

# Enable-IT 860 Series Extended Ethernet User Manual



Copyright © 1997- 2008 Enable-IT, Inc. All rights reserved. No part of this documentation may be reproduced in any form or by any means or used to make any derivative work (such as translation, transformation, or adaptation) without written permission from Enable-IT, Inc.

Enable-IT, Inc reserves the right to revise this documentation and to make changes in content from time to time without obligation on the part of Enable-IT, Inc to provide notification of such revision or change.

Enable-IT, Inc provides this documentation without warranty, term, or condition of any kind, either implied or expressed, including, but not limited to, the implied warranties, terms or conditions of merchantability, satisfactory quality, and fitness for a particular purpose. Enable-IT, Inc may make improvements or changes in the product(s) and/or the program(s) described in this documentation at any time.

If there is any software on removable media described in this documentation, it is furnished under a license agreement included with the product as a separate document, in the hard copy documentation. If you are unable to locate a copy, please contact Enable-IT, Inc and a copy will be provided to you.

#### UNITED STATES GOVERNMENT LEGEND

If you are a United States government agency, then this documentation and the software described herein are provided to you subject to the following:

All technical data and computer software are commercial in nature and developed solely at private expense. Software is delivered as "Commercial Computer Software" as defined in DFARS 252.227-7014 (June 1995) or as a "commercial item" as defined in FAR 2.101 (a) and as such is provided with only such rights as are provided in Enable-IT, Inc's standard commercial license for the Software.

Technical data is provided with limited rights only as provided in DFAR 252.227-7015 (Nov 1995) or FAR 52.227-14 (June 1987), whichever is applicable. You agree not to remove or deface any portion of any legend provided on any licensed program or documentation contained in, or delivered to you in conjunction with, this User Guide.

Unless otherwise indicated, Enable-IT, Inc registered trademarks are registered in the United States and may or may not be registered in other countries

# CONTENTS

<b>ABOUT THIS GUIDE</b>	<b>4</b>
<b>1 INTRODUCING THE ENABLE-IT 860 EXTENDED ETHERNET UNIT</b>	<b>5</b>
About the 860 Extended Ethernet Unit	5
Key Benefits	6
Summary of Features	6
Typical Applications	7
<b>2 INSTALLING THE ENABLE-IT 860 EXTENDED ETHERNET UNIT</b>	<b>8</b>
Site Plan – Installation Design Considerations	8
Unpacking the 860 Extended Ethernet Kit	8
Performing the On-Site Installation	9
Mounting the 860 Extended Ethernet Units	9
<b>A TECHNICAL SUPPORT</b>	
Online Technical Services	10
World Wide Web Site	10
Returning Products for Repair	10
<b>B Enable-IT Inc. LIMITED WARRANTY</b>	<b>10</b>

---

## ABOUT THIS GUIDE

This guide provides all the information needed to install and use the Enable-IT 860 Extended Ethernet Unit. 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

# 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.

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 PABX 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 POTS line and single 10/100MB Ethernet port.

## Summary of Features

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

- 1 Extended Ethernet line over existing CAT 2 (Telco) up to CAT5e / CAT6 wiring
- Uses RJ-11 Telco style patch cord for 1-pair transport (pins 2 & 3)
- Rapid Telco style installation – no programming required
- Supports digital VoD channels
- Drives Ethernet 10/100 Mbps full-duplex service delivery up to 6,000ft / 1,828m
- Network Equipment independence – Transparent to protocols/applications/MAC
- Maintains lifeline POTS

### Specifications:

Power Indicator  
10/100Mbps Link status/Activity  
VDSL2 Link Status/Activity

### Dimensions:

Height: 1" (25mm)  
Depth: 3" (76mm)  
Width: 2" (51mm)

### Interfaces

(1) 5v DC power Adapter  
(2) RJ-11 POTS (Pins 2 & 3)  
(2) RJ-45 10/100MB LAN Auto negotiate

### Functionality:

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

### 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 innermost pins (2 & 3) are used for transport for both voice and data. The pins (2 & 3) are flipped in straight through cabling. Using the provided telephone patch cords, this flip is already performed.

Installers have the convenience of a 10/100Mbps 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 UNITS

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.

