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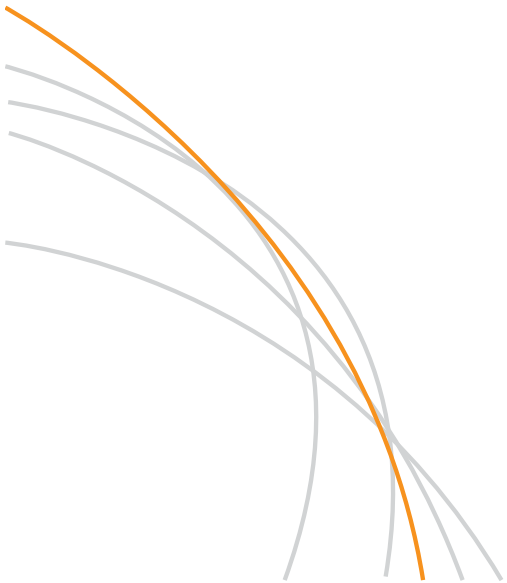
ThruLink®

LAN/WAN Transmission Systems

Operations Manual



Version 20110519

PREFACE

PART NUMBER CONFIGURATOR

THLK - ☐ ☐ - ☐ X

THLK Product Series

☐ Throughput Capacity Indicator (S= Standard; H= High)

☐ Number of Ethernet Ports (2= 1 LAN and 1 WAN; 3= 2 LAN and 1 WAN)

☐ Chassis style (W= wall mount; R= rack mount)

X Power Supply plug type (A= US; B= UK; C= Europe)

KBC THRULINK PART NUMBERS

This operations manual covers the following part numbers:

DESCRIPTION	KBC PART NUMBER
Standard Capacity unit with 1 LAN port:	THLK-S2-Wx
Standard Capacity unit with 2 LAN ports:	THLK-S3-Wx
High Capacity server unit:	THLK-H2-Rx

Note: Standard capacity only available in wall mount, high capacity only available in rack mount.

Accessories:

1000 mA 12 VDC non-regulated power supply*	PS-1000-x

* One included in THLK-S series kits, not used for THLK-H series

PRODUCTS INCLUDED IN KITS

THLK-S series
Qty 1: ThruLink Standard Capacity unit with appropriate number of LAN ports (according to selected part number)
Qty 1: 1000 mA power supply with appropriate plug
Qty 1: Operations manual
Note: a manual may only be included in one box if multiple units are ordered

THLK-H series
Qty 1: ThruLink High Capacity server. Unit must be in environmentally conditioned location
Qty 1: Power cord with appropriate plug
Qty 1: Operations manual
Note: a manual may only be included in one box if multiple units are ordered

PREFACE (CONTINUED)

TECHNICAL SUPPORT AVAILABILITY

This manual is comprehensive to the extent that it will answer many of your technical questions. Our toll free technical assistance is available should you require additional assistance. KBC offers technical support over the phone or by way of e-mail to all KBC qualified integrators on the ThruLink product. The North American technical support hotline is available during regular US west coast business hours, Monday through Friday on all non-major holiday business days. KBC will follow up on all electronic inquiries before the end of the following business day. See below for global tech support.

NORTH AMERICA
888-366-4276: Monday – Friday 10am-8pm Eastern (7am-5pm Pacific)
techsupport@kbcnetworks.com: 24hr availability, response time varies

HAWAII & ALASKA / GUAM, PR & OTHER US TERRITORIES
949-297-4930: Monday – Friday 7am-5pm Pacific Time
techsupport@kbcnetworks.com: 24hr availability, response time varies
Note: the toll free 800# does not work from Alaska

CENTRAL / SOUTH AMERICA
techsupport@kbcnetworks.com: 24hr availability, response time varies

ASIA
apactechsupport@kbcnetworks.com: 24hr availability, response time varies

SOUTH PACIFIC / PACIFIC ISLANDS
apactechsupport@kbcnetworks.com: 24hr availability, response time varies

EUROPE
+44(0)1622 418782: Monday – Friday 9am-5pm UK Time
emeatechsupport@kbcnetworks.com: 24hr availability, response time varies

MIDDLE EAST
emeatechsupport@kbcnetworks.com: 24hr availability, response time varies

AFRICA
emeatechsupport@kbcnetworks.com: 24hr availability, response time varies

Technical Support is offered in English, however, KBC has worldwide representatives who can provide technical support in many local languages.

Please note: technical assistance is available after having read through this manual. Comprehension of terms and topics will assist in trouble-shoot procedures.

IMPORTANT SAFETY INSTRUCTION

For your protection, please read and observe all safety instructions before operating this system and keep this sheet and any additional instructions for future reference.

INSTALLATION & USE

OBSERVE WARNINGS: All warnings in the operating instructions should be carefully followed. Do not make any modifications to the ThruLink unit, or any other KBC electronic device, as the device(s) will no longer comply with FCC/IC (or applicable) regulations and therefore cancel its warranty.

WATER AND MOISTURE: The ThruLink devices are not weatherproof and are designed to be located indoors or in a suitable weatherproof enclosure. Exposure to moisture can result in severe electrical shock, personal injury or damage to the equipment.

POWER SOURCE: Connect the equipment to a power source only of the type described on the operating instructions or as marked on the equipment. Excessive or insufficient amperage or voltage can cause extended trouble-shooting or even damage that could negate its warranty.

ATTACHMENTS: Use only KBC supplied or recommended Power Supplies or cords, Cat5/6 Cables, etc.

WHEN NOT IN USE: Unplug the power if the equipment is left unattended or unused for long periods of time or during lightning storms.

REPLACEMENT PARTS: When replacement parts are required, use only replacement parts specified by KBC. Unauthorized substitutions may result in damage to the system and could void the warranty. Replacement ThruLink units are available. Check the part number configuration key on page “i”.

HIGH CAPACITY ENVIRONMENTAL CONDITIONING

The High Capacity ThruLink is an industrial server and must be stored in a conditioned environment. Maintain temperature ratings in the server room within the temperature threshold as stated on the device specifications and ratings.

Rack Mount Instructions - The following or similar rack-mount instructions are included with the installation instructions:

A) Elevated Operating Ambient - If installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than room ambient. Therefore, consideration should be given to installing the equipment in an environment compatible with the maximum ambient temperature (Tma) specified by the manufacturer.

