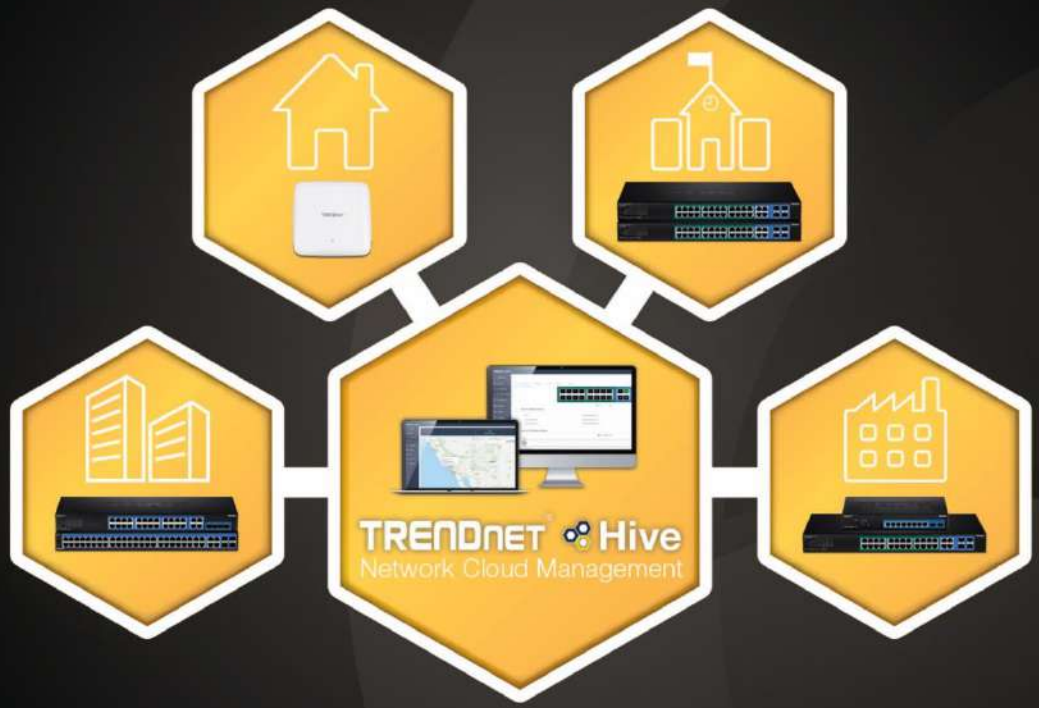
User's Guide

TRENDnet®



TRENDnet® Hive

Contents

TRENDnet Hive Overview 1

What is TRENDnet Hive?..... 1

Features 1

Hive Account Features..... 2

Sign up for a Hive Account..... 3

Adding devices to Hive 5

Hive Compatible Devices 5

Configure your device for Internet access 5

Register your device with your Hive account 7

Hive Management Portal 8

Login to your Hive account 8

Hive Dashboard 9

Create a new tenant 11

Assigning device licenses 12

Manage devices in your Hive account 15

Configure devices in your Hive account 22

Provision devices in your Hive account 31

Configuration Provisioning..... 31

Firmware Provisioning 39

Monitoring devices 47

Event Monitoring 47

Device Utilization 49

Diagnostic Tools..... 50

Ping IPv4 Host 50

Device Reboot..... 52

Cable Diagnostics 53

Account Settings 55

View Hive System Messages 62

View Device Logging 63

View System Logging 64

Configure alert notifications 65

Web Smart Switch Series Hardware Specifications 66

Web Smart Switch Series Software Specifications..... 68

Web Smart PoE Switch Series Hardware Specifications..... 70

Web Smart PoE Switch Series Software Specifications 72

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TRENDnet Hive Overview

What is TRENDnet Hive?

TRENDnet Hive is a cloud management platform that provides a centralized cloud-based management solution for TRENDnet network devices. TRENDnet network devices can be connected to the Hive cloud management platform. The TRENDnet Hive cloud networking solution offers better overall visibility of your network devices from a single intuitive and easy-to-use cloud interface.

Advanced features supported with cloud networking include event and device hardware monitoring, traffic statistics, notification alerts, and troubleshooting tools. Network device provisioning can be accomplished through scheduled or immediate deployment of batch firmware and configuration updates. Reduce the time, complexity, and management costs of your network with TRENDnet Hive.

Features

Cloud-Based Management

TRENDnet Hive network cloud manager provides better overall visibility of your network devices from a single intuitive and easy-to-use cloud interface

Hassle-Free Remote Monitoring

Remote network management support allows you to monitor your network devices from the cloud with device uptime, detailed logging, traffic statistics, event snapshots, and device health (processor/memory hardware and PoE budget utilization)

Intuitive Alerts and Notifications

Choose customized alerts and notifications to be sent based on exceeded thresholds (CPU/memory) or events (port link status, device offline, switch loop)

Ease of Provisioning

Schedule batch firmware upgrades and configuration updates for deployment from the cloud for your network devices. Create and customize configuration files in the cloud and review records of when firmware and configuration update tasks were carried out

Reduce time and management costs

Reduce maintenance time and costs by moving network device access to the cloud

Minimal Downtime

Service-Level Agreement (SLA) guaranteed 99.9 percent uptime and service availability

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Hive Account Features

Features	Hive Premium (for end users)	Hive Pro (for integrators/partners)
Multiple Device Management	Yes	Yes
Multiple Site Management	Yes	Yes
Supports all selected TRENDnet devices	Yes	Yes
Supports unlimited number of devices	Yes	Yes
Device Configuration & Monitoring	Yes	Yes
Batch Firmware and Configuration Deployment	Yes	Yes
Notification Alerts	Yes	Yes
Multiple Tenant Management	No	Yes
Multiple User Accounts	No	Yes
Role-based User Privileges	No	Yes
Google Maps™ mapping service	No	Yes

Disclaimer: Features and specifications are subject to change without notice.

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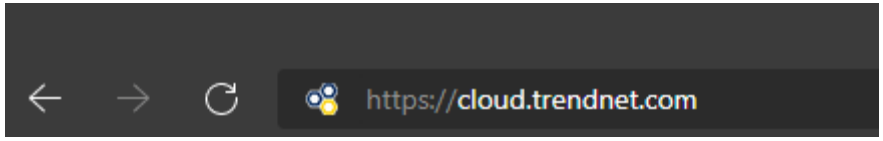
Sign up for a Hive Account

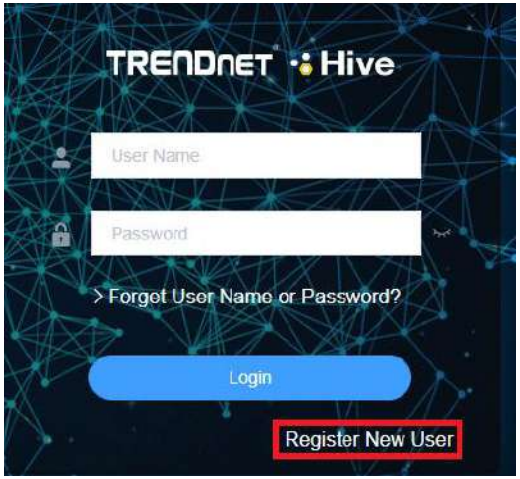
Note: *Sign up for a Hive Premium account at https://cloud.trendnet.com. For Hive Pro accounts, contact your authorized TRENDnet reseller, distributor, or TRENDnet sales.*

Hive Premium Sign Up

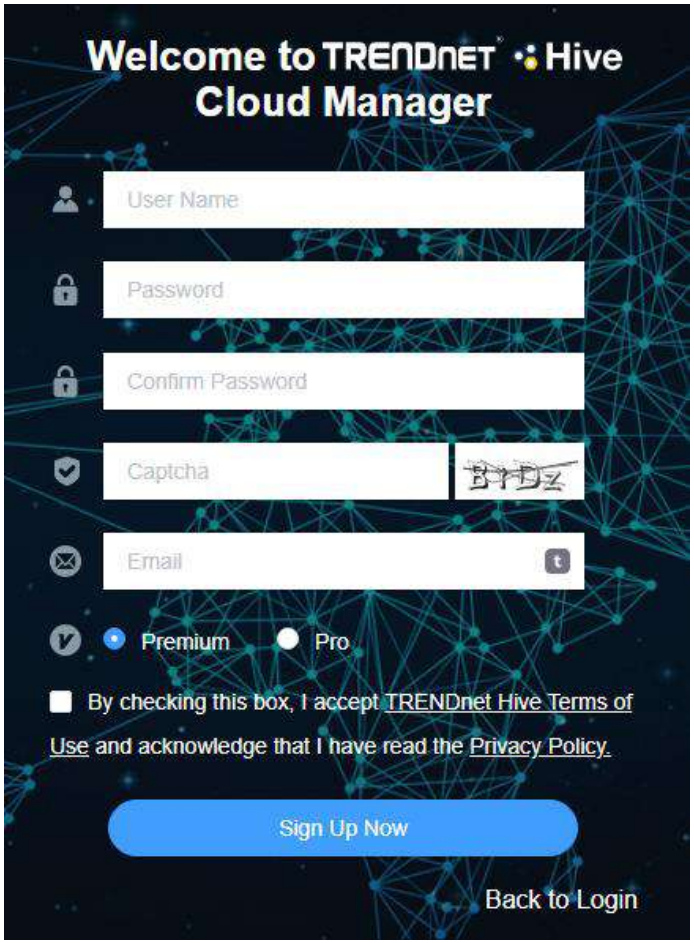
1. In your web browser, go to https://cloud.trendnet.com



2. Click on **Register New User**.



3. In the user account information in the fields provided. After you have completed entering the account information, make sure **Premium** is selected and check the box to confirm the terms of use and privacy policy. You can review the terms and privacy policy by clicking the links provided. Click **Sign Up Now.**



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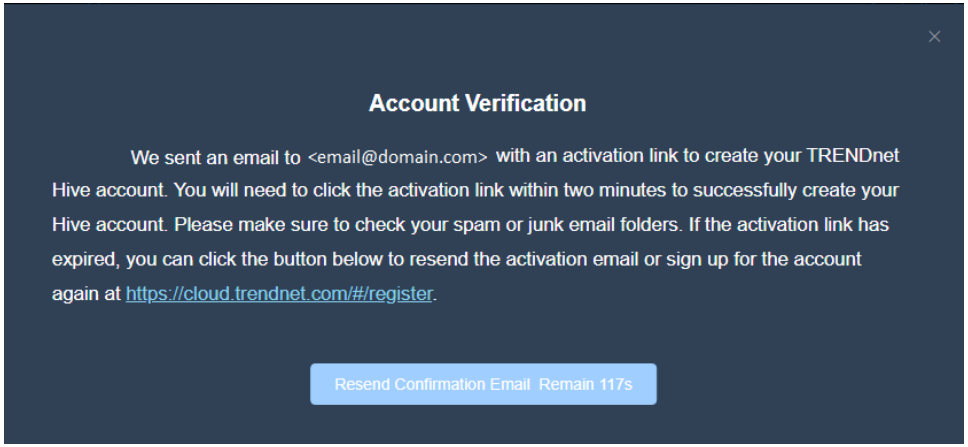
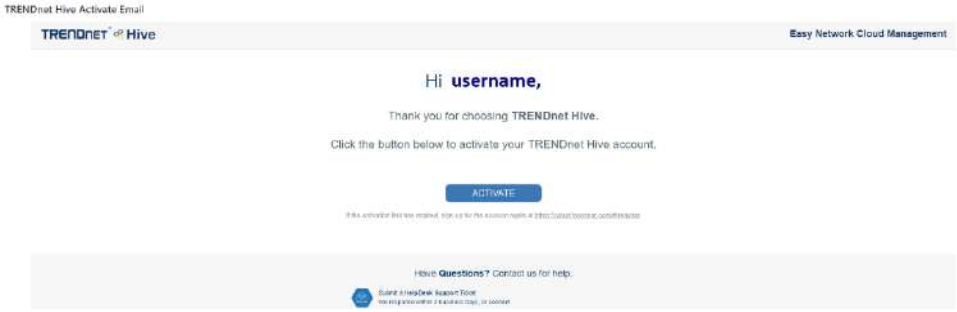
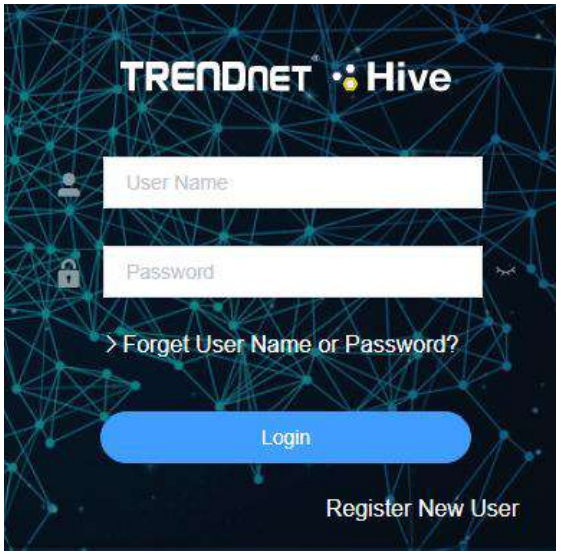
4. You will receive an account verification prompt notifying you of the verification email sent to the email address you entered with the activation link to confirm your Hive account.
   Note: *Please note that the activation link will expire in two minutes. If the activation link expires and this prompt is still open, you can click the button to resend the verification email.*



5. In the activation email, click the **Activate** button to confirm your account.



6. After you have confirmed your account, enter your Hive account credentials and click **Login.**



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Adding devices to Hive

Hive Compatible Devices

The device models listed below are currently compatible with TRENDnet Hive. You may need to upgrade the device firmware to enable TRENDnet Hive. You can find the latest list of Hive compatible devices on the TRENDnet Hive website.
https://www.trendnet.com/hive/#devices

Web Smart Switches	
Model	**Hardware Version (H/W)**
TEG-082WS	**v2.XR**
TEG-204WS	**v1.XR**
TEG-284WS	**v1.XR**
TEG-524WS	**v1.XR**
PoE Web Smart Switches	
Model	**Hardware Version (H/W)**
TPE-082WS	**v1.XR**
TPE-1620WS	**v2.XR**
TPE-1620WSF	**v1.XR**
TPE-204US	**v1.XR**
TPE-2840WS	**v2.XR**
TPE-5028WS	**v1.XR**
TPE-5048WS	**v1.XR**
TPE-5240WS	**v1.XR**

Important Note: *Please make sure you have updated TRENDnet Web Smart Switches to enable TRENDnet Hive capability (firmware version 3.01.XXX or above).*

Disclaimer: Supported models are subject to change without notice.

Configure your device for Internet access

Before connecting TRENDnet devices to the Hive management system, the devices must be configured with the proper IP address, subnet mask, default gateway address, DNS server settings, and connected to a network for Internet access before devices can connect to the Hive management system. Devices must always remain connected to the Internet to ensure they can be managed and monitored from your Hive account.

Example (TRENDnet Web Smart Switch):

Note: *The following example will provide the steps for configuring the TRENDnet web smart switch IP address, subnet mask, default gateway address, and DNS settings.*

1. Login to the web smart switch management page.
   Note: *The TRENDnet web smart switch default IP address and subnet mask is 192.168.10.200 / 255.255.255.0. The TRENDnet web smart switch default user name and password is admin / admin.*

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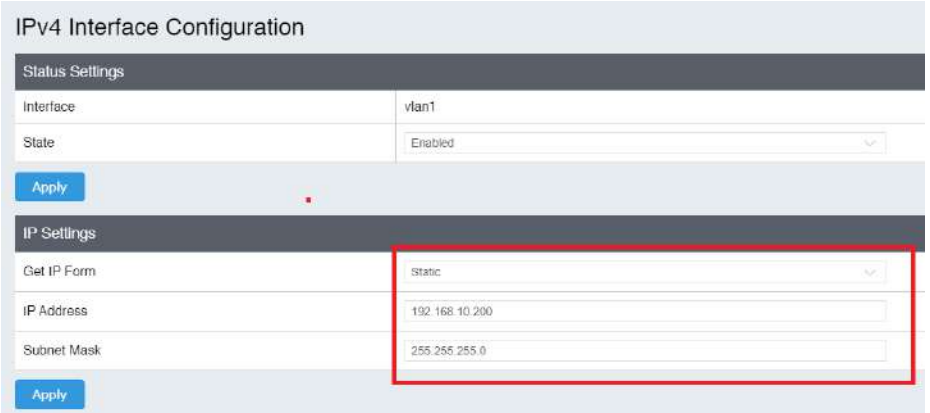
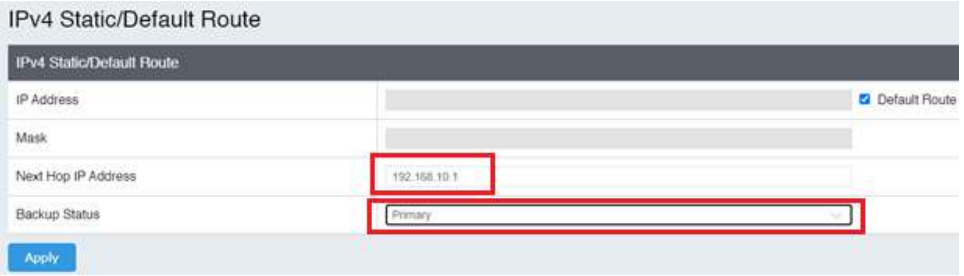
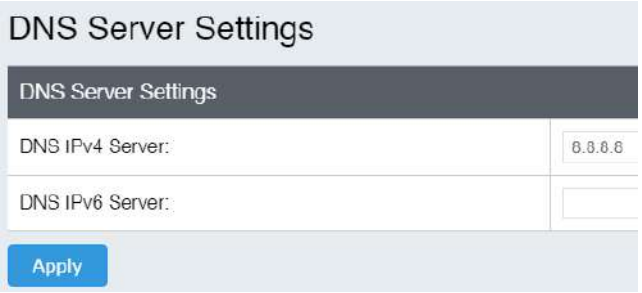
2. Click on **System > L3 Feature > IPv4 Interface.**
3. Enter the **IP Address** and **Subnet Mask** settings and click **Apply**.
   Note: *You may need to login to the switch with the new IP address settings.*



4. Click on **System > L3 Feature > IPv4 Static/Default Route.**
5. Make sure **Default Route** is checked, enter the default gateway IP address in the **Next Hop IP Address** field, select **Primary** for the **Backup Up Status**, and click **Apply**.

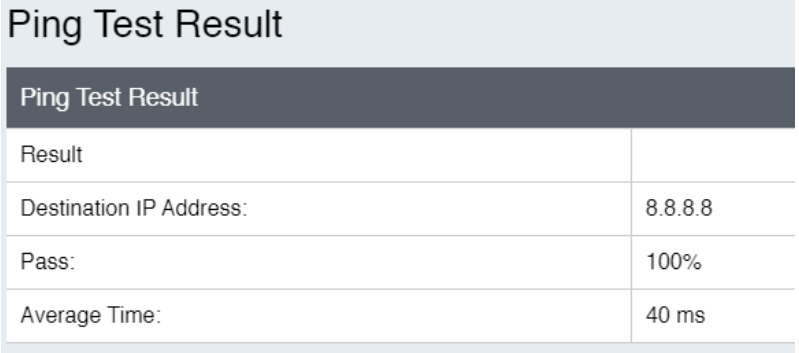


6. Click on **System > DNS.**
7. Enter the DNS server IP address in the **DNS IPv4 Server** field and click **Apply**.



8. In the top right menu, click on the save disk icon to save to NV-RAM.
   Note: *You can also click on **Save** in the left navigation menu and click on **Save Settings to Flash**.*

9. After your switch has been configured with the proper IP address and DNS server settings, connect your switch to your network with Internet access.
   Note: *After you have connected your switch to your network, you can verify Internet access by conducting a ping test from the switch in the left navigation menu **Tools > Ping** and for the **Destination IP Address,** enter an Internet IP address such as 8.8.8.8, click **Start**. After a few seconds, click **Show Ping Result** button when it becomes available to check the result. The pass result should have a value higher than 0% to indicate that the switch can access the Internet.*



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Register your device with your Hive account

After your TRENDnet device has been properly configured and and connected for Internet access, register your device with your Hive account by logging into your device management page and in the cloud settings, enter your Hive user credentials to register your device with your Hive account.

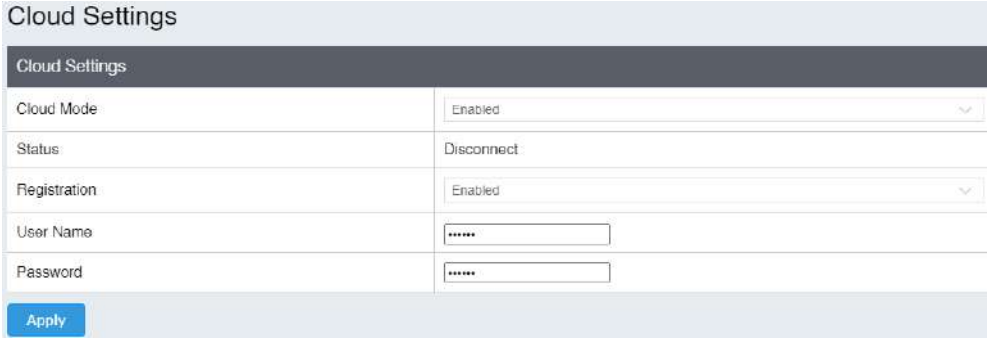
Example (TRENDnet Web Smart Switch):

Note: *The following example will provide the steps for registering the TRENDnet web smart switch to your Hive account.*

1. Login to the web smart switch management page.
   Note: *The TRENDnet web smart switch default IP address and subnet mask is 192.168.10.200 / 255.255.255.0. The TRENDnet web smart switch default user name and password is admin / admin.*

2. In the top right menu, click on the Hive icon.
   Note: *You can also click on **System > Cloud Settings** in the left navigation menu.*

3. For the **Cloud Mode**, select **Enabled.**
4. For the **Registration,** select **Enabled**
5. Enter in your Hive account credentials in the **User Name** and **Password** fields, then click **Apply**.
   Note: *Once the device is assigned to a specific Hive user account, the device cannot be assigned to a different Hive user account.*



Note: The Hive icon will turn green along with a status message update after the switch has been successfully registered.

Status	Connect Success

6. In the top right menu, click on the save disk icon to save to NV-RAM.
   Note: *You can also click on **Save** in the left navigation menu and click on **Save Settings to Flash**.*

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Hive Management Portal

This section will explain how to navigate, functionality and usage of the Hive management portal .

Login to your Hive account

Using a web browser, login to your Hive account at https://cloud.trendnet.com. Enter your user name and password account credentials and click **Login.**

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Hive Dashboard

The Hive dashboard displays the total number of tenants (multiple tenants available in Hive Pro only), devices (online/total) and the number of alarm notifications.

You can also create new tenants, remove tenants, check tenant location, check the alarm notifications and online/total number of devices for each tenant from this page.

