



25-Year Communications Channel Limited Warranty Document
Version 030

CONTENTS

- 1.0 Definitions**
- 2.0 Introduction**
- 3.0 Warranty Procedure**
- 4.0 Warranty Period**
- 5.0 Warranty Coverage**
- 6.0 Warranty Limitations**
- 7.0 Territory**
- 8.0 Actions in the Event of a Claim**
- 9.0 Obligations of Other Parties**

APPENDIX 1

APPENDIX 2

APPENDIX 3

APPENDIX 4

1.0 Definitions

<i>'Approved Installer'</i>	A company that has signed up for and to the conditions of the Leviton Installer Certification Program.
<i>'Authorised Reseller'</i>	A company that has applied and been approved to supply Leviton solutions.
<i>'Permanent Link'</i>	A cabling system as described in the ISO 11801 standard.
<i>'Blolite'</i>	An air-blown fibre optical system developed by Leviton for the installation of optical fibres within the LAN environment.
<i>'Brand-Rex'</i>	Leviton; formerly Brand-Rex, a Leviton Company Limited, Viewfield Industrial Estate, Glenrothes, Fife, KY6 2RS, Scotland, or its associated regional/international offices.
<i>'Categories and Classes of operation'</i>	The electrical and optical components and system performances as described in the ISO 11801 standard.
<i>'CAT6Plus, GigaPlus, 10GPlus, Atlas-X1, Extreme SmartPatch, Blolite/MicroBlo, Voice, FibrePlus, Hi-Dex, e2XHD, HDX, SDX, UHD'</i>	The brand names of sets of copper and optical cables and components supplied by Leviton as part of the Leviton Network Solutions Cabling System.
<i>'Channel'</i>	A cabling system described in the ISO 11801 standard.
<i>'Leviton Agreement'</i>	A set of trading terms and conditions between Leviton, their distributors, Premier Installers, and Authorised Installers serviced through the distributors.
<i>'Leviton Cabling System'</i>	A brand name of a set of cabling components supplied by Leviton.
<i>'The Standards'</i>	Unless more specifically defined, the latest versions of ISO 11801, EN 50173, EN 50174, EIA/TIA/ 568C, and IEC 61935.

2.0 Introduction

This warranty applies to a Brand-Rex Limited, (a subsidiary of Leviton Manufacturing Company Inc. and herein referred to as Leviton) cabling system purchased from a Leviton Authorised Reseller and installed and tested by a Leviton approved installer in accordance with Leviton instructions and is offered between Leviton and the owner of the Leviton Cabling System.

Only a Leviton approved installer who has completed all required professional training recognised by Leviton can offer the Leviton Warranty. Leviton training certification must be less than two years old (less than three years in USA). SmartPatch , Blolite, and MicroBlo warranties can only be given by installers who have received training specific to these products.

2.1 Terms and Conditions

- 2.2 This warranty supersedes and replaces all warranties formerly available from Brand-Rex Ltd, taking effect from any previous warranty's date of issue.
- 2.3 The warranty terms and conditions contained herein should be read in conjunction with the standard Leviton terms and conditions of sale. A copy of the standard terms and conditions of sale are available upon request.
- 2.4 The standard terms and conditions of sale of Leviton will prevail unless modified within this warranty document.
- 2.5 Each year, Leviton will, at its discretion, audit a percentage of new installations (re-testing all, or a percentage of, the installation) to ensure quality and compliance to standards and Leviton installation guidelines.

3 Warranty Procedure

- 3.1 Within 28 days of installation by the Leviton Approved Installer, the cabling system must be 100% tested according to the requirements found in the Leviton document, 'Guide to Testing and Submitting Test Results.'
- 3.2 Within 56 days of system installation, the Approved Installer shall submit a warranty application via the online Warranty Portal available through the Leviton website. The test results, in an acceptable format (refer to 'Guide to Testing and Submitting Test Results'), must be uploaded via the web portal at the time of application by the Leviton Approved Installer. Leviton reserves the right to reject applications submitted in an incorrect format or with incorrect data/results. In the case of a project completed over an extended period (in phases), results should be submitted at the end of each phase. The

whole project will be recorded using the same warranty number with several extensions as the project is completed.