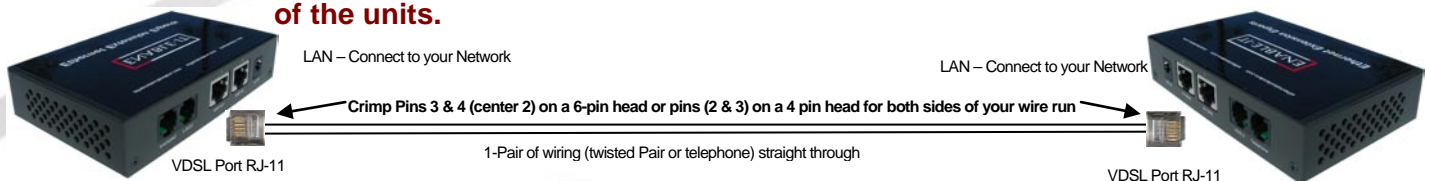
This chapter describes the recommended installation process for the Enable-IT 860 Extended Ethernet Unit. It covers the following topics:

- Site Plan – Installation Design Considerations
- Unpacking the Enable-IT 860 Extended Ethernet Units
- Performing the On-Site Installation

## Site Plan - Installation Design Considerations

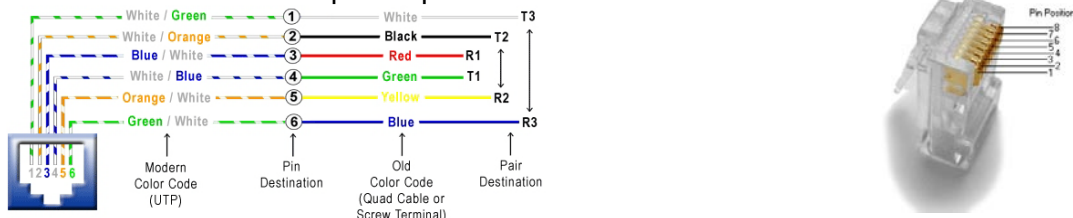
The planning process should involve a site walkthrough and discovery survey. Electrical Cable measurement tools are the most reliable method to determine the longest run of hidden wiring. Estimate the best locations to position the Broadband Concentrators to adequately reach desired connectivity on each 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 over CAT2 up to CAT5e/CAT6 wiring from end to end.
- 1 Pair CAT-2 Telco wiring .30 Gage or better cabling is required for transmission.
- **We highly recommend a quick test to ensure the working order of you 860 units. To do this, please use one of the telephone patch cords provided and attach each end to the VDSL port on the 860 units. Power up until you see a Green VDSL Link light on each unit. This confirms proper operation of the units.**



Note: The innermost pins (3&4) in a 6 pin head or (2&3) in a 4 pin head are used for transport for both voice and data. The 860's perform an automatic flip of the pins if needed as long as you use the same wire pair on each end of the run. The provided telephone patch cord can be used for your test and understanding of the wiring pins. Crimp a blank RJ-11 male head to 1-pair of your existing CAT rated cabling on each end and insert directly into the VDSL port of the 860 unit.

If you already have terminated CAT rated wiring you can use 1-pair by making an adapter cable. Using the provided telephone patch cord, cut (1) RJ-11 head off and replace with a Male RJ-45 head using the inside pins (4 & 5) on the RJ-45 Plug. Repeat for the remote end telephone patch cord.





## Unpacking the Enable-IT 860 Extended Ethernet Unit Kit

Carefully remove the Enable-IT 860 Extended Ethernet Units 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 your Enable-IT or your distributor for assistance.

- (2) The Enable-IT 860 Extended Ethernet Units
  - 5v AC/DC Power adapter
  - Telephone patch cable
  - LAN patch cable
- (1) Enable-IT 860 Extended Ethernet Unit User Manual (this manual)

## Performing the On-Site Installation

After removing the Enable-IT 860 Extended Ethernet Units from the box all that remains to install the unit on-site is to mount the unit, connect the wiring, cross connect voice lines if needed and attach the end device patch cord cabling.

### Mounting the Enable-IT 860 Extended Ethernet Units

The Enable-IT 860 Extended Ethernet Units 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 1,828m total between devices to be connected.

When wall-mounting the Enable-IT 860 Extended Ethernet Unit 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.