Note: *Devices must be assigned to tenant in order the devices to be managed from Hive.*

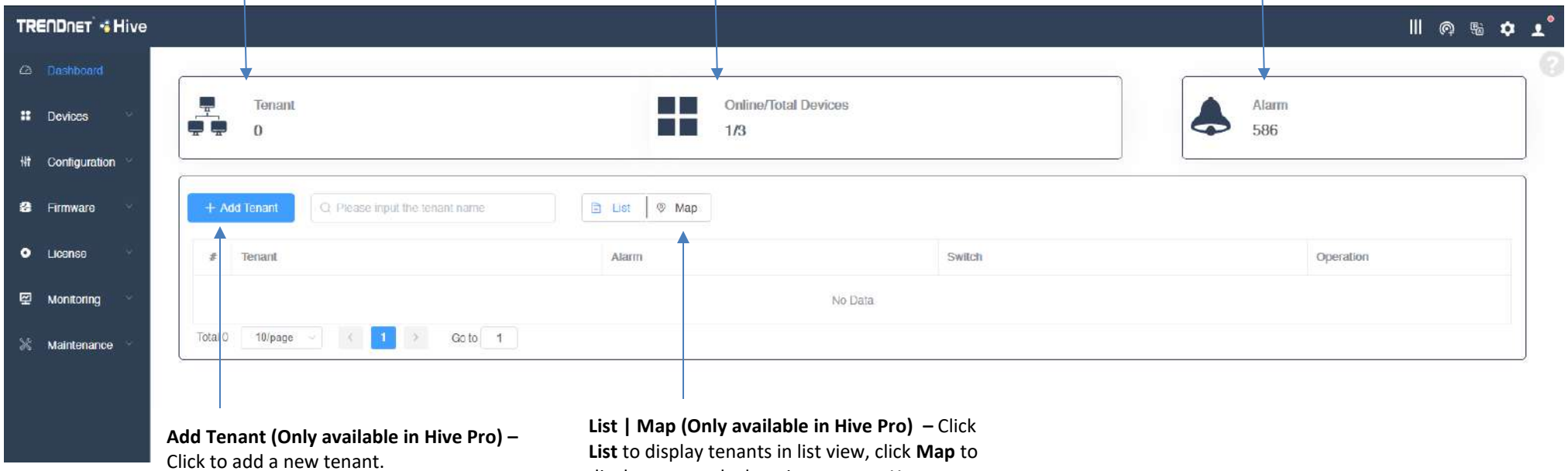
What is a tenant in the Hive Management System?

A tenant is a group in the Hive Management System for easier manageability of network locations, customers, or organizations where TRENDnet Hive compatible devices will be installed, monitored and managed. Tenant management will allow for better organization, maintenance, monitoring of each network location, customer, or organization individually. Additional users can be created for Hive access and restricted only to a specific tenant and restricted only to specific management sections for the specified tenant for access control purposes.

Tenant – Displays total number of tenants

Online/Total Devices – Displays the number of devices online/total number of devices. Click to view devices (Devices > Device List)

Alarm – Displays the number alert notifications. Click to view alerts (Account & Logging > System Log)



Add Tenant (Only available in Hive Pro) – Click to add a new tenant.

List | Map (Only available in Hive Pro) – Click **List** to display tenants in list view, click **Map** to display tenants by location on map. You can also view device location by entering the

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Collapse/Expand Left Navigation

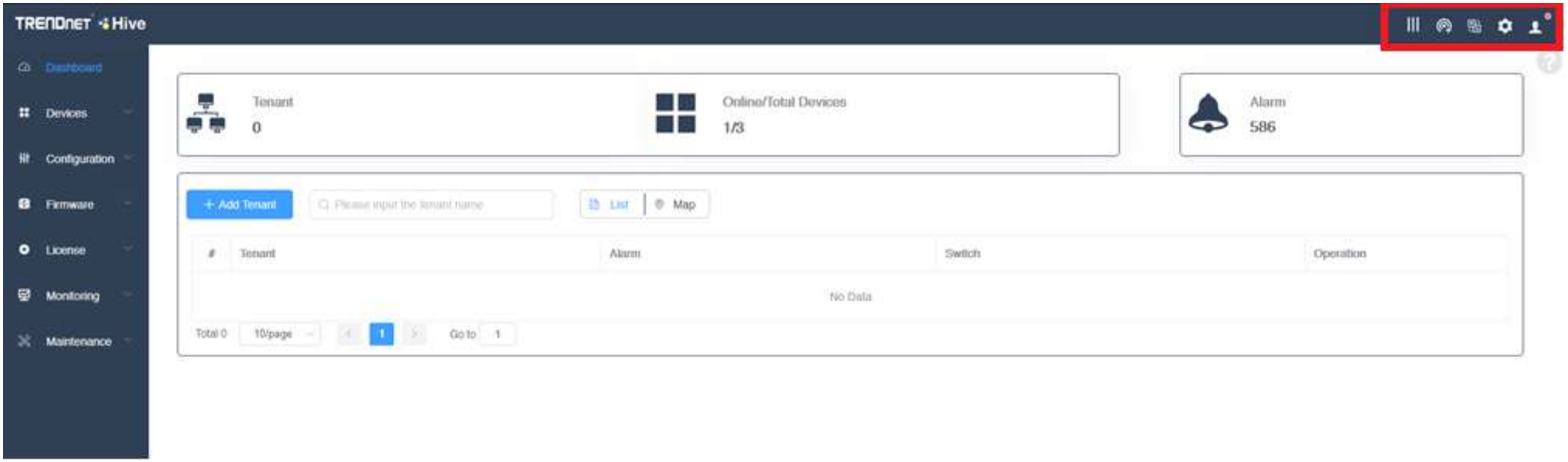
Create New Tenant (Available in Hive Pro only)

Language Selection

Alert Settings – Configure alert/email notification settings

Account & Logging – Configure your account settings such as password, email, and address. View system/device logging and messages. The red indicator will appear if a new system message is available. (System > Message List)

- User Management (Available in Hive Pro only) – Create users and assign access privileges to tenant settings and configuration.



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Create a new tenant

Important Note: *If you are using a Hive Premium account, only 1 tenant will be available, default name "MyTenant". Only Hive Pro accounts have the capability to create mulitiple tenants. Additionally, location services are only available in Hive Pro.*

Click + Add Tenant or in the top right menu, click to create a new tenant. (Only available in Hive Pro)

In the Add Tenant window, enter the **Name** and **Location** of the new tenant.Then click Submit to create the new tenant.

The new tenant will be displayed in the tenant list.

#	Tenant	Alarm	Switch	Operation
1	TENANT1	0	0/0	

- **Tenant –** Displays the tenant name.
- **Alarm –** Displays the current number of alerts for this tenant.
- **Switch** – Displays the current number of switch devices online / total number of switch devices for this tenant.
- **Operation**
  - Edit tenant name and location. (location only available in Hive Pro)
  - View available devices and assign devices to the tenant. (available only in Hive Pro)
  - Delete or remove the tenant. (available only in Hive Pro)
  - View tenant location on map. (available only in Hive Pro)
  - View tenant device topology.

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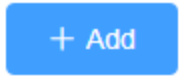
Assigning device licenses

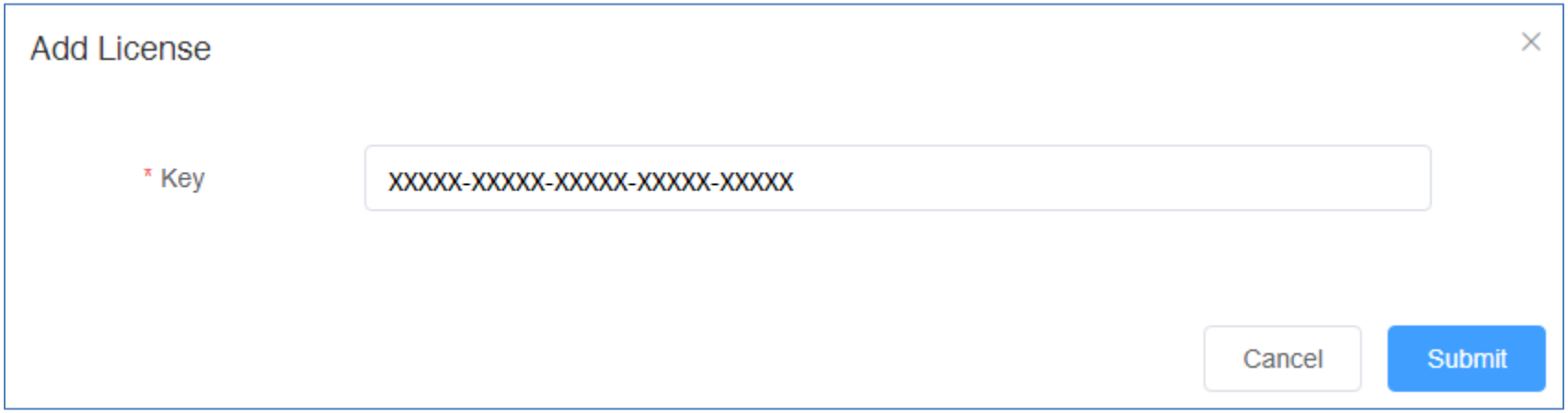
Note: *Devices require an active license subscription in order to use with the Hive Management System.*

After you have purchased a license subscription, you will sent a digital license key depending on the subscription purchased.
After receiving the license key, the key must be added to your Hive account to assign device licenses.

To add purchase a new license key to your account, in the Hive Management portal, click on **License** and **Add License** in the left navigation menu.
Click **Add** to add a new license key.



In the Add License window, enter your license key in the Key field provided and click **Submit**.



After you have entered in your license key, the new device licenses will appear in the License List (depending on the license susbscription purchased).

#	Key	Type	Valid time	Status	Device	Start Time	End Time	Create Time
1	XXXXX-XXXXX-XXXXX-XXXXX-XXXXX	Switch	1095 Day(s)	Unused	-	-	-	2021-01-15 14:18:42
2	XXXXX-XXXXX-XXXXX-XXXXX-XXXXX	Switch	1095 Day(s)	Unused	-	-	-	2021-01-15 14:18:42
3	XXXXX-XXXXX-XXXXX-XXXXX-XXXXX	Switch	1095 Day(s)	Unused	-	-	-	2021-01-15 14:18:42

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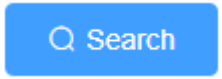
- **Key –** Displays the device license key.
- **Type –** Displays the device type.
- **Valid time –** Displays the active duration of the device license.
- **Device** - If the device license is already assigned to a device, displays the alias name of the device.
- **Start Time –** Displays the time and date the device license was activated and assigned to a device.
- **End Time –** Displays the time and date the device license will expire after being assigned to a device.

Note: *In the license list, you can search licenses by device type and license status filter fields at top of the page. Click* ***Search*** 

after you have selected to filters.

To assign an available device subscription license to a devic, in the left navigation menu, click on **Devices** and click on **Device List.**

In the top left drop-down list, select **Unused** to view a list of devices that have not been assigned to tenants.

Note: *The drop-down list will also allow you to select and view tenants which will display a list of devices assigned only to the selected tenant. If you already assigned the device to a tenant, click the drop-down list and select the tenant the unlicensed device was assigned.*

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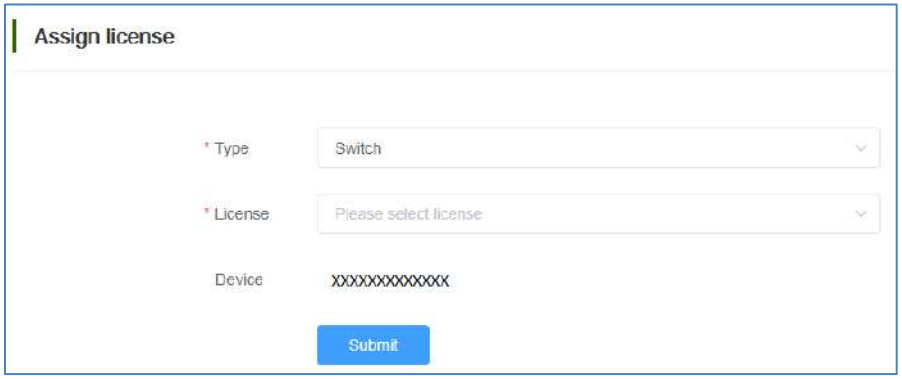
In the list of devices under **Authorize Status,** unlicensed devices will have an **Assign** button. Click on **Assign** to assign a device license to the device.

Switch

#	Status	Authorize Status	Model	MAC	Alias	SN	FW Version	Operation
1		Authorized	TEG-082WS	XX-XX-XX-XX-XX-XX	XXXXXXXXXXXX	XXXXXXXXXXXX	3.01.007	Please sel
2		Authorized	TPE-1620WS	XX-XX-XX-XX-XX-XX	XXXXXXXXXXXX	XXXXXXXXXXXX	3.01.007	Please sel
3		Unauthority Assign	TPE-082WS	XX-XX-XX-XX-XX-XX	XXXXXXXXXXXX	XXXXXXXXXXXX	3.01.007	Please sel

- **Authorize Status**
  - Unauthority Assign

    This indicates that the device does not have an active license subscription assigned. Click **Assign** to assign a valid license key to activate the device subscription.
    Note: *Devices require an active license subscription in order to use with the Hive Management System.*



  - Authorized

    This indicates that the device has a valid active license subscription assigned and is authorized for use with your Hive account.

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Manage devices in your Hive account

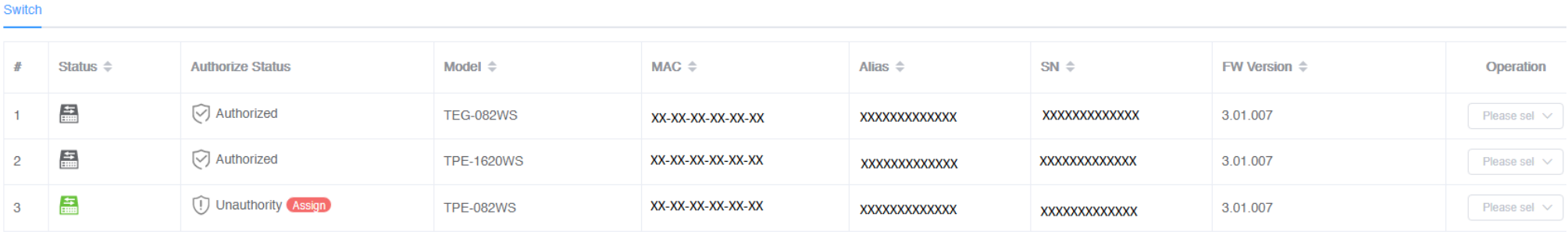
After you have registered your device with your Hive account, the device will be available in your Hive account management portal.

To view newly registered devices in your Hive management portal, in the left navigation menu, click on **Devices** and click on **Device List.**

In the top left drop-down list, select **Unused** to view a list of devices that have not been assigned to tenants.

Note: *The drop-down list will also allow you to select and view tenants which will display a list of devices assigned only to the selected tenant.*

The *Unused* list will display a list of available devices and device information.



- **Status**
  -
    This icon will indicate that the device is registered to the Hive account but is currently offline.
    Note: *Devices that are offline can be assigned to a tenant but cannot be managed, monitoring, or configured. Please ensure that the device has the correct IP address, gateway, DNS configuration, and there are no issues preventing the device from reaching the Internet at the installed location. Additionally, you have configured the cloud settings in the device management page and registering your device with your Hive user credentials.*

  - This icon will indicate that the device is registered to the Hive account and is currently online.

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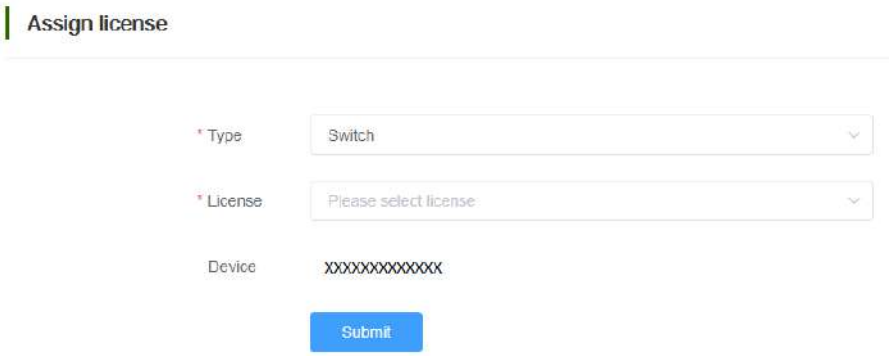
- **Authorize Status**

  - **Unauthority**
    This indicates that the device does not have an active license subscription assigned. Click **Assign** to assign a valid license key to activate the device subscription.
    Note: *Devices require an active license subscription in order to use with the Hive Management System.*



  - **Authorize**
    This indicates that the device has a valid active license subscription assigned and is authorized for use with your Hive account.

  - **Authorize Expired**
    The authorize status will be displayed as Authorized if the device has been assigned a device key previously from an inactive/expired device license subscription trial or purchase.

- **Model –** Displays the device model number.
- **MAC –** Displays the device MAC address.
- **Alias –** Displays the device name or label and is customizable. By default, the serial number (SN) is assigned to all devices as the Alias. Click the entry to modify the device alias, then click **OK**. ***Note:*** *It is recommended to change the device alias so that the device is easily identifiable in the Hive management system.*

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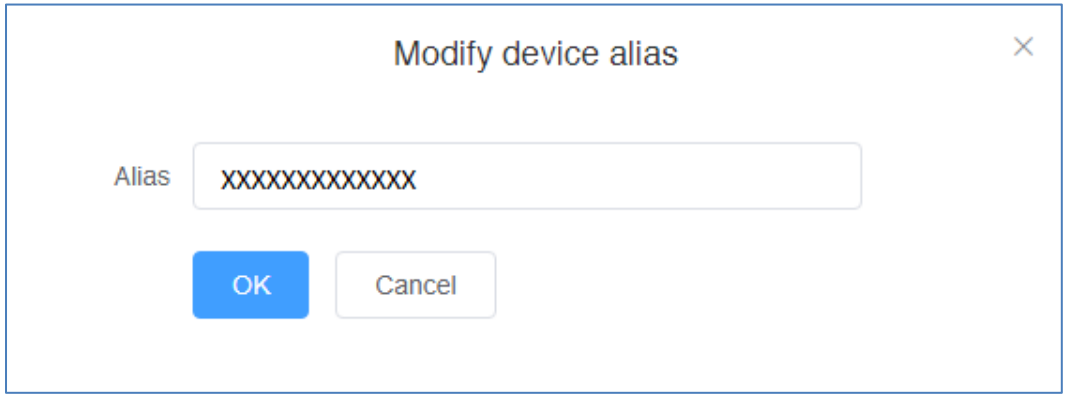
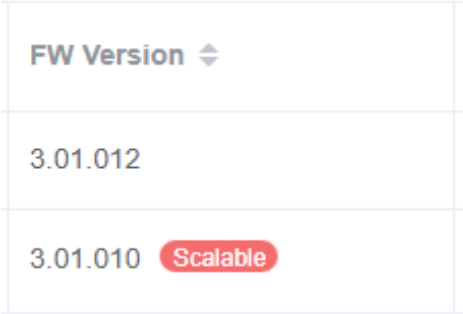
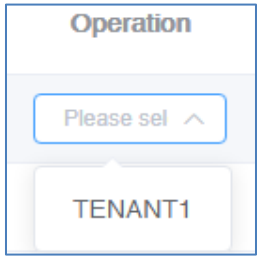


- **SN –** Displays the device serial number.
- **FW Version –** Displays the device firmware version.
  Note: *If Scalable is displayed in the FW version section, this indicates that there is a firmware upgrade available for the device. The device must be assigned to tenant and assigned a valid license first before the firmware can be upgraded. After the device is assigned to a tenant, click on Scalable to upgrade the device firmware.*



- **Operation –** Click the drop-down list to select which tenant you would like to assign the device.



Note: *You can also assign a device to tenant under Dashboard and under Operation, click the edit button* to select which devices to assign to the tenant.

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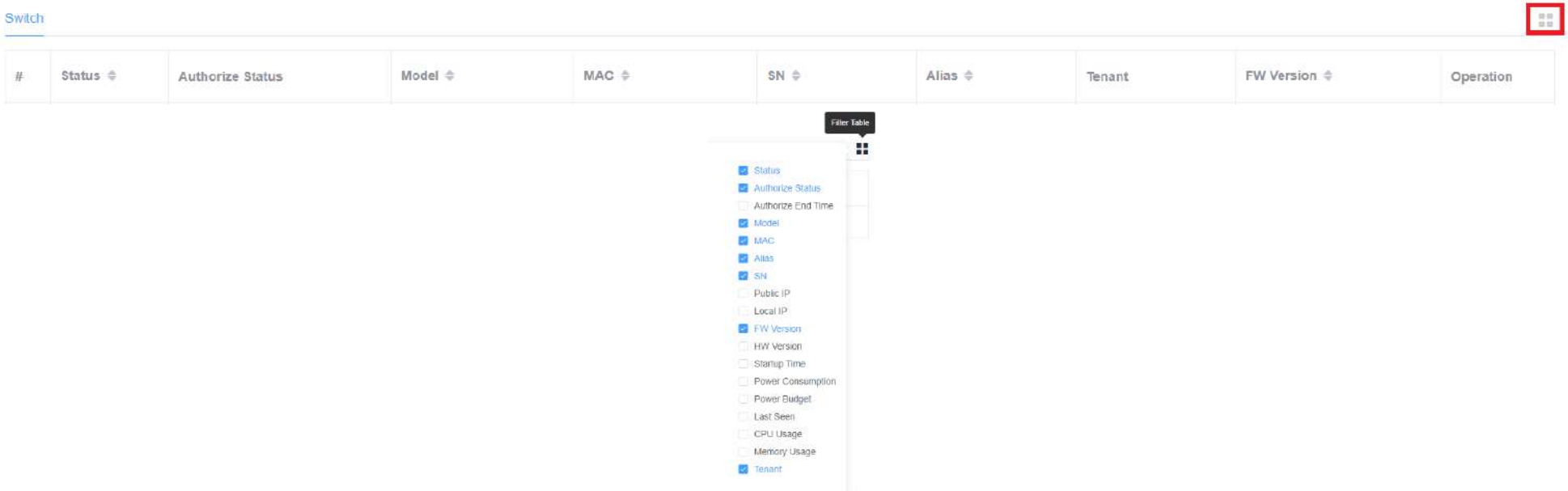
Additional Device Display Information

At the right side of the table, click the Filter Table button to select additional information to display.



