INTERNATIONAL STANDARD

ISO/IEC 19794-7

Second edition
2014-02-01

AMENDMENT 1
2015-07-15

Corrected version
2015-12-01

Information technology — Biometric data interchange formats —

Part 7: Signature/sign time series data

AMENDMENT 1: XML encoding

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

Partie 7: Données de série chronologique de signature/signe

AMENDEMENT 1: Codage XML

Reference number
ISO/IEC 19794-7:2014/Amd.1:2015(E)

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Foreword

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Amendment 1 to ISO/IEC 19794-7:2014 was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 37, *Biometrics*.

The corrected version of ISO/IEC 19794-7:2014/Amd 1:2015 incorporates the following corrections.

"Table A.2.2" in AMD 1-8 has been corrected to read "Table A.3".

"Table A.2.3" in AMD 1-9 has been corrected to read "Table A.4".

The sentence in AMD1-9 has been replaced with: "Rename clause "A.2.3 Conformance test assertions for compression format (binary format)" and ”Table A.2.3 – Conformance test assertions for compression format (binary format)” in “Annex A”.

"Table A.2.4" in AMD 1-10 has been corrected to read "Table A.5".

Information technology — Biometric data interchange formats — Part 7: Signature/sign time series data

AMENDMENT 1: XML encoding

AMD1-1: Insert the following text as introduction to AMENDMENT 1: XML encoding

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 E specifies the schema that XML encoded signature/sign time series data record must conform to, and Annex F provides an example of a valid XML encoded signature/sign time series data record.

AMD1-2: Replace in clause "1 Scope" "three data formats" with "three binary data formats"

Replace in the first listing the second bullet point "three data formats" with "three binary data formats".

AMD1-3: Add in clause "1 Scope" in the first listing a fourth bullet point"

Add in clause "1 Scope" as fourth bullet point of the first listing following:

- *an XML schema definition*

AMD1-4: Insert the following text into clause "2 Conformance" as second paragraph

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

AMD1-5: Insert the following text in the appropriate alphabetical order of Clause , Normative reference:

- http://www.w3.org/XML/Schema

AMD1-6: Replace "Table A.1 – Table of requirements" in "Annex A"

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
					Full	Compact	Compression	XML			
R-1	6.1	The coordinate system used to express the pen position shall be a three-dimensional Cartesian coordinate system.	3B	M	Y	Y	Y	Y		N/A	
R-2	6.1	The x axis shall be the horizontal axis of the writing plane, with x coordinates increasing to the right.	3B	M	Y	Y	Y	Y		N/A	
R-3	6.1	The y axis shall be the vertical axis of the writing plane, with y coordinates increasing upwards.	3B	M	Y	Y	Y	Y		N/A	
R-4	8.2.2	The format ID shall be recorded in four bytes. The format ID shall consist of three characters "SDI" followed by Null (00_{Hex}) as a string terminator.	1	M	Y	N	N	N			
R-5	10.2	The format ID shall be recorded in four bytes. The format ID shall consist of three characters "SCD" followed by Null (00_{Hex}) as a string terminator.	1	M	N	N	Y	N			
R-6	8.2.3, 10.2	The number for the version of this part of ISO/IEC 19794 shall be placed in four bytes. The version number shall consist of the three characters "020" followed by Null as a string terminator ($3032\ 3000_{Hex}$).	1	M	Y	N	Y	N			
R-7	8.2.4, 10.2	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 representation records.	2	M	Y	N	Y	N			
R-8	8.2.5, 10.2	The total number of representation records contained in the BDIR shall be recorded in two bytes. A minimum of one representation is required.	2	M	Y	N	Y	N			
R-9	8.2.6, 10.2	The one-byte certification flag shall indicate whether each Representation Header includes a certification record. A value of 00_{Hex} shall indicate that no representation contains a certification record. A value of 01_{Hex} shall indicate that all representations contain a certification record.	2	M	Y	N	Y	N			
R-10	8.3.1, 10.3.1	A Representation Header shall precede each representation providing information for that representation. There shall be one header for each representation contained in the BDIR.	1	M	Y	N	Y	N			

