

ITU-T

TELECOMMUNICATION
STANDARDIZATION SECTOR
OF ITU

L.86

(07/2010)

SERIES L: CONSTRUCTION, INSTALLATION AND
PROTECTION OF CABLES AND OTHER ELEMENTS OF
OUTSIDE PLANT

Considerations on the installation site of branching components in passive optical networks for fibre to the home

Recommendation ITU-T L.86



International
Telecommunication
Union

Document Sharing Hub

Recommendation ITU-T L.86

Considerations on the installation site of branching components in passive optical networks for fibre to the home

Summary

Recommendation ITU-T L.86 describes considerations for determining the installation site of a (fibre optic) branching component for a passive optical network (PON) designed to provide fibre to the home (FTTH).

History

Edition	Recommendation	Approval	Study Group
1.0	ITU-T L.86	2010-07-29	15

Keywords

Branching component, capital expenditures (CAPEX), operating expenditures (OPEX), passive optical network (PON).

FOREWORD

The International Telecommunication Union (ITU) is the United Nations specialized agency in the field of telecommunications, information and communication technologies (ICTs). The ITU Telecommunication Standardization Sector (ITU-T) is a permanent organ of ITU. ITU-T is responsible for studying technical, operating and tariff questions and issuing Recommendations on them with a view to standardizing telecommunications on a worldwide basis.

The World Telecommunication Standardization Assembly (WTSA), which meets every four years, establishes the topics for study by the ITU-T study groups which, in turn, produce Recommendations on these topics.

The approval of ITU-T Recommendations is covered by the procedure laid down in WTSA Resolution 1.

In some areas of information technology which fall within ITU-T's purview, the necessary standards are prepared on a collaborative basis with ISO and IEC.

NOTE

In this Recommendation, the expression "Administration" is used for conciseness to indicate both a telecommunication administration and a recognized operating agency.

Compliance with this Recommendation is voluntary. However, the Recommendation may contain certain mandatory provisions (to ensure, e.g., interoperability or applicability) and compliance with the Recommendation is achieved when all of these mandatory provisions are met. The words "shall" or some other obligatory language such as "must" and the negative equivalents are used to express requirements. The use of such words does not suggest that compliance with the Recommendation is required of any party.

INTELLECTUAL PROPERTY RIGHTS

ITU draws attention to the possibility that the practice or implementation of this Recommendation may involve the use of a claimed Intellectual Property Right. ITU takes no position concerning the evidence, validity or applicability of claimed Intellectual Property Rights, whether asserted by ITU members or others outside of the Recommendation development process.

As of the date of approval of this Recommendation, ITU had not received notice of intellectual property, protected by patents, which may be required to implement this Recommendation. However, implementers are cautioned that this may not represent the latest information and are therefore strongly urged to consult the TSB patent database at <http://www.itu.int/ITU-T/ipr/>.

© ITU 2011

All rights reserved. No part of this publication may be reproduced, by any means whatsoever, without the prior written permission of ITU.

CONTENTS

Page

1	Scope	1
2	References.....	1
3	Definitions	1
3.1	Terms defined elsewhere	1
3.2	Terms defined in this Recommendation.....	2
4	Abbreviations and acronyms	2
5	Conventions	2
6	Configuration of optical access network and installation site of fibre optic branching component for PON	2
7	Considerations when determining installation site of branching component for PON	3
7.1	Minimization of CAPEX and OPEX.....	3
7.2	Quick response to demand.....	4
7.3	Maintenance	5
7.4	Subscriber density	5
Appendix I – OFS's experience – Examples of FTTx networks in United States		7
I.1	Introduction	7
I.2	Overall network configurations	7
Appendix II – Japanese experience – Examples of PON architectures in Japan.....		9
II.1	Introduction	9
II.2	Passive optical network architectures in Japan	9
II.3	Consideration for more effective optical access network architectures	11
Bibliography.....		13

Copyright International Telecommunication Union/ITU Telecommunication Sector

Introduction

PONs are used to provide an FTTH service to subscribers in many regions and countries. The primary feature of a PON is that it realizes FTTH economically by sharing fibre access infrastructures, namely an optical line termination (OLT), fibre cable and branching component, between multiple subscribers. The branching component is one of the most important elements in a PON because its installation site has a powerful effect on both capital expenditures (CAPEX) and operating expenditures (OPEX). Therefore, the branching component installation site is an important consideration in designing this network. Recommendation ITU-T L.86 recommends considerations for selecting the location of the branching component in the network as a function of the scale of the subscriber density and geographical extent.

Copyright International Telecommunication Union/ITU-Telcommunication Sector

Recommendation ITU-T L.86

Considerations on the installation site of branching components in passive optical networks for fibre to the home

1 Scope

This Recommendation deals mainly with considerations concerning the installation site of the (fibre optic) branching component for a PON providing FTTH. This Recommendation also deals with consideration for useful PON configuration in urban and rural areas.

2 References

The following ITU-T Recommendations and other references contain provisions which, through reference in this text, constitute provisions of this Recommendation. At the time of publication, the editions indicated were valid. All Recommendations and other references are subject to revision; users of this Recommendation are therefore encouraged to investigate the possibility of applying the most recent edition of the Recommendations and other references listed below. A list of the currently valid ITU-T Recommendations is regularly published. The reference to a document within this Recommendation does not give it, as a stand-alone document, the status of a Recommendation.

- [ITU-T G.983.1] Recommendation ITU-T G.983.1 (2005), *Broadband optical access systems based on Passive Optical Networks (PON)*.
- [ITU-T G.987] Recommendation ITU-T G.987 (2010), *10-Gigabit-capable passive optical network (XG-PON) systems: Definitions, abbreviations, and acronyms*.
- [ITU-T L.40] Recommendation ITU-T L.40 (2000), *Optical fibre outside plant maintenance support, monitoring and testing system*.
- [ITU-T L.42] Recommendation ITU-T L.42 (2003), *Extending optical fibre solutions into the access network*.
- [ITU-T L.50] Recommendation ITU-T L.50 (2003), *Requirements for passive optical nodes: Optical distribution frames for central office environments*.
- [ITU-T L.52] Recommendation ITU-T L.52 (2003), *Deployment of Passive Optical Networks (PON)*.
- [ITU-T L.53] Recommendation ITU-T L.53 (2003), *Optical fibre maintenance criteria for access networks*.
- [ITU-T L.65] Recommendation ITU-T L.65 (2006), *Optical fibre distribution of access networks*.
- [ITU-T L.72] Recommendation ITU-T L.72 (2008), *Databases for optical access network infrastructure*.

3 Definitions

3.1 Terms defined elsewhere

This Recommendation uses the following terms defined elsewhere:

- 3.1.1 optical distribution frame** [ITU-T L.50]
- 3.1.2 optical line termination** [ITU-T G.983.1]
- 3.1.3 optical network unit** [ITU-T G.987]