
**Information technology — Biometric
data interchange formats —**

**Part 2:
Finger minutiae data**

**AMENDMENT 2: XML encoding and
clarification of defects**

iTeh STANDARD PREVIEW
(standards.iteh.ai)

*Technologies de l'information — Formats d'échange de données
biométriques —*

ISO/IEC 19794-2:2011/Amd 2:2015

Partie 2: Données du point caractéristique du doigt

[https://standards.iteh.ai/catalog/standards/sist/b2b99246-8d5a-430a-8ae1-](https://standards.iteh.ai/catalog/standards/sist/b2b99246-8d5a-430a-8ae1-c614e18d5a18/iso-iec-19794-2-2011-amd-2-2015)

[c614e18d5a18/iso-iec-19794-2-2011-amd-2-2015](https://standards.iteh.ai/catalog/standards/sist/b2b99246-8d5a-430a-8ae1-c614e18d5a18/iso-iec-19794-2-2011-amd-2-2015)
AMENDEMENT 2: Codage XML et précisions concernant les défauts

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[ISO/IEC 19794-2:2011/Amd 2:2015](https://standards.iteh.ai/catalog/standards/sist/b2b99246-8d5a-430a-8ae1-c614e18d67e2/iso-iec-19794-2-2011-amd-2-2015)

<https://standards.iteh.ai/catalog/standards/sist/b2b99246-8d5a-430a-8ae1-c614e18d67e2/iso-iec-19794-2-2011-amd-2-2015>



COPYRIGHT PROTECTED DOCUMENT

© ISO/IEC 2015, Published in Switzerland

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
Ch. de Blandonnet 8 • CP 401
CH-1214 Vernier, Geneva, Switzerland
Tel. +41 22 749 01 11
Fax +41 22 749 09 47
copyright@iso.org
www.iso.org

Foreword

ISO (the International Organization for Standardization) and IEC (the International Electrotechnical Commission) form the specialized system for worldwide standardization. National bodies that are members of ISO or IEC participate in the development of International Standards through technical committees established by the respective organization to deal with particular fields of technical activity. ISO and IEC technical committees collaborate in fields of mutual interest. Other international organizations, governmental and non-governmental, in liaison with ISO and IEC, also take part in the work. In the field of information technology, ISO and IEC have established a joint technical committee, ISO/IEC JTC 1.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of document should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO and IEC shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: Foreword - Supplementary information

Amendment 2 to ISO/IEC 19794-2:2011 was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 37, *Biometrics*.

iTeh STANDARD PREVIEW
(standards.iteh.ai)

ISO/IEC 19794-2:2011/Amd 2:2015

<https://standards.iteh.ai/catalog/standards/sist/b2b99246-8d5a-430a-8ae1-c614e18d67e2/iso-iec-19794-2-2011-amd-2-2015>

Information technology — Biometric data interchange formats — Part 2: Finger minutia data

Amendment 2: XML encoding and clarification of defects

1. Append the following paragraph into introduction

Additionally, this part of the ISO/IEC standard supports both binary and XML encoding, to support a spectrum of user requirement. With XML, this part will meet the requirements modern IT architectures. With binary encoding this part will also be able to be used in bandwidth or storage constrained environments. Annex G specifies the schema that XML encoded finger minutia records must conform to, and Annex H provides an example of a valid XML encoded finger minutia record.

2. Replace the existing text in clause “2– Conformance” with the following

A binary data record conforms to the finger minutiae record format of this part of ISO/IEC 19794 if it satisfies all the format requirements with respect to its structure, data values, relationships among its fields, and with respect to relations between its fields and the underlying input that are specified throughout clause 8 of this part of ISO/IEC 19794.

A binary data record conforms to the finger minutiae on-card comparison record format of this part of ISO/IEC 19794 if it satisfies all the format requirements with respect to its structure, data values, relationships among its fields, and with respect to relations between its fields and the underlying input that are specified throughout clause 9 of this part of ISO/IEC 19794.

