The Security Hardening Guide for the NPort 6000-G2 Series

Moxa Technical Support Team

support@moxa.com

Contents

Released on Jan 5, 2026

About Moxa

Moxa is a leading provider of edge connectivity, industrial computing, and network infrastructure solutions for enabling connectivity for the Industrial Internet of Things. With 35 years of industry experience, Moxa has connected more than 82 million devices worldwide and has a distribution and service network that reaches customers in more than 80 countries. Moxa delivers lasting business value by empowering industry with reliable networks and sincere service for industrial communications infrastructures. Information about Moxa's solutions is available at www.moxa.com.

1 Introduction

The NPort 6000-G2 Series configuration and security guidelines are detailed in this document. Consider the recommended steps in this document as best practices for security in most applications. We highly recommend that you review and test the configurations thoroughly before implementing them in your production system to ensure that your application is not negatively affected.

2 General System Information

2.1 Basic Information About the Device

Model	Function	Operating System	Firmware Version
NPort 6000-G2 Series	Device server	Zephyr RTOS	Version 1.1

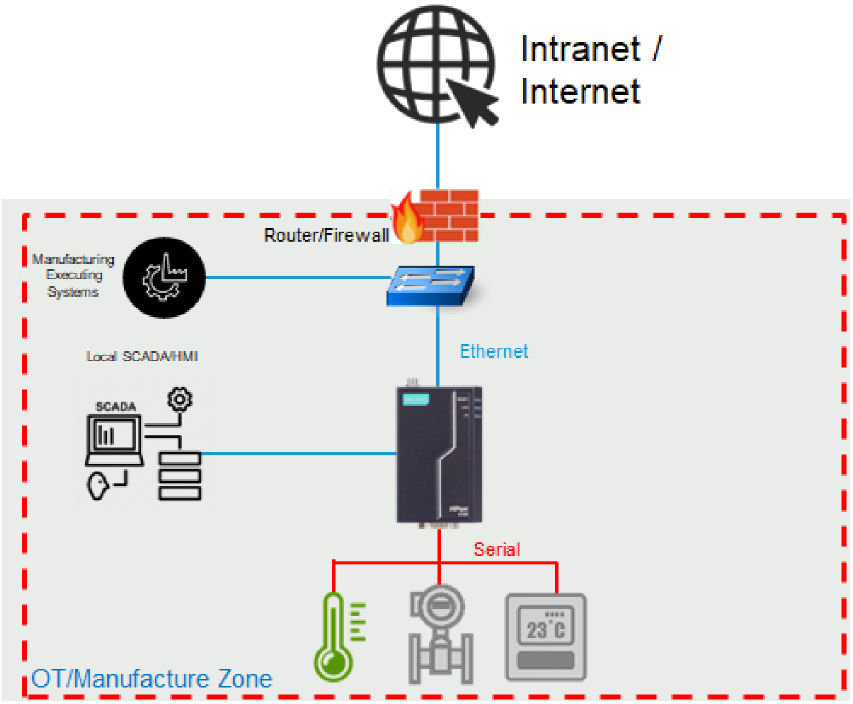
The NPort 6000-G2 Series is a device server specifically designed to allow industrial devices to be accessible directly from a network. Thus, legacy devices can be transformed into Ethernet devices, which then can be monitored and controlled from any network location or even the Internet. Different configurations and features are available for specific applications, such as Real COM drivers and TCP operation modes, to name a few. The series uses TLS protocols to transmit encrypted serial data over Ethernet.

Zephyr RTOS is a full-featured OS with an architecture that is developed with security in mind. The governance and its members have a responsibility to ensure that all aspects of the code are developed securely and conform to the expectations of the next-generation RTOS of Moxa.

2.2 Deployment of the Device

Deploy the NPort 6000-G2 Series behind a secure firewall network that has sufficient security features in place to ensure that networks are safe from internal and external threats.

Make sure that the physical protection of the NPort devices and/or the system meets the security needs of your application. Depending on the environment and the threat situation, the form of protection can vary significantly.



2.3 Security Threats

The security threats that can harm NPort 6000-G2 Series are:

1. **Attacks over the network**

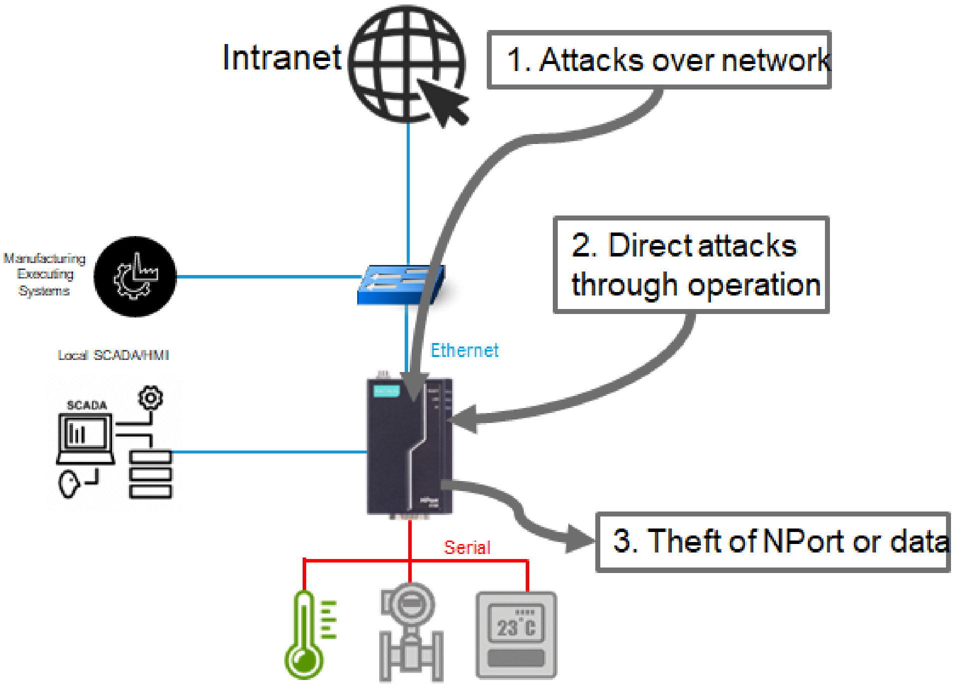
   Threats from individuals with no rights to the NPort 6000-G2 Series via networks such as intranets.

2. **Direct attacks through operation**

   Threats where individuals with no rights to the NPort 6000-G2 Series directly operate a device to affect the system and steal important data.

3. **Theft of the NPort or data**

   Threats where an NPort 6000-G2 Series or data is stolen, and important data is analyzed.


Intranet
1. Attacks over network
Manufacturing Executing Systems
2. Direct attacks through operation
Local SCADA/HMI
SCADA
Ethernet
3. Theft of NPort or data
Serial
23°C

2.4 Security Measures

To fend off security threats, we arranged security measures applied in security guides for the general business network environment and identified a set of security measures for the NPort 6000-G2 Series. We classify the security measures into three security types. The following table describes the security measures and the threats that each measure handles.

Responsibility	Security Layer	Security Measure	Risk Addressed	Threat Handled		
				1	2	3
Asset owner	Policy and procedure	Establish policies and procedures to guide employees in their roles and responsibilities for safe use of security-sensitive assets.	Vulnerabilities created because of a lack of security policies or employees' lack of awareness of procedures	Yes	Yes	No
Asset owner	Perimeter security	Physical security	Physical modification, manipulation, theft removal, or destruction of asset	No	Yes	Yes
Asset owner/ system integrator	Network security	Network firewall	Unauthorized and malicious communica-tion from an untrusted network	Yes	No	No
		Network IDS/IPS	Network attacks from various sources, such as port scanning and DDOS.	Yes	No	No
		VPN	Man-in-the-middle attacks during configuration and protocol communication	Yes	No	No
System Integrator/ Device Vendor	Device Security	IP-based access control	Unauthorized users/nodes to access the device	Yes	Yes	No
		Stopping unused services	Network attacks on weak points of the device	Yes	No	No

Responsibility	Security Layer	Security Measure	Risk Addressed	Threat Handled		
				1	2	3
		Role-based access control	Unauthorized users accessing the device or employees' incorrect operation	Yes	Yes	No
		Applying the audit policy	Lack of records for following or improving policies/procedures	Yes	Yes	No
		Applying the password policy	Brute force attack	Yes	Yes	No
		Applying the account lockout policy	Brute force attack	Yes	Yes	No

Note

1. Attacks over the network.
2. Direct attacks through the operation.
3. Theft of the NPort or data.

To defend against the theft of the NPort or data, we recommend you use the NPort 6000-G2 Series within a secure local network, as mentioned above. We also suggest that you enable the Allowlist function (for more details, refer to chapter 3.3) to only allow the necessary hosts/IPs to access the device and Secure Connection function (for more details, refer to chapter 3.1) to encode the data and protect the data from a stolen.

2.5 Defense-in-depth Strategy

The defense-in-depth strategy is a security approach to protect systems from various types of attacks by using multiple independent defense mechanisms. This strategy involves incorporating multiple layers of security to protect the product against potential attacks and vulnerabilities at various stages of its design, development, and use.

It is important to understand that no single protection measure can guarantee complete security. That's why the defense-in-depth approach makes it difficult for attackers to exploit one weakness to attack the product or the network.

