



SLOVENSKI STANDARD
oSIST prEN IEC 63206:2021
01-november-2021

Industrija - Nadzorni sistemi za procese - Zapisovalniki

Industrial - Process control systems - Recorders

iTeh STANDARD PREVIEW
(standards.iteh.ai)

Ta slovenski standard je istoveten z: prEN IEC 63206:2021

[oSIST prEN IEC 63206:2021](https://standards.iteh.ai/catalog/standards/sist/339c25ae-303c-4540-846f-1dd527ef93f4/osist-pren-iec-63206-2021)

<https://standards.iteh.ai/catalog/standards/sist/339c25ae-303c-4540-846f-1dd527ef93f4/osist-pren-iec-63206-2021>

ICS:

25.040.01	Sistemi za avtomatizacijo v industriji na splošno	Industrial automation systems in general
-----------	---	--

oSIST prEN IEC 63206:2021

en,fr,de

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[oSIST prEN IEC 63206:2021](#)

<https://standards.iteh.ai/catalog/standards/sist/339c25ae-303c-4540-846f-1dd527e93f4/osist-pren-iec-63206-2021>



65B/1204/CDV

COMMITTEE DRAFT FOR VOTE (CDV)

PROJECT NUMBER:

IEC 63206 ED1

DATE OF CIRCULATION:

2021-09-10

CLOSING DATE FOR VOTING:

2021-12-03

SUPERSEDES DOCUMENTS:

65B/1186/CD, 65B/1201/CC

IEC SC 65B : MEASUREMENT AND CONTROL DEVICES	
SECRETARIAT: United States of America	SECRETARY: Mr Angus Low
OF INTEREST TO THE FOLLOWING COMMITTEES:	PROPOSED HORIZONTAL STANDARD: <input type="checkbox"/> Other TC/SCs are requested to indicate their interest, if any, in this CDV to the secretary.
FUNCTIONS CONCERNED: <input type="checkbox"/> EMC <input type="checkbox"/> ENVIRONMENT <input type="checkbox"/> QUALITY ASSURANCE <input type="checkbox"/> SAFETY	
<input checked="" type="checkbox"/> SUBMITTED FOR CENELEC PARALLEL VOTING	<input type="checkbox"/> NOT SUBMITTED FOR CENELEC PARALLEL VOTING
<p>Attention IEC-CENELEC parallel voting https://standards.iteh.ai/catalog/standards/sist/339c25ae-303c-4540-846f-100000000000/iec-63206-2021</p> <p>The attention of IEC National Committees, members of CENELEC, is drawn to the fact that this Committee Draft for Vote (CDV) is submitted for parallel voting.</p> <p>The CENELEC members are invited to vote through the CENELEC online voting system.</p>	

This document is still under study and subject to change. It should not be used for reference purposes.

Recipients of this document are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

TITLE:

INDUSTRIAL-PROCESS CONTROL SYSTEMS – RECORDERS

PROPOSED STABILITY DATE: 2026

NOTE FROM TC/SC OFFICERS:

Copyright © 2021 International Electrotechnical Commission, IEC. All rights reserved. It is permitted to download this electronic file, to make a copy and to print out the content for the sole purpose of preparing National Committee positions. You may not copy or "mirror" the file or printed version of the document, or any part of it, for any other purpose without permission in writing from IEC.

CONTENTS

1	CONTENTS	2
2	FOREWORD	4
3	INTRODUCTION	6
4	1 Scope	7
5	2 Normative references	7
6	3 Terms and definitions	7
7	4 Classification	10
8	1.6 General	10
9	1.7 Pneumatic recorders	10
10	1.8 Electrical recorders	10
11	1.9 Paper medium recorders	11
12	1.10 Digital medium recorders	12
13	2 Performance requirements and test methods	12
14	2.1 General	12
15	2.1.1 Overview	12
16	2.1.2 General requirements	15
17	2.1.3 General testing procedures	15
18	2.1.4 Conditions during tests	17
19	4.2 Tests under reference conditions	18
20	4.2.1 Test preparation (paper medium recorders)	18
21	4.2.2 Accuracy-related factors	18
22	4.2.3 Step response	22
23	4.2.4 Input lead resistance	22
24	4.2.5 Insulation resistance	23
25	4.2.6 Electric strength	24
26	4.2.7 Electrical power consumption	24
27	4.2.8 Pneumatic power consumption	24
28	4.2.9 Start-up drift	24
29	4.2.10 Long-term drift	24
30	4.2.11 Switch output	25
31	4.2.12 Mutual interference between input channels	25
32	2.1.5 Channel synchronization and time resolution	25
33	4.2.13 Scanning rate	28
34	4.2.14 Alarm device	28
35	4.3 Effect of influence quantities	29
36	4.3.1 General	29
37	4.3.2 Ambient temperature	29
38	4.3.3 Ambient relative Humidity	29
39	4.3.4 Vibration	29
40	4.3.5 Shock, drop and topple	29
41	4.3.6 Mounting position	29
42	4.3.7 Over-range	30
43	4.3.8 Supply voltage and frequency variations	30
44	4.3.9 Reverse supply voltage protection (d.c. devices)	30

