



Edition 1.0 2018-11

TECHNICAL REPORT



Electronic displays – Part 2-4: Transparent displays – Overview of application scenarios

INTERNATIONAL ELECTROTECHNICAL COMMISSION

ICS 31.120; 31.260

ISBN 978-2-8322-6244-3

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

CONTENTS

FC	DREWO	RD	4
1	Scop	e	6
2	Norm	ative references	6
3	Term	s, definitions and abbreviated terms	6
	3.1	Terms and definitions	
	3.2	Abbreviated terms	
4	Appli	cation scenarios	
	4.1	General	7
	4.2	Performance aspects	
	4.3	Application cases	
	4.4	Intended visual information and unwanted contributions from ambient light	9
	4.4.1	General	9
	4.4.2	Visual information on screen	9
	4.4.3	Visual information behind the screen	10
	4.4.4	Intended and disturbing components of light (case 1)	10
	4.4.5	Transmissive transparent display (case 2)	11
	4.4.6		
5	Com	oonent specifications – For measurement	13
	5.1	Spectral radiance	13
	5.2	Object/scene	
	5.3	Display	
	5.4	Emissive transparent display	
	5.5	Transmissive transparent display	
	5.6	Precautions during the measurements	
Bi	bliograp	hy	19
		Two objects (i.e. a scenery) located behind and seen through a transparent	
			11
		On-screen contrast generated by electrically controlled transmittance, T_{H}	4.4
	_	······································	
	-	Luminance image of a detail of Figure 1	12
		Two objects (i.e. a scenery) located behind and seen through a transparent display (emission shown in green for illustration)	12
		Example of light which is supposed to be transmitted independently of the emission, by a transmittance T_{e}	13
		Details of Figure 4	
	-	Emissive and transmissive display screen between the observer and the	
ob	ject/sce	ne	
Fi	gure 8 –	Illustration of the effect of diffraction (left) and scattering (right)	16
		Transparent display's scheme for OLED and LCD without background lumination	17
		 Transparent display's on-screen performance affected by ambient 	
		e	17

Table 1 – Application cases	.9
Table 2 – Illustration and explanation of intended and disturbing light components in	
the case of transparent display screens (TDS)	10

INTERNATIONAL ELECTROTECHNICAL COMMISSION

ELECTRONIC DISPLAYS –

Part 2-4: Transparent displays – Overview of application scenarios

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 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.
- 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 TR 62977-2-4, which is a Technical Report, has been prepared by IEC technical committee 110: Electronic display devices.

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

Enquiry draft	Report on voting
110/972/DTR	110/988A/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 62977 series, published under the general title *Electronic displays*, can be found on the IEC website.

Future standards in this series will carry the new general title as cited above. Titles of existing standards in this series will be updated at the time of the next edition.

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.

ELECTRONIC DISPLAYS –

Part 2-4: Transparent displays – Overview of application scenarios

1 Scope

This part of IEC 62977, which is a Technical Report, provides a comprehensive overview of application scenarios for transparent displays of the two major display technologies (liquid crystal (LC) and organic light emitting diode (OLED) displays) and introduces the observation and illumination aspects that are taken into account for the establishment of appropriate measurement methods.

This document only considers direct view displays, it does not include projection displays (eye-projection and projection to screens.)

2 Normative references

There are no normative references in this document.