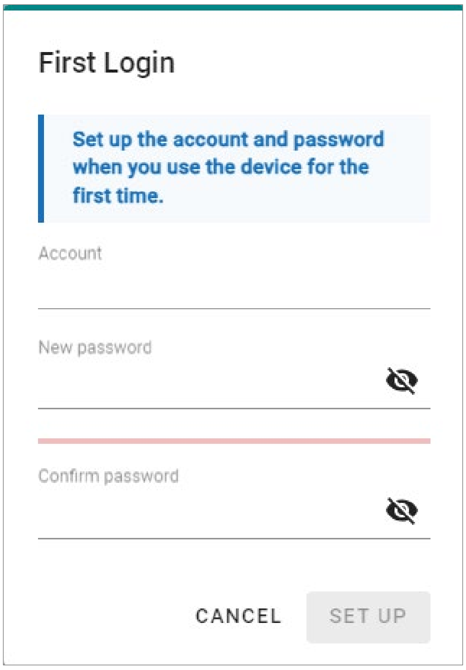
By implementing a defense-in-depth approach, attackers must overcome multiple security layers undetected, making breaches increasingly difficult. Refer to the following table for measures you can leverage to create a defense-in-depth security environment at the edge device level based on the NPort 6000-G2 Series.

Security Function	Description	Type	Implementation
Account management	Reduces human error by enforcing access privileges	Administrative control	Role-based access control, refer to Chapter 3.4.
Syslog logging	Logs operations and anomalies	Administrative control	Supports local and remote logs, refer to Chapter 3.6
Web/CLI login authentication	Prevents unauthorized user access to the device	Administrative control	Role-based access control, refer to Chapter 3.4.
Device certificate and authentication	Prevent man-in-the-middle (MITM) attacks	Logical/technical control	Supports TLS v1.2/v1.3, SNMPv3, refer to Chapter 3.3.
Signed firmware validation	Prevents unauthorized firmware uploads	Logical/technical control	Signature verification ensures firmware validity
Allowlist	Limit specific remote host IP addresses logging in to prevent unauthorized access to the gateway	Logical/technical control	Allowlist table to manage device access, refer to Chapter 3.5.
Physical Security	Prevents unauthorized physical access	Physical control	Install the device in cabinets with strict access control and surveillance

3 Configuration and Hardening Information

For security reasons, there is no default account name or password. When accessing the NPort 6000-G2 for the first time, you will be reminded to create an account name and password before logging in via the Device Search Utility (DSU) or the web console.

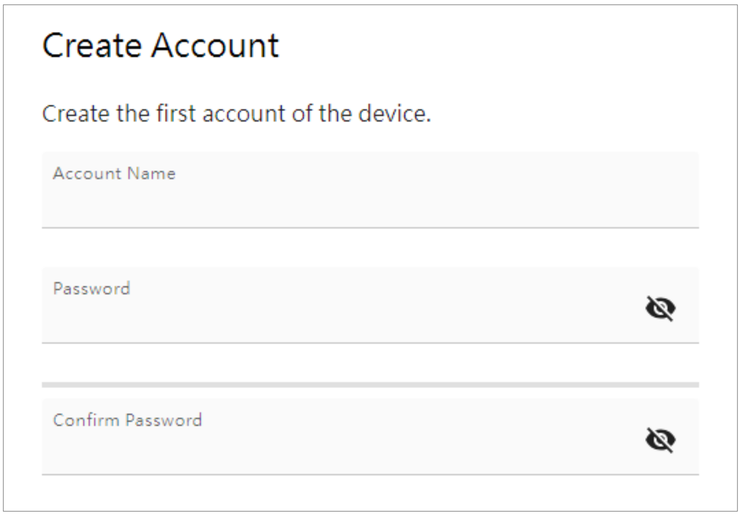
Device Search Utility V3.0 or later



First Login

Set up the account and password when you use the device for the first time.

Web console



Create Account

Create the first account of the device.

3.1 TCP/UDP Ports and Recommended Services

Refer to the table below for all the ports, protocols, and services that are used to communicate between the NPort 6000-G2 Series and other devices.

Service Name	Option	Default Settings	Type	Port Number	Description
Moxa server	Enable/ Disable	Enable	TCP	443	For Moxa utility communication
			UDP	5353	
WINS	Enable/ Disable	Disable	UDP	137	Processing WINS (Client) data
SNMP agent	Enable/ Disable	Disable	UDP	161	SNMP handling routine
RIPD_PORT	Enable/ Disable	Disable	UDP	520, 521	Processing RIP routing data
HTTPS server	Enable/ Disable	Enable	TCP	443	Secured web console
RADIUS	Enable/ Disable	Disable	UDP	User-defined (1645 as default or 1812)	Authentication server
TACACS+	Enable/ Disable	Disable	TCP	49	Authentication server
DHCP client	Enable/ Disable	Disable	UDP	68	The DHCP client needs to get the system IP address from the server
SNTP	Enable/ Disable	Disable	UDP	Random port	Synchronize time settings with a time server
Remote System Log	Enable/ Disable	Disable	UDP	Random port	Send the event log to a remote log server

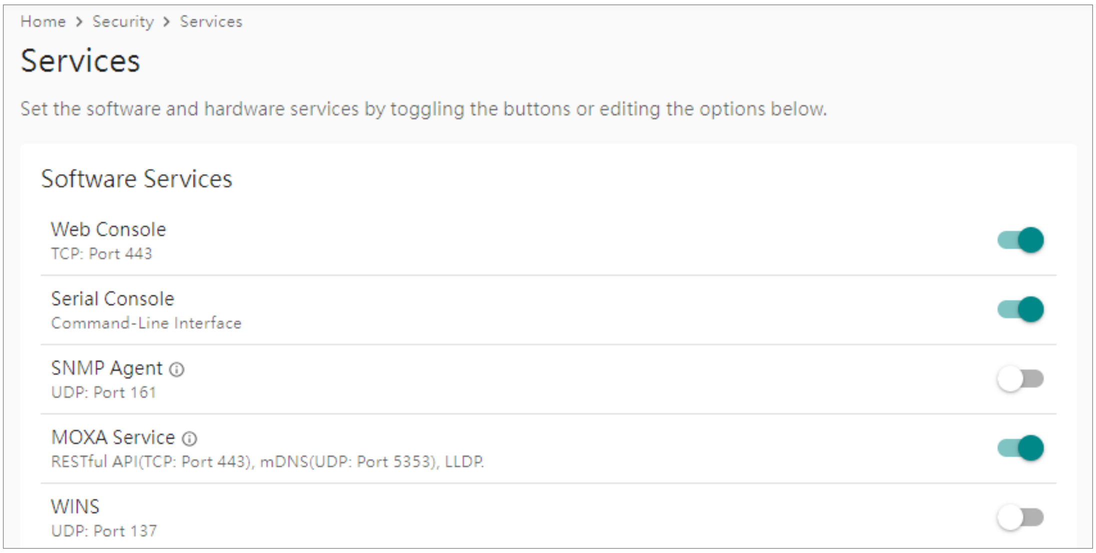
Operation Mode	Option	Default Settings	Type	Port Number
Real COM Mode	Enable/ Disable	Disable (Changed to Enable after user set username/password)	TCP	949+ (Serial port No.) 965+ (Serial port No.)
RFC2217 Mode	Enable/ Disable	Disable	TCP	User-defined (default: 4000+Serial port No.)
TCP Server Mode	Enable/ Disable	Disable	TCP	User-defined (default: 4000+Serial Port No.) User-defined (default: 965+Serial Port No.)
UDP Mode	Enable/ Disable	Disable	UDP	User-defined (default: 4000+Serial Port No.)
Pair Connection Slave Mode	Enable/ Disable	Disable	TCP	User-defined (default: 4000+Serial Port No.)
Reverse Terminal-Telnet	Enable/ Disable	Disable	TCP	User-defined (default: 4000+Serial Port No.)
Reverse Terminal-SSH	Enable/ Disable	Disable	TCP	User-defined (default: 4000+Serial Port No.)
Disabled Mode	Enable/ Disable	Disable	N/A	N/A

For security reasons, the NPort 6000-G2 Series only enables limited services to ensure the security of the device itself. It will only enable the Moxa services, HTTPS, and serial console for the user to configure the device and the Real COM mode for the COM-based Control application users. If this is not the case, you may modify or disable the above services.

To integrate the NPort 6000-G2 Series to your network topology and secure applications, consider enabling the services below with proper settings to enhance the security architecture of the network and to protect the network with depth of defense.

Service Name	Type	Port Number	Security Remark
SNMP agent	UDP	161	The Simple Network Management Protocol is a popular tool for remote device monitoring and management. If needed, turn on SNMPv3 to encrypt the communication data.
RADIUS	UDP	User Define (1645 as default or 1812)	If you are using the central account management feature (has a RADIUS server), enable this service.
TACACS+	TCP	49	If you are using the central account management feature (has a TACACS+ server), enable this service. Select either RADIUS or TACACS+ to be the central account management service and disable the other one.
DHCP Client	UDP	67, 68	If you have a DHCP Server to assign an IP automatically, enable this service for easy management.
SNTP Client	UDP	Random port	For log tracing, the time synchronization is important.
Remote System Log	UDP	Random port	Central log management may be important in some applications. Enable the remote system log service to store all the logs of the NPort 6000-G2 to a remote log server.

To enable or disable these services, log in to the HTTPS console and select **Security > Services**.



