Business To Manufacturing Markup Language

B2MML - PhysicalAsset

Version 0500 – March 2011

PhysicalAsset Schema Documentation

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Change History:

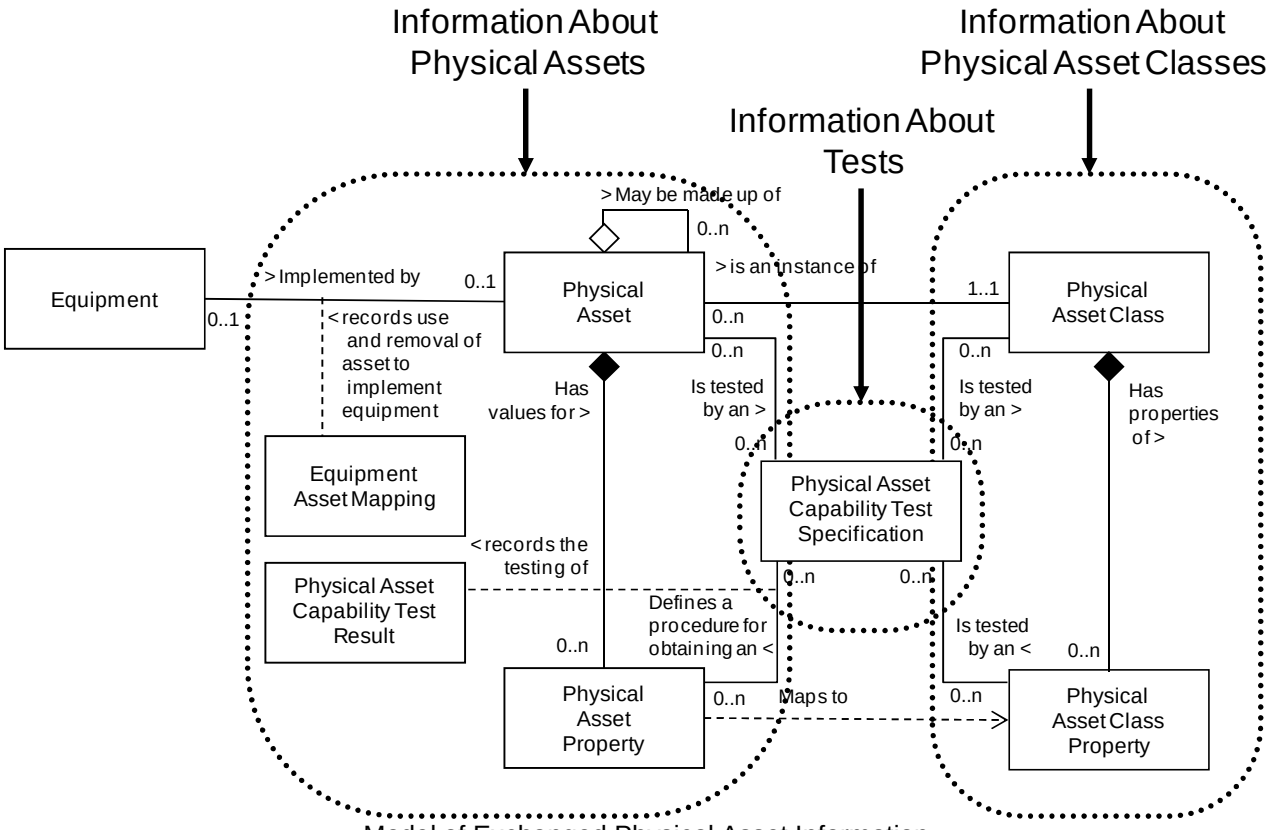
Change	Date	Person	Description
V0500	Mar 2011	Dennis Brandl	• Initial version to match ANSI/ISA 95.02-2010

1 Schema Scope

This document defines the information about Physical asset classes, physical assets, and physical asset capability tests that may be exchanged between business systems and manufacturing operations systems. This information is based on the data models and attributes defined in the ANSI/ISA 95.00.02 Enterprise/Control System Integration standard. Contact ISA (The Instrumentation, System, and Automation Society) for copies of the standard. Additional information on the standard is available at www.isa.org.

1.1 Key Information Assumptions

The data represented in these schemas is derived from the UML model below. This model is defined in the ANSI/ISA 95.00.02 standard. The information model in the model below is not hierarchical, so the key assumption is that the information may be accessed from any of three starting points: Physical Asset class, Physica lAsset, or capability test, as identified by the dotted collections in the figure.



