



CHARACTER SET GUIDE V.1

CHARACTER HANDLING WITH iQ



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The ASCII (American Standard Code for Information Interchange) and Latin-1 (West European) character sets are widely supported and usually require no special considerations before an installation. However, the support of other character sets is more challenging and involves proper planning to ensure a smooth installation and uninterrupted workflow.

We recommend that you verify whether different character sets may be necessary before any installation. Usually, this involves researching other connecting systems, such as modalities and workstations. This interaction makes it extremely important to plan and test the configuration in advance, since changing character sets at a later stage may require a lot of additional time, troubleshooting, and costs.

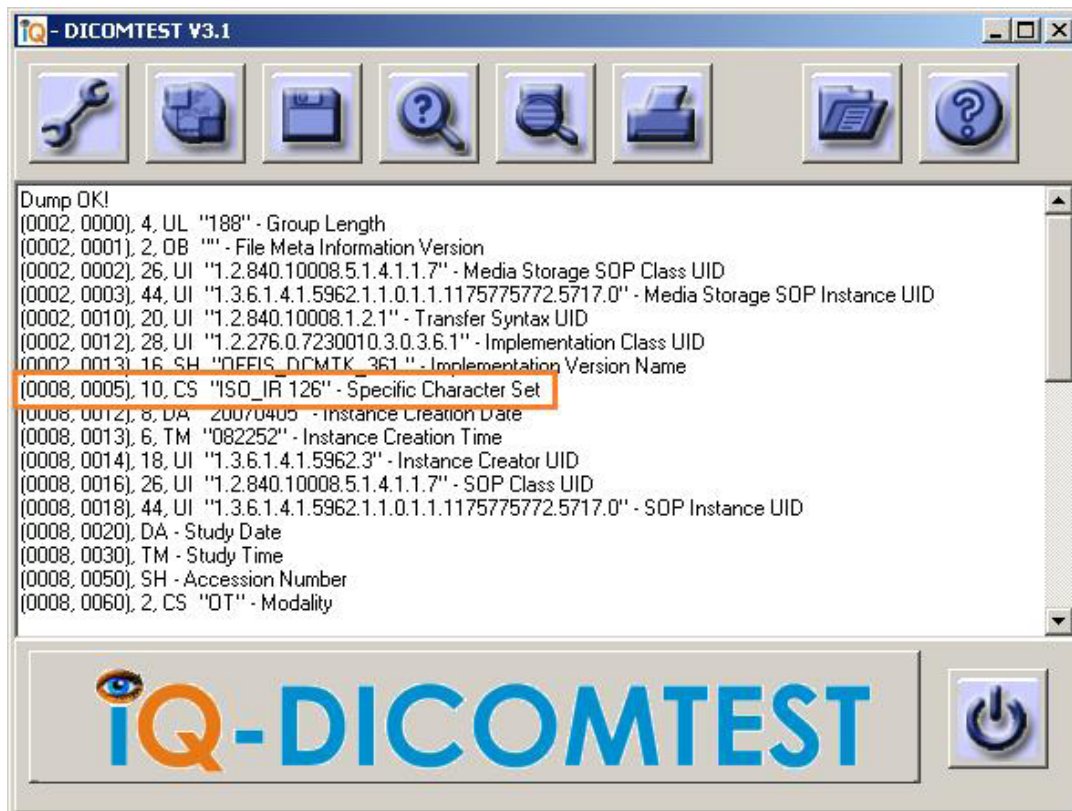
General recommendations:

NOTICE

- Always use only **one character set** per PACS. The set to use should be planned and determined before configuring the system since a change later may require a lot of effort and down time!

If multiple character sets are used, you may receive non-verifiable data sets.

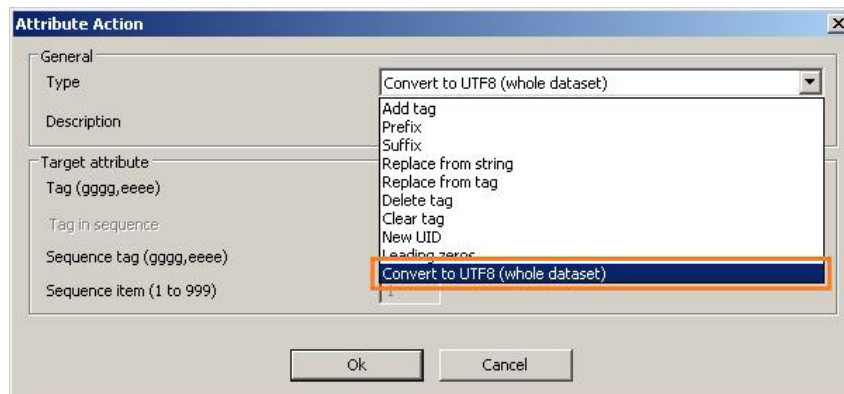
- Check the current patient names in your system to determine if they contain different character sets.
- Analyze a few sample images from all available modalities and look for the DICOM tag "0008,0005." This tag, if it exists, can be viewed using iQ-DICOMTEST to see if it contains one of the defined character set values (see Appendix "Defined DICOM Character Sets").