B) Reduced Air Flow - Installation of the equipment in a rack should be such that the amount of air flow required for safe operation of the equipment is not compromised.

C) Mechanical Loading - Mounting of the equipment in the rack should be such that a hazardous condition is not achieved due to uneven mechanical loading.

D) Circuit Overloading - Consideration should be given to the connection of the equipment to the supply circuit and the effect that overloading of the circuits might have on overcurrent protection and supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern.

E) Reliable Earthing - Reliable earthing of rack-mounted equipment should be maintained. Particular attention should be given to supply connections other than direct connections to the branch circuit (e.g. use of power strips)."

CAUTION: Risk of Explosion if Battery is replaced by an Incorrect Type. Dispose of Used Batteries According to the Instructions.

TABLE OF CONTENTS

Thrulink Operations Manual

THRULINK EASY SET UP PROCEDURES

KBC recommends that all equipment be bench tested before being installed onsite.

1. Obtain needed network information for available IP addresses. The following information may be required:
   - Available public IP address, subnet mask, gateway (if using over public WAN) at all locations
   - Available private IP address, subnet mask, gateway (if using private LAN) at all locations
2. Connect a PC/laptop running Windows® XP, Vista or 7 Operating System using an Ethernet standard straight-through* Cat5 (or Cat6) cable to the LAN port. *Type of cable is usually determined by the laptop Ethernet port. If using a 10/100 port, a crossover cable may be required. If using a gigabit port, the straight-through cable should connect to the ThruLink.
3. Connect the supplied 12 VDC 1000mA power supply to the DC jack as labeled on the Standard Capacity (SC). Connect the power supply to a sufficient voltage suppression device.
4. Configure the static setting of your connected PC/laptop to match the LAN setting of the ThruLink. Default setting is 192.168.1.10
5. Allow approximately 45 seconds for the device to boot up.
6. Open a web browser and enter the LAN configuration (default: https://192.168.1.10). *The web browser is only accessible using the secure https IP.* Accept the certificate as the connection to the ThruLink device is safe.
7. The following settings will need to be configured for communication *at the bench test level:*

   Server Configuration
   STEP 1: Click on "Set Up"
   STEP 2: Change TUNNEL MODE from DISABLED to SERVER
   STEP 3: Configure WAN settings as necessary or leave as 192.168.0.10
   STEP 4: Click Save and Reboot

   Client Configuration
   STEP 5: Click on "Set Up"
   STEP 6: Change TUNNEL MODE from DISABLED to CLIENT
   STEP 7: Enter Server WAN IP (from Step 3 above) as Client Primary Server IP Address. (Default Server WAN IP is 192.168.0.10)
   STEP 8: Configure WAN settings as necessary or change to 192.168.0.11 to avoid conflict with Server WAN IP
   STEP 9: Configure LAN setting to avoid conflict with Server LAN IP by changing to 192.168.1.11 or other available LAN address
   STEP 10: Click Save and Reboot

Visit www.thrulink.net/TLV2 to view a brief web tutorial for 2 minute KBC ThruLink tunnel set up procedure

KBC RETURN POLICY

KBC network products come with a 2-year limited warranty, (see the last page for warranty information) unless otherwise specified. In addition to the 2-year warranty, products may be returned within thirty (30) days of shipment provided the products are in new condition and in the original packaging. Contact your KBC dealer or distributor to obtain an authorization to return the merchandise for credit.

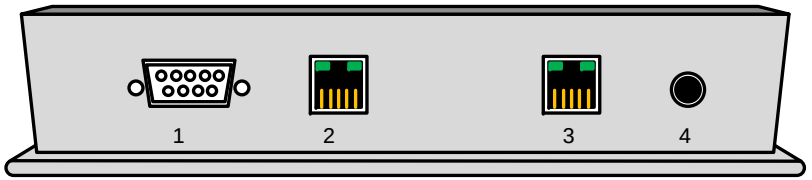
Return authorizations for repair can be sent directly to KBC with a valid RA number. RA's are issued to KBC distributors, dealers or integrators with a valid resale license. End-users should return products through their KBC dealer who can call or e-mail KBC to obtain an RA number for repair.

THRULINK PHYSICAL DETAILS – STANDARD CAPACITY

STANDARD CAPACITY SINGLE & DUAL LAN PORT (THLK-S2-Wx, THLK-S3-Wx)