An XML document conforms to this part of ISO/IEC 19794 if it satisfies the format requirements with respect to its structure, with respect to relations among its fields, and with respect to relations between its fields and the underlying input that are specified within Annex G of this part of ISO/IEC 19794.

A system that produces biometric data records is conformant to this part of ISO/IEC 19794 if all biometric data records that it outputs conform to this part of ISO/IEC 19794 (as defined above) as claimed in the Implementation Conformance Statement associated with that system. A system does not need to be capable of producing biometric data records that cover all possible aspects of this part of ISO/IEC 19794, but only those that are claimed to be supported by the system in the Implementation Conformance Statement (ICS).

A system that uses biometric data records is conformant to this part of ISO/IEC 19794 if it can read, and use for the purpose intended by that system, all biometric data records that conform to this part of ISO/IEC 19794 (as defined above) as claimed in the Implementation Conformance Statement associated with that system. A system does not need to be capable of using biometric data records that cover all possible aspects of this part of ISO/IEC 19794, but

only those that are claimed to be supported by the system in an Implementation Conformance Statement (ICS).

Biometric data interchange format conformance tests conform to this part of ISO/IEC 19794 if they satisfy all of the normative requirements set forth in Annex A. Specifically, all Level-1, Level-2 and Level-3 tests shall use the assertions defined in Table A.2 and Table A.3 of clause A.3 in conformity with the concept and rules set in ISO/IEC 19794-1:2011 AMD 1.

Implementations of this part of ISO/IEC 19794 tested according to the specified methodology shall be able to claim conformance only to those biometric data record (BDB) requirements specified in this part of ISO/IEC 19794 that are tested by the test methods established by this methodology.

Implementations of this part of ISO/IEC 19794 do not necessarily need to conform to all possible aspects of this part of ISO/IEC 19794, but only to those requirements that are claimed to be supported by the implementation in an implementation conformance statement (ICS), filled out in accordance with Annex A of ISO/IEC 19794-1:2011 AMD 1 and Table A.1 of clause A.2 of this part of ISO/IEC 19794.

3. Insert the following text in the appropriate alphabetical order of Clause 3, Normative references:

— <http://www.w3.org/XML/Schema>

ITeH STANDARD PREVIEW
(standards.iteh.ai)

4. Replace in clause 9.5.1 [ISO/IEC 19794-2:2011/Amd 2:2015](https://standards.iteh.ai/catalog/standards/sist/b2b99246-8d5a-430a-8ae1-c614e18d67e2/iso-iec-19794-2-2011-amd-2-2015)

<https://standards.iteh.ai/catalog/standards/sist/b2b99246-8d5a-430a-8ae1-c614e18d67e2/iso-iec-19794-2-2011-amd-2-2015>

Table 19 shows the biometric data template with its embedded data objects.

With

Table 19 shows the biometric data template with its embedded data objects. All coordinate fields in extended data that express spatial resolution shall have units of 10^{-1} mm. If present, angle information for cores shall be expressed in the units of clause 8.5.3.2.4. If present, angle information for deltas shall be expressed in the units of clause 8.5.3.3.4.

5. Replace Clause A.2 with the following text

A.2 Table of requirements

The normative requirements specified in this Part of ISO/IEC 19794 are listed in Table A.1, which extends over multiple pages. The supplier of the IUT should explain which optional components of the standard are supported and the testing laboratory shall note the results of the test.

35 (0023 _{Hex})	XML-finger-image	{iso(1) registration-authority(1) cbeff(19785) biometric-organization(0) jtc1-sc37(257) bdb(0) XML-finger-image(35)}
---------------------------	------------------	--

