Equip5 | 9600 | 8 | N | 1 | none | JohnW | On
3 | Undefined | 9600 | 8 | N | 1 | none | Open | On
4 | Undefined | 9600 | 8 | N | 1 | none | Open | On
5 | router2 | 9600 | 8 | N | 1 | CTS/RTS | Open | On
6 | Undefined | 9600 | 8 | N | 1 | none | Open | On
7 | Undefined | 9600 | 8 | N | 1 | none | Open | On
8 | Undefined | 9600 | 8 | N | 1 | none | Open | On

>Local Master serial is in Console mode.
>
>Enter "q" to quit or enter a port number (or M) to make changes:
    
```

Figure 26 – List of Serial Console Port Configuration Status (Terminal Screen)



Figure 27 - Serial Port Setup Menu (Web Page)

```

*****
*
*
*      Port 1 Configuration Menu
*
*
*
*****
>
>      1) Baud rate.....38400
>      2) Data bits:(7 or 8).....8
>      3) Stop bits(1 or 2).....1
>      4) Parity(1-Even,2-Odd,3-None).....3
>      5) Flow control(1-hardware,2-XonXoff,3-None)..3
>      6) Port name.....Undefined
>      7) Save:
>      8) Quit:
>Please select a parameter to change:
    
```

Figure 28 – Serial Port N Parameter Entry Table

- **Baud Rate:**

The system supports the following baud rates: 2400, 4800, 9600, 19200, 38400, 57600 and 115200.

It is strongly recommended that Master port and a user serial port have the same data rate while exchanging data between them so that data loss is eliminated. If you must run both ports using different baud rates, Flow Control (hardware handshaking) should be enabled on all connected serial console ports.

Please also note that when Telnet access is used for exchanging data between the system's Ethernet interface port and user communication equipment, without enabling flow control,

you might experience data loss when data exchange rate is high. This is because data flow from the system's Ethernet port is subject to the congestion condition of LAN traffic.

- **Data Bit:**
Supports 7 or 8 bits.
- **Stop Bits:**
Supports 1 or 2 bits.
- **Parity Bits:**
Supports Even, Odd or None.
- **Flow Control:**
Flow Control is hardware handshaking using CTS/RTS signals on the connectors. Please see Appendix A for information about RS232 connector pin assignments.
- **Port Name:**
Assign a name for the port.

Helpful Info:

- *Use the command “/sset n” to select serial port “n” to be active.*
- *Use the command “/srsv n” to reserve a serial port for your account. You must login to the system first.*
- *Use the command “/sunrsv” to un-reserve a serial port under your account.*

4.6 Power Outlet Setup Menu:

This section describes:

- 1) Power Outlet Configuration
- 2) AutoPing Functions
- 3) Timer Usages.

If you run a terminal program, power outlet setup starts with the following menu:

```
*****
*
*                                     *
*      Power Outlet Port Setup Menu   *
*                                     *
*                                     *
*****
>
>      1) Change power port parameters.
>      2) Change power reboot Duration (for all outlets).
>      3) List all power port status.
>      4) Quit and go back to previous menu.

>Please enter your selection:
```

Figure 29 – Power Outlet Setup Menu (Terminal Screen)

- **Change Power Port Parameters:**
Enter power outlet configuration submenu.
- **Change Power Reboot Duration:**
Enter power reboot duration value. When the reboot process starts, the system flips current power outlet status from On to Off, or Off to On for the number of seconds that this parameter defines. The default value is 5 seconds. This is parameter applies to all power outlets.
- **List of All Power Port Status:**
Display all power ports current statuses, as shown in Figure 30.

Helpful Info:

- *use command “/pshow” to display all power outlet status.*

```

*****
*
*
*   Power Outlet Port Parameters and Status
*
*
*****
>
>
Port |      Name |  Status | Reserved By | Timer
-----+-----+-----+-----+-----
1 | Switch5 | On | Open | Off
2 | Undefined | On | Open | Off
3 | eqt1 | On | JohnW | On
4 | Undefined | On | Open | Off

>***Power reboot duration: 5 seconds.
>
>Press key "Enter" to continue ...
    