- **Authorize End Time –** Displays the time and date when the device license subscription will expire.
- **Public IP –** Displays the public or Internet IP address of the device network location or installation site.
- **Local IP –** Displays the local or private IP address the device is currently assigned in its network location or installation site.
- **HW Version –** Displays the hardware version of the device.
- **Startup Time –** Displays the device status uptime running continuously without reboot.
- **Power Consumption** – Displays the power consumption of the device.
- **Power Budget (Applies to PSE PoE devices only) –** Displays the maximum PoE power budget available on the device.
- **Last Seen –** If the device is currently powered on and connected to Hive, **Online** will be displayed. If the device is currently offline, this field will display the most recent date and time the device was connected to Hive and online.
- **CPU Usage –** Displays the device's current CPU resource utilization by percentage (max. 100%)
- **Memory Usage –** Displays the device's current memory (RAM) utilization by perce (max. 100%)

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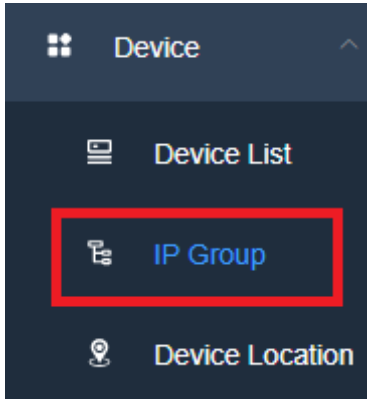
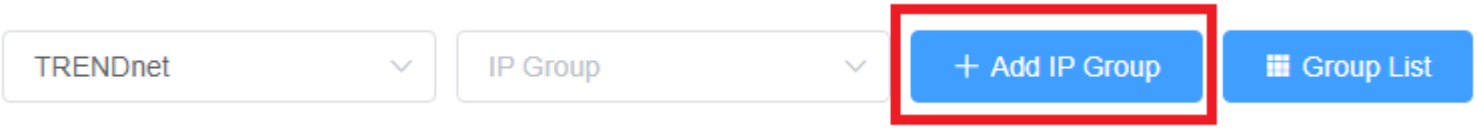
Create IP Groups

IP groups can be created under each tentant by IPv4 address range or subnet. This can better organize and simplify device provisioning if a tenant, company, or organization has multiple locations with different IP subnet. Example: TENANT - TRENDnet, IP Group 1 - HQ, IP Group -2 Branch Office 1, Branch Office 2

1. In the left navigation menu, click **Device** and click **IP Group.**



2. At the top, click **Add IP Group**.



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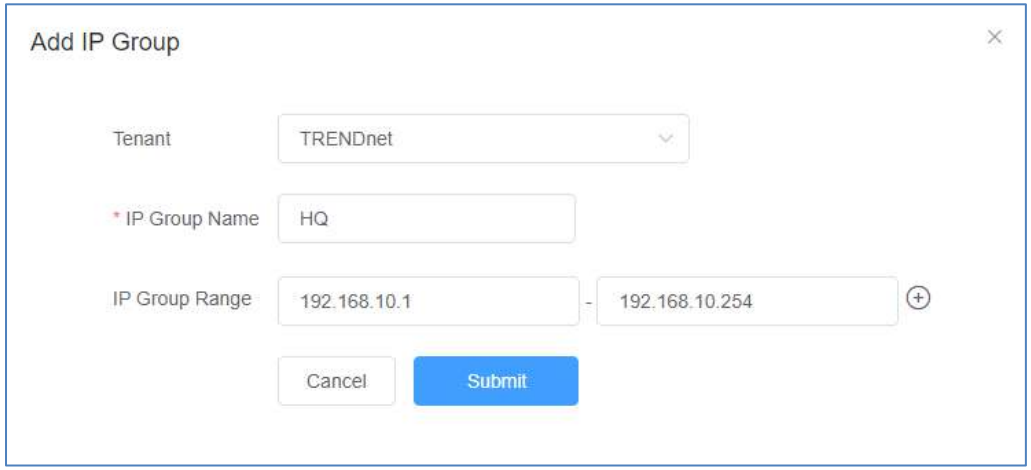
3. In the Add IP Group page, review the settings below to create the IP group and click **Submit** when completed.

- **Tenant –** Click the drop-down list to select which Tenant to create the IP group.
- **IP Group Name –** Enter the name of the IP group. (Example: HQ, Branch Office 1)
- **IP Group Range –** Enter the IPv4 address range for the group. (Example: 192.168.10.1 – 192.168.10.254)

Note: *You can clck the ⊕ add button to add additional IPv4 address ranges to the IP group. Please note each IP group must use a different IPv4 subnet.*



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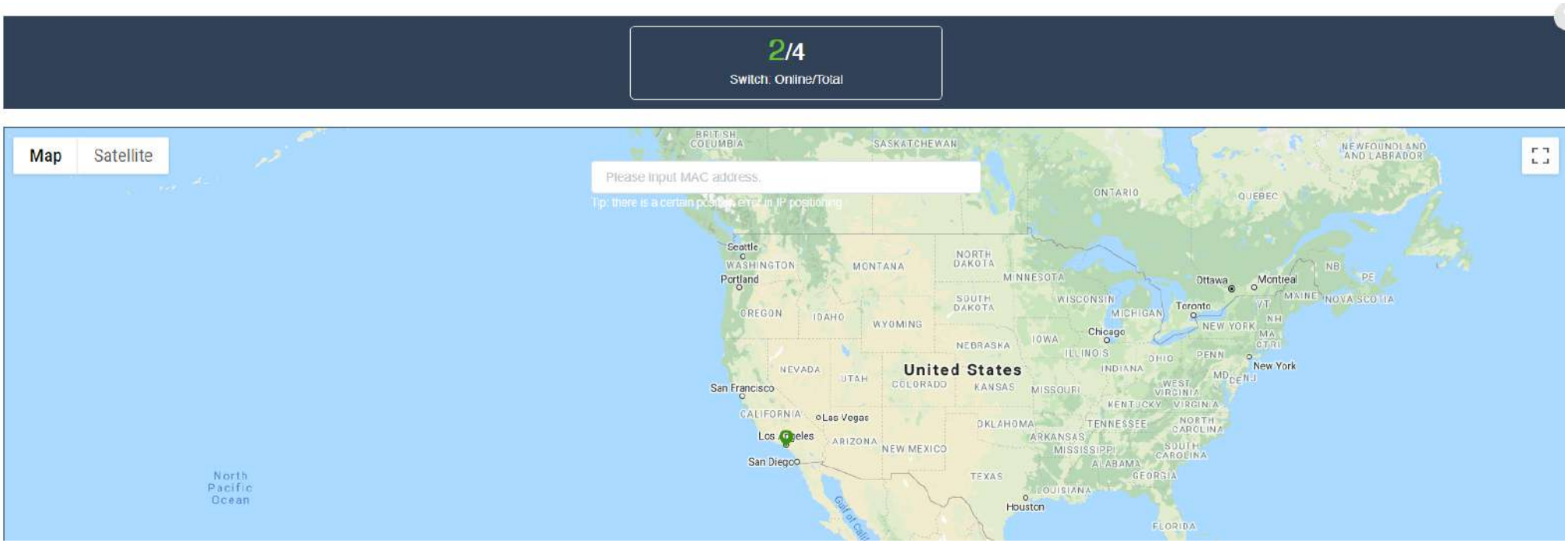
View Device Location (Available only in Hive Pro)

To view the locations of registered devices in your Hive management portal, in the left navigation menu, click on **Devices** and click on **Device Location.** You can also view the location of specific device by entering the device MAC address. (Format: XX-XX-XX-XX-XX-XX or XX:XX:XX:XX:XX:XX)



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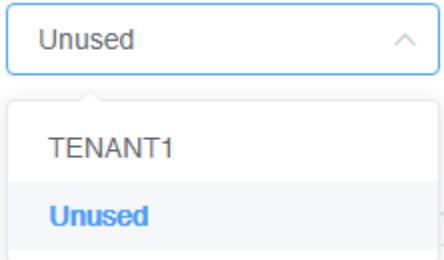
Configure devices in your Hive account

After you have assigned your devices to a tenant, you can apply configuration settings to your devices in your Hive management portal in the left navigation menu, click on **Devices** and click on **Device List.**

In the top left drop-down list and select the tenant to display the list of assigned devices.

In the example below, TENANT1 has been created and will be selected for this example.



Under TENANT1, the assigned device (TRENDnet Web Smart Switch Model TEG-082WS) will be displayed with the device information.

Switch

#	Status	Authorize Status	Model	MAC	SN	Alias	Tenant	FW Version	Operation
1		Authorized	TPE-082WS	XX-XX-XX-XX-XX-XX	XXXXXXXXXXXXX	TPE-082WSv1	TRENDnet	3.01.012	

To apply configuration settings to the device (TPE-082WS), under the **Operation** section, click the edit button

Note: *To remove the assigned deivce from the tenant, click the trash button* .

Additional device information can be displayed by clicking the filter table icon at the top right of the table.

Filters: Status, Authorize End Time (Device License Expiration), Model, MAC, Alias, SN, Public IP, Local IP, FW (Firmware) Version, HW (Hardware) Version, Startup Time, Power Consumption, Power Budget, Last Seen, CPU Usage, Memory Usage.

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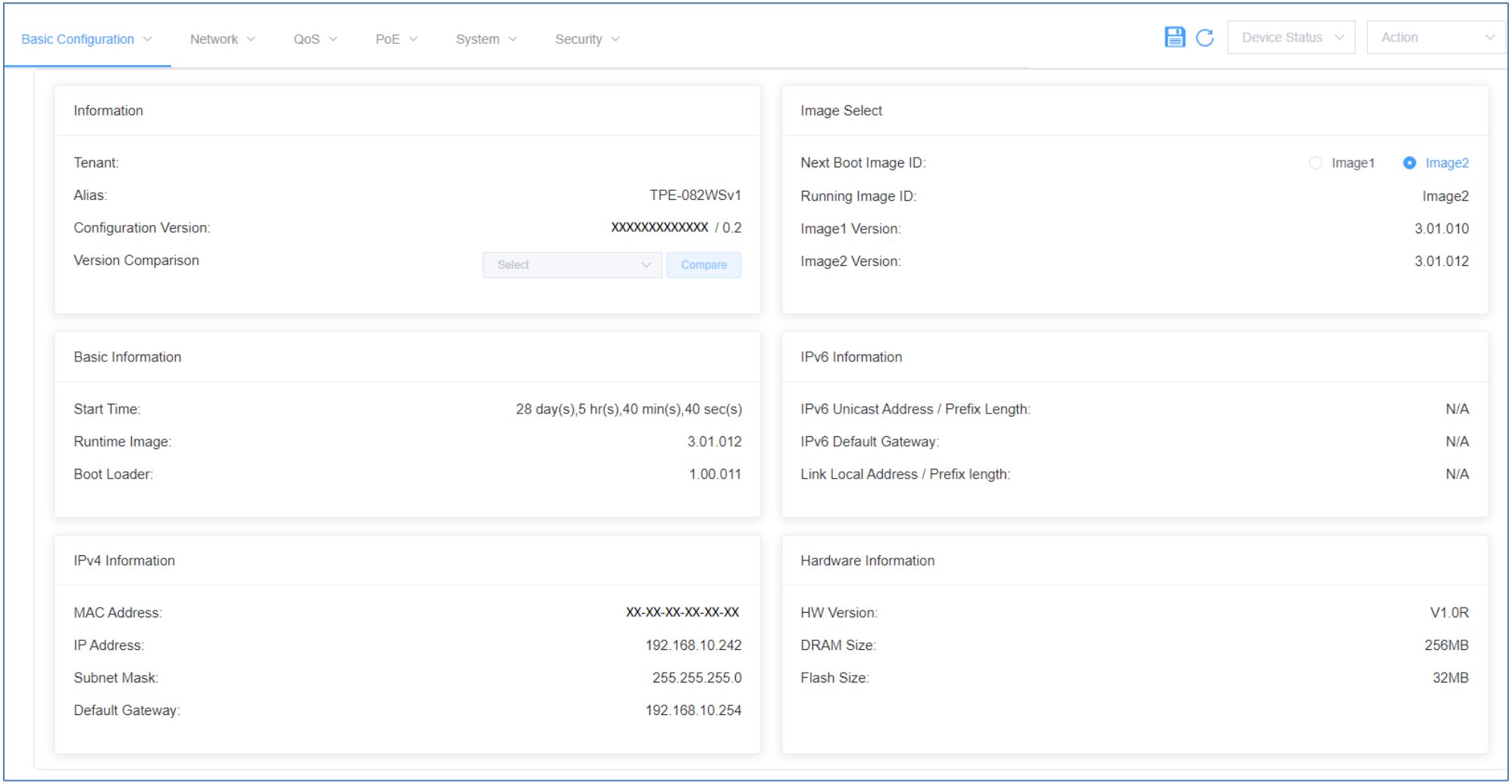
The available device configuration settings will be displayed.

Note: *Please refer to the device User Guide for additional information on the device configuration settings.*

- Displayed below are example configuration pages from TRENDnet Web Smart Switch Model TPE-082WS
- To apply configuration changes for Hive supported Web Smart Switches, modify the device configuration settings and click **Submit.**
- The Version Comparison function for Hive supported Web Smart Switches, will allow you to compare the current switch configuration with new configuration file created in the Hive management system for provisioning.



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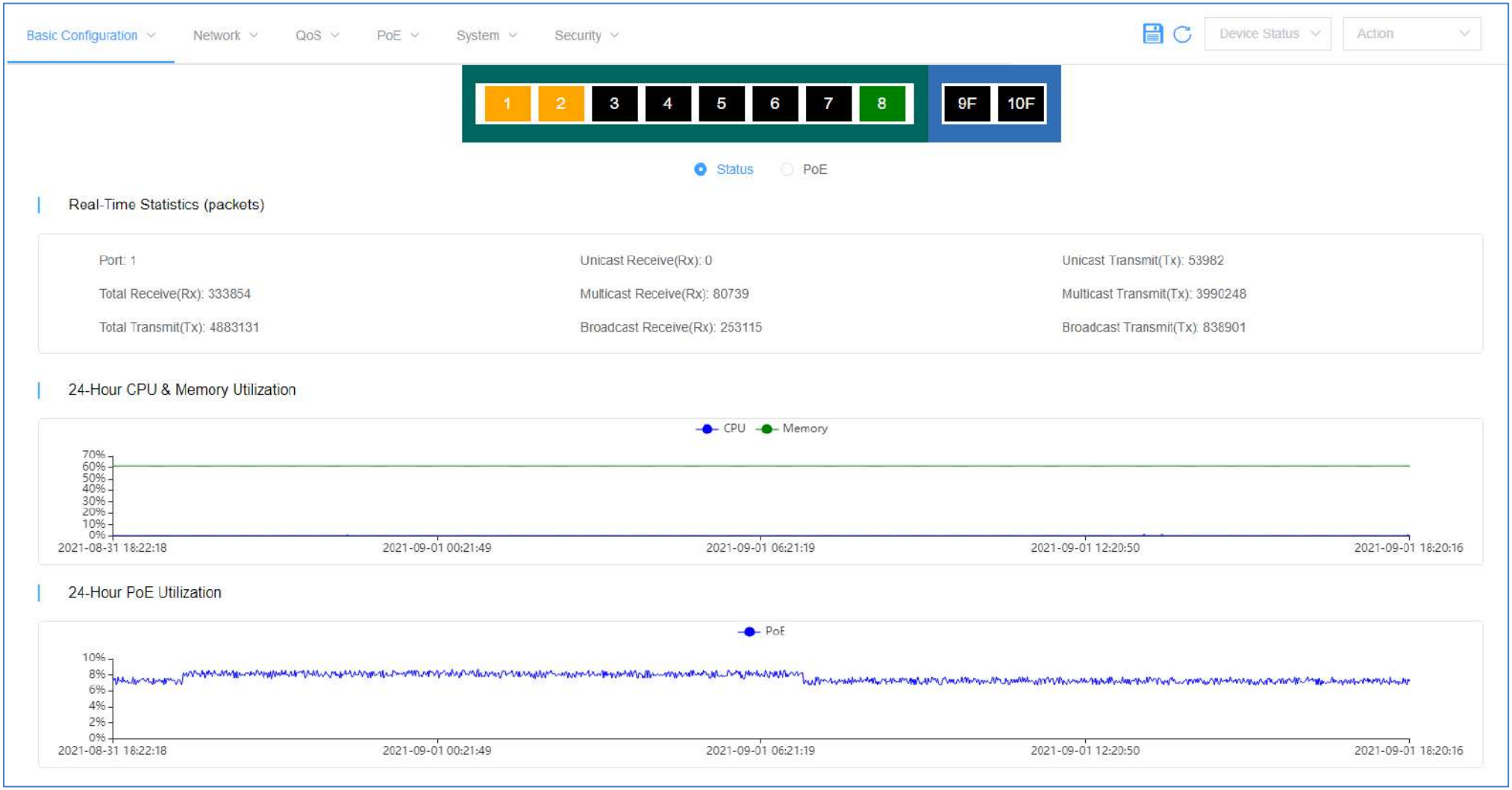

To view newly registered devices in your Hive management portal, in the left navigation menu, click on **Devices** and click on **Device List.**

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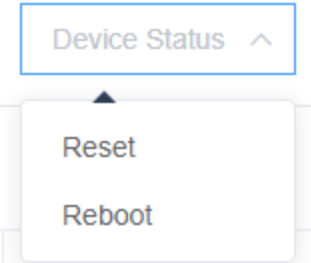
In the top right section of the device configuration page, please reference the functions below.

- - Permanently commits and saves configuration to device.
- - Refreshes the device configuration page.

- **Device Status**
  - Reset - Resets the device to factory settings default except for IP address, default gateway, DNS, and cloud registration settings.
  - Reboot – Reboots / power cycles the device.



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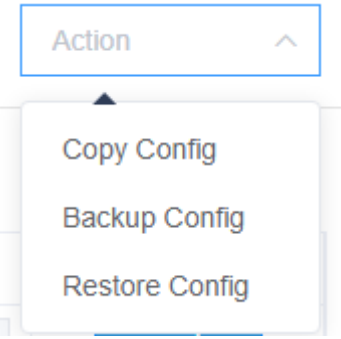
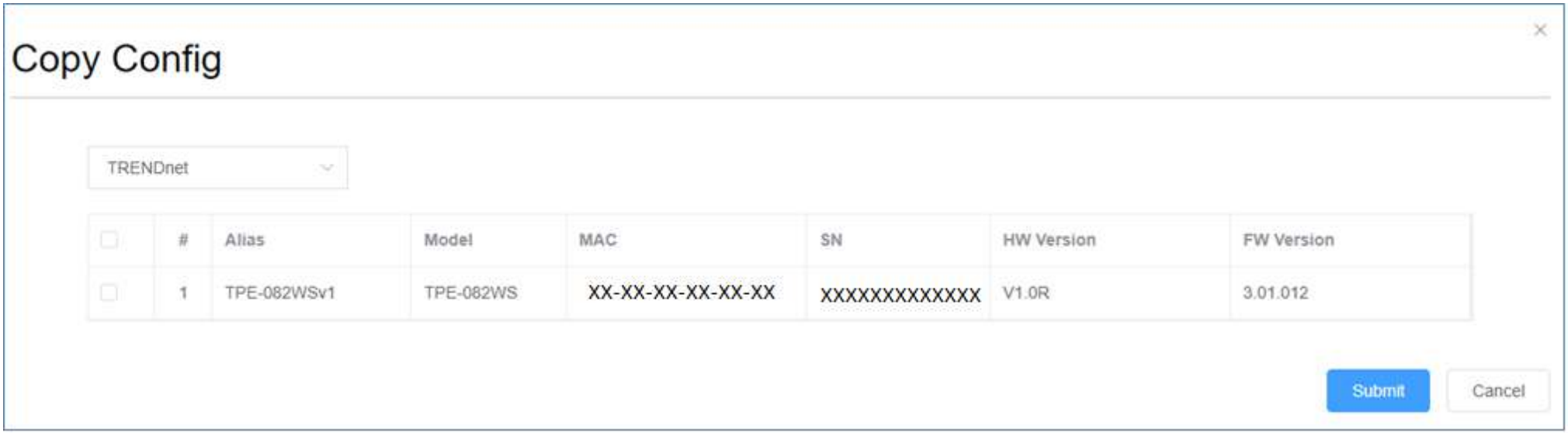
- **Action**
  Note: *The configuration backed up or copied from a device can only restored to the same model device. Configuration files that are backed up from devices to Hive cloud cannot be edited. Customizable configuration files must be created under the Configuration > Create section.*



- **Copy Config** – Backup configuration file from the device to Hive cloud and copies configuration to target device.
  To copy configuration from a device and restored another device of the same model, click **Action** and then click **Copy Config**.
  In the Copy Config window, click the drop-down to select the Tenant of the destination device you would like to copy over the configuration.
  Check the device to copy over the configuration and click **Submit.**



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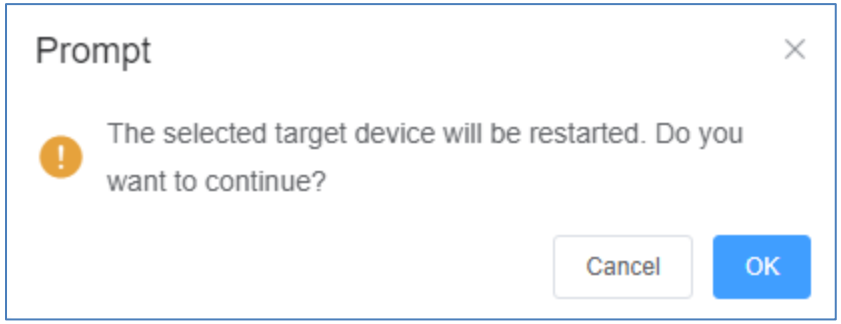
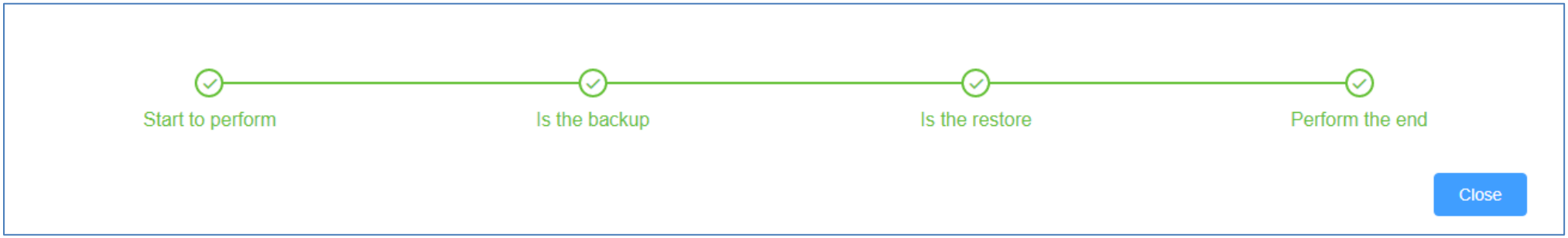
Click **OK** at the prompt to message indicating that the target device will be restarted or rebooted to restore configuration.



After the operation is completed, click **Close.**

Note: *Please wait for the operation waiting to complete before navigating to another section, otherwise, the operation may fail.*



You can verify that the device configuration was backed up to the Hive cloud under **Configuration > Backup**.

