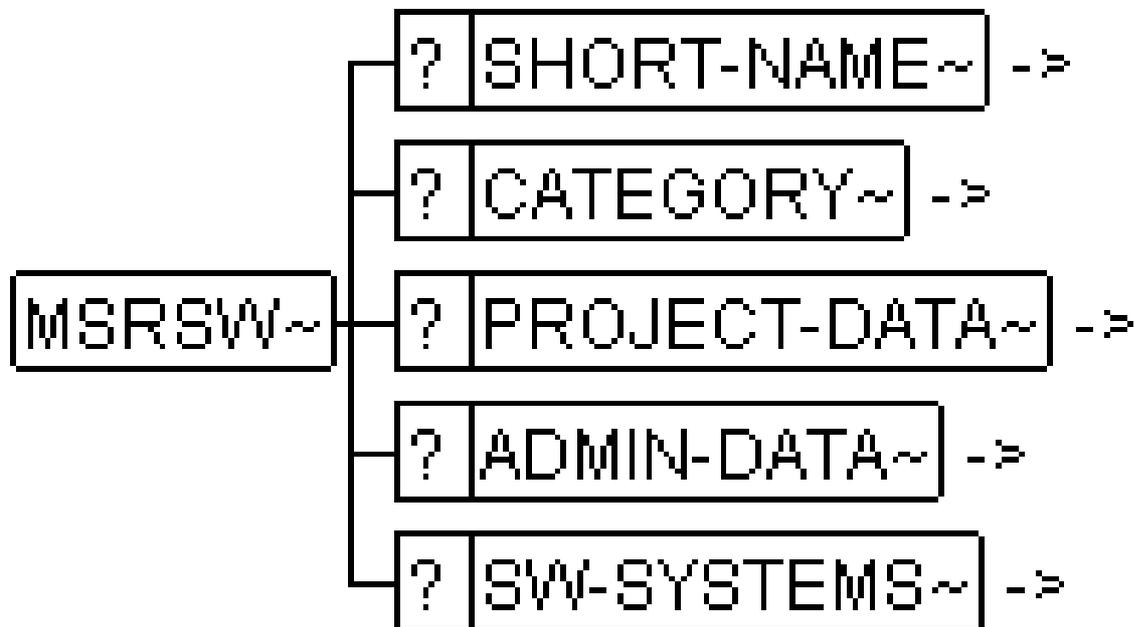**MSR**

ASAM-MCD-2MC

Implement PaCo V2.1 based on ASAM-MCD-2MC 2.2

Robert Bosch GmbH, Markus Müller, Robert Bosch GmbH, GS/EMW3

Abstract

This document describes, the implementation of *PaCo* V2.0 based on *ASAM-MCD-2MC 2.0*(M-SRSW V2.2.2) . The document refers to and . The document comprises of two parts:

- Description structured according to the specification

- Element an Attribute description of an appropriate subset of *MSRSW.DTD 2.2.2* with is the result of the common ASAM/MSR workgorup.

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a   Scope

The scope of the *PaCo* File Format specification (*PaCo*) is to identify a common ASAM standard file format that can be used to interchange applicationdata and application history between vendor-independant calibration, simulation, documentation, spreadsheet and data acquisition tools. A secondary function is to allow calibration engineers to read the file into a text or *XML editor* and easily change values.

a.1   Identification

This document describes how these requirements can be satisfied by applying *ASAM-MCD-2MC 2.0* as a particular subset. The document is the result of the task defined by Bernhard Weichel on November 2001.

a.2   General approach

In order to illustrate the desired mapping, a subset of *MSRSW.DTD* was created:

- deleting all elements not required by the *PaCo* use case
- Attributes were not removed

b How to read this document

This document is divided in two parts:

b.1 Terminology

b.2 Additional Documentation

For further information refer to additional documentation available:

- An introduction to the *ASAM-MCD-2MC.DTD/MSRSW.DTD* in particular dedicated to an ASAP based audience ( ). One should probably start reading this.

- The documentation to *MSRDCI* as finished so far. . This may help to obtain an initial understanding of the MSRDCI approach.

- The design rules for MSR DTDs, given in

- The elements and attributes are described in

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c   The following conventions apply

This document is written using *MSRREP.DTD*. The following conventions apply to this document:

<msrsw>   SGML elements are noted as technical term **[type]**=*SGMLTAG*.

[type]   SGML attributes are noted as technical term **[type]**=*SGML-attribute*.

sgml-attribute   Values of SGML attributes or discrete values for elements are noted as technical term **[type]**=*code*

ASAM-MCD-2MC 2.0   The considered languages resp. DTDs are marked as technical term **[type]**=*product*.

ASAM   The committees are noted as **[type]**=*organization*

CDF   Keywords from *CDF* are marked as technical term **[type]**=*code*.

ECU   Objects in general are marked as technical terms **[type]**=*other*. This might be automotive equipments general objects such as variables etc.

Note that an index of the technical terms is given at the end of the document.

c.1   Graphical conventions used in DTD diagrams

Since a *DTD* represents a grammar, it can be visualized graphically as a tree. The visualization in this document uses the notation given in .

Figure 1: Graphical notation of DTDs

The meaning of the symbols is:

PCDATA   The element content is **Processable Character Data (PCDATA)**. This is data that consists of zero or more characters of both text and markup. PCDATA is used to indicate that all markup delimiters defined in the SGML declaration will be recognized by the parser as markup in the given element rather than data characters.

RCDATA   The element content is **Replaceable Character Data (RCDATA)** . this is data that consists of zero or more characters, in which references to substitutions

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are not recognized (i.e. RCDATA may contain text and entity references (starting with "&"), but no sub-elements)[1].

CDATA	**Character Data (CDATA)** consists of zero or more text characters, where no markup of any kind is recognized.
ANY	a terminal type indicating that the object may contain text or any element defined in the model[2].
EMPTY	a terminal type keyword used to indicate that there is no data (i.e. no content, sub-elements or end-tags) for the object allowed in the document instance. This keyword is often used to describe elements that are placeholders or are pointers to external or system-generated data.
One	indicates that the element or the model group occurs exactly once.
ZERO-OR-ONE	indicates that the element or the model group is optional.
ONE-OR-MORE	indicates that the element or the model group occurs multiple times but at least once.
ZERO-OR-MORE	indicates that the element or the model group occurs multiple times but also can be missed (optional).
ORDERED	a connector used to specify that the sibling objects must appear in the document in the order shown in the model.
UNORDERED	a connector used to specify that the sibling objects can appear in any order in the document[3].
SELECTION	a connector used to specify that only one of the sibling objects can appear in the document.
ELEMENT	indicates a single SGML structure element.
COLLAPSED	indicates, that the content of the element is not displayed here.

Hint:

With respect to XML compliance, the following features are not used:

RCDATA, CDATA, ANY, EMPTY, UNORDERED connection,

---

[1] RCDATA is not used in the DTDs described here.

[2] ANY is not used in the DTDs described here.

[3] UNODERED is not used in the DTDs described here, since it is not conforming with XML.

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1 Mapping PaCo to ASAM-MCD-2MC

1.1 File format

MSRSW.DTD can be used as SGML as well as XML. The difference is mainly in the tools which are used. The instances are are compatible between XML and SGML.

1.1.1 Character Set Definition

When used in XML style, the *PaCo* file may be encoded in any of the character sets permitted for XML. In western countries usage of ISO-8859-1 is a good choice. XML recommendation specifies UTF-8 as default, but this prevents non unicode edtitors from safely handling the files.

1.1.2 General

If no information is available, then the field shall be left out. For this reason, every element is kept optional. The omission of an element is much easier to detect than the fact that an element is empty (e.g. because of insignificant whit space).

The general structure of the file is given in the following illustration:
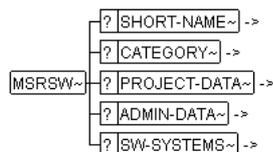
Figure 2: General structure

<MSRSW> is the root element of the file. Mainly it consists of the following sections:

<SHORT-NAME> A short designator of the file. Usually this is something like filename body a project identifier.

<CATEGORY> This is denotes the category of the file.

<ADMIN-DATA> This denotes all administrative data related to the current file.

<PROJECT-DATA> This denotes all project data related to the current file.

<SW-SYSTEMS> This section receives the intended content of the *PaCo* file.

1.1.3 Filename Definition

The file shall be saved according to committed conventions.

it is recommended to kee the extension as XML because most XML tools refer to this extension. The file could be marked as *PaCo* file by adding .paco before the extension:

Example: mycalibrations.paco.xml

1.2 XML Schemas and Namespaces

The DTD and schemas of released file formats shall be stored on the ASAM web server. Each file instance is required to supply a reference to the governig schema or DTD by an appropriate DOCTYPE declaration. By this, *PaCo* instances are required to be valid XML documents.

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XML schema as well as DTD is not strong enough to specifiy all details. Therefore it is recommended also to use Document Content Information.

Hint:

There are not many XML tools around which really support namespaces. It is therefore recommended not to request a namespace-attribute. In conjunction with a general ASAM-XML strategy, this item should be worked out.

---

2 PaCo relevant Elements in ASAM-MCD-2MC 2.0/MSRSW.DTD 2.2.2

This chapter describes all proposed elements in alphabetical order.

2.1 ADDRESS

Description **<ADDRESS>** can be used to describe the street of the company of a team-member.

Example For an example, see .

Properties Used in:

Content: Text

ADDRESS~—#PCDATA

Attribute	Type	Legal Values	Remarks
[VIEW] (implied)	cdata		Any term used for a realization of a view-concept. With it tex-telements could be included or excluded in view of an editor or a processing engine.
[S] (implied)	cdata		Signatur. Used to store the calculated signature aof an element (e.g. CRC)
[T] (implied)	cdata	dd-mm-yyyyThh:mm:ss dd/mm/yyyyThh:mm:ss dd mm yyyyThh:mm:ss	Timestamp

2.2 ADMIN-DATA

Description **<ADMIN-DATA>** can be used to capture all information regarding document management such as used language and versioning.

Example
```
<ADMIN-DATA>
  <LANGUAGE>en</LANGUAGE>

<COMPANY-DOC-INFOS>
      <COMPANY-DOC-INFO>
       <COMPANY-REF>RB</COMPANY-REF>
        <PRIVATE-CODES>
     <PRIVATE-CODE>Version 12.3</PRIVATE-CODE>
        </PRIVATE-CODES>
      </COMPANY-DOC-INFO>
   </COMPANY-DOC-INFOS>

<DOC-REVISIONS>
  <DOC-REVISION>
   <REVISION-LABEL>2</REVISION-LABEL>
   <STATE>review-candiate</STATE>
   <TEAM-MEMBER-REF ID-REF="wl">Wl</TEAM-MEMBER-REF>
   <DATE>2001.08.15</DATE>
   <MODIFICATIONS>
     <MODIFICATION>
```

```
        <CHANGE>fixed typos</CHANGE>
        <REASON>typos were found in the  internal review</REASON>
      </MODIFICATION>
    </MODIFICATIONS>
  </DOC-REVISION>

  <DOC-REVISION>
    <REVISION-LABEL>1</REVISION-LABEL>
    <STATE>initial draft</STATE>
    <TEAM-MEMBER-REF ID-REF="wl">Wl</TEAM-MEMBER-REF>
    <DATE>2001.08.12</DATE>
    <MODIFICATIONS>
      <MODIFICATION>
        <CHANGE>Created the document</CHANGE>
        <REASON>According to video-conference held at Jul 2001</REASON>
      </MODIFICATION>
    </MODIFICATIONS>
  </DOC-REVISION>
 </DOC-REVISIONS>
</ADMIN-DATA>
```
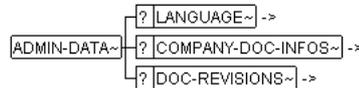
Properties

Used in: MSRSW p. 33,   SW-FEATURE p. 59

Content: LANGUAGE p. 30,   COMPANY-DOC-INFOS p. 19,   DOC-REVISIONS p. 26

Attributes

Attribute	Type	Legal Values	Remarks
[VIEW] (implied)	cdata		Any term used for a realization of a view-concept. With it tex-telements could be included or excluded in view of an editor or a processing engine.
[S] (implied)	cdata		Signatur. Used to store the calculated signature of an element (e.g. CRC)
[T] (implied)	cdata	dd-mm-yyyyThh:mm:ss dd/mm/yyyyThh:mm:ss dd mm yyyyThh:mm:ss	Timestamp

2.3   CATEGORY

Description   **<CATEGORY>** allows to denote specific, mainly process dependant modes of its parent element. This can be used by generic checkers (e.g. a *DCI checker*) to perform a more detailed evaluation of the substructure.The possible values are also described at the parent elements.

<CATEGORY> in **<MSRSW>** shall reflect the nature of the File according to asam 1.4 with extensions. It should be *PaCo*.

<CATEGORY> in **<SW-INSTANCE>** shall reflect the nature of the instance according to asam 1.4 with extensions. It could be such as map, curve, ... but also variable-map if more advanced application.

<CATEGORY> in **<SW-INSTANCE-TREE>** may reflect the nature of the intance tree such as test-data, adress-info, ...

Example The following example woud mark an MSRSR-File as an *PaCo* file.

```
<MSRSW>
  <CATEGORY>PACO</CATEGORY>
  ...
<MSRSW>
```

Properties Used in MSRSW p. 33, SW-INSTANCE p. 62, SW-INSTANCE-TREE p. 71

Content: Text

Attribute	Type	Legal Values	Remarks
[VIEW] (implied)	cdata		Any term used for a realization of a view-concept. With it tex-telements could be included or excluded in view of an editor or a processing engine.
[S] (implied)	cdata		Signatur. Used to store the calculated signature of an element (e.g. CRC)
[T] (implied)	cdata	dd-mm-yyyyThh:mm:ss dd/mm/yyyyThh:mm:ss dd mm yyyyThh:mm:ss	Timestamp

2.4 CHANGE

Description **<CHANGE>** can be used to describe the change performed in one particular modification.
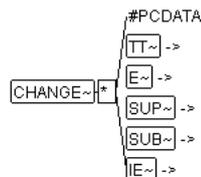
Example For an example, see Chapter 2.2 ADMIN-DATA p. 12.

Properties Used in: MODIFICATION p. 32

Content: Text, TT p. 92, E p. 26, SUP p. 45, SUB p. 45, IE p. 29

26/07/2006 16:57:05 msrsw-tr-paco.xml

Attribute	Type	Legal Values	Remarks
[VIEW] (implied)	cdata		Any term used for a realization of a view-concept. With it tex-telements could be included or excluded in view of an editor or a processing engine.
[S] (implied)	cdata		Signatur. Used to store the calculated signature of an element (e.g. CRC)
[T] (implied)	cdata	dd-mm-yyyyThh:mm:ss dd/mm/yyyyThh:mm:ss dd mm yyyyThh:mm:ss	Timestamp

2.5 CITY

Description   **<City>** can be used to describe the city of the company of a team-member.

Example   For an example, see Chapter 2.33 PROJECT-DATA p. 38.

Properties   Used in: TEAM-MEMBER p. 87

         Content: Text

CITY~ —#PCDATA

Attribute	Type	Legal Values	Remarks
[VIEW] (implied)	cdata		Any term used for a realization of a view-concept. With it tex-telements could be included or excluded in view of an editor or a processing engine.
[S] (implied)	cdata		Signatur. Used to store the calculated signature of an element (e.g. CRC)
[T] (implied)	cdata	dd-mm-yyyyThh:mm:ss dd/mm/yyyyThh:mm:ss dd mm yyyyThh:mm:ss	Timestamp

2.6 COMPANIES

Description   **<COMPANIES>** can be used to describe the companies being involved in the project. This is used mainly to specify copyright information and the involved persons. Usually there is more than one company involved in the project. The company which generated the file is determined by following

<TEAM-MEMBER-REF> within **<ADMIN-DATA>**. In simple cases there is only one company, so this lookup is not really necessary.

Example   For an example, see Chapter 2.33 PROJECT-DATA p. 38.

Properties   Used in: PROJECT p. 37

Content: COMPANY p. 16

COMPANIES~ —+— COMPANY~ ->

Attribute	Type	Legal Values	Remarks
[VIEW] (implied)	cdata		Any term used for a realization of a view-concept. With it tex-telements could be included or excluded in view of an editor or a processing engine.
[S] (implied)	cdata		Signatur. Used to store the calculated signature of an element (e.g. CRC)
[T] (implied)	cdata	dd-mm-yyyyThh:mm:ss dd/mm/yyyyThh:mm:ss dd mm yyyyThh:mm:ss	Timestamp

2.7   COMPANY

Description   **<COMPANY>** can be used to describe general company info and projectinfo.

Example   For an example, see Chapter 2.33 PROJECT-DATA p. 38.

Properties   Used in: COMPANIES p. 15

Content: LONG-NAME p. 31,   SHORT-NAME p. 42,   TEAM-MEMBERS p. 91

COMPANY~ ┬ LONG-NAME~ ->
├ SHORT-NAME~ ->
└ TEAM-MEMBERS~ ->

Attribute	Type	Legal Values	Remarks
[ROLE] (required)	namedtokengroup	• MANUFACTURER • SUPPLIER	Wählen Sie MANU-FACTURER aus, wenn das projektbeteiligte Unternehmen ein Hersteller/ Partner ist. Wählen Sie SUP-PLIER aus, wenn das projektbeiteiligte Unternehmen ein Lieferant ist.
[ID] (required)	id		Clear identification of an element inside a document.
[VIEW] (implied)	cdata		Any term used for a realization of a view-concept. With it text-elements could be included or excluded in view of an editor or a processing engine.
[S] (implied)	cdata		Signatur. Used to store the calculated signature of an element (e.g. CRC)
[T] (implied)	cdata	dd-mm-yyyyThh:mm:ss dd/mm/yyyyThh:mm:ss dd mm yyyyThh:mm:ss	Timestamp
[F-ID-CLASS] (fixed)	nmtoken	COMPANY	Fixed ID Class. The value of this attribute classifies links and link targets. This expresses the semantic constraint that a link can only link to an object of the same class. E.g. a link: **< TEAM-MEMBER-REF IDREF="ID1" F-ID-CLASS="TEAM-MEMBER">**...**</ TEAM-MEMBER- REF>** can only link to an object which is classified as "TEAM-MEMBER" like: **<TEAM-MEMBER ID="ID1" F-ID-CLASS=" TEAM-MEMBER">**...**</ TEAM-MEMBER>**.

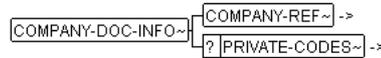| Attribute	Type	Legal Values	Remarks
[F-NAMESPACE] (fixed)	nmtokens	TEAM-MEMBER	Fixed Namespace. This attribute is placed on elements which define a namespace for linkable objects. The attribute contains a list of elements for which the element carriing the attribute is a namespace. This is used by processors which use the MSR natural linking mechanism. (Natural links address their link target with a sequence of short-names of the namesspaces and the object itself e.g. '/test.xml/sw-system1/sw-var1')
[F-CHILD-TYPE] (fixed)	cdata	LONG-NAME:SELECTION	Fixed Namespace. This attribute is placed on elements which define a namespace for linkable objects. The attribute contains a list of elements for which the element carriing the attribute is a namespace. This is used by processors which use the MSR natural linking mechanism. (Natural links address their link target with a sequence of short-names of the namesspaces and the object itself e.g. '/test.xml/sw-system1/sw-var1')

2.8 COMPANY-DOC-INFO

Description   <COMPANY-DOC-INFO> can be used to describe documentinfos of the involved companies.

