

INTERNATIONAL STANDARD



**Touch and interactive displays –
Part 12-10: Measurement methods of touch displays – Touch and electrical
performance**



THIS PUBLICATION IS COPYRIGHT PROTECTED

Copyright © 2017 IEC, Geneva, Switzerland

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either IEC or IEC's member National Committee in the country of the requester. If you have any questions about IEC copyright or have an enquiry about obtaining additional rights to this publication, please contact the address below or your local IEC member National Committee for further information.

IEC Central Office
3, rue de Varembe
CH-1211 Geneva 20
Switzerland

Tel.: +41 22 919 02 11
Fax: +41 22 919 03 00
info@iec.ch
www.iec.ch

About the IEC

The International Electrotechnical Commission (IEC) is the leading global organization that prepares and publishes International Standards for all electrical, electronic and related technologies.

About IEC publications

The technical content of IEC publications is kept under constant review by the IEC. Please make sure that you have the latest edition, a corrigenda or an amendment might have been published.

IEC Catalogue - webstore.iec.ch/catalogue

The stand-alone application for consulting the entire bibliographical information on IEC International Standards, Technical Specifications, Technical Reports and other documents. Available for PC, Mac OS, Android Tablets and iPad.

IEC publications search - www.iec.ch/searchpub

The advanced search enables to find IEC publications by a variety of criteria (reference number, text, technical committee,...). It also gives information on projects, replaced and withdrawn publications.

IEC Just Published - webstore.iec.ch/justpublished

Stay up to date on all new IEC publications. Just Published details all new publications released. Available online and also once a month by email.

Electropedia - www.electropedia.org

The world's leading online dictionary of electronic and electrical terms containing 20 000 terms and definitions in English and French, with equivalent terms in 16 additional languages. Also known as the International Electrotechnical Vocabulary (IEV) online.

IEC Glossary - www.iec.ch/glossary

65 000 electrotechnical terminology entries in English and French extracted from the Terms and Definitions clause of IEC publications issued since 2002. Some entries have been collected from earlier publications of IEC TC 37, 77, 86 and CISPR.

IEC Customer Service Centre - webstore.iec.ch/csc

If you wish to give us your feedback on this publication or need further assistance, please contact the Customer Service Centre: csc@iec.ch.

INTERNATIONAL STANDARD



**Touch and interactive displays –
Part 12-10: Measurement methods of touch displays – Touch and electrical
performance**

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

ICS 31.120

ISBN 978-2-8322-4394-7

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

CONTENTS

FOREWORD.....	5
1 Scope.....	7
2 Normative references	7
3 Terms and definitions	7
4 Measuring conditions.....	7
4.1 Standard measuring environmental conditions	7
4.2 Standard atmospheric conditions for reference measurements and tests	8
4.3 Standard positioning equipment and setup.....	8
4.4 Human operator alternative to standard positioning equipment	9
4.5 Test bar size, shape and material parameters.....	10
5 Touch performance measuring methods	11
5.1 General.....	11
5.2 Accuracy test.....	11
5.2.1 Purpose.....	11
5.2.2 Test procedure	11
5.2.3 Report	15
5.3 Repeatability/jitter test	15
5.3.1 Purpose.....	15
5.3.2 Test procedure	15
5.3.3 Report	17
5.4 Linearity test.....	18
5.4.1 Purpose.....	18
5.4.2 Test procedure	18
5.4.3 Report	20
5.5 Reproducibility test.....	20
5.5.1 Purpose.....	20
5.5.2 Test procedure	21
5.5.3 Report	22
5.6 Signal-to-noise ratio (SNR) test	23
5.6.1 Purpose.....	23
5.6.2 Test procedure	24
5.6.3 Report	25
5.7 Report rate test.....	25
5.7.1 Purpose.....	25
5.7.2 Test procedure	25
5.7.3 Report	26
5.8 Latency test	26
5.8.1 Purpose.....	26
5.8.2 Test procedure	26
5.8.3 Report	27
5.9 Electrical noise immunity test.....	27
5.9.1 Purpose.....	27
5.9.2 Test procedure	27
5.9.3 Report	28
5.10 Water droplet immunity test	28
5.10.1 Purpose.....	28
5.10.2 Test procedure	29

