MOST®
Media Oriented Systems Transport
Multimedia and Control Networking Technology

XML Import
Converting Function
Catalogs to PBN. Rev. 1.2

Document Information:
Version: 1.2-00
Release Date: 2001-06-13
XML Import
XML To PBN Converter

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## Document History

<table>
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<tr>
<th>Version</th>
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<td>Description of the two save methods for error messages added</td>
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<td>3.7</td>
<td>Added &quot;Maximum Parameters Of XML Import&quot;</td>
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<td>1.0-12</td>
<td>2001-01-25</td>
<td>3.6</td>
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<td>1.2-00</td>
<td>2001-06-13</td>
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<td>3.6</td>
<td>- PosDescriptions in TStream are now supported.</td>
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<td>- Changed maximum number of nodes from 200000 to 500000.</td>
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<td>- New restriction for T Enums.</td>
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<td>+ There were more branches than expected. Only the first 1000 will be used.</td>
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Conventions

Within this manual, the following abbreviations and symbols are used for improving readability:

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<tr>
<td>XML</td>
<td>Extensible Markup Language</td>
</tr>
<tr>
<td>DTD</td>
<td>Document Type Definition</td>
</tr>
<tr>
<td>MHz</td>
<td>Megahertz</td>
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<tr>
<td>MB</td>
<td>Megabyte</td>
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1 Introduction

XML Import of Oasis SiliconSystems AG is a standalone tool. It is designed to convert MOST databases (Function Descriptions/ Function Catalogs) in XML format into the syntax format of the tools from Oasis SiliconSystems AG.

Due to the complexity of XML descriptions, it is not possible to use them for real-time parsing/disassembling e.g. of MOST Control Messages. Therefore, the MOST Tools of Oasis SiliconSystems AG, e.g. OptoLyzer4MOST Professional, use syntax definition files based on a binary format. The files containing that kind of binary syntax definitions currently have the extension ".PBN".

XML Import can handle all kinds of XML descriptions that follow the conventions of Document Type Definition (DTD) Version 6.03. DTD 6.03 is the latest definition for structures of MOST XML databases. Although the XML database must consider those DTDs, XML Import does not require any DTD file for conversion.

2 System Requirements

XML Import is able to run on Windows 95/98/NT environments. The amount of memory required through the conversion of XML files highly depends on the size of the original XML file, and the inherent syntactical structures. The declaration of an array can be done within a single line of the XML file. The specification of the array's length as being 100 then leads to 100 structures of the respective kind to be kept in memory at the same time when converting. So it may be, that the conversion of a 3MB XML file requires about 20MB of memory.

Handling tasks of that complexity therefore requires a certain amount of memory and processing power. Converting an XML file of e.g. 3MB may take approximately 15 minutes on a Pentium Celeron 400MHz.

We therefore recommend the meeting of the following minimum requirements for a PC system in conjunction with XML Import:

- Pentium class PC 400 MHz
- 64MB memory
- 1 MB harddisk space for executable
- Harddisk space for keeping about two times the currently converted XML file. This does not include the space Windows needs for eventual swapping.

Nevertheless, XML Import is designed to work in the background. So it is no problem working at other tasks during conversion.
3 Software Reference

3.1 Installation

For installing XML Import, copy "XMLImport.exe" to the hard disk. From there, the program can be started by a simple double click, or by any other method available to start a program under Windows 95/98/NT (e.g. by creating a link).

3.2 Preparations For Conversion

Before converting any XML database, this database must be validated by using an appropriate DTD file. Converting databases that are not checked can lead to incorrect conversions, or may abort conversion. XML Import itself does not do any validation with respect to DTD files. We therefore recommend using "XML Spy" of "Icon Information Systems" (www.xmlspy.com).

3.3 Converting XML Files To PBN Files

Start XML Import, e.g. by clicking on the link created during installation (refer to 3.1). This opens the main window as shown below:

![Figure 3-1: Main window of XML Import.](image)
First, the XML databases file must be selected. This can either be done by typing, or through a file selector box. For activating the file selector box, please click on the browse button:

The following window will be opened:

![Dialog to select a XML file.](image)

After navigating to the XML file, the full path and name of the file will appear in the first input field. The next step is to name the full path of the output file (new PBN file). This can be done in the same ways as described before but in the field titled "Path to PBN file". Specifying both files will finally enable the "Start conversion" button.

For converting the file, please click on "Start conversion". The label "Elapsed time" shows the time passed since activation, while the progress bar in the middle of the main window shows the current state of the conversion.

All warnings that have been generated during processing are available in the "Messages" window. In case there are too many messages, a slider will be added. Use the slider for scrolling to the desired message. For saving the messages to a LOG file, please refer to section 3.4 on page 10.

At the end of the conversion a short report will be written to the "Messages" window.

