AISG:

XML Software Data Distribution

Standard No. XUD 1.0

10th of December, 2015

XML for ALD Software Data Distribution

Revision History

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1. FOREWORD

The ALD software (SW) upgrade is a vendor specific block of data that a primary from a different vendor may send to the ALD without visibility on its content.

There is a need for primaries to be aware of whether it is possible to upgrade the ALD with such SW upgrade file. This is possible to indicate with the ALD product number and the ALD software upgrade path.

There is also a need for vendors and operators to distribute the application SW upgrade files for their ALDs.

All these needs are met by this XML-based distribution format. A vendor can put any or all of their SW files into one XML file. Likewise, an operator can create an XML file containing the software data for all the ALDs they use.

2. SCOPE

This document contains XML schema definitions for ALD software data distribution.

3. REFERENCES

This AISG Extension Standard incorporates provisions from other publications. These are cited in the text and the referenced publications are listed below. Where references are listed with a specific version or release, subsequent amendments or revisions of these publications apply only when specifically incorporated by amendment or revision of this AISG extension. For references listed without a version or release, the latest edition of the publication referred to applies.

1 AISG Version 2.0, “Control Interface for Antenna Line Devices”

2 Vendor Codes and Device Types list on http://www.aisg.org.uk

4. ABBREVIATIONS

Where abbreviations or acronyms are used in this document they have the following meanings:

ACS	Antenna Clock Source
ALD	Antenna Line Device
ASD	Alignment Sensor Device
ASCII	American Standard Code for Information Interchange
ATS	Temperature Sensor
CPM	Configurable Power Monitor
ETN	East of True North
GLS	Geographic Location Sensor
PNG	Portable Network Graphics
RAB	Remote Azimuth Beamwidth
RAE	eAntenna
RAS	Remote Azimuth Steering
RET	Remote Electrical Tilt
TMA	Tower Mounted Amplifier
XML	Extensible Markup Language
XCD	XML Configuration Data Distribution
XSD	XML Schema Definition
XUD	XML for Software Upgrade Distribution

5. TERMINOLOGY AND DEFINITIONS

Where the following terms are used in this document, they have the following meanings:

Base64	A binary to text encoding defined in section 5.2 in RFC 1341 (http://tools.ietf.org/html/rfc1341).

6. XUD FILE STRUCTURE AND CONTENT

The XML file can contain multiple software data files with matching rules to specify for which ALDs they are applicable to.

The configurations file can also contain optional graphics of the ALDs.

6.1 XUD Regular Expressions

The compatibility fields (productNumber, hwVersion, swVersion) can include the following wildcards for a more compact definition of many compatible ALDs.

Table 6.1.1: XUD Regular Expressions in Elementary Procedures for LID

Pattern	Meaning
.	Any character
*	Any number (0 or infinite) of the previous character
.*	Any number of any character(s)
9*	Any number of 9:s
\	The next character loses its special meaning
\.	The period character
*	The asterisk character
\\	The backslash character

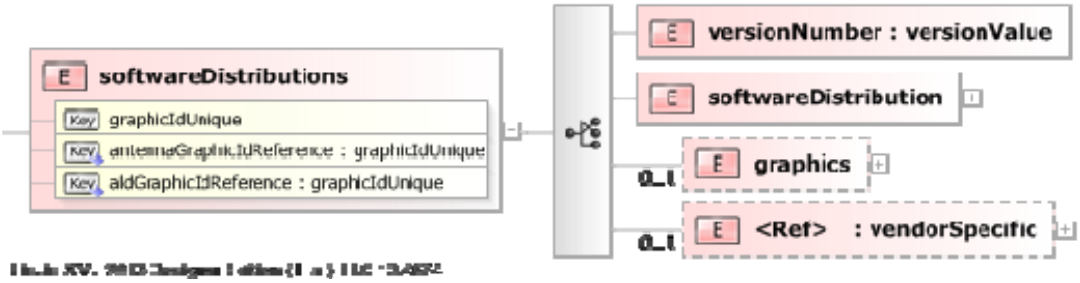
Examples:

