

Enable-IT 8930 1-Pair Extreme Reach Ethernet

Installation Manual



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ABOUT THIS GUIDE

This guide provides all the information needed to install and use the Enable-IT 8930 Extreme Reach Ethernet 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/8930 Manual.pdf>

INTRODUCING THE 8930 EXTREME REACH ETHERNET CONCENTRATOR

Congratulations on purchasing the Enable-IT's 8930 Extreme Reach Ethernet Concentrator — the simplest method to stretch your broadband solutions for in-building deployment in commercial office buildings, hotels, and multi-tenant residential units.

The 8930 Extreme Reach Ethernet Concentrator 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 8930 Extreme Reach Ethernet Concentrator and how it can be used in your network with the Enable-IT 830 Extreme Reach Ethernet CPE. It covers the following topics:

- About the 8930 Extreme Reach Ethernet Concentrator
- Key Benefits of the 8930 / 830 solution
- Summary of Features
- Typical Applications

About the 8930 Extreme Reach Ethernet Concentrator

The 8930 Extreme Reach Ethernet Concentrator is a very cost effective solution for providing high speed data and voice services over existing telephone wiring for commercial and hospitality environments.

In many office buildings, preferred network access is a dedicated Ethernet line, however Ethernet over twisted pair wiring has its distance limitations of just 325 ft. In order to drive Ethernet signal further, one would have to add repeaters to each segment of 325ft twisted pair cabling; this is often insufficient and too costly in multi-story buildings. Fortunately, the Enable-IT 8930 Extreme Reach Ethernet can push the reach of Ethernet to more than (70) seventy times the typical Ethernet distance over a 1-pair Telco wiring infrastructure with an active voice line to a 830 Extreme Reach Ethernet CPE.

A simple design methodology would be to think of the 8930 extending a standard Ethernet line up to 22,500' (6.5km) and can also include a PABX voice line simultaneously.

To increase the durability and extended use of the product providing maximum future technology protection, 8930 Extreme Reach Ethernet Concentrator meets the challenge of modern switched LANs and allows you to add features and capacity as your network expands. The Enable-IT 8930 Extreme Reach Ethernet Concentrator has been tested to provide sustained Ethernet transport up to 24MB/s down/3MB upstream over CAT2 or better cabling. Users will see a full 100MB link on their connected laptop or other LAN equipment.

Key Benefits

The following list identifies the 8930 Extreme Reach Ethernet Concentrator key benefits.

- Dramatic cost reduction over any competing technology.
- Broadband technology that delivers in-building Ethernet access over 1 pair of existing Telephone wire up to Category 6 wiring up to 22,500', 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 CPE profile, and telephone block punchdown.
- Low profile CPE with POTS line and single 10/100MB Ethernet port.

Summary of Features

The Enable-8930 Extreme Reach Ethernet Concentrator has the following hardware features:

- 1 (8) port Extreme Reach Ethernet Concentrator with 100MB uplink
- Rapid Telco style installation – RJ-21 50-pin connector to bridge into existing Telephone wiring
- Supports digital VoD channels
- Drives Ethernet 10/100 Mbps full-duplex service delivery up to 22,500ft or 6.5km
- Network Equipment independence – Transparent to protocols/applications/MAC
- Maintains lifeline POTS

This Enable-8930 is compliant with ITU G.992.5, G.992.3, G.992.1. The Enable-IT 8930 ADSL2+ technology is also backwards compatible with early version of ADSL. It is an enhanced version of the ADSL technology, which provides cross-talk free deployment and is an ideal solution for Triple-play IP deployment and requirements. Use existing copper twisted pair telephone lines to provide high speed Internet access. The Link Status LED indicators on the front panel confirm individual line connections and operational status.

The Enable-IT 8930 is configured for immediate deployment and will allow for the connection into your telecom wiring infrastructure (RJ-21) 50-pin- 25pair block and the attachment of Enable-IT 830 CPE. The Enable-IT 8930 concentrator can be managed and configured to your custom IP LAN (if needed) through a web interface.

Any PC configured with the same IP subnet as the default Enable-IT 8930, running a web browser can be attached to the 8930 LAN interface via an Ethernet crossover cable is able to manage and change the default configuration.

The out of the box default bridged configuration, the Enable-IT 8930 ADSL2+ concentrator is transparent to the network. It bridges the ADSL line to the Ethernet line, making both sides appear as a single subnet. In this configuration, an IP address only needs to be provided to the PC. It may still be beneficial to provide an IP address to the ADSL router for management.

