

Enable-IT 8950 Extended Ethernet DSLAM Installation Manual



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ABOUT THIS GUIDE

This guide provides all the information needed to install and use the Enable-IT 8950 LRE DSLAM Concentrator. 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/8950_Manual.pdf

INTRODUCING THE 8950 LRE DSLAM CONCENTRATOR

Congratulations on purchasing the Enable-IT's 8950 LRE DSLAM Concentrator — the highest throughput and simplest method to stretch your broadband solutions for in-building deployment in commercial office buildings, hotels, and multi-tenant residential units.

The 8950 LRE DSLAM Concentrator offers the highest throughput and cost effective Solution in a simple design for rapid install using existing wiring or new.

This chapter contains introductory information about The 8950 LRE DSLAM Concentrator and how it can be used in your network. It covers the following topics:

- About the 8950 LRE DSLAM Concentrator
- Key Benefits
- Summary of Features
- Typical Applications

About the 8950 LRE DSLAM Concentrator

The 8950 LRE DSLAM Concentrator 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 8950 Extended Ethernet DSLAM 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. (RJ-45 Pins 1 & 2 = Voice line 1 and Data, Pins 3 & 6 = Voice line 2). A simple design methodology would be to think of the 8950 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, 8950 LRE DSLAM Concentrator meets the challenge of modern switched LANs and allows you to add features and capacity as your network expands. The Enable-IT 8950 LRE DSLAM 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
8950	(1) pair CAT 2 up to CAT6	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 8950 LRE DSLAM Concentrator key benefits.

- Superior throughput and distance over any competing technology.
- Broadband technology that delivers in-building 100Mbps FD Ethernet access over 1 pair of existing Category 2 up to Category 6 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 1u Rackmount with small low profile CPE units.
- CPE is a Low profile box with dual POTS line and Dual Ethernet LAN ports.

Summary of Features

The Enable-8950 LRE DSLAM Concentrator 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 on CPE units
- 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 dual telephone in one RJ-11 jack.

Specifications:

Power Indicator LED
100Mbps Link status/Activity LED's
System Status LED

Dimensions:

Height: 1.75" (44.45mm)
Depth: 8.00" (203mm)
Width: 17.50" (444.5mm)

Interfaces

(1) 110 – 240VC power input
(8) RJ-11 Dual telephone line IN
(8) RJ-45 Interlink ports
(1) Gigabit Ethernet uplink
(1) Mini-GBIC fiber module port

Internal Switch Fabric

3.6Gbps / non-blocking Store-and-Forward
Address Table: 8,000 entries
Data Buffer: 1.25Mbit w/ 1536b Frame Max
Flow Control: Back pressure for Half Duplex
IEEE 802.3x Pause Frame for Full Duplex

Functionality:

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

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

Dual Telephone Line IN pins:

Pins 2 & 3 – Voice line 1
Pins 1 & 4 – Voice line 2

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

Management

IE Web Browser
SNMP v1 and v2c, SNMP Trap

Summary of Features - continued

Layer 2 Features

VLAN - Port-Based VLAN: up to 9 VLAN groups

IEEE 802.1Q Tagged Based VLAN: 4094 VLAN ID, up to 32VLAN groups

QoS - 2 priority queues for three type of Class of Service

- Port-Based
 - IEEE 802.1p priority tag
 - TCP/IP header's TOS/DSCP classifier
- Weighted Round Robin queue scheduling

Bandwidth Control - Per port bandwidth control

Port Mirroring – Transmit or Receive

Security – Physical Port Security (Per Port Disable MAC Address Learning)

SNMP MIBs - RFC-1213 MIB-II and RFC-2863 Interface MIB

MAC Address Table - Aging time: selectable Default Mode (300 Sec.) and Fast Mode (30 Sec.)

