Network Critical
The Window to your Network™

Smart Network Access
10G V-Line (Bypass) TAP User Guide

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1 Introduction

The Network Critical Smart Network Access 10G V-Line TAP (SNA10GV) is a virtually inline network traffic access point that protects your networks integrity from network failures and network appliance maintenance. The SNA10GV generates a heartbeat and supports several modes of operation.

The SNA10GV includes two duplex LC ports for live network devices, two SFP+ ports for the attached inline monitoring device, and two management ports: serial port (RJ-11) and a gigabit Ethernet port (RJ-45). The SNA10GV supports 10 Gigabit Multimode Fiber (10GBase-SR) and 10 Gigabit single mode fiber (10GBase-LR) network standards.

The SNA10GV is a 1U chassis system that will support up to (4) Network Critical Smart Network Access 10G V-Line modules, and includes redundant 110 - 220 VAC power supplies.

Figure 1: SNA10GV Module

Figure 2: Chassis Front

Figure 3: Chassis Rear

2 Features

2.1 General

The SNA10GV modules support four operation modes: **Inline**, **Bypass**, **TAP** and **LinkDrop** modes.

Inline: The SNA10GV diverts inline network traffic to attached inline monitoring appliance.

Bypass: The SNA10GV diverts inline network traffic to the other network link only.

TAP: Incoming traffic in port NETA is mirrored to port MONA and incoming traffic in port NETB is mirrored to port MONB.

LinkDrop: The SNA10GV disables the links on the network ports (NETA, NETB). The module simulates a live network device cable disconnection. Sometimes used in high availability designs, where multiple inline tools are on more than one primary/secondary link pair.

The SNA10GV modules include a "Double Safe" Bypass design. The "Double safe" Bypass architecture is based on two separate Bypass routing circuitries: An Inline (Active) Bypass circuitry and a Network (Passive) FailSafe Bypass circuitry. If the internal active bypass routing circuitry fails, the network bypass routing circuitry is activated and traffic resumes flowing.

The SNA10GV can be configured via a management serial communication port and via management Ethernet port using TELNET, SSH, HTTPS or SNMP.

2.2 Bypass Modes

The SNA10GV can be configured to switch to Bypass, TAP, or LinkDrop (also known as Reverse Bypass) mode when one of the following events occurs:

- Appliance or Application Failure
- Monitor Link Failure
- Manual Bypass for Maintenance
- Power Failure or Power Off

2.3 Appliance Failure

By default, the SNA10GV modules generate heartbeat packets from both of the monitoring appliance ports. Under normal circumstances the monitoring network appliance should be allowed to pass the heartbeat packets, indicating that the inline device is healthy.

As long as the SNA10GV receives the heartbeat packet from the other side of the monitoring loop, it will continue to operate inline using the monitoring appliance. When the SNA10GV no longer detects a heartbeat packet from the monitor loop, the monitoring appliance is bypassed. Once the monitoring appliance recovers, the module will resume inline operating mode.

When using Inline and TAP modes, the network traffic continues to flow through the network ports and is only copied to the monitor ports. As soon as the monitoring network appliance recovers and starts passing the heartbeat packets, the SNA10GV will switch back to inline mode after detecting the heartbeat packets for the amount of time set in the heartbeat holdtime preference.

2.4 Monitor Link Failure

The SNA10GV will also detect if a monitor appliance port loses link. In the event of a link state change on one of the monitor ports, the module will bypass the monitor ports and switch to Inline Bypass mode. The network traffic continues to flow through the network ports and is not diverted to the monitor ports. When the monitor link is restored and the appliance is deemed healthy and passing heartbeat packets, the module will revert back to Inline mode, using the network appliance inline.

2.5 FailSafe

If power is lost to the chassis, SNA10GV modules will become passive and operate as a straight through or patch cable. The connection between the live network ports will instantly reconnect, allowing traffic on the live network devices to resume flowing. However, all monitoring function will cease until power is reestablished.

2.6 TAP Mode

The SNA10GV modules also support TAP Mode. When enabled, incoming traffic in port NETA is copied to port MONA and incoming traffic in port NETB is copied to port MONB. This is sometimes referred to as breakout mode, where traffic is separated into different directional streams. By separating traffic into two directional streams, the risk of port oversubscription is eliminated.

2.7 LinkDrop Mode

In LinkDrop or Reverse Bypass mode the SNA10GV disables the links on the network ports (NETA, NETB). The SNA10GV simulates switch / router cable disconnection. Sometimes used in high availability designs, where multiple inline tools are on more than one primary/secondary link pair.

2.8 Link Failure Propagation

Link Failure Propagation (LFP) is a feature used primarily in High Availability network designs. LFP allows the attached network devices to detect if a failure occurs on the adjacent network interface(s). When one side of a link is lost LFP brings down the rest of the link automatically, thus allowing the network to identify the failure. This is done by continually monitoring the link status of each port of a port pair (for example, ports A & B). If a connection is lost, Smart Network Access continues to monitor both ports and will immediately bring both ports back online when the connection has been re-established.

2.9 Heartbeat Emit Mode

When Heartbeat Emit Mode is enabled (default) and the SNA10GV module no longer detects heartbeat packets from either of the monitor ports, the module will switch to Bypass, TAP, or LinkDrop modes depending on the user preferred Bypass Mode settings.

If Heartbeat Emit Mode is disabled, the module will stop sending heartbeat packets from both of the Monitor Ports. Once disabled, the module can then be manually set to operate in the following modes: Inline, Bypass, TAP, or LinkDrop. By default Heartbeat Emit Mode is not preserved after reset or after power off cycle. The Heartbeat active mode can be configured to be preserved after reset or power off cycle by enabling the Preserve Heartbeat parameter.

3 Installation

3.1 Rack Mount the SNA10GV System

The SNA10GV is a rack mountable ready unit. To rack mount the SNA10GV system:

1. Attach the 2 mounting flanges to the SNA10GV chassis using 3 screws for each mounting flange.
2. Slide the chassis into 1U slot and screw the SNA10GV to the rack using 2 screws on each mounting flange.

3.2 Connecting Power to the 220/110V AC Chassis

1. Verify that the chassis power switch is in the OFF position
2. Connect two power cables to the power supplies on to the back of the SNA10GV chassis. The PWR LED's on the front panel of the chassis will illuminate when switching on the power switch.

3.3 Connecting Power to the -48V DC Chassis

1. Verify that the power is OFF on the DC power source
2. Verify that the chassis power switch is OFF
3. Connect the DC input wires to the DC chassis input terminals as follows:
    a. Connect ground/earth wire to ground terminal (left)
    b. Connect -48V return to positive "+" terminal (center)
    c. Connect -48V wire to negative "-" terminal (right)

3.4 Connect the Serial Management Port

1. Connect the supplied RS232 DB9 to RJ11 cable to the Management RS232 port
2. Connect the other side of the RS232 cable to your Appliance RS232 port
3. Use any terminal emulation software (PuTTY, HyperTerminal…) to connect to the CLI interface to in order manage the SNA10GV
4. Set the following terminal communication parameters:
    - 115200 baud
    - 8 bits
    - No parity
    - 1 stop bit
    - Flow control off
5. Power on the SNA10GV chassis
6. Login prompt will appear in terminal window
7. The login username: **admin**, the default password: **sna10gvl**
8. After login you should change password, user and date. If you plan to use the Ethernet management port, set the IP address, net mask and gateway parameters.