45	4.3.10	Supply pressure variations (pneumatic recorders)	30
46	4.3.11	Earthing.....	30
47	4.3.12	EMC test	30
48	4.3.13	Purge gas flow.....	31
49	2.1.6	Accelerated operational life test (paper medium recorders).....	31
50	4.3.14	Effect of open-circuited and short-circuited input	31
51	4.3.15	Recording medium storage conditions	31
52	4.4	Quality of recording (paper medium recorders)	32
53	4.4.1	General	32
54	4.4.2	Long-term test	32
55	4.4.3	Marking velocity.....	32
56	4.4.4	Smear test.....	32
57	4.4.5	Chart speed.....	32
58	4.4.6	Parallax	33
59	4.4.7	Time per point (multi-channel recorder)	33
60	2.2	Function assessment	33
61	2.2.1	General assessment	33
62	2.2.2	Interface	34
63	2.2.3	Storage device	Error! Bookmark not defined.
64	5	Test report.....	35
65	Bibliography.....	iTeh STANDARD PREVIEW (standards.iteh.ai)	37
66	Figure 1	– Example of an electrical recorder hardware model	11
67	Figure 2	– Example of error curve .. oSIST prEN IEC 63206:2021	20
68	Figure 3	– Test set-up for input resistance .. https://standards.iteh.ai/catalog/standards/sist/339c25ae-303c-4540-846f-1dd527e93f4/osist-pr-en-iec-63206-2021	23
69	Figure 4	– Example of channel synchronization test.....	26
70	Figure 5	– Example of time resolution test	27
71	Figure 6	– Example of sequence of event test.....	28
72			
73	Table 1	– Performance requirements Part 1	13
74	Table 1	– Performance requirements Part 2	14
75	Table 2	– Settings of span and lower range value adjustments	16
76	Table 3	– Example of error tabulation	19
77	Table 4	– Checklist for mapping general function assessment	33
78	Table 5	– Checklist for mapping interface	35
79	Table 6	– Checklist for mapping storage device	35
80	Table 7	– Example of function assessment report	36

INTERNATIONAL ELECTROTECHNICAL COMMISSION

**INDUSTRIAL-PROCESS CONTROL SYSTEMS – RECORDERS – TESTING
AND PERFORMANCE EVALUATION**

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 63206 has been prepared by subcommittee SC65B: Measurement and control devices, of IEC technical committee TC65: Industrial-process measurement, control and automation.

The IEC 63206 cancels and replaces the IEC 60873-1 and IEC 60873-2, of which it proposes revisions and updates.

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

FDIS	Report on voting
XX/XX/FDIS	XX/XX/RVD

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 web site 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.

The National Committees are requested to note that for this publication the stability date is **20XX**.

THIS TEXT IS INCLUDED FOR THE INFORMATION OF THE NATIONAL COMMITTEES AND WILL BE DELETED AT THE PUBLICATION STAGE.

iTeh STANDARD PREVIEW (standards.iteh.ai)

[oSIST prEN IEC 63206:2021](#)

<https://standards.iteh.ai/catalog/standards/sist/339c25ae-303c-4540-846f-1dd527e93f4/osist-pren-iec-63206-2021>

81

INTRODUCTION

82 IEC 63206 is intended for use by manufacturers to determine the performance of their products
83 and by users or independent testing bodies to verify manufacturers' performance specifications.