- State <hwVersionPattern>0.7</hwVersionPattern> in the deviceInformation structure, to indicate compatibility with any 3-digit-version that starts with 0 and ends with 7, for example “017”.
- State <hwVersionPattern>0\.7</hwVersionPattern> in the deviceInformation structure, to indicate compatibility with “0.7”.
- State <hwVersionPattern>0\.7.*</hwVersionPattern> in the deviceInformation structure, to indicate compatibility with a version that starts with “0.7”. Some examples for matching versions are “0.7a”, “0.77”, “0.7.5” or “0.7”.
- State <hwVersionValue>027</hwVersionValue> in the deviceInformation structure, to indicate compatibility with “027”

6.2 XML File Structure

The XML file has two main parts, as shown in figure 6.2.1.

Figure 6.2.1: Sequence of ALD software files



The following parts shall be listed in any order:

6.2.1 Element versionNumber

This is a mandatory field containing the version number of the XML encapsulation format in ASCII format (alphanumeric). This field is defined as 1 for the first release of the XML encapsulation.6.2.2 Element softwareDistribution

This is a mandatory data structure containing one or more software data files.

6.2.3 Element graphics

This is an optional data structure containing all graphic representations for ALDs and antennas. The graphics are defined as base64 encoded PNG images, each with a maximum size of 75 kB. Each graphic file has a unique ID.

The graphic file can be referenced by its ID at the various places in the document.

This structure allows for defining the relatively large PNG image data only once and its use at all applicable places in the file.

6.2.4 Element vendorSpecific

This is an optional structure containing vendor-specific additional XML data.

6.3 Vendor-specific data

The XML file format allows for vendor-specific additions at defined places in the XML file. These can be used to add additional information that is needed by vendor-specific tools.

The vendor-specific data contains arbitrary XML data. However, that data must be in a different XML namespace than the XML namespace of the AISG XML file. This allows for tools to ignore unknown vendor-specific data by ignoring all XML elements from unknown namespaces.

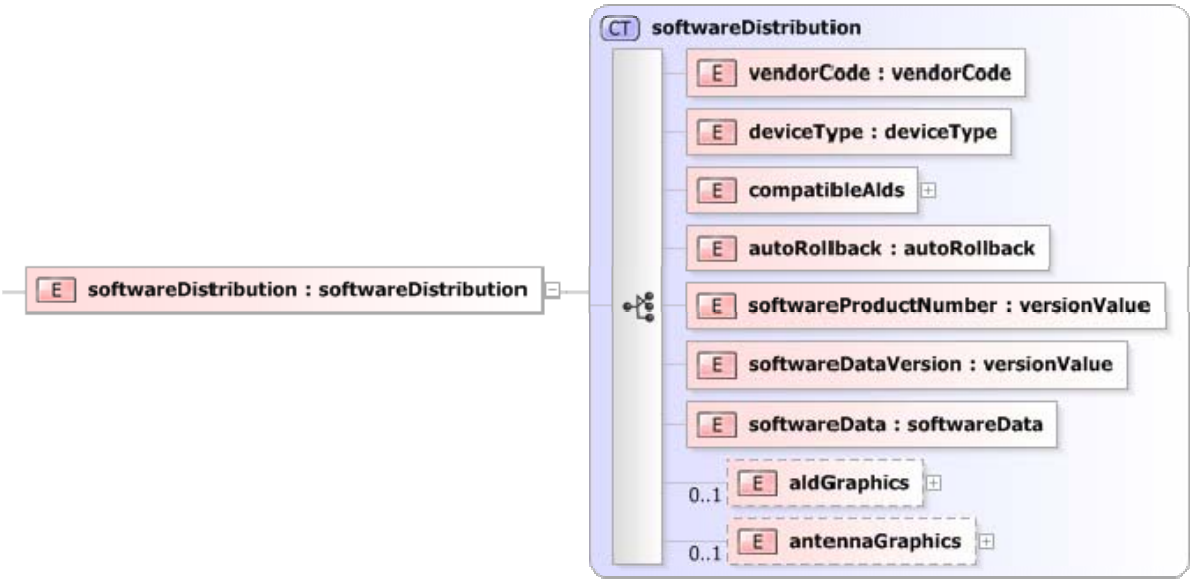
Thus, a vendor can add arbitrary additional data into the XML file without the risk of causing unexpected side-effects with the tools of other vendors.