3.5 Connect the Ethernet Management Port

1. Connect Ethernet cable (CAT5) to the Management 1G Ethernet network port
2. Use any Telnet or SSH client to connect to the CLI interface in order to manage the SNA10GV
3. The following are the default IP and login parameters

- IP address: 192.168.254.115
- Net mask: 255.255.255.0
- Gateway: 0.0.0.0
- Login name: **admin**
- Password: **sna10gvl**

4. The following are the default SNMP user/community names and passwords (for SNMP v3)
   - user/community name: **admin**
   - password: **sna10gvl**

4 Command Line Interface

Login to the Command Line Interface (CLI) by using either the RS232 or the Ethernet management interface. Available help commands will prompt after successful login. The **Help** menu displays list of available commands. The **Help Full** menu displays list of available commands with descriptions. The Help menu appears if any typo's are received. Command parameters cannot include space symbols.

4.1 Command List (help)

show/set_hb_emit,	show/set_op_mode,	show/set_lfp,
show/set_hb_interval,	show/set_hb_holdtime,	show/set_preserve_hb_mode,
show/set_bypass_mode,	show/set_inline_restore,	show/set_ip,
show/set_netmask,	show/set_gateway,	show/set_time,
set_username,	set_password,	show/set_log_dest,
show/set_device_name,	whoami,	show_ver,
show_config,	show_status,	show_hw_ver,
show_fw_ver,	show_tk_num,	show_fan_status,
show_appl_status,	show_terminal,	show_link,
show_log,	show/set_snmp_ver,	show/set_snmp_srv_ip,
show/set_snmp_user,	set_snmp_password,	apply_snmp,
reset_log,	set_default,	update,
reboot,	clear_errors,	show/set_web_https,
show_hb_pkt,	set_hb_defaults,	show/set_web_exp_time,
show/set_mgmt_port,	show/set_hb_dir,	show/set_hb_fail_mode

4.2 Heartbeat Emit Mode (set_hb_emit)

When **hb_emit** mode is ON, the SNA10GV sends heartbeat packets out both its monitor ports, through the inline appliance, and back into the opposite side of the monitor loop. If the SNA10GV does not detect the heartbeat packet received from the monitor ports, the SNA10GV module will switch to Bypass, TAP or LinkDrop mode according to the user defined **bypass_mode**. When **hb_emit** mode is set to OFF, the SNA10GV module stops sending the heartbeats and the Bypass circuitry can be set manually via the management port to one of the following modes: Inline, Bypass, TAP or LinkDrop mode. To enable and disable **hb_emit**, issue the commands **set_hb_emit ON/OFF**. By default **hb_emit** is enabled.

Note:

- Setting heartbeat emit mode ON will change the network bypass to revert to inline mode.

- If **preserve_hb** is OFF the **hb_emit** mode will remain ON after power on/off.
- If **preserve_hb** is ON the **hb_emit** mode will retain its last known state on power on/off.

4.3 Operating Mode (set_op_mode)

When **hb_emit** mode is set to OFF, the SNA10GV stops sending the heartbeats and the Bypass circuitry can be set manually via the management port to one of the following modes: Inline, Bypass, TAP or LinkDrop mode. To change **op_mode** configuration, issue the command **set_op_mode XXX**.

4.4 Link Failure Propagation (set_lfp)

Link Failure Propagation is a feature used primarily in high availability network designs. LFP allows the attached network devices to detect if a failure occurs on the adjacent network interface(s). When one side of a link is lost LFP brings down the rest of the link automatically, thus allowing the network to identify the failure. This is done by continually monitoring the link status of each port of a port pair (for example, ports A & B). If a connection is lost, Smart Network Access continues to monitor both ports and will immediately bring both ports back online when the connection has been re-established. To enable and disable LFP, issue the command **set_lfp ON/OFF**. LFP is enabled by default.

4.5 Heartbeat Interval (set_hb_interval)

The SNA10GV module generates a heartbeat packet from each of the monitor ports every # msec as indicated by the **hb_interval** preference. Default - 5, Min - 3, Max - 10000. As a general rule, the heartbeat interval should be at least 3 times less than the heartbeat holdtime value. The **hb_interval** is preserved after reset and power cycle. To configure **hb_interval**, issue the command **set_hb_interval #**.

4.6 Heartbeat Holdtime (set_hb_holdtime)

The SNA10GV module monitors the received packets from each of the monitor ports, if heartbeat packets do not arrive within # msec as specified by the **hb_holdtime** preference, the SNA10GV will switch to Bypass, TAP, or LinkDrop mode, depending on the **bypass_mode** user preference. For reliable detection of appliance failure, it is recommended that the **hb_holdtime** should be at least 3 times the **hb_interval** parameter. Default - 20, Min - 10, Max - 50000. The **hb_holdtime** is preserved after reset and power cycle. To configure **hb_holdtime**, issue the command **set_hb_holdtime #**.

4.7 Preserve Heartbeat Mode (set_preserve_hb)

When **preserve_hb** is ON, the **hb_emit** is preserved after reboot or power on. When the **preserve_hb** is set to OFF, the **hb_emit** is automatically turned ON after reboot or power on. Default value of the **preserve_hb** is OFF (disabled). To configure **preserve_hb**, issue the command **set_ preserve_hb ON/OFF**.

4.8 Bypass Mode (set_bypass_mode)

If the module does not receive heartbeat packets within the user specified **hb_holdtime** time in msec, the module will change to the mode that has been specified with **bypass_mode**. Bypass, TAP, or LinkDrop mode can be used. By default the module will bypass the appliance. To configure **bypass_mode**, issue the command **set_bypass_mode XXX**.

4.9 Inline Restore (set_inline_restore)

In addition to automatic restore, manual restore is also supported. The default value for **inline_restore** is ON. When **inline_restore** is ON, the module will return to **Inline** mode when the heartbeat packets are received from the monitor ports. When **inline_restore** is OFF, the module preserves its state and no heartbeat packets are generated. To return operation to automatic **inline_restore**, execute the following commands: **set_bypass_mode INLINE** and then **set_hb_emit ON**.

4.10 Time (set_time)

To change the SNA10GV date and time, issue the command **set_time mm DD HH MM YYYY**

- mm - month
- DD - day
- HH - hour (24 hour format)
- MM - minute
- YYYY - year

4.11 System Username (set_username)

To change the module username (factory default: **admin**) use the command **set_username**. The new user name will take effect after the next login.

4.12 System Password (set_password)

To change the module password (factory default: **sna10gvl**) use the command **set_password**. The new password will take effect after the next login.

4.13 Log File Destination (set_log_dest)

The log file can be saved in RAM or in a FLASH memory. The default SNA10GV module log file destination is the internal FLASH memory. When the log file is saved in the FLASH memory it is preserved after reboot or power off. The maximum log file size in flash is 512KB. When the log file reaches its maximum capacity, a message will appear on the terminal window and the log file will not be updated until it is reset using the **reset_log** command. When the log file is saved in the RAM, the log file will be erased in event of reboot or power OFF. To change the **log_dest**, issue the command **set_log_dest RAM/FLASH**.

4.14 Show Log File

The command **show_log** displays the log file on the module.

4.15 Reset Log, Reset Errors (reset_log, reset_err)

The command **reset_log** resets the log file on module.
The command **reset_err** resets error conditions on the module.

4.16 Device Name

Individual names can be used for each SNA10GV module on the network. The user can set the module device name (default device name: SNA10GV) using the command: **set_device_name**. Device name can be up to 25 characters long.

4.17 Who Am I (whoami)

Allows the System Ready **(RDY)** LED to be flashed on and off in order to help identify the relevant unit for onsite maintenance.

4.18 Show Versions (show_ver)

Executing the command **show_ver**, displays the module hardware, firmware, and software versions.

4.19 Show Configuration (show_config)

Executing the command **show_config**, displays the modules configuration preferences.

4.20 Show Status (show_status)

Executing the command **show_status**, displays the current operational status of the module. Often times issuing a **show_status** is much easier than executing many specific commands to obtain status.
Note: Issuing a **show_status** resets the alarm LED.

4.21 Show Fan Status (show_fan_status)

Executing the command **show_fan_status**, displays the fan status on system hardware.