Specifications:

- Power Indicator
- 10/100Mbps Link status/Activity
- Full Duplex/Half Duplex status/Collisions
- ADSL Link Status/Activity

Dimensions:

- Height: 1" (25mm)
- Depth: 15" (381mm)
- Width: 17.5" (444.5mm)

Interfaces

- (1) DB-9 Console Port
- (1) RJ-21 (25-pair) ADSL2+ bridge
- (1) RJ-45 10/100MB LAN Auto negotiate

Network Configuration Modes

- Gateway
- PC-Attached
- PC-Attached Gateway

ADSL Support

- ANSI T1.413 Issue 2
- ITU-T G.992.1 (G.dmt)
- ITU-T G.992.2 (G.lite)
- Multimode (automatic modulation detection)

ATM Support

- ATM Signaling UNI 3.1 & 4.0
- PPP (RFC 2364) over ATM
- RFC 1483
- RFC 1577 (IP over ATM)
- AAL0, AAL2, AAL5
- ATM Service Class: UBR/VBR/CBR
- 32 VCs

Functionality:

- Data Rates 10/100Mbps Full Duplex
- 24Mbps throughput downstream
- 3Mbps throughput upstream
- Protocol independent

Environment

- Operating temp: 0° to 50°C/32° - 122°F
- Storage temp: -25° to 60°C/-13° - 140°F
- Humidity 5% to 95%, non-condensing

Routing

- IP routing from Ethernet to IPoA or PPP
- Network Address Translation (NAT)
- DHCP Server

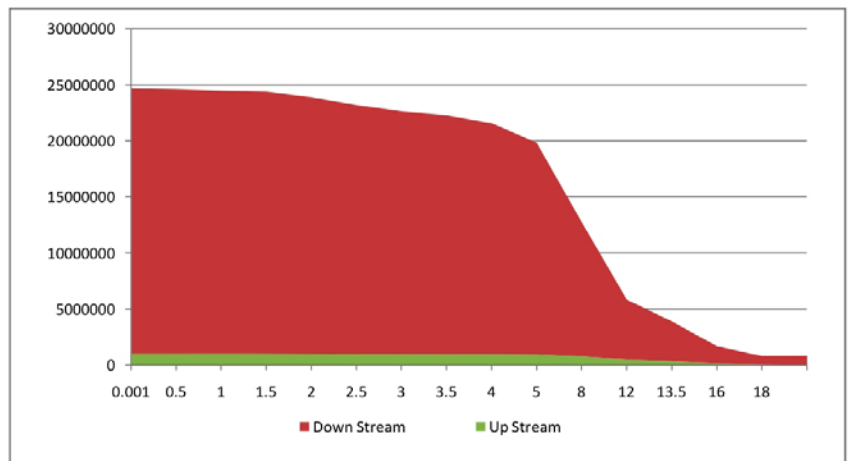
10/100BaseT Ethernet Support

Console Management

Web Management

port a0

Distance (K ft)	Down (bits/sec)	Up (bits/up)
0.001	23653500	1021900
0.5	23610600	1021900
1	23442900	1021900
1.5	23368800	1021900
2	22885300	1021900
2.5	22203200	1018200
3	21645800	1014500
3.5	21287100	1010700
4	20573800	1010700
5	18889800	966600
8	12005100	777000
12	5373500	493300
13.5	3567000	370200
16	1515400	183300
18	767300	56000
18.5	767300	40000



18K ft

Port	Down (bits/sec)	Up (bits/up)
a0	767300	56000
a1	774600	32000
a2	770900	37300
a3	754000	40000
a4	774600	34600
a5	767300	40000
a6	770900	37300
a7	754000	40000
a8	760800	52800
a9	750300	52800
a10	760800	37300
a11	703200	49700

Port	Down (bits/sec)	Up (bits/up)
a12	750300	34600
a13	757200	52800
a14	760000	40000
a15	750300	37300
a16	754000	34600
a17	767300	40000
a18	746700	37300
a19	763600	32000
a20	750300	40000
a21	760800	52800
a22	763600	49700
a23	743100	34600

Average speed (Down/Up): 757329 / 41479

Typical Applications

Enable-IT 8930 Extreme Reach Ethernet Concentrators are usually installed into telephone wiring infrastructures where extension of backbone services is required and expensive fiber options are prohibitive. The 8930 Extreme Reach Ethernet Concentrators allow a standard Ethernet segment to be deployed quickly over existing 1 pair Telco Copper Wiring in combination with existing POTS voice signals.