```

Figure 30 List of Power Outlet Status (Terminal Screen)

Power Outlet Setup Menu

Outlet Number	Outlet Name	Outlet On/Off	Owner(Locked by)	Timer On/Off	Timer Starting Time (mon.day:hour:min:sec) (Calendar Time)	Timer Period (day:hour:min:sec)	Loop Count	Toggle Duration
1	Undefined	On	Open <input type="button" value="Change Owner"/>	ON/OFF	Off	Off	Off	Off
2	Undefined	On	Open <input type="button" value="Change Owner"/>	ON/OFF	Off	Off	Off	Off

AutoSense Reboot Entry

Outlet Number	AutoSense Reboot Enable	Max Network Down Time (seconds) Allowed	AutoSense destination IP address(or URL)
1	No	60	
2	No	60	

Date:07:04:1988 Time:03:11:24

Diagram labels: Timer Start Time, Timer Period, Off, Loop Count 1, Loop Count 2, Loop Count 3, Loop Count 4, ON, Toggle Duration

Figure 31 - Power Outlet Setup Menu (WebPage)

Figure 32 shows a power outlet entry table. This is an example of the power outlet in Timer off mode. To enable the Timer, select option 3. Once a timer is enabled, the entry table is extended including all timer parameters as shown in Figure 33.

```

*****
*
*
*      Power Port 1 Configuration Menu
*
*
*****
>
>Current Time: 3:51:30. Date: 1/8/1980
> 1) Power Outlet name.....Undefined
> 2) Power Port(1-On; 0-Off).....1
> 3) Power Outlet timer(1-On; 0-Off).....0
> 4) Enable AutoPing(Reboot if Network down)(Y/N)..N
> 5) Max Network Down Time(seconds) Allowed.....60
> 6) AutoPing destination IP address(or URL).....
> 7) Save
> 8) Quit

```

Figure 32 – Power Outlet Parameter Menu (Timer Off Mode)

```

*****
*
*
*      Power Port 1 Configuration Menu
*
*
*****
>
>Current Time: 3:52:38. Date: 1/8/1980
> 1) Power Outlet name.....Undefined
> 2) Power Port(1-On; 0-Off).....1
> 3) Power Outlet timer(1-On; 0-Off).....1
> 4) Enable AutoPing(Reboot if Network down)(Y/N)..N
> 5) Max Network Down Time(seconds) Allowed.....60
> 6) AutoPing destination IP address(or URL).....
> 7) Timer Start Time (mon:day:hour:min:secs).....02:08:03:52:30
> 8) Timer Period (day:hour:min:sec).....000:24:00:00
> 9) Timer Loop Count (0 - infinite).....65535
> 10)Timer Toggle Duration .....5
> 11) Help
> 12) Save
> 13) Quit

