ThruLink™ Series 3rd Generation Quick Start Guide

Introduction

Welcome to KBC Networks' Quick Start Guide for the ThruLink 3rd Generation Transmission Solution. This document provides a step-by-step guide to setting up a ThruLink server and client, and linking them together. This guide gives information about basic connectivity. For more detailed information, please refer to the downloads section below.

Assumptions

- You have a basic understanding of IP Networking
- You can set up port forwarding on the server side of the link
- If using Bridge mode, you have pre-planned the IP range and assignments

Downloads

Full specifications, features, and additional support information can be found on the KBC Networks website product page: www.kbcnetworks.com.

General

Inspect the product upon receipt for any visible damage that may have occurred during shipping.

System Contents

Qty	Description
1	ThruLink 3rd Generation unit
1	12 Vdc power supply for Standard Capacity/Standard Capacity Plus units*
1	24 Vdc power supply for High Capacity/High Capacity Plus units**
4	Antennas (2 x paddle and 2 x cable magnetic)***
1	Quick Start Guide

* Standard Capacity and Standard Capacity Plus units only.
** High Capacity and High Capacity Plus units only.
*** LTE units only.

Index

1. Connecting to ThruLink

Note: Please ensure that the wireless connection on your computer is disabled while carrying out this procedure. For each ThruLink in the setup, follow the instructions for the appropriate setup (Server or Client). The default topology is "route" mode. If you require MULTICAST or any other LAN-designed protocol, you will need "bridge" mode for the topology. Additional support documents and contact information are available on the KBC Networks website.

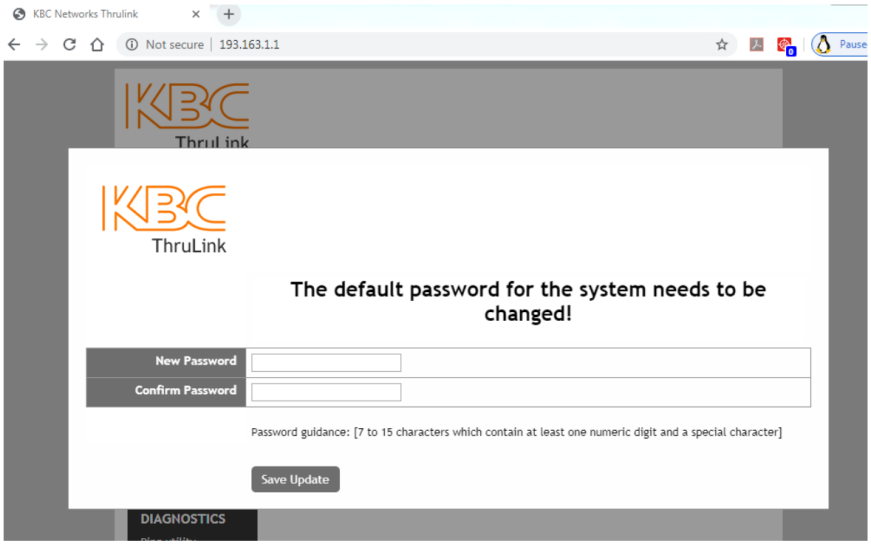
By default, ThruLink runs a DHCP service on the LAN port for convenience and the network range is 193.163.1.0/24 (ThruLink LAN IP is 193.163.1.1). If using Bridge mode, it is recommended that you disable DHCP mode on all units except the server unit.

1. Connect an appropriate RJ45 Ethernet cable to the ThruLink LAN port.
2. Connect power to the ThruLink unit.
3. Set the Ethernet port on your PC to DHCP.
4. Power up the ThruLink unit.
5. After a brief time, 15 to 30 seconds, ThruLink will provide an IP Address.
6. Open a browser on the PC, enter the LAN port's default IP address http://193.163.1.1, and press Enter.
7. You will be prompted to enter your username and password. The default username and password are set to **admin/admin**.

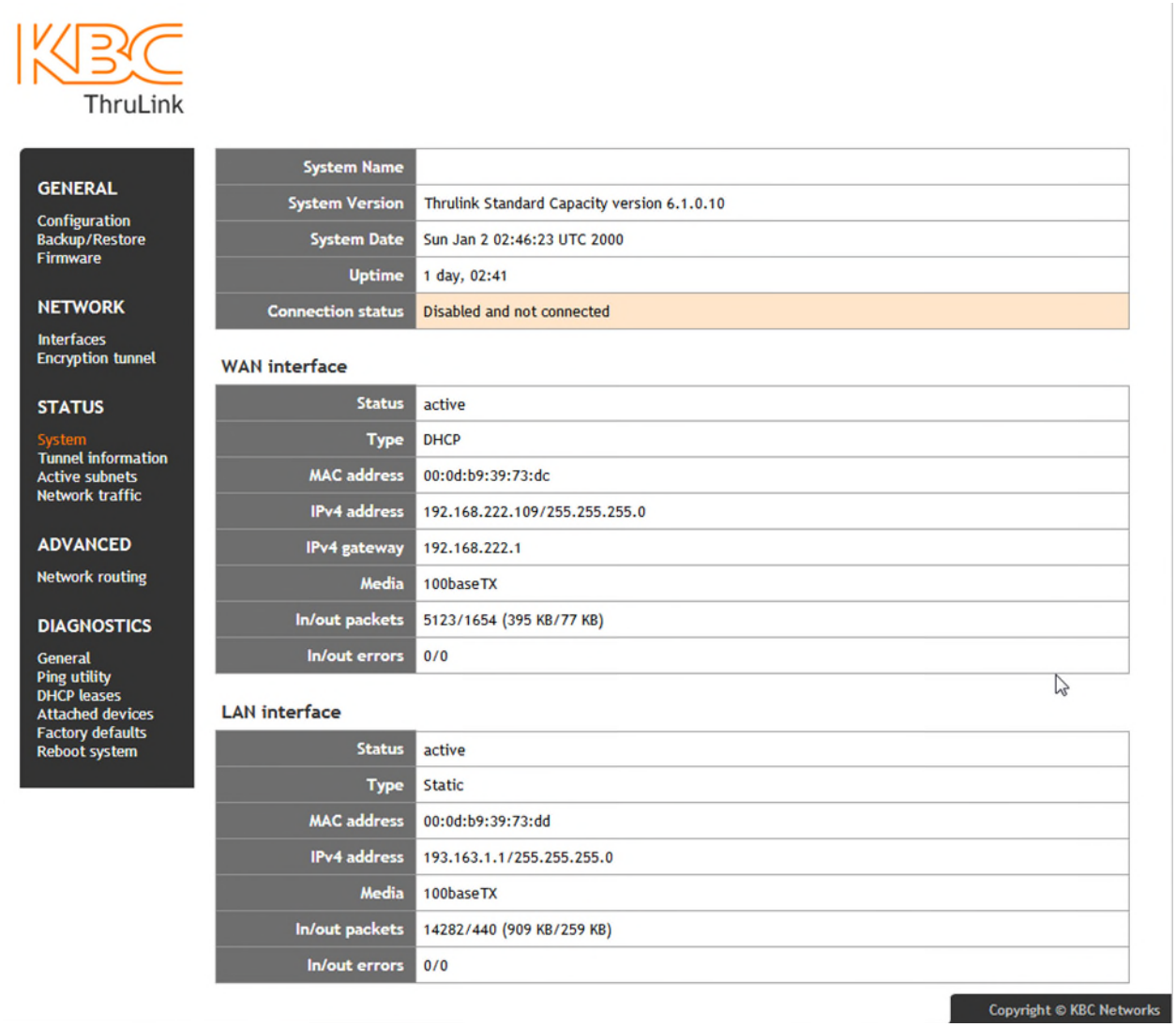
2. ThruLink GUI Default Password Change Policy