Home > Security > Services

Services

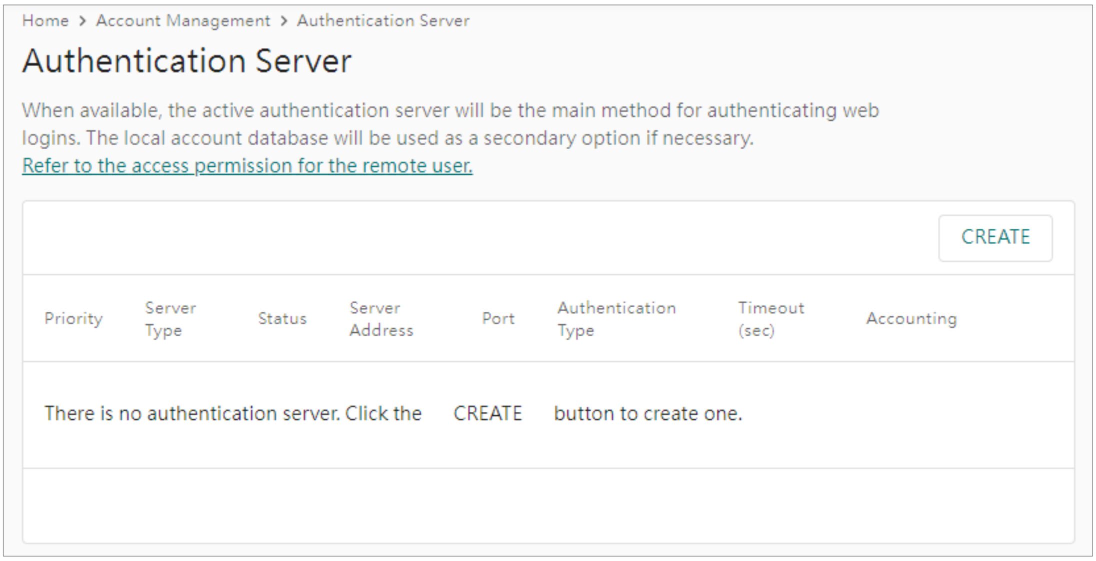
Set the software and hardware services by toggling the buttons or editing the options below.

Software Services

Web Console TCP: Port 443	●
Serial Console Command-Line Interface	●
SNMP Agent ⓘ UDP: Port 161	○
MOXA Service ⓘ RESTful API(TCP: Port 443), mDNS(UDP: Port 5353), LLDP.	●
WINS UDP: Port 137	○

To disable the SNMP agent service, log in to the HTTPS console and select **Administration > SNMP Agent**. Then, select **Disable** for SNMP.

For the RADIUS and TACACS+ server, log in to the HTTPS console and select **Account Management > Authentication Server**. Then, select the **CREATE** button to add the RADIUS or TACACS+ server and complete relative settings with the **Enable the server** checked.



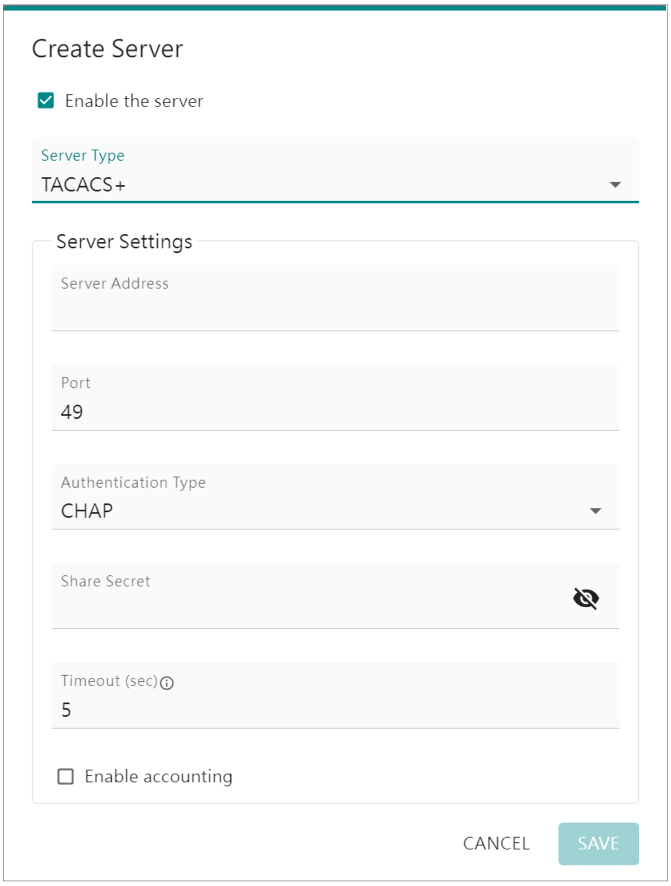
Home > Account Management > Authentication Server

Authentication Server

When available, the active authentication server will be the main method for authenticating web logins. The local account database will be used as a secondary option if necessary.

Refer to the access permission for the remote user.

Priority	Server Type	Status	Server Address	Port	Authentication Type	Timeout (sec)	Accounting
There is no authentication server. Click the CREATE button to create one.							



Create Server

☑ Enable the server

Server Type: TACACS+

Server Settings

Server Address:

Port: 49

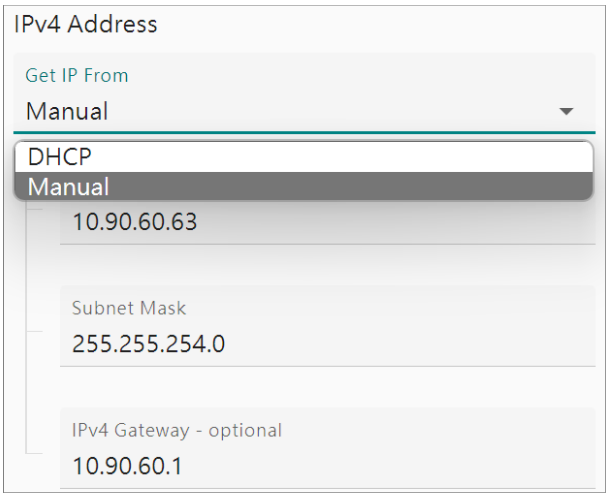
Authentication Type: CHAP

Share Secret:

Timeout (sec): 5

☐ Enable accounting

If you want to enable DHCP Client, log in to the HTTPS console, select **Network Settings > IP Address,** and select Get IP From **DHCP**.



IPv4 Address

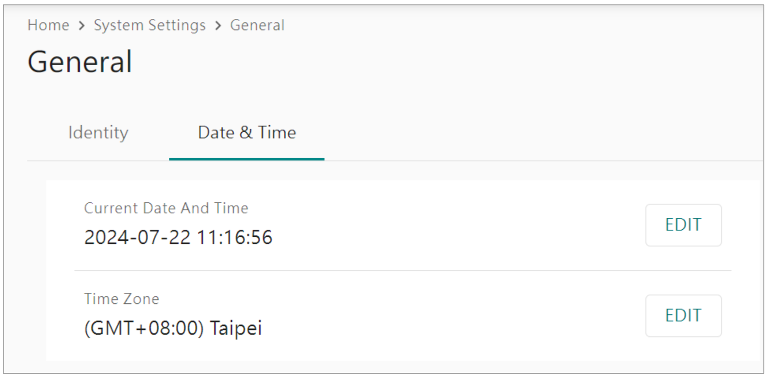
Get IP From: Manual

10.90.60.63

Subnet Mask: 255.255.254.0

IPv4 Gateway - optional: 10.90.60.1

If you want to enable SNTP Client, log in the HTTPS console, select **System Settings > General**, and select the **Date & Time** tab.


Home > System Settings > General

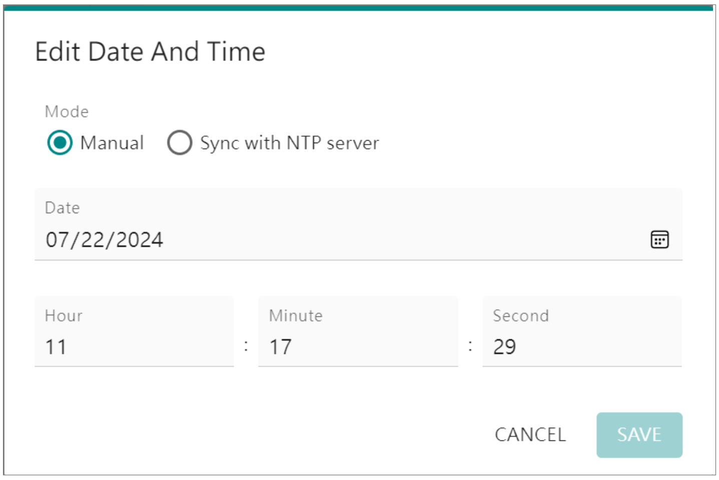
General

Identity | Date & Time

Current Date And Time
2024-07-22 11:16:56

Time Zone
(GMT+08:00) Taipei

Select the **EDIT** button and select **Sync with NTP server**. Then, select the **SAVE** button to enable it.

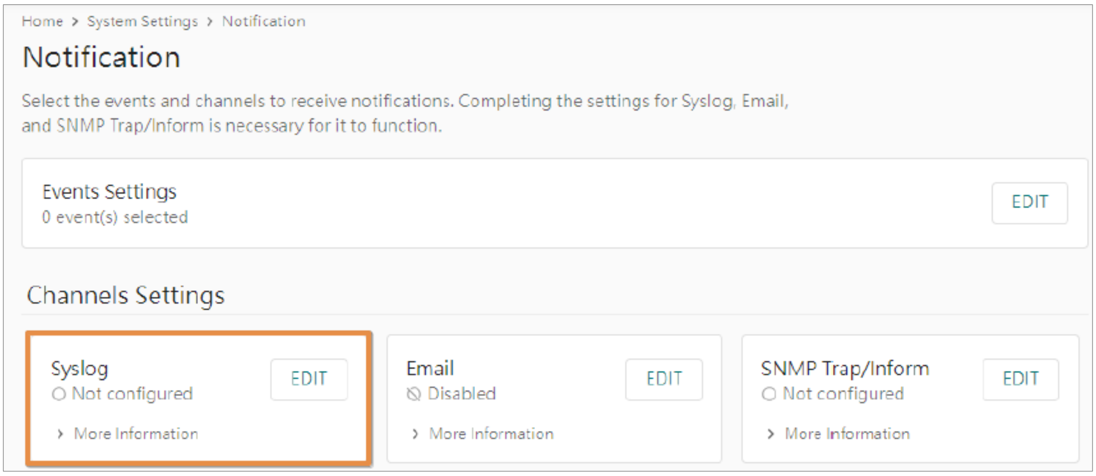

Edit Date And Time

Mode
● Manual ○ Sync with NTP server

Date
07/22/2024

Hour: 11
Minute: 17
Second: 29

For the remote system log server, log in to the HTTPS console, select **System Settings > Notification**, select the **EDIT** button next to Syslog, and add the server in the server field.