Standards Compliance

Regulation Compliance - FCC Part 15 Class A, CE

Protocols and Standards -

- IEEE 802.3 10BASE-T
- IEEE 802.3u 100BASE-TX
- IEEE 802.3z Gigabit SX/LX
- IEEE 802.3ab Gigabit 1000T
- IEEE 802.3x Flow Control
- IEEE 802.1p Class of service
- IEEE 802.1Q VLAN Tagging
- ITU-T
- G.993.1 (VDSL)
- G.997.1
- G.993.2 VDSL2 (Profile 12a Support), Annex A
- RFC 768 UDP
- RFC 793 TFTP
- RFC 791 IP
- RFC 792 ICMP
- RFC 2068 HTTP
- RFC 2030 SNTP
- RFC 1112 IGMP versions 1
- RFC 2236 IGMP versions 2

Typical Applications

Enable-IT 8950 LRE DSLAM Units are usually installed into telephone wiring infrastructures where extension of backbone services is required and expensive fiber options are prohibitive. The 8950 LRE DSLAM Units allow a standard Ethernet segment to be deployed quickly over existing 1 pair Telco Copper Wiring in combination with existing POTS voice signals. On the RJ-45 Interlink ports 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 years with no firmware or replacement issues. Bandwidth can be scaled according to the Broadband Access Provider needs.

The Enable-8950 LRE DSLAM Concentrator 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 8950 LRE DSLAM CONCENTRATOR

The Enable-IT 8950 LRE DSLAM Concentrators have a distance restriction of 6,000ft or 1,828m over 1-pair of Category 2 up to Category 5e / CAT6 wiring from concentrator to 850 CPE unit. Therefore quick, simple site surveys and installation planning are highly recommended.

This chapter describes the recommended installation process for the Enable-IT 8950 LRE DSLAM Concentrator. It covers the following topics:

- Site Plan – Installation Design Considerations
- Unpacking the Enable-IT 8950 LRE DSLAM Concentrators
- 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 8950 Interlink transmission.

For all wiring you will need to crimp a RJ-45 Male Head to each end of the wire run per 8950 Interlink port - using the following pins (1 & 2) straight through end to end. 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 on another pair of wire. Voice lines can be input directly into the RJ-11 dual voice ports – crimp an RJ-11 male head using standard pins 2 & 3 – Line 1 and 1 & 4 – Line 2.



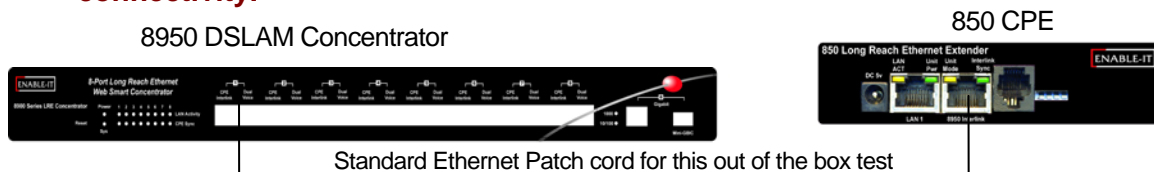
Unpacking the Enable-IT 8950 LRE DSLAM Concentrator

Carefully remove the Enable-IT 8950 LRE DSLAM Concentrators 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.

- (1) The Enable-IT 8950 DSLAM Concentrator
 - Country Specific AC Power cord
 - Rackmount dog ears
- (1) Enable-IT 8950 LRE DSLAM Concentrator Installation Manual (this manual)

Perform an out of the box Test

We highly recommend a quick test to ensure the working order of your 8950 concentrator and 850 CPE units. To do this, please use one of the Ethernet patch cords provided in the 850 CPE kit and attach to a 8950 Interlink port and the Interlink port of an 850 CPE unit. Power up the 8950 and 850 unit. After a few seconds you should see a solid Green Interlink Sync LED on the 850 CPE unit and the active port on the 8950. 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 8950 and 850 CPE units.

8950 LEDs

- Power** - Solid Green LED indicates the concentrator is receiving power.
- Sys** - Solid Orange LED indicates the concentrator operating normally.
- CPE Sync** - Solid Orange LED indicates the port has synched with the remote 850.
- Blinking Orange LED indicates the port is trying to sync with an 850.
- LAN Act** - Blinking Green LED indicates the presence of LAN traffic from the remote 850 CPE.