It is good practice to change the default password for the Graphical User Interface (GUI), even though this interface is not available by default on the WAN segment. The force password change policy has been implemented on all versions of ThruLink installed with version 6.1.0.18 onwards to facilitate this requirement. This policy is executed only when the device is in factory-default mode and will not affect any existing units that upgrade to the latest version while maintaining their current configuration.

The NEW password policy also has restrictions on characters that can be used. Any alphanumeric characters and any of the following special characters can be used in the passphrase: **! $ % ^ @ * ? #**

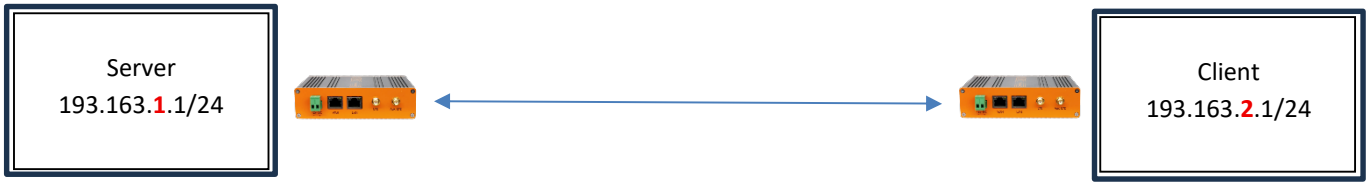


As soon as the password is changed, you will be prompted to log in again with the new password.
When your screen appears as shown below, you are connected to the ThruLink Web GUI and ready to start the configuration.



3. Route and Bridge Mode Explained

Route Mode: In route mode (LAYER3), each ThruLink would have a unique subnet, and the ThruLink system would manage the routing of all traffic as needed throughout the entire network. In the simple example below, a server and client, with the server configured with its own unique subnet on 193.163.1.xxx/24 and the client with its own unique subnet using 193.163.2.xxx/24. In this scenario, any device connected to the remote client would be configured with an IP address on the same subnet as the client, and ThruLink would automatically handle routing requirements across all remote clients.



The above two examples show that both units have their own unique .24 networks.

Bridge Mode: In bridge mode (LAYER2), the entire network operates as a single network, using the same subnet across all devices connected to it. In the system below, you can see that both ThruLink units are on the same /24 network of 193.163.1.xxx, but both ThruLink units have unique IP addresses (1 and 2). Every additional ThruLink and every additional device added to the network will also need to be configured with a unique IP address on the same subnet.

4. Design Your Network

Please ensure that you plan your implementation before you begin. Determine whether you require route or bridge mode initially, then design the IP addressing scheme you will use. For example, if using multiple types of devices, such as cameras and Building Management systems, you could consider a network map like this.

193.163.xxx.250 = ThruLink Units
193.163.xxx.20~50 = Cameras
193.163.xxx.60~80 = BMS sensors
193.163.xxx.90~100 = Computer systems/NVR/VMS

Remember that each ThruLink requires a unique name. In route mode, each ThruLink must be on a separate subnet. However, when using Bridge mode, all ThruLink units and all connected devices share a common subnet with unique IP addressing.

5. Configuring ThruLink as a Server

Each ThruLink Network requires at least one ThruLink acting as an Authentication Server.