5.10.3	Report	29
5.11	Optical noise immunity test	29
5.11.1	Purpose	29
5.11.2	Test procedure	30
5.11.3	Report	30
5.12	Power consumption test	30
5.12.1	Purpose	30
5.12.2	Test procedure	30
5.12.3	Report	30
5.13	Perpendicular touch/hover distance test	30
5.13.1	Purpose	30
5.13.2	Test procedure	30
5.13.3	Report	31
Annex A (informative) Electrical performance measuring methods of touch sensor		32
A.1	Resistance	32
A.1.1	General	32
A.1.2	Test samples	32
A.1.3	Measurement equipment	32
A.1.4	Procedures	32
A.1.5	Data analysis	33
A.1.6	Report	33
A.2	Trans-capacitance	33
A.2.1	General	33
A.2.2	Test samples	33
A.2.3	Measurement equipment	33
A.2.4	Procedure	33
A.2.5	Data analysis	34
A.2.6	Report	34
Figure 1 – Composition of test equipment		9
Figure 2 – Concept of performance measurement		9
Figure 3 – Example of manual test tool (left), positioning without triggering a touch event (middle) and reporting a touch event (right)		10
Figure 4 – Examples of test bars		10
Figure 5 – Location of edge area and centre area		12
Figure 6 – Point grid		12
Figure 7 – Accuracy definition		13
Figure 8 – Example of measurement result and calculation of accuracy		15
Figure 9 – Repeatability in touch sensor module		16
Figure 10 – Example of measurement result for repeatability		17
Figure 11 – Dragging line for linearity test		18
Figure 12 – Linearity definition		19
Figure 13 – Example of measurement and calculation of linearity		20
Figure 14 – Example of reproducibility test results		21
Figure 15 – Reproducibility test procedure		22
Figure 16 – Examples of measurements of reproducibility – Velocity dependence		23
Figure 17 – SNR definition concept		24

Figure 18 – Dragging direction for reporting time measurement 25

Figure 19 – Reporting time interval measurement 26

Figure 20 – Latency measurement 26

Figure 21 – Example of the effect of external noise 27

Figure 22 – External noise injection 28

Figure 23 – Report of external noise immunity 28

Figure 24 – Example of water drop effect 29

Figure 25 – Water droplet test procedure 29

Figure 26 – Perpendicular touch/hover distance measurement 31

Figure A.1 – Diagrammatic representation of measurement of resistance 33

Figure A.2 – Diagrammatic representation of measurement of capacitance 34

Table 1 – Standard conditions for reference measurements and tests 8

Table A.1 – Specification of LCR impedance meter 32

Currently in preview, click buy full version

INTERNATIONAL ELECTROTECHNICAL COMMISSION

TOUCH AND INTERACTIVE DISPLAYS –

Part 12-10: Measurement methods of touch displays –
Touch and electrical performance

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, accept 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.

International Standard IEC 62908-12-10 has been prepared by IEC technical committee 110: Electronic display devices.

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

FDIS	Report on voting
110/861/FDIS	110/872/RVD

Full information on the voting for the approval of this International Standard 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 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 "<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.

TOUCH AND INTERACTIVE DISPLAYS –

Part 12-10: Measurement methods of touch displays – Touch and electrical performance

1 Scope

This part of IEC 62908 specifies the standard measuring conditions and methods for determining touch performance of a touch sensor module. This document is applicable to touch sensor modules, where the structural relationship between touch sensor, touch controller, touch sensor module, display panel, touch display panel, and touch display module is defined in IEC 62908-1-2.

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 60068-1, *Environmental testing – Part 1: General and guidance*

IEC 62908-1-2¹, *Touch and interactive displays – Part 1-2: Generic – Terminology and letter symbols*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 60068-1 and IEC 62908-1-2 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>

4 Measuring conditions

4.1 Standard measuring environmental conditions

Measurements shall be carried out under the standard environmental conditions:

- temperature: 25 °C ± 3 °C,
- relative humidity: 25 % RH to 85 % RH,
- atmospheric pressure: 86 kPa to 106 kPa.

When different environmental conditions are used, they shall be noted in the measurement report.

¹ Under preparation. Stage at the time of publication: IEC/AFDIS 62908-1-2:2017.