4.22 Show Appliance Status (show_appl_status)

Executing the command **show_appl_status,** displays the current status of the application installed on the monitoring appliance:

- **Alive** - Link detected on the monitor ports, and heartbeat packets are being received
- **Fail** - Link detected on the monitor ports, but heartbeat packets are not getting through
- **Unknown** - No link detected on the monitor ports

4.23 Show Terminal State (show_terminal)

Executing the command **show_terminal**, displays the current status of the RS232 DB9 serial port.

4.24 Show Link (show_link)

Executing the command **show_link XXX**, displays the port link state as indicated below.

Where **XXX**:

- **MONA** Monitor Port A
- **MONB** Monitor Port B
- **NETA** Network Port A
- **NETB** Network Port B

4.25 SNMP Version (set_snmp_ver)

The SNA10GV modules support SNMP versions 1, 2c and 3. Executing the command **set_snmp_ver XXX** will define the version of SNMP that is preferred. The default SNMP version is 1.

Note:

- New SNMP settings will be used only after executing the command **apply_snmp**.

- SNMP v1 and 2c traps and requests are sent via the Ethernet port without encryption.

4.26 SNMP Server IP (set_snmp_srv_ip)

The **snmp_srv_ip** defines the IP address of the SNMP server to which the SNA10GV module will use to send SNMP traps and receive requests. Executing the command **set_snmp_srv_ip xxx.xxx.xxx.xxx**, will define the IP host that you wish to use as the SNMP server.

4.27 SNMP Username (set_snmp_username)

Executing the command **set_snmp_username XXX** defines both the SNMP username as well as the Web interface username. This is also used as the community name for SNMP. The default user and community name is **admin**. The user and community name can be up to 64 characters long.

4.28 SNMP Password (set_snmp_password)

SNMP v3 requires using a password to encrypt and decrypt SNMP information.
Executing the command **set_snmp_password** changes the desired SNMP password. The default password is **sna10gvl**. Please note that the same identification parameters will be used for the web interface login. The SNMP password length should include a minimum of 7 characters and can be up to 128 characters. As with most SNMP items, an **apply_snmp** is required for new settings to take place.

4.29 Apply SNMP Settings (apply_snmp)

Executing the command **apply_snmp** will apply the new SNMP configuration.

4.30 Default Configuration (set_default)

To restore the factory default settings, including system username and password, issue a **set_default** from the command line interface.

The factory default settings are:

- IP Address: 192.168.254.115
- Sub Network Mask: 255.255.255.0
- Default Gateway: 0.0.0.0
- Heartbeat Interval: 5 ms
- Heartbeat Holdtime: 20 ms
- Enable SNMP Traps: Disabled
- SNMP Server IP: 192.168.254.1
- SNMP Version: 1
- Web Expire Time: 900 Seconds
- Web HTTPS: Disabled
- TFTP Server IP: 192.168.254.1
- SNMP Username: admin
- SNMP Password: sna10gvl
- Device Name: SNA10GV
- TFTP Root: tftpboot
- Link Failure Propagation: Enabled
- Bypass Mode: Bypass
- Preserve Heartbeat Mode: Disabled
- Management Port: Enabled
- Heartbeat Emit: ON
- System Username: admin
- System Password: sna10gvl
- Heartbeat Transmit: Bidirectional
- Heartbeat Fail Criteria: Unidirectional

4.31 Web HTTPS (set_web_https)

The SNA10GV web interface supports both HTTPS and HTTP protocols. The factory default protocol is HTTP. Execute the command **set_web_https ON/OFF** to enable or disable secure web communication.

4.32 Web Timeout (set_web_exp_time)

Executing the command **set_web_exp_time XXX** will define how long the connection is allowed to idle before it is automatically terminated. The default value is set to 900 seconds (Min - 1, Max - 86400).

4.33 Ethernet Management Port (set_mgmt_port)

By default the Ethernet management port is enabled, however it can be disabled depending on user preference. To enable or disable the Ethernet management port issue the following command

set_mgmt_port ON/OFF. When enabled, management operations can be performed remotely via Ethernet. When disabled, Web interface, SNMP, Telnet, and SSH management protocols are turned off.

4.34 Ethernet Management IP Address (set_ip)

The Ethernet management port default IP address is **192.168.254.115**
The IP address can be changed using the command: **set_ip xxx.xxx.xxx.xxx**
The new IP address will take effect only after performing a **reboot**.

4.35 Ethernet Management IP Netmask (set_netmask)

The Ethernet management port default netmask address is **255.255.255.0**
The netmask address can be changed using the command: **set_netmask xxx.xxx.xxx.xxx**
The new netmask address will take effect only after performing a **reboot**.

4.36 Ethernet Management Gateway IP Address

The Ethernet management port default gateway IP address is **0.0.0.0**
The gateway address can be changed using the command: **set_gateway xxx.xxx.xxx.xxx**
The new gateway address will take effect only after performing a **reboot**.

4.37 Heartbeat Packet

4.37.1 Show Heartbeat Packet Content (show_hb_pkt)

Display the current heartbeat packet content using the command **show_hb_pkt**.

```
000: 00 e0 ed 13 24 ff 00 e0   ed 13 24 fe 81 00 00 04
010: 81 37 ff ff 00 30 00 00   00 00 40 04 ec a2 c6 13
020: 01 02 c6 13 01 01 00 00   00 00 00 00 00 00 00 00
030: 00 00 00 00 00 00 00 00   00 00 00 00 00 00 00 00
040: a0 07 37 99
```

4.37.2 Load Heartbeat Packet Content

The new heartbeat packet content should be loaded from the web interface. The file name for the new heartbeat packet should be “hb.bin”. Heartbeat packet length should be 24 – 1024 bytes.

Destination MAC	XX XX XX XX XX XX	This value will be replaced by the SNA10GV to the SNA10GV PortA/PortB MAC address
Source MAC	XX XX XX XX XX XX	This value will be replaced by the

		SNA10GV to the SNA10GV PortA/PortB MAC address
VLAN	81 00 00 04	This value will be removed by the device before transmitting. The user MUST include this field when preparing heartbeat packet
Packet Content		Any data can be included

4.37.3 Restore Default Heartbeat Packet (set_hb_defaults)

Default heartbeat packet content can be restored by command: **set_hb_defaults**

4.37.4 Heartbeat Transmit Port (set_hb_dir)

By default, heartbeat packets will be transmitted from both MONA and MONB. To change the default direction of the heartbeat packets, issue the command **set_hb_dir XXX**.

Where **XXX**:

- **MONA** From monitor port A to monitor port B
- **MONB** From monitor port B to monitor port A
- **BIDIR** Heartbeats are sent in both directions (default)

4.37.5 Heartbeat Packet Failure Criteria (set_hb_fail_mode)

The heartbeat packet failure criteria can be set to **unidirectional** or **bidirectional**. The heartbeat packet failure function will vary according to the heartbeat packet transmit direction. By **default** the heartbeat packets transmit direction is set to b**idirectional**, therefore the heartbeat packet failure criteria can be set to **unidirectional** or **bidirectional**.

Unidirectional: The SNA10GV module will change its state if one of the monitor ports does not receive heartbeat packets. The SNA10GV will restore to its default state when both monitor ports receives the heartbeat packets.

Bidirectional: The SNA10GV module will change its state if both monitor ports do not receive the heartbeat packets. The SNA10GV will restore to its default state if at least one of the monitor ports receives the heartbeat packets.

Issue the command **set_hb_fail_mode UNIDIR/BIDIR** to change between modes of operation.