Example   For an example, see Chapter 2.2 ADMIN-DATA p. 12.

Properties   Used in: COMPANY-DOC-INFOS p. 19

Attribute	Type	Legal Values	Remarks
[VIEW] (implied)	cdata		Any term used for a realization of a view-concept. With it tex-telements could be included or excluded in view of an editor or a processing engine.
[S] (implied)	cdata		Signatur. Used to store the calculated signature of an element (e.g. CRC)
[T] (implied)	cdata	dd-mm-yyyyThh:mm:ss dd/mm/yyyyThh:mm:ss dd mm yyyyThh:mm:ss	Timestamp

2.9 COMPANY-DOC-INFOS

Description   **<COMPANY-DOC-INFOS>** can be used to sum up documentinfos of the involved companies.

Example   For an example, see Chapter 2.2 ADMIN-DATA p. 12.

Properties   Used in: ADMIN-DATA p. 12

Content: Chapter 2.8 COMPANY-DOC-INFO p. 18

Attribute	Type	Legal Values	Remarks
[VIEW] (implied)	cdata		Any term used for a realization of a view-concept. With it tex-telements could be included or excluded in view of an editor or a processing engine.
[S] (implied)	cdata		Signatur. Used to store the calculated signature of an element (e.g. CRC)
[T] (implied)	cdata	dd-mm-yyyyThh:mm:ss dd/mm/yyyyThh:mm:ss dd mm yyyyThh:mm:ss	Timestamp

2.10 COMPANY-REF

Description

<COMPANY-REF> can be used to link to the company for which is the documentinfos are made of.

Caution:

The content of **<COMPANY-REF>** must follow the restrictions of **<SHORT-NAME>**, in particular must not contain whitespace and special characters.

Example

For an example, see .

Properties

Used in:

Content: Text

```
COMPANY-REF~─#PCDATA
```

Attribute	Type	Legal Values	Remarks
[ID-REF] (required)	idref		Link on an element in the document which is marked with an ID-Attribute
[VIEW] (implied)	cdata		Any term used for a realization of a view-concept. With it tex-telements could be included or excluded in view of an editor or a processing engine.
[S] (implied)	cdata		Signatur. Used to store the calculated signature of an element (e.g. CRC)
[T] (implied)	cdata	dd-mm-yyyyThh:mm:ss dd/mm/yyyyThh:mm:ss dd mm yyyyThh:mm:ss	Timestamp

26/07/2006 16:57:05 msrsw-tr-paco.xml

Attribute	Type	Legal Values	Remarks
[F-ID-CLASS] (fixed)	nmtoken	COMPANY	Fixed ID Class. The value of this attribute classifies links and link targets. This expresses the semantic constraint that a link can only link to an object of the same class. E.g. a link: **< TEAM-MEMBER-REF IDREF="ID1" F-ID-CLASS="TEAM-MEMBER">**...**</ TEAM-MEMBER- REF>** can only link to an object which is classified as "TEAM-MEMBER" like: **<TEAM-MEMBER ID="ID1" F-ID-CLASS=" TEAM-MEMBER">**...**</TEAM-MEMBER>**.
[HYTIME] (fixed)	nmtoken	CLINK	HYTIME is the standard attribute to define a HYTIME architecural form. This functionality defined in ISO 10744 HYTIME (Hypermedia/ Time-based Structuring Language). This enables to use a generic architectural form processor for link processing and traversion.
[HYNAMES] (fixed)	nmtokens	LINKEND ID-REF	HYNAMES is a mapping functionality defined in ISO 10744 HYTIME (Hypermedia/Time-based Structuring Language) The names of the locator attributes e.g. ID-REF used to address the target of a hyperlink can be mapped to names defined in the HYTIME standard, that is LINKEND. This enables to use a generic architectural form processor for link processing and traversion.

26/07/2006 16:57:05 msrsw-tr-paco.xml
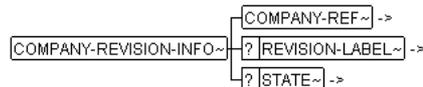
2.11 COMPANY-REVISION-INFO

Description <COMPANY-REVISION-INFO> can be used to describe the level of the documentinfos in the involved company.

Example For an example, see Chapter 2.2 ADMIN-DATA p. 12.

Properties Used in: COMPANY-REVISION-INFOS p. 22

Content COMPANY-REF p. 20,   REVISION-LABEL p. 40,   STATE p. 44

```
                                    ┌─COMPANY-REF~ ->
COMPANY-REVISION-INFO~─┤─? REVISION-LABEL~ ->
                                    └─? STATE~ ->
```

Attribute	Type	Legal Values	Remarks
[VIEW] (implied)	cdata		Any term used for a realization of a view-concept. With it textelements could be included or excluded in view of an editor or a processing engine.
[S] (implied)	cdata		Signatur. Used to store the calculated signature of an element (e.g. CRC)
[T] (implied)	cdata	dd-mm-yyyyThh:mm:ss dd/mm/yyyyThh:mm:ss dd mm yyyyThh:mm:ss	Timestamp

2.12 COMPANY-REVISION-INFOS

Description <COMPANY-REVISION-INFOS> allows to maintain company specific revision information. This supports the use case where each party involved uses a version management system of its own as well as its own versioning scheme. This approach allows a simultaneous versioning where all revision information remains visible and referrable.

Example For an example, see Chapter 2.2 ADMIN-DATA p. 12.

Properties Used in: DOC-REVISION p. 25

Content Chapter 2.11 COMPANY-REVISION-INFO p. 22

```
COMPANY-REVISION-INFOS~─┤─+ COMPANY-REVISION-INFO~ ->
```

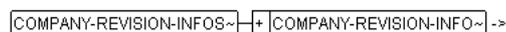| Attribute	Type	Legal Values	Remarks
[VIEW] (implied)	cdata		Any term used for a realization of a view-concept. With it tex-telements could be in-cluded or excluded in view of an editor or a processing engine.
[S] (implied)	cdata		Signatur. Used to store the calculated signa-ture of an element (e.g. CRC)
[T] (implied)	cdata	dd-mm-yyyyThh:mm:ss dd/mm/yyyyThh:mm:ss dd mm yyyyThh:mm:ss	Timestamp

2.13   DATE

Description   **<DATE>** ist used to capture a time stamp. It must match to one of the following syntaxes:

```
<YYYY>-<MM>-<DD>[T<hh>:<mm>:<ss>]
<YYYY>.<MM>.<DD>[T<hh>:<mm>:<ss>]
<YYYY>/<MM>/<DD>[T<hh>:<mm>:<ss>]
```

The last pattern is the most preferred one, since it reflects a common use in US.

Example   `<DATE>2001-03-20T09:00:00</DATE>`

Or for an example, see Chapter 2.52 SW-CS-HISTORY p. 53.

Properties   Used in: DOC-REVISION p. 25,   SW-CS-ENTRY p. 51

Content: Text

```
DATE~ ─ #PCDATA
```

Attribute	Type	Legal Values	Remarks
[SI] (implied)	cdata		Beschreibung der Se-mantischen Bedeu-tung eines Elements.
[VIEW] (implied)	cdata		Any term used for a realization of a view-concept. With it tex-telements could be in-cluded or excluded in view of an editor or a processing engine.
[S] (implied)	cdata		Signatur. Used to store the calculated signa-ture of an element (e.g. CRC)

Attribute	Type	Legal Values	Remarks
[T] (implied)	cdata	dd-mm-yyyyThh:mm:ss dd/mm/yyyyThh:mm:ss dd mm yyyyThh:mm:ss	Timestamp

2.14 DEPARTMENT

Description   **<DEPARTMENT>** can be used to describe thedepartment of a team-member.

Example   For an example, see Chapter 2.33 PROJECT-DATA p. 38.

Properties   Used in: TEAM-MEMBER p. 87

Content: Text

Attribute	Type	Legal Values	Remarks
[VIEW] (implied)	cdata		Any term used for a realization of a view-concept. With it tex-telements could be included or excluded in view of an editor or a processing engine.
[S] (implied)	cdata		Signatur. Used to store the calculated signature of an element (e.g. CRC)
[T] (implied)	cdata	dd-mm-yyyyThh:mm:ss dd/mm/yyyyThh:mm:ss dd mm yyyyThh:mm:ss	Timestamp

2.15 DESC

Description   **<DESC>** represents a general but brief description of the object in question. With respect of *PaCo* it is only used within **<PROJECT>** thus allowing to specify a brief overview of the project.

Example   For an example, see Chapter 2.33 PROJECT-DATA p. 38.

Properties   Used in: PROJECT p. 37

Content: Text,   TT p. 92,   E p. 26,   SUP p. 45,   SUB p. 45,   IE p. 29

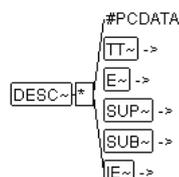| Attribute	Type	Legal Values	Remarks
[VIEW] (implied)	cdata		Any term used for a realization of a view-concept. With it tex-telements could be included or excluded in view of an editor or a processing engine.
[S] (implied)	cdata		Signatur. Used to store the calculated signature of an element (e.g. CRC)
[T] (implied)	cdata	dd-mm-yyyyThh:mm:ss dd/mm/yyyyThh:mm:ss dd mm yyyyThh:mm:ss	Timestamp

2.16   DOC-REVISION

Description   **<DOC-REVISION>** gets all information about one particular revision of the file.

Example   For an example, see Chapter 2.2 ADMIN-DATA p. 12.

Properties   Used in: DOC-REVISIONS p. 26

Content: COMPANY-REVISION-INFOS p. 22,   TEAM-MEMBER-REF p. 89,   DATE p. 23, MODIFICATIONS p. 32

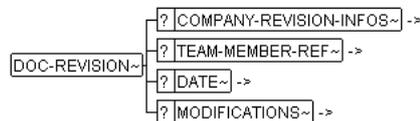| Attribute	Type	Legal Values	Remarks
[VIEW] (implied)	cdata		Any term used for a realization of a view-concept. With it tex-telements could be included or excluded in view of an editor or a processing engine.
[S] (implied)	cdata		Signatur. Used to store the calculated signature of an element (e.g. CRC)
[T] (implied)	cdata	dd-mm-yyyyThh:mm:ss dd/mm/yyyyThh:mm:ss dd mm yyyyThh:mm:ss	Timestamp

2.17 DOC-REVISIONS

Description **<DOC-REVISIONS>** is a container to get the entire change-history. Although the sequence of changes can be determined by sorting **<DOC-REVISIONS>** according to **<DOC-REVISION>**/**< DATE>**, it is recommended to put the most recent **<DOC-REVISION>** as the first child of **<DOC-REVISIONS>**.

Example For an example, see Chapter 2.2 ADMIN-DATA p. 12.

Properties Used in: ADMIN-DATA p. 12

Content: DOC-REVISION p. 25

DOC-REVISIONS~ — + DOC-REVISION~ ->

Attribute	Type	Legal Values	Remarks
[VIEW] (implied)	cdata		Any term used for a realization of a view-concept. With it textelements could be included or excluded in view of an editor or a processing engine.
[S] (implied)	cdata		Signatur. Used to store the calculated signature of an element (e.g. CRC)
[T] (implied)	cdata	dd-mm-yyyyThh:mm:ss dd/mm/yyyyThh:mm:ss dd mm yyyyThh:mm:ss	Timestamp

2.18 E

Description **<E>** can be used to emphasize a textual part of a paragraph.

Example

Properties Used in: CHANGE p. 14,   DESC p. 24,   LONG-NAME p. 31,   REASON p. 39

Content: Text

E~ — #PCDATA

Attribute	Type	Legal Values	Remarks
[TYPE] (default)	namedtokengroup	• **BOLD** • ITALIC	Verwenden Sie BOLD, um fett hervorzuheben Verwenden Sie ITALIC, um kursiv hervorzuheben

Attribute	Type	Legal Values	Remarks
[SI] (implied)	cdata		Beschreibung der Semantischen Bedeutung eines Elements.
[VIEW] (implied)	cdata		Any term used for a realization of a view-concept. With it tex-telements could be included or excluded in view of an editor or a processing engine.
[S] (implied)	cdata		Signatur. Used to store the calculated signature of an element (e.g. CRC)
[T] (implied)	cdata	dd-mm-yyyyThh:mm:ss dd/mm/yyyyThh:mm:ss dd mm yyyyThh:mm:ss	Timestamp

2.19 EMAIL

Description   <EMAIL> can be used to describe the e-mail address of a team-member.

Example   For an example, see .

Properties   Used in:

Content: Text

```
EMAIL~──#PCDATA
```

Attribute	Type	Legal Values	Remarks
[VIEW] (implied)	cdata		Any term used for a realization of a view-concept. With it tex-telements could be included or excluded in view of an editor or a processing engine.
[S] (implied)	cdata		Signatur. Used to store the calculated signature of an element (e.g. CRC)
[T] (implied)	cdata	dd-mm-yyyyThh:mm:ss dd/mm/yyyyThh:mm:ss dd mm yyyyThh:mm:ss	Timestamp

2.20 FAX

Description   **<FAX>** can be used to describe the fax-number of a team-member.

Example   For an example, see .

Properties   Used in:

Content: Text

FAX~──#PCDATA

Attribute	Type	Legal Values	Remarks
[VIEW] (implied)	cdata		Any term used for a realization of a view-concept. With it tex-telements could be included or excluded in view of an editor or a processing engine.
[S] (implied)	cdata		Signatur. Used to store the calculated signature of an element (e.g. CRC)
[T] (implied)	cdata	dd-mm-yyyyThh:mm:ss dd/mm/yyyyThh:mm:ss dd mm yyyyThh:mm:ss	Timestamp

2.21 HOMEPAGE

Description   **<HOMEPAGE>** can be used to describe the homepage of a team-member.

Example   For an example, see .

Properties   Used in:

Content: Text

HOMEPAGE~──#PCDATA

Attribute	Type	Legal Values	Remarks
[VIEW] (implied)	cdata		Any term used for a realization of a view-concept. With it tex-telements could be included or excluded in view of an editor or a processing engine.

Attribute	Type	Legal Values	Remarks
[S] (implied)	cdata		Signatur. Used to store the calculated signature of an element (e.g. CRC)
[T] (implied)	cdata	dd-mm-yyyyThh:mm:ss dd/mm/yyyyThh:mm:ss dd mm yyyyThh:mm:ss	Timestamp

2.22   IE

Description   **<IE>** can be used to declare the element as an entry in the Document-Index.

Properties   Example

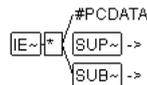| Attribute	Type	Legal Values	Remarks
[TYPE] (default)	namedtokengroup	• **BOLD** • ITALIC	Gibt einen Typ des jeweiligen Elementes an.
[SI] (implied)	cdata		Beschreibung der Semantischen Bedeutung eines Elements.
[VIEW] (implied)	cdata		Any term used for a realization of a view-concept. With it text-elements could be included or excluded in view of an editor or a processing engine.
[S] (implied)	cdata		Signatur. Used to store the calculated signature of an element (e.g. CRC)
[T] (implied)	cdata	dd-mm-yyyyThh:mm:ss dd/mm/yyyyThh:mm:ss dd mm yyyyThh:mm:ss	Timestamp

2.23   LABEL

Description   **<LABEL>** is used as a long designator (similar to **<LONG-NAME>**) for objects which cannot be referenced. In this case it is the name of the corresponding project.

<LABEL> in **<PROJECT>** shall reflect the identifier of the Project. It could be such as *Volvo Turnkey*.
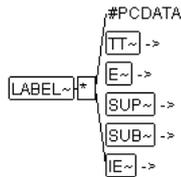
<LABEL> in **<VG>** shall reflect the constant value of one axis. It is used to raise the readability of *PaCo* in an *Editor*

Example

Properties   Used in: PROJECT p. 37, Chapter 2.86 VG p. 93

Content: Text,   TT p. 92,   E p. 26,   SUP p. 45,   SUB p. 45,   IE p. 29

Attribute	Type	Legal Values	Remarks
[VIEW] (implied)	cdata		Any term used for a realization of a view-concept. With it text-elements could be included or excluded in view of an editor or a processing engine.
[S] (implied)	cdata		Signatur. Used to store the calculated signature of an element (e.g. CRC)
[T] (implied)	cdata	dd-mm-yyyyThh:mm:ss dd/mm/yyyyThh:mm:ss dd mm yyyyThh:mm:ss	Timestamp

2.24   LANGUAGE

Description   **<LANGUAGE>** represents the human language used within the file. It is mainly used to cause the tools to switch to an appropriate language.

This element follows ISO 639-1 two letter language codes ( ). Mostly used codes are given in Table 1 Most common language codes (alphabetical) p. 30:

Table 1: Most common language codes (alphabetical)

Code	Language
de	German
en	English
es	Spanish
fr	French
it	Italian
jp	Japanese

Example   For an example, see Chapter 2.2 ADMIN-DATA p. 12.

Properties   Used in: ADMIN-DATA p. 12

Content: Text

LANGUAGE~—#PCDATA

Attribute	Type	Legal Values	Remarks
[VIEW] (implied)	cdata		Any term used for a realization of a view-concept. With it tex-telements could be included or excluded in view of an editor or a processing engine.
[S] (implied)	cdata		Signatur. Used to store the calculated signature of an element (e.g. CRC)
[T] (implied)	cdata	dd-mm-yyyyThh:mm:ss dd/mm/yyyyThh:mm:ss dd mm yyyyThh:mm:ss	Timestamp

2.25 LONG-NAME

Description <LONG-NAME> is used as a long designate for object such as companies, calibration Items.

Example For an example, see .

Properties Used in: COMPANY p. 16, SW-FEATURE p. 59, SW-INSTANCE p. 62, SW-SYSTEM p. 73, SW-VCD-CRITERION p. 82, TEAM-MEMBER p. 87

Content: Text, TT p. 92, E p. 26, SUP p. 45, SUB p. 45, IE p. 29

Attribute	Type	Legal Values	Remarks
[VIEW] (implied)	cdata		Any term used for a realization of a view-concept. With it tex-telements could be included or excluded in view of an editor or a processing engine.
[S] (implied)	cdata		Signatur. Used to store the calculated signature of an element (e.g. CRC)

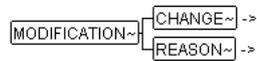| Attribute	Type	Legal Values	Remarks
[T] (implied)	cdata	dd-mm-yyyyThh:mm:ss dd/mm/yyyyThh:mm:ss dd mm yyyyThh:mm:ss	Timestamp

2.26 MODIFICATION

Description   **<MODIFICATION>** describes the modification of the file related to the predescessor.

Example   For an example, see Chapter 2.2 ADMIN-DATA p. 12.