>Please select a parameter to change:

```

Figure 33 - Power Outlet Parameter Menu (Timer On Mode)

- **Power Outlet Name:**

Define a name for the power outlet.

- **Power Outlet:**

Set the power outlet to power on or off state.

- **Power Outlet Timer:**

Enable or disable the Timer for the port.

- **Enable AutoPing (Power reboot If user equipment's network is down):**

Disable or enable AutoPing power reboot function. If it is enabled, the system schedules auto pings to the communication equipment that is connected to the power outlet. If no response is received in a period of time (user defined, see below) from the communication equipment, the system starts the power reboot process for the power outlet.

HelpInfo: use the command `"/apVbs 1"` to displays AutoPing run-time information.

- **Max Network Downtime allowed:**

Set a value of maximum network down time, in seconds. If probed communication equipment does not send ping response messages back to the system for this period of time, the system will start reboot processes for the power outlet.

Note: AutoPing starts power reboot process if and only if the following two conditions are met:

- 1) NPC system is active on the network interface. This enables AutoPing mode at system operation level.

The active network connection is verified periodically by pinging a network target IP address (default to network gateways IP address). If there is no response from the network target address, AutoPing mode is in off mode.

- 2) Once AutoPing mode is on, if user communication equipment stops sending responses back to the NPC system for a period of time (**Max Network Downtime allowed**), power rebooting process begins. If the user equipment has never sent a ping response back to the system after AutoPing mode turns on, AutoPing will never trigger the power reboot process for the power outlet.

- **AutoPing (Ping) destination IP address (or URL):**

Enter an IP address of the probed communication equipment IP. This IP address is associated to the power outlet.

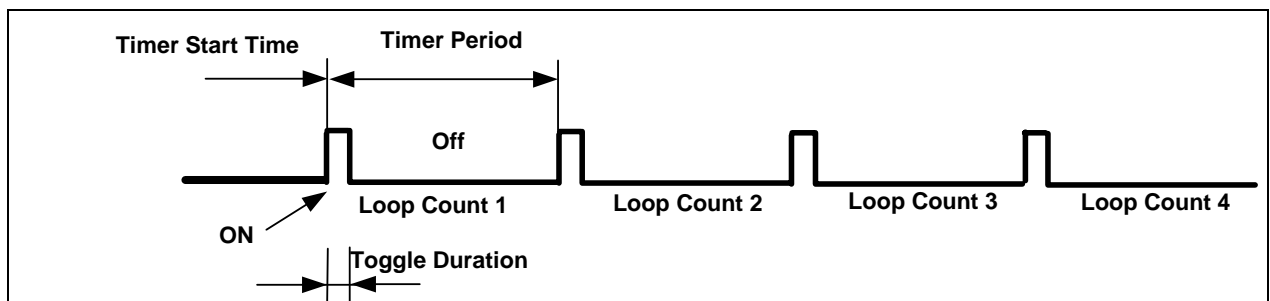


Figure 34 – Definitions of Timer Parameters

- **Timer Start Time:**

Specify starting time for the timer. The starting time is the actual calendar date and real-time clock. Once a timer reaches this specified Start Time, the power outlet on/off state will flip. It is in the format of “month:day:hour:minute:second”. For example, to start changing the power outlet on/off state at 6:31:2pm, on June 20th, the entry data is 6:20:18:31:02.

- **Timer Period:**

Specify the timer period. It is in the format of “days:hours:minutes:seconds”, which is not a calendar and real-time clock entry type. The period setting is used for applications that require the power outlet to continuously change on/off in a specific interval. For example, you need to schedule power reboot for the outlet daily, the period is 24 hours. Your entry will be 00:24:00:00.

- **Timer Loop Count:**

The number of Periods for the Timer is defined as Loop Count. For example, you schedule the timer to flip the power outlet states in every 20 seconds and want to repeat 300 times, your entry will be 300.

Enter “0” for this setting, if you schedule the power outlet simply change power state from on to off, or from off to on a specific time and date.

Enter “1” for the setting, if you schedule the power outlet to be on-off-on, or off-on-off once. For example, the system executes one power reboot cycle on a specific date and time.

- **Toggle Duration:**

Specify the duration of the power outlet state that toggles when a new Timer Period starts. This parameter is meaningful if the Timer Loop Count is > 0. The unit for the duration is in seconds. The concept of the specification can also be viewed as Duty Cycle. The value of this parameter should be $0 < \text{Toggle Duration} < \text{Timer Period}$.

There are a few examples of applications using the Power Outlet Timers:

1) Reboot daily:

Current Calendar date and time are: Aug. 10th, 10:00 am.

Requires daily power Reboot at 1:00am. Reboot duration is 10 seconds.

Timer Start Time = 8:11:1:0:0 - Reboot starts on Aug. 11th, 1:00 am.

Timer Period = 1:0:0:0 - Period is 1 day, 0 hour, 0 minute, and 0 second.

Timer Toggle Duration = 10 - Power outlet will toggle on/off state for 10 seconds.

Timer Loop Count = 1000 - 1000 days

2) Toggle Power Outlets for 300 times:

Toggling Power outlet on/off state 300 times in a period of 10 seconds starts immediately. Current Calendar date and time are: Aug. 10th, 10:00 am.

Timer Start Time = 8:10:10:00:20 - Start toggling on Aug. 10th, at 10:00:20 am.

Timer Period = 20 - Choose 20 seconds and duty cycle 50%. *Note: the period setting is not 10.*

Timer Toggle Duration = 10 - This results in 10 seconds on and 10 seconds off.

Timer Loop Count = 300 - 300 periods.

3) Reboot once on a specific date and time:

Current Calendar date and time are: Aug. 10th, 10:00 am.

To schedule a reboot on Feb 12th, 1:00 am.

Timer Start Time = 2:12:1:00:00 - Start the event at 1:00am, on Feb. 12th,

Timer Period = 6 - 6 seconds

Timer Toggle Duration = 5 - 5 seconds. Reboot duration is 5 seconds.

Timer Loop Count = 1 - Reboot once.

4.7 User Account Management Menu:

User account management includes reserving or un-reserving each serial console ports and power outlets to a current login user, as well as adding new user accounts, modifying and deleting user accounts.