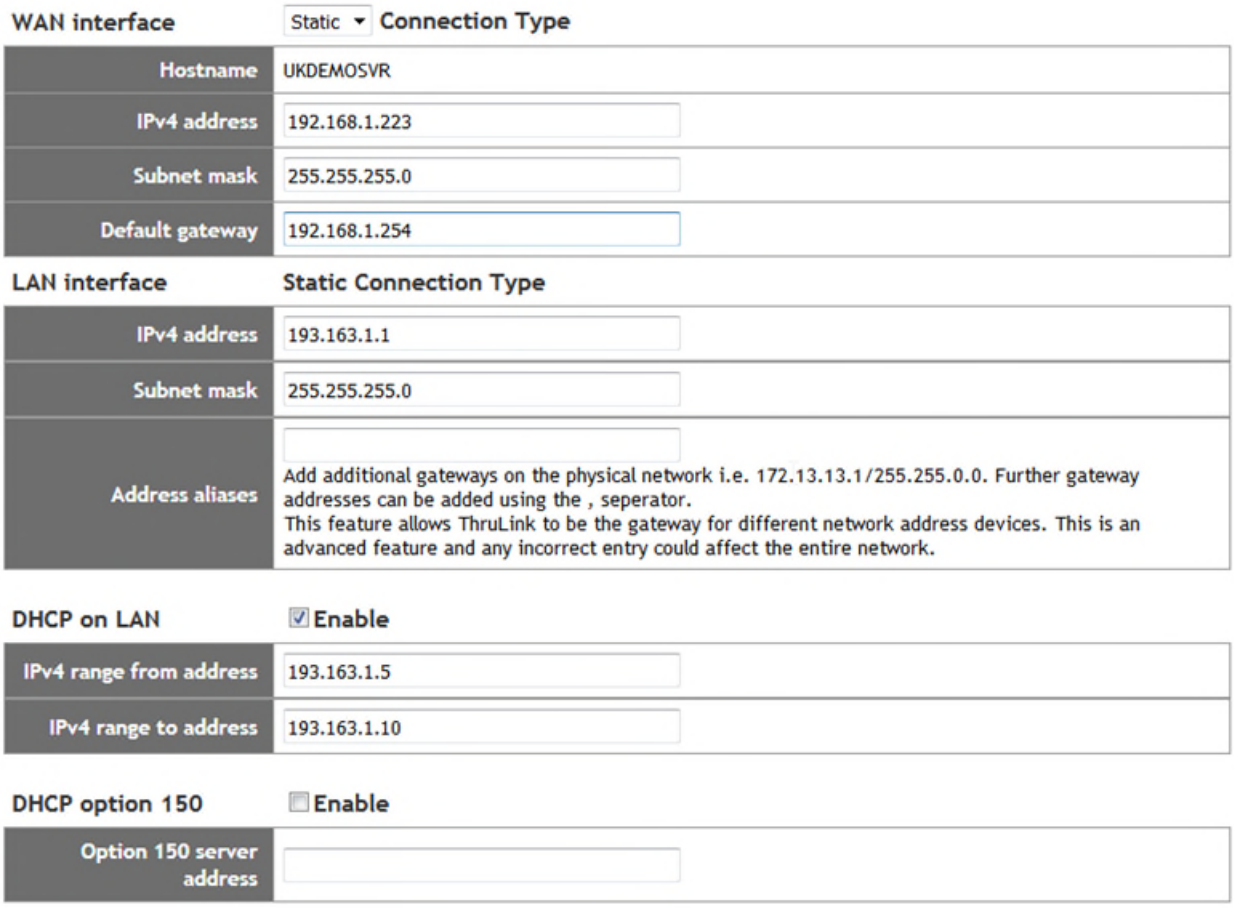
Important: *Ensure the steps in 'Connecting to ThruLink' have been followed.*

1. Click 'GENERAL->Configuration' menu link on the left and give ThruLink a unique name in the Hostname field (each ThruLink on the network requires a unique name).
2. Click 'Save Update' at the bottom of the page to validate the changes.
3. Click 'NETWORK-> Interfaces' menu link, set the WAN interface to 'static' (default is DHCP).
4. Configure the WAN interface IP address, Subnet, and gateway to place ThruLink on your local network. (You will be port-forwarding to this IP address).

Notes:

The WAN IPv4 address must be an IP address that is not already in use on the local network.
The default gateway IP will either be the router or the gateway switch on your local network.

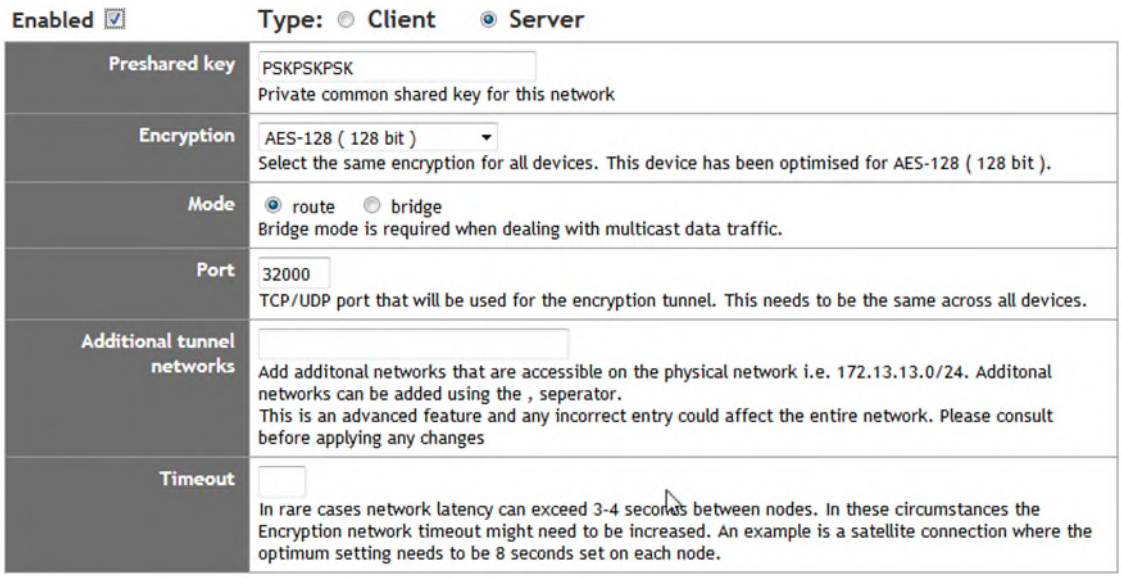
1. The LAN interface represents your private and secure local area network (LAN). The default range on ThruLink is 193.163.xxx.xxx, which you can change to meet your network requirements; however, we will leave the default IP address in place for the server for purposes of this guide. Note: This cannot be the same subnet as the WAN.
2. Click 'Save Update'.
3. The unit will prompt you to perform a reboot.
4. Log back in to the system using either the original or the new IP address. (If you forgot the IP address, open a command prompt and type 'ipconfig'. The IP address should be the gateway address shown if DHCP on the LAN interface is still enabled.
5. Click on 'NETWORK->Interfaces' and confirm that it looks like the image below. Your WAN IP Address may not be the same as the one in the image below.



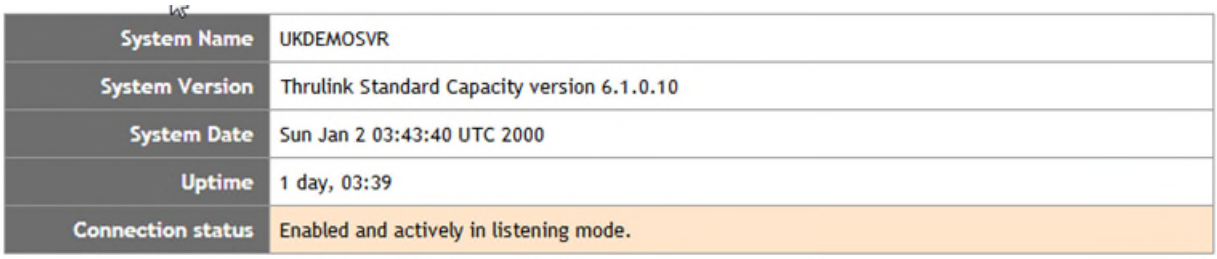
6. Click on 'NETWORK->Encryption tunnel' menu link on the left.
7. Click the 'Enabled' checkbox at the top and select 'Server' to the right.
8. Leave the default Preshared Key' PSKPSKPSK' for the setup.

