



<AutomationML/>

**The Glue for Seamless
Automation Engineering**

**Best Practice Recommendations:
Naming of related Documents and
their Versions**

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Preface

AutomationML provides the basis for an efficient data exchange within the engineering process of production systems. The AutomationML standard series IEC 62714 "Engineering data exchange format for use in industrial automation systems engineering" already contains many use cases and guidelines of how system engineering information is modelled.

In order to specify these definitions with examples, to apply them to specific use cases, and to facilitate the first steps with AutomationML, specific issues for the modelling of data in AutomationML are illustrated in Best Practise Recommendations (BPR).

In addition, the BPR shall provide a consistent realisation for specific use cases and shall thus, complement the AutomationML standard documents.

1 Motivation for naming the related documents and their versions

Until now different documents like best practice and application recommendations, whitepapers etc. have been developed or will be developed in the future. Until now, there is no recommendation about how to enable the tool manufacturers to distinguish the different documents and versions which are used within an AutomationML file. Since in practice there is a need to define a referencing mechanism. This best practice recommendation describes how to name the recommendations and additional documentation and their versions within AutomationML so that all involved tools interpret the data in the same way.

2 Modelling of reference to the related documents

In AutomationML there are already defined mechanisms regarding the versioning of the AutomationML-Version, the CAEX-Schema and a Writer Header for information concerning the writing tool. All these information is provided as “AdditionalInformation” in the file property section of an AutomationML file. Figure 1 shows this “AdditionalInformation” block.

```
<AdditionalInformation>
  <WriterHeader>
    <WriterName>AutomationML Editor</WriterName>
    <WriterID>916578CA-FE0D-474E-A4FC-9E1719892369</WriterID>
    <WriterVendor>AutomationML e.V.</WriterVendor>
    <WriterVendorURL>www.AutomationML.org</WriterVendorURL>
    <WriterVersion>4.1.6</WriterVersion>
    <WriterRelease>4.1.6.0</WriterRelease>
    <LastWritingDateTime>2016-08-26T10:32:49.0121265+02:00</LastWritingDateTime>
    <WriterProjectTitle>Sample</WriterProjectTitle>
    <WriterProjectID>unspecified</WriterProjectID>
  </WriterHeader>
</AdditionalInformation>
<AdditionalInformation AutomationMLVersion="2.0" />
```

Figure 1 – Additional information in AutomationML

To add information regarding further documents which define the content delivered with an AutomationML document like best practice recommendations, application recommendations or whitepapers the “AdditionalInformation” block shall be extended using entries describing the name and the version of each referenced document via a document identifier. Therefore, an additional information block tag with the attribute “DocumentVersions=“Recommendations”” shall be added. So other document types can be added in the same way. For each related document a “Document” tag shall be added. Each document shall have an attribute “DocumentIdentifier” containing the identifier of the referenced document and an attribute “Version” containing the version of the referenced document. The name and version shall be defined in the referenced document. Therefore a DocumentIdentifier shall be added in the title of the referenced document. Once the name of the document is defined it should not be changed afterwards. Figure 2 shows this for the example “DocumentIdentifier = AR APC” with “Version = 1.0.0” in the related document.

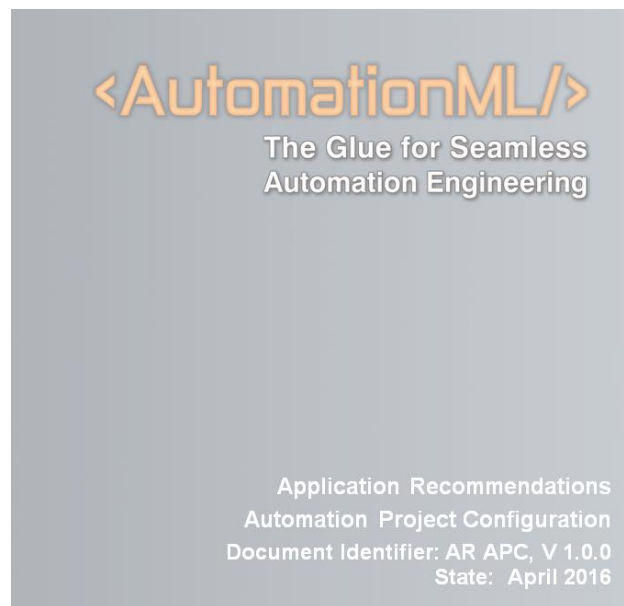


Figure 2 – Document identifier in AutomationML

Figure 3 shows this for the example “Name= AR APC“ Version = “1.0.0” in an AutomationML-file.

```

<AdditionalInformation>
  <WriterHeader>
    <WriterName>AutomationML Editor</WriterName>
    <WriterID>916578CA-FE0D-474E-A4FC-9E1719892369</WriterID>
    <WriterVendor>AutomationML e.V.</WriterVendor>
    <WriterVendorURL>www.AutomationML.org</WriterVendorURL>
    <WriterVersion>4.1.6</WriterVersion>
    <WriterRelease>4.1.6.0</WriterRelease>
    <LastWritingDateTime>2016-08-26T11:48:12.3883359+02:00</LastWritingDateTime>
    <WriterProjectTitle>Sample</WriterProjectTitle>
    <WriterProjectID>unspecified</WriterProjectID>
  </WriterHeader>
</AdditionalInformation>
<AdditionalInformation AutomationMLVersion="2.0" />
<AdditionalInformation DocumentVersions="Recommendations">
  <Document DocumentIdentifier="AR APC" Version="1.0.0" />
</AdditionalInformation>

