

Recommendation

ITU-T L.210 (11/2022)

SERIES L: Environment and ICTs, climate change, e-waste, energy efficiency; construction, installation and protection of cables and other elements of outside plant

Optical infrastructures – Infrastructure including node elements (except cables)

Requirements for passive optical nodes – Optical wall outlets and extender boxes

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ENVIRONMENT AND ICTS, CLIMATE CHANGE, E-WASTE, ENERGY EFFICIENCY; CONSTRUCTION, INSTALLATION AND PROTECTION OF CABLES AND OTHER ELEMENTS OF OUTSIDE PLANT

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Recommendation ITU-T L.210

Requirements for passive optical nodes – Optical wall outlets and extender boxes

Summary

Recommendation ITU-T L.210 refers to passive optical nodes (optical wall outlets and extender boxes) deployed in customer indoor premises. It deals with the node housing and fibre management system, and specifies the mechanical and environmental characteristics as well.

History

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Introduction

Passive optical nodes for customer indoor premises are used in the final section of access networks of fibre to the home (FTTH) and similar fibre to the x (FTTx) systems to protect interconnection points (splices or connectors) between customer drop cables and patch cords/pigtails for optical network units (ONUs) or other terminal devices, or in premises cabling systems of fibre to the room (FTTR). The nodes are usually small in dimensions and simple in structures. A node comprises a housing for mechanical protection and environmental sealing, together with internal structures (integrated or separate with the housing) to fasten, guide and store cable ends, interconnection points and cable/fibre overlength (excess cable/fibre length). Passive optical nodes for customer indoor premises include:

- optical wall outlets (surface mounted, flush mounted);
- extender boxes;
- other types of passive optical nodes.

This Recommendation provides the requirements of the passive optical nodes and the means for characterization and evaluation of the performance of the nodes according to the principles of [ITU-T L.200]. This includes mechanical performance, sealing performance and optical stability of the product which simulate the effect of environmental factors or interventions related to network maintenance and reconfiguration. It contains a basic test programme for the box which is globally applicable. Additional requirements may be agreed between customer and supplier to reflect local or special conditions. All functions and features that a product may contain should be reflected in the mix of test samples that are subjected to the test programme.

Recommendation ITU-T L.210

Requirements for passive optical nodes – Optical wall outlets and extender boxes

1 Scope

This Recommendation refers to passive optical nodes (optical wall outlets and extender boxes) for customer indoor premises. The nodes contain interconnection points (maximum of 4) between customer drop cables and patch cords/pigtails for optical network units (ONUs) and terminal devices. The passive optical nodes may also be used as an interconnect between indoor cables and may also be used to store cable/fibre overlength.

This Recommendation:

- refers to passive optical nodes for customer indoor premises, including optical wall outlets (surface mounted, flush mounted) and extender boxes;
- specifies the characteristics and requirements of the housing as well as the fibre management system;
- specifies mechanical and environmental characteristics of the nodes;
- defines a test plan for the performance evaluation of different types of the nodes used in indoor non-temperature controlled (IN) or indoor temperature controlled (IC);
- provides simulation of the effect of interventions related to network maintenance and reconfigurations;
- includes a checklist for a systematic product characterization according to [ITU-T L.200].

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.

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| [ITU-T G.652] | Recommendation ITU-T G.652 (2016), <i>Characteristics of a single-mode optical fibre and cable</i> . |
| [ITU-T G.657] | Recommendation ITU-T G.657 (2016), <i>Characteristics of a bending-loss insensitive single-mode optical fibre and cable</i> . |
| [ITU-T K.11] | Recommendation ITU-T K.11 (2009), <i>Principles of protection against over voltages and over currents</i> . |
| [ITU-T K.47] | Recommendation ITU-T K.47 (2012), <i>Protection of telecommunication lines against direct lightning flashes</i> . |
| [ITU-T L.200] | Recommendation ITU-T L.200/L.51 (2003), <i>Passive node elements for fibre optic networks – General principles and definitions for characterization and performance evaluation</i> . |
| [IEC 60529] | IEC 60529:2013, <i>Degrees of protection provided by enclosures (IP Code)</i> . |
| [IEC 60825-1] | IEC 60825-1:2014, <i>Safety of laser products – Part 1: Equipment classification and requirements</i> . |