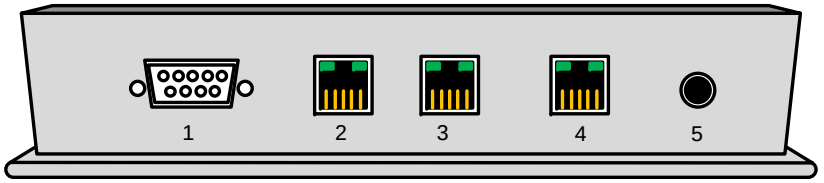
A. REAR VIEW – THLK-S2-Wx

1. Serial Port
2. LAN Port
3. WAN Port
4. Power Input Port



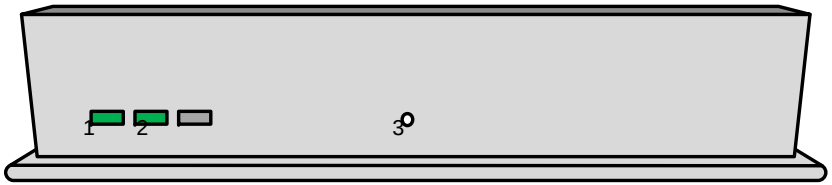
B. REAR VIEW – THLK-S3-Wx

1. Serial Port
2. LAN Port #1
3. LAN Port #2
4. WAN Port
5. Power Input Port



C. FRONT VIEW – THLK-S2-Wx & THLK-S3-Wx

1. Power LED
2. Disk LED
3. Soft Reboot Button



THRULINK PHYSICAL DETAILS – HIGH CAPACITY

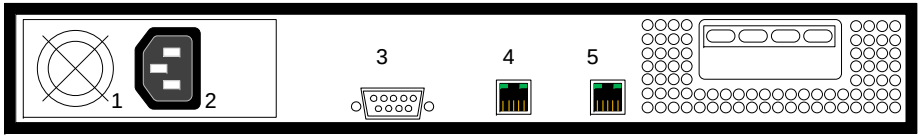
HIGH CAPACITY

To turn on: Hold ✔ **button for two seconds.**

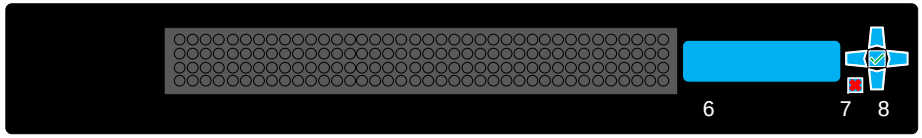
A. REAR VIEW

To turn off: Hold ✖ **button for two seconds.**

1. Fan
2. Power Input Port
3. Serial Connection
4. WAN port
5. LAN port



B. FRONT VIEW



6. LCD Display
7. Power (Off). Hold for two seconds
8. Power (On). Hold for two seconds

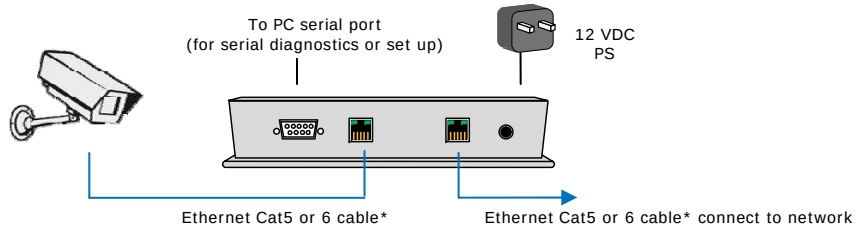
C. DIGITAL DISPLAY

`KBC Networks, Ltd.`	Boot up screen
`NetLoad (Bytes)`	Amount of load on the server in bytes
`CPU: 123456a-b`	CPU ID
♥	Heart rate. Used to show unit is active

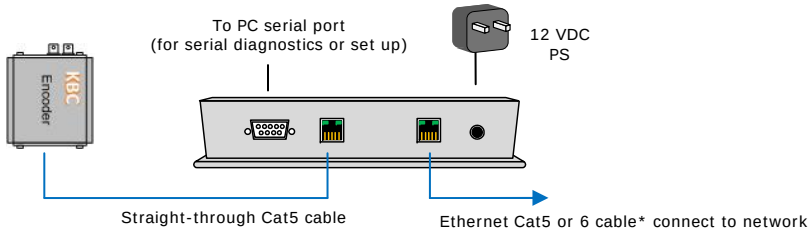
THRULINK CONNECTION DIAGRAM

The following wiring schemes represent the configuration that has been tested and verified by KBC based on typical Ethernet wiring solutions. Other wiring configurations could be possible based on the application. A bench test is recommended to verify the design below.

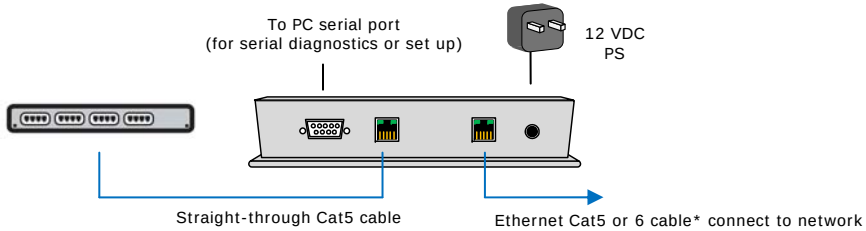
CONNECTING TO AN IP CAMERA



CONNECTING TO A KBC ENCODER OR DECODER



CONNECTING TO AN ETHERNET 10/100/1000 SWITCH

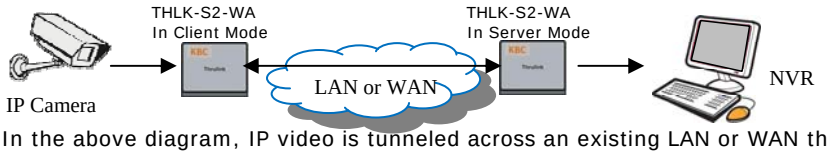


* Type of Ethernet cable is determined by the Ethernet device LAN port. If the LAN port is a 10/100 port then the connection may require a crossover cable. If the port is a gigabit connection then a straight-through cable should be used. KBC recommends that both types of cables are on hand in case your particular device requires a different configuration than what KBC has tested.

THRULINK TOPOLOGY

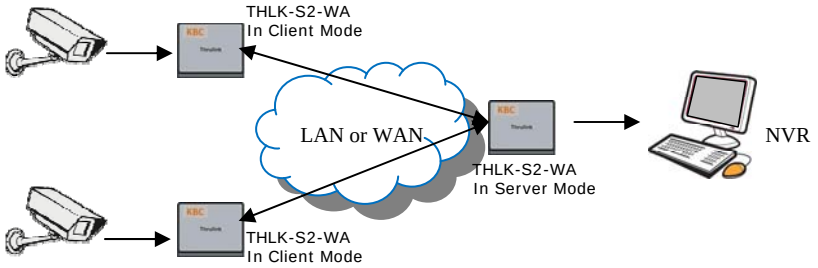
The KBC ThruLink creates a tunnel between a Server and its associated Client device/s. The connection can be one Client to one Server or multiple Clients to one Server. In addition, if a second Server is deployed, it can act as a fail over Server for any of the Clients whose primary Server is a different unit. High Capacity (HC) units are often used as servers with several Client Standard Capacity units set to connect to the HC. The following are simple diagrams of a few of the topologies which can be created.