- Review the DICOM Conformance Statements of the connected devices to determine which character sets are supported.

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- If you find that more than one character set is in use (for example, a mix of studies with Latin patient names and others with Russian patient names, e.g. Berger^Andreas and Бергер^Андрей), convert the datasets to Unicode.
- By using iQ-ROUTER, you can set up rules to automatically convert datasets into DICOM Unicode before they are stored in the PACS. Please make sure that all applications are able to work with Unicode datasets.



- Since iQ-WEBX doesn't process or send character set information, the display of query results may not be correct when searching by name. Therefore, it is recommended that Patient IDs or Accession Numbers that contain only numbers and ASCII or Latin-1 characters be used for queries.
- Keep in mind that images will continue to contain the correct information and will be displayed appropriately once the images are loaded – if the client application supports the respective character set.

NOTICE

- Never mix various character sets with code extensions in a single field, e.g. Russian and Korean characters (Николай^шлем, 안드레아스 버거)
 - The display of such studies may work in iQ-VIEW, but these datasets may cause issues in other applications where the software cannot interpret them properly. This may cause patient data to become unreadable.
- Convert all non-proper encodings to DICOM compliant characters (e.g. non-Latin characters coded as Latin-1, missing character set tag)
 - Correct the images as early as possible, preferably at the place where the images are created - for example, at the modality itself.
 - In cases where only the character set tag in the DICOM dataset is either missing or incorrect, iQ-ROUTER and/or DICOMReader may be able to correct the DICOM tag and allow the patient data to be displayed correctly.

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Simplified overview of supported character sets per product:

PRODUCT \ CHARACTER SET	English (ASCII)	West European (Latin 1) (Afrikaans, Albanian, Basque, Breton, Catalan, Corsican, Danish, English, Faroese, Galician, German, Icelandic, Indonesian, Irish, Italian, Luxembourgish, Malay, Norwegian, Portuguese, Spanish, Swedish)	Central European (Latin 2) (Albanian, Bosnian, Croatian, Czech, Hungarian, Polish, Romanian, Serbian (Latin), Slovak, Slovene, Sorbian), South European (Latin 3) (Turkish, Maltese, Esperanto), North European (Latin 4) (Estonian, Latvian, Lithuanian, Greenlandic, Sami)	Cyrillic (Bulgarian, Belarusian, Russian, Serbian, Macedonian, Ukrainian (incomplete)) Arabic, Greek, Hebrew, Turkish (Latin 5), Japanese, Thai, Korean, Chinese	UNICODE
iQ-VIEW 3.0.0	✓	✓	✓	✓	✓
iQ-3D 3.2.0	✓	✓	✓	✓	✓
iQ-4D 1.19.1	✓	✓	✓	✓	✗
iQ-MAMMO 1.3.0	✓	✓	✓	✓	✓
DICOMReader 5.0.0 ¹	✓	✓	✓	✓	✓
iQ-WEB 6.4.5 ^{2 3}	✓	✓	✗	✗	✗
iQ-X 2.2.0	✓	✓	✗	✗	✗
iQ-4VIEW 2.0	✓	✓	✓	✓	✓
iQ-WEB2GO 1.1.0 ⁴	✓	✓	✓	✓	✓
WADO HL7 1.2.0 ⁵	✗	✗	✗	✗	✗
REPORT EDITOR 2.2.0	✓	✓	✓	✓	✓
REPORT CONVERTER 1.2.0 ⁶	✗	✗	✗	✗	✗
iQ-MIGRATION 1.0.0	✓	✓	✓	✓	✓

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PRODUCT	CHARACTER SET				
	English (ASCII)	West European (Latin 1) (Afrikaans, Albanian, Basque, Breton, Catalan, Corsican, Danish, English, Faroese, Galician, German, Icelandic, Indonesian, Irish, Italian, Luxembourgish, Malay, Norwegian, Portuguese, Spanish, Swedish)	Central European (Latin 2) (Albanian, Bosnian, Croatian, Czech, Hungarian, Polish, Romanian, Serbian (Latin), Slovak, Slovene, Sorbian), South European (Latin 3) (Turkish, Maltese, Esperanto), North European (Latin 4) (Estonian, Latvian, Lithuanian, Greenlandic, Sami)	Cyrillic (Bulgarian, Belarusian, Russian, Serbian, Macedonian, Ukrainian (incomplete)) Arabic, Greek, Hebrew, Turkish (Latin 5), Japanese, Thai, Korean, Chinese	UNICODE
iQ-PRINT 2.5.0 ⁷	✓	✓			
iQ-RIS 3.3.0 ^{8 9}	✓	✓	✗	✗	✗
iQ-ROBOT 3.0.0	✓	✓	✓	✓	✓
iQ-ROUTER 2.1.0 ¹⁰	✓	✓	✓	✓	✓
iQ-WORKLIST 2.0.0 ¹¹	✓	✓	✓	✓	✓