Model of Exchanged Physical Asset Information

This schema uses a common schema for definition of elements that are used in multiple schemas, such as ID, Description, and Value. See the documentation of the common schema for definition of the common elements.

1.2 Key Use Assumptions

The model only defines the exchanged information and does not define the use of the information or encapsulation of the information in any defining transactions.

1.3 PhysicalAssetInformation

The main structuring element of the schema definition is PhysicalAssetInformation. Alternately, schemas may be made up an Physical Asset, Physical Asset class, or Physical Asset capability test specification document.

PhysicalAssetInformation elements define Physical Asset, Physical Asset classes, and/or Physical Asset capability test specifications.

1.4 PhysicalAsset

Physical Asset represents the elements of a Physica lAsset hierarchy model defined in ANSI/ISA-95.00.01.

Physical Asset may be made up of other Physical Asset, as defined in Physical Asset hierarchy model.

PhysicalAsset elements may be used to contain information about specific PhysicalAsset. PhysicalAsset elements may also include the definition of capability test results.

1.5 PhysicalAssetClass

An PhysicalAsset class is a means to describe a grouping of PhysicalAsset with similar characteristics for purposes of scheduling and planning. Any piece of PhysicalAsset may be a member of zero or more PhysicalAsset classes.

PhysicalAssetClass information may be used to contain information about classes of PhysicalAssets. It may contain the list of PhysicalAsset belonging to the class and the list of capability test specifications associated with PhysicalAsset class properties.

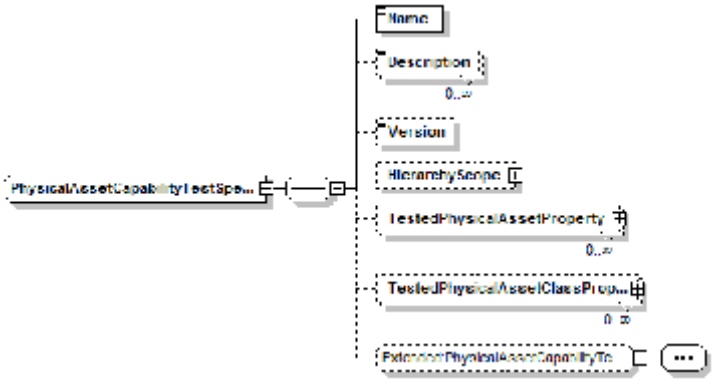
1.6 PhysicalAssetCapabilityTestSpecification

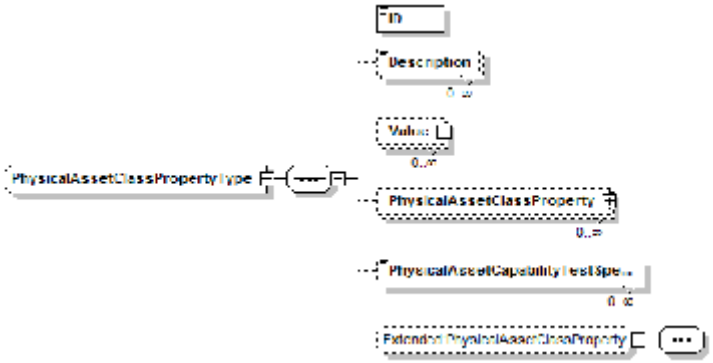
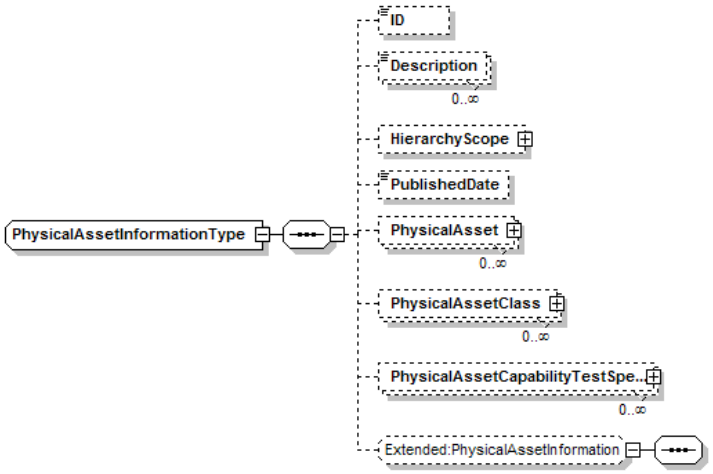
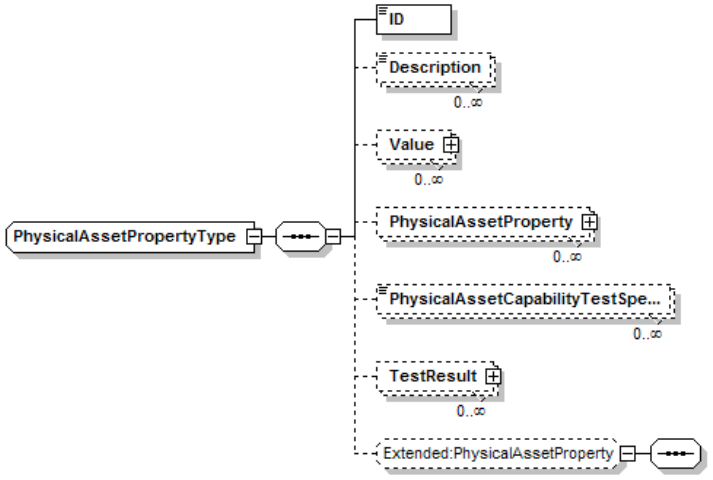
A Physica lAsset capability test specification may be associated with an Physical Asset property. This is typically used where a test is required to ensure that the Physical Asset has the rated capability. An Physical Asset capability test specification may test for one or more Physical Asset properties.