STANDARD CAPACITY - POINT TO POINT

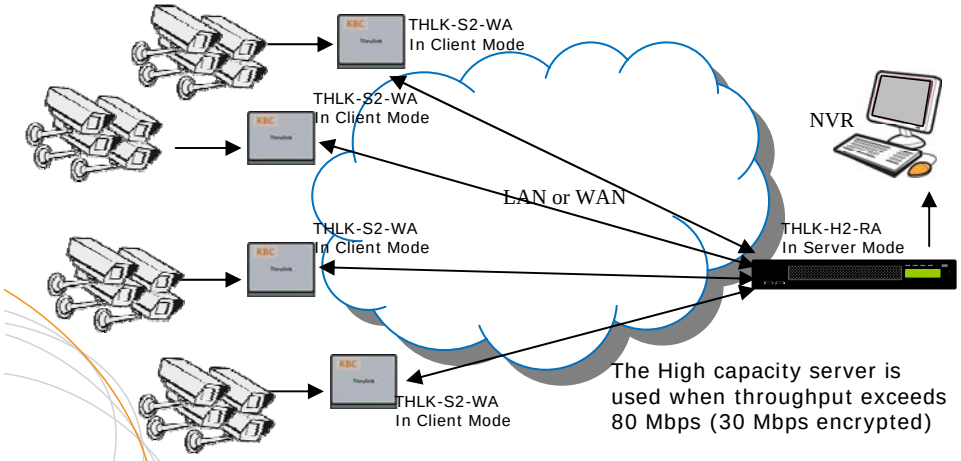


In the above diagram, IP video is tunneled across an existing LAN or WAN through the ThruLink Client and Server to an NVR.

STANDARD CAPACITY - MULTIPOINT



SEVERAL STANDARD CAPACITY LOCATIONS TO ONE HIGH CAPACITY SERVER



The High capacity server is used when throughput exceeds 80 Mbps (30 Mbps encrypted)

THRULINK TUNNEL SET UP

A. OBTAIN NETWORK INFORMATION TO CONFIGURE WAN SETTINGS
KBC recommends that network information be retrieved from the network administrator.

B. ESTABLISHING AND UNDERSTANDING THE THRULINK TUNNEL
Out of the box, the ThruLink units are set to default "Tunnel Mode Disabled." In order to connect two or more units together one unit must be enabled as SERVER and the other(s) to which the Server will connect must be configured as CLIENT(S). Each Client must have its respective Server WAN IP entered into the "Primary Server IP" section.

WAN CONFIGURATION	
IP ADDRESS	10.0.0.10
NETMASK	255.255.255.0
GATEWAY	
MEDIA / SPEED	AUTOSELECT

Server WAN Configuration. Gateway would be used if the Client WAN is on a different subnet

The WAN Configuration above shows the IP and netmask chosen for the Server. Below, the Client Tunnel Mode Primary Server is the WAN IP of the Server. However, in public WAN applications the Primary Server IP is the public IP at the server location.

SYSTEM CONFIGURATION		
HOSTNAME	KBC	
TUNNEL MODE	CLIENT	
PASSWORD	PSKPSKPSK	
PRIMARY SERVER	10.0.0.10	8080
FAILOVER SERVER		8080

Client Tunnel Mode System Configuration

LAN connection IP shown. If connection over public WAN then Static Public WAN IP or domain server hostname will be used.

THRULINK TUNNEL SET UP (CONTINUED)

C. PROCEDURES TO CONFIGURE SET UP FOR TUNNEL

To access the GUI, connect an Ethernet cable to the LAN port and verify the computer's static TCP/IP configuration is set to the same subnet (ie, 192.168.1.xxx where xxx= any number between 1 and 254 other than 10 which is the ThruLink default)

1. Open Mozilla® Firefox or Microsoft® Internet Explorer and enter https://192.168.1.10 to reach the internal GUI interface. Please note, you must enter the "https" in order to access the secure web browser interface.
2. Accept the certificate, then enter the default user ID and password (admin / admin) when prompted. For questions on the security certificate, please see page 10
3. Click on "SET UP"
4. Click on "DISABLED" under "System Configuration" next to TUNNEL MODE
5. Click "SERVER" from listed options.
6. Configure WAN IP address, netmask and gateway as described on page 8
7. Choose a port from one of the preset configurations or choose a custom port.
8. Under LAN Configuration, leave IP as 192.168.1.10 unless that IP is already taken on the local area network.
9. Click SAVE and then reboot device.
10. Connect second ThruLink device and access its LAN IP on its default setting (https://192.168.1.10)
11. Click on "SET UP"
12. Click on "DISABLED" under "System Configuration" next to TUNNEL MODE
13. Click "CLIENT" from listed options.
14. Verify PASSWORD matches the preshared key of the Server
15. Enter Server WAN Setting (or public WAN IP at Server location) as Primary Server IP and verify port matches the Server port used.
16. Under LAN Configuration, change IP to another available IP on the same subnet as the Server (other than the Server LAN IP).
17. Click SAVE and then reboot device.

Visit www.thrulink.net/TLV2 to view a brief web tutorial for 2 minute KBC ThruLink tunnel set up procedure

ADVANCED OPERATION

WEB BROWSER INTERFACE

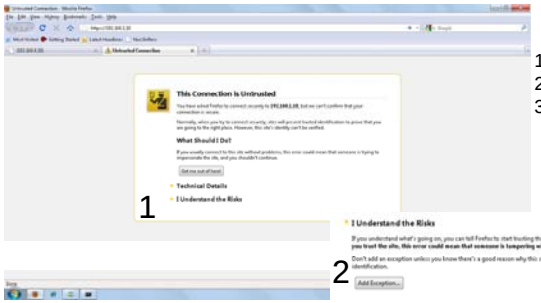
Each ThruLink has a web browser interface to access the advanced setup functions. If changing advanced settings, be sure to connect to and power the units individually. To access this interface, connect the device to the Ethernet port on a computer, launch the web browser and type in the default IP address at https://192.168.1.10. Please note that the "s" must be included as the IP alone or along with http:// will not access the interface. The configuration of the computer used to access the unit may need to be changed depending on its IP settings. The IP address of the computer should be set to 192.168.1.xxx. The xxx setting can be any address 2 – 254 excluding 10 or any other IP address(s) you wish to use for a ThruLink on that subnet (or Encoder/Decoder/WES Mesh product if applicable). The Subnet mask should be 255.255.255.0. If you have any questions or concerns about changing these settings, please contact your network administrator.

