

INTERNATIONAL STANDARD



Digital video interface – Gigabit video interface for multimedia systems
(standards.iteh.ai)

IEC 62889:2015

<https://standards.iteh.ai/catalog/standards/sist/81398087-f308-4eac-957d-04548c7d3dcf/iec-62889-2015>



THIS PUBLICATION IS COPYRIGHT PROTECTED

Copyright © 2015 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.

Electropedia - www.electropedia.org

The world's leading online dictionary of electronic and electrical terms containing more than 30 000 terms and definitions in English and French, with equivalent terms in 15 additional languages. Also known as the International Electrotechnical Vocabulary (IEV) online.

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 It also gives information on projects, replaced and withdrawn publications.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 Glossary - std.iec.ch/glossary

More than 60 000 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 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.

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 STANDARDS (standards) IEC 62889-2015

INTERNATIONAL STANDARD



Digital video interface – Gigabit video interface for multimedia systems
(standards.iteh.ai)

IEC 62889:2015

<https://standards.iteh.ai/catalog/standards/sist/81398087-f308-4eac-957d-04548c7d3dcf/iec-62889-2015>

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

ICS 33.160.40; 33.160.60; 35.200

ISBN 978-2-8322-2543-1

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

CONTENTS

FOREWORD.....	4
INTRODUCTION.....	6
1 Scope.....	7
2 Normative references	7
3 Terms, definitions and abbreviations	7
3.1 Terms and definitions.....	7
3.2 Abbreviations	9
4 Architecture.....	10
5 Electrical characteristics.....	11
5.1 DC electrical specifications	11
5.2 AC electrical specifications	12
6 Front-end.....	13
6.1 General.....	13
6.2 TX front-end.....	13
6.3 RX front-end	13
7 Transition state link	14
8 Protocol.....	15
8.1 General.....	15
8.2 Encoder	15
8.3 Decoder.....	17
9 Transmission system and transmission line electrical characteristics.....	17
Annex A (informative) Multiple link application.....	19
A.1 Single link application example	19
A.1.1 Block diagram for single link transmission	19
A.1.2 Data mapping of single link transmission	20
A.2 Multiple link application example.....	20
A.2.1 Block diagram for 2-pair parallel transmission.....	20
A.2.2 Data mapping of 2-pair transmission.....	21
Bibliography.....	22
Figure 1 – Architecture of the GVIF.....	10
Figure 2 – VOD, VOS diagram	11
Figure 3 – Transmitter eye mask specifications (TP1).....	12
Figure 4 – Front-end block diagram	13
Figure 5 – Transition state link.....	14
Figure 6 – Encoder output diagram	15
Figure 7 – C format word	16
Figure 8 – H format word	16
Figure 9 – Transmission system.....	17
Figure 10 – Transmission line tolerance impedance.....	18
Figure 11 – Transmission loss	18
Figure A.1 – Differential single link block diagram.....	19
Figure A.2 – Pixel configuration	20

iTech STANDARD PREVIEW
(standards.iteh.ai)

IEC 62889:2015
<https://standards.iteh.ai/catalog/standards/sist/81398087-b308-4eac-957d-04948c7d35de/iec-62889-2015>

Figure A.3 – Multiple link application block diagram	20
Figure A.4 – Pixel configuration when using 2-pairs	21
Table 1 – DC electrical specifications of the transmitter	11
Table 2 – DC electrical specifications of the receiver	12
Table 3 – AC electrical specifications of the transmitter	12
Table 4 – AC electrical specifications of the receiver	12
Table 5 – 4B5B conversion	16
Table 6 – VSYNC, HSYNC, DE, CNTL/AUX, SDA, TDA transition and the corresponding header	17

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[IEC 62889:2015](https://standards.iteh.ai/catalog/standards/sist/81398087-f308-4eac-957d-04548c7d3dcf/iec-62889-2015)

<https://standards.iteh.ai/catalog/standards/sist/81398087-f308-4eac-957d-04548c7d3dcf/iec-62889-2015>

INTERNATIONAL ELECTROTECHNICAL COMMISSION

**DIGITAL VIDEO INTERFACE –
GIGABIT VIDEO INTERFACE FOR MULTIMEDIA SYSTEMS**

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) 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 62889 has been prepared by subcommittee technical area 4: Digital system interfaces and protocols, of IEC technical committee 100: Audio, video and multimedia systems and equipment.

The text of this standard is based on the following documents:

CDV	Report on voting
100/2193/CDV	100/2298/RVC

Full information on the voting for the approval of this standard can be found in the report on voting indicated in the above table.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

The committee has decided that the contents of this publication will remain unchanged until the stability date indicated on the IEC website under "<http://webstore.iec.ch>" in the data related to the specific publication. At this date, the publication 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.

iTeh STANDARD PREVIEW **(standards.iteh.ai)**

[IEC 62889:2015](#)

<https://standards.iteh.ai/catalog/standards/sist/81398087-f308-4eac-957d-04548c7d3dcf/iec-62889-2015>

INTRODUCTION

This International Standard is based on a standard JEITA CP-6101: Digital monitor interface GVIF that was originally specified by the Japan Electronics and Information Technology Industries Association (JEITA).