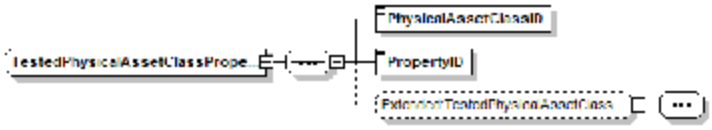
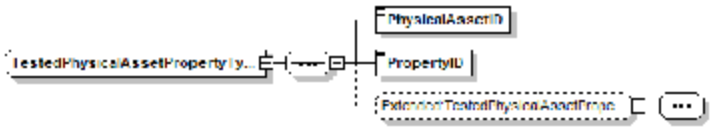
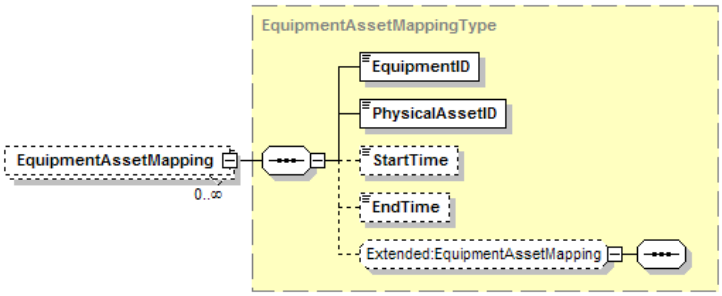
PhysicalAssetCapabilityTestSpecification information may be used to contain information about Physical Asset capability tests. It may contain identifications of the tested Physical Asset properties and the tested Physical Asset class properties.

2 Element Definitions

Element/Type	Description
PhysicalAsset ***PhysicalAssetType***	A top-level object that may contain a definition of PhysicalAsset, containing PhysicalAsset, PhysicalAsset properties, the ID's of PhysicalAsset classes the PhysicalAsset belongs to, and the PhysicalAsset to physical asset mapping. May also contain application specific elements. 

Element/Type	Description
PhysicalAssetCapabilityTestSpecification ***PhysicalAssetCapabilityTestSpecificationType***	A top level object that contains the description of an PhysicalAsset capability test specification. Containing the name of the test, version of the test, description of the test, the list of class properties tested by the test, the list of specific PhysicalAsset properties tested by the test, and additional application specific information. May also contain application specific elements. 
PhysicalAssetClass ***PhysicalAssetClassType***	A top-level object that may contain a definition of an PhysicalAsset class, containing PhysicalAsset properties, and the ID's of PhysicalAsset the belonging to the class. May also contain application specific elements. 

Element/Type	Description
PhysicalAssetClassPropertyType	Contains a definition of an PhysicalAsset class property, consisting of an ID and a description. May include the capability test specification. 
PhysicalAssetInformation ***PhysicalAssetInformationType***	A top-level object that may contain a list of PhysicalAsset, PhysicalAsset class, and/or PhysicalAsset capability test specifications. May also contain application specific elements. 
PhysicalAssetProperty ***PhysicalAssetPropertyType***	Contains a definition of a PhysicalAsset property, consisting of an ID and a description. May include the capability test specification and test result. 

