

AS/NZS IEC 62676.2.31:2020
IEC 62676-2-31:2019



Australian/New Zealand Standard™

Video surveillance systems for use in security applications

Part 2.31: Live streaming and control based on web services



currently in review, click buy full version

AS/NZS IEC 62676.2.31:2020

This Joint Australian/New Zealand Standard™ was prepared by Joint Technical Committee EL-031, Intruder Alarm Equipment and Installations. It was approved on behalf of the Council of Standards Australia on 22 September 2020 and by the New Zealand Standards Approval Board on 7 October 2020.

This Standard was published on 30 October 2020.

The following are represented on Committee EL-031:

- Australian Digital and Telecommunications Industry Association
- Australian Industry Group
- Australian Security Industry Association
- Engineers Australia
- Fire Protection Association Australia
- Insurance Council of Australia
- New Zealand Security Association
- NSW Police Force
- Security Providers Association of Australia
- South Australia Police
- Victorian Security Institute

This Standard was issued in draft form for comment as DR AS/NZS IEC 62676.2.31:2020.

Keeping Standards up-to-date

Ensure you have the latest versions of our publications and keep up-to-date about Amendments, Rulings, Withdrawals, and new projects by visiting:

www.standards.org.au

www.standards.govt.nz

ISBN 978 1 76113 016 8

Australian/New Zealand Standard™

Video surveillance systems for use in security applications

**Part 2.31: Live streaming and control based on
web services**

First published as AS/NZS IEC 62676.2.31:2020.



© IEC 2020 — All rights reserved

© Standards Australia Limited/the Crown in right of New Zealand, administered by the New Zealand Standards Executive 2020

All rights are reserved. No part of this work may be reproduced or copied in any form or by any means, electronic or mechanical, including photocopying, without the written permission of the publisher, unless otherwise permitted under the Copyright Act 1968 (Cth) or the Copyright Act 1994 (New Zealand).

Preface

This Standard was prepared by the Standards Australia/Standards New Zealand Committee EL-031, Intruder Alarm Equipment and Installations.

The objective of this document is to define procedures for communication between network video clients and video transmitter devices. This new set of specifications makes it possible to build network video systems with devices and receivers from different manufacturers using common and well-defined interfaces. These interfaces cover functions such as media and imaging configuration, real-time streaming of audio and video, pan, tilt and zoom (PTZ) control as well as analytics.

The management and control interfaces defined in this document are described as web services. Annex F contains XML schema and Web Service Description Language (WSDL) definitions for the introduced network services.

This document is identical with, and has been reproduced from, IEC 62676-2-31:2019, *Video surveillance systems for use in security applications — Part 2-31: Live streaming and control based on web services*.

As this document has been reproduced from an International Standard, a full point substitutes for a comma when referring to a decimal marker.

Australian or Australian/New Zealand Standards that are identical or options of international normative references may be used interchangeably. Refer to the online catalogue for information on specific Standards.

The terms “normative” and “informative” are used in Standards to define the application of the appendices or annexes to which they apply. A “normative” appendix or annex is an integral part of a Standard, whereas an “informative” appendix or annex is only for information and guidance.

NOTES

Currently in preview, click buy full version

CONTENTS

FOREWORD.....	8
INTRODUCTION.....	10
1 Scope.....	11
2 Normative references	11
3 Terms and definitions	12
4 Overview	13
4.1 General.....	13
4.2 Device IO.....	13
4.3 Imaging configuration.....	13
4.4 Media configuration	13
4.4.1 Media profiles	13
4.4.2 Video source mode	16
4.5 Real-time streaming.....	16
4.6 PTZ Control	17
4.7 Analytics	18
4.8 Interfaces.....	20
5 Device IO service	20
5.1 General.....	20
5.2 VideoOutputs	20
5.2.1 General	20
5.2.2 GetVideoOutputs	20
5.3 VideoOutputConfiguration	21
5.3.1 GetVideoOutputConfiguration.....	21
5.3.2 SetVideoOutputConfiguration	21
5.3.3 GetVideoOutputConfiguration Options	22
5.4 VideoSources	22
5.4.1 General	22
5.4.2 GetVideoSources	22
5.5 AudioOutputs	22
5.5.1 General	22
5.5.2 GetAudioOutputs	23
5.6 AudioSources	23
5.6.1 General	23
5.6.2 GetAudioSources.....	23
5.7 Capabilities.....	23
6 Media service	24
6.1 General.....	24
6.2 Media profile methods.....	25
6.2.1 Create media profile	25
6.2.2 Get media profiles	25
6.2.3 Add one or more configurations to a profile.....	26
6.2.4 Remove one or more configurations from a profile	27
6.2.5 Delete media profile.....	27
6.3 Media configurations.....	28
6.3.1 General	28
6.3.2 Video source configuration	28