- 3.3 All tests must be performed using appropriate test instruments and software maintained, calibrated, and operated according to the manufacturer's instructions. A list of approved instruments is available upon request.
- 3.4 If requested by the owner or intended owner of the cabling system, Leviton will conduct an audit during installation to ensure compliance with standards and Leviton guidelines; an additional non-intrusive audit up to 1,000 days after completion of installation may also be performed. This service is chargeable at the prevailing Leviton technical consultancy daily rate, plus all travel and accommodation expenses unless otherwise agreed, in writing, in advance.
- 3.5 Upon successful submission of the test results and review by Leviton, a Leviton Warranty Certificate will be issued by Leviton appertaining to the installation.
- 3.6 For Class D and E systems, the copper cable system must be 100% tested as a Permanent Link (as defined in ISO 11801: latest edition) according to the test requirements of TIA 568C, EN50346, or IEC 61935 with a Level III (or better) cable tester. Leviton will guarantee channel performance when Leviton patch cords are added to the permanent link with no requirement for further testing.
- 3.7 ISO/IEC Class E_A (10GbaseT) system must be tested as a permanent link with a Level IV (or better) tester, in accordance with the Leviton 'Guide to Testing and Submitting Test Results.' Leviton will guarantee channel performance when Leviton patch cords are added to the permanent link with no requirement needed for further testing.
- 3.8 Only patch cords manufactured or supplied by Leviton can be used in an installation submitted for a Leviton 25-Year Communications Channel Limited Warranty.

Warning

The installation of non-Leviton copper Class D (Cat 5), Class E (Cat 6), or Class E_A (AC6) patch cords or work area cables within an installation may seriously compromise the ability of the installed network to support high-speed network applications such as Gigabit or 10 Gigabit Ethernet; any such installation will invalidate the warranty.

- 3.9 Leviton pre-terminated copper solutions are provided fully tested; however, for warranty purposes, a 100% re-test after installation is mandatory for warranty acceptance.
- 3.10 Leviton pre-terminated traditional, MPO, and MTP optical systems are provided fully tested; however, for warranty purposes, all fibre must be 100% tested on each fibre link for attenuation as described in the Leviton 'Guide to Testing and Submitting Test Results.'

4 Warranty Period

4.1 Passive Cable Products

The warranty period starts on the date of issue on the Leviton Warranty certificate and covers a period of 25 years thereafter. This includes the Class D, Class E, Class E_A and optical performance of SmartPatch panels (but not the electronic products; e.g. scanners or software).

4.2 Electronic products

SmartPatch

The warranty period starts on the date of issue on the Leviton Warranty certificate and ends eighteen months thereafter. The warranty includes SmartPatch scanners, control modules, and active sections of the SmartPatch panels.

4.3 Software

Leviton products that have been satisfactorily installed, configured, commissioned, and tested according to the relevant Leviton agreement, installation manual, and testing guide are warranted to operate in accordance with specification for sixty days from date of shipment on the software license.

5 Warranty Coverage

5.1 Performance

The Leviton Cabling System is guaranteed to meet the channel electrical (or optical, as appropriate) performance defined in the Standards at the time of installation for 25 years from the date of the Warranty Certificate. The relevant Standards are:

- TIA-EIA-568
- ISO/IEC 11801
- EN50173

5.2 Applications

For the 25 year limited warranty period of the Leviton Cabling System:

- Any application requiring Class C performance is guaranteed to operate adequately over voice products.
- Any application requiring Class D performance is guaranteed to operate adequately over GigaPlus or SmartPatch Cat 5.
- Any application requiring Class E performance is guaranteed to operate adequately over Cat6Plus, eXtreme[®], Atlas-X1[™] or SmartPatch Cat 6.
- An application requiring Class E_A performance is guaranteed to operate adequately over 10GPlus, eXtreme, or Atlas-X1 products.
- Any application requiring channel performance classes OF300, OF500, or OF2000 is guaranteed to operate adequately using the appropriate optical fibre type (OM1, OM2, OM3, OM4, OS1 or OS2) using FibrePlus, Blolite, MicroBlo, UHD, HDX, e2XHD, SDX, Hi-Dex or SmartPatch Fibre products.