Note: The GUI interface is only accessible via a secure web browser address (i.e, https://192.168.1.10)

ACCEPTING THE WEB BROWSER SECURITY CERTIFICATE

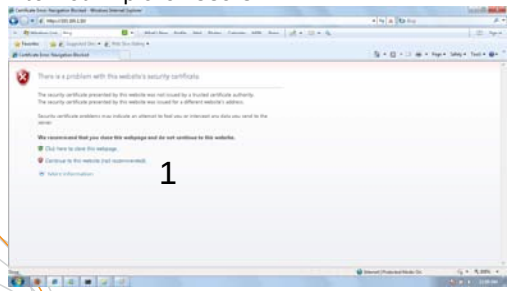
In order to reach the ID/password log in, the web browser must ensure its security. The browser will believe that the connection is not safe but it is OK to accept the certificate and access the interface.

Mozilla Firefox (Recommended Browser) Users:



1. Click "I Understand the Risks"
2. Click "Add Exception"
3. Click "Confirm Exception"

MS Internet Explorer Users:



1. Click "Continue to this Website"
2. Enter ID and password at prompt

ADVANCED OPERATION (CONTINUED)

WEB BROWSER LOG IN

The default ID and password for the ThruLink is admin and admin.

WARNING: IF YOU CHANGE THE USER NAME AND/OR PASSWORD, YOU WILL NEED TO KEEP A RECORD OF YOUR CHANGES IN A SAFE PLACE. IF THE PASSWORD IS FORGOTTEN OR MISPLACED, THE UNIT MUST BE RETURNED TO KBC TO BE RESET.

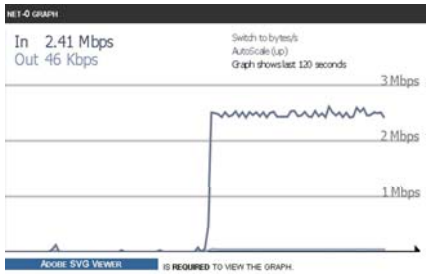
User name:	admin
Password:	admin

INTERFACE CONFIGURATOR WEB PAGES

A. DIAGNOSTICS

1. Monitor

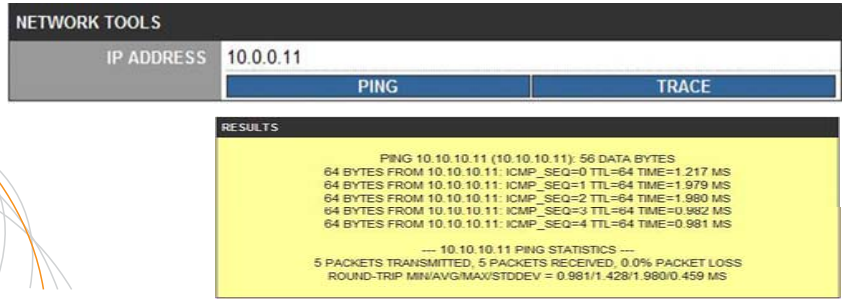
The throughput monitor graph will show the amount of throughput traffic that is being transmitted across the ThruLink tunnel. The rate can be seen in Megabits per second or percentage of overall throughput capacity.



The graph shown indicates a 2.5 Mbps stream being pulled across the Mesh network. As soon as the stream is accessed, the graph jumps from <1M up to an average of 2.41 Mbps.

2. Network

The ThruLink offers a ping and trace command tool to be used along with the Command Prompt to ping/trace the LAN or WAN IP addresses of other ThruLink or Ethernet devices on the network.



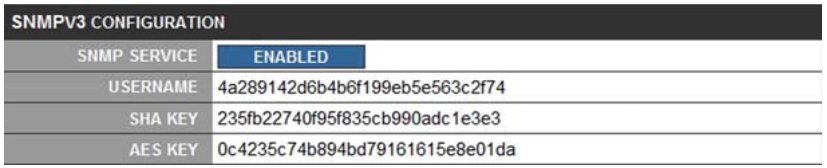
ADVANCED OPERATION (CONTINUED)

Network Diagnostics (Continued)

SNMP Enable

Default configuration is SNMPv3 Disabled.

To enable, simply click the Blue "Disabled" button in order to see the Enabled option.



3. System

The opening page of the internal configuration web browser displays the default settings. All configuration changes will be seen on this page as well.

a. System Information

SYSTEM INFORMATION	
SYSTEM NAME	KBC
OS VERSION	4.1.011340
SYSTEM ID	80F046C0-19D5-11E0-90D2-000DB9175FCC
MEMORY	29%
UPTIME	00:09
TUNNEL	DISABLED

System Name: This can be any identifier which is designated on the host name on the Set Up page.

OS Version: This is the software version and Serial BOD put together. The Serial BOD can also be found on the Firmware page.

System ID: The individual identification number for the mesh node.

Memory Used: This is the system load, the percentage will fluctuate.

System Uptime: Time since last system reboot.

Tunnel: See page 13 for Client tunnel status messages

ADVANCED OPERATION (CONTINUED)

Status Information (Continued)

ii. Tunnel Status Messages

As shown on the preceding page, the initial tunnel status message will be seen as “Disabled”. After one ThruLink is set to the Server and the other (or more) are set to Client mode, the tunnel can be attempted. Pages 8-9 of this manual describe the set up process in detail. The following are typical status messages that can be shown from the Client side of the tunnel.

STATUS: STARTING. Message shown prior to establishing link

STATUS INFORMATION	
MEMORY	30%
UPTIME	00:00
TUNNEL	CLIENT STARTING...

STATUS: ACTIVE. Upon a link to Server WAN IP

STATUS INFORMATION	
MEMORY	33%
UPTIME	00:00
TUNNEL	CLIENT ACTIVE - LINK ESTABLISHED WITH 10.10.10.11 PORT 8080

STATUS: LINK LOST. If the Client loses the link, it will reattempt the connection.

STATUS INFORMATION	
MEMORY	29%
UPTIME	00:02
TUNNEL	CLIENT LINK LOST - RECONNECTING

STATUS: INCORRECT SERVER WAN IP.

STATUS INFORMATION	
MEMORY	28%
UPTIME	00:01
TUNNEL	CLIENT UNABLE TO CONTACT SERVER 192.168.1.11 PORT 8080

STATUS: UNABLE CONTACT. If the Server WAN IP is correct, check the port selected to ensure ports are forwarded.