6.3.3	Video encoder configuration	29
6.3.4	Audio source configuration	29
6.3.5	Audio encoder configuration	29
6.3.6	PTZ Configuration	29
6.3.7	Analytics configuration.....	29
6.3.8	Metadata configuration	30
6.3.9	Audio output configuration	30
6.3.10	Audio decoder configuration	31
6.4	Media Configuration Methods.....	31
6.4.1	General	31
6.4.2	Get configurations	31
6.4.3	Modify a configuration	32
6.4.4	Get configuration options.....	32
6.4.5	GetVideoEncoderInstances.....	33
6.5	GetStreamUri.....	34
6.6	GetSnapshotUri	35
6.7	Multicast	35
6.7.1	General	35
6.7.2	Start multicast streaming	36
6.7.3	Stop multicast streaming	36
6.8	SetSynchronizationPoint	37
6.9	Video source mode	37
6.9.1	General	37
6.9.2	GetVideoSourceModes	37
6.9.3	SetVideoSourceMode	38
6.10	OSD (on-screen display).....	38
6.10.1	General	38
6.10.2	CreateOSD	39
6.10.3	DeleteOSD	40
6.10.4	GetOSDs	40
6.10.5	SetOSD	41
6.10.6	GetOSDOptions	41
6.11	Privacy masks	42
6.11.1	General	42
6.11.2	CreateMask	43
6.11.3	DeleteMask	43
6.11.4	GetMasks	44
6.11.5	SetMask	44
6.11.6	GetMaskOptions	45
6.12	Capabilities	45
6.13	Events	46
6.13.1	ProfileChange.....	46
6.13.2	ConfigurationChange	46
6.13.3	ActiveConnections	47
6.14	Deviations of media service version 1	47
6.14.1	General	47
6.14.2	Profile management.....	47
6.14.3	Configuration listing.....	48
6.14.4	Privacy masks	48

7	Imaging service	48
7.1	General.....	48
7.2	Imaging settings.....	48
7.2.1	Parameters	48
7.2.2	GetImagingSettings	50
7.2.3	SetImagingSettings.....	51
7.2.4	GetOptions	51
7.3	Imaging Presets	52
7.3.1	General	52
7.3.2	GetPresets	52
7.3.3	GetCurrentPreset	52
7.3.4	SetCurrentPreset.....	53
7.4	Focus operations	54
7.4.1	Move	54
7.4.2	GetMoveOptions	54
7.4.3	Stop.....	55
7.4.4	GetImagingStatus	55
7.5	Capabilities	56
8	PTZ service	56
8.1	General.....	56
8.2	PTZ node.....	57
8.2.1	General	57
8.2.2	GetNodes	57
8.2.3	GetNode	57
8.3	PTZ configuration	58
8.3.1	General	58
8.3.2	GetConfigurations.....	59
8.3.3	GetConfiguration	59
8.3.4	GetConfigurationOption	60
8.3.5	SetConfiguration.....	60
8.3.6	GetCompatibleConfigurations	61
8.4	Move operations	61
8.4.1	General	61
8.4.2	Absolute Move.....	61
8.4.3	Relative Move.....	62
8.4.4	ContinuousMove.....	63
8.4.5	GoMove	64
8.4.6	Stop.....	66
8.4.7	GetStatus	66
8.5	Preset operations.....	67
8.5.1	General	67
8.5.2	SetPreset	67
8.5.3	GetPresets	68
8.5.4	GotoPreset	69
8.5.5	RemovePreset.....	69
8.6	Home position operations	70
8.6.1	General	70
8.6.2	GotoHomePosition.....	70
8.6.3	SetHomePosition	71