5.3 Full Cost of Replacement

Defective materials supplied by Leviton under the terms of this warranty will be repaired or replaced, at Leviton's discretion, by either the original contractor/installer or one of Leviton's choosing. Reasonable costs of reinstatement will be met by Leviton.

5.4 Application Support

A complete list of applications supported by a Leviton channel is included in Appendix 1.

5.5 Extended Distance

Although the Standards define maximum channel lengths, in specific instances longer-distance operation is possible when using Leviton Cabling Systems. These instances are defined in Appendices 2 and 3. Extended lengths of copper cable will have a Class C or lower electrical warranty, but adequate performance of the application is guaranteed. Leviton will identify

the affected links on the warranty 'backsheet' supplied with the Warranty Certificate.

5.6 EMC/EMI

An IT network is compliant with the EMC Directive when the active equipment complies with the requirements of EN 50081, EN 50082, EN 55022, and EN 55024, and the cabling system is designed, installed, and maintained to the requirements of EN 50173 and EN 50174. Leviton cabling products and installation and maintenance programmes comply with the Standards. Compliance of the IT network with the EMC directive is assured when the active equipment used on the network is compliant with the EMC/EMI Standards.

5.7 Transfer of Warranty

The owner of the warranted cabling system may transfer the remaining lifetime of the warranty to a new owner upon written request to Leviton. However, it is recommended that a system audit be completed to ensure Standards compliance has been maintained during the change of ownership.

5.8 Five and Six Connector Models

The Standards define a horizontal copper cabling channel that contains no more than four connection points. Cat6Plus may be used with five or six connectors, and will still achieve an overall Class E channel performance when all other Class E/Cat 6 design rules and other Leviton instructions are observed.

For guidance on Class E_A/Cat 6A horizontal copper cabling channel configurations, please contact Leviton Technical Support.

6 Warranty Limitations

- 6.1 A Leviton Approved Installer must install and test the cabling system, and provide the defined test data and documentation for the project.
- 6.2 All products must be exclusively Leviton products. Product substitution may only be made with the written permission from Leviton prior to installation. Substituted products are not warranted by Leviton. Approved alternative products must have a concession number, valid only for one specific project, obtained from Leviton prior to installation. The concession number must be recorded on the warranty application form.

- 6.3 All cabling systems must be designed and tested according to the relevant national or international Standard and the Leviton 'Guide to Testing and Submitting Test Results.' Installation must follow the 'Leviton Installation Guidelines' or official video instructions (which take precedence over 'in-package' short-form instructions), and the products must be used within the environmental limits defined in the appropriate product data sheet. Other rules and instructions may be published by Leviton from time to time.
- 6.4 All installed products must be brand-new and purchased from Leviton or from an Authorised Leviton Reseller.
- 6.5 Any product moved, re-terminated, or modified in any way must be re-tested and resubmitted for warranty validation.
- 6.6 All products must be used within the electrical and environmental limits for which they were designed throughout their working life.
- 6.7 Any form of accidental or malicious damage to the cabling system is outside the scope of the warranty.
- 6.8 Any unauthorised tampering or modification of the cabling system will invalidate the warranty.
- 6.9 Connectors have a guaranteed number of mating cycles. Performance is not guaranteed beyond the number of cycles detailed in the relevant product data sheets or relevant Standards. Warranty coverage period limits and environmental limits may also be placed upon optical connectors containing index-matching gels and other products.
- 6.10 Leviton will not accept any warranty claim where damage has been caused by insertion of incorrect plugs into an RJ45 module.
- 6.11 Leviton will not accept any warranty claim where damage to the product has been caused by exposure to fire, smoke, water, paint, chemicals, or other elements or operating conditions outside of the products stated ratings or intended use.
- 6.12 Leviton accepts no liability for consequential damages arising from the performance, late delivery, or non-delivery of any Leviton product or service.
- 6.13 There is only one warranty period and one warranty certificate per site. Any products added to, or installed at, the same site after the initial installation can be included in the same warranty period (starting from the date on the original warranty certificate); however, the products must be installed and tested by an Leviton Approved Installer, with appropriate test data and documentation forwarded to Leviton. The additional links will be added to

the original warranty providing they are tested in the same manner and submitted as an addition to warranty through the online Warranty Portal. Additional projects at the same site may be added as an addendum to the 'Master' number, dated from the time of installation.