The gigabit video interface (GVIF) is a serial point to point interface supporting uncompressed digital video links that was designed to address the needs of automotive navigation and entertainment systems, etc., to transport base band digital video information. The GVIF applies low voltage differential signaling (LVDS) technology and makes use of a thin cable consisting of a single shielded twisted pair of conductors that exhibits high noise immunity and low EMI, and is optimized for small size and low weight. The GVIF supports display resolutions ranging from WQVGA through WUXGA with maximum 24 bit per pixel colour video data, and can transmit base band video signal over cable lengths over 10 m. When paired with high bandwidth data content protection (HDCP), the GVIF's standard functions and features address all of the requirements for delivering content protected video from a source to a video display monitor. Optionally, the GVIF supports audio data transmission and user data transmission.

The Association of Radio Industry Business (ARIB) refers the GVIF in its standard ARIB STD-B21 as one of authorized digital video output interfaces.

iTeh STANDARD PREVIEW (standards.iteh.ai)

[IEC 62889:2015](#)

<https://standards.iteh.ai/catalog/standards/sist/81398087-f308-4eac-957d-04548c7d3dcf/iec-62889-2015>

DIGITAL VIDEO INTERFACE – GIGABIT VIDEO INTERFACE FOR MULTIMEDIA SYSTEMS

1 Scope

This International Standard describes a serial digital interface, gigabit video interface (GVIF) for the interconnection of digital video equipment. The GVIF is primarily intended to carry high-speed digital video data for general usage and is well suited for multimedia entertainment systems in a vehicle.

This International Standard specifies the physical layer of the interface including transmission line characteristics and electrical characteristics of transmitter and receiver. Mechanical and physical specifications of connectors are not included.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 62315-1:2003, *DTV profiles for uncompressed digital video interfaces – Part 1: General*

ITU-R BT.601-5, *Studio encoding parameters of digital television for standard 4:3 and wide-screen 16:9 aspect ratios*

ITU-R BT.656-5, *Interface for digital component video signals in 525-line and 625-line television systems operating at the 4:2:2 level of Recommendation ITU-R BT.601*

3 Terms, definitions and abbreviations

3.1 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1.1

DE

display enable signal given in IEC 62315-1

3.1.2

HSYNC

display horizontal synchronous signal given in IEC 62315-1

3.1.3

VSYNC

display vertical synchronous signal given in IEC 62315-1

3.1.4

RGB

display red, green, blue colour data input (TX) or output (RX) given in ITU-R BT.601-5 and ITU-R BT.656-5

3.1.5

YU(Cb)V(Cr)

display Y, U (Cb), V (Cr) pixel data input (TX) or output (RX) given in ITU-R BT.601-5 and ITU-R BT.656-5

3.1.6

CNTL/AUX

down-stream user defined signal or audio enable signal

3.1.7

P[23:0]

digital signal data like a 24 bit colour video data such as RGB or YU (Cb) V (Cr) data input (TX) or output (RX)

3.1.8

GVIF RX

circuit that receives the serial signal from a shielded-pair transmission line, decodes them and outputs to convert into the parallel video signal

3.1.9

GVIF TX

circuit that receives the parallel video signal, the control signals, and encodes them into serial data to send a signal by driving a shielded-pair transmission line

3.1.10

LOS

loss of signal

detection signal, asserted when the differential input signal at the receiver cannot receive

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[IEC 62889:2015](https://standards.iteh.ai/catalog/standards/sist/81398087-f308-4eac-957d-04548c7d3dcf/iec-62889-2015)

3.1.11

RX front-end

front-end block of receiver side

<https://standards.iteh.ai/catalog/standards/sist/81398087-f308-4eac-957d-04548c7d3dcf/iec-62889-2015>

3.1.12

SDA

serial data

down-stream signal

3.1.13

SDATAP

down-stream positive-phase side signal of the differential serial data

3.1.14

SDATAN

down-stream negative-phase side signal of the differential serial data

3.1.15

REFRQP

current source signal for reference clock request from Rx side

3.1.16

REFRQN

current source signal for reference clock request from Rx side as well as REFRQP

3.1.17

SFTCLK

pixel clock

clock for capture of the parallel video data per pixel

3.1.18**TDA**

transmit data
down-stream user defined signal

3.1.19**TX front-end**

front-end block of transmitter side

3.1.20**UDA**

user data
up-stream user defined signal

3.1.21**IRQ**

up-stream common-mode reference request current for REFRQP/N

3.1.22**VOS**

common-mode voltage amplitude of reference request

3.1.23**VOD**

differential voltage amplitude for SDATAP/N

3.1.24**VDD**

power supply on the transmitter side

[IEC 62889:2015](https://standards.iteh.ai/catalog/standards/sist/81398087-f308-4eac-957d-04548c7d3dcf/iec-62889-2015)

<https://standards.iteh.ai/catalog/standards/sist/81398087-f308-4eac-957d-04548c7d3dcf/iec-62889-2015>

3.1.25**V_SDATAP**

single-ended voltage of SDATAP

3.1.26**V_SDATAN**

single-ended voltage of SDATAN

3.1.27**TP1**

transmitter end point for eye mask specification

3.1.28**normalized differential voltage**

voltage of transmitter output point

3.1.29**UI**

normalized time unit interval of transmitter output point

3.2 Abbreviations

AC	Alternating Current
DC	Direct Current
EMI	Electro-Magnetic Interference
GVIF	Gigabit Video InterFace
LSB	Least Significant Bit