Installers have the convenience of a 10/100Mbps LAN Ethernet unit for peace of mind connectivity and no CPE 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 8930 Extreme Reach Ethernet Concentrator is a passive device so interruption of Internet service does not affect POTS services. Carriers and Access Providers can come and go, but the 8930 Extreme Reach Ethernet Concentrator technologies continue to provide lasting value such as the other utilities like Water, gas and electricity.

The Enable-8930 Extreme Reach Ethernet 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)**



INSTALLING THE 8930 EXTREME REACH ETHERNET CONCENTRATOR

The 8930 Rackmount Extreme Reach Ethernet Concentrator is a simple to install and deploy Extreme Reach Ethernet solution. The 8930 supports up to (8) 830 Extreme Reach Ethernet CPE units. Each 830 Extreme Reach Ethernet CPE has a maximum distance restriction of 22,500ft or 6.5km over telephone wiring or better from the 8930 Extreme Reach Ethernet Concentrator.

This section describes the recommended installation process for the 8930 Rackmount Extreme Reach Ethernet Concentrator and 830 Extreme Reach Ethernet CPE units. It covers the following topics:

- Installation Design Considerations
- Unpacking the 8930 Extreme Reach Ethernet Concentrator
- Performing the 8930 Extreme Reach Ethernet Concentrator Installation

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. Also the discovery should include several in-room wiring inspections to document where the main line enters the room and how the other in-room telephone jacks are connected and the type of wiring used for extensions.

Document your findings to use in planning your installation and resource planning.

Key points to remember in the Site Survey.

- 830 Extreme Reach Ethernet CPE unit distance limitation of 22,500ft over Telco wiring from the 8930 Concentrator.
- 1 Pair Telco wiring or better from the 8930 to each 830 location.
- Location of main point of entry in the room for the first telephone wallplate.
- Location of the 8930 Concentrator is recommend in a 19-inch standard rack or cabinet with fan, grounded power and proper ventilation
- 8930 Concentrator can operate over active phone lines or spare unused lines running to each respective 830 Extreme Reach Ethernet CPE location.
- Do you have a DHCP server on your LAN or do you need the 8930 to provide for your remote locations.

Unpacking the 8930 Extreme Reach Ethernet Concentrator

Carefully remove the 8930 Extreme Reach Ethernet Concentrator from the packing box including the provided cabling, rack mount hardware and manual.

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) 8930 Extreme Reach Ethernet Concentrator
- (1) Country specific power cord
- (1) RJ-21 cable for connection of 8930 to your Telephone block with RJ-21 interface

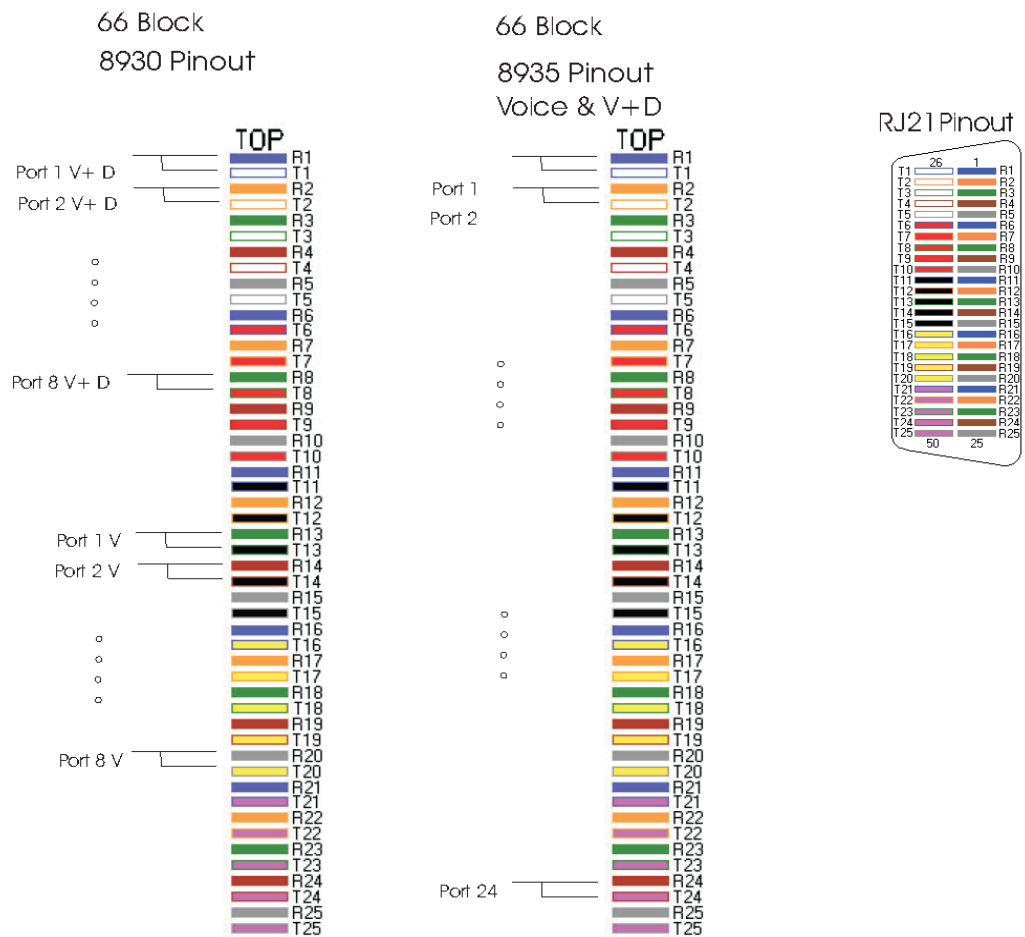
Installing the 8930 Rackmount Extreme Reach Ethernet Concentrator