Table A.1 – Table of requirements

Requirement ID	Reference in main body	Requirement summary	Level	Status	Applicable to format type			IUT support	Supported range	Test result
					Record	On-card	XML			
R-1	8.3.1	The format identifier shall be recorded in four bytes. The format identifier shall consist of three characters "FMR" followed by a zero byte as a NULL string terminator.	1	M	Y	N	N			
R-2	8.3.2	The number for the version of this part of ISO/IEC 19794 used for constructing the BDIR shall be placed in four bytes. This version number shall consist of three ASCII numerals followed by a zero byte as a NULL string terminator. The first and second character will represent the major version number and the third character will represent the minor revision number.	1	M	Y	N	N			
R-3	8.3.3	The length (in bytes) of the entire BDIR shall be recorded in four bytes. This count shall be the total length of the BDIR including the general record header and one or more finger representation records.	2	M	Y	N	N			
R-4	8.3.4	The total number of finger representation records contained in the BDIR shall be recorded in two bytes. A minimum of one finger representation is required.	2	M	Y	N	N			
R-5	8.3.5	The one-byte certification flag shall indicate whether each Representation Header includes a certification record. A value of 00 _{Hex} shall indicate that no finger representation contains a certification record. A value of 01 _{Hex} shall indicate that all finger representations contain a certification record.	2	M	Y	N	N			
R-6	8.4.1	A Representation Header shall precede each representation of finger data providing information for that finger representation. There shall be one finger header for each finger representation contained in the finger minutiae record.	1	M	Y	N	N			
R-7	8.4.2	The total number of bytes in the entire finger representation, including the representation header, shall be recorded in four bytes.	2	M	Y	N	N			
R-8	8.4.3	The Gregorian calendar year of the capture date and time field shall be encoded in the form given in ISO/IEC 19794-1.	1	M	Y	N	N			
R-9	8.4.3	The month of the capture date and time field shall be encoded in the form given in ISO/IEC 19794-1.	1	M	Y	N	N			
R-10	8.4.3	The day of the capture date and time field shall be encoded in the form given in ISO/IEC 19794-1.	1	M	Y	N	N			
R-11	8.4.3	The hour of the capture date and time field shall be encoded in the form given in ISO/IEC 19794-1.	1	M	Y	N	N			

Requirement ID	Reference in main body	Requirement summary	Level	Status	Applicable to format type			IUT support	Supported range	Test result
					Record	On-card	XML			
R-12	8.4.3	The minute of the capture date and time field shall be encoded in the form given in ISO/IEC 19794-1.	1	M	Y	N	N			
R-13	8.4.3	The second of the capture date and time field shall be encoded in the form given in ISO/IEC 19794-1.	1	M	Y	N	N			
R-14	8.4.3	The millisecond of the capture date and time field shall be encoded in the form given in ISO/IEC 19794-1.	1	M	Y	N	N			
R-15	8.4.3	The capture date and time field shall indicate when the capture of this finger representation started in Coordinated Universal Time (UTC).	3C	O-1	Y	N	Y			N/A
R-16	8.4.4	The capture device technology ID shall be encoded in one byte. This field shall indicate the class of capture device technology used to acquire the captured biometric sample. A value of 00 _{Hex} indicates unknown or unspecified technology. See Table 5 for the list of possible values.	1	M	Y	N	N			
R-17	8.4.4	The capture device technology ID shall indicate the class of capture device technology used to acquire the captured biometric sample.	3C	O-1	Y	N	Y			N/A
R-18	8.4.5	The capture device vendor identifier shall be encoded in two bytes. A value of all zeros shall indicate that the capture device vendor is unreported.	1	M	Y	N	N			
R-19	8.4.5	The capture device vendor identifier shall be registered by IBIA or other approved registration authority.	3C	O-1	Y	N	Y			N/A
R-20	8.4.6	The capture device type identifier shall be encoded in two bytes. A value of all zeros shall indicate that the capture device type is unreported.	1	M	Y	N	N			
R-21	8.4.6	The capture device type identifier shall be assigned by the registered product owner or other approved registration authority.	3C	O-1	Y	N	Y			N/A
R-22	8.4.7.2	A quality record shall begin with a length field. The length field shall consist of one byte. It shall represent the number of quality blocks as an unsigned integer.	2	M	Y	N	N			
R-23	8.4.7.3	A quality score shall be encoded in one byte as an unsigned integer. Allowed values are <ul style="list-style-type: none"> – 0 to 100 with higher values indicating better quality, – 255, i.e. ff_{Hex}, for indicating that an attempt to calculate a quality score failed. 	1	M	Y	N	N			