8.7	Auxiliary operations	71
8.7.1	General	71
8.7.2	SendAuxiliaryCommand	71
8.8	Predefined PTZ Spaces	72
8.8.1	General	72
8.8.2	Absolute position spaces	72
8.8.3	Relative translation spaces	77
8.8.4	Continuous velocity spaces	78
8.8.5	Speed spaces	79
8.9	Preset tour operations	80
8.9.1	General	80
8.9.2	GetPresetTours	81
8.9.3	GetPresetTour	81
8.9.4	GetPresetTourOptions	82
8.9.5	CreatePresetTour	82
8.9.6	ModifyPresetTour	83
8.9.7	OperatePresetTour	83
8.9.8	RemovePresetTour	84
8.9.9	Preset tour parameters	85
8.10	Pan/tilt control direction configuration	86
8.11	Capabilities	87
8.12	Events	88
8.12.1	General	88
8.12.2	PTZ presets	88
8.12.3	PresetTours	88
9	Analytics service	89
9.1	General	89
9.2	Scene description interface	89
9.2.1	Overview	89
9.2.2	Frame-related content	89
9.2.3	Scene elements	92
9.3	Rule interface	99
9.3.1	General	99
9.3.2	Rule representation	100
9.3.3	Rule description language	100
9.3.4	Operations on rules	101
9.4	Analytics modules interface	104
9.4.1	General	104
9.4.2	Analytics module configuration	105
9.4.3	Analytics module description language	105
9.4.4	Operations on analytics modules	105
9.5	GetAnalyticsModuleOptions	108
9.6	Capabilities	109
9.7	Events – Audio Detected	109
10	Real-time streaming	110
10.1	General	110
10.2	Media stream protocol	110
10.2.1	Transport format	110
10.2.2	Media transport	111

10.2.3	Synchronization points.....	115
10.2.4	JPEG over RTP	116
10.3	Media control protocol.....	118
10.3.1	RTSP stream control	118
10.3.2	Keep-alive method for RTSP session.....	120
10.3.3	RTSP audio and video synchronization.....	121
10.3.4	RTSP session for a metadata stream.....	121
10.3.5	Multicast streaming.....	122
10.3.6	RTSP message example.....	122
10.3.7	RTSP over HTTP.....	123
10.4	Back channel connection	123
10.4.1	General	123
10.4.2	RTSP Require tag.....	123
10.4.3	Connection setup for a bi- directional connection.....	124
10.4.4	Describe example for a server without backchannel support:.....	124
10.4.5	Describe example for a server with ONVIF backchannel support:.....	124
10.4.6	Multicast streaming.....	126
10.5	Error handling.....	126
Annex A (normative)	Efficient XML Interchange (EXI)	127
Annex B (normative)	Lens description.....	128
Annex C (informative)	Specified rules	130
C.1	General.....	130
C.2	LineDetector	130
C.3	FieldDetector	130
C.4	LoiteringDetector	131
C.5	Declarative motion detector	132
C.6	Counting rule	133
C.7	Query rule.....	134
Annex D (informative)	Cell motion detection	135
D.1	Cell motion detector.....	135
D.2	Cell motion analytics engine	136
D.2.1	General	136
D.2.2	Module configuration	137
Annex E (normative)	Motion detection.....	139
Annex F (normative)	Schema files	141
F.1	Device IO.....	141
F.2	Imaging.....	156
F.3	Media.....	162
F.4	Media 2.....	199
F.5	PTZ	221
F.6	Analytics	234
F.7	Common schema	240
F.8	Streaming metadata schema.....	279
Bibliography	284
Figure 1	– A media profile.....	14
Figure 2	– Complete profile configuration.....	15
Figure 3	– Layer structure.....	16

Figure 4 – Analytics architecture	19
Figure 5 – Example with four OSD configurations	39
Figure 6 – Example of screen with mask and coordinate system	42
Figure 7 – Spherical pan/tilt position space in degrees for a camera mounted on the ceiling	74
Figure 8 – Example of changes of pan/tilt control direction by E-Flip and Reverse	87
Figure 9 – Default frame coordinate system	91
Figure 10 – RTP header	111
Figure 11 – RTCP sequence	114
Figure 12 – RTCP Sender Report	115
Figure 13 – Media synchronization	115
Figure 14 – RTP/JPEG packet structure	116
Figure 15 – Stream control	119
Figure 16 – Keep alive	121
Figure B.1 – Optical mapping of angle (α) via radius (R) to normalized x/y coordinates	128
Figure B.2 – Smooth mapping using B-splines	128
Figure B.3 – Compensation of vertical axis offset	129
Figure D.1 – CellLayout of an 8 × 6 CellMotionEngine	138
Table 1 – Referenced namespaces (with prefix)	20
Table 2 – Colourspace namespace values	97
Table 3 – Description of attributes of MotionInCells type	99
Table 4 – RTP header value	112
Table 5 – RTSP methods	120
Table A.1 – ONVIF defined EXI header settings	127
Table A.2 – ONVIF defined EXI configuration settings	127
Table C.1 – Loitering Detector rule configuration parameters	132
Table C.2 – Description of loitering event fields	132
Table C.3 – Declarative motion detector rule configuration parameters	133
Table C.4 – Description of declarative motion event fields	133
Table C.5 – Counting rule configuration parameters	134
Table C.6 – Description of counting event fields	134
Table C.7 – Query Rule configuration parameters	134
Table D.1 – Cell motion detector rule configuration parameters	136
Table D.2 – Description cell motion detected event fields	136
Table D.3 – Module configuration parameters	137
Table D.4 – Description of CellLayout fields	137
Table E.1 – Motion Region Detector Rule configuration parameters	139
Table E.2 – Motion region detector rule configuration options	140
Table E.3 – Description of the motion region detector event fields	140