Locate the 8930 chassis and rackmount into your space selected. Attach a separate ground wire if applicable or desired. In some instances the rack maybe grounded and the mounting of the chassis into it will provide sufficient grounding. Connect the provided RJ-21 to the rear of the 8930 and other end to your Telephone Block.

Use a Telco standard telephone block with a RJ-21 50-pin (25-pair) connector or use the provided RJ-21 Cable and cut off one head and punch down following industry standard 25-pair color code. See following DSLAM diagram. Attach the country supplied power cord to the rear of the 8930 when ready to power up.

We highly recommend testing (1) 830 Extreme Reach Ethernet CPE on each port of the 8930 Extreme Reach Ethernet concentrator prior to installing the 830 in each remote location. To do this, simply use the provided telephone patch cord to connect the 830 to your 8930 wiring block punchdown.

DSLAM is place in series with the phone line



The out of the box default bridged configuration, the ADSL2+ router is transparent to the network. It bridges the ADSL line to the Ethernet line, making both sides appear as a single subnet. In this configuration, an IP address only needs to be provided to the PC. It may still be beneficial to provide an IP address to the ADSL router for management.

The Enable-IT 8930 is configured for immediate deployment and will allow for the connection into your telecom wiring infrastructure (RJ-21) 50-pin- 25pair block and the attachment of Enable-IT 830 CPE. The Enable-IT 8930 concentrator can be managed and configured to your custom IP LAN (if needed) through a web interface.

Any PC configured with the same IP subnet as the default Enable-IT 8930, running a web browser can be attached to the 8930 LAN interface via an Ethernet crossover cable is able to manage and change the default configuration.

The default IP setting of the Enable-IT 8930 are as follows:

IP Address: 192.168.1.253

IP Subnet: 255.255.255.0

Warning: There are many complex settings in the menu structure of the Enable-IT 8930 and should not be modified except for configuring your LAN IP Subnet scheme and DHCP Server (If you don't currently have one on your LAN). Otherwise the 8930 is plug and play operation.

- 1 Prior to performing a remote link install, test your setup and equipment.
Connect your originating LAN to the Ethernet port in the rear of the 8930 unit and attach the provided country specific power cord.

The 8930 Concentrator with corresponding, IP subnet and gateway IP address. By default the 8930 ships with a 192.168.1.253 IP address and will work with your existing LAN IP scheme transparently and pass DHCP requests to your PC or other LAN attached to a remote Enable-IT 830 CPE unit. The only reason for changing the IP address of the 8930 is to be able to manage the concentrator, which really doesn't need any management for its operation.