6.4 ALD Software Distribution Section Structure

The softwareDistribution data structure has eight parts, as shown in figure 6.4.1.

The first device information entry that matches the ALD installed in the system (as explained in section 6.4.3.) is the one that shall be used. The software data entry shall appear when the device supports loading of software files. The schematics which might be included in ALD graphics are useful for physical recognition of these devices.

Figure 6.4.1: Structure of the softwareDistribution data section



The following parts shall be listed in any order order:

6.4.1 Element vendorCode

This is a mandatory field containing the ALD vendor code.

6.4.2 Element deviceType

This is a mandatory field containing the device type as an acronym (e.g. “RET” for single RET devices, “MRET” for multi RET devices, for other device types see complete acronym list at [2]).

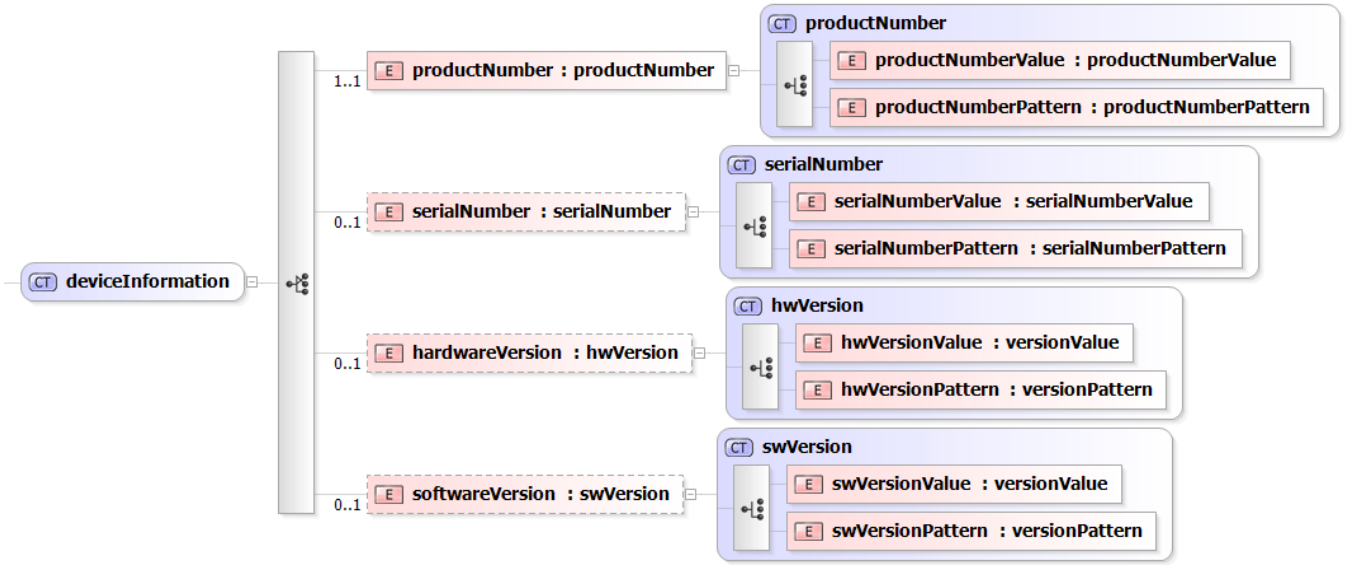
6.4.3 Element compatibleAlds

This is a mandatory data structure containing one or more definitions of ALDs whose deviceType was stated on the deviceType mandatory field. All devices described on

separate deviceInformation entries are compatible with the encapsulated software upgrade data.