Properties   Used in: MODIFICATIONS p. 32

         Content: CHANGE p. 14,   REASON p. 39

Attribute	Type	Legal Values	Remarks
[TYPE] (required)	namedtokengroup	• CONTENT-RE-LATED • DOC-RELATED	This attribute describes the level of the modification. In particular, this allows to specify, if the modification is relevant to the described systems.
[VIEW] (implied)	cdata		Any term used for a realization of a view-concept. With it tex-telements could be included or excluded in view of an editor or a processing engine.
[S] (implied)	cdata		Signatur. Used to store the calculated signature of an element (e.g. CRC)
[T] (implied)	cdata	dd-mm-yyyyThh:mm:ss dd/mm/yyyyThh:mm:ss dd mm yyyyThh:mm:ss	Timestamp

2.27 MODIFICATIONS

Description   **<MODIFICATIONS>** represents the container which receives all **<MODIFICATION>**s.

Example   For an example, see Chapter 2.2 ADMIN-DATA p. 12.

Properties   Used in: DOC-REVISION p. 25

         Content: MODIFICATION p. 32

MODIFICATIONS~ — + MODIFICATION~ ->

Attribute	Type	Legal Values	Remarks
[VIEW] (implied)	cdata		Any term used for a realization of a view-concept. With it tex-telements could be included or excluded in view of an editor or a processing engine.
[S] (implied)	cdata		Signatur. Used to store the calculated signature of an element (e.g. CRC)
[T] (implied)	cdata	dd-mm-yyyyThh:mm:ss dd/mm/yyyyThh:mm:ss dd mm yyyyThh:mm:ss	Timestamp

2.28　MSRSW

Description　**<MSRSW>** is the root element of the file. Mainly it consists of the following sections:

<SHORT-NAME>　A short designator of the file. Usually this is something like filename body a project identifier.

<CATEGORY>　**<CATEGORY>** in **<MSRSW>** shall reflect the nature of the File according to asam 1.4 with extensions. It should be *PaCo*.

<PROJECT-DATA>　This denotes all organisational and project relevant data.

<ADMIN-DATA>　This denotes al administrative data related to the current file.

<SW-SYSTEMS>　This section receives the hole application dokumentation. As an extension it supports multiple ECUs within one file.

Example
```
<MSRSW>
  <SHORT-NAME>DEMO</SHORT-NAME>

  <ADMIN-DATA>
    <LANGUAGE>en</LANGUAGE>
  </ADMIN-DATA>
  <SW-SYSTEMS>
    <SW-SYSTEM>
      <SHORT-NAME>DEMO</SHORT-NAME>
      <SW-INSTANCE-SPEC>
      <SW-INSTANCE-TREE>
        <SHORT-NAME>DEMODATA</SHORT-NAME>
        <SW-INSTANCE><SHORT-NAME>FBAM</SHORT-NAME>
          <CATEGORY>MAP</CATEGORY>
          <SW-INSTANCE-PROPS-VARIANTS>
            <SW-INSTANCE-PROPS-VARIANT>
            ...
            </SW-INSTANCE-PROPS-VARIANT></SW-INSTANCE-PROPS-VARIANTS>
        </SW-INSTANCE>
      </SW-INSTANCE-TREE>

      <SW-INSTANCE-TREE>
        <SHORT-NAME>Testdata</SHORT-NAME>
        <SW-INSTANCE><SHORT-NAME>FBAM</SHORT-NAME>
          <CATEGORY>MAP</CATEGORY>
          <SW-INSTANCE-PROPS-VARIANTS>
            <SW-INSTANCE-PROPS-VARIANT>
            ...
            </SW-INSTANCE-PROPS-VARIANT></SW-INSTANCE-PROPS-VARIANTS>
```
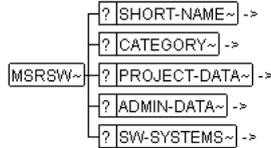
```
        </SW-INSTANCE>
      </SW-INSTANCE-TREE>
    </SW-SYSTEM>
  </SW-SYSTEMS>
</MSRSW>
```

Properties Used in: Root

Content:

Attribute	Type	Legal Values	Remarks
[PUBID] (default)	cdata	-//MSR//DTD MSR SOFTWARE DTD:V2.2.0:MSRSW.DTD//EN	Public Identifier. Dieser ist im Gegensatz zu [F-PUBID] durch eine Applikation veränderbar.
[VIEW] (implied)	cdata		Any term used for a realization of a view-concept. With it textelements could be included or excluded in view of an editor or a processing engine.
[S] (implied)	cdata		Signatur. Used to store the calculated signature of an element (e.g. CRC)
[T] (implied)	cdata	dd-mm-yyyyThh:mm:ss dd/mm/yyyyThh:mm:ss dd mm yyyyThh:mm:ss	Timestamp
[F-PUBID] (fixed)	cdata	-//MSR//DTD MSR SOFTWARE DTD:V2.2.0:MSRSW.DTD//EN	Fixed Public ID. Dieser ist im Gegensatz zu [PUBID] nicht veränderbar und beinhaltet den Public Identifier der aktuellen MSRSW.DTD.

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PHONE

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State: freigegeben

Attribute	Type	Legal Values	Remarks
[F-NAMESPACE] (fixed)	nmtokens	CHAPTER COMPANY DEF-ITEM EXTERNAL FIGURE FORMULA PRM REQUIREMENT SAMPLE SDG STD SW-ADDR-METHOD SW-AXIS-TYPE SW-BASE-TYPE SW-CAL-PRM SW-CALPRM-PROTOTYPE SW-CLASS-PROTOTYPE SW-CLASS-ATTR-IMPL SW-CLASS-INSTANCE SW-CLASS SW-CODE-SYNTAX SW-COLLECTION SW-COMPU-METHOD SW-CPU-MEM-SEG SW-DATA-CONSTR SW-FEATURE SW-GENERIC-AXIS-PARAM-TYPE SW-INSTANCE-TREE SW-INSTANCE SW-MC-BASE-TYPE SW-MC-INTERFACE-SOURCE SW-MC-INTERFACE SW-RECORD-LAYOUT SW-SYSTEM-CONST SW-SYSTEM SW-TASK SW-TEMPLATE SW-UNIT SW-USER-ACCESS-CASE SW-USER-GROUP SW-VARIABLE-PROTOTYPE SW-VARIABLE SW-VCD-CRITERION TABLE TEAM-MEMBER TOPIC VARIANT-DEF VARIANT-CHAR XDOC XFILE	Fixed Namespace. This attribute is placed on elements which define a namespace for linkable objects. The attribute contains a list of elements for which the element carriing the attribute is a namespace. This is used by processors which use the MSR natural linking mechanism. (Natural links address their link target with a sequence of short-names of the namesspaces and the object itself e.g. '/test.xml/sw-system1/sw-var1')
[HYTIME] (fixed)	nmtoken	HYDOC	HYTIME is the standard attribute to define a HYTIME architecural form. This functionality defined in ISO 10744 HYTIME (Hypermedia/ Time-based Structuring Language). This enables to use a generic architectural form processor for link processing and traversion.

2.29   PHONE

Description   **<PHONE>** can be used to describe the phone-number of a team-member.

Example   For an example, see Chapter 2.33 PROJECT-DATA p. 38.

Properties   Used in: TEAM-MEMBER p. 87

Content: Text

PHONE~——#PCDATA

Attribute	Type	Legal Values	Remarks
[VIEW] (implied)	cdata		Any term used for a realization of a view-concept. With it tex-telements could be included or excluded in view of an editor or a processing engine.
[S] (implied)	cdata		Signatur. Used to store the calculated signature of an element (e.g. CRC)
[T] (implied)	cdata	dd-mm-yyyyThh:mm:ss dd/mm/yyyyThh:mm:ss dd mm yyyyThh:mm:ss	Timestamp

2.30   PRIVATE-CODE

Description   **<PRIVATE-CODE>** can be used to describe special adjusted systems or processes.

Example   For an example, see Chapter 2.2 ADMIN-DATA p. 12.

Properties   Used in: PRIVATE-CODE p. 36

Content: Text

PRIVATE-CODE~——#PCDATA

Attribute	Type	Legal Values	Remarks
[TYPE] (implied)	cdata		Gibt einen Typ des jeweiligen Elementes an.

Attribute	Type	Legal Values	Remarks
[VIEW] (implied)	cdata		Any term used for a realization of a view-concept. With it tex-telements could be included or excluded in view of an editor or a processing engine.
[S] (implied)	cdata		Signatur. Used to store the calculated signature of an element (e.g. CRC)
[T] (implied)	cdata	dd-mm-yyyyThh:mm:ss dd/mm/yyyyThh:mm:ss dd mm yyyyThh:mm:ss	Timestamp

2.31 PRIVATE-CODES

Description **<PRIVATE-CODES>** can be used to sum up the discriptions for special adjusted systems or processes.

Example For an example, see Chapter 2.2 ADMIN-DATA p. 12.

Properties Used in: COMPANY-DOC-INFO p. 18

Content: Chapter 2.30 PRIVATE-CODE p. 36

PRIVATE-CODE~ — #PCDATA

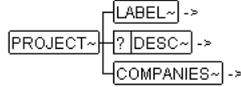| Attribute	Type	Legal Values	Remarks
[VIEW] (implied)	cdata		Any term used for a realization of a view-concept. With it tex-telements could be included or excluded in view of an editor or a processing engine.
[S] (implied)	cdata		Signatur. Used to store the calculated signature of an element (e.g. CRC)
[T] (implied)	cdata	dd-mm-yyyyThh:mm:ss dd/mm/yyyyThh:mm:ss dd mm yyyyThh:mm:ss	Timestamp

2.32 PROJECT

Description Use **<PROJECT>** to describe the project configuration.

Example For an example, see Chapter 2.33 PROJECT-DATA p. 38.

26/07/2006 16:57:05 msrsw-tr-paco.xml

Properties

Used in:

Content:

Attribute	Type	Legal Values	Remarks
[VIEW] (implied)	cdata		Any term used for a realization of a view-concept. With it text-elements could be included or excluded in view of an editor or a processing engine.
[S] (implied)	cdata		Signatur. Used to store the calculated signature of an element (e.g. CRC)
[T] (implied)	cdata	dd-mm-yyyyThh:mm:ss dd/mm/yyyyThh:mm:ss dd mm yyyyThh:mm:ss	Timestamp

2.33 PROJECT-DATA

Description Use **<PROJECT-DATA>** to capture information about the project the file belongs to.

Example
```
<PROJECT-DATA>
    <PROJECT><LABEL>Demo project for PaCo file format with MSRSW.DTD</LABEL>
        <DESC>Tthis project is used to illustrate how PaCo format can be defined
          by following the structures of ASAM-MCD-2MC 2.0 resp. MSRSW.DTD 2.2.0 </DESC>
        <COMPANIES>
            <COMPANY ROLE=""SUPPLIER"" ID=""rb"">
                <LONG-NAME>Robert Bosch GmbH</LONG-NAME>
                <SHORT-NAME>Bosch</SHORT-NAME>
                <TEAM-MEMBERS>
                    <TEAM-MEMBER ID=""wl"">
                        <LONG-NAME>Markus Müller</LONG-NAME>
                        <SHORT-NAME>Ml</SHORT-NAME>
                        <ROLES>
                            <ROLE>Author</ROLE>
                        </ROLES>
                        <DEPARTMENT>GS/EMW3</DEPARTMENT>
                        <ADDRESS>Robert-Bosch-Strasse 2</ADDRESS>
                        <ZIP>71701</ZIP>
                        <CITY>Schwieberdingen</CITY>
                        <PHONE>(0711)811-35582</PHONE>
                        <FAX>(0711)811-8262</FAX>
                        <EMAIL>markus.mueller1@de.bosch.com</EMAIL>
                        <HOMEPAGE>www.mypage.net</HOMEPAGE>
                    </TEAM-MEMBER>
                </TEAM-MEMBERS>
            </COMPANY>
        </COMPANIES>
    </PROJECT>
</PROJECT-DATA>
```

Properties

Used in:

Content:

26/07/2006 16:57:05 msrsw-tr-paco.xml

PROJECT-DATA~ — PROJECT~ ->

Attribute	Type	Legal Values	Remarks
[VIEW] (implied)	cdata		Any term used for a realization of a view-concept. With it tex-telements could be included or excluded in view of an editor or a processing engine.
[S] (implied)	cdata		Signatur. Used to store the calculated signature of an element (e.g. CRC)
[T] (implied)	cdata	dd-mm-yyyyThh:mm:ss dd/mm/yyyyThh:mm:ss dd mm yyyyThh:mm:ss	Timestamp

2.34 REASON

Description   Use **<REASON>** to specify the reason of a particular modification.
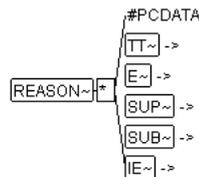
Example   For an example, see Chapter 2.2 ADMIN-DATA p. 12.

Properties   Used in: MODIFICATION p. 32

Content: Text,   TT p. 92,   E p. 26,   SUP p. 45,   SUB p. 45,   IE p. 29

Attribute	Type	Legal Values	Remarks
[VIEW] (implied)	cdata		Any term used for a realization of a view-concept. With it tex-telements could be included or excluded in view of an editor or a processing engine.
[S] (implied)	cdata		Signatur. Used to store the calculated signature of an element (e.g. CRC)

Attribute	Type	Legal Values	Remarks
[T] (implied)	cdata	dd-mm-yyyyThh:mm:ss dd/mm/yyyyThh:mm:ss dd mm yyyyThh:mm:ss	Timestamp

2.35 REVISION-LABEL

Description **<REVISION-LABEL>** is used to denote version number of the current file.

Example

Properties   Used in:

Content: Text

```
REVISION-LABEL~ #PCDATA
```

Attribute	Type	Legal Values	Remarks
[VIEW] (implied)	cdata		Any term used for a realization of a view-concept. With it tex-telements could be included or excluded in view of an editor or a processing engine.
[S] (implied)	cdata		Signatur. Used to store the calculated signature of an element (e.g. CRC)
[T] (implied)	cdata	dd-mm-yyyyThh:mm:ss dd/mm/yyyyThh:mm:ss dd mm yyyyThh:mm:ss	Timestamp

2.36 ROLE

Description **<ROLE>** denotes one particular role taken by the team member in question within the current project. Roles are such as "Author", "Calibration engineer", "Supporter", "Quality assurance".

Example

Properties   Used in:

Content: Text

```
ROLE~ #PCDATA
```

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ROLES

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State: freigegeben

MSR

Attribute	Type	Legal Values	Remarks
[VIEW] (implied)	cdata		Any term used for a realization of a view-concept. With it tex-telements could be included or excluded in view of an editor or a processing engine.
[S] (implied)	cdata		Signatur. Used to store the calculated signature of an element (e.g. CRC)
[T] (implied)	cdata	dd-mm-yyyyThh:mm:ss dd/mm/yyyyThh:mm:ss dd mm yyyyThh:mm:ss	Timestamp

2.37 ROLES

Description   **<ROLES>** is the container for all roles one particular team member takes within the project.

Example   For an example, see Chapter 2.33 PROJECT-DATA p. 38.

Properties   Used in: TEAM-MEMBER p. 87

Content: ROLE p. 40

ROLES~ — + ROLE~ ->

Attribute	Type	Legal Values	Remarks
[VIEW] (implied)	cdata		Any term used for a realization of a view-concept. With it tex-telements could be included or excluded in view of an editor or a processing engine.
[S] (implied)	cdata		Signatur. Used to store the calculated signature of an element (e.g. CRC)
[T] (implied)	cdata	dd-mm-yyyyThh:mm:ss dd/mm/yyyyThh:mm:ss dd mm yyyyThh:mm:ss	Timestamp

Attribute	Type	Legal Values	Remarks
[F-CHILD-TYPE] (fixed)	cdata	ROLE:SELECTION	Fixed Child Type. Warning: This attribute is only in the DTD for compatibility with older versions of the DTD and should not be used for any new implementations. It might be removed in future versions of the DTD. This attribute contains the information which child elements of the element carring this attribute should be checked by an semantic checker.

2.38   SHORT-NAME

Description   <SHORT-NAME> represents a short designator for objects which **can** be referred to.

Example   For an example, see Chapter 2.62 SW-INSTANCE p. 62.

Properties

Content: Text

SHORT-NAME~├─#PCDATA

Attribute	Type	Legal Values	Remarks
[VIEW] (implied)	cdata		Any term used for a realization of a view-concept. With it tex-telements could be included or excluded in view of an editor or a processing engine.
[S] (implied)	cdata		Signatur. Used to store the calculated signature of an element (e.g. CRC)
[T] (implied)	cdata	dd-mm-yyyyThh:mm:ss dd/mm/yyyyThh:mm:ss dd mm yyyyThh:mm:ss	Timestamp

2.39 SI-UNIT

Description **<SI-UNIT>** specifies a measurement founded on seven SI base units for seven base quantities assumed to be mutually independent, as given in Table 1.

Table 2: base quantities for SI units

Base quantity	Name	Symbol
length	meter	m
mass	kilogram	kg
time	second	s
electric current	ampere	A
thermodynamic temperature	kelvin	K
amount of substance	mole	mol
luminous intensity	candela	cd

The quantitiy exponents are speicified in appropriate attributes.Die Maßeinheiten-Exponenten werden über die entsprechenden spezifischen Attribute bestimmt.

Eine **<SW-UNIT>** kann sowohl auf Basis einer **<SI-UNIT>** als auch auf einer anderen beliebigen Maßeinheit mittels der Referenz **<SW-UNIT-REF>** definiert werden. Dabei ist zu beachten:

- Bei Verwendung von referenzierten Maßeinheiten muß die Kette der Verweise bei einer **<SI-UNIT>** enden.
- Die Umrechnung der aktuellen Maßeinheit in die referenzierte Maßeinheit wird spezifizert durch **<SW-UNIT-CONVERSION-METHOD>**.

Dabei gilt: Umrechnung von Maßeinheiten

SW-UNIT = SW-UNIT-GRADIENT * SW-UNIT-REF + SW-UNIT-OFFSET

Example For an example, see Chapter 2.59 SW-DATA-DICTIONARY-SPEC p. 58.

Properties Used in: Chapter 2.69 SW-UNIT p. 76

Content: Text

Attribute	Type	Legal Values	Remarks
[LENGTH-EXPO] (implied)	cdata		Exponent der Längeneinheit
[TIME-EXPO] (implied)	cdata		Exponent der Zeiteinheit
[MASS-EXPO] (implied)	cdata		Exponent der Masseneinheit
[ELECTRIC-CURRENT-EXPO] (implied)	cdata		Exponent der Stromeinheit
[THERMODYNAMIC-TEMPERATURE-EX-PO] (implied)	cdata		Exponent der Temperatureinheit

Attribute	Type	Legal Values	Remarks
[LUMINOUS-INTEN-SITY-EXPO] (implied)	cdata		Exponent der Licht-stärkeneinheit
[AMOUNT-OF-SUB-STANCE-EXPO] (implied)	cdata		Exponent der Stoff-mengeneinheit
[VIEW] (implied)	cdata		Any term used for a realization of a view-concept. With it tex-telements could be in-cluded or excluded in view of an editor or a processing engine.
[S] (implied)	cdata		Signatur. Used to store the calculated signa-ture of an element (e.g. CRC)
[T] (implied)	cdata	dd-mm-yyyyThh:mm:ss dd/mm/yyyyThh:mm:ss dd mm yyyyThh:mm:ss	Timestamp

2.40 STATE

Description **<STATE>** represents the current state of the current file according to the configuration management plan.