4.38 Firmware Update

The **update** command updates the SNA10GV module firmware file system as well as the kernel image. Follow the instructions below in order to perform the firmware update:

1. Connect the SNA10GV management port to the network
2. Configure the Host computer to the same IP range and connect it to the network
3. Install a TFTP server on the Host computer
4. Copy the new firmware files to the TFTP server root directory
5. From the Host computer, issue one of the following commands

- **update 192.168.254.115 tftpboot**
- **update 192.168.254.115 tftpboot force**
  (Using **force** will update the firmware version even if it is the same firmware version installed)

Once running the update the module saves the TFTP server IP address. On the next firmware update there is no need to enter the TFTP server IP address again.

Note:

- If the firmware update process is interrupted, your SNA10GV module may not function properly.
- We recommend the update process be done in an environment with a steady power supply (preferably a UPS).

4.39 Reboot

Issuing a **reboot** forces a reboot of the SNA10GV module.

5 SNMP Tables

5.1 SNMP Variables

Variable code:
.iso(1).org(3).dod(6).internet(1).private(4).enterprises(1).networkcritical(15694).sna10gv(2).X.0

Variable name	Variable code (X=)	Type	Attributes	Value	Description
SNA10GV DevName	1.2	OCTET STRING (SIZE(1..32))	read-only		Device name
SNA10GVDevTrackingNumber	1.3	OCTET STRING (SIZE(1..32))	read-only		Show device tracking number
SNA10GV DevHwVer	1.4	OCTET STRING (SIZE(1..32))	read-only		Show device hardware version

SNA10GV DevFwVer	1.5	OCTET STRING (SIZE(1..32))	read-only		Show device firmware version
SNA10GV SnmpAgentVer	1.6	OCTET STRING (SIZE(1..32))	read-only		SNMP agent version
SNA10GV LogFileSize	1.7	INTEGER	read-only	ok(1), exceed(2)	Show log file size exceed flag
SNA10GV MONALink	1.8	INTEGER	read-only	down(1), up(2)	Monitor port A link status.
SNA10GV MONBLink	1.9	INTEGER	read-only	down(1), up(2)	Monitor port B link status.
SNA10GV NETALink	1.10	INTEGER	read-only	down(1), up(2)	Network port A link status.
SNA10GV NETBLink	1.11	INTEGER	read-only	down(1), up(2)	Network port B link status.
SNA10GV ApplState	1.12	INTEGER	read-only	unknown(1), fail(2), alive(3)	Appliance/application state
SNA10GV TermStatus	1.13	INTEGER	read-only	disconnected(1), connected(2)	Rs232 management port status
SNA10GVLogLastLine	1.14	INTEGER	read-only		Show log file last line number.
SNA10GVLogReadLine	1.15	INTEGER	read-write		Show/set log file line number to read from.
SNA10GVetLog	1.16	OCTET STRING (SIZE(1..2048))	read-only		Get log file content (20 lines beginning from the last read line).
SNA10GV SnmpVer	2.1	INTEGER	read-write	1(1), 2c(2), 3(3)	Set SNMP version
SNA10GV SnmpServerIp	2.2	IpAddress	read-write		Set/show SNMP server IP address
SNA10GV SnmpUser	2.3	OCTET STRING (SIZE(1..64))	read-write		Set SNMP user/community and Web interface user name
SNA10GV SnmpPassword	2.4	OCTET STRING (SIZE(1..128))	write-only		Define the SNMP v3 and Web interface password
SNA10GV SnmpApply	2.5	INTEGER	write-only	apply (1)	Activate all the SNMP changes
SNA10GV SysTime	3.1	OCTET STRING (SIZE(1..32))	read-write		Set/show device current time/Date
SNA10GV SysIp	3.3	IpAddress	read-write		Set/show SNA10GV IP address
SNA10GV SysNetmask	3.4	IpAddress	read-write		Set/show SNA10GV IP subnet mask
SNA10GV SysGateway	3.5	IpAddress	read-write		Set/Show SNA10GV gateway IP address
SNA10GV SysResetLog	3.6	INTEGER	write-only	reset	Reset/clear SNA10GV log file
SNA10GV SysLogDest	3.7	INTEGER	read-write	ram (1), flash (2)	Show/set SNA10GV log file location.
SNA10GV SysReboot	3.8	INTEGER	write-only	reboot (1)	Reboot the SNA10GV
	3.9				
SNA10GV UnitName	3.10	OCTET STRING (SIZE(1..32))	read-write		Set/show unit name
SNA10GV SysTftpIp	3.11	IpAddress	read-write		Set/show TFTP server IP address.
SNA10GV SysTftpRoot	3.12	OCTET STRING (SIZE(1..64))	read-write		Set/show TFTP server root directory
SNA10GV SysUpdate	3.13	INTEGER	read-write	update(1), force(2)	Update the SNA10GV firmware
SNA10GV SysUpdateStatus	3.14	OCTET STRING (SIZE(1..1024))	read-only		Show SNA10GV firmware update status
SNA10GV SysResetErr	3.14	INTEGER	read-write	reset(1)	Reset/clear SNA10GV errors
SNA10GVSysWhoami	3.15	INTEGER	read-write	on(1), off(2)	Unit identification. On/off system OK led blink.
SNA10GV Conf2pl	4.1	INTEGER	read-write	enable (1), disable (2)	Show/set two-port link mode

SNA10GV ConfHbExpState	4.2	INTEGER	read-write	bypass(2), TAP(3), LinkDrop(4)	Get/set heartbeat expiration mode
SNA10GV ConfHbInterval	4.3	INTEGER	read-write		Get/Set heartbeat interval
SNA10GV ConfHbHoldTime	4.4	INTEGER	read-write		Get/Set heartbeat hold time
SNA10GVConfHbActModeLock	4.5	INTEGER	read-write	enable (1), disable (2)	Get/Set heartbeat active mode lock state
SNA10GV ConfHttps	4.6	INTEGER	read-write	enable (1), disable (2)	Get/Set HTTPS protocol enable status
SNA10GV ConfSesTimeout	4.7	INTEGER	read-write		Get/Set Web session timeout
SNA10GVConfEnActHbRestore	4.8	INTEGER	read-write	enable (1), disable (2)	Set/Get enable active heartbeat restore
SNA10GVConfHbPkt	4.11	OCTET STRING (SIZE(48..2048))	read-write		Get current heartbeat packet content. Set new heartbeat packet content. Packet size: 24-1024 bytes.
SNA10GVConfHbTxDir	4.12	INTEGER	read-write	MONA(1) MONB(2) bidir(3)	Set/Get heartbeats transmit port. If SNA10GVConfHbTxDir is set to either MONA or MONB the SNA10GVConfHbFail will be reset to unidir.
SNA10GVConfHbFail	4.13	INTEGER	read-write	unidir(1) bidir(2)	Set/Get criteria for determine heartbeat failure. If SNA10GVConfHbTxDir set to either MONA or MONB, the SNA10GVConfHbFail must be set to unidir.
SNA10GVConfDefHbPkt	4.14	INTEGER	read-write	default(1)	Restore default heartbeat packet content. Set only variable, read will return zero.
SNA10GV OpHbActMode	5.1	INTEGER	read-write	on (1), off (2)	Get/Set heartbeat active mode on/off
SNA10GV OpActBypass	5.2	INTEGER	read-write	off (1), on (2), TAP (3), LinkDrop(4)	Get/Set the state of the active bypass state
SNA10GV OpPasBypass	5.3	INTEGER	read-only	off (1), on (2)	Get the state of the passive bypass state
SNA10GV RecoveryDefault	6.1	INTEGER	write		Restore system default parameter
SNA10GV TrapConfApplFail	7.2	INTEGER	read-write	enable (1), disable (2)	Enable/Disable getting trap info on application failed/restored events status change: SNA10GV TrapApplFail / SNA10GVTrapApplRecover
SNA10GV TrapConfBypass	7.3	INTEGER	read-write	enable (1), disable (2)	Enable/Disable getting trap info on bypass(passive and Active) status change events: SNA10GVTrapActBypassOn / SNA10GV TrapActInlineOn, SNA10GV TrapPasBypassOn / SNA10GVTrapPasBypassOff,