Figure 6.4.3.1: Structure of the compatibleAlds section

Figure 6.4.3.2: Structure of the device information section



Compatibility is determined by comparing the Product Number, Hardware Version and Software Version values returned by GetInformation to the values listed in the compatibility definition.

The ALD is compatible if productNumber matches Product Number. It is optional to state hwVersion and swVersion and serialNumber. If any of them is stated compatibility means that hardwareVersion matches Hardware Version, softwareVersion matches Software Version and serialNumber matches Serial Number for any of the aldConfiguration sections.

The use of wildcards described in section 6 shall be indicated by the suffix “Pattern” while plain values are indicated by the suffix “Value”. It shall be noted that only one form can be used to describe these attributes (i.e. either state productNumberValue OR productNumberPattern, never both).

6.4.4 Element autoRollback

This is a mandatory data structure that describes the behaviour of the given device in ASCII format. When set to “Y”, the ALD will roll back to the previous working SW in case of not being able to re-establish the connection with the primary after the upgrade. When set to “N” the ALD will stay in the downloaded software, independently of AISG link status.

6.4.5 Element softwareProductNumber

This is an optional field containing the product number of the software data encapsulated in the XML in ASCII format (alphanumeric). The length and structure of this field may vary among different vendors.

6.4.6 Element softwareDataVersion

This is a mandatory field containing the version number of the software data in ASCII format (alphanumeric). This value corresponds to the Software Version value returned by the ALD response to GetInformation, once the upgrade with the distributed software data is complete.

6.4.7 Element softwareData

This is a mandatory field containing the software upgrade data coded as a base64 string.

6.4.8 Element antennaGraphics

This is an optional data structure containing one or more antenna graphic representations.

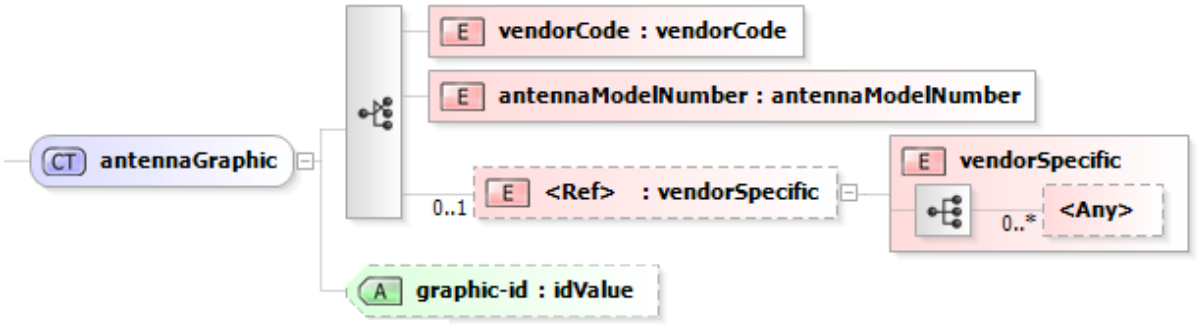
6.4.9 Element aldGraphics

This is an optional data structure containing one or more ALD graphic representations.

6.5 Antenna Graphic Section Structure

The antennaGraphic data structure is optional. When defined, it has three mandatory parts, as shown in figure 6.4.1.

Figure 6.5.1: Structure of the antenna graphic section



The following parts shall be listed in any order:

6.5.1 Element vendorCode

This is a mandatory field containing a vendor code.

6.5.2 Element antennaModelNumber

This is a mandatory field containing an antenna model number.

6.5.3 Element vendorSpecific

This is an optional structure containing vendor-specific additional XML data.

