

INTERNATIONAL STANDARD

NORME INTERNATIONALE



**Safety of laser products –
Part 12: Safety of free space optical communication systems used for
transmission of information**

**Sécurité des appareils à laser –
Partie 12: Sécurité des systèmes de communication optique en espace libre
utilisés pour la transmission d'informations**



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CONTENTS

FOREWORD.....	4
INTRODUCTION.....	6
1 Scope.....	7
2 Normative references	7
3 Terms and definitions	7
4 Assessment of access level.....	12
4.1 General.....	12
4.2 Determination of access level and the use of Condition 2.....	13
4.3 Access level 1 and 1M	14
4.4 Access level 2 and 2M	15
4.5 Access level 3R	16
4.6 Access level 3B	16
4.7 Access level 4.....	16
4.8 Time base.....	17
5 Classification and evaluation of access level	17
5.1 General.....	17
5.2 Impact of using automatic power reduction features	18
5.3 Automatic power reduction mechanisms (APR)	18
5.3.1 General	18
5.3.2 APR performance requirements	18
5.4 Installation protection systems (IPS)	19
6 Access level and classification requirements by location type.....	19
6.1 General.....	19
6.2 Requirements for unrestricted locations	22
6.2.1 General	22
6.2.2 Use of access level 1M and access level 2M FSOCS equipment in unrestricted locations.....	24
6.2.3 Use of access level 3R FSOCS equipment in unrestricted locations	26
6.2.4 General	26
6.2.5 Use of access level 3R FSOCS equipment in restricted locations	27
6.3 Requirements for controlled locations	28
6.3.1 General	28
6.3.2 Use of access level 3B and access level 4 FSOCS equipment in controlled locations.....	29
6.4 Requirements for inaccessible space	29
6.5 Specular reflections	29
7 Organizational requirements.....	30
7.1 Requirements for manufacturers of ready-to-use FSOCS transmitter or turn key systems	30
7.1.1 General	30
7.1.2 Additional manufacturer's requirements	31
7.2 Installation and service organization requirements	32
7.3 Operating organization requirements	33
8 Marking	33
8.1 General.....	33
8.2 Marking of aperture for transmitter	35
8.3 Durability – Indelibility requirements for safety markings	35

8.4	Warning for invisible radiation	35
Annex A (informative)	Rationale.....	36
Annex B (informative)	Clarification of the meaning of "access level"	37
B.1	General.....	37
B.2	Class	37
B.3	Access level.....	37
Annex C (informative)	Examples of applications and calculations.....	38
C.1	Symbols used in the example of this annex.....	38
C.2	Examples of NHZ and ENHZ	38
C.2.1	General	38
C.2.2	Example – Collimated beam access level 1M FSOCS.....	38
C.2.3	Example – Diverging beam access level 1M FSOCS.....	39
C.2.4	Example – Access level 3B FSOCS product	39
C.3	Viewing a specular (mirror-like) reflection	40
C.4	Example of divergent, diffuse IR transmitter	41
C.5	FSOCS link between two restricted locations	42
C.6	Unmanned (uncrewed) Aerial (aircraft) system (UAS)	45
Annex D (informative)	Methods of hazard/safety analysis	48
Annex E (informative)	Guidance for installing, servicing and operating organizations.....	49
E.1	Working practices for FSOCSs.....	49
E.1.1	General	49
E.1.2	General working practices	49
E.1.3	Additional working practices for Class/access level 1M, 2M, 3R, 3B and 4 systems	50
E.2	Education and training	50
Bibliography	51
Figure 1	– Commercial structures	20
Figure 2	– Residential areas	21
Figure 3	– Examples of external location types	23
Figure 4	– Access level 1M or 2M transmitter near edge of unrestricted rooftop.....	25
Figure 5	– Access level 1M transmitter in unrestricted location	25
Figure 6	– Access level 3R transmitter in restricted location	28
Figure C.1	– Link between two widely separated locations.....	42
Figure C.2	– Unmanned (uncrewed) Aerial (aircraft) System with FSOCS	45
Figure C.3	– Grounded FSOCS installed to the ground	46
Figure C.4	– Grounded FSOCS installed to the controlled location.....	46
Table 1	– Measurement aperture diameters and distances for the default (simplified) evaluation	14
Table 2	– Restrictions for the use of FSOCS based on access levels.....	22
Table 3	– Requirements for warning signs	32
Table 4	– Marking requirements.....	34
Table C.1	– Symbols used in the example of Annex C	38
Table C.2	– Allowed access levels and installation requirements	47

INTERNATIONAL ELECTROTECHNICAL COMMISSION

SAFETY OF LASER PRODUCTS –

**Part 12: Safety of free space optical communication systems
used for transmission of information**

FOREWORD

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IEC 60825-12 has been prepared by IEC technical committee 76: Optical radiation safety and laser equipment. It is an International Standard.

This third edition cancels and replaces the second edition published in 2019. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition.

- a) Where relevant and appropriate, references to IEC 60825-1 have been changed to a specific dated reference i.e. IEC 60825-1:2014.
- b) Condition 2 has been changed from 7 mm aperture stop and 70 mm distance as follows,
 - For wavelengths less than 1 400 nm, 3,5 mm aperture stop and 35 mm distance,
 - For wavelengths equal to or greater than 1 400 nm, 3,5 mm aperture stop and 14 mm distance.

- c) For wavelengths between 1 200 nm and 1 400 nm, an additional limitation is required equal to the equivalent radiant power of the skin MPE. C_7 has therefore been revised in accordance with IEC 60825-1:2014, but with this additional limitation related to the skin MPE; see 4.2.
- d) Additional detail added regarding time base, see 4.8.
- e) Additional clarification added to Clause 8 regarding the content and formatting of labels.
- f) Annex A has been added, providing a rationale for the differences in approach between this document and IEC 60825-1:2014.
- g) Annex B has been added, providing clarification of the meaning of the term "access level".
- h) Worked examples have been added for a variety of scenarios; see Clauses C.2 to C.5.
- i) Clause C.6 has been added on UAS, unmanned aerial systems.

The text of this International Standard is based on the following documents:

Draft	Report on voting
76/717/FDIS	76/722/RVD

Full information on the voting for its approval can be found in the report on voting indicated in the above table.

The language used for the development of this International Standard is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/standardsdev/publications.

The list of all parts of the IEC 60825 series, published under the title *Safety of laser products*, can be found on the IEC website.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under webstore.iec.ch in the data related to the specific document. At this date, the document will be

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INTRODUCTION

The objective of this document is to:

- protect people from hazardous optical radiation emitted by FSOCSs;
- provide safety requirements and guidance for the design, manufacture and use of laser products or laser systems, which emit laser radiation for the purpose of free space optical data transmission;
- provide guidance for installation, operation, maintenance and service to assure the safe deployment and use of such laser systems.

This document only addresses the open beam portion of the laser product or laser system.

This document places the responsibility for certain product safety requirements, as well as requirements for providing appropriate information on how to use these systems safely, on the manufacturer of the system or the transmitters. It places the responsibility for the safe deployment and use of these systems on the installer or the operating organization. It places the responsibility for adherence to safety instructions during installation and service operations on the installation and service organizations as appropriate, and during operation and maintenance functions on the operating organization. It is recognized that the user of this document may fall into one or more of the categories of manufacturer, installer, service organization and/or operating organization as mentioned above.

Annex A gives a more detailed rationale for this document, and some examples are given in Annex C.