Home > System Settings > Notification

Notification

Select the events and channels to receive notifications. Completing the settings for Syslog, Email, and SNMP Trap/Inform is necessary for it to function.

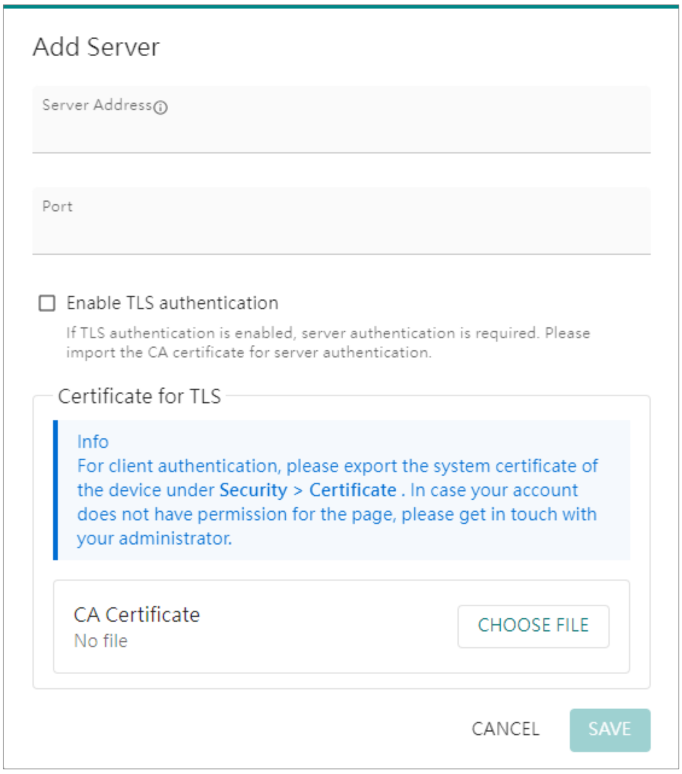
Events Settings
0 event(s) selected

Channels Settings

Syslog
○ Not configured

Email
Disabled

SNMP Trap/Inform
○ Not configured



□ Enable TLS authentication

If TLS authentication is enabled, server authentication is required. Please import the CA certificate for server authentication.

Certificate for TLS

Info
For client authentication, please export the system certificate of the device under **Security** > **Certificate** . In case your account does not have permission for the page, please get in touch with your administrator.

CA Certificate
No file

You may also **Enable TLS authentication**. The NPort 6000-G2 will then authenticate whether the remote syslog server is the correct one or not. This function will require you to import the CA Certificate by selecting the **CHOOSE FILE** button.

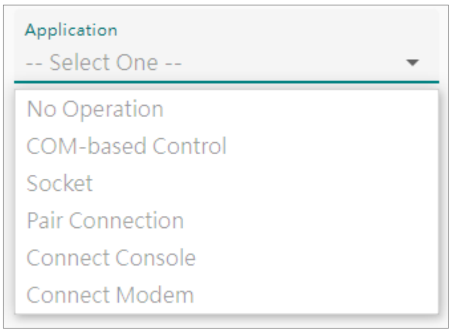
3.2 Serial Ports and Recommended Services

For security reasons, the serial port service (the operation mode) of the NPort 6000-G2 Series is disabled while shipping out from the Moxa factory. Only when you successfully create the first administrator on the device and set up the IP address, the device will restart with the Real COM mode for each serial port. If this is not the case, you may change or disable the service.

The serial protocols used to communicate between the NPort 6000-G2 Series and other devices are listed in the following table:

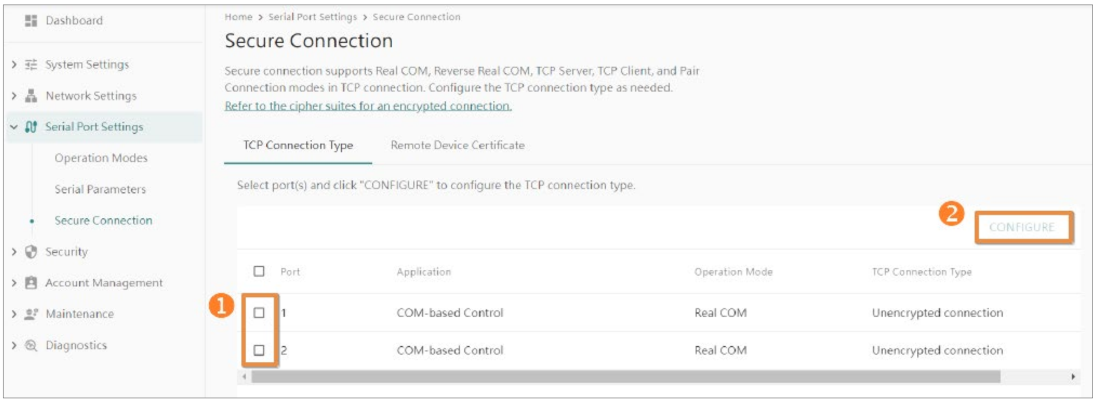
Service Name	Option	Default Settings	Type	Description
Proprietary serial	N/A	Disabled	RS-232/422/485	User-designed data frame for proprietary serial protocol

The operation mode services depend on your serial device’s Ethernet network connection method. For example, if your host PC uses legacy software to open a COM port to communicate with the serial device, then the NPort will enable the Real COM mode for this application. If you don't want the NPort to provide such a service, log in to the HTTPS console, select **Serial Port Settings > Operation Modes > Port # > CONFIGURE**, and then select **No Operation**.



If you are concerned about serial data being transmitted or received with plaintext over the Ethernet network, enable the TLS encryption to encode the serial data. Log in the HTTPS console and select **Serial Port Settings > Secure Connection**.

Select the target serial ports and select the **CONFIGURE** button to select the Encrypted **connection** option to enable the TLS encryption function.



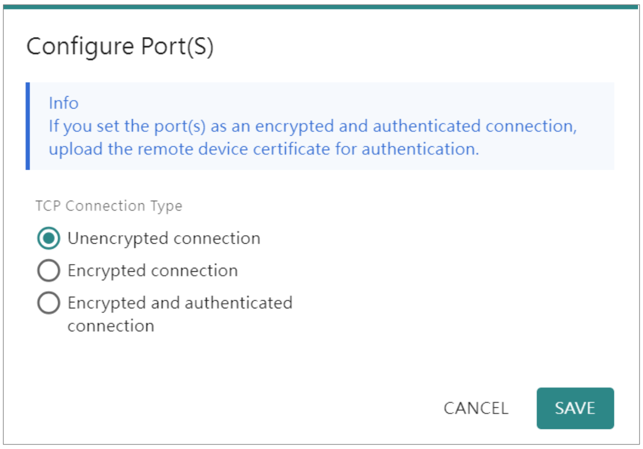
Secure Connection

Secure connection supports Real COM, Reverse Real COM, TCP Server, TCP Client, and Pair Connection modes in TCP connection. Configure the TCP connection type as needed.

Refer to the cipher suites for an encrypted connection.

Select port(s) and click "CONFIGURE" to configure the TCP connection type.

□	Port	Application	Operation Mode	TCP Connection Type
□	1	COM-based Control	Real COM	Unencrypted connection
□	2	COM-based Control	Real COM	Unencrypted connection



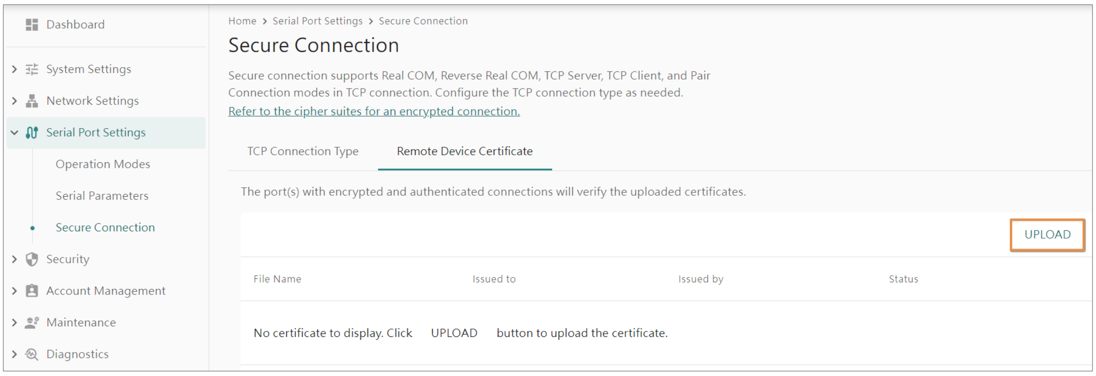
Configure Port(S)

Info
If you set the port(s) as an encrypted and authenticated connection, upload the remote device certificate for authentication.

TCP Connection Type

● Unencrypted connection
○ Encrypted connection
○ Encrypted and authenticated connection

Selecting the **Encrypted and authenticated connection** will also trigger the NPort 6000-G2 to authenticate whether the remote device/host is the correct one or not. This function will require you to import the CA Certificate by switching to the **Remote Device Certificate** tab and selecting the **UPLOAD** button.