Name	Operator	Tenant	Model	Create Time
TPE-082WSv1-cfg1	XXXXXXXXXX	TRENDnet	TPE-082WS	2021-09-02 18:12:15
SNXXXXXXXXXX #0851	XXXXXXXXXXX	TRENDnet	TPE-082WS	2021-09-02 18:01:16

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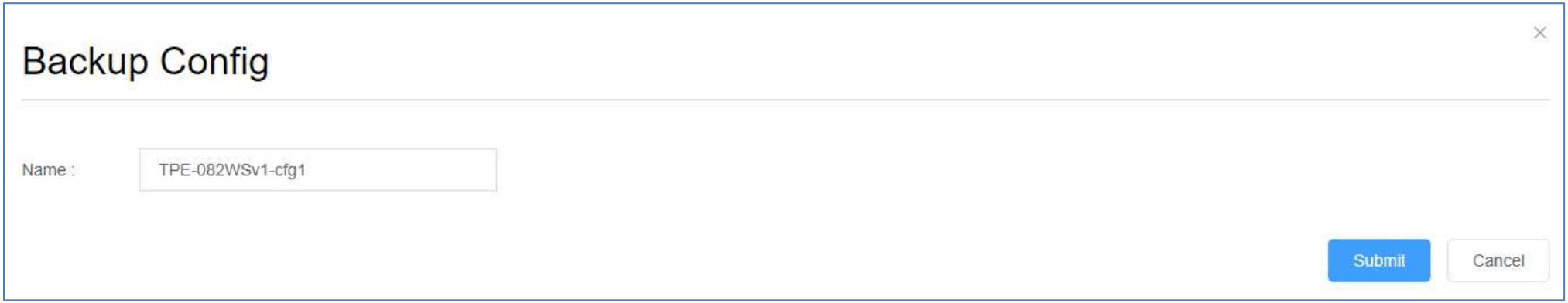
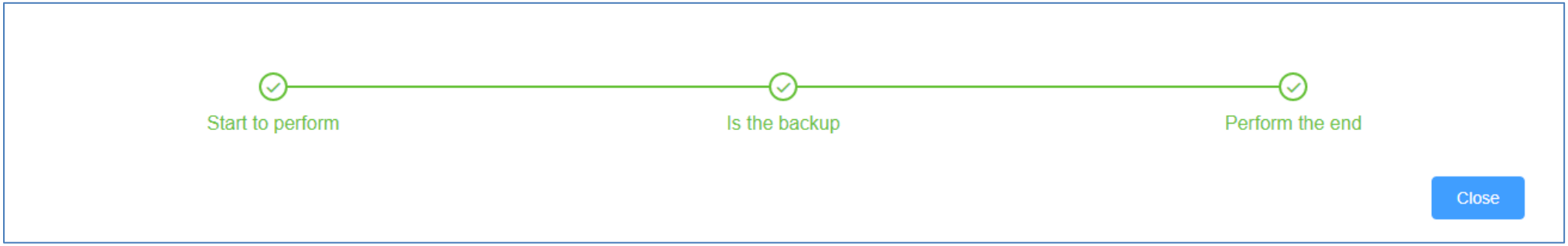
- **Backup Config** – Backup configuration file from the device to Hive cloud.
  To backup configuration from a device and save to Hive cloud to be restored later, click **Action** and then click **Backup Config**.
  In the Backup Config window, enter a name for the configuration file and click **Submit.**



After the operation is completed, click **Close.**

Note: *Please wait for the operation waiting to complete before navigating to another section, otherwise, the operation may fail.*



You can verify that the device configuration was backed up to the Hive cloud under **Configuration > Backup**.

	Name	Operator	Tenant	Model	Create Time
	TPE-082WSv1-cfg1	XXXXXXXXXX	TRENDnet	TPE-082WS	2021-09-02 18:12:15
	SNXXXXXXXXXX#0851	XXXXXXXXXX	TRENDnet	TPE-082WS	2021-09-02 18:01:16

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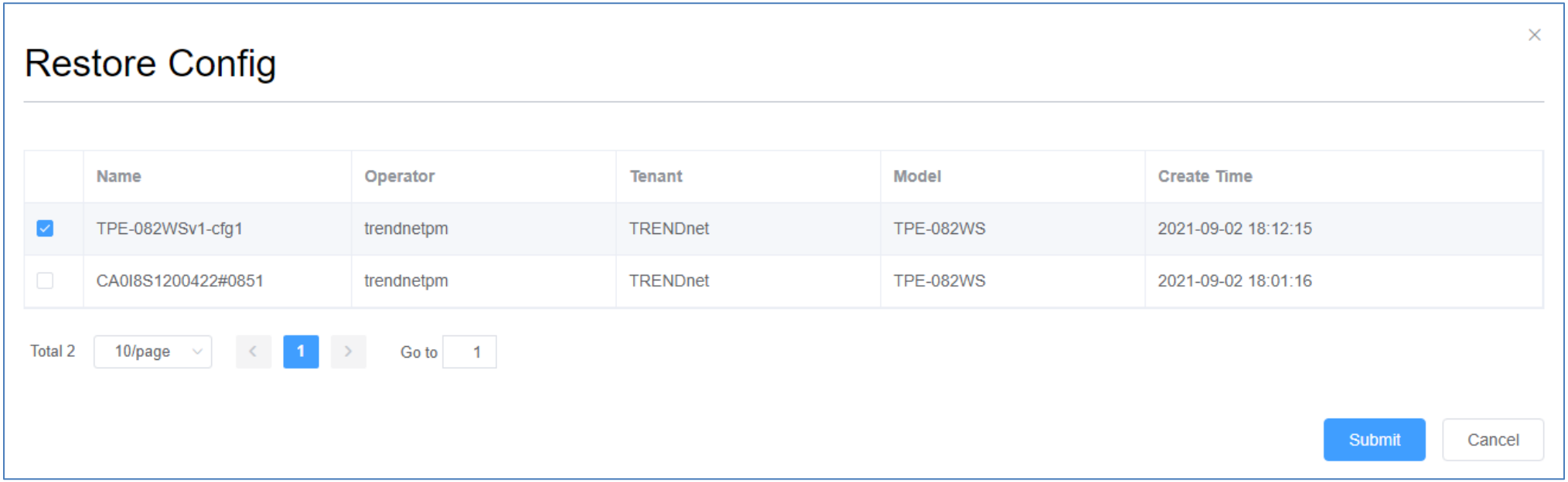
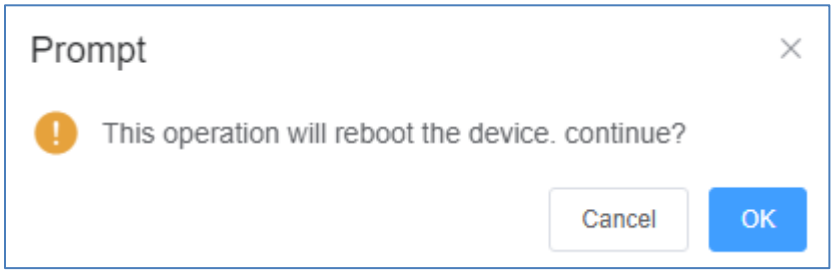
- **Restore Config** – Restores configuration to target device from a previously backed up configuration on the Hive Cloud.
  To restore configuration to a target device, click **Action** and then click **Restore Config**.
  In the Restore Config window, check the previously backed up configuration file to restore and click **Submit.**



Click **OK** at the prompt to message indicating that the target device will be restarted or rebooted to restore configuration.



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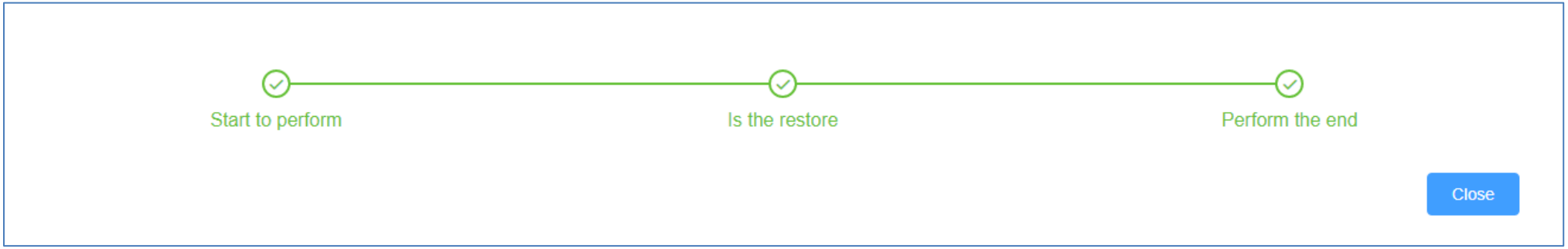
After the operation is completed, click **Close.**

Note: *Please wait for the operation waiting to complete before navigating to another section, otherwise, the operation may fail.*



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Provision devices in your Hive account

Devices in Hive can be provisioned through configuration and firmware upgrades.

Configuration Provisioning

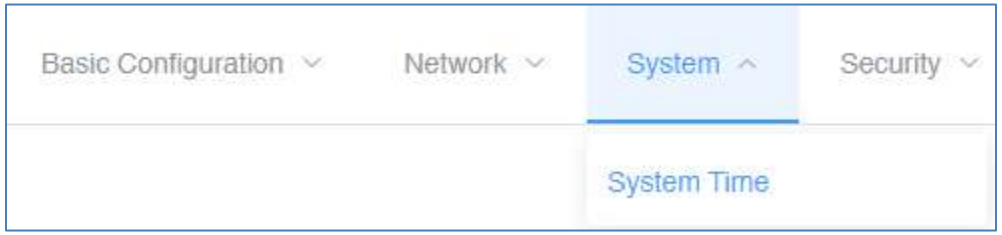
To provision device configuration, configuration files must first be created in the Hive Management System. Batch configuration provisioning tasks can only be deployed for single TRENDnet device model. (Example: Multiple TRENDnet TEG-082WS or multiple TPE-082WS switches but not both models for a single provisioning task.)

To create a new configuration file, in the left navigation menu, click on **Configuration** and click on **Create**.

In the top left, click the drop-down list to select the type of device to create a new configuration file and click **Add**.

In the example below, we will create a new configuration file for the TEG-082WS.

For the new configuration file, first configure the SNTP/Time Settings under **System > System Time**.



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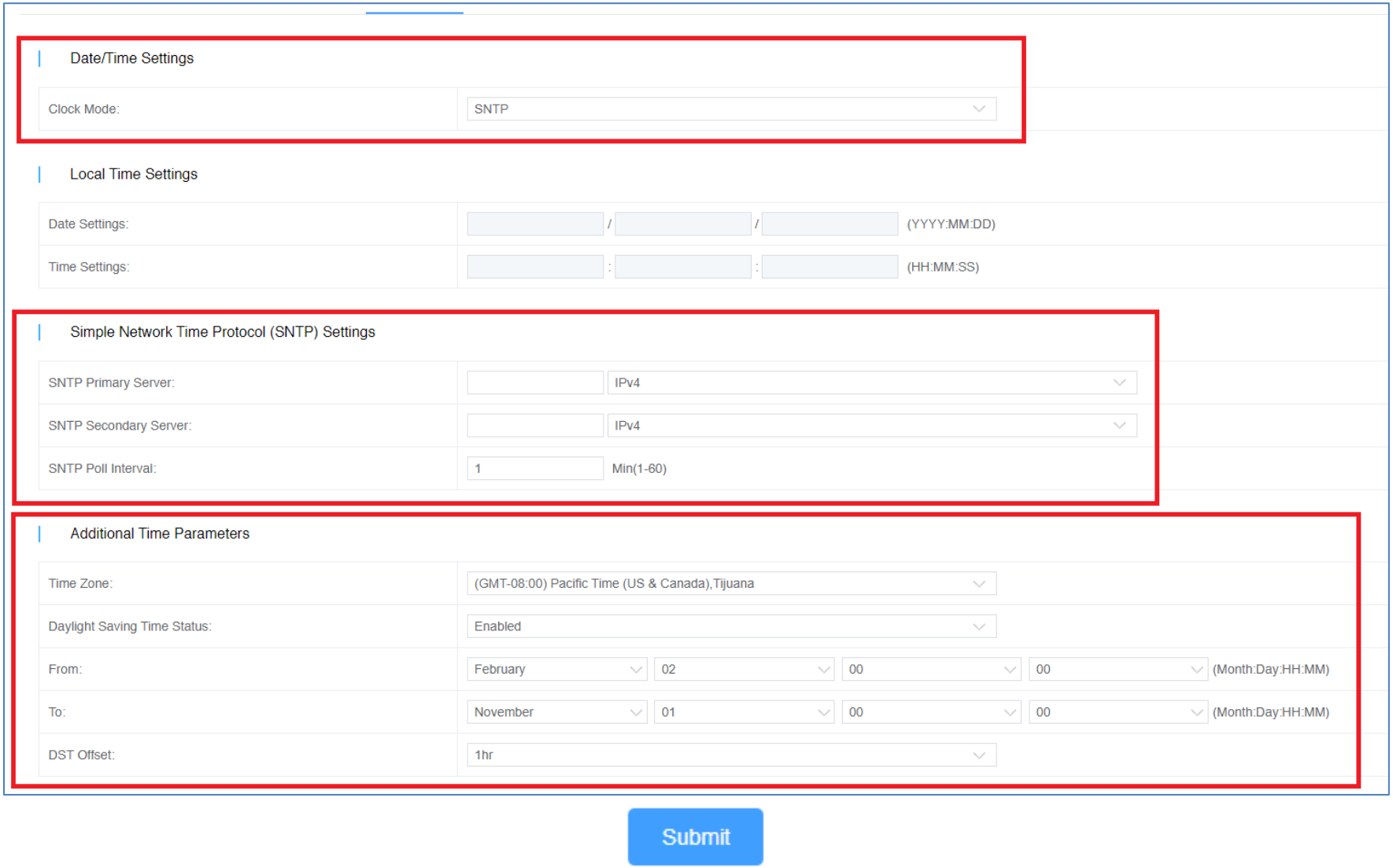
If configuring SNTP, under **Date/Time Settings**, click the **Clock Mode** drop-down list and select **SNTP.**

In the **Simple Network Time Protocol (SNTP) Settings**, enter the **SNTP Primary Server, SNTP Secondary Server** as an IPv4 address, IPv6 address, or Domain Name and in top right. In the **Additional Time Parameters** section, click the **Time Zone** drop-down list and select the correct Time Zone and enable and configure your daylight savings time, if any, then click **Submit**.



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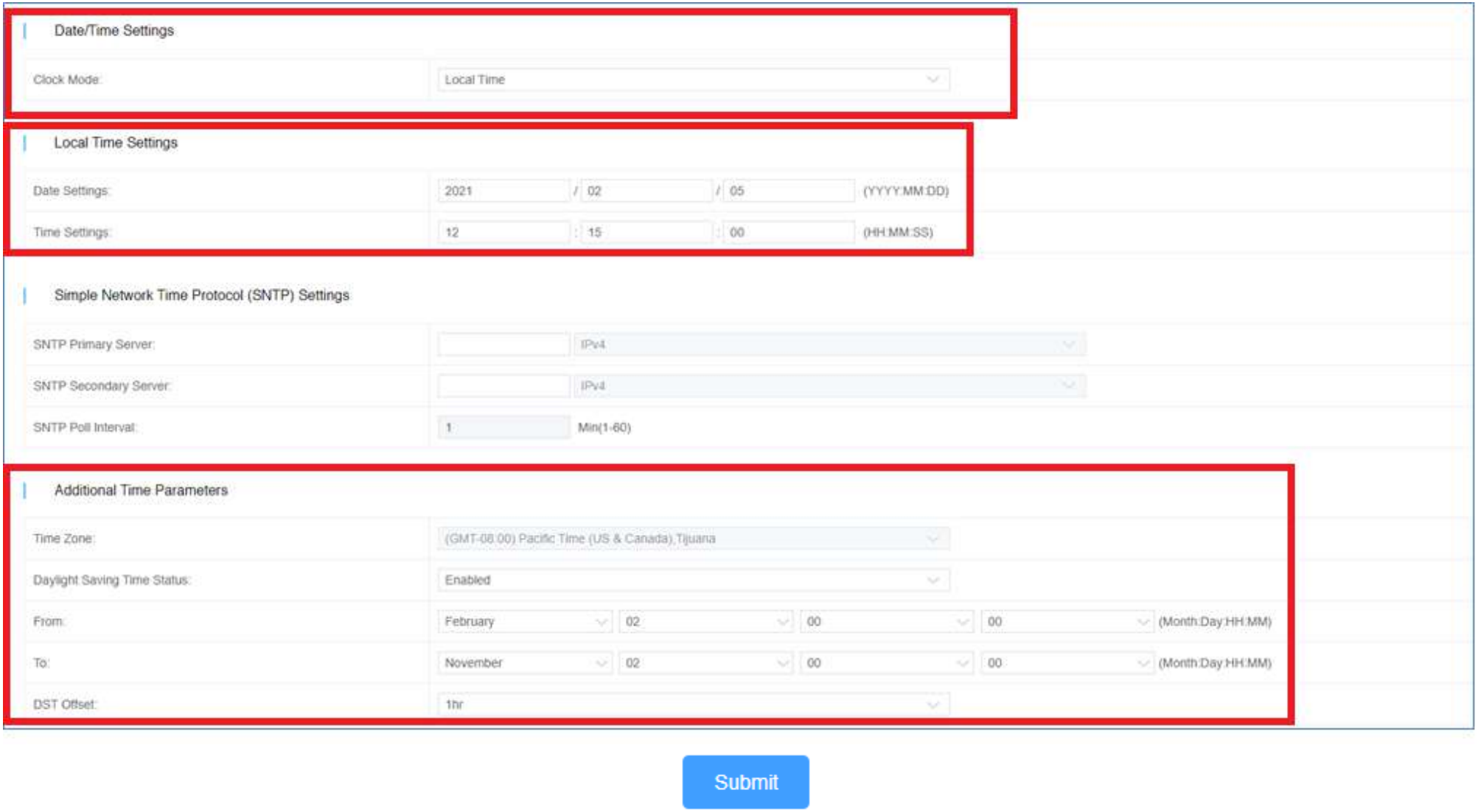
If configuring Local Time Settings, under **Date/Time Settings**, click the **Clock Mode** drop-down list and select **Local Time.**

In the **Local Time Settings**, enter the **Date Settings** and **Time Settings.** click **Submit**.

In the **Additional Time Parameters** section, click the **Time Zone** drop-down list and select the correct Time Zone and enable and configure your daylight savings time, if any, then click **Submit**.



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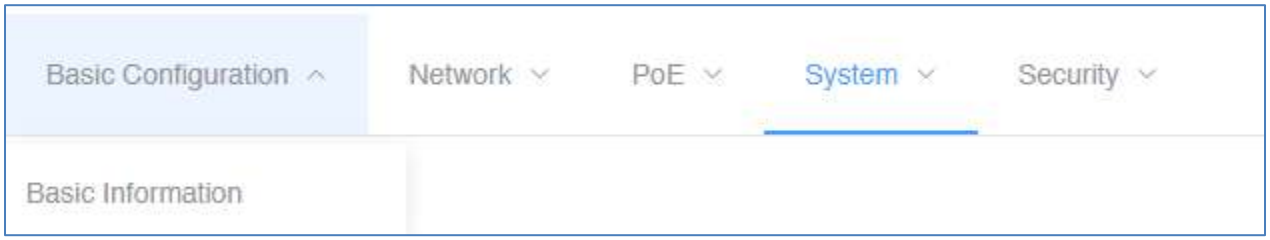
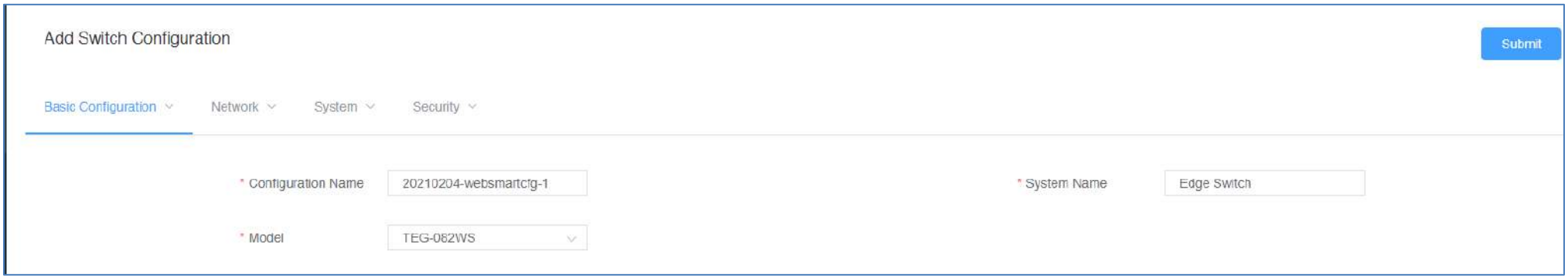
After you have configured and saved the time and date settings for the configuration file, you can more configuration changes to the configuration file.

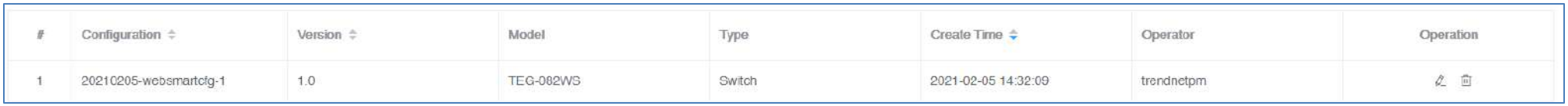
After applying all configuration changes for the new configuration file, in the **Basic Configuration** tab, select **Basic Information.**

Note: *For each configuration change, please make sure to click* ***Submit*** *in the top right after configuration settings have been modified.*



Enter a **Configuration Name**, a **System Name**, and click the **Model** drop-down list to select the TRENDnet device model. In the top right, click **Submit** to save the new configuration file.**.**





#	Configuration	Version	Model	Type	Create Time	Operator	Operation
1	20210205-websmartcfg-1	1.0	TEG-082WS	Switch	2021-02-05 14:32:09	trendnetpm	

Clicking the edit button will allow you to modify the configuration file.

Clicking the delete button will delete the configuration file.

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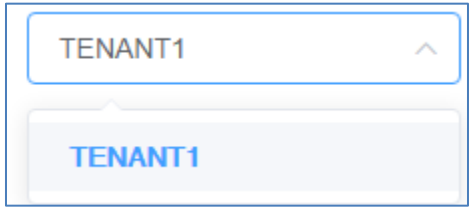
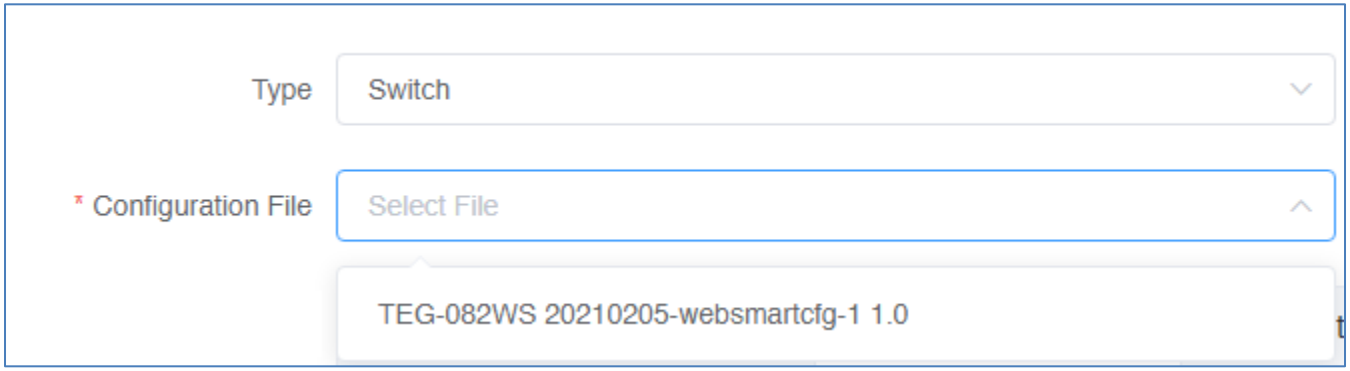
To provision devices with a new configuration file, click on **Configuration** and click on **Provision**.

