

Enable-IT 860 Series Extended Ethernet User Manual



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ABOUT THIS GUIDE

This guide provides all the information needed to install and use the Enable-IT 860 Extended Ethernet Kit. This guide is intended for use by technicians who are responsible for installing and setting up network equipment. Consequently, it is assumed that the installer has a basic working knowledge of LANs (Local Area Networks) and voice telecom wiring.

If the information in the release notes that are shipped with your product differs from the information in this guide, follow the instructions in the release notes.

Most user guides and release notes are available in Adobe Acrobat

Reader Portable Document Format (PDF) or HTML on the Enable-IT World Wide Web site: <http://www.ethernetextender.com/manuals/860 Manual.pdf>

INTRODUCING THE 860 EXTENDED ETHERNET UNIT

Congratulations on purchasing the Enable-IT's 860 Extended Ethernet Unit — the simplest method to stretch your broadband solutions for in-building deployment in commercial office buildings, hotels, and multi-tenant residential units.

The 860 Extended Ethernet Unit offers the Lowest Cost Solution in a simple design for rapid install using existing 1 pair Telco wiring.

This chapter contains introductory information about The 860 Extended Ethernet Unit and how it can be used in your network. It covers the following topics:

- About the 860 Extended Ethernet Unit
- Key Benefits
- Summary of Features
- Typical Applications

About the 860 Extended Ethernet Unit

The 860 Extended Ethernet Unit solves the problem of high costs associated with stretching your backbone with traditional fiber or a series of hubs/repeaters.

In many office buildings, preferred network access is a dedicated Ethernet line, however Ethernet over twisted pair wiring has its distance limitations of just 328 ft. In order to drive Ethernet signal further, one would have to add repeaters to each segment of 328ft twisted pair cabling; this is often insufficient and too costly in multi-story buildings. Fortunately, the Enable-IT 860 Series Extended Ethernet can push the reach of Ethernet to more than (19) nineteen times the typical Ethernet distance over a 1-pair Telco wiring infrastructure or better.

A simple design methodology would be to think of the 860 extending a standard Ethernet line up to 6,000 (1,828m) and can also include a dual voice line simultaneously.

To increase the durability and extended use of the product providing maximum future technology protection, 860 Extended Ethernet Unit meets the challenge of modern switched LANs and allows you to add features and capacity as your network expands. The Enable-IT 860 Extended Ethernet has been tested to provide full duplex transport up to 90MB/s over CAT2, and up to 100MB/s over CAT5e cabling.

Unit Model	Wiring	Min Data Rate	Max. Distance
860	(1) pair CAT 2 up to CAT5e	100Mbps FD	6,000ft / 1,828m

Up to 700ft (200m) - 100Mbps
 700ft (200m) to 1,350ft (400m) - 90Mbps
 1,350ft (400m) to 1,970ft (600m) - 70Mbps
 1,970ft (600m) to 2,625ft (800m) - 52Mbps
 2,625ft (800m) to 3,280ft (1000m) - 42Mbps
 3,300ft (1005m) to 6,000(1,828m) - 30Mbps

* Actual data rate will vary on the quality of the copper wire, twisted pair and environmental factors

Key Benefits

The following list identifies the 860 Extended Ethernet Unit key benefits.

- Dramatic cost reduction over any competing technology.
- Broadband technology that delivers in-building Ethernet access over 1 pair of existing Category 2 up to Category 5e wiring up to 6,000', whether spare or actively in use for analog or digital voice. This means no new wiring is required.
- Provides one scalable infrastructure for Internet access, POTS, VoIP, video, and virtual private networking.
- Rapid installation with small box profile, no programming and no firmware to upgrade.
- Low profile box with dual POTS line and Ethernet data all in a single RJ-45 Ethernet jack.