- 6.14 Product or labour made impracticable by any cause beyond the reasonable control of Leviton Network Solutions including, without limitation, acts or omissions of customer, acts of God or government, natural disasters or storms, fire, political strife, labour disputes, failure or delay of transportation, unavailability of parts or personnel.

7 Territory

- 7.1 The worldwide Leviton Warranty is only available through Leviton Approved Installers installing Leviton products within their agreed territories of operation.

8 Actions in the Event of a Claim

- 8.1 In the event of a claim against the warranty, the owner or user of the cabling system must inform the original installer, in writing, within 28 days of the occurrence of the fault. If the original installer is no longer available, the claim should be directed to the Leviton distributor that serviced the original installer, or the nearest Leviton office.
- 8.2 The installer or distributor will inspect the installation and decide if the problem was caused by the product or the installation method. If the latter is determined to be the cause, then the installer is responsible for rectifying the issue. If the installer believes the problem was caused by the product, they must inform Leviton, in writing, within 14 days.

Leviton will dispatch an engineer to the site to assess the problem and recommend appropriate actions. If, in the opinion of the Leviton engineer, the Leviton products are not at fault, a fee will be chargeable at the prevailing Leviton technical consultancy daily rate, plus all travel and accommodation expenses.

9 Obligations of Other Parties

- 9.1 Nothing in this agreement shall entitle any other party to use any Leviton logo, trade name, livery, or trademark.

- 9.2 This agreement is the full extent of the warranty and its remedies, and no other party may offer any extension beyond the terms defined herein.
- 9.3 The installer and owner of the cabling system must expedite access, by Leviton personnel, to any site involved in a warranty claim.

APPENDIX 1

METALLIC CABLE APPLICATIONS

Supported data systems protocols include (but are not limited to):

ATM	af-phy-0162.000	155 and 1,200 Mb/s
Ethernet	IEEE 802.3 10BASE-T	10 Mb/s
Ethernet	IEEE 802.3 100BASE-T4	100 Mb/s
Ethernet	IEEE 802.3 100BASE-T2	100 Mb/s
Ethernet	IEEE 802.3 100BASE-TX	100 Mb/s
ISO Ethernet	IEEE 802.9a	16 Mb/s
Ethernet	100BaseVG-ANYLAN	100 Mb/s
Gigabit Ethernet	IEEE 802.3ab 1000BASE-T	1,000 Mb/s
10 Gigabit Ethernet*	IEEE 802.3an 10GBASE-T	10,000 Mb/s
Token Ring	IEEE 802.5	4, 16, 100 Mb/s
TP-PMD	ANSI X3T9.5	100 Mb/s
ISDN	CCITT I.430	64 Kb/s, 2 Mb/s

*Using 10GPlus products

The following protocols can be connected via a suitably-wired D-type to RJ45 connector:

EIA-232-D	CCITT V24, V28	19.2 Kb/s
EIA-422-A	CCITT V11	100 Kb/s

The following networks can be connected to, and are supported on, the cabling system when connected via the appropriate balun:

<u>LAN</u>	<u>Original Cable Media</u>
IBM 3270	93 ohm RG 62 coax
IBM AS400	105 ohm twinax
IBM token ring	150 ohm two pair
Wang VS OIS	75 ohm twinax
Ethernet 10BASE-2	50 ohm thinnet coax RG58
Reuters	75 ohm RGB triple coax

The following video systems are supported when used with the correct balun:

Baseband video

RGB video

Broadband video

Financial information services (e.g. Reuters, Bloomberg, Telerate)

Many other balanced applications, not directly related to video or data, can also be supported on Leviton systems, including analogue voice telephony, TTL and building control systems incorporating fire control and detection, access control, PoE and PoE+. Separate Application Notes are available for balun interconnection.