Note: Please remember to change this value when implementing this system in a live environment to something more complicated. All ASCII characters are supported except the space character. You can use up to 50 characters, but no spaces. A good example of a key would be ***9@xrB7~5zB)/D3>3*qKf***. A good, strong key is important, but please do not use this example.

9. Leave the 'Encryption' set to 'AES-128' for this setup. (All ThruLink units on the same network must be configured with the same level of Encryption.)
10. Leave the 'Mode' setting (default: Route).
11. Leave the 'Port' setting (default: 32000).
12. Click 'Save update' and confirm your configuration is the same as the following image:



13. Click 'STATUS-> System' menu on the left. A similar indicator, like the following image, should appear:



14. Three modes of operation between Cellular, WAN and LAN:

    1) When Cellular is enabled, the WAN port is disabled by default if WAN Failover or Dual LAN is not set.
    2) If WAN Failover is enabled, both the Cellular and WAN ports can be the default gateway in a Primary and Secondary configuration.
    3) If Dual LAN is enabled, the WAN port will be assigned as an additional LAN port if the Cellular port is active.

6. Port Forwarding Between Internet Router and Server

The ThruLink in Server mode will be listening for remote clients trying to authenticate and join the network. Typically, the ThruLink Server is situated behind an internet router or other Internet-connected device with a firewall. For any remote connection to operate correctly, it must first establish a connection to the server; therefore, a single port must be open on the router or firewall. This is known as ***"Port forwarding,"*** *also sometimes referred to as a* ***"virtual server."***

Ports and port forward rules

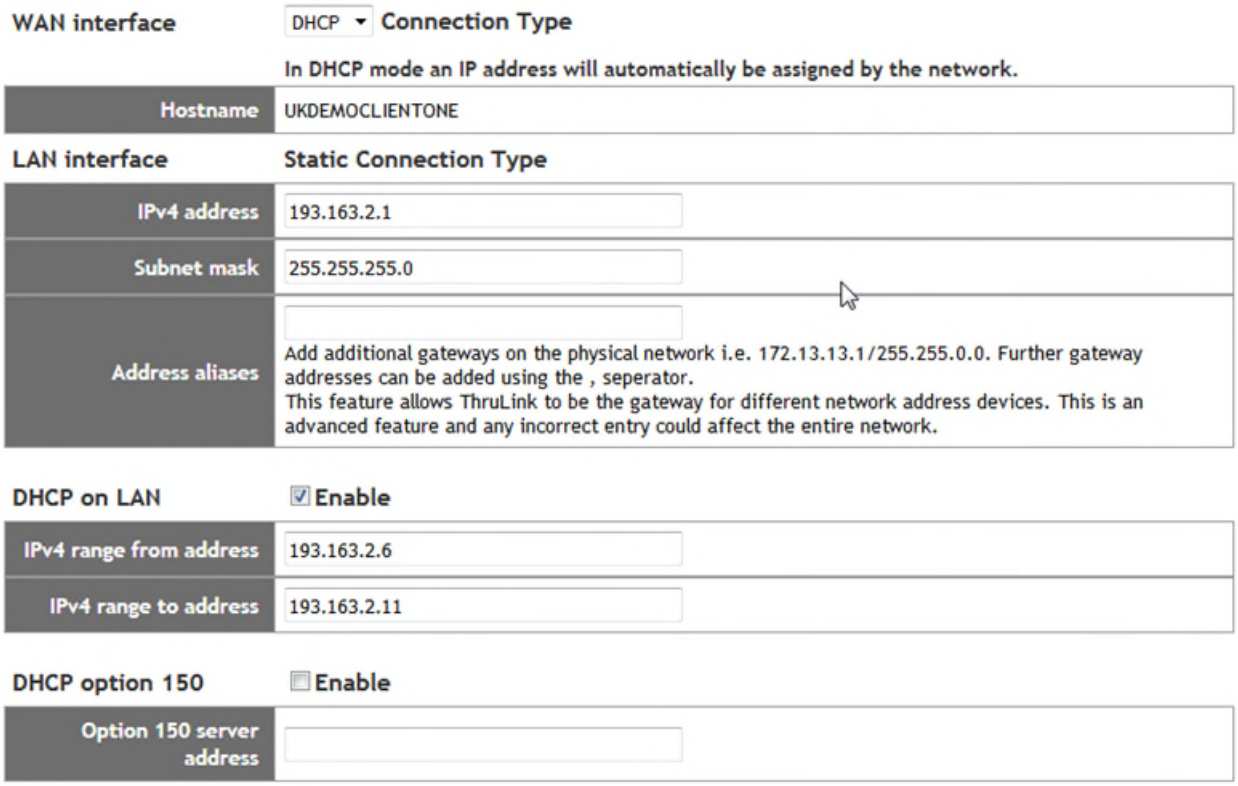
Every IP network device uses one or more of the 65,535 available ports to communicate with other devices. For example, the HTTP protocol uses port 80 and FTP uses port 21. The default port for ThruLink is 32000, which can be changed to your preferred port. For remote ThruLink clients to be able to authenticate with the ThruLink server, you need to forward port 32000 (or your preferred port) to the WAN IP address of the ThruLink server. You will need to ensure that both TCP and UDP ports are forwarded, and if possible, maintain two separate rules rather than one single rule for both.

If you change the default port, please note that all ThruLink units, including the server, must use the same port.

7. Configuring ThruLink as a Client

Important: *Ensure the steps in 'Connecting to ThruLink' have been followed*.