					SNA10GV TrapTAPOn., SNA10GVTrapLinkDropOn
SNA10GV TrapConfMonLink	7.4	INTEGER	read-write	enable (1), disable (2)	Enable/Disable getting trap info on Monitor ports Link status change events: SNA10GV TrapMONALinkDown / SNA10GVTrapMONALinkUp, SNA10GV TrapMONBLinkDown / SNA10GVTrapMONBLinkUp
SNA10GV TrapConfNetLink	7.5	INTEGER	read-write	enable (1), disable (2)	Enable/Disable getting trap info on Network ports Link status change events: SNA10GV TrapNETALinkDown / SNA10GV TrapNETALinkUp, SNA10GV TrapNETBLinkDown / SNA10GVTrapNETBLinkUp
SNA10GV TrapConfTerm	7.6	INTEGER	read-write	enable (1), disable (2)	Enable/Disable getting trap info on Terminal connect / disconnect status change events: SNA10GV TrapTermDisc / SNA10GV TrapTermCon
SNA10GV TrapConfErr	7.7	INTEGER	read-write	enable (1), disable (2)	Enable/Disable getting trap info on error reports from the system: SNA10GVTrapErr
SNA10GV TrapConfLogSize	7.8	INTEGER	read-write	enable (1), disable (2)	Enable/Disable getting trap info on Log size overflow: SNA10GV TrapLogSize
SNA10GV TrapConfUpdate	7.10	INTEGER	read-write	enable (1), disable (2)	Enable/Disable getting trap info on update finish event: SNA10GVTrapUpdate

5.2 SNMP Traps

Trap	Value	Description
SNA10GV TrapStart	1	Reserved
SNA10GV TrapApplFail	2	Trap is sent when the Monitor application does not send back the HB packets within the hold time Interval defined by hb_holdtime variable.
SNA10GV TrapApplRecover	3	Trap is sent when the Monitor application starts again to send the HB packets.
SNA10GV TrapPasBypassOn	4	Trap is sent when passive bypass changes to bypass mode.
SNA10GV TrapPasBypassOff	5	Trap is sent when passive bypass changes to inline mode.
SNA10GV TrapActBypassOn	6	Trap is sent when active bypass changes to bypass mode.
SNA10GV TrapActInlineOn	7	Trap is sent when active bypass changes to inline mode.
SNA10GVTrapMONALinkDown	8	Trap is sent when monitor port-A link drops.
SNA10GV TrapMONALinkUp	9	Trap is sent when monitor port-A link is restored.
SNA10GVTrapMONBLinkDown	10	Trap is sent when monitor port-B link drops.
SNA10GV TrapMONBLinkUp	11	Trap is sent when monitor port-B link is restored.
SNA10GV1TrapNETALinkDown	12	Trap is sent when network port-A link drops.

SNA10GV TrapNETALinkUp	13	Trap is sent when network port-A link is restored.
SNA10GV TrapNETBLinkDown	14	Trap is sent when network port-B link drops.
SNA10GV TrapNETBLinkUp	15	Trap is sent when network port-B link is restored.
SNA10GV TrapTermDisc	16	Trap is sent when local serial RS232 connection is disconnected.
SNA10GV TrapTermCon	17	Trap is sent when local serial RS232 connection is connected.
SNA10GV TrapErr	18	Trap is sent as indication of an error within the SNA10GV, with some description of the error.
SNA10GV TrapLogSize	19	Trap is sent when the log file size exceed its maximum allowed size.
SNA10GV TrapTAPOn	20	This trap is sent when switch changes mode to TAP.
SNA10GV TrapUpdate	21	Trap is sent when firmware update is finished.
SNA10GV TrapLinkDropOn	22	This trap is sent when switch changes mode to LinkDrop.

5.3 Displaying Log File Via SNMP

Use the following command to control the log display via SNMP

1) SNA10GVLogLastLine – Get log file last line number.
2) SNA10GVLogReadLine 0 (xxx) - Read the log file from line xxx
3) SNA10GVetLog - Read 20 lines form the log file

Note: When reading the log file forward incrementing read line number is automatic.
When reading the log file backward read line number should be set by “SNA10GVLogReadLine xxx

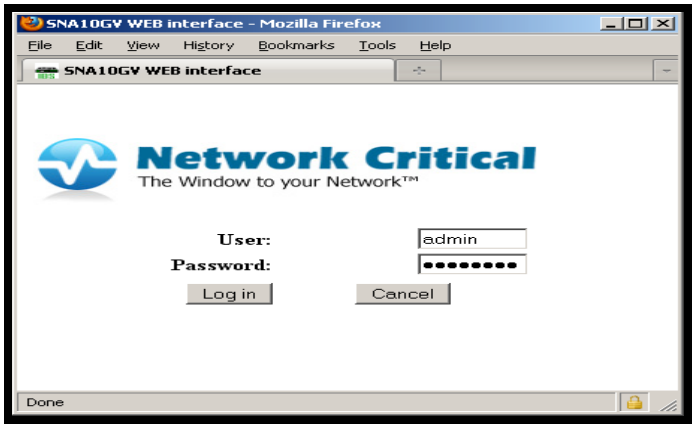
6 Web Interface

6.1 Web Interface Startup

The SNA10GV Web interface can be accessed from most web browsers.

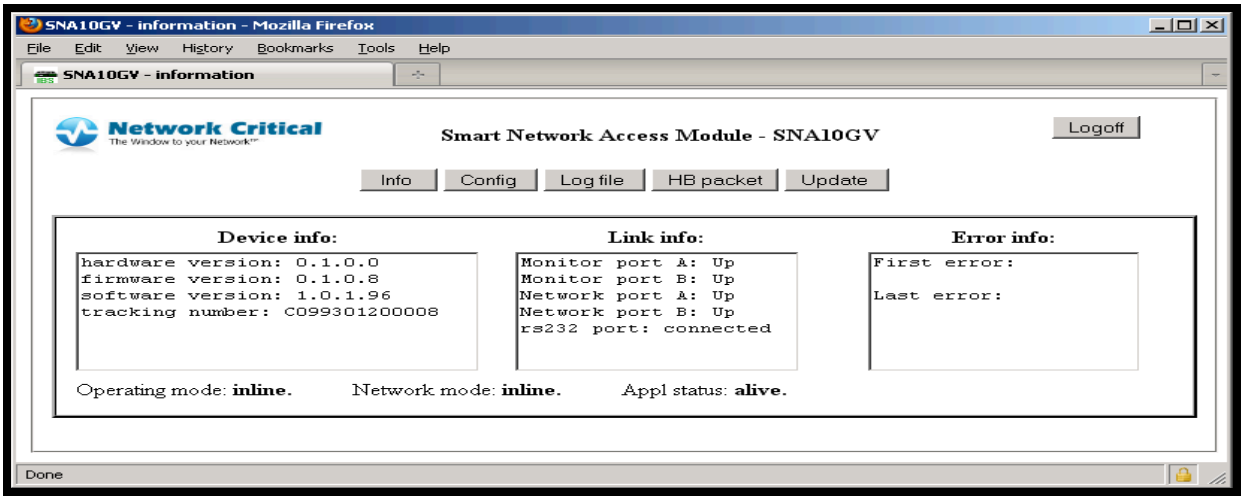
- Web interface terminology can be referenced in the Command Line Interface section
- If the Web interface is inactive more than the **web_exp_time**, a login screen will prompt
- Most web application fields contain context help
- The new settings in the Web interface will take affect only after clicking the **apply** button