In the top left drop-down list, select the tenant.



Click the **Type** drop-down list and select the device type. The click the **Configuration File** drop-down list to select the configuration file.



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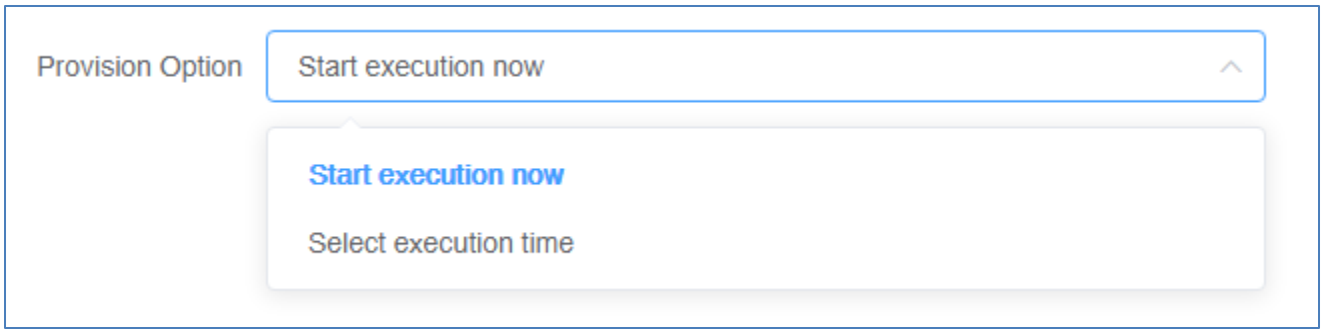
After the configuration file is selected, the applicable online devices for the selected configuration file will appear in the **Device/Online Device List**.

Check the devices you would like to provision, and click to move the devices to the selected list.

Click the **Provision Option** drop-down list to select when to provision selected devices with the configuration file. After you have selected this desired option, click **Submit.**

- **Start execution now –** Selecting this option will execute the task immediately.



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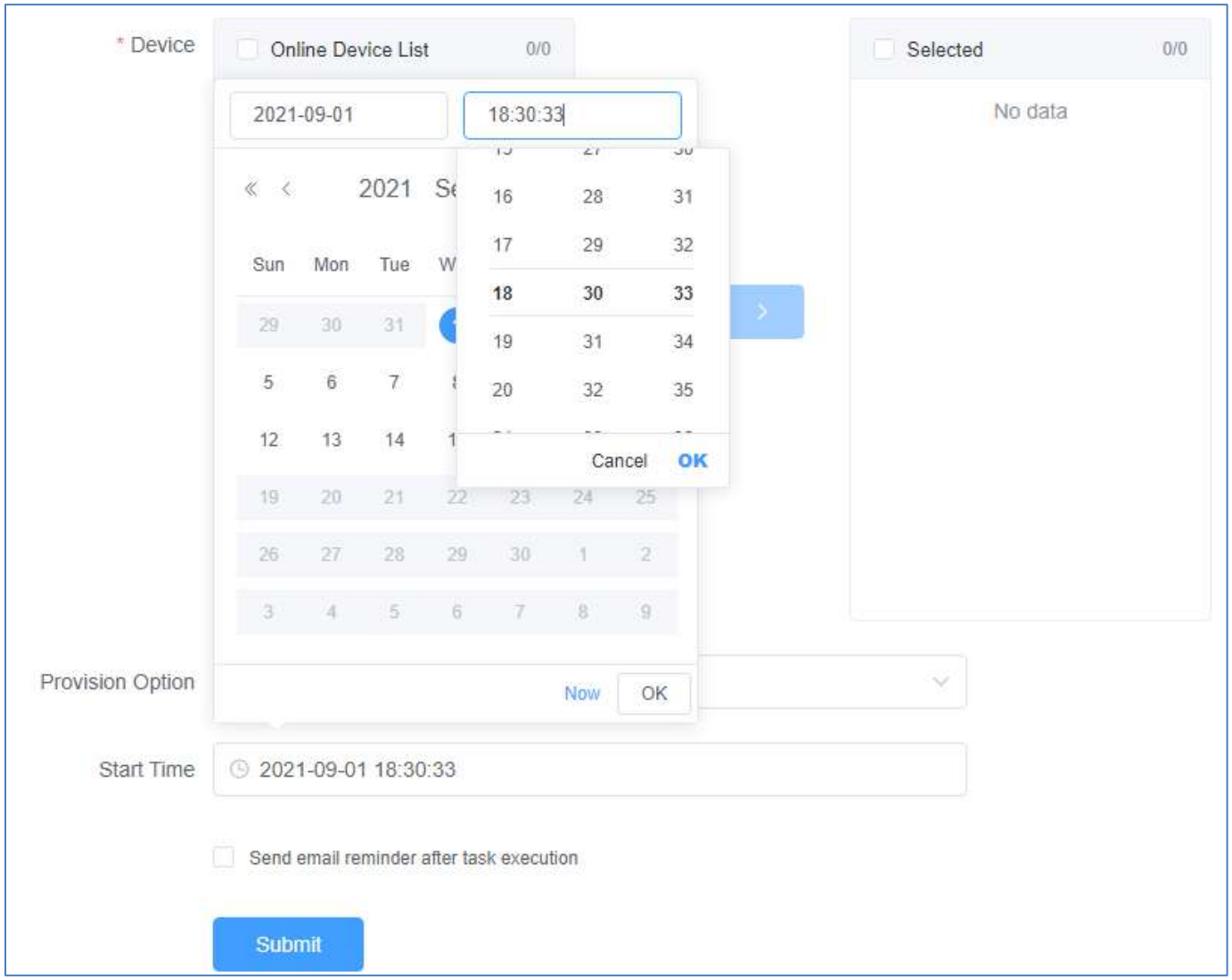
- **Select execution time –** Selecting this option will allow you to schedule a future date and time when to execute this task. Configure the date and time schedule when to execute this task and click **OK**.
  Note: *If scheduling this task, checking the option to Send email reminder after task execution will send an email notification.*



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After creating a scheduled configuration task, the task will be listed under **Configuration** > **Schedule** from the left navigation menu.

#	Configuration	Operator	Version	Create Time	Execution Time	Task Status	Operation
1	20210205-websmartcfg-1	XXXXXXXX	1.0	2021-02-05 14:49:58	2021-02-05 15:00:00	Waiting	

- **Configuration** – Displays the configuration file name.
- **Operator** – Displays the user that created the task.
- **Version -** Displays the configuration file version.
  Note: *If the original configuration file is modified under Configuration > Create section, a new version of the configuration file is created and the system will automatically update the version number. (Example: 1.0, 2.0, 3.0, etc)*
- **Create Time –** Displays the date and time the scheduled task was created.
- **Execution Time** - Displays the date and time the task is scheduled to be executed.
- **Task Status** – Displays the current task status.
  - **Waiting –** Indicates that the scheduled task is pending to be carried out until the scheduled/Execution time is reached.
  - **Execution –** Indicates that the scheduled task has already been completed.
- **Operation**

  See task detail.

  Cancel the task.

  After a task is cancelled before the schedule date and time, you can restore or restart the task.

  After tasks are executed, click this button to view more detail.

After configuration tasks have been executed, you can check the status details under **Configuration > Record** and in the **Details** column, click to view more information.

Status List

#	Alias	MAC	Update Time	Status
1	TEG-082WSv2	XX-XX-XX-XX-XX-XX	2021-02-05 17:30:19	Configuration Upgrade Success

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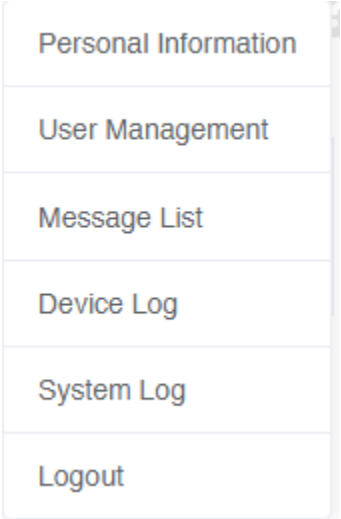
Firmware Provisioning

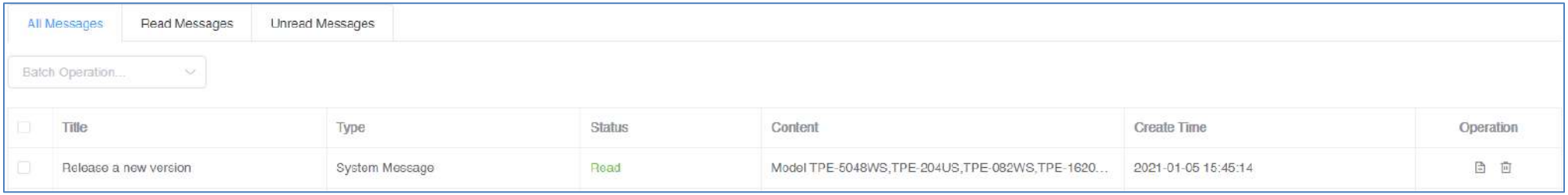
Standard device firmware will be released by TRENDnet periodically and be available within the Hive Management System for provisioning and can be found under the **Firmware > Information** section from the left navigation menu. You can check the current firmware version of devices under **Devices > Devices List**.

Note: *Only Hive compatible device firmware releases will be available on the Hive Management System. For previous firmware releases, please download from our website https://trendnet.com/support*

A system message will be sent out to your Hive account when a new firmware is released. An indicator will appear in the top right menu above the Account/Logging button.

Mouse over the Account/Logging button to view the sub menu and click Message List to view system messages.





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To view the available device firmware releases, in the left navigation click on **Firmware** and click on **Information.**

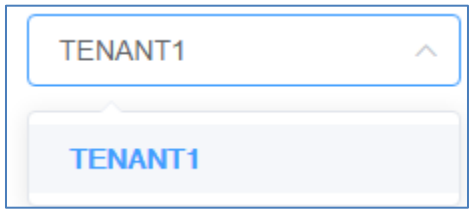
#	Model	Operator	FW Version	Check Sum	MD5	Create Time
1	TPE-5048WS , TPE-204US , TPE-082WS , TPE-1620W...	XXXXXXXXXX	3.01.007	582B7577	00a43e727de27280c8367f2f...	2021-01-05 15:45:14

Total 1 10/page 1 Go to 1

- **Model –** Displays the device model(s) the firmware release applies.
- **Operator –** Displays the user account that created the firmware release.
- **FW Version –** Displays the firmware version number.
- **Check Sum –** Displays the firmware file checksum.
- **MD5 –** Displays the firmware file MD5 checksum.
- **Create Time –** Displays the date and time the firmware release was created.

To provision devices with a new firmware image file, click on **Firmware** and click on **Provision**.

In the top left drop-down list, select the tenant.



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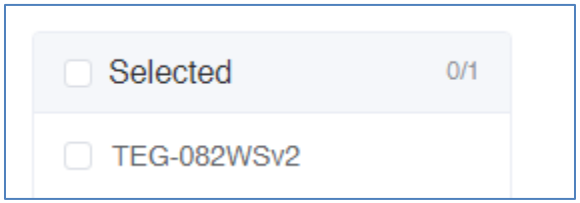
Click the **Type** drop-down list and select the device type. The click the **FW** drop-down list to select the firmware image file.

After you have selected the Type and FW (firmware image file), the applicable online devices for the selected firmware file will appear in the **Device/Online Device List.**

Check the devices you would like to provision, and click to move the devices to the selected list.



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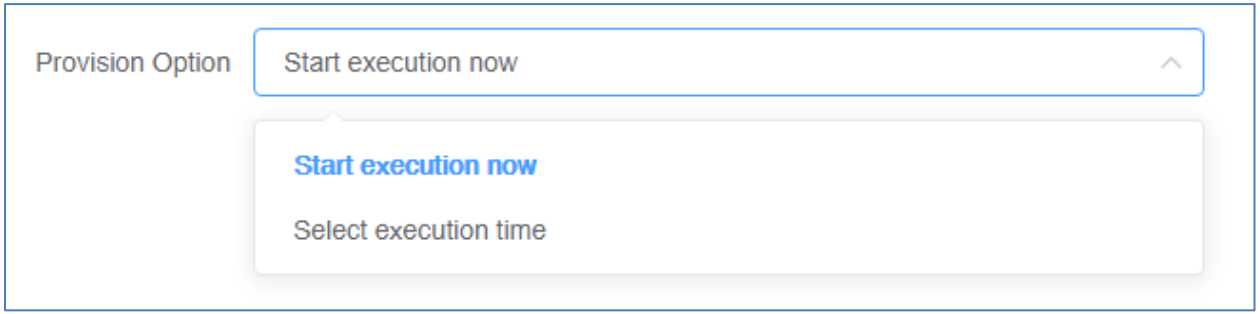
Click the **Provision Option** drop-down list to select when to provision selected devices with the firmware image file. After you have selected this desired option, click **Submit.**

- **Start execution now –** Selecting this option will execute the task immediately.



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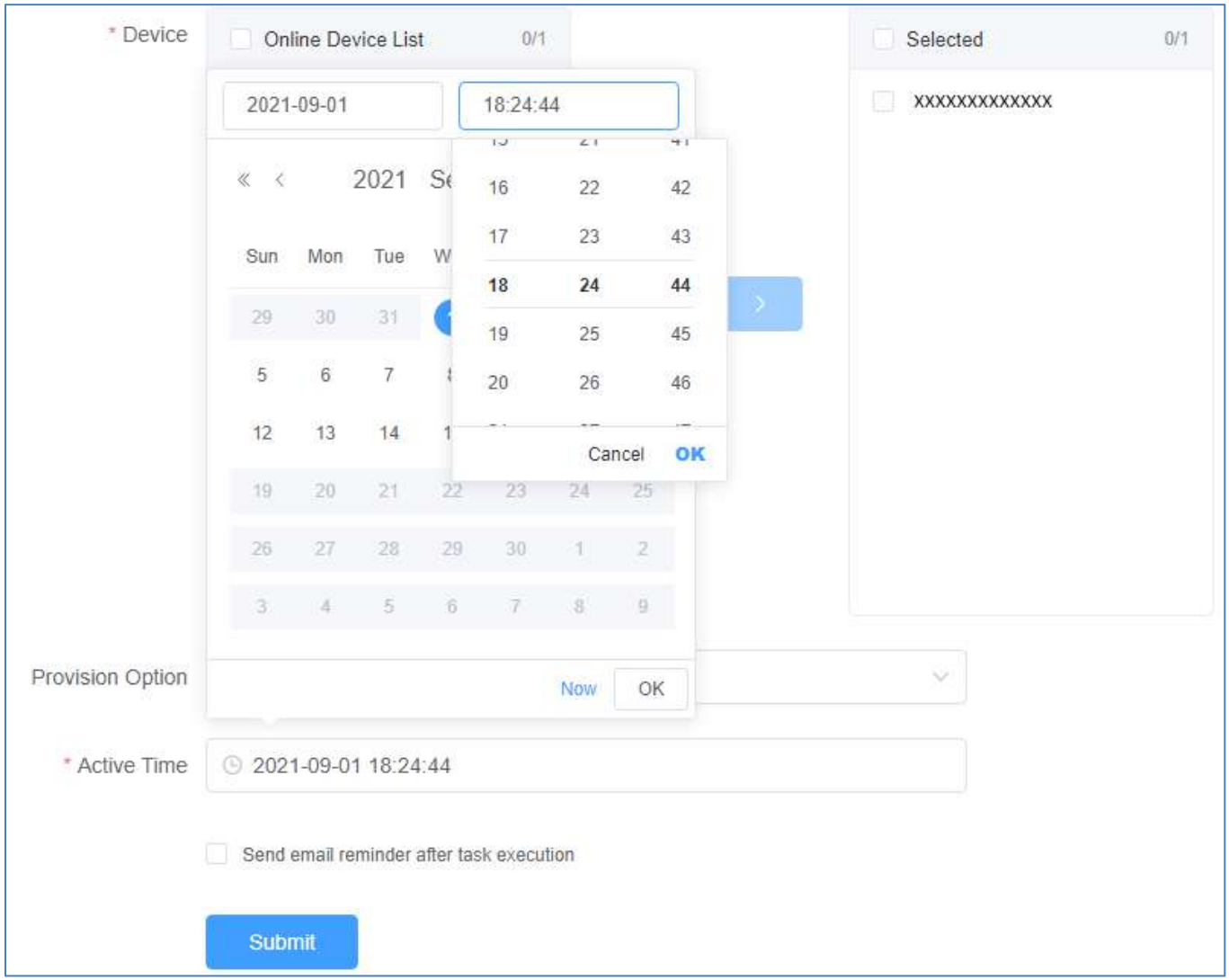
- **Select execution time –** Selecting this option will allow you to schedule a future date and time when to execute this task. Configure the date and time schedule when to execute this task and click **OK**.
  Note: *If scheduling this task, checking the option to Send email reminder after task execution will send an email notification.*



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After creating a scheduled configuration task, the task will be listed under **Firmware** > **Schedule** from the left navigation menu.

#	FW Version	Operator	Create Time	Execution Time	Task Status	Operation
1	3.01.007	XXXXXXXXXXXXXXX	2021-02-08 16:04:59	2021-02-08 16:07:00	Waiting	

- **FW Version** – Displays the firmware version number that will be used to provision devices.
- **Operator** – Displays the user that created the task.
- **Create Time –** Displays the date and time the scheduled task was created.
- **Execution Time** - Displays the date and time the task is scheduled to be executed.
- **Task Status** – Displays the current task status.
  - **Waiting –** Indicates that the scheduled task is pending to be carried out until the scheduled/Execution time is reached.
  - **Execution –** Indicates that the scheduled task has already been completed.
- **Operation**

  See task detail.

  Cancel the task.

  After a task is cancelled before the schedule date and time, you can restore or restart the task.

  After tasks are executed, click this button to view more detail.

After firmware tasks have been executed, you can check the status details under **Firmware > Record** and in the **Details** column, click to view more information.

Status List

#	Model	Alias	MAC	Update Time	Status
1	TEG-082WS	TEG-082WSv2	XX-XX-XX-XX-XX-XX	2021-02-08 16:10:36	Upgrade Success

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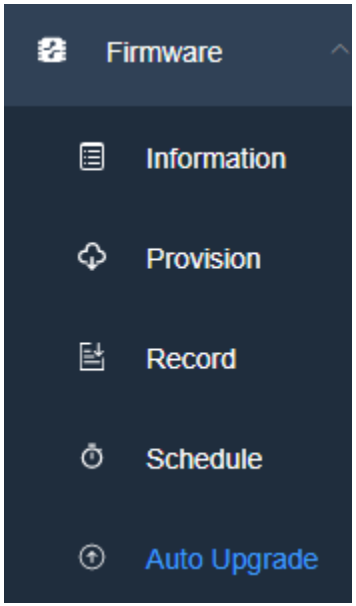
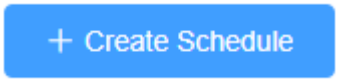
Firmware Auto Upgrade

Firmware upgrades can be completed automatically by schedule and frequency through the Auto Upgrade function.

To configure firmware auto upgrade, in the left navigation menu, click **Firmware** and click **Auto Upgrade.**



At the top of the page, click **Create Schedule.**



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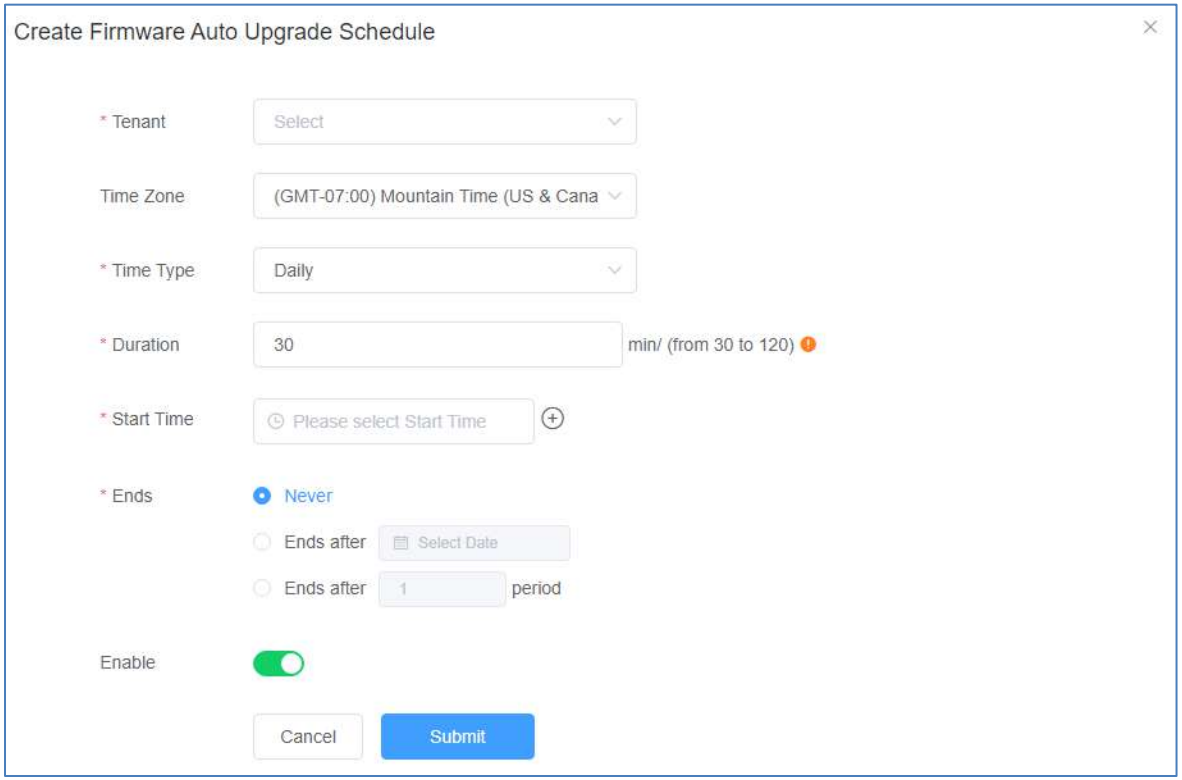
Review the settings below to configuration the automatic upgrade schedule. After you have completed the configuration, click **Submit**.

- **Tenant –** Click the drop-down list and select the tenant to apply the firmware auto upgrade schedule.
- **Time Zone –** Click the drop-down list and select the Time Zone.
- **Time Type –** Select the frequency of the automatic firmware upgrade, daily, weekly, or monthly and select the day or date accordingly.
- **Duration –** This is maximum allowable time for automatic firmware upgrades to complete including device reboot to consider down time. More devices may require more time. Default time is set to minimum of 30 minutes. It is recommended to increase the time if there several devices assigned to the tenant. Edge devices will upgraded first such as WiFi access points, then distribution devices such as switches, and final core devices such as routers or gateways will be upgraded last.
- **Start Time –** Click the field to set the time the automatic upgrade will start daily, selected day or date.
- **Ends**
    - **Never –** The automatic upgrade schedule will always be active on the set time, day, or date.
    - **End after –** Selecting this option will stop automatic firmware upgrades after the selected date.
    - **Ends after –** Selecting this option and specifying a period wil set a limited number of times to automatically upgrade firmware based on the Time Type or frequency set.
- **Enable –** Enable this option to enable the automatic firmware upgrade function.