```
*****
*
*
*      User Account Management Menu
*
*
*****
>
>      1) Add a new user name
>      2) Delete an existing user name
>      3) List all user names
>      4) Change login name and password
>      5) Lock power outlet
>      6) Unlock power outlet
>      7) Lock serial port
>      8) Unlock serial port
>      9) Quit
```

Figure 35 - User Account Management Menu (Terminal)

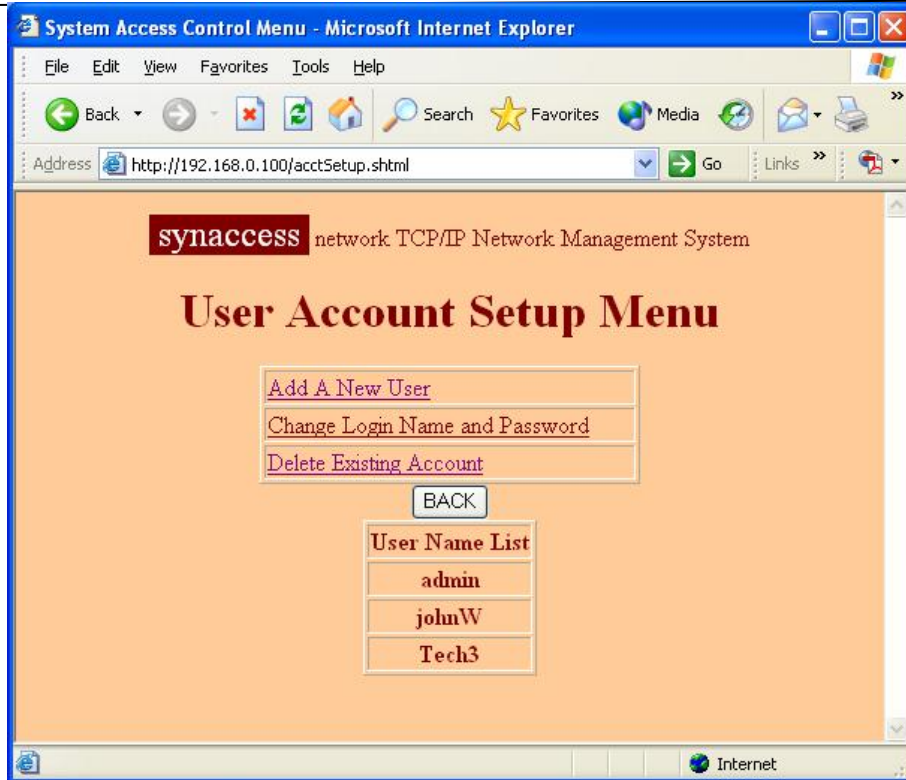


Figure 36 - User Account Management Menu (Web Page)

Helpful Info:

- Use the command *"/userlist"* to view all existing account

4.7 Viewing and Changing Operation Status with a Web Page:

Figure 37 shows a web page that lets you to view and change serial console port and power outlet operation status.

With this web page, you are able to:

- View the current active user serial console ports. As shown in the table, the active port is set to port 1.
- View on/off status for each power outlet. Power outlet 1, in the Figure 37, is power on (illuminated in red) and outlet 2 is power off (not illuminated, in grey).
- Change current active user console port by clicking the "connection" radio button.
- Change power outlet on/off status by clicking "on/off" push switch button icon.
- Reboot a power outlet by clicking "Reboot" push switch button icon.
- Get current ports status by pressing "Refresh View" button.

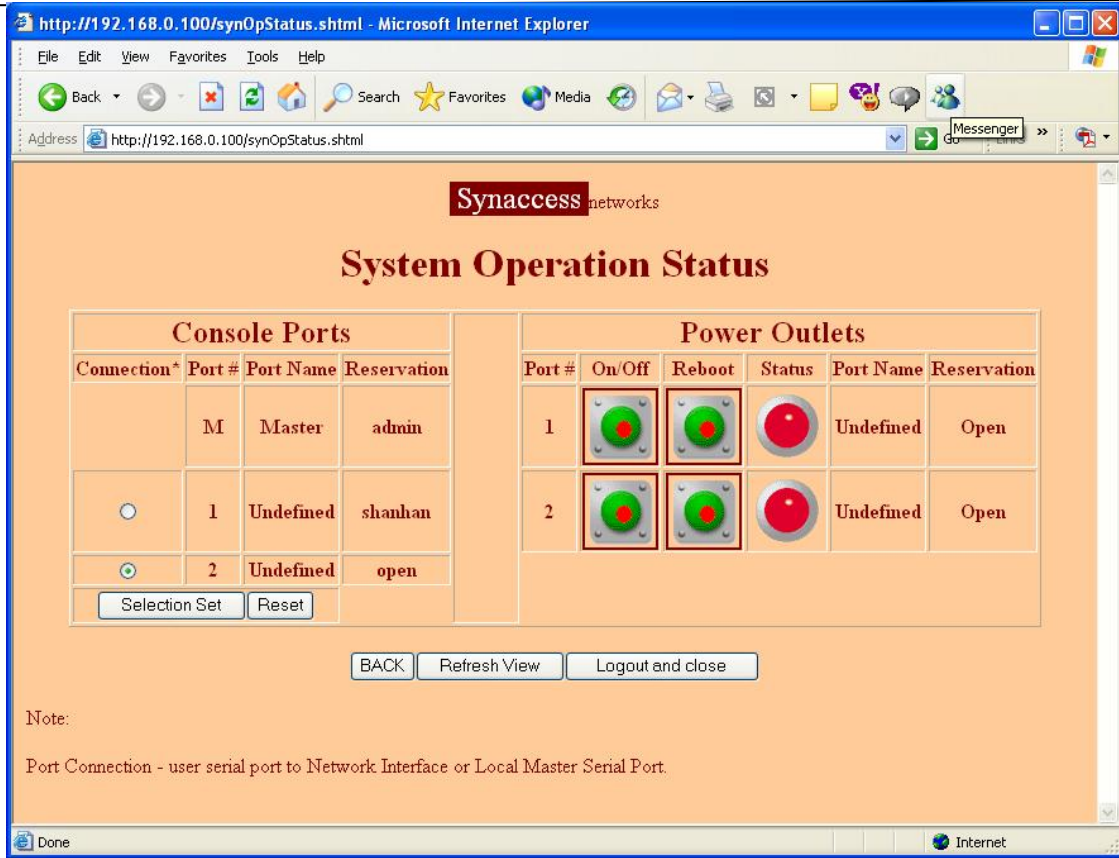


Figure 37 – Viewing and Changing System Operation Status

Appendix A Serial Console Port Interfaces

Local Master Port - DB-9 Female DCE

Pin #	Name	Long Name	Direction	Description
1	DCD	Data Carrier Detect	<<<	Raised when an carrier communication is established.