```

Figure 3 – Additional DocumentIdentifier in AutomationML

In case of the need of a transfer of user defined data from a source tool to a target tool based on additional documents like best practice recommendations, application recommendations, or whitepapers, it is necessary to store information about these documents directly into the AML document. Hence, the following provisions apply:

- Each AML document shall provide information about the additional documents and versions which are used in the AML document.
- If an AML document consists of several files, then each of the files must reference to the same version of the referenced documents.
- This information shall be stored as a part of the AutomationML element AdditionalInformation of the root object of the AutomationML document.
- The element "AdditionalInformation" shall have an attribute "DocumentVersions".
- The value of this attribute “DocumentVersions” shall be “Recommendations”.
- The meta information shall provide information about:
 - Document Identifier of the referenced document,
 - Version of the referenced document.
- The content of the meta information shall be of type xs:string.
- The required information shall be stored by means of the attributes shown in *Table 1*

Table 1 – Meta information about the tag “Document”

XML attribute name	Type	Level	Example
DocumentIdentifier	xs:string	Mandatory	“AR APC”
Version	xs:string	Mandatory	“1.0.0”

For the XML representation of the meta information, the following provisions apply:

- The document attribute “DocumentIdentifier” shall define the name of the referenced document. The identifier and version shall be defined in the referenced document.
- The document attribute “Version” shall define the version range of the referenced document. The version shall be defined in the referenced document. The version number shall have three numbers separated by “.”.
- The three numbers define “main version”, “minor version” and “revision”.
- A change of the main version sets the minor version to “0”.
- A change of the minor version sets the revision to “0”.
- A number needs not to be a single number (e.g. 1.10.0 is also possible).
- The “DocumentIdentifier” of the document should not be changed.

3 Example

As an example for the modelling of document names and versions a model based on the Application Recommendation Automation Project Configuration (AR APC) is used. One element within this model is the reference to the AR APC version 1.0.0. The following figures represent the modelling of DocumentIdentifier and version for the AR APC V1.0.0 in the AutomationML file:

```
<AdditionalInformation DocumentVersions="Recommendations">  
  <Document DocumentIdentifier="AR APC" Version="1.0.0" />  
</AdditionalInformation>
```

Figure 4 – AMLDocumentVersions example as XML representation

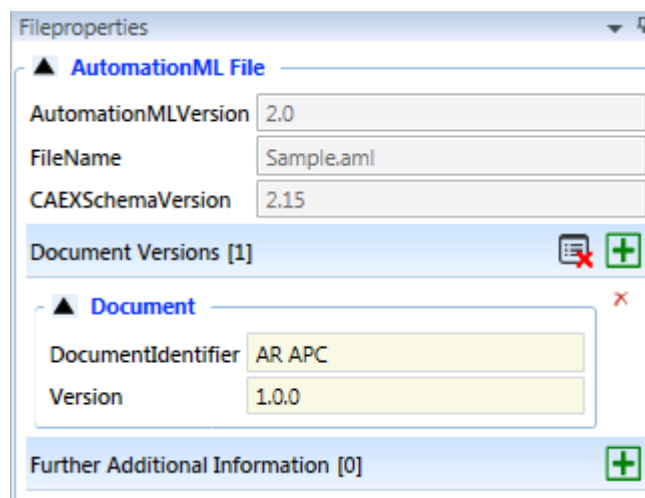


Figure 5 – Example for additional information as AutomationML Editor Fileproperties

4 References

The following documents are referenced in this document and are indispensable for its application. For dated references, only the edition cited applies.

Extensible Markup Language (XML) 1.0:2004, W3C Recommendation (available at <<http://www.w3.org/TR/2004/REC-xml-20040204/>>)

Whitepaper AutomationML Part 1 – AutomationML Architecture, May 2012

Whitepaper AutomationML Part 2 –AutomationML Role Libraries, May 2012

Whitepaper AutomationML Part 3 – AutomationML Geometry and Kinematics, May 2012

Whitepaper AutomationML Part 4 – AutomationML Logic Description, May 2012

Whitepaper AutomationML Communication, September 2014

Whitepaper AutomationML AutomationML and eCI@ss Integration, November 2015

Application Recommendation Automation Project Configuration, April 2016