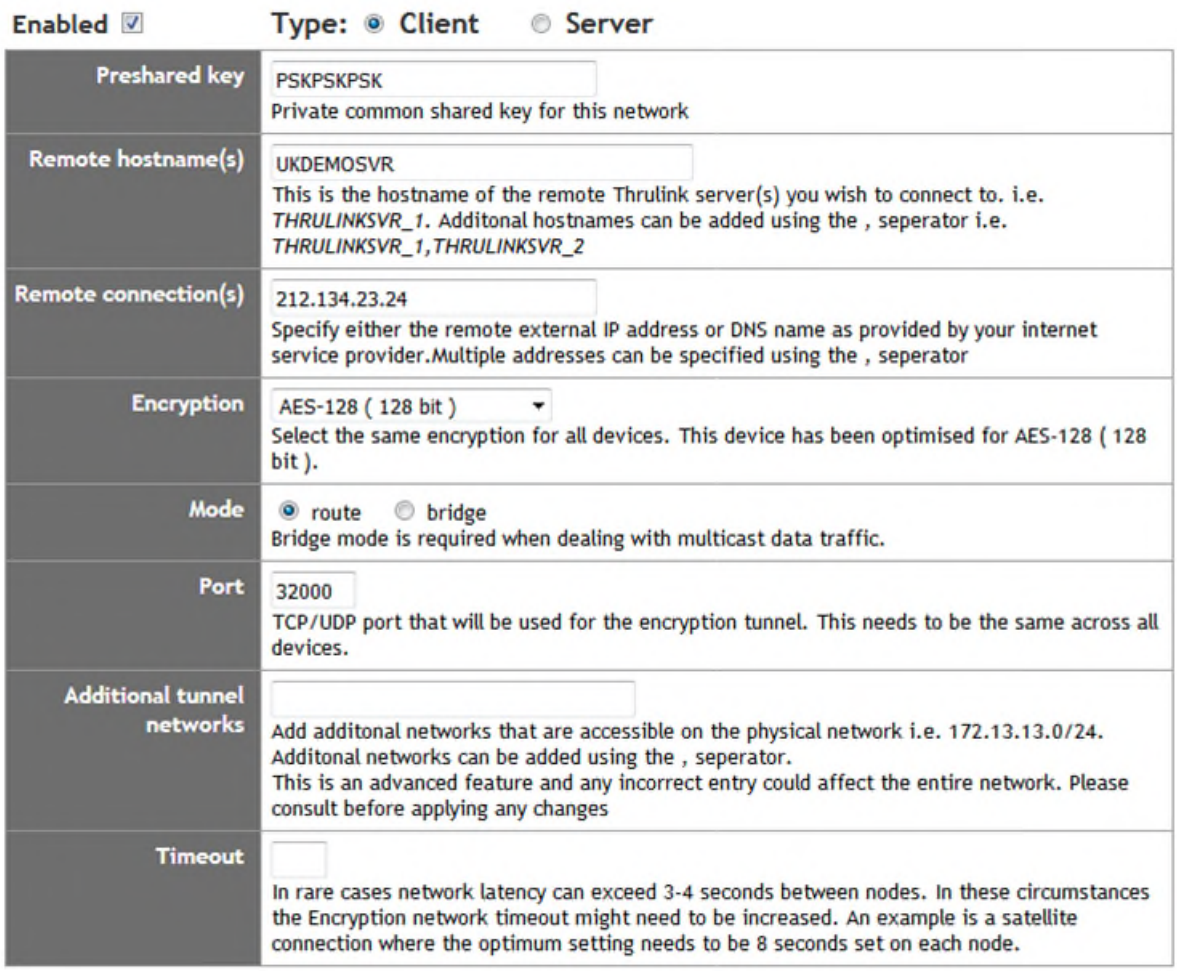
1. Click 'GENERAL->Configuration' menu link on the left and give ThruLink a unique name in the Hostname field (every ThruLink on the network requires a unique name).
2. Click 'Save Update' at the bottom of the page.
3. Click 'NETWORK-> Interfaces' menu link on the left and ensure the 'WAN Interface' is set to DHCP (*assuming it is connected or will be connected to a network that can supply DHCP*).
4. Set the 'LAN interface' to 193.163.2.1 (or a unique subnet of your choosing).
5. Click 'Save update' (you will be prompted to reboot the unit).
   Note: The DHCP Server is enabled, and the IP range will be updated to reflect the LAN IP address in use.
6. The unit will function after about 1 minute.
7. Log back into the system using either the same IP address or the new IP address (if you forgot the IP address, open a command prompt and type 'ipconfig'). The IP address should be the gateway address shown if DHCP is still enabled on the LAN interface.
8. Click on 'NETWORK->Interfaces' and confirm it looks like the following image:



9. Click on 'NETWORK->Encryption tunnel' menu on the left.
10. Click the 'Enabled' checkbox at the top and select 'Client' to the right of it.
11. Leave the default 'Preshared key' (PSKPSKPSK) for this setup.

Note: Please remember to change this value when implementing this system in a live environment to something more complicated. Any ASCII character is supported except the space character (all units must have the same key).

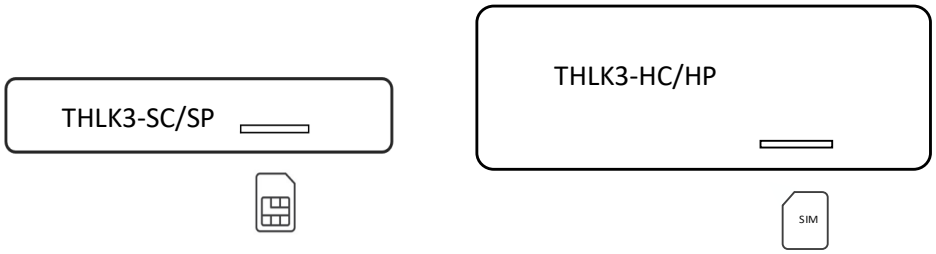
12. Type in the name of the server in the 'Remote host' field. This is the unique hostname you gave the server.
13. Type in the Public IP address of the router that the server is connected to in the 'Remote connection' field. (If performing this step on a local network, type in the static IP address configured on the server). If the server is behind a router or firewall, the public Internet address is the router's address.
14. Leave the 'Encryption' field set to 'AES-128' (128-bit).
15. Select 'Route' or 'Bridge' mode as set in the Server configuration (default: Route).
16. Set the 'Port' field to the same as the Server configuration (default: 32000).
17. Click 'Save update' at the bottom of the page and confirm that your setup matches the one shown in the following image.