Secure Connection

Secure connection supports Real COM, Reverse Real COM, TCP Server, TCP Client, and Pair Connection modes in TCP connection. Configure the TCP connection type as needed.

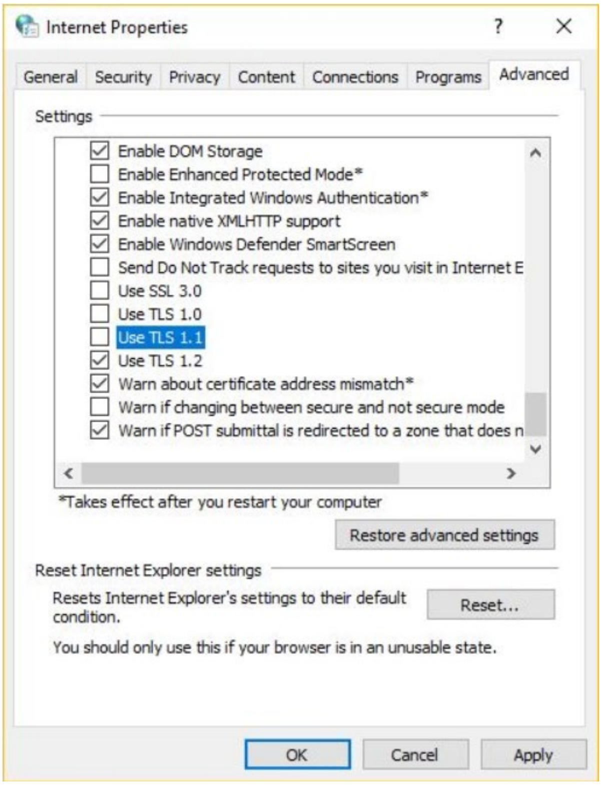
Refer to the cipher suites for an encrypted connection.

The port(s) with encrypted and authenticated connections will verify the uploaded certificates.

File Name	Issued to	Issued by	Status
No certificate to display. Click UPLOAD button to upload the certificate.			

3.3 HTTPS and SSL Certificates

HTTPS is an encrypted communication channel. Because TLS v1.1 and lower versions have severe, easily exploitable vulnerabilities, the NPort 6000-G2 Series uses TLS v1.2 or v1.3 for HTTPS to secure data transmissions. Make sure your browser has TLS v1.2/v1.3 enabled.



☑ Enable DOM Storage
□ Enable Enhanced Protected Mode*
☑ Enable Integrated Windows Authentication*
☑ Enable native XMLHTTP support
☑ Enable Windows Defender SmartScreen
□ Send Do Not Track requests to sites you visit in Internet E
□ Use SSL 3.0
□ Use TLS 1.0
□ Use TLS 1.1
☑ Use TLS 1.2
☑ Warn about certificate address mismatch*
□ Warn if changing between secure and not secure mode
☑ Warn if POST submittal is redirected to a zone that does n

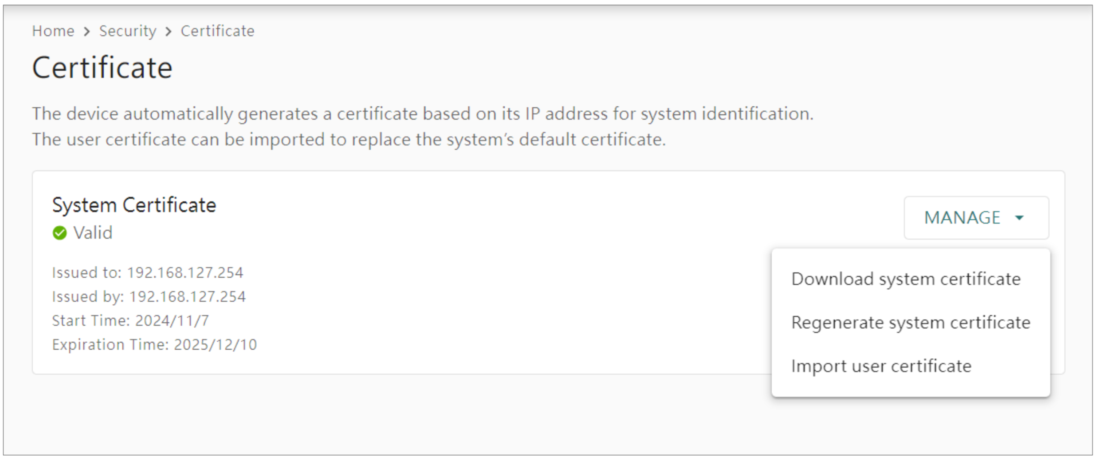
*Takes effect after you restart your computer

Resets Internet Explorer's settings to their default condition.

You should only use this if your browser is in an unusable state.

To use the HTTPS console without a certificate warning appearing, you need to import a trusted certificate issued by a third-party certificate authority or export the "NPort self-signed" certificate to the browser.

Log in to the HTTPS console and select **Security > Certificate**. Select the **MANAGE** button to **Import user certificate**.


Home > Security > Certificate
Certificate

The device automatically generates a certificate based on its IP address for system identification.
The user certificate can be imported to replace the system's default certificate.

System Certificate
✓ Valid

Issued to: 192.168.127.254
Issued by: 192.168.127.254
Start Time: 2024/11/7
Expiration Time: 2025/12/10

MANAGE
Download system certificate
Regenerate system certificate
Import user certificate

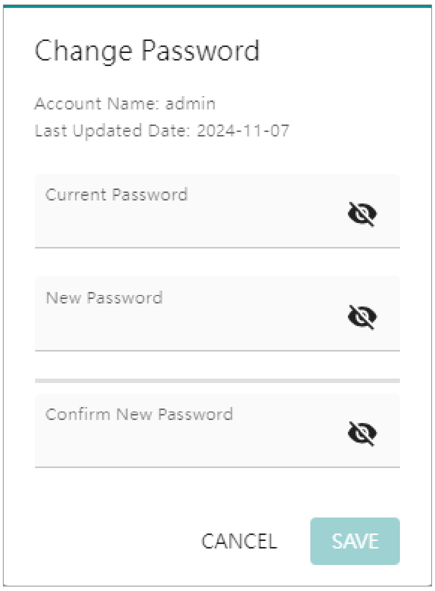
- Behavior of the System Certificate on an NPort 6000-G2 device
  - ➢ NPort devices will auto-generate a self-signed SSL certificate when the IP address is changed or you can select the **Regenerate system certificate** option to generate a new one manually. It is recommended that you import SSL certificates that are certified by a trusted third-party Certificate Authority (CA) or by an organization's CA.
  - ➢ The NPort device's self-signed certificate is encoded based on the Elliptic Curve Cryptography (ECC) 256-bit algorithm, which should be compatible with most applications. Some applications may need a longer or stronger key, requiring importing a third-party certificate. Note that longer keys will mean browsing the web console will be slower because of the increased complexity of encrypting and decrypting communicated data.
- Importing the third-party trusted SSL certificate:

  To generate the SSL certificate through the third party, here are the steps:
  - ➢ Step 1. Create a certification authority (Root CA), such as Microsoft AD Certificate Service (https://mizitechinfo.wordpress.com/2014/07/19/step-by-step-installing-certificate-authority-on-windows-server-2012-r2/)
  - ➢ Step 2. Find a tool to issue a certificate signing request (CSR) file. Get one from a third-party CA company such as DigiCert (https://www.digicert.com/easy-csr/openssl.htm).
  - ➢ Step 3. Submit the CSR file to a public certification authority to get a signed certificate.
  - ➢ Step 4. Import the certificate to the NPort device. Note that NPort devices only accept certificates using a "**.pem**" format. The NPort 6000-G2 Series supports the algorithms below:
    - ▪ RSA-1024, RSA-2048, RSA-3072, RSA-4096
    - ▪ ECC-256, ECC-384, ECC-521
- Some well-known third-party CA (Certificate Authority) companies for your reference (https://en.wikipedia.org/wiki/Certificate_authority):
  - ➢ IdenTrust (https://www.identrust.com/)
  - ➢ DigiCert (https://www.digicert.com/)
  - ➢ Comodo Cybersecurity (https://www.comodo.com/)
  - ➢ GoDaddy (https://www.godaddy.com/)
  - ➢ Verisign (https://www.verisign.com/)

3.4 Account Management

The NPort 6000-G2 Series provides two different user groups, Administrator, and Operator. With an Administrator account, you can access and change all settings through the web console. With an Operator account, you can change and monitor most of the settings, except **Security** and **Account Management**.

Set the Administrator's account and password before you log in the first time. To manage accounts, log in to the web console and select **Account Management > Accounts**. To change the password of an existing account, select on the account name’s option icon. Input the old password and the new password twice (at least 8 characters) to change the password.