6.2 Login

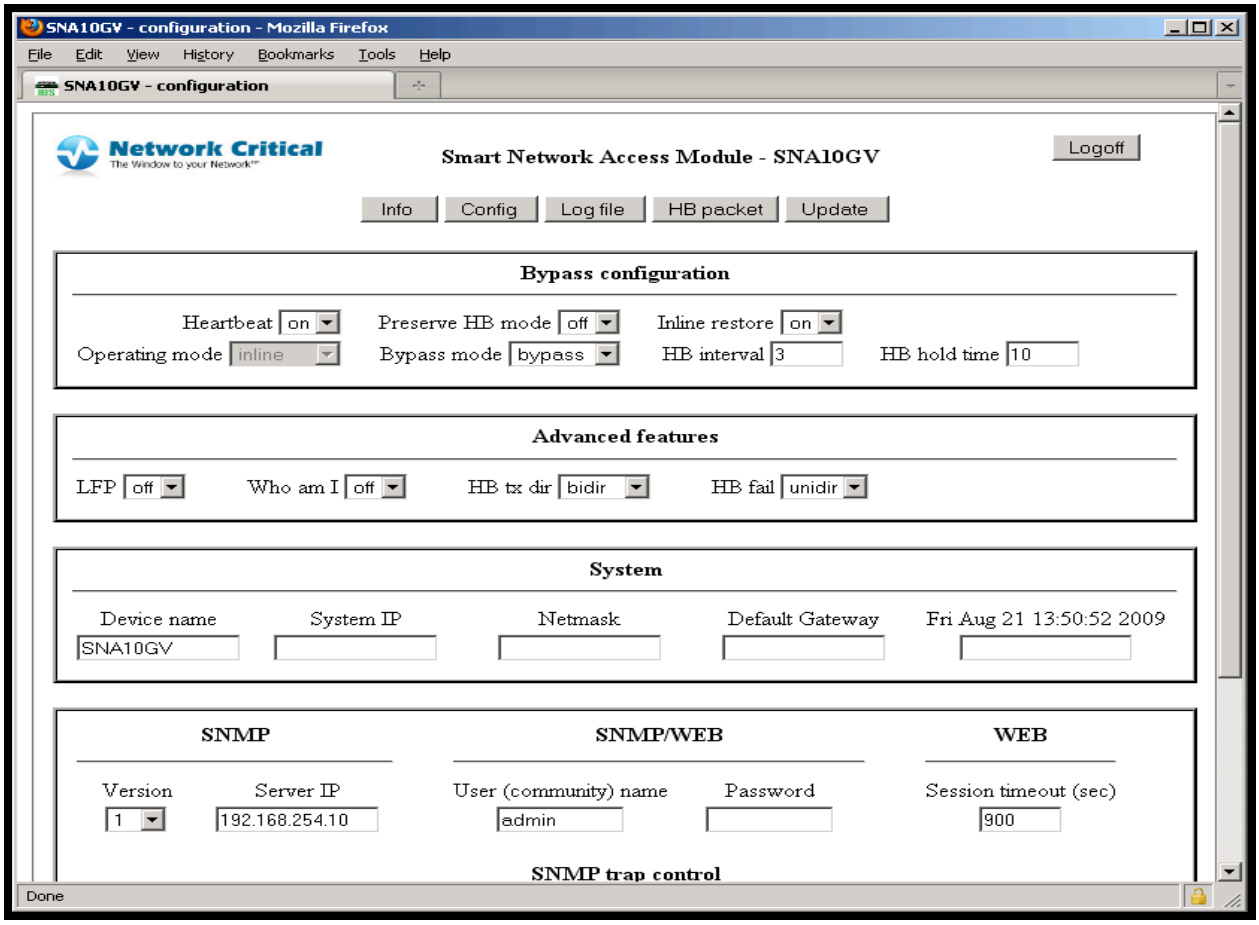


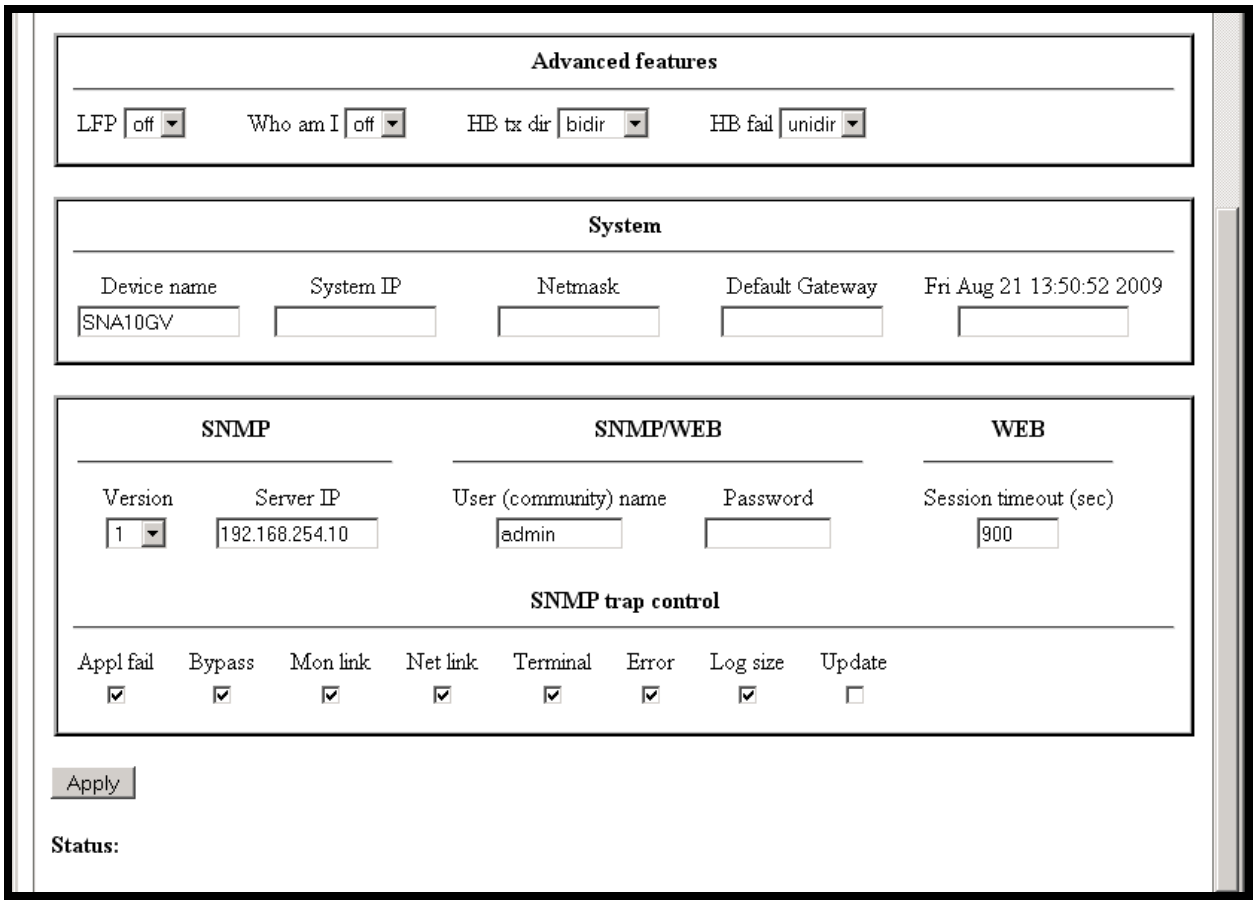
Username: **admin**
Password: **sna10gvl**

6.3 Information Page



6.4 Configuration page





6.4.1 SNMP Trap Control

SNMP trap control destined to enable/disable SNMP trap groups. SNMP traps are disabled by default. It can be enabled by checking the check box for the relevant trap group.

a) Appl fail enable/disable following traps:
   - SNA10GVTrapApplFail
   - SNA10GV TrapApplRecover.

b) Bypass enable/disable following traps:
   - SNA10GV TrapActBypassOn
   - SNA10GV TrapActInlineOn
   - SNA10GV TrapPasBypassOn
   - SNA10GV TrapPasBypassOff
   - SNA10GV TrapTAPOn

c) Mon link enable/disable following traps:
   - SNA10GV TrapMONALinkDown
   - SNA10GV TrapMONALinkUp
   - SNA10GV TrapMONBLinkDown
   - SNA10GV TrapMONBLinkUp.

d) Net link enable/disable following traps:

- SNA10GV TrapNETALinkDown
- SNA10GV TrapNETALinkUp
- SNA10GV TrapNETBLinkDown
- SNA10GV TrapNETBLinkUp.