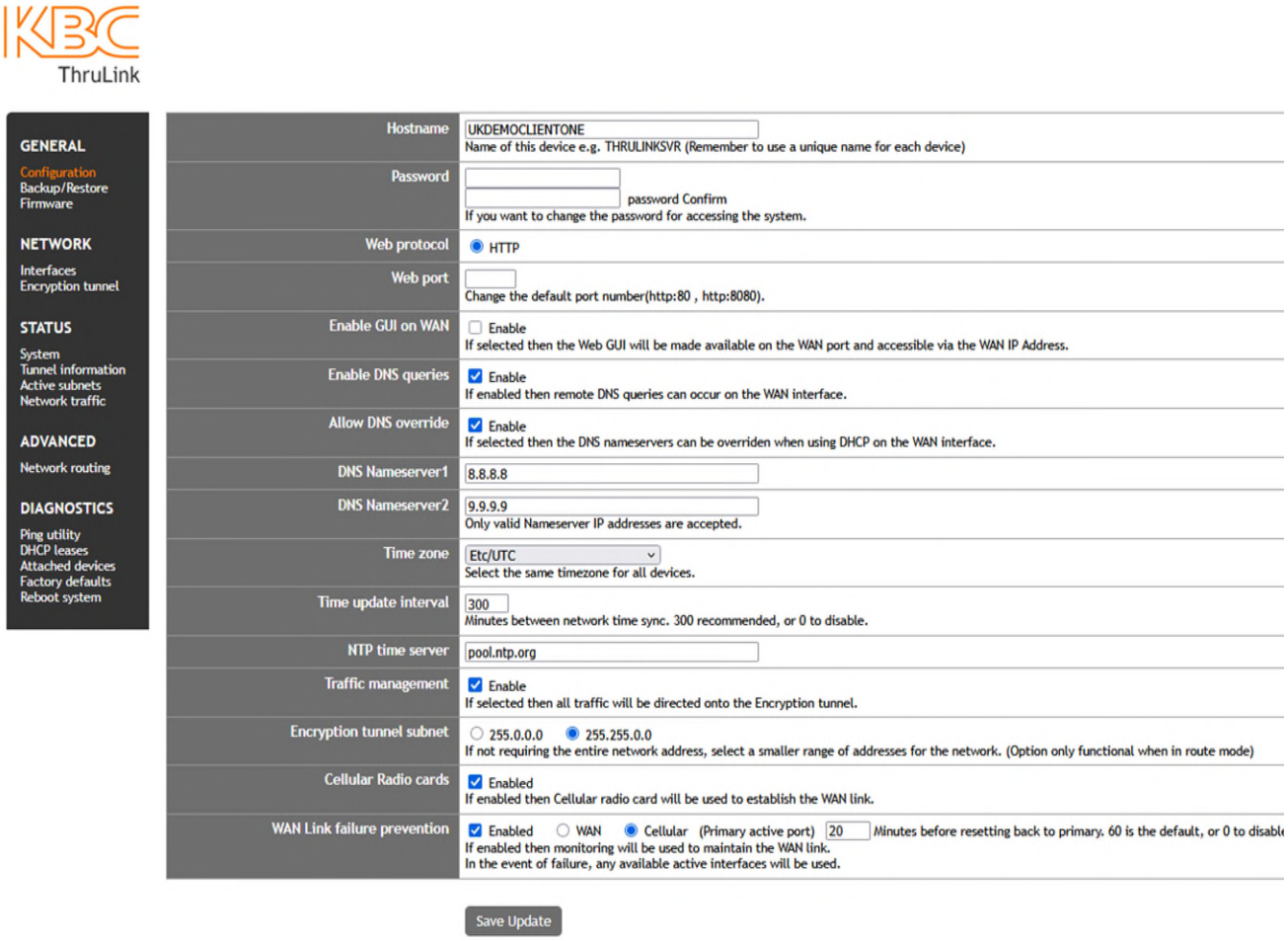
Note: The connection status between the Client and Server can be viewed via the 'STATUS-> System' menu (i.e., 'Enabled and actively connected to UKDEMOSVR', while 'STATUS->Tunnel information' and 'STATUS->Active subnets' displays each ThruLink on the secured encryption network.

8. Configuring ThruLink LTE as a Client

Important: *Ensure the steps in 'Connecting to ThruLink' have been followed.*
Ensure the DATA SIM has been inserted in the SIM slot before powering up the unit.
(THLK3-SC/SP: copper side up, notch first – SIM holder has a push click mechanism)
(THLK3-HC/HP: copper side down, notch first – SIM holder has a push click mechanism)



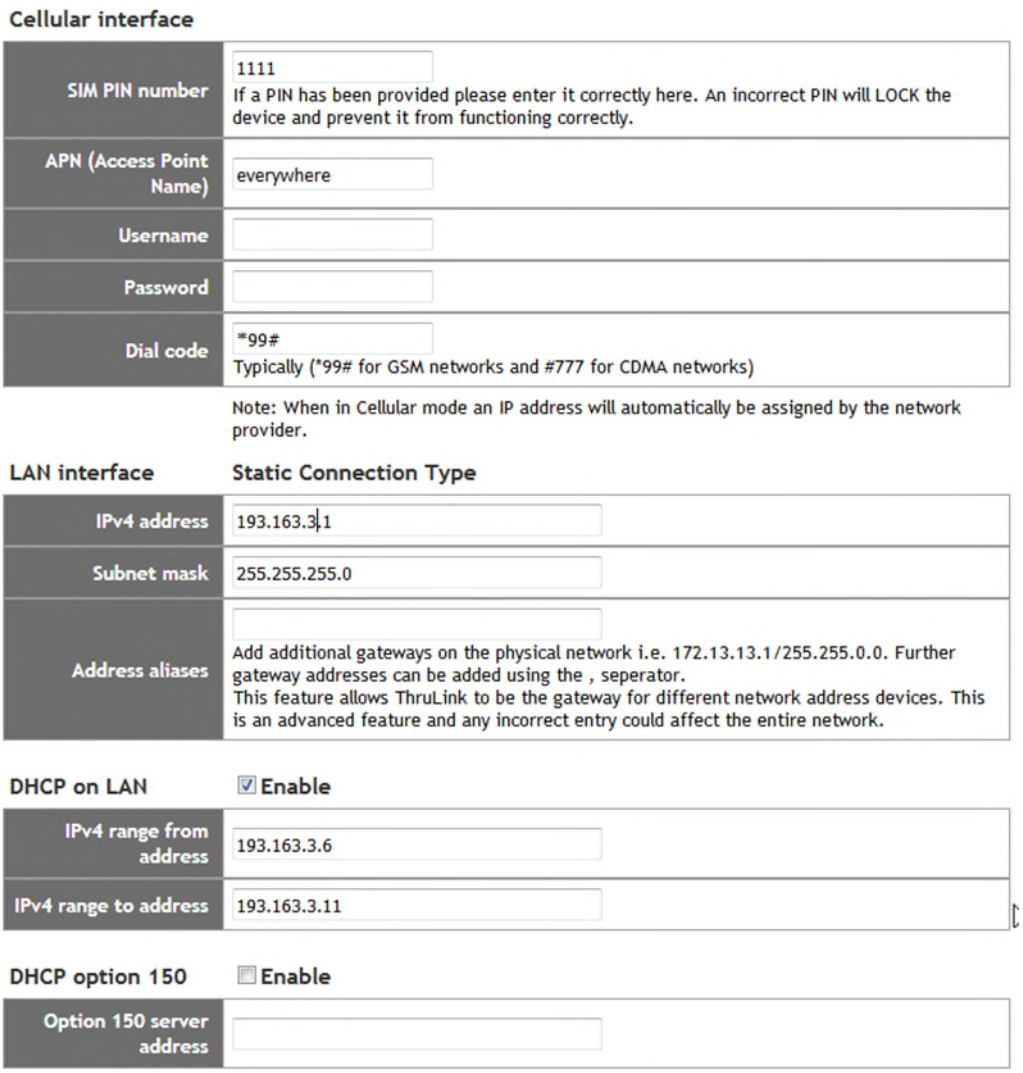
1. Click 'GENERAL->Configuration' menu link on the left and give ThruLink a unique name in the Hostname field (every ThruLink on the network requires a unique name).
2. Ensure 'Cellular Radio Cards' is enabled.
3. Enable WAN Link failure prevention if the unit is to be positioned in a static area. This feature must remain unchecked if used in a moving vehicle.
4. Click 'Save update' at the bottom of the page and confirm your setup is the same as the following image:



5. Click 'NETWORK-> Interfaces' menu and set the 'Sim PIN number' field if you were provided with a SIM PIN.
6. Set the 'APN (Access Point Name)' field. Your provider can supply this, or contact support for help, or you may find it on our APN list at the following address: https://www.kbcnetworks.com/apns
7. Set the 'Username and Password' fields if you were provided this information (typically not required).
8. Set the 'Dial code' if connected to a GSM CDMA only network (the default value is suitable for most LTE networks).
9. Set the 'LAN interface' to 193.163.3.1 (or a unique subnet of your choosing).
10. Click 'Save update' (you will be prompted to reboot the unit).

Note: The DHCP Server is enabled, and the IP range will be updated to reflect the LAN IP address used.

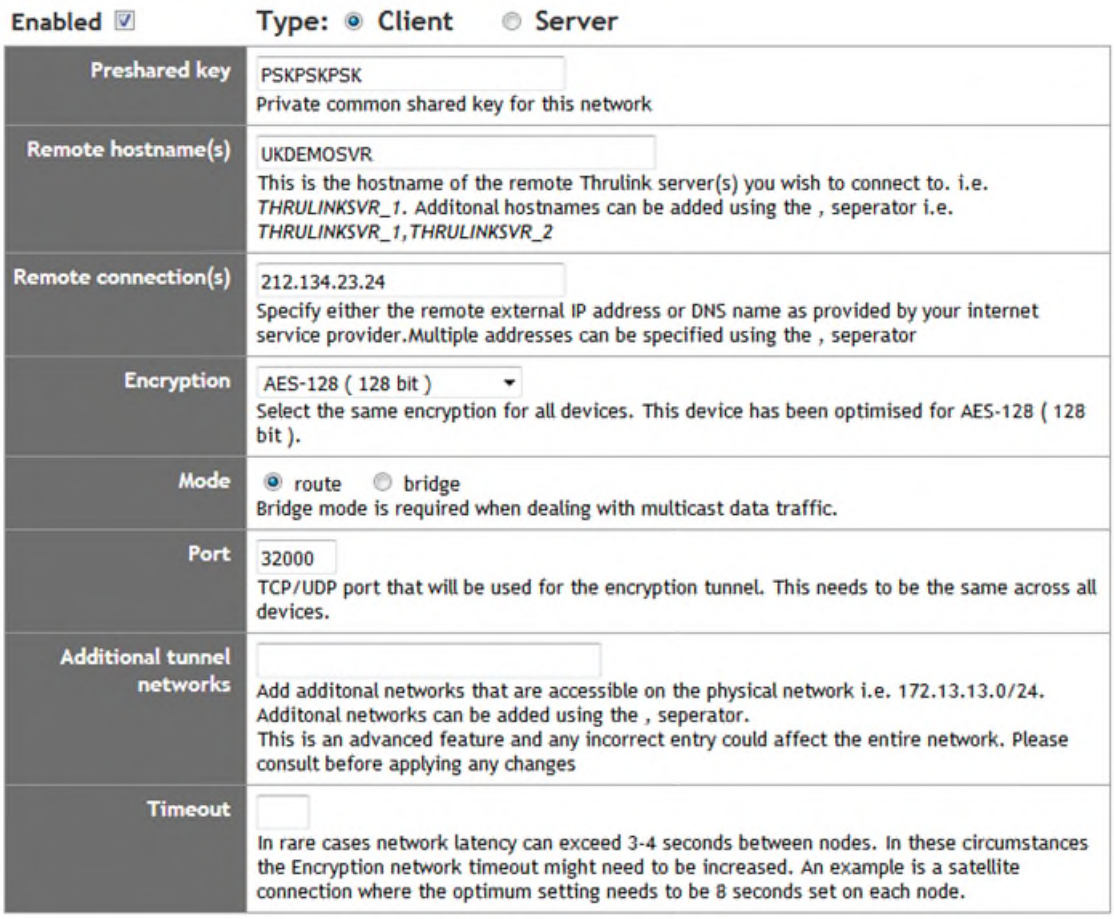
11. The unit will function after about 1 minute.
12. Log back in to the system using the same IP address or the new IP address (if you forgot the IP address, open a command prompt and type 'ipconfig'). The IP address should be the gateway address shown if DHCP is still enabled on the LAN interface.
13. Click on 'NETWORK->Interfaces' and confirm it looks like the following image:



14. Click on 'NETWORK->Encryption tunnel' menu on the left.
15. Click the 'Enabled' checkbox at the top and select 'Client' to the right of it.
16. Leave the default 'Preshared key' (PSKPSKPSK) for this setup.

Note: Please remember to change the preshared key value when implementing this system in a live environment to something more complicated. All ASCII characters are supported except the space character (all units must have the same key).