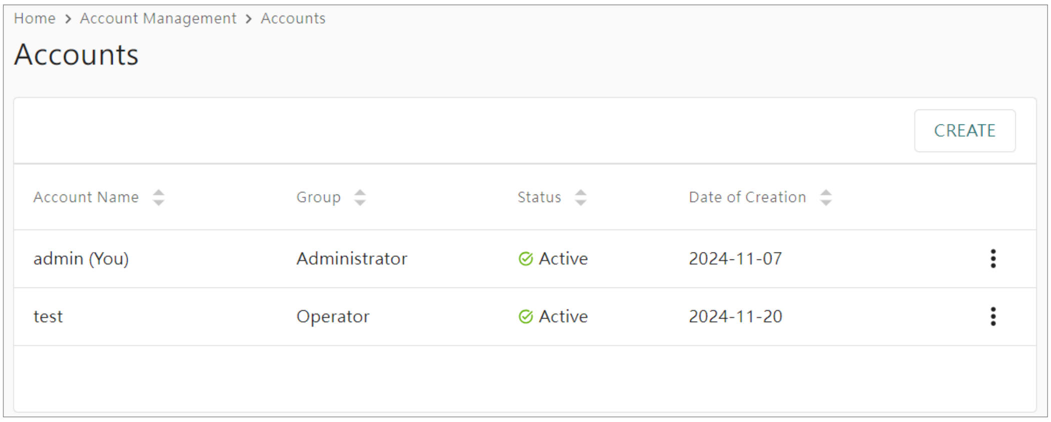


Change Password

Account Name: admin

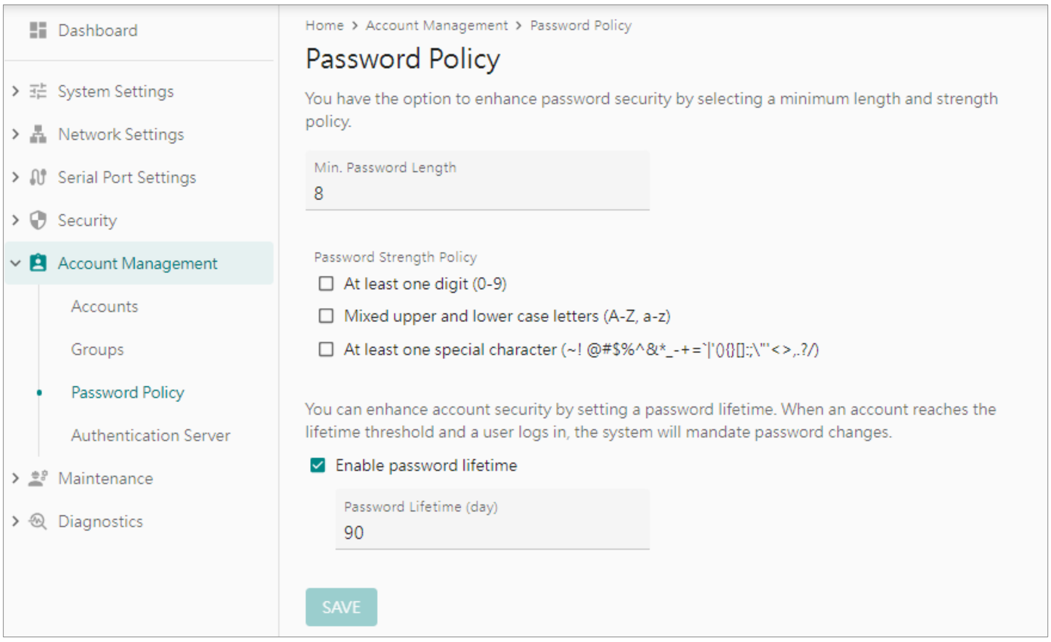
Last Updated Date: 2024-11-07

To add new accounts, select **Account Management > Accounts > CREAT**. A window will pop up for you to input account information and assign a password to the user. Also, the Administrator(s) shall assign a proper **Group** to users to limit their privileges of using the NPort 6000-G2. To add/delete/edit the **Group** privileges, go to the **Groups** section in the menu. The **Password** rules can be set up in **Password Policy** section.



Account Name	Group	Status	Date of Creation
admin (You)	Administrator	✓ Active	2024-11-07
test	Operator	✓ Active	2024-11-20

Configure the login password policy and account login failure lockout to improve security. To configure them, log in to the HTTPS console and select **Account management > Password Policy**.



Password Policy

You have the option to enhance password security by selecting a minimum length and strength policy.

Min. Password Length: 8

Password Strength Policy

☐ At least one digit (0-9)

☐ Mixed upper and lower case letters (A-Z, a-z)

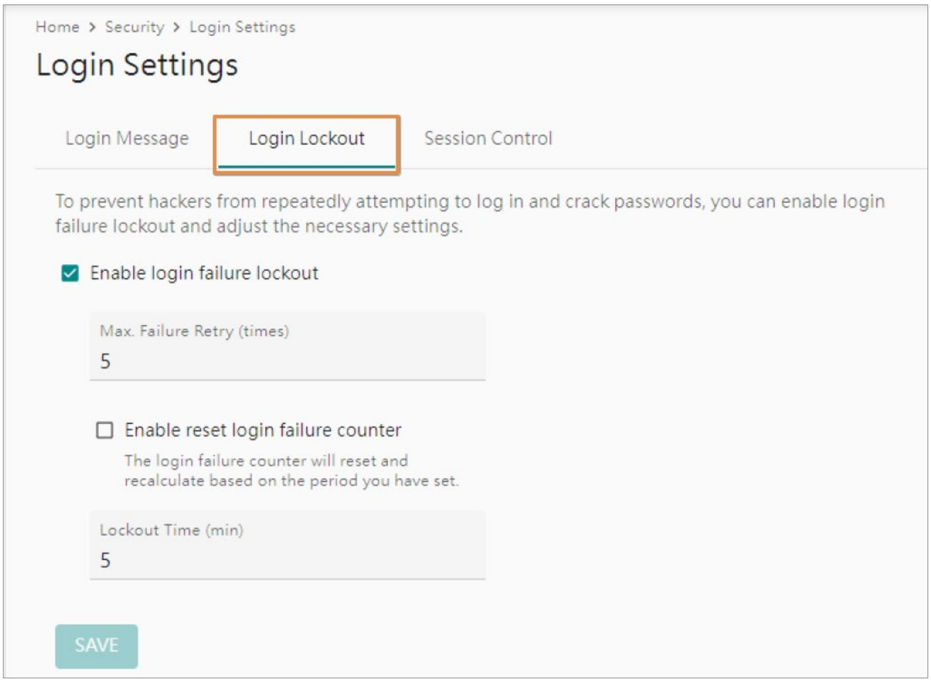
☐ At least one special character (~! @#$%^&*_-+=`|'(){}[]:;\"'<>,.?/)

You can enhance account security by setting a password lifetime. When an account reaches the lifetime threshold and a user logs in, the system will mandate password changes.

☑ Enable password lifetime

Password Lifetime (day): 90

Adjust the password policy to require more complex passwords. For example, set the **Min. Password Length** to 16, enable all **Password Strength Policy** checks, and enable the **Password lifetime** options. Also, to avoid a brute-force attack, we suggest that you **Enable login failure lockout** feature. Select **Security > Login Settings > Login Lockout** to enable the function.



Login Settings

To prevent hackers from repeatedly attempting to log in and crack passwords, you can enable login failure lockout and adjust the necessary settings.

☑ Enable login failure lockout

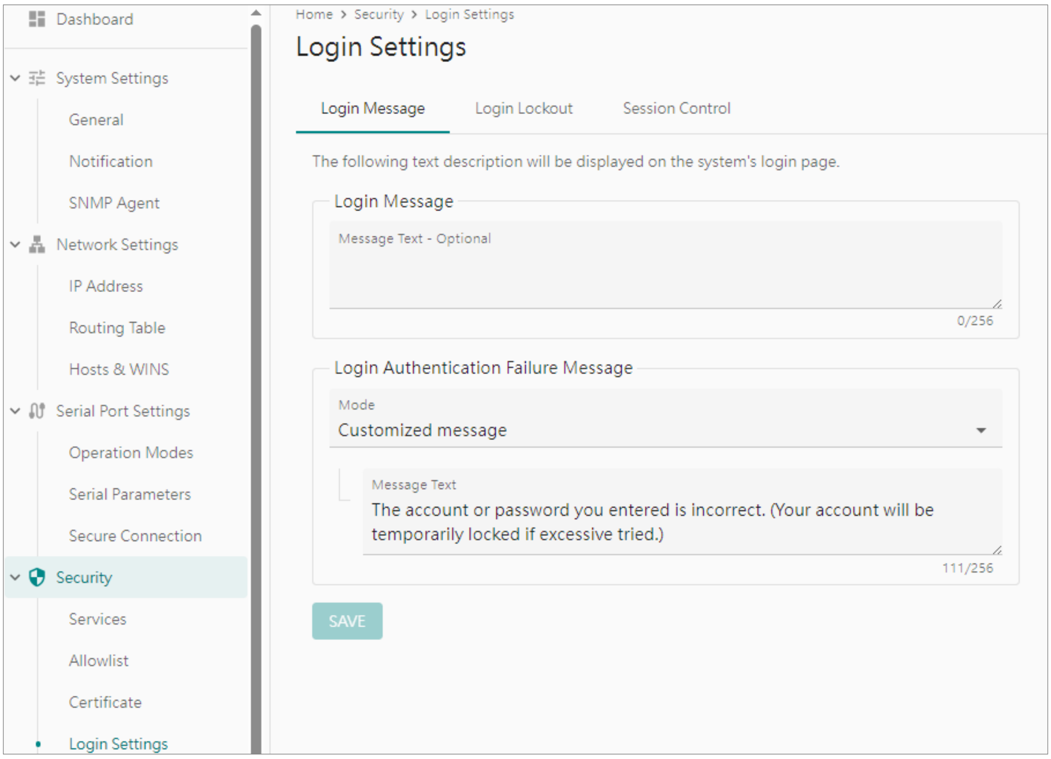
Max. Failure Retry (times): 5

☐ Enable reset login failure counter

The login failure counter will reset and recalculate based on the period you have set.

Lockout Time (min): 5

For some system security requirements, a warning message may be shown to every user who logs in. To add a login message, select **Security > Login Settings > Login Message**, and enter the messages to be delivered.



The following text description will be displayed on the system's login page.

