

# TECHNICAL REPORT



---

## Dynamic Modules – Part 6-11: Design guidelines – Software and hardware interface for optical multicast switches

INTERNATIONAL  
ELECTROTECHNICAL  
COMMISSION

ICS 33.180.01

ISBN 978-2-8322-7526-9

**Warning! Make sure that you obtained this publication from an authorized distributor.**

## CONTENTS

FOREWORD.....	3
INTRODUCTION.....	5
1 Scope.....	6
2 Normative references .....	6
3 Terms, definitions and abbreviated terms .....	6
3.1 Terms and definitions.....	6
3.2 Abbreviated terms.....	6
4 Survey results .....	7
4.1 Survey contents .....	7
4.2 Survey conditions .....	7
4.3 The analysis of responses .....	7
4.4 Future direction.....	9
Annex A (informative) Hardware and software interfaces .....	10
A.1 Hardware interfaces.....	10
A.1.1 Electrical connector .....	10
A.1.2 Pin assignment and functions .....	10
A.2 Software interfaces .....	13
A.2.1 General .....	13
A.2.2 UART communication .....	13
A.2.3 I <sup>2</sup> C communication .....	13
A.2.4 Command sets.....	14
A.2.5 Reset.....	14
A.2.6 Alarm.....	15
Bibliography.....	16
Figure A.1 – Connector appearance.....	10
Table 1 – Analyzed results of software and hardware interface .....	7
Table 2 – Analyzed results of communication formats .....	8
Table A.1 – Connector form .....	10
Table A.2 – Pin assignment .....	11
Table A.3 – Explanation of functions .....	12
Table A.4 – Power supply voltage range .....	13
Table A.5 – Logical pin voltage range .....	13
Table A.6 – Communication command .....	14
Table A.7 – Reset type and interface .....	14
Table A.8 – Alarm functions .....	15

## INTERNATIONAL ELECTROTECHNICAL COMMISSION

## DYNAMIC MODULES –

**Part 6-11: Design guidelines – Software and hardware  
interface for optical multicast switches**

## FOREWORD

- 1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
- 2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.
- 3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
- 4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
- 5) IEC itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
- 6) All users should ensure that they have the latest edition of this publication.
- 7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
- 8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
- 9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

The main task of IEC technical committees is to prepare International Standards. However, a technical committee may propose the publication of a Technical Report when it has collected data of a different kind from that which is normally published as an International Standard, for example "state of the art".

IEC 62343-6-11, which is a Technical Report, has been prepared by subcommittee 86C: Fibre optic systems and active devices, of IEC technical committee 86: Fibre optics.

The text of this Technical Report is based on the following documents:

Draft TR	Report on voting
86C/1604/DTR	86C/1612/RVDTR

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

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

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

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

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

**IMPORTANT – The 'colour inside' logo on the cover page of this publication indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.**

## INTRODUCTION

An optical multicast switch (MCS) is a dynamic module that is mainly used in a reconfigurable optical add-drop multiplexer (ROADM) to realize a colourless, directionless and contentionless (CDC) function. The MCS functions as an optical switch and a non-wavelength dependent branching device. It is electrically controlled with software, which directs an input signal from one input port to the required output port. This document clarifies MCS software and hardware interfaces, which were investigated based on results from a survey by Dynamic Module Sub-Committee, Fibre Optic Standardization Committee, and OITDA (Optoelectronic Industry and Technology Development Association) in 2017. The questionnaire was sent to 24 appropriate companies all over the world via their representatives. Responses from six companies including three specific proposals for a specification were received.

## **DYNAMIC MODULES –**

### **Part 6-11: Design guidelines – Software and hardware interface for optical multicast switches**

#### **1 Scope**

This part of IEC 62343, which is a Technical Report, proposes a software and hardware interface for the optical multicast switch (MCS). This switch can be controlled by resident firmware within the interface that is intended to enable a user or host to retrieve the switch status and/or adjust relevant switch settings. The MCS is defined in IEC 62343-3-4. The technical information regarding MCS and its applications in dense wavelength division multiplexing (DWDM) systems is described in IEC TR 62343-6-4. The objective of this document is a proposal for a software and hardware interface standard of MCS.

#### **2 Normative references**

There are no normative references in this document.