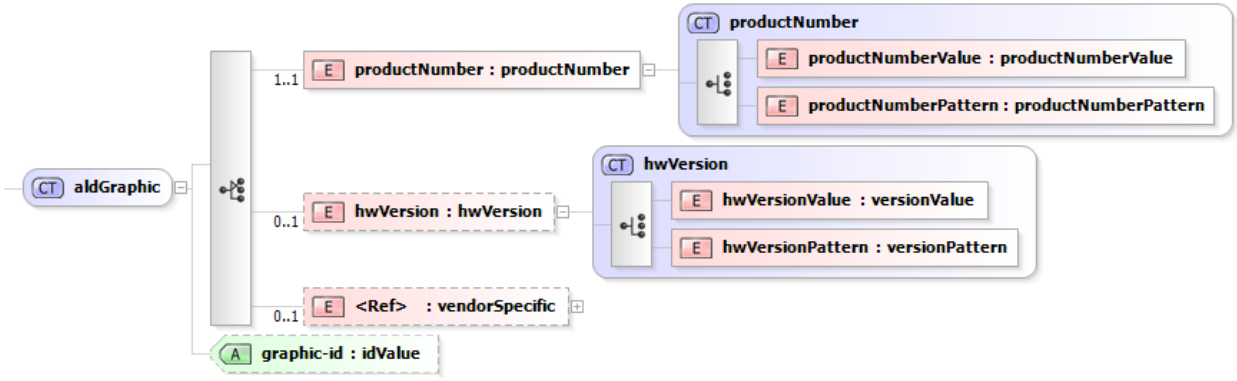
6.5.4 Attribute graphic-id

This is a mandatory attribute containing the unique ID of a graphic PNG image as defined in a graphic element.

6.6 ALD Graphic Section Structure

The aldGraphic data structure is optional. When defined, it has mandatory parts, as shown in figure 6.5.1.

Figure 6.6.1: The structure of the ALD graphic section



The following parts shall be listed in any order:

6.6.1 Element productNumber

This is a mandatory field containing a productNumber that matches the product number of the ALD, as returned by GetInformation.

6.6.2 Element hardwareVersion

This is a mandatory field containing a hardwareVersion that matches the hardware version of the ALD, as returned by GetInformation.

6.6.3 Element vendorSpecific

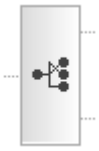
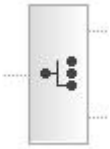
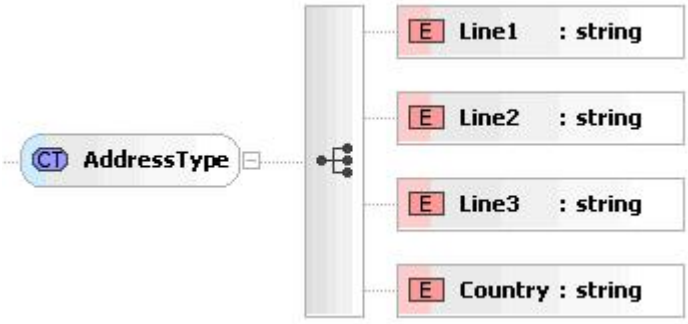
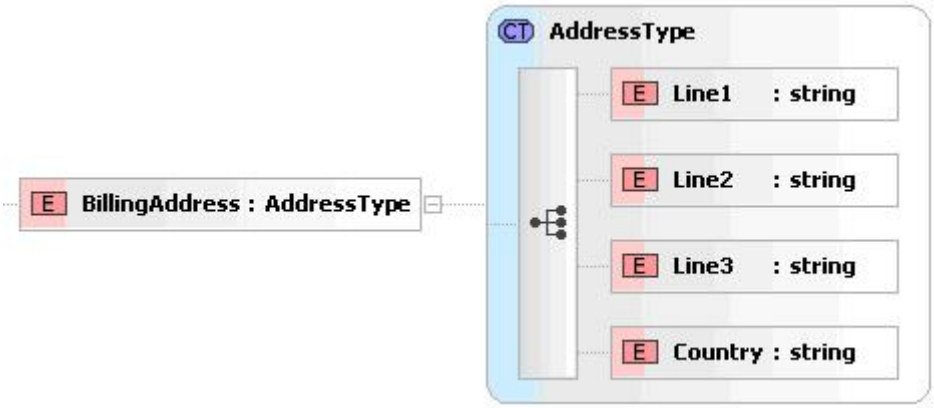
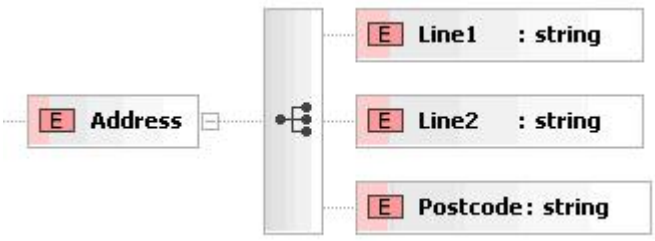
This is an optional structure containing vendor-specific additional XML data.