2	TD	Transmitting Data	>>>	Serial data stream sent to the DTE device. Same note as above apply.
3	RD	Receive Data	<<<	Receives serial data stream.
4	DSR	Open	<<<	Not connected.
5	GND	Signal Ground		
6	DTR	Terminal Ready	>>>	Indication of serial port activated.
7	CTS	Clear To Send	<<<	When hardware flow control is enabled, if this signal is raised, an external device can send data to Local Master Port.
8	RTS	Request To Send	>>>	When hardware flow control is enabled, this signal is raised by the Local Master Port when it is ready to receive new data from an external device.
9	Open			Open

User Console Port - DB-9 Male DTE

Pin #	Name	Long Name	Direction	Description
1	Open		<<<	Open
3	TD	Transmitting Data	>>>	Serial data stream sent to the DTE device. Same note as above apply.
2	RD	Receive Data	<<<	Receiving serial data stream.
4	Open		>>>	Open
5	GND	Signal Ground		

6	Open		<<<	Not connected.
8	CTS	Clear To Send	<<<	When hardware flow control is enabled, if this signal is raised, an external device can send data to Local Master Port.
7	RTS	Request To Send	>>>	When hardware flow control is enabled, this signal is raised by the Local Master Port when it is ready to receive new data from an external device.
9	Open			Open

Appendix B System Specifications

Item	NPC-22	NPC-48
Power Input	15 Amps Max	15 Amps Max
Voltage	100 – 240 VAC	100 – 240 VAC
Connector	Power Cord	Power Cord
AC Output Outlet	2	4
Outlet Type	NEMA 5-15	NEMA 5-15
Total Load (Combine all AC outlets)	15 Amps Max	15 Amps Max
Physical Dimensions	5.25" X 6.75" X 2.5"	19" X 1.5" X 6.25" (19"-1U)