Element/Type	Description
TestedPhysicalAssetClassProperty ***TestedPhysicalAssetClassPropertyType***	Contains a definition of a class property type tested by a qualification test specification. The ID defines the property. 
TestedPhysicalAssetProperty ***TestedPhysicalAssetPropertyType***	Contains a definition of a property type tested by a qualification test specification. The ID defines the property. 
EquipmenttAssetMapping ***EquipmentAssetMappingType***	Defines the mapping of PhysicalAsset to a physical asset. 

3 Transaction Elements

The following elements are defined to support the ISA 95 Part 5 transactions, using the transaction data types defined in the B2MML-Common.xsd schema.

PhysicalAsset Information Elements	Description
GetPhysicalAssetInformation	Get *PhysicalAssetClass*, *PhysicalAsset*, and *PhysicalAssetCapabilityTestSpecification* definitions.
ShowPhysicalAssetInformation	Returned information from the *GetPhysicalAssetInformation* message.
ProcessPhysicalAssetInformation	Process *PhysicalAssetClass*, *PhysicalAsset*, and *PhysicalAssetCapabilityTestSpecification* definitions.
AcknowledgePhysicalAssetInformation	Returned status from the *ProcessPhysicalAssetInformation* message.
ChangePhysicalAssetInformation	Change *PhysicalAssetClass*, *PhysicalAsset*, and *PhysicalAssetCapabilityTestSpecification* definitions.
RespondPhysicalAssetInformation	Returned status from the *ChangePhysicalAssetInformation* message.
CancelPhysicalAssetInformation	Cancel *PhysicalAssetClass*, *PhysicalAsset*, and *PhysicalAssetCapabilityTestSpecification* definitions.
SyncPhysicalAssetInformation	Published *PhysicalAssetClass*, *PhysicalAsset*, and *PhysicalAssetCapabilityTestSpecification* definitions.

PhysicalAsset Class Elements	Description
GetPhysicalAssetClass	Get *PhysicalAssetClass* definitions.
ShowPhysicalAssetClass	Returned information from the *GetPhysicalAssetClass* message.
ProcessPhysicalAssetClass	Process *PhysicalAssetClass* definitions.
AcknowledgePhysicalAssetClass	Returned status from the *ProcessPhysicalAssetClass* message.
ChangePhysicalAssetClass	Change *PhysicalAssetClass* definitions.
RespondPhysicalAssetClass	Returned status from the *ChangePhysicalAssetClass* message.
CancelPhysicalAssetClass	Cancel *PhysicalAssetClass* definitions.
SyncPhysicalAssetClass	Published *PhysicalAssetClass* definitions.

PhysicalAsset Elements	Description
GetPhysicalAsset	Get *PhysicalAsset* definitions.
ShowPhysicalAsset	Returned information from the *GetPhysicalAsset* message.
ProcessPhysicalAsset	Process *PhysicalAsset* definitions.
AcknowledgePhysicalAsset	Returned status from the *ProcessPhysicalAsset* message.
ChangePhysicalAsset	Change *PhysicalAsset* definitions.
RespondPhysicalAsset	Returned status from the *ChangePhysicalAsset* message.
CancelPhysicalAsset	Cancel *PhysicalAsset* definitions.
SyncPhysicalAsset	Published *PhysicalAsset* definitions.

PhysicalAssetCapabilityTestSpec Elements	Description
GetPhysicalAssetCapabilityTestSpec	Get *PhysicalAssetCapabilityTestSpecification* definitions.
ShowPhysicalAssetCapabilityTestSpec	Returned information from the *GetPhysicalAssetCapabilityTestSpec* message.
ProcessPhysicalAssetCapabilityTestSpec	Process *PhysicalAssetCapabilityTestSpecification*

PhysicalAssetCapabilityTestSpec Elements	Description
	definitions.
AcknowledgePhysicalAssetCapabilityTestSpec	Returned status from the *ProcessPhysicalAssetCapabilityTestSpec* message.
ChangePhysicalAssetCapabilityTestSpec	Change *PhysicalAssetCapabilityTestSpecification* definitions.
RespondPhysicalAssetCapabilityTestSpec	Returned status from the *ChangePhysicalAssetCapabilityTestSpec* message.
CancelPhysicalAssetICapabilityTestSpec	Cancel *PhysicalAssetCapabilityTestSpecification* definitions.
SyncPhysicalAssetCapabilityTestSpec	Published *PhysicalAssetCapabilityTestSpecification* definitions.

4 Diagram Convention

The schema diagrams using the following convention to illustrate the structure of the schema elements, the type of the elements and attributes, and the rules for optional elements and repetition.