✓ Supported

✗ Limited support – see note

✗ Not supported

1 DICOMReader cannot read files in paths with Unicode characters, e.g. Japanese characters.

2 Different DICOM character sets are not supported within one server, but the data sets are stored as they are received. Requests in a specific character set will be ignored.

3 For proper display on the web interface, the encoding of the browser can be changed to the appropriate character set encoding.

4 Support depends on the encoding settings of the browser used.

5 Character set support can be added, but is then limited to a single fixed value and has to be supported by the sending and receiving HL7 applications.

6 Character set support can be added, but is then limited to a single fixed value and has to be supported by the sending and receiving HL7 applications.

7 Character set support for annotations – has not been tested yet!

8 Latin-X characters are supported if the operating system is Windows 7 Professional or higher and the Windows support for these characters is enabled.

9 Structured Reports are always created in Latin-1 (ISO_IR 100).

10 Attribute comparison and modification work only if the character sets match. Otherwise, the dataset will be converted into Unicode (ISO_IR 192).

11 One character set can be specified per AE title in the iQ-WORKLIST configuration.

Appendix

Defined DICOM Character Sets ¹³

Single Byte Character Sets without code extension:

CHARACTER SET DESCRIPTION	DEFINED TERM	CHARACTER SET
Default repertoire	None	ISO 646
Latin alphabet No. 1	ISO_IR 100	Supplementary set of ISO 8859
Latin alphabet No. 2	ISO_IR 101	Supplementary set of ISO 8859
Latin alphabet No. 3	ISO_IR 109	Supplementary set of ISO 8859
Latin alphabet No. 4	ISO_IR 110	Supplementary set of ISO 8859
Cyrillic	ISO_IR 144	Supplementary set of ISO 8859
Arabic	ISO_IR 127	Supplementary set of ISO 8859
Greek	ISO_IR 126	Supplementary set of ISO 8859
Hebrew	ISO_IR 138	Supplementary set of ISO 8859
Latin alphabet No. 5	ISO_IR 148	Supplementary set of ISO 8859
Japanese	ISO_IR 13	JIS X 0201(Katakana, Romaji)
Thai	ISO_IR 166	TIS 620-2533 (1990)

Multi-byte Character Sets without code extension:

CHARACTER SET DESCRIPTION	DEFINED TERM	CHARACTER SET
Unicode in UTF-8	ISO_IR 192	UTF-8 Unicode
GB18030	GB18030	Chinese

¹³ Based on the DICOM Standard 2011 (PS 3.3-2011 – C.12.1.1.2)

Appendix

Single Byte Character Sets with code extension:

CHARACTER SET DESCRIPTION	DEFINED TERM	CHARACTER SET
Default repertoire	None	ISO 646
Latin alphabet No. 1	ISO 2022 IR 100	Supplementary set of ISO 8859
Latin alphabet No. 2	ISO 2022 IR 101	Supplementary set of ISO 8859
Latin alphabet No. 3	ISO 2022 IR 109	Supplementary set of ISO 8859
Latin alphabet No. 4	ISO 2022 IR 110	Supplementary set of ISO 8859
Cyrillic	ISO 2022 IR 144	Supplementary set of ISO 8859
Arabic	ISO 2022 IR 127	Supplementary set of ISO 8859
Greek	ISO 2022 IR 126	Supplementary set of ISO 8859
Hebrew	ISO 2022 IR 138	Supplementary set of ISO 8859
Latin alphabet No. 5	ISO 2022 IR 148	Supplementary set of ISO 8859
Japanese	ISO 2022 IR 13	JIS X 0201(Katakana, Romaji)
Thai	ISO 2022 IR 166	TIS 620-2533 (1990)

Multi-byte Character Sets with code extension:

CHARACTER SET DESCRIPTION	DEFINED TERM	CHARACTER SET
Japanese	ISO 2022 IR 87	JIS X 0208 (Kanji)
Japanese	ISO 2022 IR 159	JIS X 0212 (Supplementary Kanji set)
Korean	ISO 2022 IR 149	KS X 1001 (Hangul and Hanja)

Recommended configuration