Requirement ID	Reference in main body	Requirement summary	Level	Status	Applicable to format type				IUT support	Supported range	Test result
					Full	Compact	Compression	XML			
R-11	8.3.2.2, 10.3.2.1	The total number of bytes in the entire representation, including the Representation Header, shall be recorded in four bytes.	2	M	Y	N	Y	N			
R-12	8.3.2.3, 10.3.2.1	The Gregorian calendar year of the capture date and time field shall be encoded in the form given in ISO/IEC 19794-1:2011.	1	M	Y	N	Y	N			
R-13	8.3.2.3, 10.3.2.1	The month of the capture date and time field shall be encoded in the form given in ISO/IEC 19794-1:2011.	1	M	Y	N	Y	N			
R-14	8.3.2.3, 10.3.2.1	The day of the capture date and time field shall be encoded in the form given in ISO/IEC 19794-1:2011.	1	M	Y	N	Y	N			
R-15	8.3.2.3, 10.3.2.1	The hour of the capture date and time field shall be encoded in the form given in ISO/IEC 19794-1:2011.	1	M	Y	N	Y	N			
R-16	8.3.2.3, 10.3.2.1	The minute of the capture date and time field shall be encoded in the form given in ISO/IEC 19794-1:2011.	1	M	Y	N	Y	N			
R-17	8.3.2.3, 10.3.2.1	The second of the capture date and time field shall be encoded in the form given in ISO/IEC 19794-1:2011.	1	M	Y	N	Y	N			
R-18	8.3.2.3, 10.3.2.1	The millisecond of the capture date and time field shall be encoded in the form given in ISO/IEC 19794-1:2011.	1	M	Y	N	Y	N			
R-19	8.3.2.3, 10.3.2.1	The capture date and time field shall indicate when the capture of this representation started in Coordinated Universal Time (UTC).	3C	M	Y	N	Y	N			
R-20	8.3.2.4, 10.3.2.1	The capture device technology ID shall be encoded in one byte. A value of 00_{Hex} indicates unknown or unspecified technology. See Table 3 for the list of possible values.	1	M	Y	N	Y	N			
R-21	8.3.2.4, 10.3.2.1	The capture device technology ID shall indicate the class of capture device technology used to acquire the captured biometric sample.	3C	M	Y	N	Y	N			
R-22	8.3.2.5, 10.3.2.1	The capture device vendor ID shall be encoded in two bytes. A value of all zeros shall indicate that the capture device vendor is unreported.	1	M	Y	N	Y	N			

Requirement ID	Reference in main body	Requirement summary	Level	Status	Applicable to format type				IUT support	Supported range	Test result
					Full	Compact	Compression	XML			
R-23	8.3.2.5, 10.3.2.1	The capture device vendor ID shall be registered by IBIA or other approved registration authority.	3C	M	Y	N	Y	N			
R-24	8.3.2.6, 10.3.2.1	The capture device type ID shall be encoded in two bytes. A value of all zeros shall indicate that the capture device type is unreported.	1	M	Y	N	Y	N			
R-25	8.3.2.6, 10.3.2.1	The capture device type ID shall be assigned by the registered product owner or other approved registration authority.	3C	M	Y	N	Y	N			
R-26	8.3.2.7, 10.3.2.1	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	Y	N			
R-27	8.3.2.7, 10.3.2.1	A quality score shall be encoded in one byte as an unsigned integer. Allowed values are – 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	Y	N			
R-28	8.3.2.7, 10.3.2.1	The quality algorithm vendor ID shall be encoded in two bytes. A value of all zeros shall indicate that the quality algorithm vendor is unreported.	1	M	Y	N	Y	N			
R-29	8.3.2.7, 10.3.2.1	The quality algorithm vendor ID shall be registered by IBIA or other approved registration authority.	3C	M	Y	N	Y	N			
R-30	8.3.2.7, 10.3.2.1	The quality algorithm ID shall be encoded in two bytes. A value of all zeros shall indicate that the quality algorithm is unreported.	1	M	Y	N	Y	N			
R-31	8.3.2.7, 10.3.2.1	The quality algorithm ID shall be registered by IBIA or other approved registration authority.	3C	M	Y	N	Y	N			
R-32	8.3.2.8.1, 10.3.2.1	The channel inclusion field shall consist of two bytes.	1	M	Y	N	Y	N			

Requirement ID	Reference in main body	Requirement summary	Level	Status	Applicable to format type				IUT support	Supported range	Test result
					Full	Compact	Compression	XML			
R-33	8.3.2.8.1, 10.3.2.1	A bit value of 1 in the channel inclusion field shall encode the presence of the corresponding channel; a bit value of 0 shall encode the absence of the corresponding channel. The channel inclusion field shall be followed by a sequence of channel descriptions for the channels indicated as present in the channel inclusion field. The order of the channel descriptions is determined by the order of indicated inclusion within the channel inclusion field starting with the X channel. The channel descriptions are mandatory for all channels present in the signature/sign time series data record.	2	M	Y	N	Y	N			
R-34	8.3.2.8.1, 10.3.2.1	Each bit of the channel inclusion field shall correspond to a channel as shown in Table 4.	3A	M	Y	N	Y	N			
R-35	8.3.2.8.2, 10.3.2.1	Each channel description shall begin with a preamble. Each channel description preamble shall consist of one byte. The unused trailing bit of the preamble shall have value 0 and is reserved by ISO/IEC JTC 1/SC 37 for future use.	1	M	Y	N	Y	N			
R-36	8.3.2.8.2, 10.3.2.1	Each of the bits 4 through 8 of a channel description preamble shall correspond to a channel attribute as shown in Table 5. A bit value of 1 shall encode the presence of the corresponding channel attribute; a bit value of 0 shall encode the absence of the corresponding channel attribute. If any of the bits 4 through 8 of a channel description preamble are set to 1, the preamble shall be followed by a sequence of channel attributes in the same order as indicated in the preamble starting with the scaling value.	2	M	Y	N	Y	N			
R-37	8.3.2.8.2, 10.3.2.1	A value of 1 for bit 3 of a channel description preamble shall indicate that the value of this channel is constant. If bit 3 of a channel description preamble is set to 1, then this channel shall be absent in the representation body even though the representation header indicates the presence of the channel.	2	M	Y	N	Y	N			
R-38	8.3.2.8.2, 10.3.2.1	If the channel description of a channel whose value is constant contains a scaling value, then the constant value of this channel shall be 1 divided by the scaling value.	3A	M	Y	N	Y	N			
R-39	8.3.2.8.2, 10.3.2.1	A value of 1 for bit 2 of a channel description preamble shall indicate that the linear component of the regression line for this channel has been removed from this channel.	2	M	Y	N	Y	N			