Requirement ID	Reference in main body	Requirement summary	Level	Status	Applicable to format type			IUT support	Supported range	Test result
					Record	On-card	XML			
R-24	8.4.7.4	The quality algorithm vendor identifier shall be encoded in two bytes. A value of all zeros shall indicate that the quality algorithm vendor is unreported.	1	M	Y	N	N			
R-25	8.4.7.4	The quality algorithm vendor identifier shall be registered by IBIA or other approved registration authority.	3C	O-1	Y	N	Y			N/A
R-26	8.4.7.5	The quality algorithm identifier shall be encoded in two bytes. A value of all zeros shall indicate that the quality algorithm is unreported.	1	M	Y	N	N			
R-27	8.4.7.5	The quality algorithm identifier shall be registered by IBIA or other approved registration authority.	3C	O-1	Y	N	Y			N/A
R-28	8.4.8.2	A certification record shall begin with a length field. The length field shall consist of one byte. It shall represent the number of certification blocks as an unsigned integer.	2	M	Y	N	N			
R-29	8.4.8.3	The certification authority identifier shall be encoded in two bytes. A value of all zeros shall indicate that the certification authority is unreported.	1	M	Y	N	N			
R-30	8.4.8.3	The certification authority identifier shall be registered by IBIA or other approved registration authority.	3C	O-1	Y	N	N			N/A
R-31	8.4.8.4	The certification scheme identifier shall be encoded in one byte. A list of current certification scheme identifiers is contained in Table 6.	1	M	Y	N	N			
R-32	8.4.9	The finger position shall be recorded in one byte.	1	M	Y	N	N			
R-33	8.4.10	The number associated with the specific representation shall be recorded in one byte.	1	M	Y	N	N			
R-34	8.4.10	If there is more than one finger representation from the same finger in a finger minutiae record, each finger representation shall have a unique representation number. The combination of finger location and representation number shall uniquely identify a particular finger representation within a minutiae record.	2	M	Y	N	N			
R-35	8.4.10	Multiple finger representations from the same finger shall be numbered with increasing representation numbers, beginning with 0. Where only one finger representation is taken from each finger, this field shall be set to 0.	2	M	Y	N	N			

Requirement ID	Reference in main body	Requirement summary	Level	Status	Applicable to format type			IUT support	Supported range	Test result
					Record	On-card	XML			
R-36	8.4.11	The horizontal spatial sampling rate of the minutiae coordinate system shall be recorded in two bytes having the units of pixels per centimeter. The value of the X spatial sampling rate shall not be less than 98.45 pixels per centimeter (250 pixels per inch).	1	M	Y	N	N			
R-37	8.4.12	The vertical spatial sampling rate of the minutiae coordinate system shall be recorded in two bytes having the units of pixels per centimeter. The value of the Y spatial sampling rate shall not be less than 98.45 pixels per centimeter (250 pixels per inch).	1	M	Y	N	N			
R-38	8.4.13	The impression type of the finger images from which the minutiae data was derived shall be recorded in this one-byte field.	1	M	Y	N	N			
R-39	8.4.14	The value for the size of the scanned image in x direction shall be written in a two-byte binary field. It shall be used to specify the number of pixels contained on a single horizontal line of the transmitted image. The range of allowed values is 0000 _{Hex} to 3FFF _{Hex} for compatibility with the Minutia, Core, and Delta Position fields.	1	M	Y	N	N			
R-40	8.4.15	The value for the size of the scanned image in y direction shall be written in a two-byte binary field. It shall be used to specify the number of horizontal lines contained in the transmitted image. The range of allowed values is 0000 _{Hex} to 3FFF _{Hex} for compatibility with the Minutia, Core, and Delta Position fields.	1	M	Y	N	N			
R-41	8.4.16	The number of bytes required to describe each minutia shall be recorded in the four high-order (most significant) bits of the byte. Allowed values are 5 (to indicate a 5-byte minutia format with no quality information, or 6 to indicate a 6-byte minutia format, including a 1-byte quality field.	1	M	Y	N	N			
R-42	8.4.17	The method used to determine the location of a ridge ending shall be recorded in the four low-order (least significant) bits of the byte.	1	M	Y	N	N			
R-43	8.4.18	The number of minutiae extracted and encoded for the finger shall be recorded in this one byte.	2	M	Y	N	Y			
R-44	8.4.19.1.2	The type of minutia shall be recorded in the upper two bits of the first byte of the minutia representation.	1	M	Y	N	N			
R-45	8.4.19.1.2, 9.2.4	'00' shall represent a minutia of "other" type.	3C	O-1	Y	Y	N			N/A
R-46	8.4.19.1.2, 9.2.4	'01' shall represent a ridge ending.	3C	O-1	Y	Y	N			N/A