- ❶ Prior to performing a remote link install, test your setup and equipment. Connect your LAN to the Ethernet port of the primary 860 unit and power adapter. Using the provided telephone patch cord connect each end of the cord into the VDSL port on both 860 units. Connect your remote end device or LAN to the Ethernet port of the remote 860 unit and power adapter. Power on all equipment and test your connectivity and throughput. The Power, Activity and Link lights will initially come on. After the VDSL Sync light illuminates green your units are in sync and connectivity is established.

Note: The innermost pins (3&4) in a 6 pin head or (2&3) in a 4 pin head are used for transport for both voice and data. The 860's perform an automatic flip of the pins if needed as long as you use the same wire pair on each end of the run. The provided telephone patch cord can be used for your test and understanding of the wiring pins. Crimp a blank RJ-11 male head to 1-pair of your existing CAT rated cabling on each end and insert directly into the VDSL port of the 860 unit.

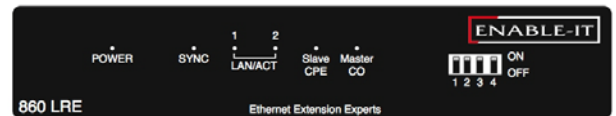
If the VDSL Sync light illuminates flashing, then the wiring between each 860 unit is not able to provide synchronization between each end. Items to check are:

- 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 telephone patch cord in each 860 unit and power applied and each 860 unit switched on.

- 2 Once testing is completed, the remote 860 unit can be located to its permanent location. Insert the telephone patch cord into the VDSL port Insert into the back of the remote 860 unit and the other end into the wallplate connected to your remote pair of backbone wiring. Connect your remote end device to the Ethernet port of the remote 860 unit and power adapter. Perform the same operation on the primary 860 unit for connecting cabling and power to the unit. Make sure the backbone wiring pair (1-pair) match each other on each end of your connection. Power on all equipment and test your connectivity and throughput.
  
- 3 For troubleshooting, first examine the backbone wiring pair and make sure you have solid connections. The VDSL Link will be lit on each 860 unit to show proper connection and pairing. If the VDSL 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 telephone patch cord in each 860 unit and power applied and each 860 unit switched on.
  - 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 off position.

860 CO DIP Switch settings

860 CPE DIP Switch settings  
*Never change the CPE DIP switches*



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

### 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

### **Returning Products for Warranty Repair**

Enable-IT, Inc. warrants to the original purchaser of the Product ("you" or the "End User") that, for the one (1) 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. Optional two (2) year and three (3) year warranties are available to extend this coverage if purchased during the first year of coverage.

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 one (1) 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. 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' 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).

e. Warranty Disclaimers THE EXPRESS WARRANTY SET FORTH ABOVE IS IN LIEU OF ALL OTHER WARRANTIES, WHETHER WRITTEN, ORAL, EXPRESS OR IMPLIED. ENABLE-IT DISCLAIMS, TO THE MAXIMUM EXTENT PERMITTED BY LAW, THE IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR NONINFRINGEMENT OF THIRD PARTY RIGHTS. NO PERSON (INCLUDING WITHOUT LIMITATION, ENABLE-IT' EMPLOYEES, AGENTS, RESELLERS, OEMS OR DISTRIBUTORS) IS AUTHORIZED TO MAKE ANY OTHER WARRANTY OR REPRESENTATION CONCERNING THE PRODUCT. IF THE DISCLAIMER OF ANY IMPLIED WARRANTY IS NOT PERMITTED BY LAW, THE DURATION OF ANY SUCH IMPLIED WARRANTY IS LIMITED TO ONE (1) YEAR FROM THE DATE OF PURCHASE. SOME JURISDICTIONS DO NOT ALLOW THE EXCLUSION OF IMPLIED WARRANTIES OR LIMITATIONS ON HOW LONG AN IMPLIED WARRANTY MAY LAST, SO SUCH LIMITATIONS OR EXCLUSIONS MAY NOT APPLY. THIS WARRANTY GIVES THE END USER SPECIFIC LEGAL RIGHTS AND THE END USER MAY ALSO HAVE OTHER RIGHTS WHICH VARY FROM JURISDICTION TO JURISDICTION. ENABLE-IT DOES NOT WARRANT THAT THE OPERATION OF THE PRODUCT WILL BE UNINTERRUPTED OR ERROR FREE.

ENABLE-IT IS NOT RESPONSIBLE FOR ANY DAMAGE TO OR LOSS OF ANY PROGRAMS, DATA, OR OTHER INFORMATION STORED ON OR TRANSMITTED USING THE PRODUCT.