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CONSOLIDATED VERSION

Dynamic modules - Generic specification

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CONTENTS

INTERNATIONAL ELECTROTECHNICAL COMMISSION

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Dynamic modules - Generic specification

FOREWORD

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This consolidated version of the official IEC Standard and its amendment has been prepared for user convenience.

IEC 62343 edition 3.1 contains the third edition (2023-01) [documents 86C/1803/CDV and 86C/1827/RVC] and its amendment 1 (2026-01) [documents 86C/1983/CDV and 86C/1999/RVC].

In this Redline version, a vertical line in the margin shows where the technical content is modified by amendment 1. Additions are in green text, deletions are in strikethrough red text. A separate Final version with all changes accepted is available in this publication.

IEC 62343 has been prepared by subcommittee 86C: Fibre optic systems and active devices, of IEC technical committee 86: Fibre optics. It is an International Standard.

This third edition cancels and replaces the second edition published in 2017. This edition constitutes a technical revision.

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

a) addition of terms and definitions for optical multicast switches (3.8);
b) revision of Clause 4, listing the requirements for standards in the IEC 62343 series;
c) addition of Clause 6 (Safety requirements).

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

Draft	Report on voting
86C/1803/CDV	86C/1827/RVC

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/publications.

A list of all parts of the IEC 62343 series, published under the general title *Dynamic modules*, can be found on the IEC website.

The committee has decided that the contents of this document and its amendment 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

– reconfirmed,
– withdrawn, or
– revised.

INTRODUCTION

This document applies to dynamic devices as defined in IEC TS 62538. This document contains general guidance for the IEC 62343 series related to dynamic devices and definitions which apply to dynamic devices. The dynamic module (DM), or device, has two distinguishing characteristics: dynamic and module.

"Dynamic" highlights the functions of the products to include "tuning, varying, switching, configuring, and other continuous optimization," often accomplished by electronics, firmware, software or their combinations. The dynamic device usually has a certain level of intelligence to monitor or measure its configuration or settings and make decisions for necessary (optimization) actions. The behaviour of dynamic modules can be characterized by transient characteristics as the dynamic module undergoes tuning, switching, configuring, and other continuous optimization. Characterization of transient characteristics will be considered in individual dynamic module standards.

"Module" defines that products covered by this document are the integration of active and passive components (either or both), through interconnecting materials or devices. The controlling electronics can be inside or outside the optical package that contains all or most of the optical components and interconnection. The product can be a small printed wiring board (PWB) or child-board with mounted optical module, or it can be a small box (e.g., housing) with optical components and electronics enclosed. In the former case, it is more like an assembly (i.e., generally not packaged in a box or housing) than a module (i.e., generally packaged in a box or housing).

For historical reasons and convenience, a dynamic module or device is referred to as a dynamic module in the IEC 62343 series.

The number of dynamic modules and devices is rapidly growing as optical communications networks evolve. The following list provides some examples of the products covered by the IEC 62343 series. It should be noted that the list is not exhaustive and the products to be covered are not limited by the listed examples:

- channel gain equalizer;
- dynamic channel equalizer;
- dynamic gain tilt equalizer;
- dynamic slope equalizer;
- tuneable chromatic dispersion compensator;
- polarization mode dispersion compensator;
- reconfigurable optical add-drop multiplexer;
- switch with monitoring and controls;
- variable optical attenuator with monitoring and controls;
- optical channel monitor;
- wavelength selective switch;
- optical multicast switch.

The IEC 62343 series covers performance templates, performance standards, reliability qualification requirements, hardware and software interfaces, and related testing methods.

The structure of the IEC 62343 series, under the general title *Dynamic modules,* is as follows:

- IEC 62343-1 series Part 1: Performance standards
- IEC 62343-2 series Part 2: Reliability qualification
- IEC 62343-3 series Part 3: Performance specification templates
- IEC 62343-4 series Part 4: Software and hardware interface
- IEC 62343-5 series Part 5: Test methods
- IEC 62343-6 series Part 6: Design guidelines

A complete set of standards related to a dynamic module or device should include the following:

- optical performance standards;
- reliability qualification standards;
- optical performance specification templates;
- hardware and software interface standards;
- test methods;
- technical reports.