850 LEDs

- Interlink Sync** - Solid Green LED indicates the 850 has synched with the 8950.
- Unit Pwr** - Solid Green LED indicates that 850 CPE is receiving 5v power.
- Unit Mode** - Solid Yellow LED on 850 CPE unit only
- LAN ACT** - Yellow LED – Lit solid indicates the presence of local LAN
- Blinking indicates the presence of local LAN traffic

Setup and Configuring the Enable-IT 8950 LRE DSLAM Concentrator

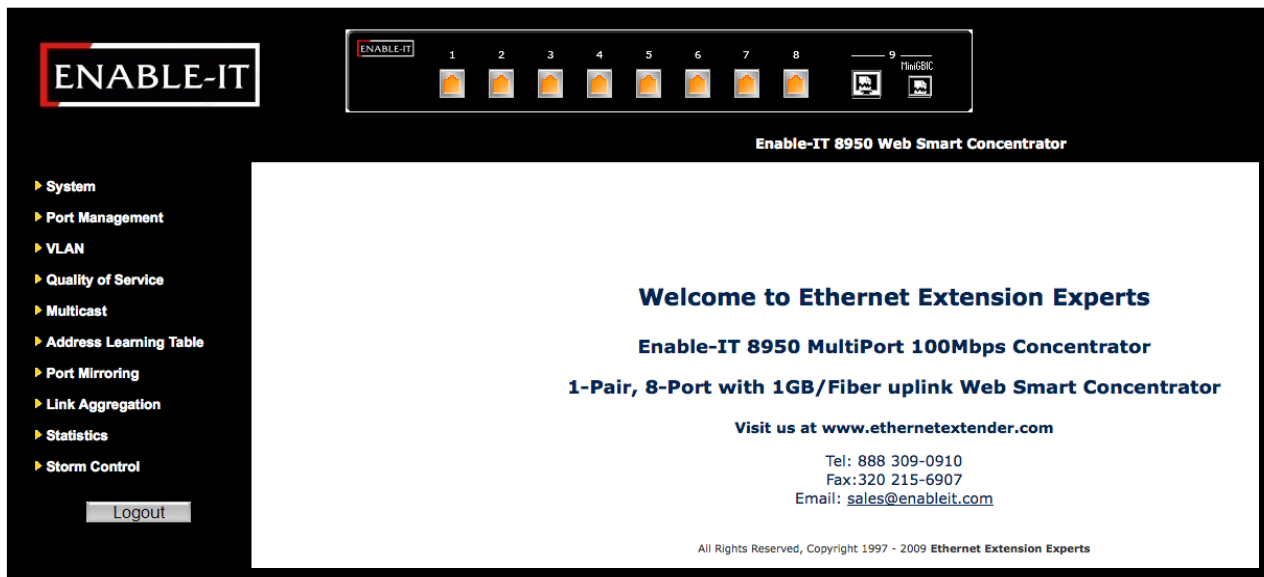
The Enable-IT 8950 LRE DSLAM provides a built in web browser interface to configure and manage the switch to provide a more custom installation for your network. You can access and manage the 8950 through a remote host with a java enabled Microsoft Internet Explorer only. Other web browsers such as Netscape Navigator, Mozilla Firefox, Apple Safari, or Opera will not display or update the settings correctly. It is recommended to use the latest versions of Microsoft Internet Explorer only with a JAVA runtime plug-in installed.

To initially access the web management interface your host system must be on the same local IP subnet as the default settings for the Enable-IT 8950 concentrator. The 8950 is set to the following IP addressing: 192.168.0.100
255.255.255.0 subnet mask

Using your host web browser enter the URL <http://192.168.0.100> You should see a separate login popup window. The default username is "admin" the default password is "admin".

Enable-IT 8950 Web Management Menu

After a successful login the following Web Management Menu will appear. If you do not see the active JAVA image of the 8950 concentrator in the top header you will need to activate the JAVA plug-in.