- [IEC 60825-2] IEC 60825-2:2021, *Safety of laser products – Part 2: Safety of optical fibre communication systems (OFCSs)*.
- [IEC 61300-2-1] IEC 61300-2-1:2009, *Fibre optic interconnecting devices and passive components – Basic test and measurement procedures – Part 2-1: Tests – Vibration (sinusoidal)*.
- [IEC 61300-2-4] IEC 61300-2-4:2019, *Fibre optic interconnecting devices and passive components – Basic test and measurement procedures – Part 2-4: Tests – Fibre or cable retention*.
- [IEC 61300-2-5] IEC 61300-2-5:2022, *Fibre optic interconnecting devices and passive components – Basic test and measurement procedures – Part 2-5: Tests – Torsion*.
- [IEC 61300-2-9] IEC 61300-2-9:2017, *Fibre optic interconnecting devices and passive components – Basic test and measurement procedures – Part 2-9: Tests – Shock*.
- [IEC 61300-2-10] IEC 61300-2-10:2021, *Fibre optic interconnecting devices and passive components – Basic test and measurement procedures – Part 2-10: Tests – Crush and load resistance*.
- [IEC 61300-2-12] IEC 61300-2-12:2009, *Fibre optic interconnecting devices and passive components – Basic test and measurement procedures – Part 2-12: Tests – Impact*.
- [IEC 61300-2-22] IEC 61300-2-22:2007, *Fibre optic interconnecting devices and passive components – Basic test and measurement procedures – Part 2-22: Tests – Change of temperature*.
- [IEC 61300-2-33] IEC 61300-2-33:2012, *Fibre optic interconnecting devices and passive components – Basic test and measurement procedures – Part 2-33: Tests – Assembly and disassembly of fibre optic mechanical splices, fibre management systems and closures*.
- [IEC 61300-2-37] IEC 61300-2-37:2016, *Fibre optic interconnecting devices and passive components – Basic test and measurement procedures – Part 2-37: Tests – Cable bending for fibre optic closures*.
- [IEC 61300-2-48] IEC 61300-2-48:2009, *Fibre optic interconnecting devices and passive components – Basic test and measurement procedures – Part 2-48: Tests – Temperature-humidity cycling*.
- [IEC 61300-3-1] IEC 61300-3-1:2005, *Fibre optic interconnecting devices and passive components – Basic test and measurement procedures – Part 3-1: Examinations and measurements – Visual examination*.
- [IEC 61300-3-3] IEC 61300-3-3:2009, *Fibre optic interconnecting devices and passive components – Basic test and measurement procedures – Part 3-3: Examinations and measurements – Active monitoring of changes in attenuation and return loss*.
- [IEC 61300-3-28] IEC 61300-3-28:2012, *Fibre optic interconnecting devices and passive components – Basic test and measurement procedures – Part 3-28: Examinations and measurements – Transient loss*.
- [IEC 61756-1] IEC 61756-1:2019, *Fibre optic interconnecting devices and passive components – Interface standard for fibre management systems – Part 1: General and guidance*.

3 Definitions

3.1 Terms defined elsewhere

None.

3.2 Terms defined in this Recommendation

This Recommendation defines the following terms:

3.2.1 optical wall outlet: A passive optical node in customer indoor premises used to terminate the customer drop cable and provide a number of ports for connections to optical network units or other terminal devices.

3.2.2 extender box: A passive optical node in customer indoor premises used to seal and protect the splicing or connection points for extending customer drop cables, or indoor cables to optical wall outlets, optical network units or other terminal devices.

4 Abbreviations and acronyms

This Recommendation uses the following abbreviations and acronyms:

FMS	Fibre Management System
FTTH	Fibre to the Home
FTTR	Fibre to the Room
FTTx	Fibre to the x
HTB	Home Termination Box
IC	Indoor temperature Controlled
IN	Indoor Non-temperature controlled
IP	Ingress Protection
OLT	Optical Line Terminal
ONU	Optical Network Unit
SC	Single Circuit
SF	Single Fibre
SPB	Subscriber Premises Box
SR	Single Ribbon

5 Conventions

None.