ISO/IEC 19794-2:2011/Amd 2:2015(E)

Requirement ID	Reference in main body	Requirement summary	Level	Status	Applicable to format type			IUT support	Supported range	Test result
					Record	On-card	XML			
R-47	8.4.19.1.2, 9.2.4	'10' shall represent a ridge bifurcation.	3C	O-1	Y	Y	N			N/A
R-48	8.4.19.1.3	The X coordinate of the minutia shall be recorded in the lower fourteen bits of the first two bytes of the minutia representation.	1	M	Y	N	N			
R-49	8.4.19.1.3	The upper two bits of the next byte of the minutia representation shall be set to '00'.	1	M	Y	N	N			
R-50	8.4.19.1.3	The Y coordinate of the minutia shall be recorded in the lower fourteen bits of the third and fourth byte of the minutia representation.	1	M	Y	N	N			
R-51	8.4.19.1.4	The angle of the minutia shall be recorded in one byte.	1	M	Y	N	N			
R-52	8.4.19.1.4	The angle of the minutia shall be recorded in units of 1,40625 (360/256) degrees.	3C	O-1	Y	N	Y			N/A
R-53	8.4.19.1.5	The quality of the minutia shall be recorded in one byte. The quality value shall range from 100 as a maximum to 0 as a minimum. A value of 254 indicates the quality was not reported and a value of 255 indicates a failure to acquire a quality score.	1	M	Y	N	N			
R-54	6.3.2	A minutia point shall be encoded once. A minutia point is uniquely identified by the location and angle.	2	M	Y	Y	Y			
R-55	8.5.1.1	The extended data length field shall consist of two bytes.	1/2	M	Y	N	N			
R-56	8.5.1.2	The extended data area type code shall be recorded in two bytes. A value of zero in both bytes shall not be used.	1	O	Y	N	N			
R-57	8.5.1.3	The length of the extended data section shall be recorded in two bytes.	1/2	O	Y	N	N			
R-58	8.5.2.1	Each ridge count area shall begin with a single byte indicating the ridge count extraction method. Allowed values are 00 _{Hex} , 01 _{Hex} , and 02 _{Hex} .	1	O	Y	N	N			
R-59	8.5.2.1	Each ridge count area shall begin with a single byte indicating the ridge count extraction method. A value of 00 _{Hex} shall indicate no specific ridge count extraction method. A value of 01 _{Hex} shall indicate the four-neighbour ridge count extraction method. A value of 02 _{Hex} shall indicate the eight-neighbour ridge count extraction method.	3C	O-1	Y	N	N			N/A
R-60	8.5.2.2	The first and second bytes of a ridge count area are index numbers, indicating which minutiae in the corresponding minutiae area are considered.	3C	O-1	Y	N	N			N/A
R-61	8.5.3.2.1	The number of core points shall be recorded in the least significant four bits of the first byte of the core data. Allowed values are from 0 to 15.	1/2	O	Y	N	N			