The screenshot shows the web management interface for the Enable-IT 8950 Web Smart Concentrator. At the top, there is a navigation bar with the ENABLE-IT logo on the left and a status bar on the right showing eight active ports (1-8) and two inactive ports (9-10). Below the navigation bar is a sidebar menu on the left with the following items: System, Port Management, VLAN, Quality of Service, Multicast, Address Learning Table, Port Mirroring, Link Aggregation, Statistics, and Storm Control. A Logout button is located at the bottom of the sidebar. The main content area displays a welcome message: "Welcome to Ethernet Extension Experts" followed by "Enable-IT 8950 MultiPort 100Mbps Concentrator" and "1-Pair, 8-Port with 1GB/Fiber uplink Web Smart Concentrator". Contact information is provided: "Visit us at www.ethernetextender.com", "Tel: 888 309-0910", "Fax: 320 215-6907", and "Email: sales@enableit.com". At the bottom of the main content area, it states "All Rights Reserved, Copyright 1997 - 2009 Ethernet Extension Experts".

A recommended first task is to change the default password. Select the System menu from the main menu list on the left. Select Password Setting and using lowercase only – change the default password. Click Save to finish. If you forget your password you can reset the 8950 concentrator by pressing the recessed reset button on the left front panel. Press and hold for 10 seconds – the 8950 will reboot and reset the default IP address and default login information.

For customizing the IP addressing information to better fit your network requirements you can select the IP Configuration menu (Under the System menu). DHCP addressing is enabled by default.

Other submenus will allow you to access options such as configuring VLANs, QoS, bandwidth shaping and port configurations. Port configurations are currently set for optimal performance and should not be changed.

Performing the On-Site Installation

After removing the Enable-IT 8950 LRE DSLAM Concentrator from the box and performing the out of the box testing all that remains for installing the unit on-site is to mount the concentrator, 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 8950 LRE DSLAM Concentrators

The Enable-IT 8950 LRE DSLAM Concentrators can rackmounted or stacked. Choose a location where the maximum distance does not exceed 6,000ft or 1,829m total between the 8950 and the furthest 850 CPE devices to be connected.

2 Building the 8950 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 wire run per 8950 Interlink port - using the following pins (1 & 2) straight through end to end. 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 on another pair of wire. Voice lines can be input directly into the 8950 concentrator RJ-11 dual voice ports – crimp an RJ-11 male head using standard pins 2 & 3 – Line 1 and 1 & 4 – Line 2.

Wire runs can be standard Category rated twisted pair from a spool or existing telephone wiring.

3 Remote end 850 CPE unit wiring.

The 850 CPE can be connected to any standard telephone wallplate by using a modified telephone patch cord. The 850 CPE kit contains this dual phone line RJ-11 to RJ-45 telephone patch cord. You can build one easily if needed by using a single line or dual line telephone patch cable. Cut off the head for the telephone side and crimp on a blank RJ-45 male plug using the line 1 pins from the phone jack to RJ-45 Pins 1 & 2. If your phone jack provided dual voice the line 2 pins from the phone jack to RJ-45 Pins 3 & 6.

Attach your remote LAN device to the 850 CPE unit LAN port with Ethernet patch cord provided. Attach the power adapter to the 850 CPE unit.

If you plan on using voice service as well, insert your telephone to the 850 Dual Voice RJ-11 port. Your equipment should now be powered up and functioning. The following LED indicators will provide visual operational status of the 850 CPE units.

Interlink Sync	- Solid Green LED indicates the 850 has synced with the 8950.
Unit Pwr	- Solid Green LED indicates that 850 CPE is receiving 5v power.
Unit Mode	- Solid Yellow LED on 850 CPE unit only
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 850 unit to show proper connection and pairing. If the Interlink Sync LED Link is flashing –

- 1) Make sure your wiring pairs is straight through and not flipped at any Telco punch down block. Open the telephone wallplate and make sure you have solid connections and no loose wires or bridged connections.
- 2) Check for a firm connection of the RJ-45 connections in the 850 CPE unit, power is applied to the 850 CPE unit.
- 3) If your installation has performance issues not resolved by the first two steps, you can change the 850 DIP Switch (2 & 4) to the ON position.

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/help/tech-support/index.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 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.

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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 8950 LRE DSLAM Concentrators solely pursuant to the following terms and conditions.

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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'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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