To log into and configure the 8930 concentrator you will need a Ethernet crossover cable, the serial port is not used for initial configuration and is a spare port for a alternate management console if needed. Insert your Ethernet crossover cable into the RJ-45 LAN port on the rear of the 8930 Concentrator. Power on the 8930 concentrator and using your PC web browser login to the default IP <http://192.168.1.253>

Default Username: admin Default Password: admin

- 2 Unpack a few 830 CPE units and using the provided telephone patch cord in each 830 CPE kit, connect each end of the cord into your Telephone wiring infrastructure that is connected as described in the previous section to the 8930 concentrator. Connect a laptop to the Ethernet port of the 830 CPE and power on the 830 CPE. Power on all equipment and test your connectivity and throughput. The Power, Activity and Link lights will initially come on. After the Sync light illuminates green your units are in sync and connectivity is established.

If the Alarm light illuminates red, then the wiring between the 830 CPE and 8930 concentrator is not able to provide synchronization between each end. Items to check are reversed wire between the 830 and 8930, firm connection of telephone patch cord in the 830 CPE and power applied and each 830 CPE switched on. A DSL filter can clean up any noise on the line that may affect the data losing connection (RED Alarm light) from time to time.

Once you have tested a few of the ports of the 8930 for connectivity and become familiar with the basic operation, you can begin the remote installation of the 830 Extreme Reach Ethernet CPE's.

- ③ Detailed 830 CPE installation directions are provided in the 830 CPE manual. Otherwise to install the remote 830 CPE units, locate them to its permanent location (desktop mounted under the desk). Insert the telephone patch cord into the Line port on the back of the 830 CPE and the other end into the wallplate connected to your telephone wiring. Attach the provided wall power adapter to the electrical outlet and the 830 CPE. Power the unit on and attach your Ethernet cable. Power on all equipment and test your connectivity and throughput.
- ④ For troubleshooting, first examine the telephone wiring pair and make sure you have solid connections. The Sync LED will be lit green on the 830 CPE to show proper connection and airing with the 8930 concentrator. If the Sync LED is not lit or lit Red, try swapping the order of the 1-pair telephone wiring at the telephone wallplate jack.

We highly recommend testing a few ports/rooms to clearly understand the process and your specific wiring.

TROUBLESHOOTING TECHNICAL REFERENCE

There are few issues that can effect the proper operation and installation of Enable-IT 8930 concentrator or the 830 CPE. These technical notes address the proper installation and the most common, troubleshooting challenges that may arise.

Assuming the equipment is installed correctly; troubleshooting challenges fall into two (2) categories: Equipment Defects - DOA; in-Room wiring issues – shorts, cable quality, and or wiring configuration.

To test questionable 8930 ports and/or any suspect Enable-IT 830 CPE simply attach a known good Enable-IT 830 CPE directly onto the 8930 port at the back of the 8930, Line port. Connect your PC and verify Ethernet connectivity to the switch. If no connectivity is detected, try another 8930 port or swap the 830 CPE.

If connectivity is established with the tested 8930 port and Enable-IT 830 CPE, then your troubleshooting focus is the in-room wiring or the Home run wiring from the room to the 8930 1-Pair Ethernet Extension controller.

Equipment Defects - DOA

Enable-IT, Inc. certifies all of our equipment prior to shipping and takes protective precautions when shipping orders; however, there are possibilities of shipping damage during transit.

In order to save time in your installation process, we recommend that your installation engineers carry several Enable-IT 830 CPE with them when installing rooms. This way they can focus on getting rooms up and running and set aside any suspect CPE to be tested for DOA.

When DOA equipment is discovered, please contact your Enable-IT sales representative immediately so that we can RMA and replace your units in a timely manner for your project.

In-Room Wiring

In-Room wiring and the home run wiring scheme are where connectivity issues are often found. We highly recommend looking at the segments of the cabling to quickly pinpoint the issue and move on to the next room or troubleshooting challenge. To understand the segments involved for room wiring and troubleshooting, please refer to the following descriptions and sample diagram:

- (1) Home run wire (Wiring segment from the IDF or MDF to the main point of entry jack for a given room). This segment should be under 22,500 feet and can be easily tested following the Steps as listed in the installation guide.
- (2) In-Room phone extensions (Wiring segments from the Main point of entry jack to all other in-room phone jacks). These segments can be daisy-chained, a star configuration, or a combination of both. In all cases you must document the wire color and wire number order on the main point of entry jack in relation to all the other in-room attached wiring segments. Connect only the jack needed for the location of the Enable-IT 830 CPE and test.

DSL filters (provided) can be used in any existing telephone wallplate that is connected to the in-room wiring between the Enable-IT 830 wallplate and the Enable-IT 8930 concentrator to filter out any line noise interference.

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 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

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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.

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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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