APPENDIX 2

EXTENDED OPTICAL FIBRE DISTANCES

Minimum transmission distances, in metres, for two-connector channels and different fibres at different wavelengths (presuming attenuation and/or bandwidth requirements are not exceeded).

Network Application		Wavelength l nm	OM1 62.5/125 m	OM2 50/125 m	OM3 50/125 m	OM4 50/125 m	OS1 SMF m	OS2 SMF m
Ethernet	10Base-FL	850	2,000	1,514	1,514	1,514	-	-
	100Base-FX	1300	2,000	2,000	2,000	2,000	-	-
	1000Base-SX*	850	275	550	550	550	-	-
	1000Base-LX*	1300	550	550	550	550	2,560	5,000
	10GBase-SR/SW*	850	32	82	300	550 ¹	-	-
	10GBase-LX4*	1300	300	300	300	300	4,200	10,000
	10GBase-LR/LW*	1310	-	-	-	-	4,200	10,000
	10GBase-ER/EW*	1550	-	-	-	-	8,900	22,250
	40GBase-SR4*	850	-	-	100	150	-	-
	40GBase-LR4	1300	-	-	-	-	4,700	10,000
	100GBase-SR10*	850	-	-	100	150	-	-
	100GBase-LR4	1300	-	-	-	-	6,300	10,000
100GBase-ER4	1550	-	-	-	-	16,000	40,000	
Fibre Channel	1062Mbit/s	850	300	500	500	500	-	-
		1310	-	-	-	-	2,000	10,000
	1Gbit/s FC 100-MX-SN-I	850	300	500	1,000	1,100	-	-
		1310	-	-	-	-	5,800	10,000
	2Gbit/s FC 200-MX-SN-I	850	-	300	500	500	-	-
		1310	-	-	-	-	5,800	10,000
	4Gbit/s FC 400-MX-SN	850	-	150	380	400	-	-
		1310	-	-	-	-	2,400	10,000
	8Gbit/s FC 800-MX-SA	850	-	100	300	300	-	-
		1310	-	-	-	-	4,400	10,000
	10Gbit/s FC 1200-MX-SN-I	850	-	82	300	550	-	-
		1310	-	-	-	-	4,400	10,000
16Gbit/s FC 1600-MX-SN	850	-	35	100	125	-	-	
	1310	-	-	-	-	4,400	10,000	
ATM	155Mbit/s	850	1,000	1,000	1,000	1,000	-	-
		1300	2,000	2,000	2,000	2,000	2,000	12,500
	622Mbit/s*	850	300	300	300	300	-	-
		1300	500	330	330	330	2,000	12,500

* Bandwidth limited at length stated

¹ **10G** speeds at link lengths up to **550m** is a result of the combination of higher bandwidth fibre and lower cable attenuation, cable attenuation <3.0dB/km @ 850nm, and accumulative connector losses of 1.0dB/km for complete channel

APPENDIX 3

EXTENDED COPPER CABLE DISTANCES

Maximum Supported Distance per LAN Application per Leviton Cu Cable Type

LAN Applications		Class ¹	Maximum Supported Distance (m) By System Type		
			Cat6 U/UTP	Cat6A U/UTP	Cat6A Shielded
Ethernet	10BASE-T	C	185	185	185
	100BASE-T2	C	140	140	140
	100BASE-T4	C	140	140	140
	100BASE-TX	D	140	140	140
	100VG-AnyLAN	C	160	160	160
	1000BASE-T	D	100	100	120
	10GBASE-T	EA	NS	100	100
<hr/>					
PoE	PoE (13W)	C	100	100	100
	PoE+ (24W)	D	100	100	100
	UPoE (60W)	E	100	100	100
	4PPoE (100W)	E	100	100	100

NS = Not Supported

Note 1: The minimum cabling system class required to support the application

Note 2: The distances in the table above are calculated based on a maximum of 4 connectors in the channel.

Class D, E and E_A horizontal cabling, up to 100 metres, will be tested and classified as such. For lengths over 100 metres, the electrical performance of Category 5, 6 and 6A cabling is downgraded to the next appropriate class according to the length.