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Monitoring devices

Event Monitoring

To monitor device events, in the left navigation menu, click on **Monitoring** and click on **Events**.

The **Top 10 Device Events** tab displays an event snapshot of the top 10 devices that generated the most events in the last 24 hours.

Click the top left drop-down list to select a specific tenant or select All to view devices from all tenants.

Click the drop-down list next to the tenant selection to select the type of event.

The devices will be listed on the left and the bars will display the number of occurrences the event took place.

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To view more detail on device events, in the left navigation menu, click on the **Device Event Analysis** tab.

Click the top left drop-down list to select a specific tenant or select All to view devices from all tenants.

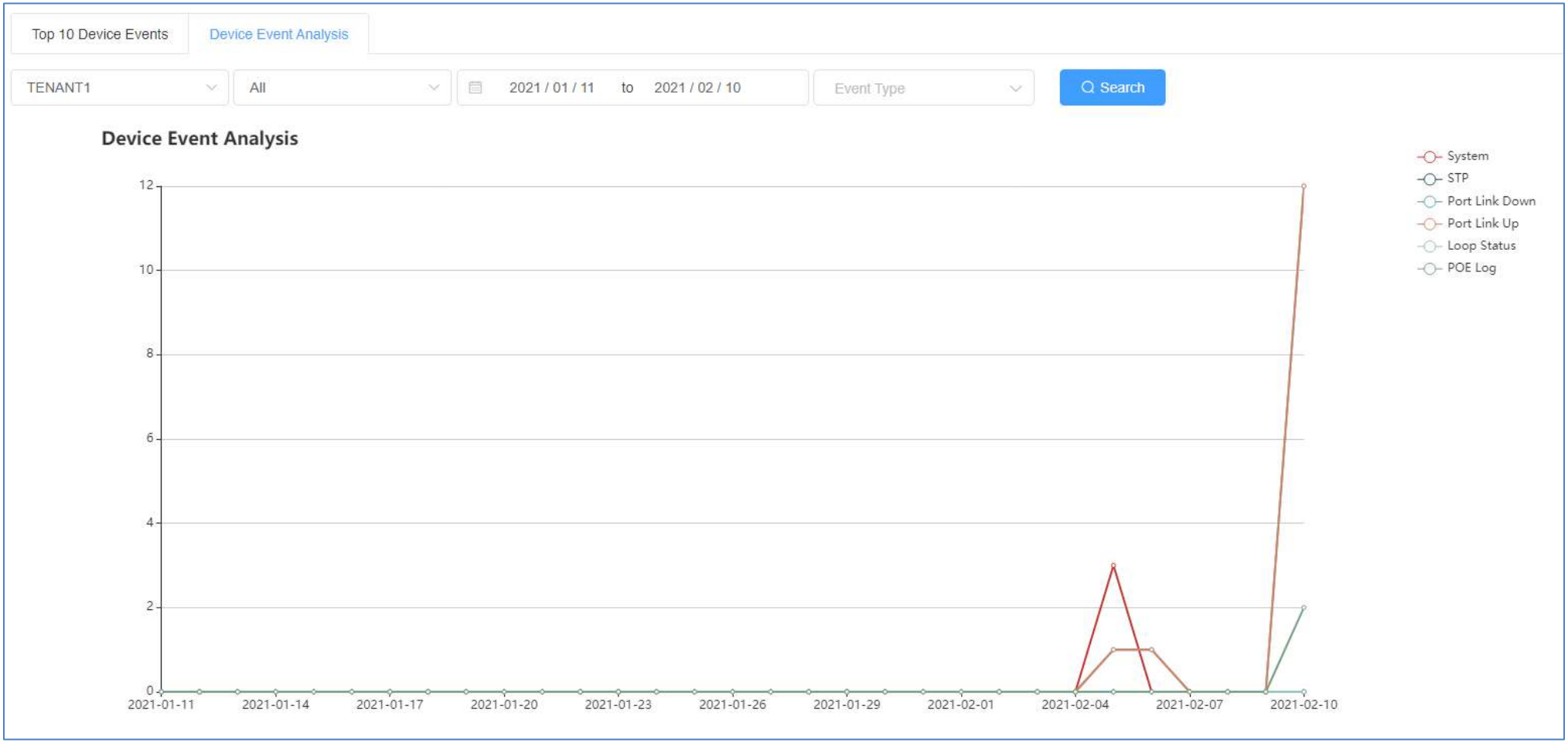
Click the drop-down list next to the tenant selection to select a specific device or select All to view all devices.

Click the drop-down list next to the device selection and select the range of dates to view.

Note: *Event data is limited to only to 30 days prior to the current date.*

Click on **Event Type** drop-down list to select a specific event or select All to view all events. If none is select, by default, the chart will display all events.

Mouse over the chart to view the specific number of occurrences the events took place on the specific date.



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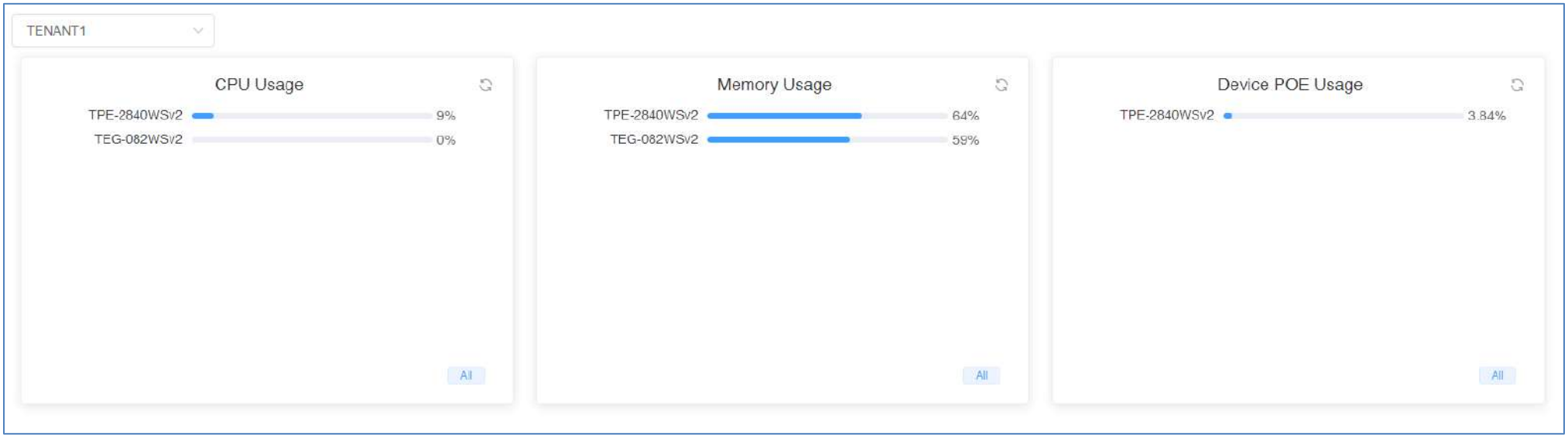
Device Utilization

To view device CPU, memory, and PoE utilization (if applicable), click on **Monitoring** and click on **Utilization**.

Click the top left drop-down list to select a specific tenant or select All to view devices from all tenants.

The current CPU, memory, and PoE budget utilization will be displayed for the devices.



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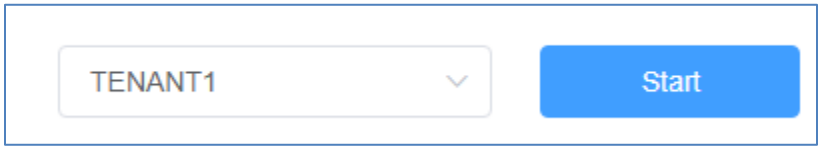
Diagnostic Tools

To access the diagnostic tools, in the left navigation menu, click on **Maintenance** and click on **Diagnostic.**

At the top, click the drop-down list to select the tenant to run the diagnostic and click on **Start**.

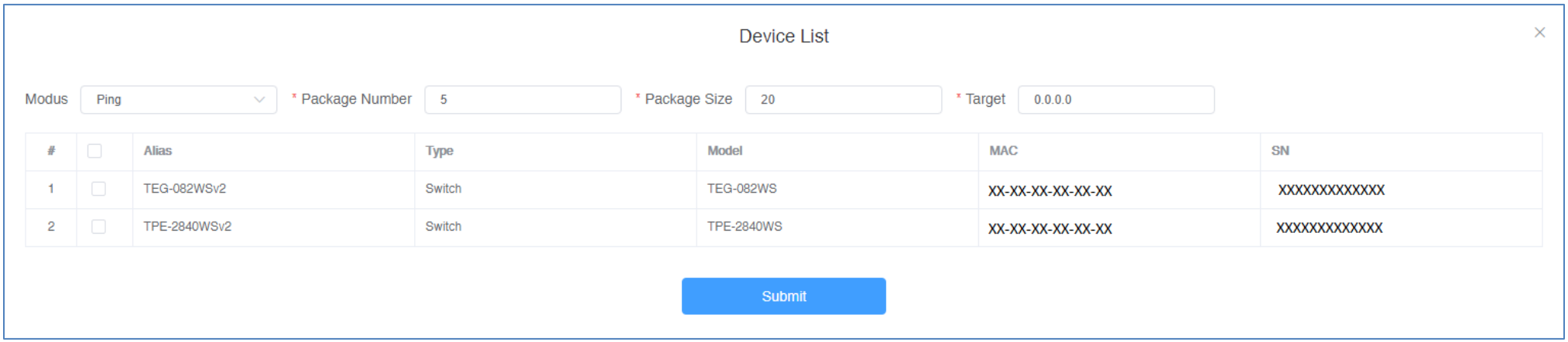


Ping IPv4 Host

To run a ping test to check for network connectivity from a device to an IPv4 host, click the **Modus** drop-down list and select **Ping**.

- **Package Number –** Value specifies the number of ping requests to send.
- **Package Size –** Value specifies the ping packet size in bytes.
- **Target –** Enter the IPv4 address of the host to send pings to check network connectivity.

In the list, check the devices you would like to run the ping test, click **Submit.**



#		Alias	Type	Model	MAC	SN
1		TEG-082WSv2	Switch	TEG-082WS	XX-XX-XX-XX-XX-XX	XXXXXXXXXXXX
2		TPE-2840WSv2	Switch	TPE-2840WS	XX-XX-XX-XX-XX-XX	XXXXXXXXXXXX

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The submitted diagnostic test will appear in the list.

#	Modus	Operator	Time	Operation
1	Ping	XXXXXXXXXX	2021-02-10 13:48:08	

Under **Operation**

Click this button to show the test detail.

Click this button to delete the entry.

Under the test detail window, under **Details**, click view button for additional test detail for each device.

Detail

	Alias	MAC	Update Time	Status	Details
1	TPE-2840WSv2	XX-XX-XX-XX-XX-XX	2021-02-10 13:48:13	Execute successfully	
2	TEG-082WSv2	XX-XX-XX-XX-XX-XX	2021-02-10 13:48:13	Execute successfully	

Diagnostic Details

Reply Received From : 192.168.10.254, TimeTaken : 20 ms

Reply Received From : 192.168.10.254, TimeTaken : 10 ms

Reply Received From : 192.168.10.254, TimeTaken : 10 ms

Reply Received From : 192.168.10.254, TimeTaken : 10 ms

Reply Received From : 192.168.10.254, TimeTaken : 10 ms

--- 192.168.10.254 Ping Statistics ---

5 Packets Transmitted, 5 Packets Received, 0% Packets Loss

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Device Reboot

To reboot devices, click the **Modus** drop-down list and select **Reboot**.

Check the devices you would like to reboot and click **Submit.**

Device List

Modus Reboot

#		Alias	Type	Model	MAC	SN
1		TEG-082WSv2	Switch	TEG-082WS	XX-XX-XX-XX-XX-XX	XXXXXXXXXXXXX
2		TPE-2840WSv2	Switch	TPE-2840WS	XX-XX-XX-XX-XX-XX	XXXXXXXXXXXXX

Submit

The submitted diagnostic test will appear in the list.

#	Modus	Operator	Time	Operation
1	Reboot	XXXXXXXXXXX	2021-02-10 14:00:54	

Under **Operation**

Click this button to show the test detail.

Click this button to delete the entry.

Detail

	Alias	MAC	Update Time	Status	Details
1	TPE-2840WSv2	XX-XX-XX-XX-XX-XX	2021-02-10 14:00:54	Execute successfully	/
2	TEG-082WSv2	XX-XX-XX-XX-XX-XX	2021-02-10 14:00:54	Execute successfully	/

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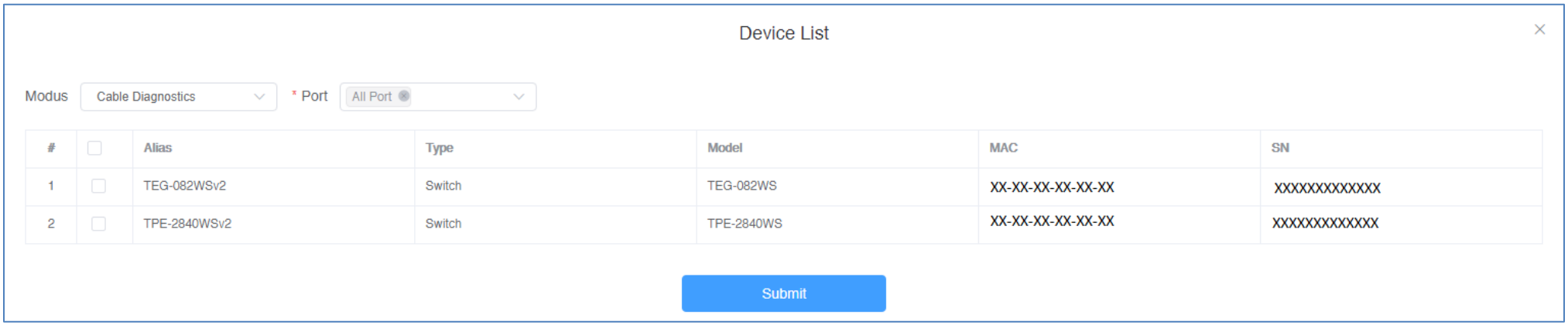
Cable Diagnostics

To run cable diagnostics, click the **Modus** drop-down list and select **Cable Diagnostics**.

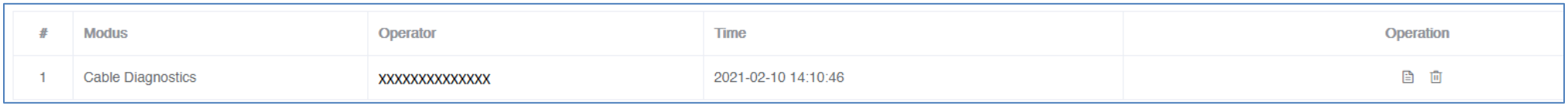
Click the **Port** drop-down list to select a specific port to run cable diagnostic or select All port to run a cable diagnostic on all ports.

Check the devices you would like to run the cable diagnostic and click **Submit.**



#		Alias	Type	Model	MAC	SN
1		TEG-082WSv2	Switch	TEG-082WS	XX-XX-XX-XX-XX-XX	XXXXXXXXXXXXX
2		TPE-2840WSv2	Switch	TPE-2840WS	XX-XX-XX-XX-XX-XX	XXXXXXXXXXXXX

The submitted diagnostic test will appear in the list.



#	Modus	Operator	Time	Operation
1	Cable Diagnostics	XXXXXXXXXXXXXX	2021-02-10 14:10:46	

Under **Operation**

Click this button to show the test detail.

Click this button to delete the entry.

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Under the test detail window, under **Details**, click view button for additional test detail for each device.

Note: *The view button will be available after the diagnostic test has completed.*

Detail

	Alias	MAC	Update Time	Status	Details
1	TPE-2840WSv2	XX-XX-XX-XX-XX-XX	2021-02-10 14:10:47	In execution	/
2	TEG-082WSv2	XX-XX-XX-XX-XX-XX	2021-02-10 14:11:03	Execute successfully	

Diagnostic Details

Port	Test Result	Cable Fault Distance (meters)	Cable Length (meters) [in range]
Port 1	Pair 1 Open in Cable	Pair 1 0	N/A
	Pair 2 Open in Cable	Pair 2 0	
	Pair 3 Open in Cable	Pair 3 0	
	Pair 4 Open in Cable	Pair 4 0	
Port 2	Pair 1 Open in Cable	Pair 1 0	N/A
	Pair 2 Open in Cable	Pair 2 0	
	Pair 3 Open in Cable	Pair 3 0	
	Pair 4 Open in Cable	Pair 4 0	
Port 3	Pair 1 Open in Cable	Pair 1 0	N/A
	Pair 2 Open in Cable	Pair 2 0	
	Pair 3 Open in Cable	Pair 3 0	
	Pair 4 Open in Cable	Pair 4 0	

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Account Settings

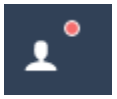
In the top right menu are the items below.

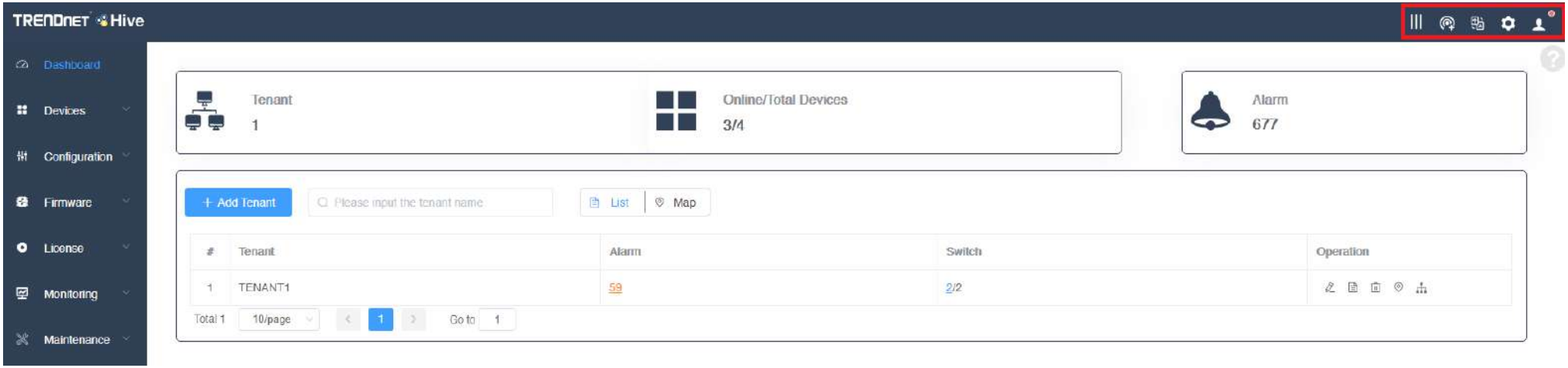
Expand/Collapse left navigation menu

Create new tenant

Select language

Alert notification settings

 Account Settings and Logging



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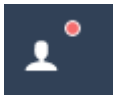
Modify Hive Account Settings

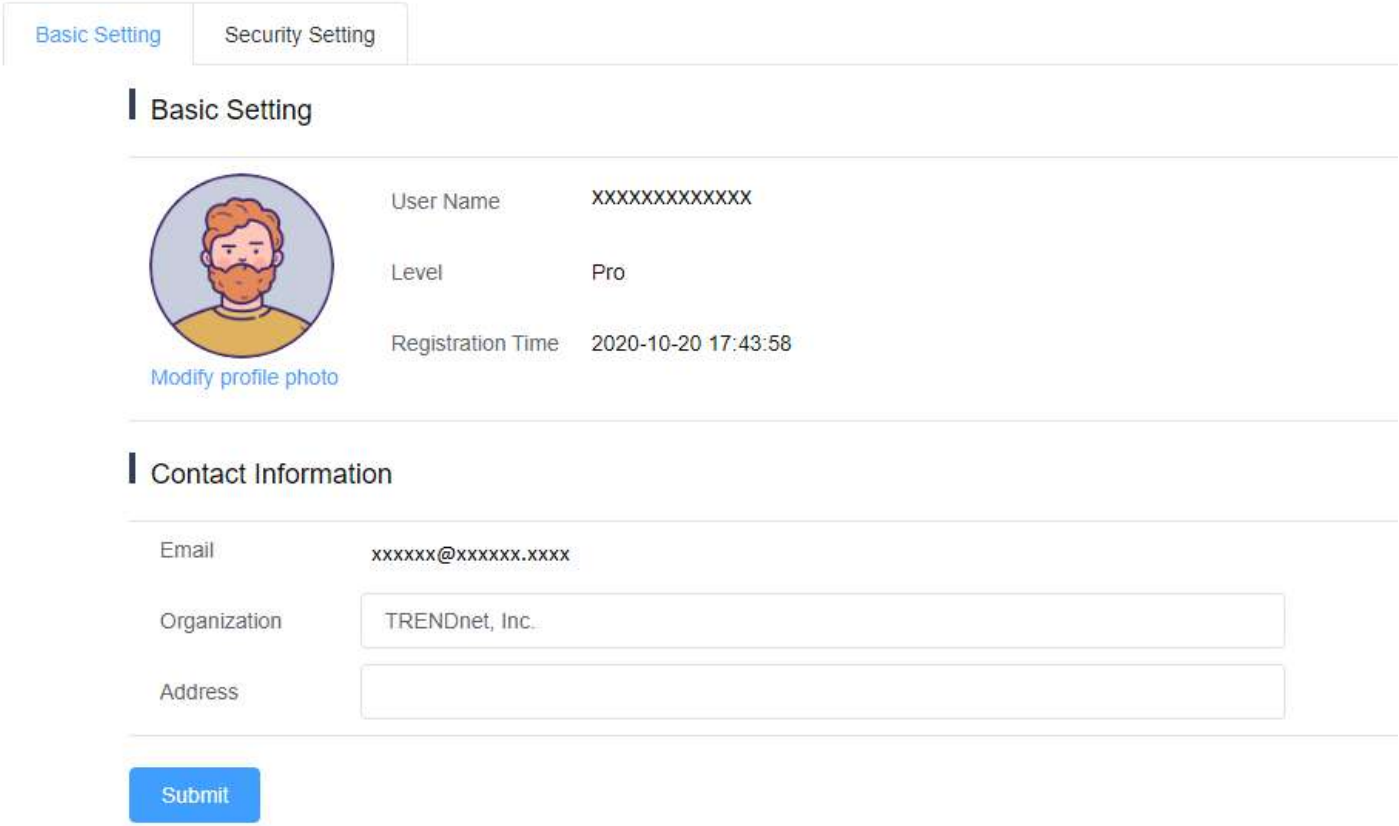
To modify your Hive personal account information, in the top right menu, click the **Account/Logging** button and click on **Personal Information.**



Personal Information

The **Basic Settings** tab wil display your Hive User Name, Hive Account/Level/Type, Registration Date and Time, and contact information. You can edit your profile photo/avatar, the organization and address for your Hive account on this tab. After you modify settings, click **Submit.**

Note: *Additionally, this section displays a login history including the time/date, user account, country, city, time zone, and public IP address of the session.*