17. Type in the name of the server in the 'Remote host' field.
18. Type in the Public IP address of the router that the server is connected to in the 'Remote connection' field. (If performing this on a local network, type in the static IP address configured on the server.
19. Leave the 'Encryption' field set to 'AES-128' (128-bit).
20. Select 'Route' or 'Bridge' mode as set in the Server configuration (default: Route).
21. Set the 'Port' field to the same as the Server configuration (default: 32000).
22. Click 'Save update' at the bottom of the page and confirm your setup is the same as the following image:



Note: The connection status between the Client and Server can be viewed via the 'STATUS-> System' menu (i.e., 'Enabled and actively connected to UKDEMOSVR', while 'STATUS->Tunnel information' and 'STATUS->Active subnets' show all ThruLink units on the encrypted ThruLink network.

9. Working with Multiple Remote Clients

If you are working with multiple remote clients, it is advisable to follow the procedure below to ensure that there are no typos or errors in the configuration.

1. Create a document listing the name and LAN IP address for each ThruLink unit.
2. Configure a single client and confirm it is connecting correctly. You should see a statement like the pink line below that shows the connection.

System Name	LTEDEMO7
System Version	Thrulink Standard Capacity version 6.1.0.10
System Date	Sun Apr 8 15:50:40 UTC 2018
Uptime	00:11
Last config change	Sun Apr 8 15:50:27 UTC 2018
Connection status	Enabled and actively connected to KBCUK.

3. Go to the Backup/Restore section on the working client and create a configuration backup (note that this is encrypted for security).
4. Power on and log in to the new client.
5. Go to Backup/Restore and restore the backup from the previous unit (this will force a restart).
6. Please remember to access the unit using the new LAN IP address, not the default one.
7. Go to the configuration page and update the hostname of the new client (client2, etc.).
8. Click the Save update at the bottom.
9. Go to the Interfaces page and change the LAN IP.

Notes:

- In bridge mode, the IP will remain in the same subnet but not conflict with any other IP addresses.
- In route mode, the subnet must be unique.
- The default 193.163.1.1/255.255.255.0 is one unique subnet. On the second unit, change it to 193.163.2.1/255.255.255.0 to ensure it is a unique subnet.

10. Click save update, and the unit will request a restart again.
11. Once restarted, log back in with the new IP address and test to ensure a successful connection.
12. Repeat this process for each client, noting the name and corresponding LAN IP address for each.

The ThruLink setup configuration is complete!

10. Troubleshooting

1. The client is unable to connect to the server.
    a. Does the client have a working internet connection?
    b. Use the ping utility built into the ThruLink GUI to ping a known-working IP address, such as Google's DNS server, 8.8.8.8. If you do not get a positive response, then your ThruLink does not have a working internet connection.
    c. Assuming the ping is successful, confirm that the IP address you instruct the client to connect to is correct and that the pre-shared keys match both the server and the clients.
    d. Using Telnet on your computer or phone, connect to the server's public IP address on the selected network port, as follows.

    TELNET 80.80.80.80 32000 (replace 80.80.80.80 with your servers public IP

    If the port-forwarding rules are working correctly, you should see the name of your server and a string of characters displayed. If you do not see this and are certain the IP and port are correct, it is likely that the port rules are either not set up correctly or are pointing to the wrong IP address.

11. ThruLink3 Reset Utility

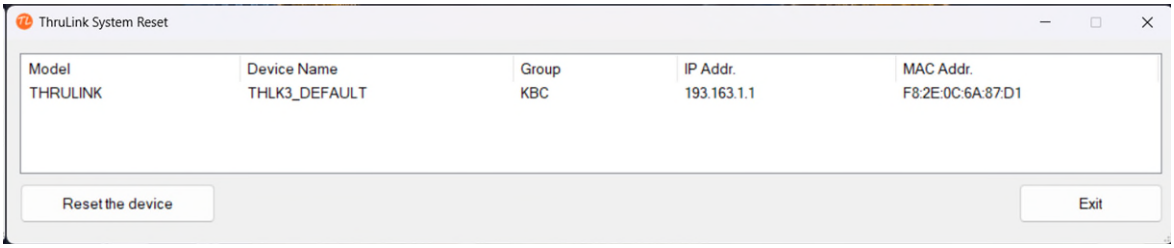
ThruLink3 uses a reset utility to perform a factory reset on the unit. This is typically used when you have forgotten the LAN port's IP address or the password to log in to the device's GUI.

The reset utility can be downloaded from the following link
https://www.kbcnetworks.com/support/download-resources/thrulink-3-reset-utility/download

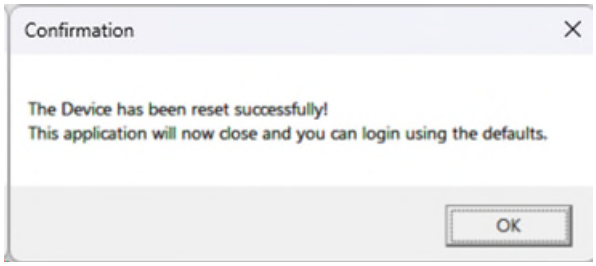
Please follow the guide below to reset the ThruLink3.

1. Download the utility from the link above.
2. Extract the zip file to your computer.
    a. The zip file contains the following two files: ***thlksysreset.exe, Newtonsoft.Json.dll***
3. Please make sure the ThruLink unit is powered off.
4. Connect your computer Ethernet port to the LAN port of the ThruLink.
5. Disable all other network connections on your computer (Wireless, secondary LAN, VPN, Virtual devices, etc.).
6. Power up the ThruLink and wait for approximately 10 seconds.
7. After 10 seconds, right-click the Reset utility software and select Run as administrator.
8. Once open, you should see the following window:

9. After a few seconds, the software should detect your ThruLink unit, and the display should refresh to show your device, as shown below (note that your device name, IP address, etc., may not be the same).



10. Select the ThruLink unit from the list, then click the "Reset the device" button in the lower left.
11. You should get this message to confirm:



Your ThruLink will now restart and be reset to its factory defaults. You can now open a web browser and go to http://193.163.1.1, then log in with the default admin/admin credentials.

12. Warranty

Warranty information can be found at www.kbcnetworks.com.

Need Help/Troubleshooting?

Visit our website www.kbcnetworks.com or contact your nearest KBC office or dealer:

USA:
Phone: +1 949-503-3470
Toll Free: +1 888-366-4276

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