STATUS INFORMATION	
MEMORY	31%
UPTIME	00:01
TUNNEL	CLIENT UNABLE TO CONTACT SERVER 10.10.10.11 PORT 8080

STATUS: PSK MISMATCH

STATUS INFORMATION	
MEMORY	28%
UPTIME	00:00
TUNNEL	CLIENT PRESHARED KEY DOES NOT MATCH SERVER

ADVANCED OPERATION (CONTINUED)

c. WAN Interface

WAN INFORMATION	
PORT STATUS	NO CARRIER - (AUTOSELECT / NONE)
MAC ADDRESS	00:0D:B9:16:5A:DC
IP ADDRESS	192.168.0.10
SUBNET MASK	255.255.255.0
MEDIA TYPE	ETHERNET
INBOUND PACKETS	0
INBOUND ERRORS	0
OUTBOUND PACKETS	0
OUTBOUND ERRORS	0
COLLISIONS	0
DROPPED	0

Port Status:

MAC Address: Each device has an individual and unique MAC address.

IP Address: Shows the IP Address of the WAN connection.

Subnet Mask: Shows the net mask of the WAN connection.

Media Type:

Inbound Packets and Error Information: Indicates the packet transfer between Client and Server on the WAN connection.

ADVANCED OPERATION (CONTINUED)

d. LAN Interface
The same configurations as described under the WAN Interface are shown for the LAN Interface.

LAN INFORMATION	
PORT STATUS	NO CARRIER - (AUTOSELECT / NONE)
PORT STATUS	ACTIVE - (AUTOSELECT / 100BASETX / FULL-DUPLEX)
MAC ADDRESS	BA:CC:D4:16:5A:DC
IP ADDRESS	192.168.1.10
SUBNET MASK	255.255.255.0
MEDIA TYPE	ETHERNET
INBOUND PACKETS	57
INBOUND ERRORS	0
OUTBOUND PACKETS	0
OUTBOUND ERRORS	83
COLLISIONS	0
DROPPED	0

Note: If the unit is a THLK-S3 series, it will display two port statuses under the LAN information. In the example above, only one LAN port is being used so one status shows active while the other shows “no carrier”

ADVANCED OPERATION (CONTINUED)

B. NETWORK
1. Set Up
a. Tunnel Configuration
i. GUI Access
The Graphical User Interface web pages can be access from either the LAN or WAN ports. This option (defaulted as “Any”) can be restricted to allow access through only the LAN or only the WAN port(s).

SYSTEM CONFIGURATION			
HOSTNAME	kbc		
GUI ACCESS	ANY	WAN	LAN

ii. Tunnel Mode Options
The ThruLink is set to Disabled Tunnel mode out of the box. The user must select the intended mode for each ThruLink device. KBC recommends setting the Server first as the Client must have the Server WAN IP information entered into it to connect the tunnel. The various options are shown below.

SYSTEM CONFIGURATION			
TUNNEL MODE	DISABLED	SERVER	CLIENT
DYNAMIC DNS	DISABLED		

1. Server Mode
Below are the options available once Server mode is selected.

TUNNEL CONFIGURATION				
PASSWORD	PSKPSKPSK			
ENCRYPTION	ON	OFF	LEGACY+ON	LEGACY+OFF
PROTOCOL	TCP	UDP		
PORT	8080	8081	8082	8083
	8084	8085	8086	8087
	OTHER			

a. Password
Each Server and Client must share the identical pre-shared key in order to communicate. Default is upper case PSKPSKPSK.

b. Encryption
When selected “ON” the cipher selection must be set. The picture below shows the options for encryption cipher method. Legacy mode is selected to communicate with Clients with pre 3.0 version software. (Cipher options picture shown on page 17)

ADVANCED OPERATION (CONTINUED)

TUNNEL CONFIGURATION			
PASSWORD	PSKPSKPSK		
ENCRYPTION	ON		
CIPHER	AES-128	AES-192	AES-256
	BLOWFISH-128	BLOWFISH-192	BLOWFISH-256
	CAMELLIA-128	CAMELLIA-192	CAMELLIA-256
PROTOCOL	UDP		
PORT	8080		

c. Protocol
UDP and TCP are available protocols. UDP is default and recommended for most connections. TCP is recommended in a high packet loss environment as it guarantees packet delivery.

d. Port Selection
A port must be identified on the Server and matched on the Client side as well. Ports 8080 through 8087 are available as preset selections, however any port can be assigned by clicking “OTHER” and then typing in the desired port.

Preset port chosen:

TUNNEL CONFIGURATION	
PASSWORD	PSKPSKPSK
ENCRYPTION	OFF
PROTOCOL	UDP
PORT	8080
NOTE: IF BEHIND FIREWALL/ROUTER, ALLOW/FORWARD UDP PORT 8080 TO 192.168.0.10	

The note that appears under the port indication reminds the user to forward the port chosen to the WAN IP of the server. If the WAN IP address is different than 192.168.0.10, the note will adjust accordingly.

When a custom port is selected, the note will change to reflect the custom port:

TUNNEL CONFIGURATION		
PASSWORD	PSKPSKPSK	
ENCRYPTION	OFF	
PROTOCOL	UDP	
PORT	OTHER	10000
NOTE: IF BEHIND FIREWALL/ROUTER, ALLOW/FORWARD UDP PORT 10000 TO 192.168.0.10		

ADVANCED OPERATION (CONTINUED)

2. Client Mode
In the picture below, the Client is set to communicate to its primary Server, whose WAN IP address is 10.0.0.10 on Port 8080. The Host Name does not need to match the Server Host Name in order to establish the tunnel. A secondary Server (if one is available) can be used as the “Failover Server” in the event the connection is lost to the primary Server. A failover Server will only receive the information from the Client if the primary Server connection is lost. Further, the secondary Server must have throughput availability to accept the traffic previously handled by the primary Server.

SYSTEM CONFIGURATION		
HOSTNAME	KBC	
TUNNEL MODE	CLIENT	
PASSWORD	PSKPSKPSK	
PRIMARY SERVER	10.0.0.10	8080
FAILOVER SERVER		8080

a. Connecting to a Server at a DNS Host name
If the Server is set to a Dynamic DNS Service, the Primary Server IP on the Client side can either be the host name address or the Public IP (if known). In the screen capture below a Client is attempting to connect to a Server via the DDNS host address:

TUNNEL CONFIGURATION	
PASSWORD	PSKPSKPSK
PRIMARY	yourhostid.serviceprovider.extension
	8080
FAILOVER	
	8080

The actual host ID, service provider and extension to be determined by your host ID configuration settings. If the actual IP address is known it can be used in place of the web address.