The safety standards related to dynamic modules are mostly optical power considerations, which are covered by the IEC 60825 series.

Only those dynamic modules for which standards are complete or in preparation are included in Clause 3. To reflect the rapidly growing market for dynamic modules, additional terms and definitions will be added in subsequent revisions as the series expands.

It should be noted that optical amplifiers could be regarded as dynamic modules. They are not included in the IEC 62343 series but are covered in their own series of IEC standards.

1 Scope

This document applies to all commercially available optical dynamic modules and devices. It describes the products covered by the IEC 62343 series, defines terminology, fundamental considerations and basic approaches.

The object of this document is to

- establish uniform requirements for operation, reliability and environmental properties of dynamic modules (DMs) to be implemented in the appropriate DM standard, and
- provide assistance to the purchaser in the selection of consistently high-quality DM products for their particular applications, as well as in the consultation of the appropriate specific DM standard(s).

This document covers performance templates, performance standards, reliability qualification requirements, hardware and software interfaces and related testing methods.

Since a dynamic module integrates an optical module/device, printed wiring board, and software/firmware, the standards developed in the series will mimic appropriate existing standards. On the other hand, since "dynamic module" is a relatively new product category, the dynamic module standards series will not be bound by the existing practices where requirements differ.

The safety standards as related to dynamic modules are mostly optical power considerations, which is covered by the IEC 60825 series (see Clause 6).

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60050-731, *International Electrotechnical Vocabulary – Chapter 731: Optical fibre communication* (available at www.electropedia.org)

IEC 61000-6-1, *Electromagnetic compatibility (EMC) - Part 6-1: Generic standards - Immunity standard for residential, commercial and light-industrial environments*

IEC 61000-6-3, *Electromagnetic compatibility (EMC) - Part 6-3: Generic standards - Emission standard for equipment in residential environments*

IEC TR 61931, *Fibre optic – Terminology*

Bibliography

IEC 60825 (all parts), *Safety of laser products*

IEC 60876-1:2014, *Fibre optic interconnecting devices and passive components – Fibre optic spatial switches – Part 1: Generic specification*

IEC 61000 (all parts), *Electromagnetic compatibility (EMC)*

IEC 61290 (all parts), *Optical amplifiers – Test methods*

IEC 61291 (all parts), *Optical amplifiers*

IEC TR 61292 (all parts), *Optical amplifiers*

IEC 61300 (all parts), *Fibre optic interconnecting devices and passive components – Basic test and measurement procedures*

IEC 61300-3-38, *Fibre optic interconnecting devices and passive components – Basic test and measurement procedures – Part 3-38: Examinations and measurements – Group delay, chromatic dispersion and phase ripple*

IEC 61753 (all parts), *Fibre optic interconnecting devices and passive components – Performance standard*

IEC 62343 (all parts), *Dynamic modules*

IEC 62343-1 (all parts), *Dynamic modules – Performance standards*

IEC 62343-2-1, *Dynamic modules – Part 2-1: Reliability qualification – Test template*

IEC 62343-3 (all parts), *Dynamic modules – Performance specification templates*

IEC 62343-3-1:2016, *Dynamic modules – Part 3-1: Performance specification templates – Dynamic channel equalizers*

IEC 62343-3-2:2016, *Dynamic modules – Part 3-2: Performance specification templates – Optical channel monitor*

IEC 62343-3-3:2020, *Dynamic modules – Part 3-3: Performance specification templates – Wavelength selective switches*

IEC 62343-3-4:2018, *Dynamic modules – Part 3-4: Performance specification templates – Multicast optical switches*

IEC 62343-4 (all parts), *Dynamic modules – Part 4: Software and hardware interface*

IEC 62343-4-1:2016, *Dynamic modules – Part 4-1: Software and hardware interface – 1 x 9 wavelength selective switch*

IEC 62343-5 (all parts), *Dynamic modules – Part 5: Test methods*

IEC 62343-6 (all parts), *Dynamic modules – Part 6: Design guides*

IEC 62368 (all parts), *Audio/video, information and communication technology equipment*