Example `<STATE>reviewed</STATE>`

Properties Used in:

Content: Text

`STATE~—#PCDATA`

Attribute	Type	Legal Values	Remarks
[SI] (implied)	cdata		Description of the se-mantic meaning of an element. This can be used to match to formal state definitions.
[VIEW] (implied)	cdata		Any term used for a realization of a view-concept. With it tex-telements could be in-cluded or excluded in view of an editor or a processing engine.

Attribute	Type	Legal Values	Remarks
[S] (implied)	cdata		Signatur. Used to store the calculated signature of an element (e.g. CRC)
[T] (implied)	cdata	dd-mm-yyyyThh:mm:ss dd/mm/yyyyThh:mm:ss dd mm yyyyThh:mm:ss	Timestamp

2.41 SUB

Description   **<SUB>** can be used to display a part of a paragraph in smaller font beneath the groundline.

Example   For an example, see Chapter 2.59 SW-DATA-DICTIONARY-SPEC p. 58.

Properties   Used in: CHANGE p. 14,   DESC p. 24,   IE p. 29,   LONG-NAME p. 31,   REASON p. 39,   SW-UNIT-DISPLAY p. 77

Content: Text

SUB~—#PCDATA

Attribute	Type	Legal Values	Remarks
[SI] (implied)	cdata		Description of the semantic meaning of an element.
[VIEW] (implied)	cdata		Any term used for a realization of a view-concept. With it textelements could be included or excluded in view of an editor or a processing engine.
[S] (implied)	cdata		Signatur. Used to store the calculated signature of an element (e.g. CRC)
[T] (implied)	cdata	dd-mm-yyyyThh:mm:ss dd/mm/yyyyThh:mm:ss dd mm yyyyThh:mm:ss	Timestamp

2.42 SUP

Description   **<SUP>** can be used to display a part of a paragraph in smaller font above the groundline.

Example   For an example, see Chapter 2.59 SW-DATA-DICTIONARY-SPEC p. 58.

Properties   Used in: CHANGE p. 14,   DESC p. 24,   IE p. 29,   LONG-NAME p. 31,   REASON p. 39,   SW-UNIT-DISPLAY p. 77

Content: Text

```
SUP~ ─ #PCDATA
```

Attribute	Type	Legal Values	Remarks
[SI] (implied)	cdata		Description of the semantic meaning of an element.
[VIEW] (implied)	cdata		Any term used for a realization of a view-concept. With it tex-telements could be included or excluded in view of an editor or a processing engine.
[S] (implied)	cdata		Signatur. Used to store the calculated signature of an element (e.g. CRC)
[T] (implied)	cdata	dd-mm-yyyyThh:mm:ss dd/mm/yyyyThh:mm:ss dd mm yyyyThh:mm:ss	Timestamp

2.43 SW-ARRAY-INDEX

Description   In general, a **<SW-INSTANCE>** corresponds to a particular data object (variable or calibration parameter), a compoent of a data structure or a particulare element of an array.

If the **<SW-INSTANCE>** in question corresponds to an array element, then the index number of the array element is specified in **<SW-ARRAY-INDEX>**.

Array index is zero based. The first array element is therefore indicated by SW-ARRAY-INDEX 0

Example   For an example, see .

Properties   Used in:

Content: Text

```
SW-ARRAY-INDEX~ ─ #PCDATA
```

Attribute	Type	Legal Values	Remarks
[VIEW] (implied)	cdata		Any term used for a realization of a view-concept. With it tex-telements could be included or excluded in view of an editor or a processing engine.

Attribute	Type	Legal Values	Remarks
[S] (implied)	cdata		Signatur. Used to store the calculated signature of an element (e.g. CRC)
[T] (implied)	cdata	dd-mm-yyyyThh:mm:ss dd/mm/yyyyThh:mm:ss dd mm yyyyThh:mm:ss	Timestamp

2.44 SW-AXIS-CONT

Description

<SW-AXIS-CONT> takes the contents of one particular axis (denoted by **<SW-AXIS-INDEX>**) of the current calibration item.

If there are more than one axis, then the axis with the index 1 is incrementing first. This means that the values are given in the following order:

v(1,1)	...	v(n,1)
v(1,2)	...	v(n,2)
...		
v(1,m)	...	v(n, m)

Example

For an example, see

Properties

Used in:

Content:

Attribute	Type	Legal Values	Remarks
[VIEW] (implied)	cdata		Any term used for a realization of a view-concept. With it tex-telements could be included or excluded in view of an editor or a processing engine.
[S] (implied)	cdata		Signatur. Used to store the calculated signature of an element (e.g. CRC)
[T] (implied)	cdata	dd-mm-yyyyThh:mm:ss dd/mm/yyyyThh:mm:ss dd mm yyyyThh:mm:ss	Timestamp

2.45 SW-AXIS-CONTS

Description

<SW-AXIS-CONTS> represents the contents of all axes of one particular calibration item.

Example   For an example, see Chapter 2.65 SW-INSTANCE-SPEC p. 70.

Properties   Used in: SW-INSTANCE-PROPS-VARIANT p. 68

Content: SW-AXIS-CONT p. 47

SW-AXIS-CONTS~—*—SW-AXIS-CONT~ ->

Attribute	Type	Legal Values	Remarks
[VIEW] (implied)	cdata		Any term used for a realization of a view-concept. With it tex-telements could be included or excluded in view of an editor or a processing engine.
[S] (implied)	cdata		Signatur. Used to store the calculated signature of an element (e.g. CRC)
[T] (implied)	cdata	dd-mm-yyyyThh:mm:ss dd/mm/yyyyThh:mm:ss dd mm yyyyThh:mm:ss	Timestamp

2.46   SW-AXIS-INDEX

Description   <SW-AXIS-INDEX> denotes the index of the current axis for which the contents is specified. The index uses the following convention:

0: This is the value axis of a curve or a map

1: This is the X-axis of a curve or a map.

2: This is the Y-axis of a map

3: This is the Z-axis of a cuboid ...

Example   For an example, see Chapter 2.65 SW-INSTANCE-SPEC p. 70.

Properties   Used in: SW-AXIS-CONT p. 47

Content: Text

SW-AXIS-INDEX~—#PCDATA

Attribute	Type	Legal Values	Remarks
[VIEW] (implied)	cdata		Any term used for a realization of a view-concept. With it text-elements could be included or excluded in view of an editor or a processing engine.
[S] (implied)	cdata		Signatur. Used to store the calculated signature of an element (e.g. CRC)
[T] (implied)	cdata	dd-mm-yyyyThh:mm:ss dd/mm/yyyyThh:mm:ss dd mm yyyyThh:mm:ss	Timestamp

2.47 SW-COMPONENT-SPEC

Description

In the *PaCo* use case **<SW-COMPONENT-SPEC>** includes a list of **<SW-FEATURE>** which is equal with a list of all ECU-Functions that are documented in this *PaCo*-File

The link from the calibartion-items to a ECU-Function is built with a **<SW-FEATURE-REF>** in every **<SW-INSTANCE>**

Example

```
<SW-COMPONENT-SPEC><SW-COMPONENTS>
    <SW-FEATURE><LONG-NAME>Abgasrueckfuehrung</LONG-NAME>
        <SHORT-NAME>AGR</SHORT-NAME>
    </SW-FEATURE>
    <SW-FEATURE><LONG-NAME>Assembler-Funktion</LONG-NAME>
        <SHORT-NAME>fkt_ASS</SHORT-NAME>
        <ADMIN-DATA>
            <LANGUAGE></LANGUAGE>
            <DOC-REVISIONS>
                <DOC-REVISION>
                    <COMPANY-REVISION-INFOS>
                        <COMPANY-REVISION-INFO>
                            <COMPANY-REF>company-not-available</COMPANY-REF>
                            <REVISION-LABEL>17.3</REVISION-LABEL>
                            <STATE>erzeugt-aus-DAMOS</STATE>
                        </COMPANY-REVISION-INFO>
                    </COMPANY-REVISION-INFOS>
                    <TEAM-MEMBER-REF>company-not-available/team-member-not-available</TEAM-MEMBER-REF>

                    <DATE>2001.07.16</DATE>
                    <MODIFICATIONS>
                        <MODIFICATION TYPE="content-related">
                            <CHANGE></CHANGE>
                            <REASON></REASON>
                        </MODIFICATION>
                    </MODIFICATIONS>
                </DOC-REVISION>
            </DOC-REVISIONS>
        </ADMIN-DATA>
    </SW-FEATURE>
</SW-COMPONENTS>
</SW-COMPONENT-SPEC>
```

Properties

Used in: Chapter 2.67 SW-SYSTEM p. 73

Content: Chapter 2.48 SW-COMPONENTS p. 50

SW-COMPONENT-SPEC~ — SW-COMPONENTS~ ->

Attribute	Type	Legal Values	Remarks
[VIEW] (implied)	cdata		Any term used for a realization of a view-concept. With it tex-telements could be included or excluded in view of an editor or a processing engine.
[S] (implied)	cdata		Signatur. Used to store the calculated signature of an element (e.g. CRC)
[T] (implied)	cdata	dd-mm-yyyyThh:mm:ss dd/mm/yyyyThh:mm:ss dd mm yyyyThh:mm:ss	Timestamp

2.48 SW-COMPONENTS

Description In the *PaCo* use case the **<SW-COMPONENTS>** is a container for **<SW-FEATURE>**

Example For an example, see Chapter 2.47 SW-COMPONENT-SPEC p. 49.

Properties Used in: Chapter 2.47 SW-COMPONENT-SPEC p. 49

Content: Chapter 2.60 SW-FEATURE p. 59

SW-COMPONENTS~ —* SW-FEATURE~ ->

Attribute	Type	Legal Values	Remarks
[VIEW] (implied)	cdata		Any term used for a realization of a view-concept. With it tex-telements could be included or excluded in view of an editor or a processing engine.
[S] (implied)	cdata		Signatur. Used to store the calculated signature of an element (e.g. CRC)
[T] (implied)	cdata	dd-mm-yyyyThh:mm:ss dd/mm/yyyyThh:mm:ss dd mm yyyyThh:mm:ss	Timestamp

2.49 SW-CS-DATA-IDENTIFIER

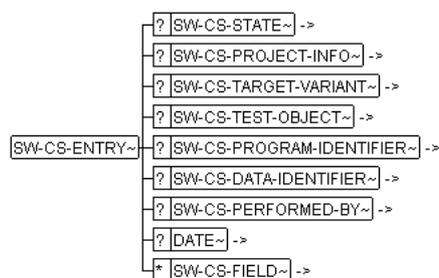**Description** **<SW-CS-DATA-IDENTIFIER>** denotes an identification string for the data version in which the calibration item was set to its current contents.

Example For an example, see Chapter 2.52 SW-CS-HISTORY p. 53.

Properties   Used in: SW-CS-ENTRY p. 51

Content: Text

Attribute	Type	Legal Values	Remarks
[VIEW] (implied)	cdata		Any term used for a realization of a view-concept. With it tex-telements could be included or excluded in view of an editor or a processing engine.
[S] (implied)	cdata		Signatur. Used to store the calculated signature of an element (e.g. CRC)
[T] (implied)	cdata	dd-mm-yyyyThh:mm:ss dd/mm/yyyyThh:mm:ss dd mm yyyyThh:mm:ss	Timestamp

2.50   SW-CS-ENTRY

Description   **<SW-CS-ENTRY>** is one particular entry in the calibration history.

Instruction:

If a calibration item contains no **<SW-CS-STATE>** the reading system has to interpret this as a calibration item with the lowest possible state.

Example   For an example, see Chapter 2.52 SW-CS-HISTORY p. 53.

Properties   Used in: SW-CS-HISTORY p. 53

Content: SW-CS-STATE p. 56,   SW-CS-PROJECT-INFO p. 55,   SW-CS-TARGET-VARIANT p. 57,   SW-CS-TEST-OBJECT p. 57,   SW-CS-PROGRAM-IDENTIFIER p. 54, SW-CS-DATA-IDENTIFIER p. 50,   SW-CS-PERFORMED-BY p. 54,   DATE p. 23,   SW-CS-FIELD p. 52

Attribute	Type	Legal Values	Remarks
[VIEW] (implied)	cdata		Any term used for a realization of a view-concept. With it tex-telements could be included or excluded in view of an editor or a processing engine.
[S] (implied)	cdata		Signatur. Used to store the calculated signature of an element (e.g. CRC)
[T] (implied)	cdata	dd-mm-yyyyThh:mm:ss dd/mm/yyyyThh:mm:ss dd mm yyyyThh:mm:ss	Timestamp

2.51   SW-CS-FIELD

Description   **<SW-CS-FIELD>** can be used to declare any kind of application-information. The semantic must be declared in **[SI]** .

Example   For an example, see Chapter 2.52 SW-CS-HISTORY p. 53.

Properties   Used in: SW-CS-ENTRY p. 51

Content: Text

SW-CS-FIELD~ ── #PCDATA

Attribute	Type	Legal Values	Remarks
[SI] (implied)	cdata		Description of the semantic meaning of an element.
[VIEW] (implied)	cdata		Any term used for a realization of a view-concept. With it tex-telements could be included or excluded in view of an editor or a processing engine.
[S] (implied)	cdata		Signatur. Used to store the calculated signature of an element (e.g. CRC)
[T] (implied)	cdata	dd-mm-yyyyThh:mm:ss dd/mm/yyyyThh:mm:ss dd mm yyyyThh:mm:ss	Timestamp

2.52   SW-CS-HISTORY

Description

<SW-CS-HISTORY> allows to track the history of the calibration process for one particular calibration item as well as for the entire calibration list. The history therefore allows to keep more than one history entry.

Instruction:

In case of a missing index the last inserted history entry must be on the bottom. This is very important because after a copy operation the value in **<DATE>** must not be equal with the date when the entry was inserted. A reading calibration system has to interpret the last **<SW-CS-ENTRY>** as the youngest not the one with the nearest value in **<DATE>**.

Example

```
<SW-CS-HISTORY>
   <SW-CS-ENTRY>
      <SW-CS-STATE>calibrated</SW-CS-STATE>
      <SW-CS-CONTEXT>development of demo version</SW-CS-CONTEXT>
      <SW-CS-PROJECT-INFO>Demo-Project CDF / ASAM-MCD-2D</SW-CS-PROJECT-INFO>
      <SW-CS-TARGET-VARIANT>automatic gear</SW-CS-TARGET-VARIANT>
      <SW-CS-TEST-OBJECT>Vehicle: S-Nn-4455</SW-CS-TEST-OBJECT>
      <SW-CS-PROGRAM-IDENTIFIER>67985</SW-CS-PROGRAM-IDENTIFIER>
      <SW-CS-DATA-IDENTIFIER>67985:123.4</SW-CS-DATA-IDENTIFIER>
      <SW-CS-PERFORMED-BY>Weichel</SW-CS-PERFORMED-BY>
      <REMARK>
        <P>Note that we did not really calibrate this. The current
           structure is for demonstration purposes only.
        </P>
      </REMARK>
      <DATE>2001.05.18T13.23</DATE>
      <SW-CS-FIELD SI="feeling">We did feel good while doing this stuff.</SW-CS-FIELD>
   </SW-CS-ENTRY>
</SW-CS-HISTORY>
```

Properties

Used in: SW-INSTANCE-PROPS-VARIANT p. 68; Chapter 2.66 SW-INSTANCE-TREE p. 71

Content: SW-CS-ENTRY p. 51

SW-CS-HISTORY~ —— * SW-CS-ENTRY~ ->

Attribute	Type	Legal Values	Remarks
[VIEW] (implied)	cdata		Any term used for a realization of a view-concept. With it tex-telements could be included or excluded in view of an editor or a processing engine.
[S] (implied)	cdata		Signatur. Used to store the calculated signature of an element (e.g. CRC)
[T] (implied)	cdata	dd-mm-yyyyThh:mm:ss dd/mm/yyyyThh:mm:ss dd mm yyyyThh:mm:ss	Timestamp

Implement PaCo V2.1 based on ASAM-MCD-2MC 2.2

SW-CS-PROGRAM-IDENTIFIER

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Version: 2.1.1
Date: 26.07.2006
State: freigegeben

2.53 SW-CS-PERFORMED-BY

Description   **<SW-CS-PERFORMED-BY>** specifies the particular individual which assigned the current calibration state. Although this could be a reference to **<TEAM-MEMBER>**, it is simply a string. This is because data might be copied from project to project, which would make the formal reference invalid.

Example   For an example, see .

Properties   Used in:

Content: Text

```
SW-CS-PERFORMED-BY~ ── #PCDATA
```

Attribute	Type	Legal Values	Remarks
[VIEW] (implied)	cdata		Any term used for a realization of a view-concept. With it tex-telements could be included or excluded in view of an editor or a processing engine.
[S] (implied)	cdata		Signatur. Used to store the calculated signature of an element (e.g. CRC)
[T] (implied)	cdata	dd-mm-yyyyThh:mm:ss dd/mm/yyyyThh:mm:ss dd mm yyyyThh:mm:ss	Timestamp

2.54 SW-CS-PROGRAM-IDENTIFIER

Description   **<SW-CS-PROGRAM-IDENTIFIER>** denotes the identifier of the ECU program which was used while calibrating the current calibration item up to the state of the current calibration history.

To some extent, this should give the basis to determine the matching *ASAM-2-MC* file.

Example   For an example, see .

Properties   Used in:

Content: Text

```
SW-CS-PROGRAM-IDENTIFIER~ ── #PCDATA
```

Attribute	Type	Legal Values	Remarks
[VIEW] (implied)	cdata		Any term used for a realization of a view-concept. With it tex-telements could be included or excluded in view of an editor or a processing engine.
[S] (implied)	cdata		Signatur. Used to store the calculated signature of an element (e.g. CRC)
[T] (implied)	cdata	dd-mm-yyyyThh:mm:ss dd/mm/yyyyThh:mm:ss dd mm yyyyThh:mm:ss	Timestamp

2.55   SW-CS-PROJECT-INFO

Description   **<SW-CS-PROJECT-INFO>** allows to denote a project identifier in order to specify the project in which the current calibration state was achieved. This makes sense, because, calibration items can be copied from one project to another. Therefore the information in **<PROJECT-DATA>** is not sufficient for this use case.

Example   For an example, see Chapter 2.52 SW-CS-HISTORY p. 53.