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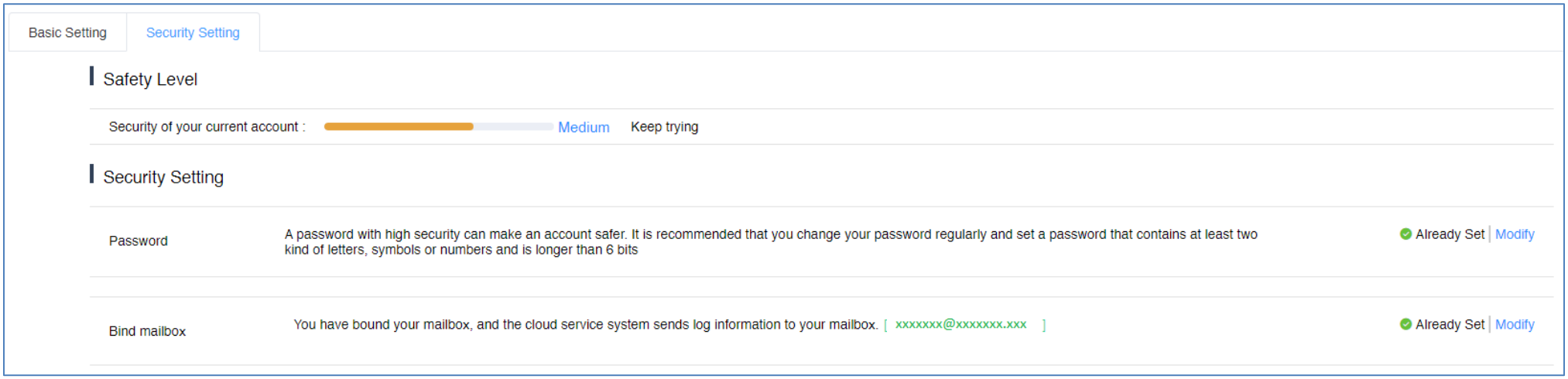
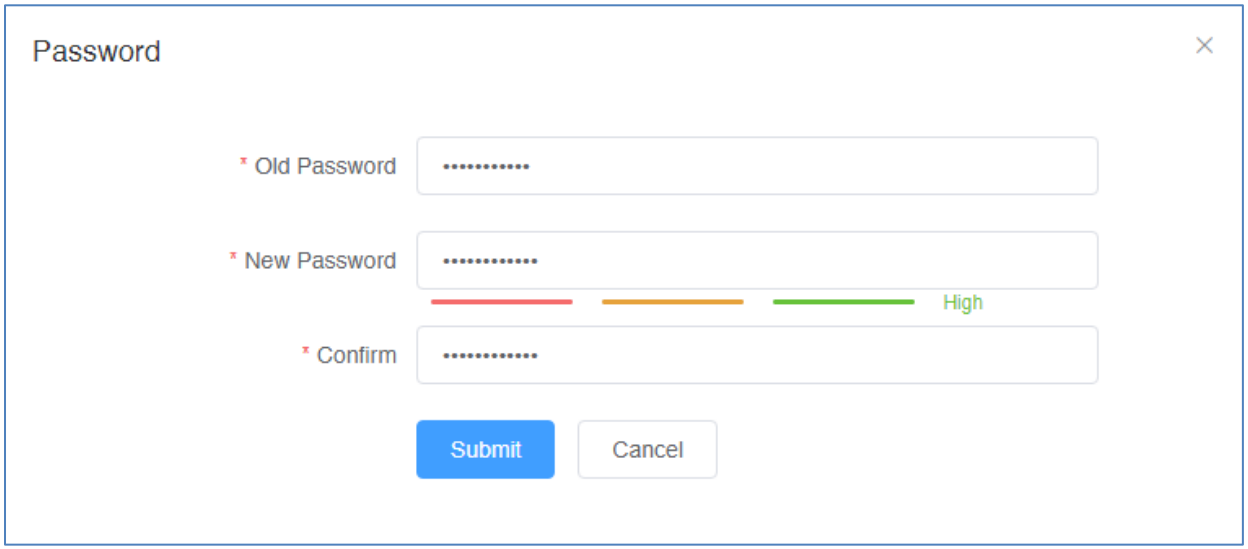
To edit your Hive account password, click on the **Security Settings** tab.

The Safety Level indicates the current security level of your account based on the complexity of your current Hive account password.

Note: *It is recommended to change your Hive account password with High security level rating.*



Under the Security Setting section, for the Password setting, click on **Modify** to modify your Hive account password.



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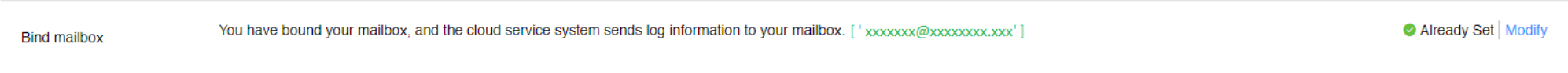
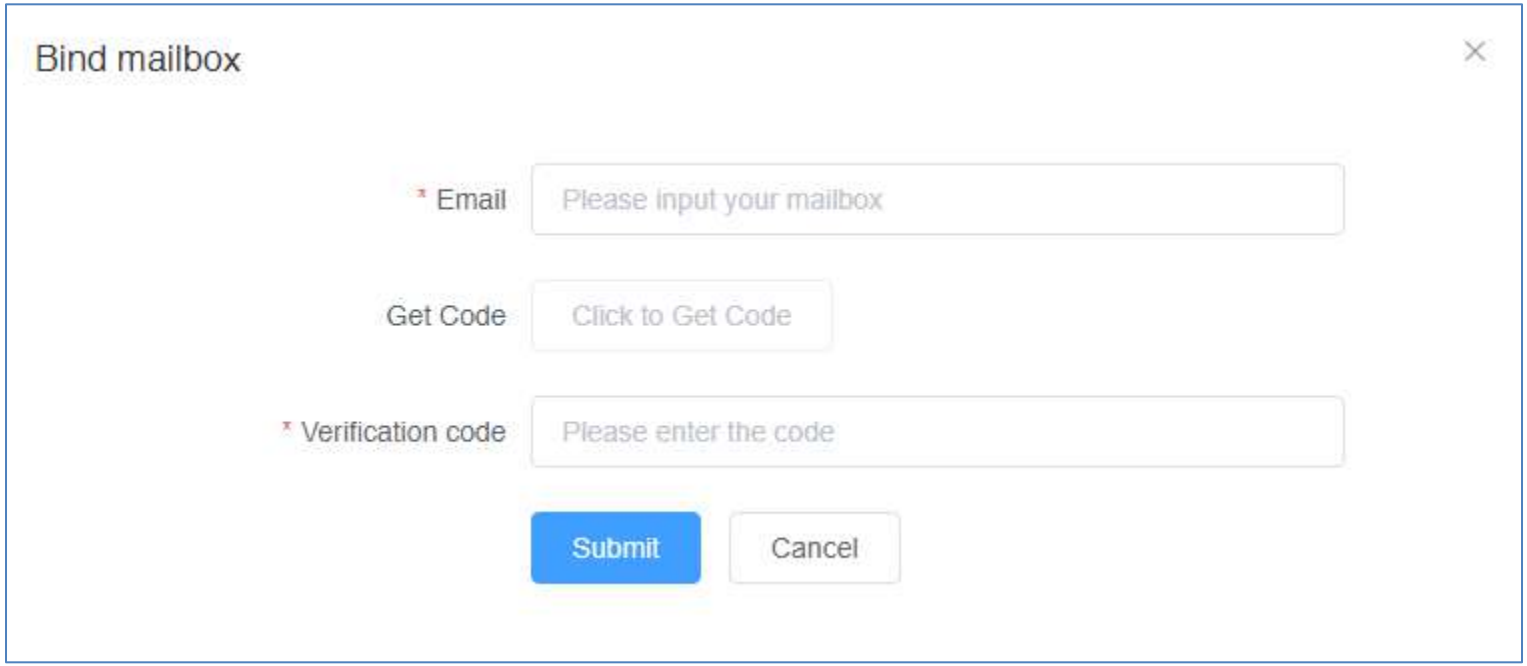
To change the email address your Hive account is associated, under the Security Setting section, for Bind mailbox, click on **Modify** to modify your Hive email address.
The current email address the Hive account is associated will be displayed in green.



Enter the new email address in the field provided, then click **Get Code** to receive a verification from the Hive system at the new email address.
Check the new email mailbox and enter the verification code received in the field provided, then click **Submit.**



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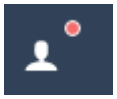
Create Users and Assign Permissions

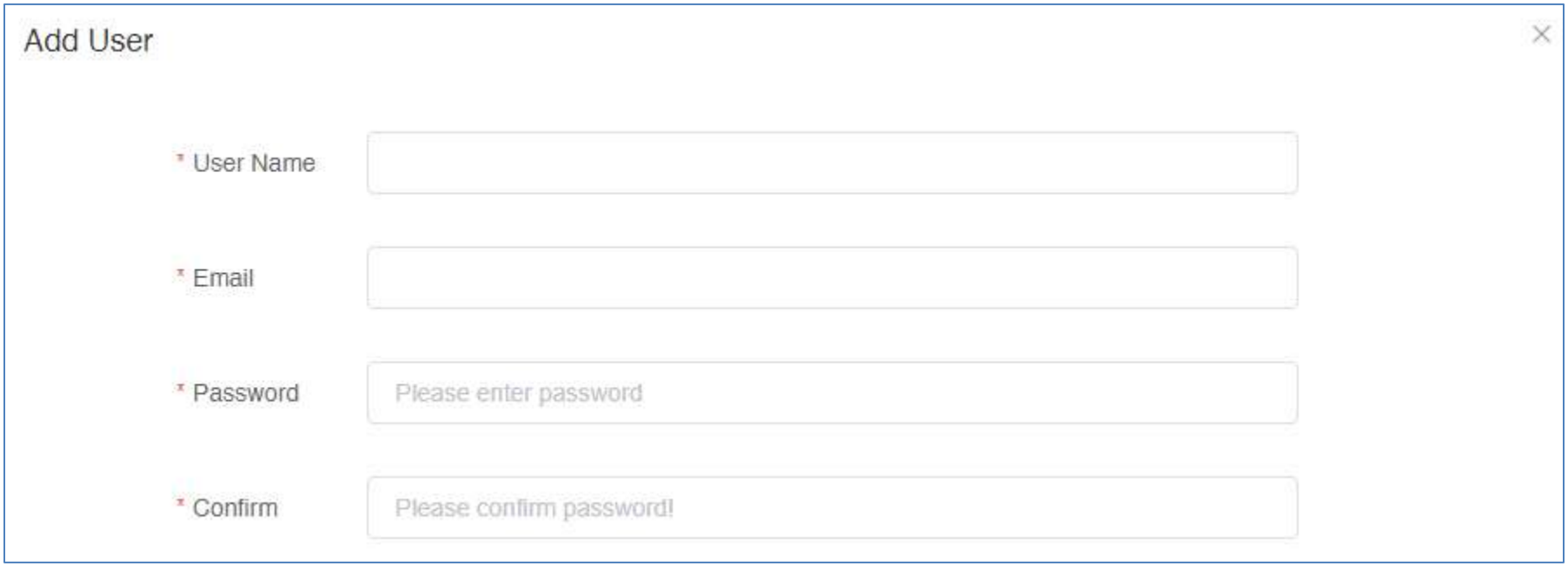
To modify your Hive personal account information, in the top right menu, click the **Account/Logging** button and click on **User Management.**



User Management

To add a new user, at the top, click the + Add button.

Enter the user details such as **User Name**, **Email**, **Password.**



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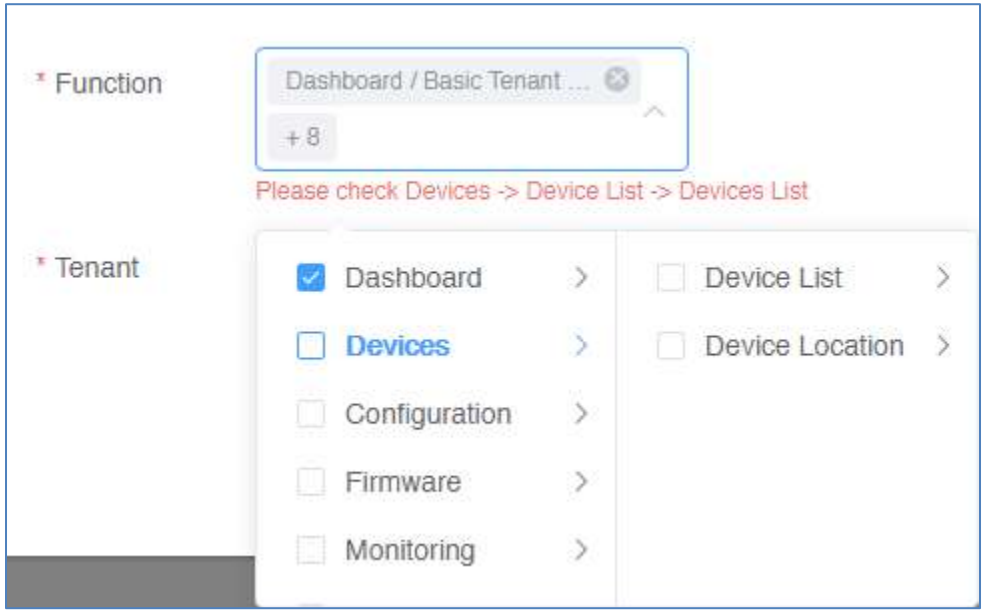
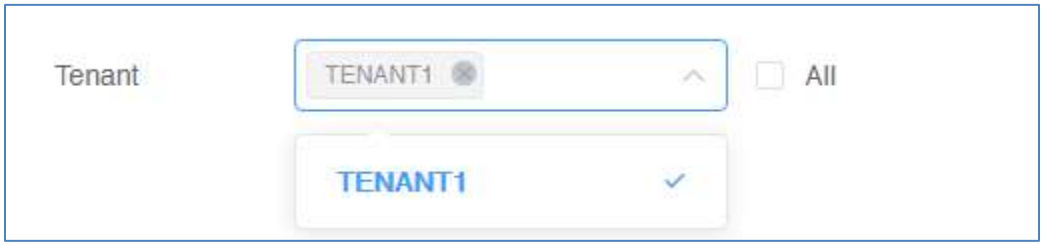
Click the **Function** drop-down to select the Hive section the user will have access. Any sections not seletected will not be accessible for the new user.

Note: *When checking sections, if dependency sections are required in order to access a selected section, a notification will appear in red indicating other specific dependencies that must also be checked in order for the user to access selected section.*



Click the **Tenant** drop-down list to select the specific tenant the user will have access. The user will only have access to the selected tenant. Then click **Submit** to create the new user.

Note: *To allow the user access to all tenants, check the All option.*



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The new user will be displayed in the user list.

#	User Name	Email	Create Time	Operation
1	XXXXXXXXX	XXXXXX@XXXXXX.XXX	2021-02-10 17:42:21	

Under the **Operation** section

- Edit the user account settings. Allows you to modify the user email, access sections, and issue a reset password.

- Delete the user account.

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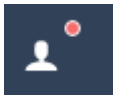
View Hive System Messages

System messages related the Hive Management system internally. (ex: New device firmware update release in Hive Management System).

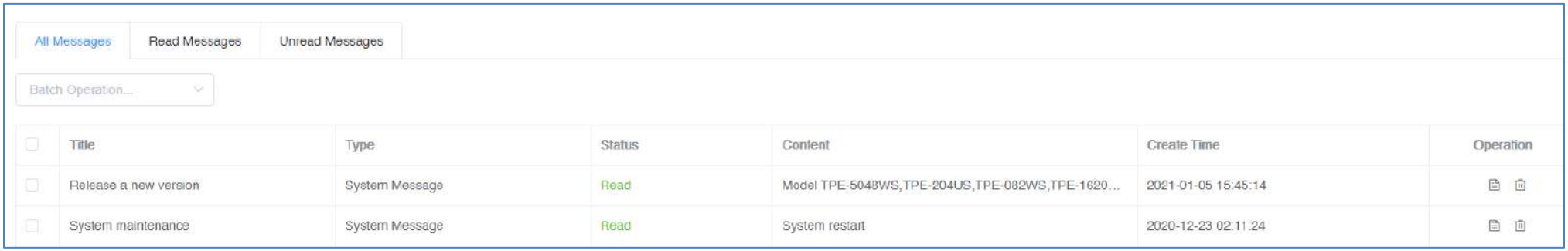
To view Hive system messages, click the **Account/Logging** button and click on **Message List.**



Message List

The system messages will display in the list.

Note: *You can click on the* ***Read Messages*** *tab to view messages that have already been read or click the* ***Unread Messages*** *tab to view messages that not yet been read.*



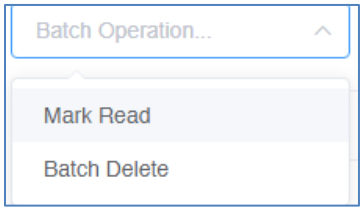
Under the **Operation** section for each message,

- Click this button view the message details

- Click this button to delete the message.

At the top left of the page, you can click the **Batch Operation** to mark multiple messages as Read (**Mark Read)** or delete multiple messages (**Batch Delete).**

First, check all messages to apply the batch operation, then click the **Batch Operation** drop-down list and selected batch operation to use.



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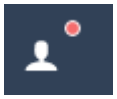
View Device Logging

To view Hive device logging, click the **Account/Logging** button and click on **Device Log**



Device Log

This section displays device logging from devices managed from your Hive account.

At the top left, enter the keyword (if any) to search in device logging.

Select the **Start Date** and **End Date** range of device logging to display.

Note: *Logging data is limited only to 30 days prior to the current date.*

Click the **Select Level** drop-down list to select only specific types of logging to be displayed (optional, if none selected, logging will be displayed for all)

Click the **Event Type** drop-down list to select only specific events to be displayed (optional, if none selected, logging will be displayed for all)

Click **Search** to display logging within your defined filters.

After the search has completed, you can click **Export** to export logging to an excel (.xlsx) file.

Please input the keyword of content | Start Date to End Date | Select level | Event Type | Search | Export

#	Update Time	Model	SN	Tenant	Level	Event Type	Content	Operation
1	2021-02-10 14:03:52	TPE-2840WS	XXXXXXXXXXXXXX	TENANT1	Informational mes...	Port Link Up	Port 23 link up, 100Mbps FULL duplex	
2	2021-02-10 14:03:50	TPE-2840WS	XXXXXXXXXXXXXX	TENANT1	Informational mes...	Port Link Down	Port 23 link down	
3	2021-02-10 14:03:49	TPE-2840WS	XXXXXXXXXXXXXX	TENANT1	Informational mes...	Port Link Up	Port 19 link up, 100Mbps FULL duplex	
4	2021-02-10 14:03:48	TPE-2840WS	XXXXXXXXXXXXXX	TENANT1	Informational mes...	Port Link Down	Port 19 link down	

Under the **Operation** section for each log entry,

- Click this button to delete the logging entry.

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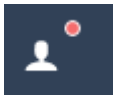
View System Logging

To view Hive system logging, click the **Account/Logging** button and click on **System Log**



System Log

This section displays Hive system logging of activity in your Hive account and alarm notifications.

At the top left, enter the keyword (if any) to search in system logging.

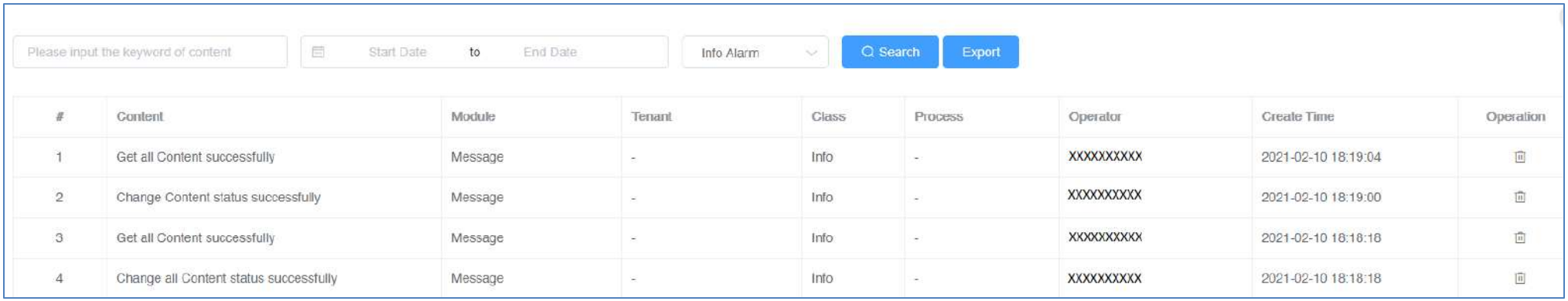
Select the **Start Date** and **End Date** range of system logging to display.

Note: *Logging data is limited only to 30 days prior to the current date.*

Click the **Info Alarm** drop-down list to select the class system logging to display.

Click **Search** to display logging within your defined filters.

After the search has completed, you can click **Export** to export logging to an excel (.xlsx) file.



#	Content	Module	Tenant	Class	Process	Operator	Create Time	Operation
1	Get all Content successfully	Message	-	Info	-	XXXXXXXXXX	2021-02-10 18:19:04	
2	Change Content status successfully	Message	-	Info	-	XXXXXXXXXX	2021-02-10 18:19:00	
3	Get all Content successfully	Message	-	Info	-	XXXXXXXXXX	2021-02-10 18:18:18	
4	Change all Content status successfully	Message	-	Info	-	XXXXXXXXXX	2021-02-10 18:18:18	

Under the **Operation** section for each log entry,

- Click this button to delete the logging entry.

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Configure alert notifications

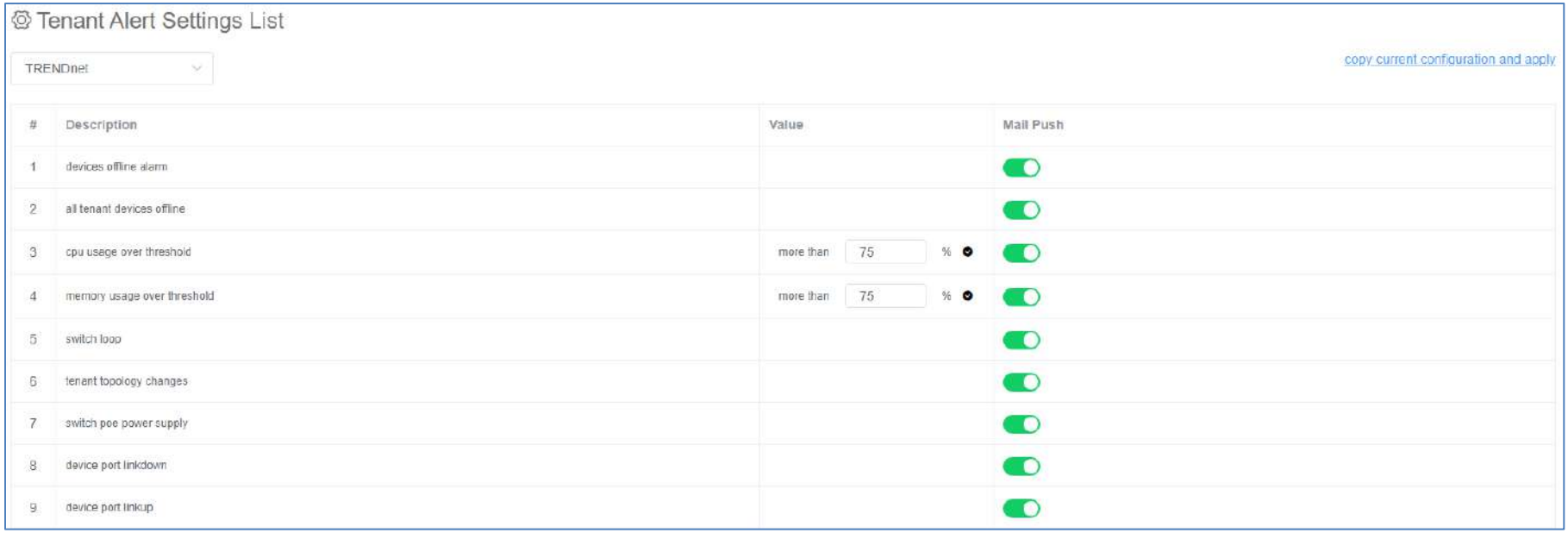
To configure alert notifications, in the top right menu.