INTERNATIONAL ELECTROTECHNICAL COMMISSION

VIDEO SURVEILLANCE SYSTEMS FOR USE IN SECURITY APPLICATIONS –

Part 2-31: Live streaming and control based on web services

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 62676-2-31 has been prepared by IEC technical committee 79: Alarm and electronic security systems.

This first edition, together with IEC 60839-11-31 and IEC 62676-2-32, cancels and replaces IEC 62676-2-3:2013.

This edition includes the following significant technical changes with respect to IEC 62676-2-3:2013:

- a) addition of the Media2 service;
- b) additional methods for the imaging service;
- c) method duplicates from the device IO service have been removed;
- d) both the display and analytics device service are no more included.

This publication contains attached schema files. These files are intended to be used as a complement and do not form an integral part of the standard

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

FDIS	Report on voting
79/620/FDIS	79/622/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 62676 series, published under the general title *Video surveillance systems for use in security applications*, 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.

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.

INTRODUCTION

The goal of this document is to provide a fully interoperable network video implementation comprised of products from different network video vendors. This document describes the network video model, interfaces, data types and data exchange patterns. The document reuses existing relevant standards where available and introduces new specifications only where necessary to support the specific requirements for network video surveillance.

VIDEO SURVEILLANCE SYSTEMS FOR USE IN SECURITY APPLICATIONS –

Part 2-31: Live streaming and control based on web services

1 Scope

This document defines procedures for communication between network video clients and video transmitter devices. This new set of specifications makes it possible to build network video systems with devices and receivers from different manufacturers using common and well-defined interfaces. These interfaces cover functions such as media and imaging configuration, real-time streaming of audio and video, pan, tilt and zoom (PTZ) control as well as analytics.

The management and control interfaces defined in this document are described as web services. Annex F contains XML schema and Web Service Description Language (WSDL) definitions for the introduced network services.

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 60839-11-31, *Alarm and electronic security systems – Part 11-31: Electronic access control systems – Core interoperability protocol based on Web services*

ISO 12639, *Graphic technology – Prepress digital data exchange – Tag image file format for image technology (TIFF/IT)*

INTERNET ENGINEERING TASK FORCE (IETF). RFC 1952: *GZIP file format specification version 4.3* [online]. Edited by P. Deutsch. May 1996 [viewed 2019-01-08]. Available at <http://tools.ietf.org/html/rfc1952>

INTERNET ENGINEERING TASK FORCE (IETF). RFC 2326: *Real Time Streaming Protocol (RTSP)* [online]. Edited by H. Schulzrinne et al. April 1998 [viewed 2019-01-08]. Available at <http://www.ietf.org/rfc/rfc2326.txt>

INTERNET ENGINEERING TASK FORCE (IETF). RFC 2435: *RTP Payload Format for JPEG-compressed Video* [online]. Edited by L. Berc et al. October 1998 [viewed 2019-01-08]. Available at <http://www.ietf.org/rfc/rfc2435.txt>

INTERNET ENGINEERING TASK FORCE (IETF), RFC 2818: *HTTP over TLS* [online]. Edited by E. Rescorla. May 2000 [viewed 2019-01-08]. Available at <http://www.ietf.org/rfc/rfc2818.txt>

INTERNET ENGINEERING TASK FORCE (IETF), RFC 3016: *RTP Payload Format for MPEG-4 Audio/Visual Streams* [online]. Edited by Y. Kikuchi et al. November 2000 [viewed 2019-01-08]. Available at <http://www.ietf.org/rfc/rfc3016.txt>