84 IEC 63206 has fully covered IEC 60873-1 *Electrical and pneumatic analogue chart recorders*
85 *for use in industrial-process systems –Part 1: Methods for performance evaluation* and IEC
86 *60873-2 Electrical and pneumatic analogue chart recorders for use in industrial-process*
87 *systems –Part 2: Guidance for inspection and routine testing*, they are withdrawn.

iTeh STANDARD PREVIEW (standards.iteh.ai)

[oSIST prEN IEC 63206:2021](https://standards.iteh.ai/catalog/standards/sist/339c25ae-303c-4540-846f-1dd527e93f4/osist-pren-iec-63206-2021)

<https://standards.iteh.ai/catalog/standards/sist/339c25ae-303c-4540-846f-1dd527e93f4/osist-pren-iec-63206-2021>

INDUSTRIAL-PROCESS CONTROL SYSTEMS – RECORDERS – TESTING AND PERFORMANCE EVALUATION

1 Scope

This International Standard IEC 63206 specifies the classification (e.g.: analogue chart recorder, digital recorder, X-Y recorder, paperless recorder, event recorder, data logger, and data acquisition device, etc.) and performance evaluation methods of recorders. It covers type tests as well as routine tests.

This International Standard is applicable to recorder devices and recorder modules for control systems.

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 60050-313, *International Electrotechnical Vocabulary – Electrical and electronic measurements and measuring instruments – Part 313: Types of electrical measuring instruments* (available at <<http://www.electropedia.org>>)

IEC 60050-351, *International Electrotechnical Vocabulary – Part 351: Control technology* (available at <<http://www.electropedia.org>>)

IEC 61003-1:2016, *Industrial-process control systems – Instruments with analogue inputs and two- or multi-position outputs – Part 1: Methods for evaluating performance*

IEC 61326-1:2020, *Electrical equipment for measurement, control and laboratory use – EMC requirements – Part 1: General requirements*

IEC 61010-1:2017, *Safety requirements for electrical equipment for measurement, control, and laboratory use - Part 1 General requirements*

IEC 62828-1:2017, *Reference conditions and procedures for testing industrial and process measurement transmitters – Part 1: General procedures for all types of transmitters*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 60050-313, IEC 60050-351, IEC 62828-1 and the following apply.

3.1

data acquisition device, DAQ
device for entering or collecting data.

Note 1 to entry: Multifunction DAQ devices rely on an industrial computer (commercial PC, Industrial PC, Compact PCI, notebook etc.) for control. These devices are designed to meet the needs of a general-purpose measurement system. They are not designed for a specific type of measurement. DAQ devices generally provide multiple

127 measurement modes such as analogue input, analogue output, digital input, digital output, and counter-timer
128 functionality.

129 [SOURCE: IEC 62008: 2005^[1], 3.1.4]

130 3.2

131 data logger

132 system to measure a number of variables and make written tabulations and/or records in a form
133 suitable for computer input.

134 [SOURCE: IEC 61968-2: 2011^[2], 2.63]

135 3.3

136 digital medium recorder

137 recorder whose recording medium is electronic media, e.g. magnetic disk, optical disk or solid
138 state disk.

139 3.4

140 error in timekeeping

141 the value obtained by subtracting the true value of elapsed time from the recorded value of
142 time.

143 [SOURCE: IEC 61143-1:1998^[1] 3.7.5]

iTeh STANDARD PREVIEW

144 3.5

145 friction effect

146 in the case of continuous line recorders, effect that friction of the marking device produces on
147 the recording chart.

[oSIST prEN IEC 63206:2021](https://standards.iteh.ai/catalog/standards/sist/339c25ae-303c-4540-846f-1dd527e93f4/osist-pr-en-iec-63206-2021)

<https://standards.iteh.ai/catalog/standards/sist/339c25ae-303c-4540-846f-1dd527e93f4/osist-pr-en-iec-63206-2021>

148 3.6

149 measuring range

150 region between the limits within which a quantity is measured, or received, expressed by stating
151 the lower and upper range values (for example, 0 mA, 100 mA). The zero value greater than
152 the lowest range value, is called "elevated"; and less than the lowest range value is called
153 "suppressed".

154 Note 1 to entry: Instruments may be supplied with manual or automatic means of adjusting the range. As used in
155 this standard, the term "range" and the definitions below apply to the characteristics of the instruments for a specified
156 setting of the adjustment means.

157 3.7

158 Output

159 a) position of the marking device of a recorder (for paper medium recorder)

160 If an indicator is directly connected to the marking device, the indicated value is tested as a
161 second output

162 b) stored data in recording medium (for digital medium recorder)

163 3.8

164 paperless recorder

165 recording instrument in which the chart is displayed on an electronic screen.