Summary of Features

The Enable-860 Extended Ethernet Kit has the following hardware features:

- Extended Ethernet line over existing CAT 2 up to CAT5e / CAT6 wiring
- Uses RJ-45 Interlink port for transport (Dual voice and 100Mbps data)
- Rapid Telco style installation – no programming required
- Supports digital VoD channels
- Drives Ethernet 100 Mbps full-duplex service delivery with dual voice up to 6,000ft or 1,829m
- Network Equipment independence – Transparent to protocols/applications/MAC
- Maintains lifeline POTS

Specifications:

Power Indicator
100Mbps Link status/Activity
VDSL2 Link Status/Activity

Dimensions:

Height: 1.5" (38mm)
Depth: 3.75" (95mm)
Width: 5.75" (146mm)

Interfaces

(1) 5v DC power Adapter 860 CO unit
(1) RJ-11 Dual telephone
(2) RJ-45 100MB LAN Auto negotiate

Functionality:

Data Rates 100Mbps Full Duplex
Full Duplex/Half Duplex status/Collisions
Protocol independent

860 Interlink port pins:

Pins 1 & 2 – Voice line 1 and Data
Pins 3 & 6 – Voice line 2(optional)
Pins 4 & 5 – not used
Pins 7 & 8 – not used

Environment

Operating temp: -20° to 70°C/-4° - 160°F
Storage temp: -25° to 70°C/-13° - 160°F
Humidity 5% to 95%, non-condensing

Typical Applications

Enable-IT 860 Extended Ethernet Units are usually installed into telephone wiring infrastructures where extension of backbone services is required and expensive fiber options are prohibitive. The 860 Extended Ethernet Units allow a standard Ethernet segment to be deployed quickly over existing 1 pair Telco Copper Wiring in combination with existing POTS voice signals. The pins (1 & 2) are used for transport for both voice and data. The pins (3 & 4) are used for Voice line 2 and the remaining pins 4,5,7 & 8 are unused.

Installers have the convenience of a 100Mbps LAN Ethernet unit for peace of mind connectivity and no device maintenance. Rapid installation allows for minimal interruption and the Broadband technology allows for investment protection up to 10 -15 years with no firmware or replacement issues. Bandwidth can be scaled according to the Broadband Access Provider needs. The 860 Extended Ethernet Unit is a passive device so interruption of Internet service does not affect POTS services. Carriers and Access Providers can come and go, but the 860 Extended Ethernet Unit technologies continue to provide lasting value such as the other utilities like Water, gas and electricity.

The Enable-860 Extended Ethernet Unit is suited for the following key environments:

- **Commercial Buildings (Multi-Tenant Units)**
- **Business Parks (Multi-Tenant Units)**
- **Apartments (Multi-Residential Units)**
- **Hotels (Multi-Hospitality Units)**
- **Business Suites (Multi-Hospitality Units)**
- **School Campuses (University, K-12)**
- **College Housing (Multi-Residential Units)**
- **Mining Operations – Quarries, Mine shafts**
- **Nautical Infrastructure – Cruise ships, Marinas, dive operations, subs**
- **Video Surveillance/Security**
- **WiFi Deployment – ISP's, RV Parks, Construction sites**
- **Manufacturing – Foundries, pharmaceutical, aerospace, automotive, petroleum, concrete plants, etc.**
- **Retail POS – Department stores, Bars, restaurants, retail spaces**
- **Government – Naval ships, FEMA, Housing, USGS, National Parks, Forestry, Research stations, NASA, utilities, etc.**
- **Education – outdoor camps, college campuses**
- **Healthcare – Hospitals, elder care, outpatient facilities**
- **Entertainment – Movie theaters, home entertainment, fairs, outdoor venues**

INSTALLING THE 860 EXTENDED ETHERNET KIT

The Enable-IT 860 Extended Ethernet Units have a distance restriction of 6,000ft or 1,828m over 1-pair of Category 2 up to Category 5e / CAT6 wiring from device extension to device extension. Therefore quick, simple site surveys and installation planning are highly recommended.

This chapter describes the recommended installation process for the Enable-IT 860 Extended Ethernet Unit. It covers the following topics:

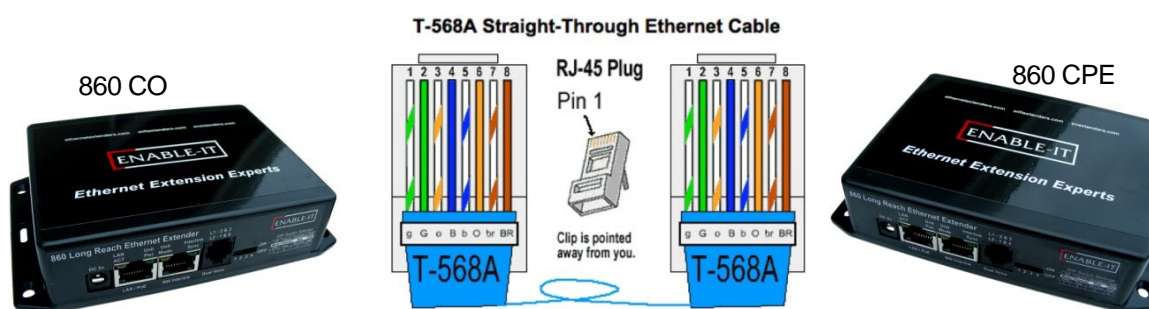
- Site Plan – Installation Design Considerations
- Unpacking the Enable-IT 860 Extended Ethernet Kits
- Perform an out of the box Test
- Performing the On-Site Installation

Site Plan - Installation Design Considerations

The planning process should involve a site walkthrough and discovery survey. Electrical Cable measurement tools are the most reliable method to determine the longest run of hidden wiring. Estimate the best locations to position the Broadband Concentrators to adequately reach desired connectivity on each floor. Document your findings to use in designing a network topology to support the Ethernet Switches and backbone connectivity. Key points to remember in the Site Survey.

- Total distance limitation of 6,000ft or 1,829m from end to end.
- 1 Pair CAT-2 wiring or 4-pair Cat5e .30 Gage or better cabling is required for the 860 Interlink transmission.

For all wiring you will need to crimp a RJ-45 Male Head to each end of the contiguous wire run and using the following pins (1 & 2) straight through. This will deliver 1 Voice line, Ethernet Data. If you desire to use the second voice line, you can also use pins (3 & 6) on each end straight through.



Unpacking the Enable-IT 860 Extended Ethernet Kit

Carefully remove the Enable-IT 860 Extended Ethernet Kits all packing materials from the box. Verify that the items listed below are present. Make sure that the equipment supplied matches what you ordered. If any items are missing or damaged, please contact Enable-IT or your distributor for assistance.

- (2) The Enable-IT 860 Extended Ethernet Units (CO & CPE)
 - 5v AC/DC Power adapter
 - LAN patch cables
- (1) Enable-IT 860 Extended Ethernet Kit User Manual (this manual)

Perform an out of the box Test

We highly recommend a quick test to ensure the working order of you 860 units. To do this, please use one of the Ethernet patch cords provided and attach to the 860 Interlink port of each 860 unit. Power up both 860 units. After a few seconds you should see a solid Green Interlink Sync LED on each unit. This confirms basic proper operation of the units. Next for a more detailed test and to confirm your LAN Equipment works with the 860, connect your Ethernet LAN and remote device to the 860 LAN ports and test connectivity.



LED indicators will provide visual operational status of the 860 units.

- Interlink Sync** - Solid Green LED indicates that the 860 units see each other.
- Unit Pwr** - Solid Green LED indicates that both units are receiving 5v power.
- Unit Mode** - Solid Yellow LED on CPE unit only – No LED lit on CO
- LAN ACT** - Yellow LED – Lit solid indicates the presence of local LAN
– Blinking indicates the presence of local LAN traffic

Performing the On-Site Installation

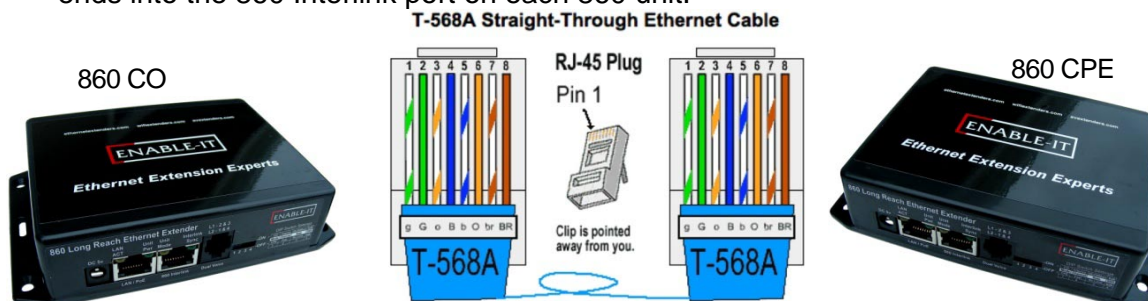
After removing the Enable-IT 860 Extended Ethernet Kit from the box and performing the out of the box testing all that remains to install the unit on-site is to mount the unit, build the interconnect wiring, add voice lines if needed and attach the LAN device cabling with the provided Ethernet Patch cords.