Properties   Used in: SW-CS-ENTRY p. 51

Content: Text

```
SW-CS-PROJECT-INFO~ #PCDATA
```

Attribute	Type	Legal Values	Remarks
[VIEW] (implied)	cdata		Any term used for a realization of a view-concept. With it tex-telements could be included or excluded in view of an editor or a processing engine.
[S] (implied)	cdata		Signatur. Used to store the calculated signature of an element (e.g. CRC)
[T] (implied)	cdata	dd-mm-yyyyThh:mm:ss dd/mm/yyyyThh:mm:ss dd mm yyyyThh:mm:ss	Timestamp

2.56   SW-CS-STATE

Description   **<SW-CS-STATE>** is used to denote the current state of the calibration item. For the sake of worldwide uniform standard calibration state labels the state labels and their meaning must be fixed. Table 3 describes the legal values for calibration states.

Table 3: Legal values of <SW-CS-STATE> in PaCo-Usecase

Value	Calibration progress	Meaning
---	0%	Label/function is untouched.
changed	0%	Label/function was changed without evaluation.
prelimCalibrated	25%	Label/function contains default data, no calibration performed.
calibrated	50%	Label/function is partly calibrated or contains data from variant without any evaluation.
checked	75%	Label/function is calibrated, final validation still has to come. Data is expected to be production intend.
completed	100%	Label/function is completely calibrated, final validation is done.

Instruction:

If a calibration item contains no **<SW-CS-STATE>** the reading system has to interpret this as a calibration item with the lowest possible state!

Example
```
<SW-CS-STATE>calibrated<SW-CS-STATE>
```
For a further example, see SW-CS-HISTORY p. 53.

Properties   Used in: SW-CS-ENTRY p. 51

Content: Text

SW-CS-STATE~ — #PCDATA

Attribute	Type	Legal Values	Remarks
[VIEW] (implied)	cdata		Any term used for a realization of a view-concept. With it tex-telements could be in-cluded or excluded in view of an editor or a processing engine.
[S] (implied)	cdata		Signatur. Used to store the calculated signa-ture of an element (e.g. CRC)
[T] (implied)	cdata	dd-mm-yyyyThh:mm:ss dd/mm/yyyyThh:mm:ss dd mm yyyyThh:mm:ss	Timestamp

2.57 SW-CS-TARGET-VARIANT

Description   **<SW-CS-TARGET-VARIANT>** is used to specify the variant of the target system which was used to achieve the current calibration state.

Example   For an example, see Chapter 2.52 SW-CS-HISTORY p. 53.

Properties   Used in: SW-CS-ENTRY p. 51

Content: Text

SW-CS-TARGET-VARIANT~├─#PCDATA

Attribute	Type	Legal Values	Remarks
[VIEW] (implied)	cdata		Any term used for a realization of a view-concept. With it tex-telements could be included or excluded in view of an editor or a processing engine.
[S] (implied)	cdata		Signatur. Used to store the calculated signature of an element (e.g. CRC)
[T] (implied)	cdata	dd-mm-yyyyThh:mm:ss dd/mm/yyyyThh:mm:ss dd mm yyyyThh:mm:ss	Timestamp

2.58 SW-CS-TEST-OBJECT

Description   **<SW-CS-TEST-OBJECT>** denotes the object witin the the current calibration item was calibrated. This is mainly a vehicle or a particular test environment.

Example   For an example, see Chapter 2.52 SW-CS-HISTORY p. 53.

Properties   Used in: SW-CS-ENTRY p. 51

Content: Text

SW-CS-TEST-OBJECT~├─#PCDATA

Attribute	Type	Legal Values	Remarks
[VIEW] (implied)	cdata		Any term used for a realization of a view-concept. With it tex-telements could be included or excluded in view of an editor or a processing engine.
[S] (implied)	cdata		Signatur. Used to store the calculated signature of an element (e.g. CRC)
[T] (implied)	cdata	dd-mm-yyyyThh:mm:ss dd/mm/yyyyThh:mm:ss dd mm yyyyThh:mm:ss	Timestamp

2.59 SW-DATA-DICTIONARY-SPEC

Description

In the *PaCo* use case the **<DATA-DICTIONARY-SPEC>** is a container for **<SW-UNITS>**.

In the *ASAM-2-MC* use case much more information about particular data objects are kept here.

Example

```
<SW-DATA-DICTIONARY-SPEC><SW-UNITS>
        <SW-UNIT><SHORT-NAME>1_057sec</SHORT-NAME>
            <SW-UNIT-DISPLAY>1/sec</SW-UNIT-DISPLAY>
            <SI-UNIT>tbd</SI-UNIT>
        </SW-UNIT>
        <SW-UNIT><SHORT-NAME>dez</SHORT-NAME>
            <SW-UNIT-DISPLAY>dez</SW-UNIT-DISPLAY>
            <SI-UNIT>tbd</SI-UNIT>
        </SW-UNIT>
        <SW-UNIT><SHORT-NAME>digital</SHORT-NAME>
            <SW-UNIT-DISPLAY>digital</SW-UNIT-DISPLAY>
            <SI-UNIT>tbd</SI-UNIT>
        </SW-UNIT>
        <SW-UNIT><SHORT-NAME>grad_040C</SHORT-NAME>
            <SW-UNIT-DISPLAY>grad C</SW-UNIT-DISPLAY>
            <SI-UNIT>tbd</SI-UNIT>
        </SW-UNIT>
        <SW-UNIT><SHORT-NAME>Grad_040KW</SHORT-NAME>
            <SW-UNIT-DISPLAY>Grad KW</SW-UNIT-DISPLAY>
            <SI-UNIT>tbd</SI-UNIT>
        </SW-UNIT>
        <SW-UNIT><SHORT-NAME>grad_040KW</SHORT-NAME>
            <SW-UNIT-DISPLAY>grad KW</SW-UNIT-DISPLAY>
            <SI-UNIT>tbd</SI-UNIT>
        </SW-UNIT>
        <SW-UNIT><SHORT-NAME>kg_057h</SHORT-NAME>
            <SW-UNIT-DISPLAY>kg/h</SW-UNIT-DISPLAY>
            <SI-UNIT>tbd</SI-UNIT>
        </SW-UNIT>
    </SW-UNITS>
</SW-DATA-DICTIONARY-SPEC>
```

Properties

Used in: SW-SYSTEM p. 73

Content: SW-UNITS p. 80

```
SW-DATA-DICTIONARY-SPEC~ — ? SW-UNITS~ ->
```

Attribute	Type	Legal Values	Remarks
[VIEW] (implied)	cdata		Any term used for a realization of a view-concept. With it tex-telements could be included or excluded in view of an editor or a processing engine.
[S] (implied)	cdata		Signatur. Used to store the calculated signature of an element (e.g. CRC)
[T] (implied)	cdata	dd-mm-yyyyThh:mm:ss dd/mm/yyyyThh:mm:ss dd mm yyyyThh:mm:ss	Timestamp

2.60   SW-FEATURE

Description   In the *PaCo* use cases **<SW-FEATURE>**describes a particular function of the software with respect of the calibration items being introduced.

Example   For an example, see Chapter 2.47 SW-COMPONENT-SPEC p. 49.

Properties   Used in Chapter 2.48 SW-COMPONENTS p. 50

Content LONG-NAME p. 31, SHORT-NAME p. 42, ADMIN-DATA p. 12

Attribute	Type	Legal Values	Remarks
[ID] (required)	id		Clear identification of an element inside a document.
[VIEW] (implied)	cdata		Any term used for a realization of a view-concept. With it tex-telements could be included or excluded in view of an editor or a processing engine.
[S] (implied)	cdata		Signatur. Used to store the calculated signature of an element (e.g. CRC)
[T] (implied)	cdata	dd-mm-yyyyThh:mm:ss dd/mm/yyyyThh:mm:ss dd mm yyyyThh:mm:ss	Timestamp

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SW-FEATURE-REF

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Attribute	Type	Legal Values	Remarks
[F-ID-CLASS] (fixed)	nmtoken	SW-FEATURE	Fixed ID Class. The value of this attribute classifies links and link targets. This expresses the semantic constraint that a link can only link to an object of the same class. E.g. a link: **< TEAM-MEMBER-REF IDREF="ID1" F-ID-CLASS="TEAM-MEM-BER">**...**</ TEAM-MEMBER- REF>** can only link to an object which is classified as "TEAM-MEM-BER" like: **<TEAM-MEMBER ID="ID1" F-ID-CLASS=" TEAM-MEMBER">**...**</ TEAM-MEMBER>**.
[F-NAMESPACE] (fixed)	nmtokens	SW-ADDR-METHOD SW-AXIS-TYPE SW-BASE-TYPE SW-CLASS-INSTANCE SW-CODE-SYNTAX SW-COMPU-METHOD SW-DATA-CONSTR SW-CAL-PRM SW-RECORD-LAYOUT SW-SYS-TEM-CONST SW-TEMPLATE SW-UNIT SW-VARIABLE	Fixed Namespace. This attribute is placed on elements which define a namespace for linkable objects. The attribute contains a list of elements for which the element carriing the attribute is a namespace. This is used by processors which use the MSR natural linking mechanism. (Natural links address their link target with a sequence of short-names of the namesspaces and the object itself e.g. '/test.xml/sw-system1/ sw-var1')

2.61 SW-FEATURE-REF

Description   **<SW-FEATURE-REF>** in **<SW-INSTANCE >** can be used to build a link to a **<SW-FEATURE>**. This feature can be used by an process linking from the calibration item to the related feature (particular function of the software).

Caution:

The content of **<SW-FEATURE-REF>** must follow the restrictions of **<SHORT-NAME>**, in particular must not contain whitespace and special characters.

Example   For an example, see Chapter 2.65 SW-INSTANCE-SPEC p. 70.

Properties   Used in Chapter 2.62 SW-INSTANCE p. 62, Chapter 2.66 SW-INSTANCE-TREE p. 71

Content Text

SW-FEATURE-REF~─#PCDATA

Attribute	Type	Legal Values	Remarks
[ID-REF] (required)	idref		Link on an element in the document which is marked with an ID-Attribute
[VIEW] (implied)	cdata		Any term used for a realization of a view-concept. With it text-elements could be included or excluded in view of an editor or a processing engine.
[S] (implied)	cdata		Signatur. Used to store the calculated signature of an element (e.g. CRC)
[T] (implied)	cdata	dd-mm-yyyyThh:mm:ss dd/mm/yyyyThh:mm:ss dd mm yyyyThh:mm:ss	Timestamp
[HYTIME] (fixed)	nmtoken	CLINK	HYTIME is the standard attribute to define a HYTIME architecural form. This functionality defined in ISO 10744 HYTIME (Hypermedia/ Time-based Structuring Language). This enables to use a generic architectural form processor for link processing and traversion.

Attribute	Type	Legal Values	Remarks
[HYNAMES] (fixed)	nmtokens	LINKEND ID-REF	HYNAMES is a mapping functionality defined in ISO 10744 HYTIME (Hypermedia/Time-based Structuring Language) The names of the locator attributes e.g. ID-REF used to address the target of a hyperlink can be mapped to names defined in the HYTIME standard, that is LINKEND. This enables to use a generic architectural form processor for link processing and traversion.
[F-ID-CLASS] (fixed)	nmtoken	SW-FEATURE	Fixed ID Class. The value of this attribute classifies links and link targets. This expresses the semantic constraint that a link can only link to an object of the same class. E.g. a link: **< TEAM-MEMBER-REF IDREF="ID1" F-ID-CLASS="TEAM-MEMBER">**...**</ TEAM-MEMBER- REF>** can only link to an object which is classified as "TEAM-MEMBER" like: **<TEAM-MEMBER ID="ID1" F-ID-CLASS=" TEAM-MEMBER">**...**</ TEAM-MEMBER>**.

2.62   SW-INSTANCE

Description   **<SW-INSTANCE>** represents one particular calibration item. With the possibility to include an **< SW-INSTANCE>** in an **<SW-INSTANCE>** hierarchical structures can be mapped. This mechanism is used to implement classes in *PaCo*.

<CATEGORY> in **<SW-INSTANCE>** shall reflect the nature of the instance according to asam 1.4 with extensions. In addition zu asam 1.4 the value *SW_COMPONENT* is used to store meta-data represented by a **<SW-CS-HISTORY>** tree.

Table 4: Legal values of <CATEGORY> in <SW-INSTANCE>

Value	Meaning	Remark
SW_COMPONENT	Specific ECU function	This is used to store meta data for a specific ECU function in the according dataset described by the whole SW-INSTANCE-TREE.
VALUE	Characteristic value	This represents a single value.
CURVE_INDIVIDUAL	Characteristic	This represents a curve with an embedded axis.
MAP_INDIVIDUAL	Map	This represents a map with embedded axes.
CURVE_FIXED	Fixed characteristic	This represents a curve of which the axis are calculated by the ecu-program. The algorithm is fixed and therefore the axis-points can not be calibrated.
MAP_FIXED	Fixed map	This represents a map of which the axes are calculated by the ecu-program. The algorithm is fixed and therefore the axis-points can not be calibrated.
CURVE_GROUPED	Group characteristic	This represents a curve which uses the axis-points of another calibration parameter.
		Because the *PaCo*-Format does not include the grouped axis there must be implemented some special algorithms in the Tools.
		When a *PaCo*-File is read the axis values must be compared with the values of the group axis in the ASAP File and there should be no difference between those both.
		When a *PaCo*-File is written the values of the group axis must be written for every calibration item that needs the axis.
MAP_GROUPED	Group map	This represents a map which uses the axis-points of another calibration parameter.
		Because the *PaCo*-Format does not include the grouped axis there must be implemented some special algorithms in the Tools.
		When a *PaCo*-File is read the axis values must be compared with the values of the group axis in the ASAP File and there should be no difference between those both.
		When a *PaCo*-File is written the values of the group axis must be written for every calibration item that needs the axis.
ASCII	Characteristic text	This represents a parameter which is text (e.g. a message).
STRUCTURE	Parameter structure	This represents a structure of calibration parameters. In this case, a nested **<SW-INSTANCE>** should exist.
		This **<CATEGORY>** is also used to represent an instance of a parameter class. In this case for each **<SW-INSTANCE>** representing a class structure and including other **<SW-INSTANCE>** this **<CATEGORY>** is mandatory. The **<CATEGORY>** of the "terminal" **<SW-INSTANCE>** reflects the data type represented by this terminal (see Figure 4 SW-INSTANCE with classes p. 66)
VALUE_BLOCK	Characteristic values block	This represents a homogeneous set of parameters which are handled as a block. In opposite to structures or arrays, the components of a value block appear whithin one particular **<SW-INSTANCE>** in the instance tree. This means, that every value of the first axis is interpreted as a block value.
AXIS_VALUES	Group datapoints	This represents the axis points of a calibration parameter. This means, that the values of of the first axis are interpreted as a group axis.

Hint:

For **<SW-INSTANCE>** representing a ECU function(**<CATEGORY >**= SW_COMPONENT) the **<SHORT-NAME>**and the **<SW-FEATURE-REF>** must contain the name of the ECU function and will be equal.

Hint:

For the calibration items of types *CURVE_FIXED*, *MAP_FIXED*, *CURVE_GROUPED*, *MAP_-GROUPED* the axis values of the source dataset **must** be included in the *PaCo* file as redundant information, even if they are already defined in another calibration item or calculated by the ECU. This information can be used to detect incompatibilities when data is copied from one project to another. It can also be use te reinterpolate the values according to new axis points if appropriate.

Hint:

If the **<SW-INSTANCE>** represents a class structure, then hierarchical levels must be implemented top down starting with the root.

The implementation of classes with the **<CATEGORY>** *STRUCTURE* might be replaced in the next PaCo release with the new **<CATEGORY>** *value CLASS_INSTANCE.*

Example

```
<SW-INSTANCE>
  <LONG-NAME>lazy bears from somewhere (Viktualienmarkt)</LONG-NAME>
  <SHORT-NAME>FBAM_V</SHORT-NAME>
  <CATEGORY>MAP</CATEGORY>
  <SW-FEATURE-REF>FEATURE1</SW-FEATURE-REF>
    <SW-INSTANCE-PROPS-VARIANTS>
      <SW-INSTANCE-PROPS-VARIANT>
        <SW-AXIS-CONTS>
          <SW-AXIS-CONT>
            <SW-UNIT-REF>grad_040C</SW-UNIT-REF>
            <SW-AXIS-INDEX>1</SW-AXIS-INDEX>
            <SW-VALUES-PHYS>
              <V>10</V>
              <V>13</V>
              <V>15</V>
              <V>30</V>
            </SW-VALUES-PHYS>
          </SW-AXIS-CONT>
          <SW-AXIS-CONT>
            <SW-UNIT-REF>grad_040C</SW-UNIT-REF>
            <SW-AXIS-INDEX>2</SW-AXIS-INDEX>
            <SW-VALUES-PHYS>
              <V>-35.6</V>
              <V>-32.0</V>
            </SW-VALUES-PHYS>
          </SW-AXIS-CONT>
          <SW-AXIS-CONT>
            <SW-UNIT-REF>km_pro_h</SW-UNIT-REF>
            <SW-AXIS-INDEX>0</SW-AXIS-INDEX>
            <SW-VALUES-PHYS>
              <VG>
               <LABEL>-35.6</LABEL>
               <V>0.00</V>
               <V>3.63</V>
               <V>3.75</V>
               <V>3.88</V>
              </VG>
              <VG>
               <LABEL>-32.0</LABEL>
               <V>0.00</V>
               <V>3.63</V>
               <V>3.75</V>
               <V>3.88</V>
              </VG>
            </SW-VALUES-PHYS>
          </SW-AXIS-CONT>
        </SW-AXIS-CONTS>
        <SW-CS-HISTORY>
          <SW-CS-ENTRY>
            <SW-CS-STATE>calibrated</SW-CS-STATE>
            <SW-CS-CONTEXT>development of demo version</SW-CS-CONTEXT>
            <SW-CS-PROJECT-INFO>Demo-Project CDF / ASAM-MCD-2D</SW-CS-PROJECT-INFO>
            <SW-CS-TARGET-VARIANT>automatic gear</SW-CS-TARGET-VARIANT>
            <SW-CS-TEST-OBJECT>Vehicle: S-Nn-4455</SW-CS-TEST-OBJECT>
            <SW-CS-PROGRAM-IDENTIFIER>67985</SW-CS-PROGRAM-IDENTIFIER>
            <SW-CS-DATA-IDENTIFIER>67985:123.4</SW-CS-DATA-IDENTIFIER>
            <SW-CS-PERFORMED-BY>Weichel</SW-CS-PERFORMED-BY>
            <REMARK>
              <P>Note that we did not really calibrate this. The current
                 structure is for demonstration purposes only.
              </P>
            </REMARK>
            <DATE>2001.05.18T13.23</DATE>
            <SW-CS-FIELD SI="feeling">We did feel good while doing this stuff.</SW-CS-FIELD>
          </SW-CS-ENTRY>
        </SW-CS-HISTORY>
      </SW-INSTANCE-PROPS-VARIANT>
    </SW-INSTANCE-PROPS-VARIANTS>
</SW-INSTANCE>
```
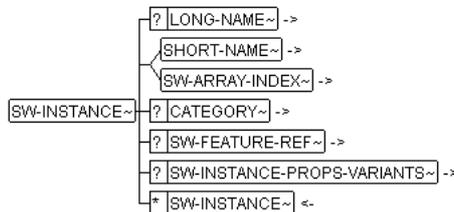
Figure 3: SW-INSTANCES without classes

The next example shows an instance (SENSOR1) of a class with consists of another class instance (LEFTSIDE) with two components: (DHSJE, FBAM).