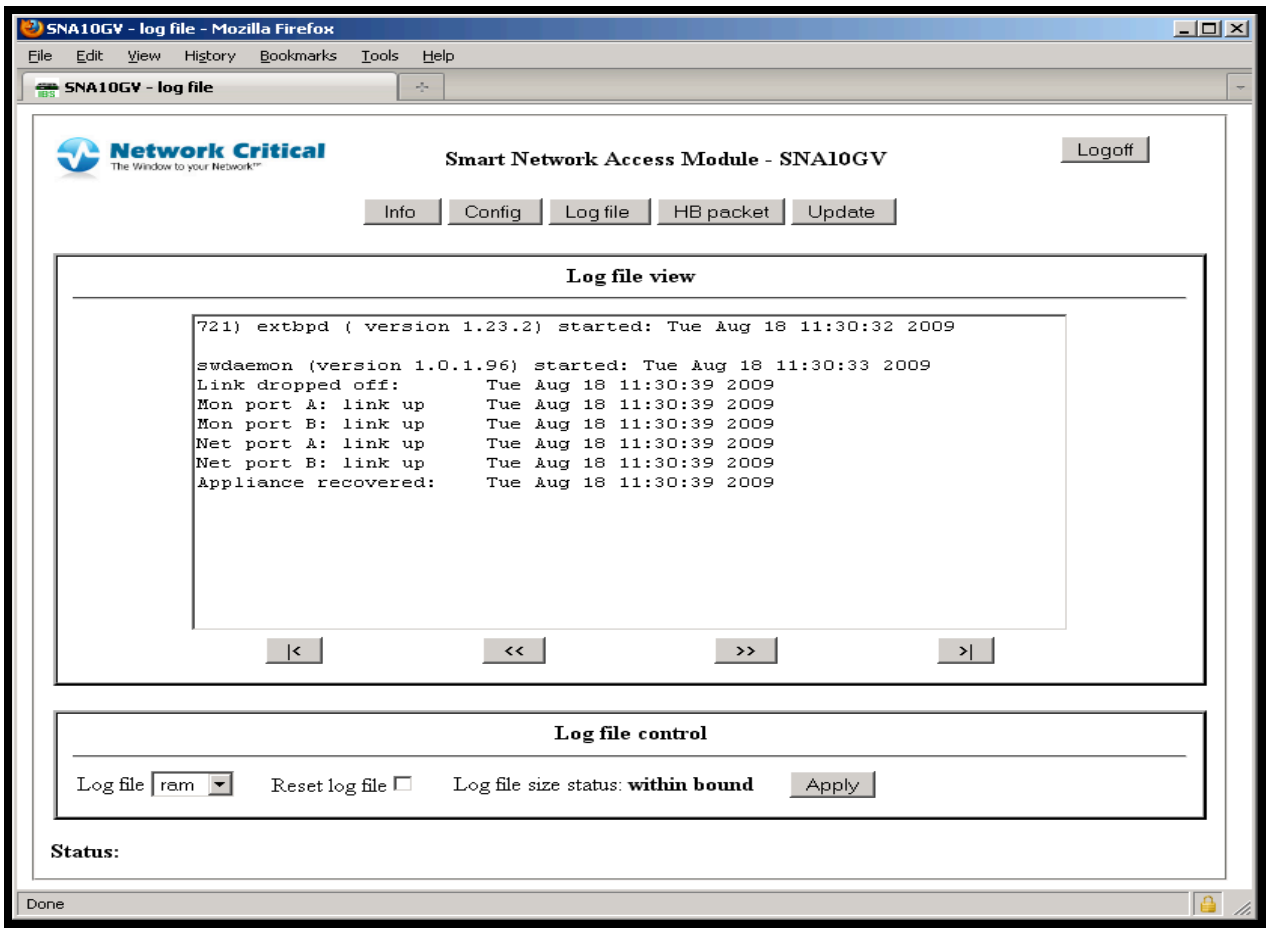
e) Terminal enable/disable following traps:
- SNA10GV TrapTermDisc
- SNA10GV TrapTermCon.

f) Error enable/disable following traps:
- SNA10GV TrapErr

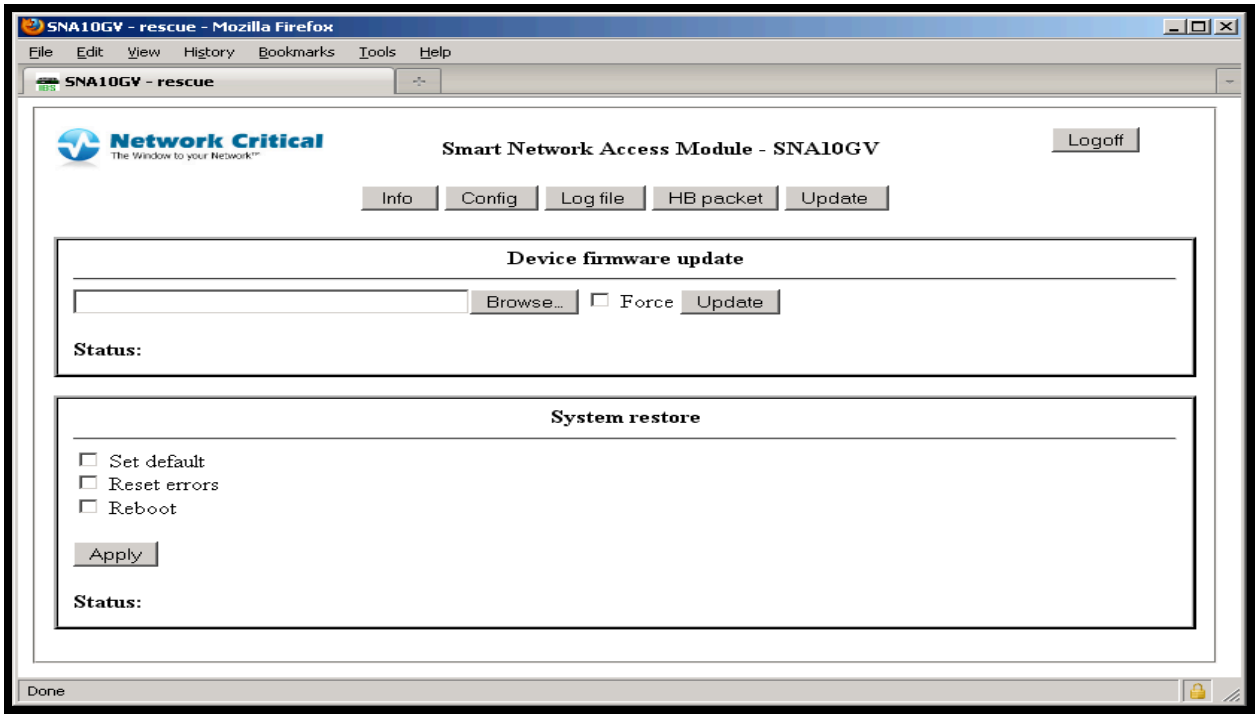
g) Log size enable/disable following traps:
- SNA10GV TrapLogSize

h) Update
- SNA10GV TrapUpdate

6.5 Log file page



6.6 Update page



6.6.1 Device Firmware Update

There are two firmware parts that can be updated:

- root file system
- kernel image

Follow the instructions below in order to perform the firmware update:

1. Use the browse to select the firmware update file.
   For the root file system browse the file: rootfs.ext2.gz.uboot_X.X.X.X.
   For the kernel image browse the file: uImage_X.X.X.X
2. Check the Force check box in case that firmware version is identical or older version than the current firmware version that is installed.
3. Click on the **StartHttpUpdate** button update. It can take several minutes to finish update, please do not press any buttons in the browser window.