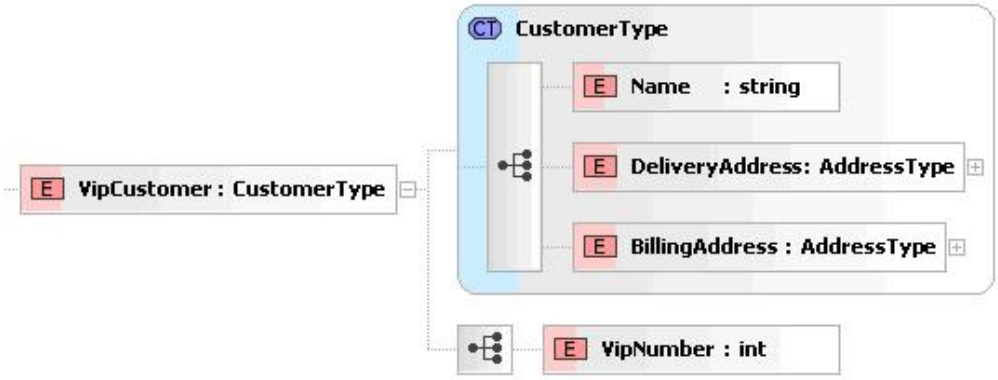
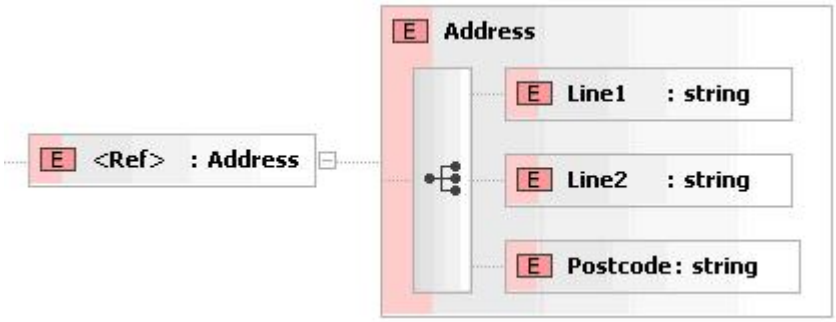
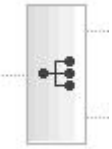
6.6.4 Tag graphic-id

This is a mandatory attribute containing the unique ID of a graphic PNG image as defined in a graphic elelement.

Annex A: XML Graphical Notation Overview (Informative)

Table A.1: XML Graphical Notation Overview

Type	Symbol
All	
Choice	
Complex Type Definition	
Complex Type Reference	
Element Definition (Child Elements)	

Element Definition (Data)	
Element Definition (Complex Content)	
Element Reference	
Group Reference	
Sequence	
Simple Type