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Touch and interactive displays – Part 42-10: Measurement methods of motion-tracking image-control response time for interactive projection display

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FOREWORD

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IEC 62908-42-10 has been prepared by IEC technical committee 110: Electronic displays. It is an International Standard.

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

Draft	Report on voting
110/1729/FDIS	110/1744/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 62908 series, published under the general title *Touch and interactive displays*, 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

- reconfirmed,
- withdrawn, or
- revised.

INTRODUCTION

Projection displays have a configuration allowing for the freedom of motion of both the first and the second objects and the third object(s) in the space between them. That is, the projection displays can interactively track the motions of the first, second, or third object using sensing devices such as a camera, a light detection and ranging (LiDAR) system, etc. As a result, the interactive projection displays with the motion-tracking system create new applications, such as image projection (projection mapping) from moving objects (e.g. vehicles, drones), projection mapping onto moving objects (e.g. dancers), interactive image control by human motions, or protecting a human body moving into a region of high-intensity light exposure from photobiological damage. Hence, quick shut-down systems are important for ensuring safety, and for smooth tracking of projection mapping onto moving objects.

Therefore, response time (latency) of the motion-tracking image control system is a key performance indicator of the above interactive projection displays. Some advanced systems can track various complicated motions. However, this document provides fundamental measurement methods for measuring the response time of the motion-tracking image control systems, in which the image is controlled according to simple motions. The measurements can be carried out simply using small pattens, photodiodes (PD), and a high-speed oscilloscope. The complicated motions specific to the advanced systems are not included in this document. They are categorized as specific measurements for the customized specifications.

There are various types of projection display, such as full-frame projectors using a lamp, LEDs, hybrid phosphor laser, or RGB lasers as light sources, raster scanning RGB laser projectors, etc. [1][1], [2], [3]. This document is applicable to such various projection displays which can interactively control the image via motion-tracking sensors.

The measurement methods in this document are commonly applicable to full-frame and scanning projectors.

[1] Numbers in square brackets refer to the Bibliography.

TOUCH AND INTERACTIVE DISPLAYS –

Part 42-10: Measurement methods of motion-tracking image-control response time for interactive projection display

1 Scope

This part of IEC 62908 specifies standard measurement conditions and fundamental measurement methods of response time of interactive projection displays with sensors detecting the motion of the projector, the projected image on the object, or the third objects, interactively controlling the projection image responding to the motions.

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 60825-1, *Safety of laser products – Part 1: Equipment classification and requirements*

IEC 62471-5, *Photobiological safety of lamps and lamp systems – Part 5: Image projectors*

IEC 62906-1-2, *Laser display devices – Part 1-2: Vocabulary and letter symbols*

IEC 62908-1-2, *Touch and interactive displays – Part 1-2: Generic – Terminology and letter symbols*

3 Terms, definitions, abbreviated terms and symbols

For the purposes of this document, the terms and definitions given in IEC 62906-1-2, IEC 62908-1-2 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/
- ISO Online browsing platform: available at http://www.iso.org/obp

3.1 Terms and definitions

3.1.1
first object
interactive projection display
projector part projecting images on second object (3.1.2), which has a motion-tracking image-control system (3.1.4)

3.1.2
second object
screen part including a living form, on which images are projected by the first object (projector part)