Login Message

Message Text - Optional

0/256

Login Authentication Failure Message

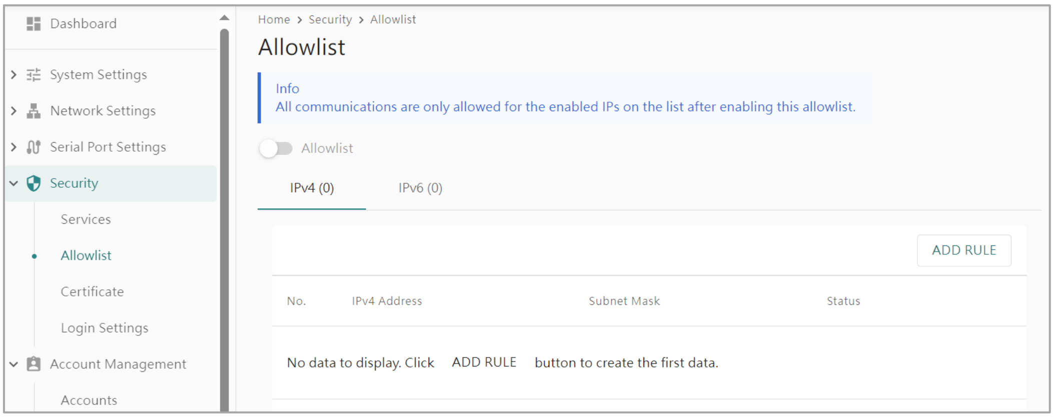
Mode: Customized message

Message Text: The account or password you entered is incorrect. (Your account will be temporarily locked if excessive tried.)

111/256

3.5 Allowlist

- An allowlist is a list of IP addresses or domains that are provided privileged access. Enabling this function limits the number of IP addresses that can access the device server, which can prevent unauthorized access from an untrusted network.



Info
All communications are only allowed for the enabled IPs on the list after enabling this allowlist.

No data to display. Click ADD RULE button to create the first data.

- Add a specific address or range of addresses by using a combination of an IP address and a subnet mask:
  - **To allow access to a specific IP address:** Enter the IP address in the corresponding field; enter 255.255.255.255 for the netmask.
  - **To allow access to hosts on a specific subnet:** For both the IP address and netmask, use 0 for the last digit (e.g., "192.168.1.0" and "255.255.255.0").
  - **To allow access to all IP addresses:** Make sure that the **Allowlist** toggle button is closed.

Additional configuration examples are shown in the following table:

Desired IP Range	IP Address Field	Netmask Field
Any host	Disable	Enable
192.168.1.120	192.168.1.120	255.255.255.255
192.168.1.1 to 192.168.1.254	192.168.1.0	255.255.255.0
192.168.1.1 to 192.168.255.254	192.168.0.0	255.255.0.0
192.168.1.1 to 192.168.1.126	192.168.1.0	255.255.255.128
192.168.1.129 to 192.168.1.254	192.168.1.128	255.255.255.128

⚠ **WARNING**

Ensure that the IP address of the PC you are using to access the web console is in the **Allowlist**.

3.6 Logging and Auditing

The local syslog function is enabled to record the events that happened on the NPort 6000-G2 device. Under the Security category, the severity of events—Notice, Warning and Error—will be saved on the local flash memory by default. The events can be recorded for up to 10,000 items.

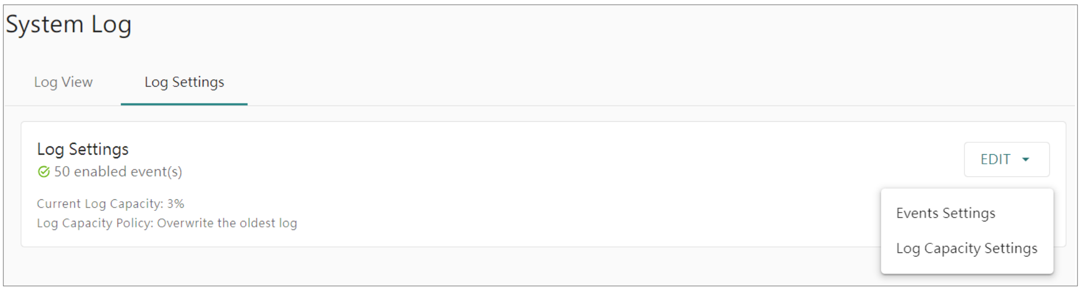
These are the five categories of events:

Category	Description
System	The events related to the NPort itself, like firmware ready.
Network	The events related to the Ethernet interface, for example, the Ethernet link up.
Security	In the event that may be considered security related; the administrator may need to figure out why it happened. For example, a login fail event.
Maintenance	The events that usually happen during the maintenance process, for example, firmware upgrades.
Serial	The events related to the serial interface(s), for example, Port connect.

There are four severities of the events:

Priority	Severity	Description
1	Error	Events that indicate problems, but in a category that may or may not require immediate attention.
2	Warning	Events that provide forewarning of potential problems and indicate that some further actions could result in a critical error.
3	Notice	Events that are not error conditions but may require special handling.
4	Informational	Confirmation that the program works as expected.

To enable what events shall be recorded, log in to the HTTPS console and select **Diagnostics > System Log> Log Settings > EDIT > Events Settings**. Select the events you would like to save in the system log.

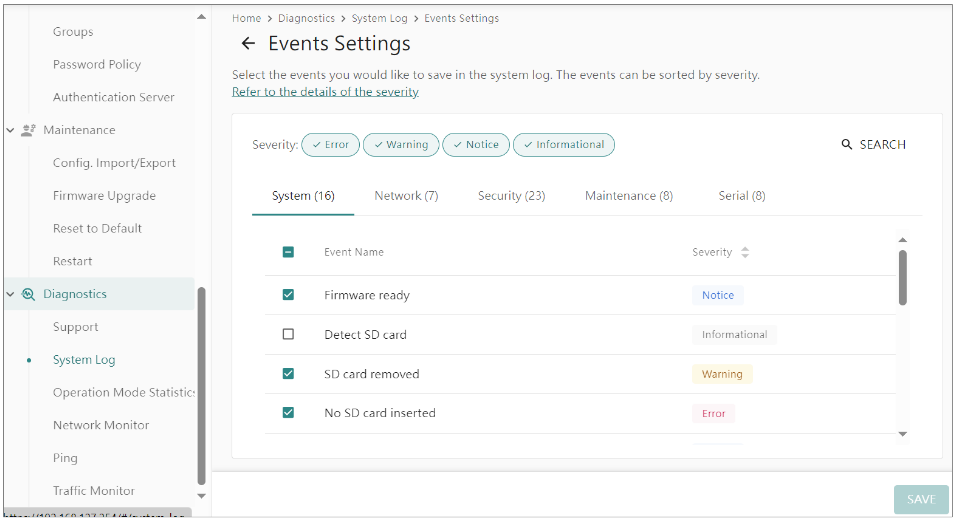

System Log

Log Settings

✓ 50 enabled event(s)

Current Log Capacity: 3%

Log Capacity Policy: Overwrite the oldest log



Events Settings

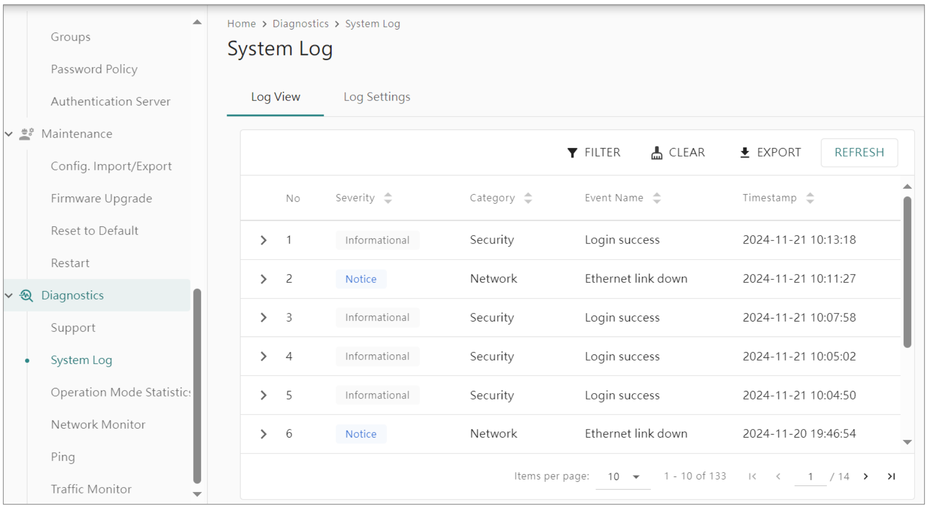
Select the events you would like to save in the system log. The events can be sorted by severity.
Refer to the details of the severity

Severity: ✓ Error ✓ Warning ✓ Notice ✓ Informational

System (16) | Network (7) | Security (23) | Maintenance (8) | Serial (8)

☑	Event Name	Severity
☑	Firmware ready	Notice
□	Detect SD card	Informational
☑	SD card removed	Warning
☑	No SD card inserted	Error

To view events in the system log, select **Diagnostics > System Log > Log View**.

