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Transmitting and receiving equipment for radiocommunication – Frequency response of optical-to-electric conversion device in high-frequency radio-over-fibre systems –
Part 3: Measurement method of non-linear response of optical-to-electric converter

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OF INTEREST TO THE FOLLOWING COMMITTEES:	HORIZONTAL STANDARD: ☐
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TITLE:

Transmitting and receiving equipment for radiocommunication - Frequency response of optical-to-electric conversion device in high-frequency radio-over-fibre systems - Part 3: Measurement method of non-linear response of optical-to-electric converter

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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TRANSMITTING AND RECEIVING EQUIPMENT FOR RADIOCOMMUNICATION – FREQUENCY RESPONSE OF OPTICAL-TO-ELECTRIC CONVERSION DEVICE IN HIGH-FREQUENCY RADIO-OVER-FIBRE SYSTEMS –

Part 3: Measurement method of nonlinear response of optical-to-electric converter

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

Draft	Report on voting
103/XX/FDIS	103/XX/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/publications.

A list of all parts in the IEC 62803 series, published under the general title *Transmitting and receiving equipment for radiocommunication – Frequency response of optical-to-electric conversion device in high-frequency radio-over-fibre systems*, 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

A variety of photonic devices operated in microwave, millimetre-wave, and terahertz-wave bands are useful for an optical fibre transport system as well as for wireless communication and broadcasting systems. An optical-to-electric conversion device plays as an interface, which converts an optical signal into an electrical signal directly.

Microwave/millimetre-wave/terahertz-wave radio-over-fibre (RoF) systems are comprised of two parts: an electric-to-optical converter (E/O), and an optical-to-electric converter (O/E). Radio waves are converted into an optical signal at the E/O, and the signal is transferred through the optical fibre, and then the radio waves are regenerated at the O/E.

A variety of photonic devices which carry microwave, millimeter-wave, and terahertz-wave signals at subcarrier frequencies are used for high-frequency RoF systems. In advanced radio wireless communication systems, orthogonal frequency domain multiplexing and multi-level modulation techniques have been implemented for the enhancement of spectral efficiency. Even in high-frequency wireless systems in the millimetre-wave and terahertz-wave bands, high spectral efficiency modulation and demodulation formats are indispensable. These advanced modulation formats require a high linearity in devices and transmission lines, and therefore, the high-frequency RoF system should also have high linearity to transfer these radio signals. Particularly in optical-to-electric converters, nonlinear distortions directly affect the quality of regenerated radio signals, to be compliant with radio regulations. Therefore, the nonlinear response of the optical-to-electric converter is a key characteristic to specify result signal quality. This document defines the measurement method of a nonlinear response, which has a significant impact on the performance of RoF systems.

TRANSMITTING AND RECEIVING EQUIPMENT FOR RADIOCOMMUNICATION – FREQUENCY RESPONSE OF OPTICAL-TO-ELECTRIC CONVERSION DEVICE IN HIGH-FREQUENCY RADIO-OVER-FIBRE SYSTEMS –

Part 3: Measurement method of nonlinear response of optical-to-electric converter

1 Scope

This part of IEC 62803 specifies the measurement method of the nonlinear response of optical-to-electric converters in both optical signal transport systems and RoF systems. The method applies for the following:

– frequency range: up to 170 GHz;

– wavelength band: 0,8 μm to 2,0 μm.

2 Normative references

There are no normative references in this document.