1 Mounting the Enable-IT 860 Extended Ethernet Units

The Enable-IT 860 Extended Ethernet Kits are designed for quick wall mounting. Choose a location to mount each of the Enable-IT 860's where the maximum distance does not exceed 6,000ft or 1,829m total between devices to be connected. When wall-mounting the Enable-IT 860 Extended Ethernet Kit it is recommended that you use the appropriate screw anchors for your mounting surface. If mounting on existing plywood use wood screws; if mounting onto drywall or sheetrock, use plastic drywall anchors to secure your installation.

2 Building the 860 Interlink wiring

The most important aspect of the install is the correct wiring of the Interlink cabling. For all wiring you will need to crimp a RJ-45 Male Head to each end of the contiguous wire run and using the following pins (1 & 2) straight through. This will deliver 1 Voice line, Ethernet Data. If you desire to use the second voice line, you can also use pins (3 & 6) on each end straight through. Insert the completed RJ-45 ends into the 860 Interlink port on each 860 unit.



- ③ Attaching cabling and devices to the Enable-IT 860 Extended Ethernet Kit.
 Attach your remote LAN device to the 860 CPE unit LAN port with Ethernet patch cord provided. Attach your local LAN to the 860 CO LAN port with Ethernet patch cord provided. Attach the power adapters to both 860 units.
 If you plan on using voice service as well, insert your dial tone voice line/lines to the 860 CO unit - Dual Voice RJ-11port and telephone handset to the 860 CPE unit Dual Voice RJ-11 port. Your equipment should now be powered up and functioning.

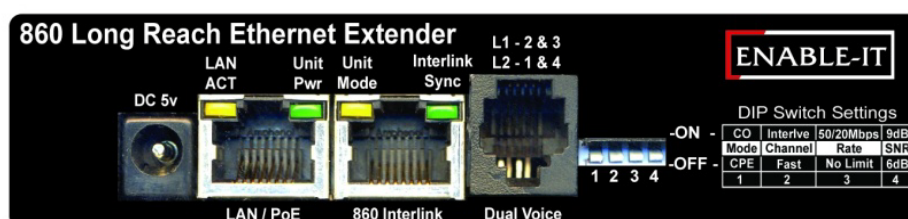
LED indicators will provide visual operational status of the 860 units.

- Interlink Sync** - Solid Green LED indicates that the 860 units see eachother.
 - Blinking indicates the units are trying to connect.
- Unit Pwr** - Solid Green LED indicates that both units are receiving 5v power.
- Unit Mode** - Solid Yellow LED on CPE unit only – No LED lit on CO
- LAN ACT** - Yellow LED – Lit solid indicates the presence of local LAN
 – Blinking indicates the presence of local LAN traffic

- ④ For troubleshooting, first examine the backbone wiring pair and make sure you have solid connections. The Interlink Sync LED will be lit on each 860 unit to show proper connection and pairing. If the Interlink Sync LED Link is flashing –

- 1) Make sure your wiring is straight through and not connected to any Telco punch down block; use Telco butt clips to bridge wire.
- 2) Check for a firm connection of the RJ-45 connections in each 860 unit, power is applied to the 860 CO & CPE units.
- 3) If your installation has performance issues not resolved by the first two steps, you can change the 860 CO DIP Switches (2 & 4) to the ON position. See the following chart for DIP switch settings.

NEVER CHANGE THE CPE DIP SWITCHES



	DIP-1	DIP-2	DIP-3	DIP-4
	Mode	Channel	Rate Limit	Signal Noise Ratio
ON	CO	Interleave	50/20 Mbps	9dB
OFF (Default)	CPE	Fast	No Limit	6dB

NEVER CHANGE THE CPE DIP SWITCHES

Technical Support

Enable-IT OEM Technical Support is available directly to customers and distributors. All support requests are processed through the online support portal. This allows us to provide assigned support ticket numbers in order to bring closure to any technical issues.