ADVANCED OPERATION (CONTINUED)

b. WAN Configuration
Select a WAN mode, IP, Subnet mask and Gateway. See page 9 if the WAN configuration will match the existing network settings. If a different subnet will be used, select the desired configuration.

i. Static
To configure your own selected settings, use the Static setting. Make sure you do not set the WAN subnet to the same subnet as the LAN IP.

WAN CONFIGURATION	
INTERFACE MODE	STATIC
IP ADDRESS	192.168.0.10
NETMASK	255.255.255.0
GATEWAY	
MEDIA / SPEED	AUTOSELECT

ii. Dynamic DHCP
If dynamic is selected, the WAN IP subnet, address, netmask and gateway will be configured from the DHCP server. In the screen shot below, the following settings were configured automatically while connected to a router handing out IPs on the 192.168.1 subnet:

WAN CONFIGURATION	
INTERFACE MODE	DHCP
IP ADDRESS	192.168.1.188
NETMASK	255.255.255.0
GATEWAY	192.168.1.1
MEDIA / SPEED	AUTOSELECT

1. Dynamic DNS Service Setting
Below are the options to select the DNS settings

DYNAMIC DNS CONFIGURATION				
DDNS SERVICE	RFC2136	DYNDNS	DHS	DYNS
	EASYDNS	NOIP	ODS	ZONEEDIT
	LOOPIA	FREEDNS	TZO	
HOSTNAME				

2. Example of settings
The following are example configurations; insert your settings from your ISP.

DYNAMIC DNS CONFIGURATION	
DDNS SERVICE	DYNDNS
HOSTNAME	yourhostid.serviceprovider.extension
USERNAME	your_username
PASSWORD	••••••••••••

ADVANCED OPERATION (CONTINUED)

a. LAN Configuration
Select a LAN IP and Subnet mask. See page 9 if the LAN configuration will match the existing network settings. If a different subnet will be used, select the desired configuration.

LAN CONFIGURATION	
IP ADDRESS	192.168.1.10
NETMASK	255.255.255.0
MEDIA / SPEED	AUTOSELECT

Note: the LAN configuration shown above would not be available if the Dynamic WAN setting configured the WAN IP to the 192.168.1 subnet. The WAN and LAN settings must be on different subnets.

C. SYSTEM
The software version, default restore and password settings are indicated/configured through the System links.

1. Firmware
KBC recommends restoring the defaults prior to firmware updates, however, the previous settings will remain if not restored.

FIRMWARE INFORMATION	
OS VERSION	4.3.151834
SYSTEM ID	6E9734F3-BFDE-11D3-B37C-000DB9165ADC

FIRMWARE MAINTINENCE	
RESTORE DEFAULTS	YES
UPGRADE FIRMWARE	YES

ADVANCED OPERATION (CONTINUED)

b. Restore Defaults
The following configurations will appear on the Set Up page upon restoring to default:

Tunnel Mode:	Disabled
GUI Access:	Any
Password:	PSKPSKPSK (note: this is all capitalized)
WAN IP Address:	192.168.0.10
Netmask:	255.255.255.0
Gateway:	BLANK
LAN IP Address:	192.168.1.10
Netmask:	255.255.255.0
Media/Speed:	AUTOSELECT

2. Password

To change, enter the new password and confirm. When you select another link, such as Set Up for example, you will need to re-enter the new Username and password.

ANY CHANGES TO THE USERNAME AND/OR PASSWORD MUST BE SAVED AND KEPT AVAILABLE. IN THE EVENT AN ID OR PASSWORD IS FORGOTTEN, THE NODE MUST BE RETURNED TO KBC FOR A HARD RESET. ALL CONFIGURATIONS WILL BE LOST AND RETURNED TO DEFAULT SETTINGS UNLESS OTHERWISE NOTED.

3. Reboot
The Reboot link will soft restart the device. Any configuration change that was saved will be held after the reboot. Settings changed without applying (clicking save) will not be held after the reboot.

CONSOLE SET UP

In the event that the GUI interface cannot be reached via the LAN or WAN ports, set up can be performed through the serial connection. The console is designed to change only the minimum required information to enable access to the system via a network. Once network access has been established, the web GUI provides complete system configuration (as detailed in pages 8 through 21).

To use the serial console of the system, a null modem serial cable.

1. Connect the null modem cable to the console port.
2. Open a terminal application and configure your connection to 38400-8-N-1
3. Open your serial port (connect)

If the steps are completed successfully, you will receive a menu system like the one below:

ThruLink Console
****
1) Assign WAN IP address
2) Reset GUI password
3) Reset to factory defaults
4) Reboot system
5) Ping host

The various options listed can be selected by entering 1-5 at the prompt.

Assign WAN IP Address – Used to change the default IP address of the system.

Reset GUI password – Reset the previously saved GUI password in the event it is lost.

Reset to factory defaults – Reset the system to a factory default configuration.

Reboot system – Reboots the system.

Ping host – Used to test for connectivity or during troubleshooting.

To end your console session, simply disconnect your terminal client, and remove the cable.

THRULINK PRODUCT SPECIFICATIONS

For product improvement, design and specifications are subject to change without notice.

STANDARD CAPACITY (THLK-S2-Wx & THLK-S3-Wx Series)

Bandwidth:	80 Mbps unencrypted 30 Mbps encrypted (128 bit) 20 Mbps encrypted (192 bit) 16 Mbps encrypted (256 bit)
NETWORK MANAGEMENT	
User Interface:	Web GUI via https secure Console via Serial Port
Protocols Used:	UDP; TCP
Multicast Support:	Yes
SECURITY	
Available Ciphers:	Blowfish 128, 192 & 256; AES 128, 192 & 256; Camellia 128, 192 & 256 (User select via web GUI)
MECHANICAL	
Physical Dimensions:	19.05mm (7.5") W x 16.51 (6.5") D x 1.125" H
Weight:	
ENVIRONMENTAL	
Operating Temperature:	-33ºC (-25ºF) ~ +83ºC (+180ºF)
Operating Humidity:	0 to 95% non-condensing
POWER	
Power Requirements:	12 VDC
Power Method:	Direct connect plug in via 1000mA transformer
Connector:	Barrel type; plug type determined by part number
APPROVALS	
FCC ID:	
IC:	
CE:	

Warranty

2 YEAR LIMITED WARRANTY (SEE PAGE 25 FOR DETAILS)

THRULINK PRODUCT SPECIFICATIONS (CONTINUED)

For product improvement, design and specifications are subject to change without notice.