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```
<SW-INSTANCE>
 <SHORT-NAME>SENSOR1</SHORT-NAME>
 <CATEGORY>STRUCTURE</CATEGORY>
 <SW-FEATURE-REF>FEATURE1</SW-FEATURE-REF>
   <SW-INSTANCE>
   <SHORT-NAME>LEFTSIDE</SHORT-NAME>
   <CATEGORY>STRUCTURE</CATEGORY>
   <SW-FEATURE-REF>FEATURE1</SW-FEATURE-REF>
     <SW-INSTANCE>
     <SHORT-NAME>DHSJE</SHORT-NAME>
     <CATEGORY>VALUE</CATEGORY>
     <SW-FEATURE-REF>FEATURE1</SW-FEATURE-REF>
       <SW-INSTANCE-PROPS-VARIANTS>
         <SW-INSTANCE-PROPS-VARIANT>
          <SW-AXIS-CONTS>
            <SW-AXIS-CONT>
             <SW-AXIS-INDEX>0</SW-AXIS-INDEX>
             <SW-VALUES-PHYS>
               <V>4000.00000</V>
             </SW-VALUES-PHYS>
            </SW-AXIS-CONT>
          </SW-AXIS-CONTS>
          <SW-CS-HISTORY>
           <SW-CS-ENTRY>
            <SW-CS-STATE>calibrated</SW-CS-STATE>
            <SW-CS-DATA-IDENTIFIER>grimm</SW-CS-DATA-IDENTIFIER>
            <SW-CS-PERFORMED-BY>Baumann</SW-CS-PERFORMED-BY>
            <DATE>2002.05.03 T16:16:00</DATE>
           </SW-CS-ENTRY>
           <SW-CS-ENTRY>
            <SW-CS-STATE>completed</SW-CS-STATE>
            <SW-CS-DATA-IDENTIFIER>grimm</SW-CS-DATA-IDENTIFIER>
            <SW-CS-PERFORMED-BY>Baumann</SW-CS-PERFORMED-BY>
            <DATE>2002.05.03 T16:15:00</DATE>
           </SW-CS-ENTRY>
          </SW-CS-HISTORY>
         </SW-INSTANCE-PROPS-VARIANT>
       </SW-INSTANCE-PROPS-VARIANTS>
     </SW-INSTANCE>

   <SW-INSTANCE>
    <LONG-NAME>lazy bears from somewhere (Viktualienmarkt)</LONG-NAME>
    <SHORT-NAME>FBAM_V</SHORT-NAME>
    <CATEGORY>MAP</CATEGORY>
    <SW-FEATURE-REF>FEATURE1</SW-FEATURE-REF>
      <SW-INSTANCE-PROPS-VARIANTS>
        <SW-INSTANCE-PROPS-VARIANT>
         <SW-AXIS-CONTS>
           <SW-AXIS-CONT>
             <SW-UNIT-REF>grad_040C</SW-UNIT-REF>
             <SW-AXIS-INDEX>1</SW-AXIS-INDEX>
             <SW-VALUES-PHYS>
               <V>10</V>
               <V>13</V>
               <V>15</V>
               <V>30</V>
             </SW-VALUES-PHYS>
           </SW-AXIS-CONT>
           <SW-AXIS-CONT>
             <SW-UNIT-REF>grad_040C</SW-UNIT-REF>
             <SW-AXIS-INDEX>2</SW-AXIS-INDEX>
             <SW-VALUES-PHYS>
               <V>-35.6</V>
               <V>-32.0</V>
             </SW-VALUES-PHYS>
           </SW-AXIS-CONT>
           <SW-AXIS-CONT>
             <SW-UNIT-REF>km_pro_h</SW-UNIT-REF>
             <SW-AXIS-INDEX>0</SW-AXIS-INDEX>
             <SW-VALUES-PHYS>
               <VG>
                 <LABEL>-35.6</LABEL>
                 <V>0.00</V>
                 <V>3.63</V>
                 <V>3.75</V>
                 <V>3.88</V>
               </VG>
               <VG>
                 <LABEL>-32.0</LABEL>
                 <V>0.00</V>
                 <V>3.63</V>
                 <V>3.75</V>
                 <V>3.88</V>
               </VG>
             </SW-VALUES-PHYS>
           </SW-AXIS-CONT>
         </SW-AXIS-CONTS>
         <SW-CS-HISTORY>
          <SW-CS-ENTRY>
           <SW-CS-STATE>calibrated</SW-CS-STATE>
           <SW-CS-CONTEXT>development of demo version</SW-CS-CONTEXT>
           <SW-CS-PROJECT-INFO>Demo-Project CDF / ASAM-MCD-2D</SW-CS-PROJECT-INFO>
           <SW-CS-TARGET-VARIANT>automatic gear</SW-CS-TARGET-VARIANT>
```
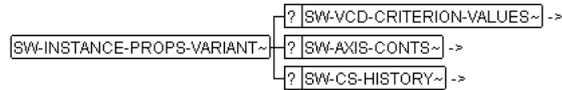
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SW-INSTANCE

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```
<SW-INSTANCE>
  <SHORT-NAME>ACIFI</SHORT-NAME>
  <CATEGORY>SW_COMPONENT</CATEGORY>
  <SW-FEATURE-REF>ACIFI</SW-FEATURE-REF>
  <SW-INSTANCE-PROPS-VARIANTS>
    <SW-INSTANCE-PROPS-VARIANT>
      <SW-CS-HISTORY>
        <SW-CS-ENTRY>
          <SW-CS-STATE>calibrated</SW-CS-STATE>
          <SW-CS-DATA-IDENTIFIER>grimm</SW-CS-DATA-IDENTIFIER>
          <SW-CS-PERFORMED-BY>Baumann</SW-CS-PERFORMED-BY>
          <DATE>2002.05.03 T16:16:00</DATE>
        </SW-CS-ENTRY>
        <SW-CS-ENTRY>
          <SW-CS-STATE>completed</SW-CS-STATE>
          <SW-CS-DATA-IDENTIFIER>grimm</SW-CS-DATA-IDENTIFIER>
          <SW-CS-PERFORMED-BY>Baumann</SW-CS-PERFORMED-BY>
          <DATE>2002.05.03 T16:15:00</DATE>
        </SW-CS-ENTRY>
      </SW-CS-HISTORY>
    </SW-INSTANCE-PROPS-VARIANT>
  </SW-INSTANCE-PROPS-VARIANTS>
</SW-INSTANCE>
```

Figure 5: SW-INSTANCE representing ECU function metadata

Properties

Used in: SW-INSTANCE-TREE p. 71

Content: LONG-NAME p. 31, SHORT-NAME p. 42, SW-ARRAY-INDEX p. 46, SW-FEATURE-REF p. 60, CATEGORY p. 13, SW-INSTANCE-PROPS-VARIANTS p. 69

Attribute	Type	Legal Values	Remarks
[ID] (required)	id		Clear identification of an element inside a document.
[VIEW] (implied)	cdata		Any term used for a realization of a view-concept. With it tex-telements could be included or excluded in view of an editor or a processing engine.
[S] (implied)	cdata		Signatur. Used to store the calculated signature of an element (e.g. CRC)
[T] (implied)	cdata	dd-mm-yyyyThh:mm:ss dd/mm/yyyyThh:mm:ss dd mm yyyyThh:mm:ss	Timestamp

Attribute	Type	Legal Values	Remarks
[F-ID-CLASS] (fixed)	nmtoken	SW-INSTANCE	Fixed ID Class. The value of this attribute classifies links and link targets. This expresses the semantic constraint that a link can only link to an object of the same class. E.g. a link: **< TEAM-MEMBER-REF IDREF="ID1" F-ID-CLASS="TEAM-MEM-BER">**...**</ TEAM-MEMBER- REF>** can only link to an object which is classified as "TEAM-MEM-BER" like: **<TEAM-MEMBER ID="ID1" F-ID-CLASS=" TEAM-MEMBER">**...**</ TEAM-MEMBER>**.
[F-NAMESPACE] (fixed)	nmtoken	SW-INSTANCE	Fixed Namespace. This attribute is placed on elements which define a namespace for linkable objects. The attribute contains a list of elements for which the element carriing the attribute is a namespace. This is used by processors which use the MSR natural linking mechanism. (Natural links address their link target with a sequence of short-names of the namesspaces and the object itself e.g. '/test.xml/sw-system1/ sw-var1')

2.63   SW-INSTANCE-PROPS-VARIANT

Description   **<SW-INSTANCE-PROPS-VARIANT>** describes one particular variant of the current calibration item. The variants are intended to be runtime variants. This makes all variants being kept in one particular ecu software. As opposite to this, compile time variants are not kept in the ECU simultanously. Each compile time variant will end up in a *PaCo* file of its own.

Example   For an example, see

Properties   Used in:

Content:

Attribute	Type	Legal Values	Remarks
[VIEW] (implied)	cdata		Any term used for a realization of a view-concept. With it tex-telements could be included or excluded in view of an editor or a processing engine.
[S] (implied)	cdata		Signatur. Used to store the calculated signature of an element (e.g. CRC)
[T] (implied)	cdata	dd-mm-yyyyThh:mm:ss dd/mm/yyyyThh:mm:ss dd mm yyyyThh:mm:ss	Timestamp

2.64   SW-INSTANCE-PROPS-VARIANTS

Description   **<SW-INSTANCE-PROPS-VARIANTS>** is the container which takes all variants of one particular calibration item.

Example   For an example, see Chapter 2.65 SW-INSTANCE-SPEC p. 70.

Properties   Used in: SW-INSTANCE p. 62

Content: SW-INSTANCE-PROPS-VARIANT p. 68

Attribute	Type	Legal Values	Remarks
[VIEW] (implied)	cdata		Any term used for a realization of a view-concept. With it tex-telements could be included or excluded in view of an editor or a processing engine.
[S] (implied)	cdata		Signatur. Used to store the calculated signature of an element (e.g. CRC)

Attribute	Type	Legal Values	Remarks
[T] (implied)	cdata	dd-mm-yyyyThh:mm:ss dd/mm/yyyyThh:mm:ss dd mm yyyyThh:mm:ss	Timestamp

2.65 SW-INSTANCE-SPEC

Description **<SW-INSTANCE-SPEC>** is the section within a **<SW-SYSTEM>** which takes all information about the instances of data items within the ECU, in particular the calibration items.

Example:

```
<SW-INSTANCE-SPEC>
  <SW-INSTANCE-TREE><SHORT-NAME>grimm</SHORT-NAME>
    <CATEGORY>grimm</CATEGORY>
    <SW-INSTANCE><LONG-NAME>LLR-Integratorsteigung positiv</LONG-NAME>
      <SHORT-NAME>DLIP</SHORT-NAME>
      <SW-FEATURE-REF>AGR</SW-FEATURE-REF>
      <CATEGORY>CURVE_FIXED</CATEGORY>
      <SW-INSTANCE-PROPS-VARIANTS>
       <SW-INSTANCE-PROPS-VARIANT>
       <SW-AXIS-CONTS>
         <SW-AXIS-CONT>
          <SW-UNIT-REF>Upm</SW-UNIT-REF>
          <SW-AXIS-INDEX>1</SW-AXIS-INDEX>
          <SW-VALUES-PHYS>
           <V>0.0</V>
           <V>20.0</V>
           <V>40.0</V>
           <V>60.0</V>
           <V>80.0</V>
           <V>100.0</V>
          </SW-VALUES-PHYS>
         </SW-AXIS-CONT>
         <SW-AXIS-CONT>
          <SW-UNIT-REF>kg_057h_040pro_040sec</SW-UNIT-REF>
          <SW-AXIS-INDEX>0</SW-AXIS-INDEX>
          <SW-VALUES-PHYS>
           <V>1.95</V>
           <V>3.90</V>
           <V>5.85</V>
           <V>7.80</V>
           <V>9.75</V>
           <V>11.70</V>
          </SW-VALUES-PHYS>
         </SW-AXIS-CONT>
       </SW-AXIS-CONTS>
       <SW-CS-HISTORY>
        <SW-CS-ENTRY>
         <SW-CS-STATE>Prelim Calibrated</SW-CS-STATE>
         <SW-CS-PROJECT-INFO>Demo-Project PaCo-Format</SW-CS-PROJECT-INFO>
         <SW-CS-TARGET-VARIANT>z-04</SW-CS-TARGET-VARIANT>
         <SW-CS-TEST-OBJECT>t-188</SW-CS-TEST-OBJECT>
         <SW-CS-PROGRAM-IDENTIFIER>08567</SW-CS-PROGRAM-IDENTIFIER>
         <SW-CS-DATA-IDENTIFIER>grimm</SW-CS-DATA-IDENTIFIER>
         <SW-CS-PERFORMED-BY>Baumann</SW-CS-PERFORMED-BY>
         <DATE>2001.07.16 T07.33</DATE>
         <SW-CS-FIELD SI="FreeComment">Free comment of the calibrationdata</SW-CS-FIELD>
        </SW-CS-ENTRY>
        <SW-CS-ENTRY>
         <SW-CS-STATE>Checked</SW-CS-STATE>
         <SW-CS-PROJECT-INFO>Demo-Project PaCo-Format</SW-CS-PROJECT-INFO>
         <SW-CS-TARGET-VARIANT>z-06</SW-CS-TARGET-VARIANT>
         <SW-CS-TEST-OBJECT>t-188</SW-CS-TEST-OBJECT>
         <SW-CS-PROGRAM-IDENTIFIER>08567</SW-CS-PROGRAM-IDENTIFIER>
         <SW-CS-DATA-IDENTIFIER>grimm</SW-CS-DATA-IDENTIFIER>
         <SW-CS-PERFORMED-BY>Baumann</SW-CS-PERFORMED-BY>
         <SW-CS-FIELD SI="FreeComment">Free comment of the calibrationdata</SW-CS-FIELD>
         <DATE>2001.07.16 T07.34</DATE>
        </SW-CS-ENTRY>
       </SW-CS-HISTORY>
      </SW-INSTANCE-PROPS-VARIANT>
     </SW-INSTANCE-PROPS-VARIANTS>
    </SW-INSTANCE>

    ...
```
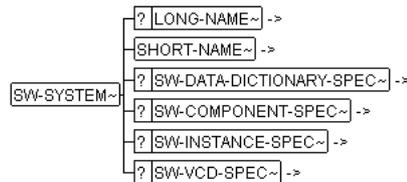
```
    </SW-INSTANCE-TREE>
  </SW-INSTANCE-SPEC>
```

Properties

Used in: SW-SYSTEM p. 73

Content: SW-INSTANCE-TREE p. 71

SW-INSTANCE-SPEC~ ─┤ * │ SW-INSTANCE-TREE~ ─»

Attribute	Type	Legal Values	Remarks
[VIEW] (implied)	cdata		Any term used for a realization of a view-concept. With it tex-telements could be included or excluded in view of an editor or a processing engine.
[S] (implied)	cdata		Signatur. Used to store the calculated signature of an element (e.g. CRC)
[T] (implied)	cdata	dd-mm-yyyyThh:mm:ss dd/mm/yyyyThh:mm:ss dd mm yyyyThh:mm:ss	Timestamp

2.66 SW-INSTANCE-TREE

Description

<SW-INSTANCE-TREE> receives one particular set of calibration items.

<CATEGORY> in **<SW-INSTANCE-TREE>** may reflect the nature of the intance tree such as test-data, adress-info, ...

As there may be multiple instance trees within one file, there may be multiple use cases to be supported:

1. multiple compile time variants

2. multiple data states

3. multiple levels of information such as test-data average data, raw data

4. ...

The instance trees may be differentiated by short-name and/or category.

Example

```
<SW-INSTANCE-SPEC>
  <INTRODUCTION>
    <P>This is the system to demonstrate, how PaCo should work.</P>
  </INTRODUCTION>
  <SW-INSTANCE-TREE><SHORT-NAME>Summertest</SHORT-NAME>
    <SW-INSTANCE ><LONG-NAME>lazy bears from somewhere (Viktualienmarkt)</LONG-NAME>
      <SHORT-NAME>FBAM_V</SHORT-NAME>

      ...

    </SW-INSTANCE>
  </SW-INSTANCE-TREE>

  <SW-INSTANCE-TREE><SHORT-NAME>Wintertest</SHORT-NAME>
    <SW-INSTANCE ><LONG-NAME>lazy bears from somewhere (Viktualienmarkt)</LONG-NAME>
      <SHORT-NAME>FBAM_V</SHORT-NAME>

      ...
```

```
      </SW-INSTANCE>
    </SW-INSTANCE-TREE>
  </SW-INSTANCE-SPEC>
```

Properties   Used in: SW-INSTANCE-SPEC p. 70

Content: SHORT-NAME p. 42,   CATEGORY p. 13,   SW-INSTANCE p. 62 ,   Chapter 2.61
SW-FEATURE-REF p. 60,   Chapter 2.52 SW-CS-HISTORY p. 53

Attribute	Type	Legal Values	Remarks
[ID] (required)	id		Clear identification of an element inside a document.
[VIEW] (implied)	cdata		Any term used for a realization of a view-concept. With it tex-telements could be included or excluded in view of an editor or a processing engine.
[S] (implied)	cdata		Signatur. Used to store the calculated signature of an element (e.g. CRC)
[T] (implied)	cdata	dd-mm-yyyyThh:mm:ss dd/mm/yyyyThh:mm:ss dd mm yyyyThh:mm:ss	Timestamp

Attribute	Type	Legal Values	Remarks
[F-ID-CLASS] (fixed)	nmtoken	SW-INSTANCE-TREE	Fixed ID Class. The value of this attribute classifies links and link targets. This expresses the semantic constraint that a link can only link to an object of the same class. E.g. a link: **< TEAM-MEMBER-REF IDREF="ID1" F-ID-CLASS="TEAM-MEMBER">**...**</ TEAM-MEMBER- REF>** can only link to an object which is classified as "TEAM-MEMBER" like: **<TEAM-MEMBER ID="ID1" F-ID-CLASS=" TEAM-MEMBER">**...**</ TEAM-MEMBER>**.
[F-NAMESPACE] (fixed)	nmtoken	SW-INSTANCE	Fixed Namespace. This attribute is placed on elements which define a namespace for linkable objects. The attribute contains a list of elements for which the element carriing the attribute is a namespace. This is used by processors which use the MSR natural linking mechanism. (Natural links address their link target with a sequence of short-names of the namesspaces and the object itself e.g. '/test.xml/sw-system1/ sw-var1')

2.67 SW-SYSTEM

Description   **<SW-SYSTEM>** describes one particular system within the current file. This supports to transfer the calibration data of multi ecu systems within one file.