NOTE: If the firmware update process is interrupted, your SNA10GV may not function properly. We recommend the process be done in an environment with a steady power supply (preferably with UPS).

7 Management Push Button Interface

The SNA10GV includes 2 management push buttons. Use the **Top** and **Bottom** push buttons to query and control the SNA10GV modules.

Top Button:

- If held for more than 3 seconds enters or exits from main menu
- When pressed briefly moves to the next menu

Bottom Button:

- If held for more than 3 seconds resets the SNA10GV errors
- When pressed briefly selects the item or displays the next data item

7.1 Main menu

Press and hold the **top button** for more than 3 seconds to enter to the main menu.
The main menu includes the following sub menus:

INFO
INFOMNF
OP
EXIT

7.2 INFO menu

The INFO menu includes the following queries:

HW_VER	Displays the hardware version
FW_VER	Displays the firmware version
SW_VER	Displays the software version
UNIT	Displays the device name
IP_ADDR	Displays the management port IP address.
EXIT	Exits to the main menu

7.3 INFO MNF Menu

The INFO menu includes the following queries:

PRODUCT	Displays the product name
TK_NUM	Displays product tracking number
MAC MGMT	Displays the management port MAC address
EXIT	Exits to the main menu

7.4 OP Menu

The OP menu includes the following actions:

SHUTDOWN	Shutdown the SNA10GV unit (the unit will reload by pressing the RST button)
REBOOT	Resets the SNA10GV module
DEFAULT	Return to factory default parameters
EXIT	Exits to the main menu

8 Appendix

8.1 Technical specifications

8.1.1 SNAC1-AC-10GV

8.1.1.1 SNAC1-AC-10GV: 1U Chassis System Technical Specifications

Dockings:	Front holders
Voltage Input:	100-120/200-240VAC, 5/2.5A, 50/60Hz
Power Consumption:	100W maximum (4 modules)
Size:	444mm x 339.3mm x 44 mm (17.48" x 13.358" x 1.732")
Operating Humidity:	0%–90%, non-condensing
Operating Temperature:	0°C – 50°C (32°F - 122°F)
Storage Temperature:	-20°C–65°C (-4°F–149°F)
EMC Certifications:	Class B FCC / CE / VCCI
Safety:	UL
MTBF*:	> 150,000 hours

8.1.1.2 SNAC1-AC-10GV: 1U Chassis System LED Specifications

LEDs:	(2) Power LED – Green, Power is on, LED per power supply

8.1.2 SNAM-10GSR-V

8.1.2.1 Fiber Gigabit Ethernet Technical Specifications - (Base-SR) Adapters:

IEEE Standard / Network topology:	Fiber Gigabit Ethernet, Base-SR (850nM)
Data Transfer Rate:	20Gbit/s in full duplex mode per port
Cables and Operating distance:	Multimode fiber: 62.5um 16.5m maximum at 62.5 um ** Theoretical Distance – Defined as half a distance as stated by the IEEE 802.3 standard
Output Transmit Power:	Typical: -2.6 dBm Minimum: -3 dBm
Optical Receive Sensitivity:	Typical: -14.6 dBm Maximum: -11.1 dBm
Insertion Loss (Passive: Normal Mode)	Typical: 0.8 dB Maximum: 1.9 dB
Insertion Loss (Passive: Bypass Mode)	Typical: 0.8 dB Maximum: 1.9 dB
Voltage:	12V
Power Consumption:	25W max.
Operating Humidity:	0%–90%, non-condensing
Operating Temperature:	0°C – 50°C (32°F - 122°F)
Storage Temperature:	-20°C–65°C (-4°F–149°F)
EMC Certifications:	Class B / FCC / CE / VCCI

Safety:	UL
MTBF*:	> 150,000 hours

8.1.2.2 SNA10GV-SR: LED and Connector Specifications

LEDs:	Network / Monitor ports: Link LED – (Green) On Link partner is detected. Activity LED – (Yellow) Blinks on activity. Power - Green power is on Normal – Green, Switch in Normal mode. SysOK – Yellow when Sys is OK, WDT – Blink Yellow when WDT is activated Light Yellow WDT time out Off: WDT is disabled Bypass - Red when bypass, off on Normal Alarm – Red on system alarm
Connectors:	Network: 2 LC Duplex Monitor: 2 SFP+ Management: RJ-11 serial port, RJ-45 1G copper Ethernet

8.1.3 SNAM-10GLR-V

8.1.3.1 Fiber Gigabit Ethernet Technical Specifications - (Base-LR) Adapters:

IEEE Standard / Network topology:	Fiber Gigabit Ethernet, Base-LR (1310nM)
Data Transfer Rate:	20Gbit/s in full duplex mode per port
Network ports Cables and Operating distance:	Single mode fiber: 5000m maximum at 9 um **
Insertion Loss (Passive: Normal Mode)	Typical: 1.2 dB Maximum: 1.6dB
Insertion Loss (Passive: Bypass Mode)	Typical: 1.2 dB Maximum: 1.6dB
Voltage:	12V
Power Consumption:	25W max.
Operating Humidity:	0%–90%, non-condensing
Operating Temperature:	0°C – 50°C (32°F - 122°F)
Storage Temperature:	-20°C–65°C (-4°F–149°F)
EMC Certifications:	Class B FCC / CE / VCCI /
Safety:	UL
MTBF*:	> 150,000 hours

8.1.3.2 SNA10GV-LR: LED and Connector Specifications

LEDs:	Network / Monitor ports: Link LED – (Green) On Link partner is detected. Activity LED – (Yellow) Blinks on activity. Power - Green power is on Normal – Green, Switch in Normal mode. SysOK – Yellow when Sys is OK, WDT – Blink Yellow when WDT is activated Light Yellow WDT time out Off: WDT is disabled

	Bypass - Red when bypass, off on Normal Alarm – Red on system alarm
Connectors:	Network: 2 LC Duplex Monitor: 2 SFP+ Management: RJ-11 serial port, RJ-45 1G copper Ethernet

8.2 Safety Precautions

CAUTION:

- **The battery requires special handling at end-of-life. The battery can explode or cause burns if disassembled, charged, or exposed to water, fire or high temperature. After replacing the battery, properly dispose of used battery according to instructions.**
- **There is a risk of explosion if the battery is replaced by an incorrect type. Ensure to replace the battery with the same type.**
- **To avoid the possibility of electric shock, all power cords must be disconnected from the switch before starting this procedure.**

CAUTION:

The fiber optic ports contain a Class 1 laser device. When the ports are disconnected, always cover them with the provided plug. If an abnormal fault occurs, skin or eye damage may result if in close proximity to the exposed ports.

- **Remove and save the fiber optic connector cover.**
- **Insert a fiber optic cable into the ports on the network adapter bracket as shown.**

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Subject to the provisions described below, this NETWORK CRITICAL SOLUTIONS product is protected for one (1) year from date of purchase against defect in material and workmanship.

Should a product fail to perform as described above within the warranted period, it will be repaired or replaced with the same or functionally equivalent product by NETWORK CRITICAL SOLUTIONS, at its discretion, free of charge provided you: (1) return the product to a NETWORK CRITICAL SOLUTIONS designated repair facility with shipping charge prepaid, and (2) provide NETWORK CRITICAL SOLUTIONS with proof of the original date of purchase. Repaired or replacement products will be returned to you with shipping charges prepaid.

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