HIGH CAPACITY (THLK-H2-Rx Series)

Bandwidth:	650 Mbps unencrypted 400 Mbps encrypted (128 bit)
NETWORK MANAGEMENT	
User Interface:	Web GUI via https secure Console via Serial Port Front Panel LCD
Protocols Used:	UDP; TCP
Multicast Support:	Yes
SECURITY	
Available Ciphers:	Blowfish 128, 192 & 256; AES 128, 192 & 256; Camellia 128, 192 & 256 (User select via web GUI)
MECHANICAL	
Physical Dimensions:	483mm (19") W x 389mm (15.3") D x 43mm (1.7") H
Weight:	
ENVIRONMENTAL	
Operating Temperature:	-33ºC (-25ºF) ~ +83ºC (+180ºF)
Operating Humidity:	0 to 95% non-condensing
POWER	
Power Requirements:	12 VDC
Power Method:	Direct connect plug in via power plug
Connector:	Three prong PC type; plug type determined by part number
APPROVALS	
FCC ID:	
IC:	
CE:	

Warranty

2 YEAR LIMITED WARRANTY (SEE PAGE 25 FOR DETAILS)

TROUBLE-SHOOTING

Problem	Suggestion
Cannot access web GUI	- Verify correct static IP settings for your computer. - Verify secure web browser address is used (https://192.168.1.10 for example) - Attempt to ping the device and check for network connectivity. - If ping replies, reboot/power cycle the ThruLink - Connect to WAN port and ping WAN IP. If ping replies, access the GUI using the WAN IP using the https protocol. If LAN and WAN configurations are set to the same subnet, change to differing subnets. - If still unresponsive, escalate for support

Problem	Suggestion
Cannot log in to web GUI using ID/Password	- Verify correct ID and password - If system has been defaulted, access using default “admin / admin” - Connect to serial console, choose option 2 to reset interface password “admin”

Problem	Suggestion
Unsure the network is working correctly	- Use the network tool to ping the gateway IP - Use the ping tool to verify other devices on the network respond - If no response, verify ISP/WAN/LAN configurations - Check Tunnel Mode activity messages from System page (see page 13 of this manual for details). - Power cycle router

Problem	Suggestion
Tunnel will not connect	- Check Tunnel Mode activity messages from System page (see page 13 of this manual for details). - Ping remote Server/Client WAN IP using Network ping tool - Ping remote Server/Client WAN IP using MS Command Prompt - If applicable, ping gateway IP using local ThruLink Network ping tool - If applicable, ping gateway IP using MS Command Prompt - Verify Firewall settings. If firewall enabled, verify ICMP port has been allowed. Disable firewall to check if connection can be established. If the MS firewall is disabled, verify no other firewall software is enabled. - Verify router ports are correctly forwarded

Further assistance is available by contacting the nearest KBC technical support representative. See preface page “ii” for contact information and availability.

WARRANTY INFORMATION

KBC extends the following LIMITED WARRANTY to the original owner/purchaser of this product as follows:

- Two years from the date of initial sale for all wireless and network products.
- Five years from the date of initial sale for all fiber products.

1) If, within the specified warranty period, this product, or any part or portion thereof, shall prove upon examination by KBC, to be defective in material or workmanship, KBC will repair or replace such part or portion at KBC’s option. The warranty period on the repaired or replaced part or portion of this product shall be limited to the unexpired term of the original warranty. The buyer shall be responsible for all shipping and transportation of the product to KBC for any performance under this warranty.
2) Conditions and Exceptions:
   a) Any accident to this product, any misuse or abuse, alternation, use in modified form, or any attempt to repair this product shall void this warranty. These conditions to the warranty include, but are not limited to, incorrect power connections, physical damage due to mechanical shock, exposure to moisture, and circuit modification.
   b) SHOULD THIS PRODUCT PROVE DEFECTIVE FOLLOWING PURCHASE, THE BUYER, NOT THE MANUFACTURER, DISTRIBUTOR, OR RETAILER, ASSUMES THE ENTIRE COST OF ALL SERVICING OR REPAIR, EXCEPT AS OTHERWISE PROVIDED BY THE TERMS OF THIS WARRANTY.
   c) FOR BREACH OF ANY WRITTEN OR IMPLIED WARRANTY ON THIS PRODUCT, THE BUYER IS LIMITED TO THE FOLLOWING DAMAGES. (1) THE COST OF LABOR TO REPAIR OR REPLACE DEFECTIVE PARTS OR PORTIONS OF THIS PRODUCT, AND (2) THE COST OF THE REPAIRED OR REPLACE PARTS OR PORTIONS OF THIS PRODUCT.
   d) NO OTHER EXPRESSED OR IMPLIED WARRANTIES HAVE BEEN MADE OR WILL BE MADE ON BEHALF OF KBC WITH RESPECT TO THE SALE, REPAIR, INSTALLATION, OPERATION, OR REPLACEMENT OF THIS PRODUCT. KBC DISCLAIMS ANY IMPLIED WARRANTY OF MERCHANTABILITY OF THIS PRODUCT OR ITS FITNESS FOR ANY PURPOSE, AND THE BUYER AGREES THAT THIS PRODUCT IS SOLD “AS IS” AND THAT THE ENTIRE RISK OF QUALITY AND PERFORMANCE OF THIS PRODUCT IS WITH THE BUYER, EXCEPT AS OTHERWISE PROVIDED BY THE TERMS OF THIS WARRANTY.
   e) Some states/jurisdictions do not allow exclusions or limitations of incidental or consequential damages, or limitations on how long an implied warranty lasts, so the above exclusions or limitations may not apply to you.
      f) If you do not wish to be bound by any of the provisions in this warranty, please return the product(s) immediately.
      3) Contact your dealer regarding return authorizations for out of warranty repairs and any further product information.