Class of Application	Class A	Class B	Class C	Class D	Class E	Augmented Cat 6
Frequency Range	100 kHz	1 MHz	16 MHz	100 MHz	250 MHz	500 MHz
Cat 5	2000 m	240 m	160 m	90 m	-	-
Cat 6	2000 m	250 m	175 m	90 m	90 m	-
Cat 6A	2000 m	260 m	180 m	90 m	90 m	90 m

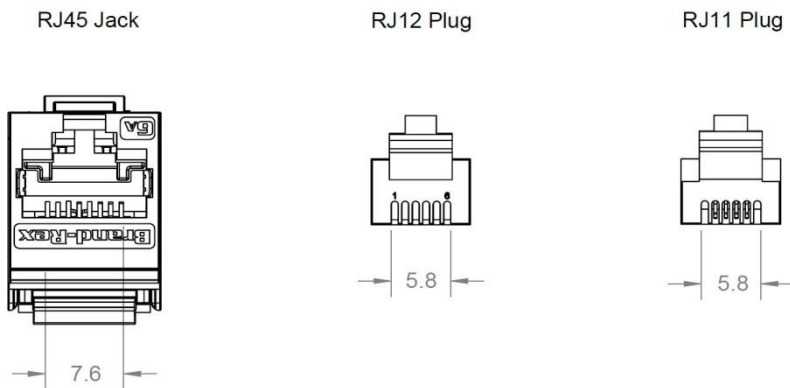
Note: The figures in the table are permanent link figures and assume no more than a total of 10m of patch cord to form the channel.

APPENDIX 4

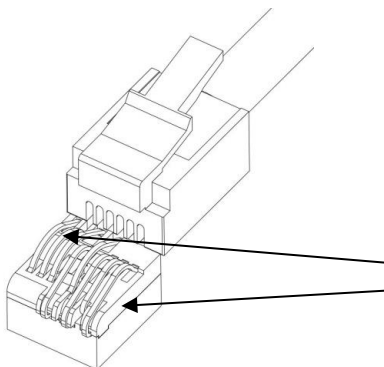
RJ45, RJ11, AND RJ12 INTEROPERABILITY

WARNING: RJ45, RJ11, and RJ12 are not compatible with Gigaplug, Cat6Plus, or 10GPlus components.

As detailed in IEC (60)603-7, RJ45 is an 8-position (8 pin) modular module/socket. RJ11 and RJ12 plugs are 6 or 4 pin, as shown in the diagram below.



A connector, such as an RJ11 or RJ12, can fit inside the RJ45 module. However, the jacks are of different dimensions and are not designed to be inserted in an RJ45 module. Over time, this insertion will cause permanent damage to the RJ45 module. Inserting an incorrect plug into the RJ45 module will reduce the performance of the channel, and will not support any extended distances stipulated by Leviton in its Warranty Award document.



Leviton will not accept any warranty claim in which damage was caused by the insertion of the incorrect plugs into an RJ45 module.

- END -

A record of all amendments will be made and details of each will be recorded in the table below.

Issue	Date	Brief Details of Amendment
15	28-04-05	Update for 10GBASE-T
16	16-01-06	Inclusion of SmartPower products and 10GbaseT test update
17	10-05-06	Patchcord requirement changed; 10Gbase-T testing changed
18	20-10-06	General update, inclusion of voice product
19	3-07-09	General update, 10GBase-T testing and standard references
20	30-09-10	Amendment to clause 8.2
21	12-12-11	New format
22	04-03-14	General update, all pages overviewed/reviewed. Pre-terminated and MicroBlo solutions added
23	13-08-14	Ian Wilkie's signature added
24	01-07-15	6.10 and Appendix 4 added. RJ45, RJ11 and RJ12 Interoperability
25	04-10-16	Format change and introduction of new fibre application table
26	02-11-17	General update and alignment of terms
27	1-31-18	Brand update and copy edit
28	4/23/18	Additional revisions

Approved By:



Carl Adshead

Contractor Program Manager

Date: 20-05-2018