Example

```
<SW-SYSTEM>
  <SHORT-NAME>DEMO</SHORT-NAME>
  <SW-INSTANCE-SPEC>
    <INTRODUCTION>
        <P>This is the system to demonstrate, how CDF should work.</P>
    </INTRODUCTION>
    <SW-INSTANCE-TREE><SHORT-NAME>Summertest</SHORT-NAME>
      <SW-INSTANCE >
```

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SW-SYSTEM

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```
        <LONG-NAME>lazy bears from somewhere (Viktualienmarkt)</LONG-NAME>
        <SHORT-NAME>FBAM_V</SHORT-NAME>
        ...
      </SW-INSTANCE>
    </SW-INSTANCE-TREE>
  </SW-INSTANCE-SPEC>
</SW-SYSTEM>
```

Properties

Used in: SW-SYSTEMS p. 75

Content: LONG-NAME p. 31,   SHORT-NAME p. 42,   SW-DATA-DICTIONARY-SPEC p. 58,   SW-COMPONENT-SPEC p. 49,   SW-INSTANCE-SPEC p. 70,   SW-VCD-SPEC p. 87

```
                          ┌?│LONG-NAME~│ ->
                          ├─│SHORT-NAME~│ ->
                          ├?│SW-DATA-DICTIONARY-SPEC~│ ->
     │SW-SYSTEM~├─────────┼?│SW-COMPONENT-SPEC~│ ->
                          ├?│SW-INSTANCE-SPEC~│ ->
                          └?│SW-VCD-SPEC~│ ->
```

Attribute	Type	Legal Values	Remarks
[ID] (required)	id		Clear identification of an element inside a document.
[VIEW] (implied)	cdata		Any term used for a realization of a view-concept. With it tex-telements could be included or excluded in view of an editor or a processing engine.
[S] (implied)	cdata		Signatur. Used to store the calculated signature of an element (e.g. CRC)
[T] (implied)	cdata	dd-mm-yyyyThh:mm:ss dd/mm/yyyyThh:mm:ss dd mm yyyyThh:mm:ss	Timestamp

Attribute	Type	Legal Values	Remarks
[F-ID-CLASS] (fixed)	nmtoken	SW-SYSTEM	Fixed ID Class. The value of this attribute classifies links and link targets. This expresses the semantic constraint that a link can only link to an object of the same class. E.g. a link: **< TEAM-MEMBER-REF IDREF="ID1" F-ID-CLASS="TEAM-MEMBER">**...**</ TEAM-MEMBER- REF>** can only link to an object which is classified as "TEAM-MEMBER" like: **<TEAM-MEMBER ID="ID1" F-ID-CLASS=" TEAM-MEMBER">**...**</ TEAM-MEMBER>**.
[F-NAMESPACE] (fixed)	nmtoken	SW-ADDR-METHOD SW-AXIS-TYPE SW-BASE-TYPE SW-CAL-PRM SW-CALPRM-PROTOTYPE SW-CLASS-PROTOTYPE SW-CLASS-ATTR-IMPL SW-CLASS-INSTANCE SW-CLASS SW-CODE-SYNTAX SW-COL-LECTION SW-COMPU-METHOD SW-CPU-MEM-SEG SW-DATA-CONSTR SW-FEA-TURE SW-GENERIC-AXIS-PARAM-TYPE SW-INSTANCE-TREE SW-INSTANCE SW-RECORD-LAYOUT SW-SYSTEM-CONST SW-TASK SW-TEMPLATE SW-UNIT SW-USER-ACCESS-CASE SW-USER-GROUP SW-VARIABLE-PROTO-TYPE SW-VARIABLE SW-VCD-CRITERION	Fixed Namespace. This attribute is placed on elements which define a namespace for linkable objects. The attribute contains a list of elements for which the element carriing the attribute is a namespace. This is used by processors which use the MSR natural linking mechanism. (Natural links address their link target with a sequence of short-names of the namesspaces and the object itself e.g. '/test.xml/sw-system1/ sw-var1')

2.68   SW-SYSTEMS

Description   **<SW-SYSTEMS>** is the container to recieve all **<SW-SYSTEM>** in the current file.

Example

```
<SW-SYSTEMS>
  <SW-SYSTEM>
   <SHORT-NAME>DEMO</SHORT-NAME>
   <SW-INSTANCE-SPEC>
     <INTRODUCTION>
         <P>This is the system to demonstrate, how PaCo should work.</P>
     </INTRODUCTION>
     <SW-INSTANCE-TREE><SHORT-NAME>Summertest</SHORT-NAME>
       <SW-INSTANCE >
         <LONG-NAME>lazy bears from somewhere (Viktualienmarkt)</LONG-NAME>
         <SHORT-NAME>FBAM_V</SHORT-NAME>
         ...
       </SW-INSTANCE>
     </SW-INSTANCE-TREE>
   </SW-INSTANCE-SPEC>
  </SW-SYSTEM>
</SW-SYSTEMS>
```

Properties

Used in MSRSW p. 33

SW-SYSTEMS~ —⟦*⟧ SW-SYSTEM~ ->

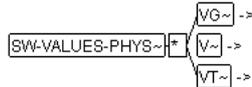| Attribute	Type	Legal Values	Remarks
[VIEW] (implied)	cdata		Any term used for a realization of a view-concept. With it tex-telements could be included or excluded in view of an editor or a processing engine.
[S] (implied)	cdata		Signatur. Used to store the calculated signature of an element (e.g. CRC)
[T] (implied)	cdata	dd-mm-yyyyThh:mm:ss dd/mm/yyyyThh:mm:ss dd mm yyyyThh:mm:ss	Timestamp

2.69   SW-UNIT

Description

<SW-UNIT> can be used to describe a unit of measurement for calibration items. It can be based on **<SI-UNIT>** as well as on other **<SW-UNITS>** (by applying **<SW-UNIT-REF>**.

The following restrictions apply:

*   When using referenced units, the chain of references must end at a **<SW-UNIT>** based on **<SI-UNIT>**. Otherwise the physical semantics of the unit would still be ambiguous.

*   The conversion of th unit in question to the referenced unit is specified in **<SW-UNIT-CON-VERSION-METHOD>** based on the following formula:

    Formula 1: Conversion of measurement units

    ```
    SW-UNIT = SW-UNIT-GRADIENT * SW-UNIT-REF + SW-UNIT-OFFSET
    ```

Example

For an example, see Chapter 2.59 SW-DATA-DICTIONARY-SPEC p. 58.

Properties

Used in Chapter 2.72 SW-UNITS p. 80

Content

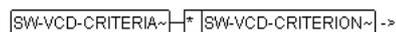| Attribute	Type	Legal Values	Remarks
[ID] (required)	id		Clear identification of an element inside a document.
[VIEW] (implied)	cdata		Any term used for a realization of a view-concept. With it tex-telements could be included or excluded in view of an editor or a processing engine.
[S] (implied)	cdata		Signatur. Used to store the calculated signature of an element (e.g. CRC)
[T] (implied)	cdata	dd-mm-yyyyThh:mm:ss dd/mm/yyyyThh:mm:ss dd mm yyyyThh:mm:ss	Timestamp
[F-ID-CLASS] (fixed)	nmtoken	SW-UNIT	Fixed ID Class. The value of this attribute classifies links and link targets. This expresses the semantic constraint that a link can only link to an object of the same class. E.g. a link: **< TEAM-MEMBER-REF IDREF="ID1" F-ID-CLASS="TEAM-MEM-BER">**...**</ TEAM-MEMBER- REF>** can only link to an object which is classified as "TEAM-MEM-BER" like: **<TEAM-MEMBER ID="ID1" F-ID-CLASS=" TEAM-MEMBER">**...**</ TEAM-MEMBER>**.

2.70 SW-UNIT-DISPLAY

Description   **<SW-UNIT>** contains the textual presentation of a unit of measurement.

Example For an example, see Chapter 2.59 SW-DATA-DICTIONARY-SPEC p. 58.

Properties Used in: Chapter 2.69 SW-UNIT p. 76

Content: Text, Chapter 2.41 SUB p. 45, Chapter 2.42 SUP p. 45

Attribute	Type	Legal Values	Remarks
[VIEW] (implied)	cdata		Any term used for a realization of a view-concept. With it tex-telements could be included or excluded in view of an editor or a processing engine.
[S] (implied)	cdata		Signatur. Used to store the calculated signature of an element (e.g. CRC)
[T] (implied)	cdata	dd-mm-yyyyThh:mm:ss dd/mm/yyyyThh:mm:ss dd mm yyyyThh:mm:ss	Timestamp

2.71 SW-UNIT-REF

Description **<SW-UNIT-REF>** is a formal reference to a measurement unit.

> **Caution:**
> The content of **<SW-UNIT-REF>** must follow the restrictions of **<SHORT-NAME>**, in particular must not contain whitespace and special characters.

Example For an example, see Chapter 2.65 SW-INSTANCE-SPEC p. 70.

Properties Used in: SW-AXIS-CONT p. 47

Content: Text

Attribute	Type	Legal Values	Remarks
[ID-REF] (required)	idref		Link on an element in the document which is marked with an ID-Attribute

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SW-UNIT-REF

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Attribute	Type	Legal Values	Remarks
[VIEW] (implied)	cdata		Any term used for a realization of a view-concept. With it tex-telements could be included or excluded in view of an editor or a processing engine.
[S] (implied)	cdata		Signatur. Used to store the calculated signature of an element (e.g. CRC)
[T] (implied)	cdata	dd-mm-yyyyThh:mm:ss dd/mm/yyyyThh:mm:ss dd mm yyyyThh:mm:ss	Timestamp
[HYTIME] (fixed)	nmtoken	CLINK	HYTIME is the standard attribute to define a HYTIME architecural form. This functionality defined in ISO 10744 HYTIME (Hypermedia/ Time-based Structuring Language). This enables to use a generic architectural form processor for link processing and traversion.
[HYNAMES] (fixed)	nmtokens	LINKEND ID-REF	HYNAMES is a mapping functionality defined in ISO 10744 HYTIME (Hypermedia/Time-based Structuring Language) The names of the locator attributes e.g. ID-REF used to address the target of a hyperlink can be mapped to names defined in the HYTIME standard, that is LINKEND. This enables to use a generic architectural form processor for link processing and traversion.

Attribute	Type	Legal Values	Remarks
[F-ID-CLASS] (fixed)	nmtoken	SW-UNIT	Fixed ID Class. The value of this attribute classifies links and link targets. This expresses the semantic constraint that a link can only link to an object of the same class. E.g. a link: **< TEAM-MEMBER-REF IDREF="ID1" F-ID-CLASS="TEAM-MEM-BER">**...**</ TEAM-MEMBER- REF>** can only link to an object which is classified as "TEAM-MEM-BER" like: **<TEAM-MEMBER ID="ID1" F-ID-CLASS=" TEAM-MEMBER">**...**</ TEAM-MEMBER>**.

2.72   SW-UNITS

Description   **<SW-UNIT>** ist a container for **<SW-UNIT>**

Example   For an example, see Chapter 2.59 SW-DATA-DICTIONARY-SPEC p. 58.

Properties   Used in Chapter 2.59 SW-DATA-DICTIONARY-SPEC p. 58

Content Chapter 2.69 SW-UNIT p. 76

SW-UNITS~ ─┤─* SW-UNIT~ ─>

Attribute	Type	Legal Values	Remarks
[VIEW] (implied)	cdata		Any term used for a realization of a view-concept. With it tex-telements could be included or excluded in view of an editor or a processing engine.
[S] (implied)	cdata		Signatur. Used to store the calculated signature of an element (e.g. CRC)
[T] (implied)	cdata	dd-mm-yyyyThh:mm:ss dd/mm/yyyyThh:mm:ss dd mm yyyyThh:mm:ss	Timestamp

2.73   SW-VALUES-PHYS

Description   **<SW-VALUES-PHYS>** receives the physical values of the calibration item.

Example   For an example, see Chapter 2.65 SW-INSTANCE-SPEC p. 70.

Properties   Used in: SW-AXIS-CONT p. 47

Content: V p. 93, VT p. 94, Chapter 2.86 VG p. 93

Attribute	Type	Legal Values	Remarks
[VIEW] (implied)	cdata		Any term used for a realization of a view-concept. With it tex-telements could be included or excluded in view of an editor or a processing engine.
[S] (implied)	cdata		Signatur. Used to store the calculated signature of an element (e.g. CRC)
[T] (implied)	cdata	dd-mm-yyyyThh:mm:ss dd/mm/yyyyThh:mm:ss dd mm yyyyThh:mm:ss	Timestamp

2.74   SW-VCD-CRITERIA

Description   **<SW-VCD-CRITERIA>** is a container for **<SW-VCD-CRITERION>**.

Example   For an example, see Chapter 2.80 SW-VCD-SPEC p. 87 .

Properties   Used in Chapter 2.80 SW-VCD-SPEC p. 87

Content Chapter 2.75 SW-VCD-CRITERION p. 82

Attribute	Type	Legal Values	Remarks
[VIEW] (implied)	cdata		Any term used for a realization of a view-concept. With it tex-telements could be included or excluded in view of an editor or a processing engine.
[S] (implied)	cdata		Signatur. Used to store the calculated signature of an element (e.g. CRC)
[T] (implied)	cdata	dd-mm-yyyyThh:mm:ss dd/mm/yyyyThh:mm:ss dd mm yyyyThh:mm:ss	Timestamp

2.75 SW-VCD-CRITERION

Description In the *PaCo* use case **<SW-VCD-CRITERION>** describes the possible characteristics of the car variants and its possible values.

Example For an example, see Chapter 2.80 SW-VCD-SPEC p. 87.

Properties Used in Chapter 2.74 SW-VCD-CRITERIA p. 81

Content LONG-NAME p. 31, SHORT-NAME p. 42, SW-VCD-CRITERION-POSSIBLE-VALUES p. 83

Attribute	Type	Legal Values	Remarks
[ID] (required)	id		Clear identification of an element inside a document.
[VIEW] (implied)	cdata		Any term used for a realization of a view-concept. With it tex-telements could be included or excluded in view of an editor or a processing engine.
[S] (implied)	cdata		Signatur. Used to store the calculated signature of an element (e.g. CRC)
[T] (implied)	cdata	dd-mm-yyyyThh:mm:ss dd/mm/yyyyThh:mm:ss dd mm yyyyThh:mm:ss	Timestamp

Attribute	Type	Legal Values	Remarks
[F-ID-CLASS] (fixed)	nmtoken	SW-VCD-CRITERION	Fixed ID Class. The value of this attribute classifies links and link targets. This expresses the semantic constraint that a link can only link to an object of the same class. E.g. a link: **< TEAM-MEMBER-REF IDREF="ID1" F-ID-CLASS="TEAM-MEMBER">**...**</ TEAM-MEMBER- REF>** can only link to an object which is classified as "TEAM-MEMBER" like: **<TEAM-MEMBER ID="ID1" F-ID-CLASS=" TEAM-MEMBER">**...**</TEAM-MEMBER>**.

2.76   SW-VCD-CRITERION-POSSIBLE-VALUES

Description   **<SW-VCD-CRITERION-POSSIBLE-VALUES>** contains the possible values for one characteristica of a car variant.

Example   For an example, see Chapter 2.80 SW-VCD-SPEC p. 87 .

Properties   Used in Chapter 2.75 SW-VCD-CRITERION p. 82

Content Chapter 2.87 VT p. 94

```
SW-VCD-CRITERION-POSSIBLE-VALUES~─┤─*│VT~│ ->
```

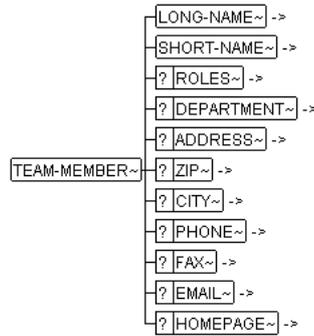| Attribute	Type	Legal Values	Remarks
[VIEW] (implied)	cdata		Any term used for a realization of a view-concept. With it tex-telements could be included or excluded in view of an editor or a processing engine.
[S] (implied)	cdata		Signatur. Used to store the calculated signature of an element (e.g. CRC)
[T] (implied)	cdata	dd-mm-yyyyThh:mm:ss dd/mm/yyyyThh:mm:ss dd mm yyyyThh:mm:ss	Timestamp

2.77 SW-VCD-CRITERION-REF

Description   **<SW-VCD-CRITERION-REF>** can be used to build a link to a **<SW-VCD-CRITERION>**.

Caution:

The content of **<SW-VCD-CRITERION-REF>** must follow the restrictions of **<SHORT-NAME>**, in particular must not contain whitespace and special characters.

Example   For an example, see Chapter 2.80 SW-VCD-SPEC p. 87 or Chapter 2.65 SW-INSTANCE-SPEC p. 70.

Properties   Used in Chapter 2.78 SW-VCD-CRITERION-VALUE p. 85

Content Text