166 Note 1 to entry: in industry it not uncommon to refer these kinds of recorders as "chartless"

167 3.9

168 paper recorder

169 whose recording medium is a type of paper.

170 Note 1 to entry: examples are dotted line recorder, strip chart recorder, stylus recorder, (ink) jet recorder, printing
171 recorder, spot recorder, thermal recorder.

172 Note 2 to entry: examples are paper: regular paper, light-sensitive medium, heat-sensitive paper, dielectric-coated
173 paper or other papers.

174 **3.10**

175 **record**

176 trace or event marked on the instrument chart, text or stored electromagnetic information in
177 response to a signal.

178 **3.11**

179 **recorder**

180 measuring instrument which records on a recording medium information corresponding to the
181 values of the measurand

182 Note 1 to entry: Some recording instruments can incorporate an indicating device.

183 Note 2 to entry: Some recording instruments can record information corresponding to more than one measurand.

184 [SOURCE: IEC 60050 312-02-11]

185 **3.12**

186 **multiple-channel recorder**

187 recorder for more than one signal to the recorder.

188 **3.13**

189 **multiple-pen recorder**

190 recorder for more than one signal providing an individual pen or other marking device for each
191 signal.

iTeh STANDARD PREVIEW
(standards.iteh.ai)
oSIST prEN IEC 63206:2021
<https://standards.iteh.ai/catalog/standards/sist/339c25ae-303c-4540-846f-1dd527ef93f4/osist-pren-iec-63206-2021>

192 **3.14**

193 **time per point**

194 time interval between two immediately successive readings of the same or different signals.

195 Note to entry: sample time, time interval, sample hold time, are different ways to express the definition.

196 **3.15**

197 **time resolution**

198 the minimum time by which two events are separated in order that the corresponding time tags
199 be different.

200 Note 1 to entry: The time resolution cannot be shorter than the separating capability.

201 [SOURCE: IEC 60050 371-05-03]

202 **3.16**

203 **zero adjustment**

204 means provided in an instrument to cause a parallel shift in the input-output relation.

205 [SOURCE: IEC 61987-1, 3.56]

206 4 Classification

207 4.1 General

208 Recorders can be classified by the way they are powered (e.g.: pneumatic recorder and
209 electrical recorder), by recording medium (e.g.: paper medium recorder and digital medium
210 recorder) or by function (e.g.: continuous signal recorder and event recorder).

211 4.2 Pneumatic recorders

212 Pneumatic recorders mainly record pneumatic standard signals of 20 kPa to 100 kPa, and use
213 paper as recording medium; their marking device and the recording medium are driven by
214 compressed air or electrical motor.

215 4.3 Electrical recorders

216 Electrical recorders record electric signals and are electrically powered. Electrical recorders
217 can be classified:

- 218 – by mechanical structure as: desktop type, rail mounted type, panel mounted type, portable
219 or board card type;
- 220 – by function as: chart recorder, X-t recorder (or trend recorder), X-Y recorder, paperless
221 recorder, event recorder, data logger and data acquisition device.

222 In case of control systems, the recorder function could also be done by a software with no
223 hardware dedicated elements.

224 The hardware model for an electrical recorder is as shown in Figure 1. The electrically power
225 supply unit, the input channel unit and the data processing unit are basic modules of a recorder
226 (for example: a data logger). Besides, there should be at least one module of paper medium
227 recording unit, digital medium recording unit (magnetic or CD-RW disk and solid state medium)
228 or communication unit. Display unit, alarm unit and switch output unit are optional.

229 These units' functions are:

- 230 – Electrical power supply unit, to provide the recorder with the energy from a power regulator
231 unit that is supplied by AC or DC power supply or a set of rechargeable batteries.
- 232 – Input channel unit, to receive the signals from process field, it is the interface between the
233 recorder and the external world.
- 234 – Data processing unit, it is the most important part of an electrical recorder. Its main function
235 is to provide and process the measured signals, make written tabulations and records in a
236 form suitable for digital medium recording units, communication unit or paper medium
237 recording unit. Besides the main measurement function, it may be equipped with a number
238 of additional functions: configuration, adjustment, self-testing, diagnostics, condition
239 monitoring, external process control function, internal data storage, etc.

240 An event recorder, besides above functions, also contains a clock with sufficient time resolution
241 to associate to all input events a time stamp to distinguish their precedence relationship.

242

243

244

245