Click the Alert Notifications button and click on **Alert Settings.**

Click the drop-down list in the left to select which tenant to configure the alert notification settings.

Enable/disable alert notificatons for **Mail Push** for email notifications.

Note: *Some alert settings require threshold percentages or data restrictions to be entered. You can also click the copy current configuration and apply link to apply the alert notification settings to a different tenant.*



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Web Smart Switch Series Hardware Specifications

	TEG-082WS (2.0R)	TEG-204WS (1.0R)	TEG-284WS (1.0R)	TEG-524WS (1.0R)
Device Interface	LED Mode select button and LED indicators			
	8 x Gigabit ports	16 x Gigabit ports	24 x Gigabit ports	48 x Gigabit ports
	2 x SFP slots	4 x Shared Gigabit ports (RJ-45/SFP)		
Data Transfer Rate	Ethernet: 10 Mbps (half duplex), 20 Mbps (full duplex)			
	Fast Ethernet: 100 Mbps (half duplex), 200 Mbps (full duplex)			
	Gigabit Ethernet: 2000 Mbps (full duplex)			
Switch fabric	20 Gbps	40 Gbps	56 Gbps	104 Gbps
RAM buffer	4.1 Mbits			12 Mbits
MAC Address Table	8K entries			16K entries
Jumbo Frames	10 Kbytes			
Forwarding	14.9Mpps (64-byte packet size)	29.8Mpps (64-byte packet size)	41.7Mpps (64-byte packet size)	77.4Mpps (64-byte packet size)
HOL Blocking Prevention	HOL Blocking Prevention supported on all models			
Power Input	100 - 240V AC, 50/60 Hz, internal power supply			
Power Consumption	7.1 Watts (max.)	14.6 Watts (max.)	17.3 Watts (max.)	34.9 Watts (max.)
Fan Quantity	Fanless			
Noise Level	N/A (fanless)			
MTBF	1,092,872 hours	835,519 hours	787,004 hours	400,158 hours

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	TEG-082WS (2.0R)	TEG-204WS (1.0R)	TEG-284WS (1.0R)	TEG-524WS (1.0R)
Operating Temperature	-5° – 50°C (23° - 122°F)			
Operating Humidity	Max. 95% non-condensing			
Dimensions	280 x 125.8 x 44 mm (11 x 5 x 1.74 in.)	280 x 180 x 44 mm (11 x 7 x 1.74 in.)	440 x 140 x 44mm (17.4 x 5.51 x 1.74 in.)	440 x 210 x 44mm (17.3 x 8.3 x 1.74 in.)
	Rack mountable 1U height			
Weight	0.98 kg (2.2 lbs.)	1.76 kg (3.88 lbs.)	2.15 kg (4.73 lbs.)	3.48 kg (7.67 lbs.)
Certifications	CE			
	FCC			
	UL			
Warranty	Lifetime			
Package Contents	In addition to the switch, the package contents include the following:			
	Quick Installation Guide			
	Rack mount kit			
	Power cord (1.8m/6 ft.)			

***Model requires update to firmware 3.01.XXX to enable Hive capability.**

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Web Smart Switch Series Software Specifications

Standards	• IEEE 802.1d • IEEE 802.1p • IEEE 802.1Q • IEEE 802.1s • IEEE 802.1w	• IEEE 802.1X • IEEE 802.1ab • IEEE 802.3 • IEEE 802.3u • IEEE 802.3x	• IEEE 802.3z • IEEE 802.3ab • IEEE 802.3ad • IEEE 802.3az
Management	• CLI (Telnet / SSHv2) for basic administration • HTTP/HTTPS (SSL v2/3 TLS) Web based GUI • SNMP v1, v2c, v3 • RMON v1	• Static Unicast MAC Address • Enable/disable 802.3az Power Saving • LLDP and LLDP-MED • Virtual Cable Diagnostics Test	• IPv6: IPv6 Neighbor Discovery, IPv6 Static IP, DHCPv6, Auto configuration • Dual image and configuration • TC Root/Protect
Hive Cloud Management (requires update to firmware 3.01.XXX to enable Hive capability)	• Configure, monitor, and manage through the TRENDnet Hive Cloud Management Portal remotely via PC or Mac web browser • Multi-device management • Provisioning through scheduled batch firmware or configuration updates for multiple switches	• Enable & disable PoE, set PD (powered device) alive check, configure PoE scheduling, and monitor PoE budget utilization (for PoE switches only) • Event/hardware network monitoring (CPU/memory utilization)	• Configure features such as IP address settings, VLANs, spanning tree, loopback detection, IGMP snooping, link aggregation, and bandwidth control through cloud management
MIB	• IP Forward Table MIB RFC 1354 • RMON MIB RFC 1271 • IPv4 MIB RFC 1213 • IPv6 MIB RFC 2465 • GVRP MIB IEEE 802.1Q-VLAN • LA MIB IEEE 802.3ad • LLDP MIB IEEE 802.1ab • IGMP Snooping MIB RFC 2933 • MLD Snooping MIB RFC 3019 • Private VLAN MIB IEEE 802.1Q	• DHCP Snooping MIB RFC 2026 • QoS MIB RFC 4323 • SNMP MIB RFC 3415 • STP MIB RFC 4318 • PNAC MIB IEEE 802.1x • VLAN MIB IEEE 802.1q • DNS MIB RFC 1611 • ACL MIB • Bandwidth CTRL MIB • LBD MIB	• Mirror MIB • IPv6 Neighbor MIB • SNTP MIB • Storm CTRL MIB • Statistics MIB • Tool MIB • Voice VLAN MIB • DoS MIB
Spanning Tree	• IEEE 802.1D STP (Spanning Tree protocol)	• IEEE 802.1w RSTP (Rapid Spanning Tree protocol)	• IEEE 802.1s MSTP (Multiple Spanning Tree protocol)

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Link Aggregation	• Static Link Aggregation	• 802.3ad Dynamic LACP	
Quality of Service (QoS)	• 802.1p Class of Service (CoS) • DSCP (Differentiated Services Code Point)	• Bandwidth Control per port	• Queue Scheduling: Strict Priority, Weighted Round Robin (WRR)
VLAN	• Multiple management VLAN assignment • Asymmetric VLAN • 802.1Q Tagged VLAN	• Dynamic GVRP • MAC-based VLAN • Protocol-based VLAN	• Up to 256 VLAN groups, ID Range 1-4094 • Private VLAN (Protected Ports) • Voice VLAN (10 user defined OUIs)
Multicast	• IGMP Snooping v1, v2, v3 • MLD Snooping v1, v2	• IGMP fast leave • MVR (Multicast VLAN Registration)	• Static Multicast Address • Up to 256 multicast entries
Port Mirror	• RX, TX, or Both	• Many to one	
Access Control	• 802.1X Port-Based Network Access Control , RADIUS, TACACS+ • Local Dial In User Authentication • DHCP Snooping (per VLAN) • Loopback Detection	• Duplicated Address Detection • Trusted Host • Denial of Service (DoS) • IP MAC port binding	• Dynamic ARP inspection • Block unknown multicast
ACL IPv4 L2-L4 & IPv6	• MAC Address • VLAN ID • Ether Type (IPv4 only)	• IP Protocol 0-255 • TCP/UDP Port 1-65535 • 802.1p	• DSCP (IPv4 only) • IPv6 Address (IPv6 only)
Layer 3 Features	• IPv4 / IPv6 static routing • IP interfaces: Up to 6	• Routing table entries: Up to 32 (IPv4 / IPv6) • ARP table (up to 128 entries)	• Inter-VLAN routing
Compatibility	Optional Software Utility: Windows® 10, 8.1, 8, 7, Vista, XP, Windows® 2003/2008 Server		

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Web Smart PoE Switch Series Hardware Specifications

	TPE-082WS (1.0R)	TPE-1620WS (2.0R)	TPE-1620WSF (1.0R)	TPE-2840WS (2.0R)	TPE-5028WS (1.0R)	TPE-5240WS (1.0R)	TPE-5048WS (1.0R)
Device Interface	LED Mode select button and LED indicators						
	8 x Gigabit PoE+ ports	16 x Gigabit PoE+ ports		24 x Gigabit PoE+ ports		48 x Gigabit PoE+ ports	
	2 x SFP slots	4 x Shared Gigabit ports (RJ-45/SFP)					
Data Transfer Rate	Ethernet: 10 Mbps (half duplex), 20 Mbps (full duplex)						
	Fast Ethernet: 100 Mbps (half duplex), 200 Mbps (full duplex)						
	Gigabit Ethernet: 2000 Mbps (full duplex)						
Switch fabric	20 Gbps	40 Gbps		56 Gbps		104 Gbps	
RAM buffer	4.1 Mbits					12 Mbits	
MAC Address Table	8K entries					16K entries	
Jumbo Frames	10 Kbytes						
Forwarding	14.9 Mpps (64-byte packet size)	29.8Mpps (64-byte packet size)		41.7Mpps (64-byte packet size)		77.4Mpps (64-byte packet size)	
HOL Blocking Prevention	HOL Blocking Prevention supported on all models						
Power Input	External power supply (54V DC, 1.67A)	100 - 240V AC, 50/60 Hz, internal power supply					
Power Consumption	82 Watts (max.)	226W (max.)	460W (max.)	256W (max.)	446W (max.)	479W (max.)	963W (max.)
PoE Type	802.3at: Up to 30W per port						
PoE Budget	75 Watts	185W	370W	185W	370W	740W	75 Watts
Fan Quantity	Fanless	2				3	5
Noise Level	N/A (fanless)	52 dBA (max.)				52.4 dBA (max.)	55 dBA (max.)
MTBF	862,966 hours	465,862 hours	192,382 hours	443,825 hours	277,604 hours	239,897 hours	338,601 hours

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	TPE-082WS (1.0R)	TPE-1620WS (2.0R)	TPE-1620WSF (1.0R)	TPE-2840WS (2.0R)	TPE-5028WS (1.0R)	TPE-5240WS (1.0R)	TPE-5048WS (1.0R)
Operating Temperature	-5° – 50°C (23° - 122°F)						
Operating Humidity	Max. 95% non-condensing		Max. 90% non-condensing	Max. 95% non-condensing			
Dimensions	280 x 125.8 x 44 mm (11 x 5 x 1.74 in.)	440 x 250 x 44mm (17.3 x 9.8 x 1.74 in.)				440 x 430 x 44mm (17.3 x 17 x 1.74 in.)	
	Rack mountable 1U height						
Weight	0.92 kg (2 lbs.)	3.66kg (8 lbs.)	3.89kg (8.5 lbs.)	3.75kg (8.26 lbs.)	3.92kg (8.64 lbs.)	6.12kg (13.5 lbs.)	6.58kg (14.5 lbs.)
Certifications	CE						
	FCC						
	External Power Adapter (UL)	UL					
Warranty	Lifetime						
Package Contents	In addition to the switch, the package contents include the following:						
	Quick Installation Guide						
	Rack mount kit						
	Power adapter (54V DC, 1.67A)	Power cord (1.8m/6 ft.)					

***Model requires update to firmware 3.01.XXX to enable Hive capability.**

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Web Smart Switch Series Software Specifications

Standards	• IEEE 802.1d • IEEE 802.1p • IEEE 802.1Q • IEEE 802.1s • IEEE 802.1w • IEEE 802.1X	• IEEE 802.1ab • IEEE 802.1ax • IEEE 802.3 • IEEE 802.3u • IEEE 802.3x • IEEE 802.3z • IEEE 802.3ab	• IEEE 802.3ad • IEEE 802.3af • IEEE 802.3at • IEEE 802.3az
Management	• CLI (Telnet / SSHv2) for basic administration** • HTTP/HTTPS (SSL v2/3 TLS) Web based GUI • SNMP v1, v2c, v3 • RMON v1	• Static Unicast MAC Address • Enable/disable 802.3az Power Saving • LLDP (Basic/Dot1/Dot3 TLV Settings**) and LLDP-MED • Virtual Cable Diagnostics Test	• IPv6: IPv6 Neighbor Discovery, IPv6 Static IP, DHCPv6, Auto configuration • Dual image and configuration** • TC Root/Protect • Ping watchdog***
MIB	• IP Forward Table MIB RFC 1354 • RMON MIB RFC 1271 • IPv4 MIB RFC 1213 • IPv6 MIB RFC 2465 • GVRP MIB IEEE 802.1Q-VLAN • LA MIB IEEE 802.3ad • LLDP MIB IEEE 802.1ab • IGMP Snooping MIB RFC 2933 • MLD Snooping MIB RFC 3019 • Private VLAN MIB IEEE 802.1Q	• DHCP Snooping MIB RFC 2026 • QoS MIB RFC 4323 • SNMP MIB RFC 3415 • STP MIB RFC 4318 • PNAC MIB IEEE 802.1x • VLAN MIB IEEE 802.1q • DNS MIB RFC 1611 • ACL MIB • Bandwidth CTRL MIB • LBD MIB	• Mirror MIB • IPv6 Neighbor MIB • SNTP MIB • Storm CTRL MIB • Statistics MIB • Tool MIB • Voice VLAN MIB • DoS MIB
Spanning Tree	• IEEE 802.1D STP (Spanning Tree protocol)	• IEEE 802.1w RSTP (Rapid Spanning Tree protocol)	• IEEE 802.1s MSTP (Multiple Spanning Tree protocol)
Link Aggregation	• Static Link Aggregation	• 802.3ad Dynamic LACP	• 802.1ax Link Aggregation
Quality of Service (QoS)	• 802.1p Class of Service (CoS) • DSCP (Differentiated Services Code Point)	• Bandwidth Control per port	• Queue Scheduling: Strict Priority, Weighted Round Robin (WRR)
VLAN	• Multiple management VLAN assignment • Asymmetric VLAN • 802.1Q Tagged VLAN	• Dynamic GVRP • MAC-based VLAN • Protocol-based VLAN • Multicast VLAN**	• Up to 256 VLAN groups, ID Range 1-4094 • Private VLAN (Protected Ports) • Voice VLAN (10 user defined OUIs)

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Multicast	• IGMP Snooping v1, v2, v3 • MLD Snooping v1, v2** • IGMP fast leave	• MVR (Multicast VLAN Registration)** • Static Multicast Address	• Multicast Filtering** • Up to 256 multicast entries
Port Mirror	• RX, TX, or Both	• Many to one	
Access Control	• 802.1X Port-Based Network Access Control , RADIUS, TACACS+ • Local Dial In User Authentication • DHCP Snooping (per VLAN) • Loopback Detection	• Duplicated Address Detection • Trusted Host • Denial of Service (DoS) • IP MAC port binding	• Dynamic ARP inspection** • Block unknown multicast • Port Security/MAC address learning restriction (Up to 64 entries per port)
ACL IPv4 L2-L4 & IPv6	• MAC Address • VLAN ID • Ether Type (IPv4 only)	• IP Protocol 0-255 • TCP/UDP Port 1-65535 • 802.1p	• DSCP (IPv4 only) • IPv6 Address (IPv6 only)
Layer 3 Features*	• IPv4 / IPv6 static routing • IP interfaces: Up to 6	• Routing table entries: Up to 32 (IPv4 / IPv6) • ARP table (up to 128 entries)	• Inter-VLAN routing
PoE Features**	• PoE Mode A: Pins 1, 2, 3, and 6 for power • PoE auto classification	• PoE port priority • PoE power scheduling	• PD alive check
TRENDnet Hive Features*** https://www.trendnet.com/hive (Requires subscription purchase) (Click here to view list of Hive compatible devices)	• Centralized network device management through cloud-based Hive portal • Overview of devices, client, and system logs • View user, traffic statistics, and device lists • Access, manage, configure, and troubleshoot devices remotely • Event/hardware monitoring	• Provisioning through schedule batch firmware or configuration updates • Backup, restore, copy device configuration to Hive cloud**** • Email alerts and notifications • Multi-site management • Google Maps™ location tracking (Pro version only)	• Multi-tenant management (Pro version only) • Multi-user roles and permissions (Pro version only) • Service-Level Agreement (SLA) guaranteed 99.9 percent uptime • Works with TRENDnet Hive enabled devices
Compatibility	Optional Software Utility: Windows® 10, 8.1, 8, 7, Vista, XP, Windows® 2003/2008 Server		

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*Feature available with firmware version 2.10.010 or above.

**Feature only applies to TRENDnet Power over Ethernet (PoE) models

***Feature available with firmware version 3.01.007 or above.

****Feature available with firmware 3.01.012 or above.

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Limited Warranty

TRENDnet warrants only to the original purchaser of this product from a TRENDnet authorized reseller or distributor that this product will be free from defects in material and workmanship under normal use and service. This limited warranty is non-transferable and does not apply to any purchaser who bought the product from a reseller or distributor not authorized by TRENDnet, including but not limited to purchases from Internet auction sites.

Limited Warranty

TRENDnet warrants its products against defects in material and workmanship, under normal use and service. Specific warranty periods are listed on each of the respective product pages on the TRENDnet website.

- AC/DC Power Adapter, Cooling Fan, and Power Supply carry a one-year warranty.

Limited Lifetime Warranty

TRENDnet offers a limited lifetime warranty for all of its metal-enclosed network switches that have been purchased in the United States/Canada on or after 1/1/2015.

- Cooling fan and internal power supply carry a one-year warranty

To obtain an RMA, the ORIGINAL PURCHASER must show Proof of Purchase and return the unit to the address provided. The customer is responsible for any shipping-related costs that may occur. Replacement goods will be shipped back to the customer at TRENDnet's expense.

Upon receiving the RMA unit, TRENDnet may repair the unit using refurbished parts. In the event that the RMA unit needs to be replaced, TRENDnet may replace it with a refurbished product of the same or comparable model.

In the event that, after evaluation, TRENDnet cannot replace the defective product or there is no comparable model available, we will refund the depreciated value of the product.

If a product does not operate as warranted during the applicable warranty period, TRENDnet shall reserve the right, at its expense, to repair or replace the defective product or part and deliver an equivalent product or part to the customer. The repair/replacement unit's warranty continues from the original date of purchase. All products that are replaced become the property of TRENDnet. Replacement products may be new or reconditioned. TRENDnet does not issue refunds or credit. Please contact the point-of-purchase for their return policies.

TRENDnet shall not be responsible for any software, firmware, information, or memory data of customer contained in, stored on, or integrated with any products returned to TRENDnet pursuant to any warranty.

There are no user serviceable parts inside the product. Do not remove or attempt to service the product by any unauthorized service center. This warranty is voided if (i) the product has been modified or repaired by any unauthorized service center, (ii) the product was subject to accident, abuse, or improper use, or (iii) the product was subject to conditions more severe than those specified in the manual.

Warranty service may be obtained by contacting TRENDnet within the applicable warranty period and providing a copy of the dated proof of the purchase. Upon proper submission of required documentation, a Return Material Authorization (RMA) number will be issued. An RMA number is required in order to initiate warranty service support for all TRENDnet products. Products that are sent to TRENDnet for RMA service must have the RMA number marked on the outside of return packages and sent to TRENDnet prepaid, insured and packaged appropriately for safe shipment. International customers

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shipping from outside of the USA and Canada are responsible for any return shipping and/or customs charges, including but not limited to, duty, tax, and other fees.

Refurbished product: Refurbished products carry a 90-day warranty after date of purchase. Please retain the dated sales receipt with purchase price clearly visible as evidence of the original purchaser's date of purchase. Replacement products may be refurbished or contain refurbished materials. If TRENDnet, by its sole determination, is unable to replace the defective product, we will offer a refund for the depreciated value of the product.

WARRANTIES EXCLUSIVE: IF THE TRENDNET PRODUCT DOES NOT OPERATE AS WARRANTED ABOVE, THE CUSTOMER'S SOLE REMEDY SHALL BE, AT TRENDNET'S OPTION, REPAIR OR REPLACE. THE FOREGOING WARRANTIES AND REMEDIES ARE EXCLUSIVE AND ARE IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, EITHER IN FACT OR BY OPERATION OF LAW, STATUTORY OR OTHERWISE, INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. TRENDNET NEITHER ASSUMES NOR AUTHORIZES ANY OTHER PERSON TO ASSUME FOR IT ANY OTHER LIABILITY IN CONNECTION WITH THE SALE, INSTALLATION, MAINTENANCE, OR USE OF TRENDNET'S PRODUCTS.

TRENDNET SHALL NOT BE LIABLE UNDER THIS WARRANTY IF ITS TESTING AND EXAMINATION DISCLOSE THAT THE ALLEGED DEFECT IN THE PRODUCT DOES NOT EXIST OR WAS CAUSED BY CUSTOMER'S OR ANY THIRD PERSON'S MISUSE, NEGLECT, IMPROPER INSTALLATION OR TESTING, UNAUTHORIZED ATTEMPTS TO REPAIR OR MODIFY, OR ANY OTHER CAUSE BEYOND THE RANGE OF THE INTENDED USE, OR BY ACCIDENT, FIRE, LIGHTNING, OR OTHER HAZARD.

LIMITATION OF LIABILITY: TO THE FULL EXTENT ALLOWED BY LAW, TRENDNET ALSO EXCLUDES FOR ITSELF AND ITS SUPPLIERS ANY LIABILITY, WHETHER BASED IN CONTRACT OR TORT (INCLUDING NEGLIGENCE), FOR INCIDENTAL, CONSEQUENTIAL, INDIRECT, SPECIAL, OR PUNITIVE DAMAGES OF ANY KIND, OR FOR LOSS OF REVENUE OR PROFITS, LOSS OF BUSINESS, LOSS OF INFORMATION OR DATE, OR OTHER FINANCIAL LOSS ARISING OUT OF OR IN CONNECTION WITH THE SALE, INSTALLATION, MAINTENANCE, USE, PERFORMANCE, FAILURE, OR INTERRUPTION OF THE POSSIBILITY OF SUCH DAMAGES, AND LIMITS ITS LIABILITY TO REPAIR, REPLACEMENT, OR REFUND OF THE PURCHASE PRICE PAID, AT TRENDNET'S OPTION. THIS DISCLAIMER OF LIABILITY FOR DAMAGES WILL NOT BE AFFECTED IF ANY REMEDY PROVIDED HEREIN SHALL FAIL OF ITS ESSENTIAL PURPOSE.

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Product Warranty Registration

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Please ensure your switch's firmware version is V2.10.010 or newer for full support of Layer 2+ management features. See the Firmware Upgrade section in this document for additional information regarding the firmware upgrade procedure.

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