Requirement ID	Reference in main body	Requirement summary	Level	Status	Applicable to format type				IUT support	Supported range	Test result
					Full	Compact	Compression	XML			
R-40	8.3.2.8.3, 10.3.2.1	If present, scaling values shall consist of two bytes. The five most significant bits of the first byte shall constitute the exponent field *E*, and the remaining 11 bits shall constitute the fraction field *F*. The scaling value *s* is calculated by $s = \left(1 + \frac{F}{2^{11}}\right) \cdot 2^{E-16}$.	1	O	Y	N	Y	N			
R-41	8.3.2.8.4, 10.3.2.1	If present, the minimum and maximum possible channel values shall be encoded in two bytes.	1	O	Y	N	Y	N			
R-42	8.3.2.8.4, 10.3.2.1	If present, the minimum and maximum possible channel values shall indicate the scaled range of values that the deployed capture device may deliver for the corresponding channel. For the minimum and maximum possible channel values of the Z, T, DT, F, A, E, and R channels, integer values in the range from 0 to 65 535 are allowed. These values shall be encoded in two bytes as unsigned integers. For the minimum and maximum possible channel values of the X, Y, VX, VY, AX, AY, TX, and TY channels, integer values in the range from –32 768 to 32 767 are allowed. These values shall be encoded in two bytes as unsigned integers after adding 32 768 to each value. Hence, for non-negative numbers, bit 8 of the most significant byte has the value 1; for negative numbers, bit 8 of the most significant byte has the value 0. For decoding these values, 32 768 is to be subtracted from each recorded value.	3A	O	Y	N	Y	N			
R-43	8.3.2.8.3, 10.3.2.1	If a scaling value is present, the minimum and maximum possible channel values are to be divided by the corresponding scaling value to obtain their actual values.	3A	O	Y	N	Y	N			

Requirement ID	Reference in main body	Requirement summary	Level	Status	Applicable to format type				IUT support	Supported range	Test result
					Full	Compact	Compression	XML			
R-44	8.3.2.8.5, 10.3.2.1	If present, the average of the channel values shall be the arithmetic mean $\bar{c}$, rounded to the nearest integer, of all values c_i ($1 \le i \le N$ where N is the number of sample points) for the corresponding channel within a signature/sign time series data record: $\bar{c} = \frac{1}{N}\sum_{i=1}^{N} c_i$. For the averages of the Z, T, DT, F, A, E, and R channels, integer values in the range from 0 to 65 535 are allowed. These values shall be encoded in two bytes as unsigned integers. For the averages of the X, Y, VX, VY, AX, AY, TX, and TY channels, integer values in the range from -32 768 to 32 767 are allowed. These values shall be encoded in two bytes as unsigned integers after adding 32 768 to each value. Hence, for non-negative numbers, bit 8 of the most significant byte has the value 1; for negative numbers, bit 8 of the most significant byte has the value 0. For decoding these values, 32 768 is to be subtracted from each recorded value.	2	O	Y	N	Y	N			
R-45	8.3.2.8.3, 10.3.2.1	If a scaling value is present, the average channel values are to be divided by the corresponding scaling value to obtain their actual values.	3A	O	Y	N	Y	N			
R-46	8.3.2.8.5, 10.3.2.1	If present, the standard deviation of the channel values shall be the empirical standard deviation σ_c, rounded to the nearest integer, of all values c_i ($1 \le i \le N$) for the corresponding channel within a signature/sign time series data record: $\sigma_c = \sqrt{\frac{1}{N}\sum_{i=1}^{N}(c_i - \bar{c})^2}$. For the standard deviations of all channels, integer values in the range from 0 to 65 535 are allowed. These values shall be encoded in two bytes as unsigned integers.	2	O	Y	N	Y	N			
R-47	8.3.2.8.3, 10.3.2.1	If a scaling value is present, the standard deviation values are to be divided by the corresponding scaling value to obtain their actual values.	3A	O	Y	N	Y	N			
R-48	8.3.2.9, 10.3.2.1	The length field shall consist of three bytes.	1	M	Y	N	Y	N			