Console Interface – Local Master Port	1 RS232 Port. DB-9 Female DCE Data: 7 or 8 bits. Stop Bits: 1 or 2. Parity: None, Odd or Even. Flow Control: None or RTS/CTS. Baud Rate: 2400 to 115200.	1 RS232 Port. DB-9 Female DCE Data: 7 or 8 bits. Stop Bits: 1 or 2. Parity: None, Odd or Even. Flow Control: None or RTS/CTS. Baud Rate: 2400 to 115200.
Console Interface – User Console Ports	2 RS232 Ports. DB-9 Male DTE. Data: 7 or 8 bits. Stop Bits: 1 or 2. Parity: None, Odd or Even. Flow Control: None or RTS/CTS. Baud Rate: 2400 to 115200.	8 RS232 Ports. DB-9 Male DTE. Data: 7 or 8 bits. Stop Bits: 1 or 2. Parity: None, Odd or Even. Flow Control: None or RTS/CTS. Baud Rate: 2400 to 115200.
LED	2 power outlet LEDs 1 system power LED. 2 Network LEDs.	4 power outlet LEDs 8 user console port LEDs 1 system power LED. 2 Network LEDs.
Weight	3 lbs, shipping weight	5 lbs. Shipping Weight.
Operational Temperature Environment	32F° – 122F° (0C° – 50C°)	32F° – 122F° (0C° – 50C°)
Humidity	10 – 90% RH	10 – 90% RH
Storage Temperature	-20F° – 140F° (-29C° – 60C°)	-20F° – 140F° (-29C° – 60C°)

Appendix C RS-232 To RJ45 Conversion Cables

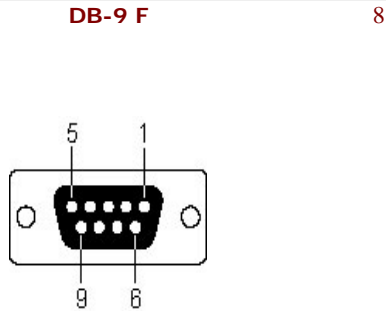
RS-232 — RJ45 (8-pin)

C-RJ45-DB9F-4, RJ-45 to RS232 (Female, DCE) cable, 4'.

RS-232 — DB9 Female

RJ45 (8-pin)

Pin No.	Signal
1	DCD
2	TxD
3	RxD
4	DSR
5	GND
6	DTR
7	CTS
8	RTS
9	---



Pin No.	Signal
1	DSR
2	RTS
3	GND
4	TxD
5	RxD
6	DCD
7	CTS
8	DTR

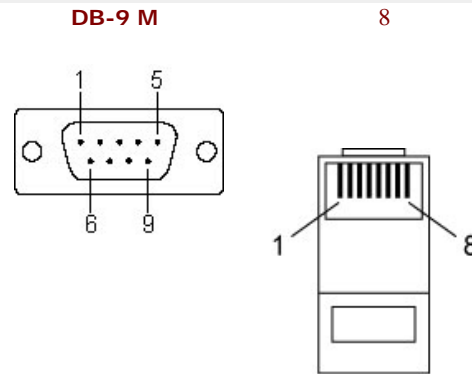
RS-232 — RJ45 (8-pin)

C-RJ45-DB9M-4, RJ-45 to RS232 (Male, DTE) cable, 4'.

RS-232 — DB9 Male

RJ45 (8-pin)

Pin No.	Signal
1	DCD
2	RxD
3	TxD
4	DTR
5	GND
6	DSR
7	RTS
8	CTS
9	---



Pin No.	Signal
1	DSR
2	RTS
3	GND
4	TxD
5	RxD
6	DCD
7	CTS
8	DTR