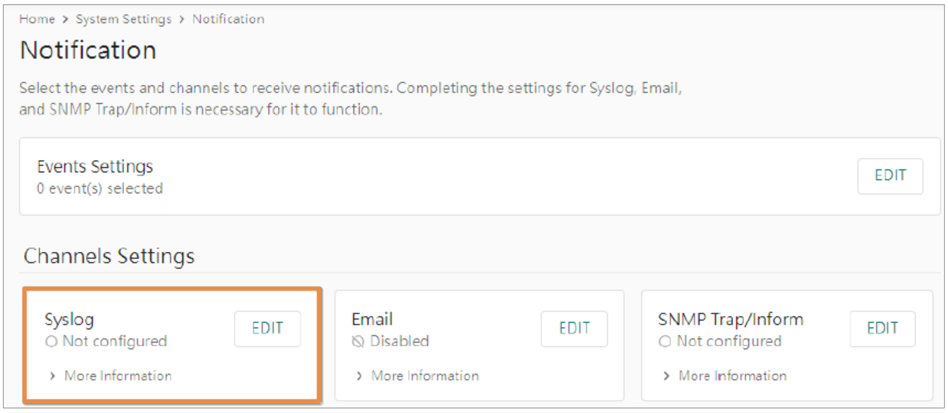


System Log

No	Severity	Category	Event Name	Timestamp
1	Informational	Security	Login success	2024-11-21 10:13:18
2	Notice	Network	Ethernet link down	2024-11-21 10:11:27
3	Informational	Security	Login success	2024-11-21 10:07:58
4	Informational	Security	Login success	2024-11-21 10:05:02
5	Informational	Security	Login success	2024-11-21 10:04:50
6	Notice	Network	Ethernet link down	2024-11-20 19:46:54

Items per page: 10 1 - 10 of 133 1 / 14

To enable the remote log server, select **System Settings > Notification**. Select the **EDIT** button next to **Syslog** and add the server in the server field.



Notification

Select the events and channels to receive notifications. Completing the settings for Syslog, Email, and SNMP Trap/Inform is necessary for it to function.

Events Settings
0 event(s) selected

Channels Settings

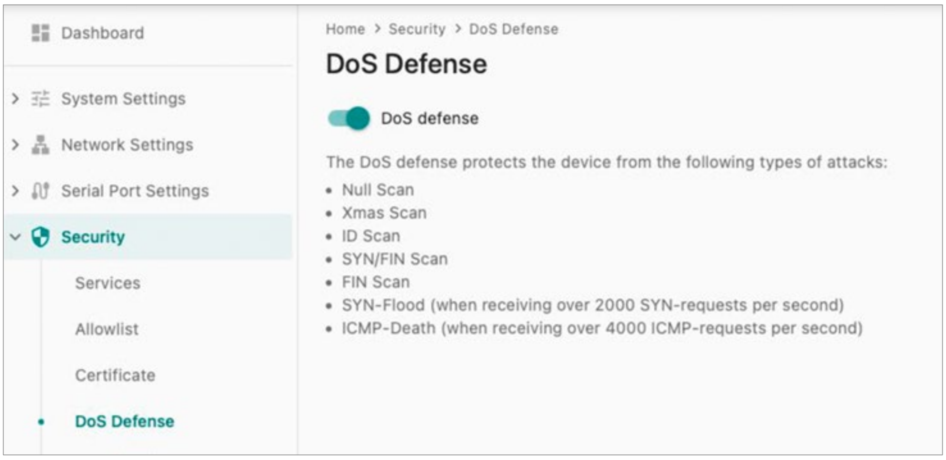
Syslog ○ Not configured

Email Disabled

SNMP Trap/Inform ○ Not configured

3.7 DOS Defense

Positioned as an edge device within the network topology, the NPort 6000-G2 Series features a built-in **DoS Defense** mechanism. This function is enabled by default to mitigate specific Denial of Service (DoS) attacks and enhance device resilience.



DoS Defense

DoS defense

The DoS defense protects the device from the following types of attacks:

- Null Scan
- Xmas Scan
- ID Scan
- SYN/FIN Scan
- FIN Scan
- SYN-Flood (when receiving over 2000 SYN-requests per second)
- ICMP-Death (when receiving over 4000 ICMP-requests per second)

4 Patching/Upgrades

4.1 Patch Management

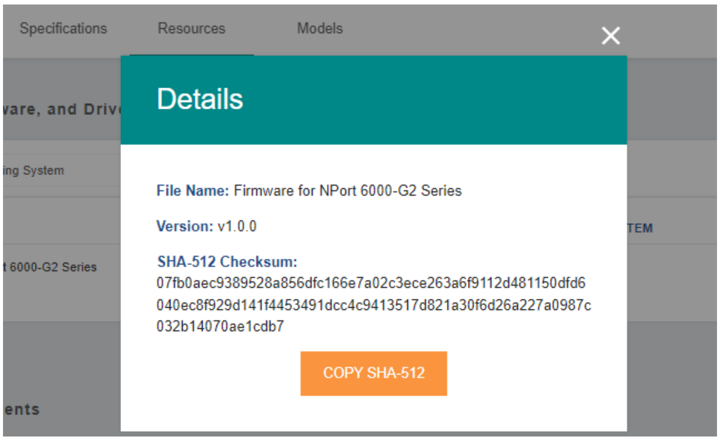
Regarding patch management, Moxa releases version enhancements annually, with detailed release notes.

4.2 Firmware Upgrades

The process for upgrading firmware is:

- Download the latest firmware and software, along with its release notes and hash values for your NPort device from the Moxa website:
  - ➢ Firmware of NPort 6100-G2/6200-G2 Series:

    https://www.moxa.com/en/support/search?psid=137659
- Moxa's website provides the SHA-512 hash value for you to double-check if the firmware is identical to the one on the website.

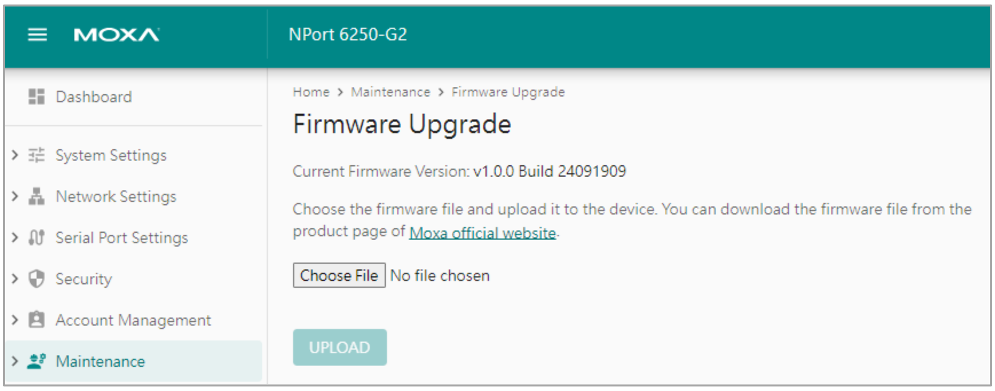


File Name: Firmware for NPort 6000-G2 Series

Version: v1.0.0

SHA-512 Checksum: 07fb0aec9389528a856dfc166e7a02c3ece263a6f9112d481150dfd6040ec8f929d141f4453491dcc4c9413517d821a30f6d26a227a0987c032b14070ae1cdb7

- Log in to the HTTPS console and select **Maintenance > Firmware Upgrade**. Select the **Choose File** button to select the proper firmware and select **UPLOAD** to upgrade the firmware.



Firmware Upgrade

Current Firmware Version: v1.0.0 Build 24091909

Choose the firmware file and upload it to the device. You can download the firmware file from the product page of Moxa official website.

Choose File No file chosen

  - ➢ Manual for the NPort 6000-G2 Series:

    https://www.moxa.com/en/support/search?psid=137659

4.3 Recommendation to Secure the Environment

Besides using devices that support security functions, network managers can follow several recommendations to protect the entire network and devices.

To prevent unauthorized access to a device, follow these recommendations:

- Testing tools are available for checking cybersecurity environment. Some may provide limited free use, for example, Nessus. These tools help identify probable security leaks in the environment.
- The device must be operated inside a secure network, protected by a firewall or router that blocks attacks via the Internet.
- Control/restrict access to the serial console (depends on the model deployed), and physical access to the device itself.
- Avoid using insecure services such as SNMPv1 or v2c. We recommend disabling them completely.
- Limit the number of simultaneous web server sessions allowed. We recommend changing the passwords periodically.
- Back up the configuration files periodically.
- Audit the devices periodically to ensure that they comply with these recommendations and/or any internal security policies.
- If there is a need to return the unit to Moxa, ensure that you back up the configuration on it.

Note DISCLAIMER:
The information above and this guide (the "information") are for your reference only. We do not guarantee a cyberthreat-free environment. These guidelines are to increase the security level to defend against cyber intrusions and is not guaranteed to meet your specific requirements. We provide the abovementioned information "as-is" and do not warrant its accuracy, completeness, or performance, whether express, implied, or otherwise.

5 Decommission

Since the NPort is the primary device for transferring serial data to Ethernet devices, decommissioning an NPort device requires arranging annual maintenance to replace the old unit with a new one. Follow these steps to complete the process:

1. Export the configuration file from the old NPort and import it to the new unit. This will save you from having to configure the new unit manually.
2. Stop communication and replace the old unit.
3. Restart communication and check if everything works fine. If yes, proceed to step d to decommission the old unit. If not, you may need assistance to troubleshoot the issue.
4. Keep the old unit powered on and press the Reset button for 5 seconds to restore the settings to factory default.
5. After the device reboots and all user settings are removed or overwritten, you may scrap it.

Note If you enable the function Reset button "Only enable with 60 seconds after booting". You will need to push the Reset button within 60 seconds after booting to enable the Reset function.

6 Security Information and Vulnerability Feedback

As the adoption of the Industrial IoT (IIoT) continues to grow rapidly, security has become one of the top priorities. The Moxa Product Security Incident Response Team (PSIRT) is taking a proactive approach to protect our products from security vulnerabilities and help our customers better manage security risks.

Follow the updated Moxa security information from the link below:
https://www.moxa.com/en/support/product-support/security-advisory