Online Technical Services

The Enable-IT Support Portal is available 24/7. No password or user account is necessary. Please use this support website as your first source for help as it contains an on line knowledge base of articles, documentation, FAQ's and other problem-solving resources. This web-based support resource provides the quickest solution to the most common technical support issues.

http://www.ethernetextender.com/support/support_overview.php

Returning Products for Warranty Repair

Enable-IT, Inc. warrants to the original purchaser of the Product ("you" or the "End User") that, for the three (3) year period commencing on the date the Product was purchased (the "Warranty Period"), the Product will be substantially free from defects in materials and workmanship under normal use and conditions. **Electrical damage is not an item that is covered under this warranty or extended warranties.**

If authorized by Enable-IT to return a Product which does not conform to the warranty set forth above, the End User must: (1) obtain a return materials authorization (RMA) number from Enable-IT by contacting the Customer Service Dept. at 888-309-0910 between the hours of 8:00 a.m. and 5:00 p.m. PST and otherwise fully comply with Enable-IT's then-current RMA policy; (2) return the Product to Enable-IT, Inc. in its original packaging freight pre-paid; and (3) provide to Enable-IT the original receipt or bill of sale establishing the date on which the Product was purchased.

Please ship Authorized RMAs to:

Enable-IT Processing Facility
16600 Harbor Blvd, Ste G
Fountain Valley, CA 92708

Returning Products for Refund

30-Day refund applies to single kit Ethernet Extenders only and is subject to a 25% Restocking Fee. Shipments without valid / authorized RMA number or sent to our corporate Las Vegas Address can be refused and or billed for additional shipping.

ENABLE-IT LIMITED WARRANTY

Enable-IT warrants the Enable-IT 860 Extended Ethernet Kits solely pursuant to the following terms and conditions.

1. PRODUCT WARRANTY

a. Express Warranty Enable-IT warrants to the original purchaser of the Product ("you" or the "End User") that, for the three (3) year period commencing on the date the Product was purchased (the "Warranty Period"), the Product will be substantially free from defects in materials and workmanship under normal use and conditions. This warranty does not apply to Products which are resold as used, repaired or reconditioned or consumables (such as batteries) supplied with the Product. **Electrical damage is not an item that is covered under this warranty or extended warranties.** Enable-IT does not make any warranty with respect to any third party product, software or accessory supplied with or used in connection with the Product and such third party products, software and accessories, if any, are provided "AS IS." Warranty claims related to such third party products, software and accessories must be made to the applicable third party manufacturer.

b. Remedies for Breach of Warranty In the event of a breach of the foregoing warranty, Enable-IT will, in its sole discretion and at its cost and subject to the terms of the following paragraph, repair the non-conforming Product, replace the non-conforming Product with a new or reconditioned Product or refund of the purchase price for the Product. Any new or reconditioned Product provided pursuant to this paragraph is warranted as provided herein for the remainder of the original Warranty Period. THE REMEDY SET FORTH IN THIS PARAGRAPH SHALL BE THE END USER'S SOLE AND EXCLUSIVE REMEDY FOR BREACH OF THE FOREGOING WARRANTY.

c. Conditions for Warranty Qualification If authorized by Enable-IT to return a Product which does not conform to the warranty set forth above, the End User must: (1) obtain a return materials authorization (RMA) number from Enable-IT by contacting the Customer Service Dept. at 888-309-0910 between the hours of 8:00 a.m. and 5:00 p.m. PST and otherwise fully comply with Enable-IT's then-current RMA policy; (2) return the Product to Enable-IT in its original packaging freight pre-paid; and (3) provide to Enable-IT the original receipt or bill of sale establishing the date on which the Product was purchased.

Products returned to Enable-IT without an RMA number will be returned to the End User.

Enable-IT shall not be responsible for damage or loss during shipment of the returned Product to Enable-IT.

d. Voiding of Warranty. The express warranty set forth above shall not apply to failure of the Product if the Product has been subjected to: (i) physical abuse, misuse, improper installation, abnormal use, power failure or surge, or use not consistent with the operating instructions provided by Enable-IT; (ii) modification (including but not limited to opening the Product housing) or repair by any party in any manner other than as approved by Enable-IT in writing; (iii) fraud, tampering, unusual physical or electrical stress, unsuitable operating or physical conditions, negligence or accidents; (iv) removal or alteration of the Product serial number tag; (v) improper packaging of Product returns; or (vi) damage during shipment (other than during the original shipment of the Product to the End User from Enable-IT, if applicable).

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