```
SW-VCD-CRITERION-REF~ ─┤─ #PCDATA
```

Attribute	Type	Legal Values	Remarks
[ID-REF] (required)	idref		Link on an element in the document which is marked with an ID-Attribute
[VIEW] (implied)	cdata		Any term used for a realization of a view-concept. With it tex-telements could be included or excluded in view of an editor or a processing engine.
[S] (implied)	cdata		Signatur. Used to store the calculated signature of an element (e.g. CRC)
[T] (implied)	cdata	dd-mm-yyyyThh:mm:ss dd/mm/yyyyThh:mm:ss dd mm yyyyThh:mm:ss	Timestamp
[HYTIME] (fixed)	nmtoken	CLINK	HYTIME is the standard attribute to define a HYTIME archicural form. This functionality defined in ISO 10744 HYTIME (Hypermedia/ Time-based Structuring Language). This enables to use a generic architectural form processor for link processing and traversion.

Attribute	Type	Legal Values	Remarks
[HYNAMES] (fixed)	nmtokens	LINKEND ID-REF	HYNAMES is a mapping functionality defined in ISO 10744 HYTIME (Hypermedia/Time-based Structuring Language) The names of the locator attributes e.g. ID-REF used to address the target of a hyperlink can be mapped to names defined in the HYTIME standard, that is LINKEND. This enables to use a generic architectural form processor for link processing and traversion.
[F-ID-CLASS] (fixed)	nmtoken	SW-VCD-CRITERION	Fixed ID Class. The value of this attribute classifies links and link targets. This expresses the semantic constraint that a link can only link to an object of the same class. E.g. a link: **< TEAM-MEMBER-REF IDREF="ID1" F-ID-CLASS="TEAM-MEMBER">**...**</ TEAM-MEMBER- REF>** can only link to an object which is classified as "TEAM-MEMBER" like: **<TEAM-MEMBER ID="ID1" F-ID-CLASS=" TEAM-MEMBER">**...**</ TEAM-MEMBER>**.

2.78 SW-VCD-CRITERION-VALUE

Description   **<SW-VCD-CRITERION-VALUE>** contains multiple **<SW-VCD-CRITERION-REF>** or **<VT>** elements. The combination of these elements are the discription of the car variant the actual application item is valid for. The legal content of the Elements are described in Chapter 2.76 SW-VCD-CRITERION-POSSIBLE-VALUES p. 83

Example   For an example, see Chapter 2.65 SW-INSTANCE-SPEC p. 70.

Properties   Used in Chapter 2.79 SW-VCD-CRITERION-VALUES p. 86

Content Chapter 2.77 SW-VCD-CRITERION-REF p. 84, Chapter 2.87 VT p. 94

SW-VCD-CRITERION-VALUE~ — SW-VCD-CRITERION-REF~ ->
VT~ ->

Attribute	Type	Legal Values	Remarks
[VIEW] (implied)	cdata		Any term used for a realization of a view-concept. With it tex-telements could be included or excluded in view of an editor or a processing engine.
[S] (implied)	cdata		Signatur. Used to store the calculated signature of an element (e.g. CRC)
[T] (implied)	cdata	dd-mm-yyyyThh:mm:ss dd/mm/yyyyThh:mm:ss dd mm yyyyThh:mm:ss	Timestamp

2.79 SW-VCD-CRITERION-VALUES

Description **<SW-VCD-CRITERION-VALUES>** is a container for **<SW-VCD-CRITERION-VALUE>**.

Example For an example, see Chapter 2.65 SW-INSTANCE-SPEC p. 70.

Properties Used in Chapter 2.63 SW-INSTANCE-PROPS-VARIANT p. 68

Content Chapter 2.78 SW-VCD-CRITERION-VALUE p. 85

SW-VCD-CRITERION-VALUES~ — * SW-VCD-CRITERION-VALUE~ ->

Attribute	Type	Legal Values	Remarks
[VIEW] (implied)	cdata		Any term used for a realization of a view-concept. With it tex-telements could be included or excluded in view of an editor or a processing engine.
[S] (implied)	cdata		Signatur. Used to store the calculated signature of an element (e.g. CRC)
[T] (implied)	cdata	dd-mm-yyyyThh:mm:ss dd/mm/yyyyThh:mm:ss dd mm yyyyThh:mm:ss	Timestamp

2.80 SW-VCD-SPEC

Description **<SW-VCD-SPEC>** is a container for **<SW-VCD-CRITERIA>**. In the *PaCo* use case it contains all the car variants valid for the calibration items. the Variants are intended to be runtime variants. This makes all variants being kept in one particular ecu software. As opposite to this, compile time variants are not kept in the ECU simultanously. Each compile time variant will end up in a *PaCo* file of its own.

Example
```
<SW-VCD-SPEC>
 <SW-VCD-CRITERIA>
       <SW-VCD-CRITERION><LONG-NAME>Abgasnorm</LONG-NAME>
        <SHORT-NAME>Abgas</SHORT-NAME>
        <SW-VCD-CRITERION-POSSIBLE-VALUES>
         <VT>MVEGI</VT>
       <VT>MVEGII</VT>
   </SW-VCD-CRITERION-POSSIBLE-VALUES>
  </SW-VCD-CRITERION>
       <SW-VCD-CRITERION><LONG-NAME>Getriebeart</LONG-NAME>
        <SHORT-NAME>Getriebe</SHORT-NAME>
        <SW-VCD-CRITERION-POSSIBLE-VALUES>
        <VT>Hs</VT>
        <VT>AG</VT>
   </SW-VCD-CRITERION-POSSIBLE-VALUES>
  </SW-VCD-CRITERION>
       <SW-VCD-CRITERION><LONG-NAME>Antriebsart</LONG-NAME>
        <SHORT-NAME>Spezial</SHORT-NAME>
        <SW-VCD-CRITERION-POSSIBLE-VALUES>
        <VT>Heck</VT>
        <VT>Front</VT>
        <VT>Quattro</VT>
   </SW-VCD-CRITERION-POSSIBLE-VALUES>
  </SW-VCD-CRITERION>
   </SW-VCD-CRITERIA>
</SW-VCD-SPEC>
```

Properties Used in Chapter 2.67 SW-SYSTEM p. 73

Content Chapter 2.74 SW-VCD-CRITERIA p. 81

```
SW-VCD-SPEC~ — ? SW-VCD-CRITERIA~ ->
```

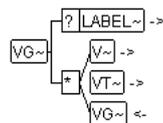| Attribute	Type	Legal Values	Remarks
[VIEW] (implied)	cdata		Any term used for a realization of a view-concept. With it tex-telements could be included or excluded in view of an editor or a processing engine.
[S] (implied)	cdata		Signatur. Used to store the calculated signature of an element (e.g. CRC)
[T] (implied)	cdata	dd-mm-yyyyThh:mm:ss dd/mm/yyyyThh:mm:ss dd mm yyyyThh:mm:ss	Timestamp

2.81 TEAM-MEMBER

Description **<TEAM-MEMBER>** contains all information of the persons involved in the project.

Example   For an example, see Chapter 2.33 PROJECT-DATA p. 38.

Properties   Used in: TEAM-MEMBERS p. 91

Content: LONG-NAME p. 31,   SHORT-NAME p. 42,   ROLES p. 41,   DEPARTMENT p. 24,   ADDRESS p. 12,   ZIP p. 95,   CITY p. 15,   PHONE p. 36,   FAX p. 28,   EMAIL p. 27,   HOMEPAGE p. 28

```
                        ┌ LONG-NAME~ ->
                        ├ SHORT-NAME~ ->
                        ├ ? ROLES~ ->
                        ├ ? DEPARTMENT~ ->
                        ├ ? ADDRESS~ ->
        TEAM-MEMBER~ ─┤ ? ZIP~ ->
                        ├ ? CITY~ ->
                        ├ ? PHONE~ ->
                        ├ ? FAX~ ->
                        ├ ? EMAIL~ ->
                        └ ? HOMEPAGE~ ->
```

Attribute	Type	Legal Values	Remarks
[ID] (required)	id		Clear identification of an element inside a document.
[VIEW] (implied)	cdata		Any term used for a realization of a view-concept. With it tex-telements could be included or excluded in view of an editor or a processing engine.
[S] (implied)	cdata		Signatur. Used to store the calculated signature of an element (e.g. CRC)
[T] (implied)	cdata	dd-mm-yyyyThh:mm:ss dd/mm/yyyyThh:mm:ss dd mm yyyyThh:mm:ss	Timestamp

Attribute	Type	Legal Values	Remarks
[F-ID-CLASS] (fixed)	nmtoken	TEAM-MEMBER	Fixed ID Class. The value of this attribute classifies links and link targets. This expresses the semantic constraint that a link can only link to an object of the same class. E.g. a link: **< TEAM-MEMBER-REF IDREF="ID1" F-ID-CLASS="TEAM-MEMBER">**...**</ TEAM-MEMBER- REF>** can only link to an object which is classified as "TEAM-MEMBER" like: **<TEAM-MEMBER ID="ID1" F-ID-CLASS=" TEAM-MEMBER">**...**</ TEAM-MEMBER>**.

2.82 TEAM-MEMBER-REF

Description
<TEAM-MEMBER-REF> is the pointer to one particular team member. The content is the **<SHORT-NAME>** of the corresponding **<TEAM-MEMBER>**.

> *Caution:*
> The content of **<TEAM-MEMBER-REF>** must follow the restrictions of **<SHORT-NAME>**, in particular must not contain whitespace and special characters.

Example
For an example, see Chapter 2.2 ADMIN-DATA p. 12.

Properties
Used in: DOC-REVISION p. 25

Content: Text

TEAM-MEMBER-REF~—#PCDATA

Attribute	Type	Legal Values	Remarks
[ID-REF] (required)	idref		Link on an element in the document which is marked with an ID-Attribute

Attribute	Type	Legal Values	Remarks
[VIEW] (implied)	cdata		Any term used for a realization of a view-concept. With it text-elements could be included or excluded in view of an editor or a processing engine.
[S] (implied)	cdata		Signatur. Used to store the calculated signature of an element (e.g. CRC)
[T] (implied)	cdata	dd-mm-yyyyThh:mm:ss dd/mm/yyyyThh:mm:ss dd mm yyyyThh:mm:ss	Timestamp
[HYTIME] (fixed)	nmtoken	CLINK	HYTIME is the standard attribute to define a HYTIME architecural form. This functionality defined in ISO 10744 HYTIME (Hypermedia/ Time-based Structuring Language). This enables to use a generic architectural form processor for link processing and traversion.
[HYNAMES] (fixed)	nmtokens	LINKEND ID-REF	HYNAMES is a mapping functionality defined in ISO 10744 HYTIME (Hypermedia/Time-based Structuring Language) The names of the locator attributes e.g. ID-REF used to address the target of a hyperlink can be mapped to names defined in the HYTIME standard, that is LINKEND. This enables to use a generic architectural form processor for link processing and traversion.

Attribute	Type	Legal Values	Remarks
[F-ID-CLASS] (fixed)	nmtoken	TEAM-MEMBER	Fixed ID Class. The value of this attribute classifies links and link targets. This expresses the semantic constraint that a link can only link to an object of the same class. E.g. a link: **< TEAM-MEMBER-REF IDREF="ID1" F-ID-CLASS="TEAM-MEM-BER">**...**</ TEAM-MEMBER- REF>** can only link to an object which is classified as "TEAM-MEM-BER" like: **<TEAM-MEMBER ID="ID1" F-ID-CLASS=" TEAM-MEMBER">**...**</ TEAM-MEMBER>**.

2.83 TEAM-MEMBERS

Description   **<TEAM-MEMBERS>** is a container for all **<TEAM-MEMBER>**

Example   For an example, see Chapter 2.33 PROJECT-DATA p. 38.

Properties   Used in: COMPANY p. 16

     Content: TEAM-MEMBER p. 87

```
TEAM-MEMBERS~  ─┼─* TEAM-MEMBER~ ->
```

Attribute	Type	Legal Values	Remarks
[VIEW] (implied)	cdata		Any term used for a realization of a view-concept. With it tex-telements could be in-cluded or excluded in view of an editor or a processing engine.
[S] (implied)	cdata		Signatur. Used to store the calculated signa-ture of an element (e.g. CRC)
[T] (implied)	cdata	dd-mm-yyyyThh:mm:ss dd/mm/yyyyThh:mm:ss dd mm yyyyThh:mm:ss	Timestamp

2.84 TT

Description **<TT>** can be used to format technical terms in a paragraph.

Example

Properties Used in: CHANGE p. 14, DESC p. 24, LONG-NAME p. 31, REASON p. 39

Content: Text

TT~—#PCDATA

Attribute	Type	Legal Values	Remarks
[TYPE] (required)	namedtokengroup	• SGMLTAG • SGML-ATTRIBUTE • TOOL • PRODUCT • VARIABLE • STATE • PRM • MATERIAL • CONTROL-ELE-MENT • CODE • ORGANISATION • OTHER	Gibt einen Typ des jeweiligen Elementes an.
[USER-DEFINED-TYPE] (implied)	cdata		Erlaubt es, benutzerspezifische TTs einzuführen.
[SI] (implied)	cdata		Description of the semantic meaning of an element.
[VIEW] (implied)	cdata		Any term used for a realization of a view-concept. With it textelements could be included or excluded in view of an editor or a processing engine.
[S] (implied)	cdata		Signatur. Used to store the calculated signature of an element (e.g. CRC)
[T] (implied)	cdata	dd-mm-yyyyThh:mm:ss dd/mm/yyyyThh:mm:ss dd mm yyyyThh:mm:ss	Teitstempelangabe

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2.85 V

Description   **<V>** represents one particular numerical value of the the calibration item. **<V>** must be a valid floating number or a hexadecimal number in C-notation.

Example   For an example, see Chapter 2.65 SW-INSTANCE-SPEC p. 70.

Properties   Used in: SW-VALUES-PHYS p. 81

Content: Text

Attribute	Type	Legal Values	Remarks
[VIEW] (implied)	cdata		Any term used for a realization of a view-concept. With it textelements could be included or excluded in view of an editor or a processing engine.
[S] (implied)	cdata		Signatur. Used to store the calculated signature of an element (e.g. CRC)
[T] (implied)	cdata	dd-mm-yyyyThh:mm:ss dd/mm/yyyyThh:mm:ss dd mm yyyyThh:mm:ss	Timestamp

2.86 VG

Description   **<VG>** represents a group of Values which belong together. The meaning of the group is represented by the **<label>**. **<VG>** is only used for documentation purposes.

Example   For an example, see Chapter 2.62 SW-INSTANCE p. 62.

Properties   Used in: Chapter 2.73 SW-VALUES-PHYS p. 81, Chapter 2.86 VG p. 93

Content: Chapter 2.23 LABEL p. 29, V p. 93, VT p. 94, Chapter 2.86 VG p. 93

Attribute	Type	Legal Values	Remarks
[VIEW] (implied)	cdata		Any term used for a realization of a view-concept. With it text-elements could be included or excluded in view of an editor or a processing engine.
[S] (implied)	cdata		Signatur. Used to store the calculated signature of an element (e.g. CRC)
[T] (implied)	cdata	dd-mm-yyyyThh:mm:ss dd/mm/yyyyThh:mm:ss dd mm yyyyThh:mm:ss	Timestamp

2.87 VT

Description **<VT>** represents one particular textual value of the the calibration item. **<VT>** is used to take the text values e.g. for enumerators. To some extent, **<VT>** values are physical values, since these values are displayed in the VCD-System's physical mode.

Example
```
<SW-INSTANCE>
  <LONG-NAME>Stupid Messages</LONG-NAME>
  <SHORT-NAME>murph</SHORT-NAME>
  <CATEGORY>VALUE_BLOCK</CATEGORY>
  <SW-INSTANCE-PROPS-VARIANTS>
    <SW-INSTANCE-PROPS-VARIANT>
      <SW-AXIS-CONTS>
        <SW-AXIS-CONT>
          <SW-AXIS-INDEX>0</SW-AXIS-INDEX>
          <SW-VALUES-PHYS>
            <VT>Things appear to be nearer than they are</VT>
            <VT>Shit happens</VT>
            <VT>Things will never be the same</VT>
            <VT>Stay tuned to see unexpected results</VT>
          </SW-VALUES-PHYS>
        </SW-AXIS-CONT>
      </SW-AXIS-CONTS>
    </SW-INSTANCE-PROPS-VARIANT>
  </SW-INSTANCE-PROPS-VARIANTS>
</SW-INSTANCE>
```

Properties Used in:

Content: Text

Attribute	Type	Legal Values	Remarks
[VIEW] (implied)	cdata		Any term used for a realization of a view-concept. With it tex-telements could be in-cluded or excluded in view of an editor or a processing engine.
[S] (implied)	cdata		Signatur. Used to store the calculated signa-ture of an element (e.g. CRC)
[T] (implied)	cdata	dd-mm-yyyyThh:mm:ss dd/mm/yyyyThh:mm:ss dd mm yyyyThh:mm:ss	Timestamp

2.88 ZIP

Description   **<ZIP>** can be used to describe the postcode ot the company of a team-member.

Example   For an example, see Chapter 2.33 PROJECT-DATA p. 38.

Properties   Used in: TEAM-MEMBER p. 87

Content: Text

ZIP~—#PCDATA

Attribute	Type	Legal Values	Remarks
[VIEW] (implied)	cdata		Any term used for a realization of a view-concept. With it tex-telements could be in-cluded or excluded in view of an editor or a processing engine.
[S] (implied)	cdata		Signatur. Used to store the calculated signa-ture of an element (e.g. CRC)
[T] (implied)	cdata	dd-mm-yyyyThh:mm:ss dd/mm/yyyyThh:mm:ss dd mm yyyyThh:mm:ss	Timestamp

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Document Administration

Table : version overview

Version	Date	Publisher	State
2.1.1	26.07.2006	Markus Müller	freigegeben
2.1.0	12.07.2004	Markus Müller	Freigegeben
12	2003-12-12	Markus Müller	Freigegeben
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6	2002-03-25	Markus Müller	locked
5	2002-03-12	Markus Müller	initial draft
4	2002-01-30	Markus Müller	initial draft
3	2002-01-30	Markus Müller	initial draft
2	2002-01-30	Markus Müller	initial draft
1	2002-01-10	Markus Müller	initial draft

Table : modifications

Version	Change	Related to
2.1.1	Change the note in Chapter 2.52 SW-CS-HISTORY p. 53 about the interpretation of the sequence of **<SW-CS-ENTRY>**s Reason: All Tools supporting PaCo do it the other way round	Content
2.1.0	Integration of **[SW_COMPONENT]** as a legal value für **<CATEGORY>** in **<SW-INSTANCE>** . Reason: This will replace the strategie of representing function oriented calibration documentation in several **<SW-INSTANCE-TREE>**s.	Content
	Deleting the hint about the strategie of representing function oriented calibration documentation in several **<SW-INSTANCE-TREE>**s. in Chapter 2.66 SW-INSTANCE-TREE p. 71 Reason: Replacement of the strategie of representing function oriented calibration documentation in several **<SW-INSTANCE-TREE>**s.	Content
	Inserting a note in Chapter 2.52 SW-CS-HISTORY p. 53 about the interpretation of the sequence of **<SW-CS-ENTRY>**s Reason: The **<SW-CS-ENTRY>** with ne nearest value in **<DATE>** must not be the one that had been inserted last.	Content
	Inserting a note in Chapter 2.56 SW-CS-STATE p. 56 how to interpret the state of **<SW-INSTANCE>**s without a **<SW-CS-STATE>**.	Content
12	Rework of the examples. Reason: Several inconsistencies in the examples.	Content
11	Inserting Chapter 2.87 VT p. 94 als legal content in Chapter 2.86 VG p. 93 and Chapter 2.73 SW-VALUES-PHYS p. 81. Reason: Bugfix, VT is necessary **<SW-INSTANCE>** with **<CATEGORY>** **[ASCII]**	Content

Table (Cont.): modifications

Version	Change	Related to
10	Extending Chapter 2.62 SW-INSTANCE p. 62 with a new example for class support and a few notes.	Content
	Update of date-field Reason: wrong format	Content
	rearranged admin-data Reason: place the recent revision on top	Content
9	Changing wrong Character set definition ISO-8850-1 in Chapter 1.1.1 Character Set Definition p. 10 to the correct definition ISO-8859-1	Content
8	Extending Chapter 2.66 SW-INSTANCE-TREE p. 71 whith a description of the mechanisem to mange calibration items function oriented in PaCo	Content
	Extending Chapter 2.61 SW-FEATURE-REF p. 60 whith a description of the mechanisem to mange calibration items function oriented in PaCo	Content
7	Postition of **<CATEGORY>** in **<SW-INSTANCE>** corrected Reason: Position of **<CATEGORY>** must be before **<SW-FEATURE-REF>**	Content
	Adding explicit legal Values for **<CATEGORY>** in **<SW-INSTANCE>** and **<SW-CS-STATE>** Reason: Neccessary for a worldwide uniform standard and meaning	Content
6	Integrating changes from MSR-SW 2.2.2 Reason: Be up to date with MSR-SW.	Content
5	Removing several chapters Reason: Modification of PaCo_DTD up to Version 2.3	Content
	Editing several chapters Reason: Notes from B. Weichel, 06.02.2002	Content
	Editing Several Chapters Reason: Notes from K. Pinnow, 11.03.2002	Content
4	Removing several chapters Reason: Modification of PaCo_DTD up to Version 2.2	Content
3	Fixing document code Reason: Errors while processing	Document
2	Fixing document code Reason: Errors while processing	Document
1	Created the document Reason: According to question from Bernhard Weichel GS/EMW4	Content

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