6 Characteristics of nodes for customer indoor premises

6.1 General requirements

Each node for customer indoor premises should comply with the general requirements as listed in clause 8 of [ITU-T L.200].

Examples of typical optical wall outlet applications are shown in Figure 1. Examples of optical wall outlet applications with splitters are in Appendix IV.

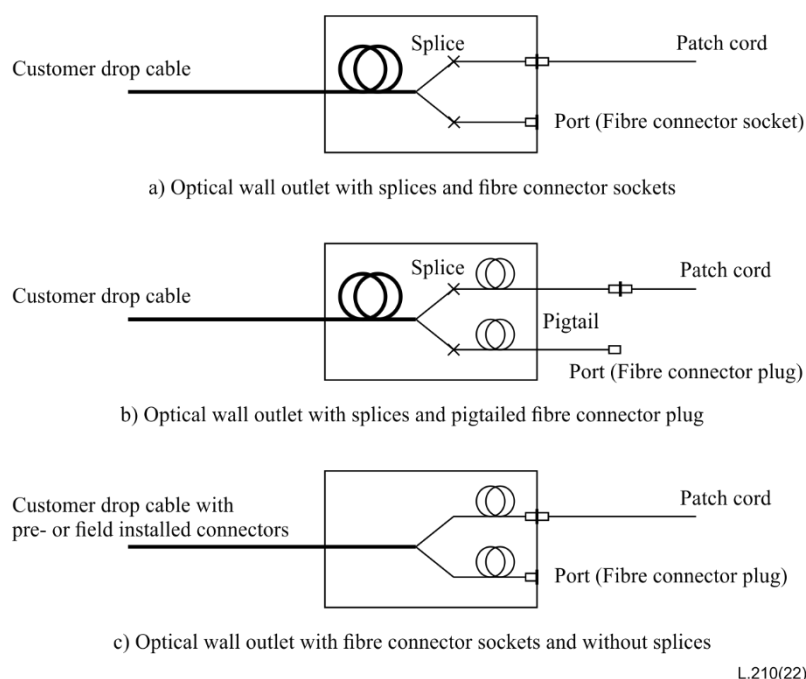


Figure 1 – Examples of typical optical wall outlet applications

Examples of extender box applications are shown in Figure 2.

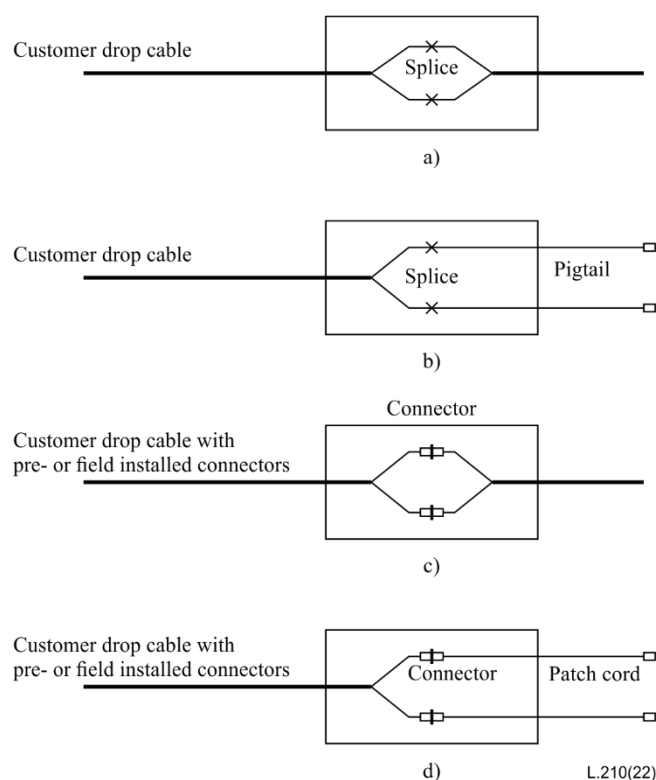


**Figure 2 – Examples of typical extender box applications –
a) and b) Extender boxes with splices; c) and d) Extender boxes with connectors**

Examples of locations of nodes for customer indoor premises are shown in Figure 3.