

INTERNATIONAL STANDARD

Dynamic modules – General and guidance



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Dynamic modules – General and guidance

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CONTENTS

FOREWORD.....	3
INTRODUCTION.....	5
1 Scope.....	7
2 Normative references	7
3 Terms and definitions	7
3.1 General terms and definitions	8
3.2 Dynamic module terms and definitions	8
3.3 Dynamic channel equalizer (DCE) terms and definitions	9
3.4 Tuneable dispersion compensator (TDC) or dynamic chromatic dispersion compensator (DCDC) terms and definitions	9
3.5 Dynamic gain tilt equalizer (DGTE) terms and definitions	10
3.6 Optical channel monitor (OCM) terms and definitions	10
3.7 Wavelength selective switch (WSS) terms and definitions	14
4 Preparation of standards	21
4.1 General.....	21
4.2 Product definition.....	22
4.3 Tests	22
4.4 Details	22
4.5 Requirements	22
4.6 Sample size	22
4.7 Sample definition	22
4.8 Groupings/sequences	22
4.9 Pass/fail criteria	22
4.10 Reference product definition	22
4.11 Performance standard test report.....	23
5 Electromagnetic compatibility (EMC) requirements	23
Bibliography.....	24
Figure 1 – Illustration of X -dB bandwidth.....	15
Figure 2 – Illustration of adjacent channel crosstalk and adjacent channel isolation	16
Figure 3 – Illustration of non-adjacent channel crosstalk	17
Figure 4 – Illustration of latency time, rise time, fall time, bounce time, and switching time	20

INTERNATIONAL ELECTROTECHNICAL COMMISSION

DYNAMIC MODULES – GENERAL AND GUIDANCE

FOREWORD

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

This second edition cancels and replaces the first edition published in 2013. This edition constitutes a technical revision.

This edition includes the following significant technical change with respect to the previous edition: the inclusion of definitions for the wavelength selective switch.

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

FDIS	Report on voting
86C/1444/FDIS	86C/1450/RVD

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

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

A list of all the parts in 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 publication will remain unchanged until the stability date indicated on the IEC web site under "<http://webstore.iec.ch>" in the data related to the specific publication. At this date, the publication will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

A bilingual version of this publication may be issued at a later date.

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INTRODUCTION

IEC 62343 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 the situation and make decisions for necessary (optimization) actions. The behaviour of dynamic modules may 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 the products covered by the standard 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 look like a small printed wiring board (PWB or child-board with mounted optical module) or a small box (housing) with optical components and electronics enclosed. In the former case, it is more like an assembly (generally not packaged in a box or housing) than a module (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;
- multicast optical switch.

The IEC 62343 series will cover 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:

- 62343-1 series Part 1: Performance standards
- 62343-2 series Part 2: Reliability qualification

- 62343-3 series Part 3: Performance specification templates
- 62343-4 series Part 4: Software and hardware interface standards
- 62343-5 series Part 5: Test methods
- 62343-6 series Part 6: Design guides

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 IEC TC 76: Optical radiation safety and laser equipment.

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.

DYNAMIC MODULES – GENERAL AND GUIDANCE

1 Scope

IEC 62343 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 his 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 bounded by the existing practices where requirements differ.

The safety standards as related to dynamic modules are mostly optical power considerations, which is covered by IEC TC 76: Optical radiation safety and laser equipment.

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*

IEC TR 61931, *Fibre optic – Terminology*

IEC Guide 107, *Electromagnetic compatibility – Guide to the drafting of electromagnetic compatibility publications*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 60050-731 and IEC TR 61931 and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at <http://www.electropedia.org/>