



Edition 1.0 2025-09

# TECHNICAL REPORT

Remote control and remote assistance system in home and local area

ICS 33.040; 03.080.30 ISBN 978-2-8327-0725-8



# THIS PUBLICATION IS COPYRIGHT PROTECTED Copyright © 2025 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 Secretariat Tel.: +41 22 919 02 11

3, rue de Varembé info@iec.ch CH-1211 Geneva 20 www.iec.ch

Switzerland

#### 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 corrigendum or an amendment might have been published.

## IEC publications search -

#### webstore.iec.ch/advsearchform

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 It also gives information on projects, replaced and withdrawn publications.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 once a month by email.

## 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: sales@jec.ch.

## IEC Products & Services Portal - products.iec.ch

Discover our powerful search engine and read freely all the publications previews, graphical symbols and the glossary. With a subscription you will always have access to up to date content tailored to your needs.

# Electropedia - www.electropedia.org

The world's leading online dictionary on electrotechnology, containing more than 22 500 terminological entries in English and French, with equivalent terms in 25 additional languages. Also known as the International Electrotechnical Vocabulary (IEV) online.

# CONTENTS

F	DREWO	RD	3			
1	Scop	e	5			
2	Norm	Normative references				
3	Term	Terms and definitions				
4	Remote control and remote assistance system technologies					
	4.1 General information					
	4.2	Classification of remote control and remote assistance system				
	4.3	Components of remote control and remote assistance system				
5	Interaction					
	5.1	General	12			
	5.2	Input				
	5.2.1	General				
	5.2.2	Sensor data	12			
	5.2.3	User's commands	12			
	5.2.4	Commands from objects in workplace	13			
	5.2.5	Information from objects in workplace	13			
	5.3	Processing	13			
	5.3.1	General				
	5.3.2					
	5.3.3					
	5.3.4 Command generation					
	5.4	Output				
	5.4.1	General				
	5.4.2	3				
	5.4.3	•				
	5.4.4	· · · · · · · · · · · · · · · · · · ·				
	5.4.5	,				
6	Performance characteristics					
	6.1	General				
	6.2	Interaction performance				
	6.2.1	Interaction performance characteristics				
	6.2.2	'				
	6.2.3	, , ,				
	6.2.4					
	6.3	Examples				
	6.3.1 6.3.2	Transmission of camera image from worker side to manager side				
	6.3.2	, 3				
	6.3.4	,				
	6.4	Electrical performance				
	6.5	Local or private network performance				
	6.5.1	General				
	6.5.2					
	6.5.3	·				
	6.5.4	'				
		·				

	6.5.	5.5 Evaluation performance of wireless communicati environment	
(	6.6	Transmission performance	
	6.7	System reliability and durability	
7	Spe	ecifications	
Anı	nex A	A (informative) Possible standardization items	24
Bib	liogra	aphy	25
Fig	ure 1	1 – Remote control and remote assistance system in a h	ome and local area6
Fig	ure 2	2 –AR remote control and remote assistance system in h	ome and local area7
Fig	ure 3	3 – VR remote control and remote assistance system in a	a home and local area8
Fig	ure 4	4 – Classification of remote control and remote assistance	ce system10
Fig	ure 5	5 – Components of remote control and remote assistance	e system11
Fig	ure 6	6 – Example of interaction process	12
Fig	ure 7	7 – Transmission of camera image from worker side to m	nanager side15
Fig	ure 8	8 – Working instruction by hand gesture	17
Fig	ure 9	9 – Comparison of task completion time	17
Fig	ure 10	10 – Trackability against rotation	19
Fig	ure 11	11 – AR image and object in reality before and after rota	tion19
Fig	ure 12	12 – Ambient image brightness adjustment according to	brightness20
		13 – Example actual environment for performing a compa pe in remote support system	
Fig act	ure 14 ual en	14 – Example of the results of video quality (PLTE: 2 K, environment	6 Mbps, 30 FPS) in 22
		– Example of measurement results of delay time in cam	

# INTERNATIONAL ELECTROTECHNICAL COMMISSION

# Remote control and remote assistance system in home and local area

# **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) IEC draws attention to the possibility that the implementation of this document may involve the use of (a) patent(s). IEC takes no position concerning the evidence, validity or applicability of any claimed patent rights in respect thereof. As of the date of publication of this document, IEC had not received notice of (a) patent(s), which may be required to implement this document. However, implementers are cautioned that this may not represent the latest information, which may be obtained from the patent database available at https://patents.iec.ch. IEC shall not be held responsible for identifying any or all such patent rights.

IEC TR 63511 has been prepared by subcommittee 18: Multimedia home systems and applications for end-user networks, of IEC technical committee 100: Audio, video and multimedia systems and equipment. It is a Technical Report.

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

Draft	Report on voting
100/4344/DTR	100/4376/RVDTR

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 Technical Report 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 <a href="https://www.iec.ch/members\_experts/refdocs">www.iec.ch/members\_experts/refdocs</a>. The main document types developed by IEC are described in greater detail at <a href="https://www.iec.ch/publications">www.iec.ch/publications</a>.

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.

# 1 Scope

This document provides general information on a remote control and remote assistance system for use from the user side, especially in the home and local area with private or local network. This document includes an overview of the technology, performance characteristics, issues of performance measurements, and other information.

# 2 Normative references

There are no normative references in this document.