For closing XML Import, simply click on "Exit". In case of a successful conversion, a new PBN file will be available at the previously selected location. The usage of PBN files is described in the documentation of the respective MOST Tools.
3.4 Storing Error Messages in LOG Files

Error reports or warnings in the message window can be stored into a LOG file. There are two different ways for achieving this. Both options are selected through a context menu, which can be opened by clicking with the right mouse button into the Message Window:

![Figure 3-3: Context menu of Message Window](image)

Option "About" opens the splash screen of XML Import. For saving all messages to a LOG file, please select "Save to file". This opens a save dialog, where path, name and type of the LOG file can be specified. It is recommended to keep the default settings (.TXT) for the LOG file's extension.

For being able to transfer all messages directly to another software, choose "Copy to clipboard".

3.5 Supported Element Arrangements

The following list shows, which element arrangements of the MOST Specification are supported by XML Import:

- TArray of TBool
- TArray of TBitfield
- TArray of TNumber
- TArray of TString
- TArray of TStream
- TStream of TBool
- TStream of TNumber
- TStream of TString
- TRecord of TBool
- TRecord of TNumber
- TRecord of TString
- TRecord of TArray
- TRecord of TStream
3.6 Critical Element Arrangements

For avoiding memory overflow during conversion, XML Import limits the output generated by some element arrangements. Therefore, some combinations will be missing in the resulting PBN file:

- **TArray of TEnum**
  Converting an array consisting of 4 enumeration type entries that have 3 elements each, would result in 120 elements to be written to the PBN file. The length of TArray therefore is set to 1.

- **TStream of TEnum**
  Stream length is set to 1. After a TEnum in a TStream no more stream nodes will be appended due to complexity of the result.

- **TStream of TStream**
  All stream lengths will be set to 1.

- **TRecord of TEnum**
  This arrangement is limited, for avoiding excessive expanding of the resulting PBN file. In any case, the record elements after the enumeration are appended to the first element of the enumeration only.
3.7 Maximum Parameters Of XML Import

- **Node Count:**
  The maximum number of nodes is 500000.

- **OPType:**
  All parameters and the OPType will be skipped, if the OPType is missing or wrong.

- **TRecord:**
  If a TRecord has an insufficient size, the last parameters will be skipped.

- **Position Cases:**
  If a data section contains more then 100 PosDescriptions, 100 PosDescriptions will be processed, the rest will be ignored.

- **TEnum:**
  When translating an Enumeration into a syntax tree file, all Enumerations must be inserted (expanded) into the tree explicitly. In case of nested Enumerations, or Enumerations in direct succession, this behavior leads to an inefficient size of the tree. Therefore, the expanding stops after 1000 branches.

- **Repeating Elements:**
  Repeating elements will not be shown in the syntax tree of Optolyzer4MOST Professional or Optolyzer4MOST Standard. In case a message is sent that contains repeating elements, the viewer shows all elements in the "Disassemble" column.
3.8 Warnings And Error messages

- **Allocation of memory failed!**
  This error is displayed when an allocation of memory was not successful (due to insufficient memory). In most cases the run of XML Import will be aborted after that.

- **Conversion of XML file stopped!**
  This message is displayed when the run of XML Import was stopped and aborted. This can happen due to different causes.

- **Could not localize the correct position of a TStream node.**
  If a TStream node has no corresponding node (where it should be appended), this message will be printed.

- **Could not open output file!**
  There may be problems with the output file. Please check if the given file is not in use by another application, or write protected.

- **Function Blocks with same IDs are not allowed!**
  FBlockIDs must be unique. Otherwise, this warning will be generated. Nevertheless, the respective FBlocks will be implemented in the PBN file. It is recommended to change the relevant ID(s) in the XML file and to start the conversion again.

- **Functions with same IDs are not allowed in one FBlock!**
  Function IDs (FktIDs) in one Function Block must be unique. XML Import has found two identical FktIDs.

- **Max node count exceeded in ...**
  This error will stop XML Import immediately because the maximum number of nodes is exceeded (refer to section 3.7 on page 12).

- **Max position cases exceeded.**
  If too many PosDescriptions were defined, this warning will be generated. The following PosDescriptions will be ignored (refer to section 3.7 on page 12).

- **More than 2 arrays in one parameter.**
  If a parameter of a function contains more than two arrays this error will be displayed in the message window. This error will be generated, since the MOST Specification does not allow more than 2 arrays per parameter.

- **More than one record in one parameter!**
  The MOST Specification does not allow using more than one record in one parameter.

- **OTType is missing or wrong.**
  This message will not stop the program. All parameters behind OTType will be skipped.

- **Record is too small.**
  The XML file contains a TRecord structure that has more elements as described by the attribute NEElements.
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- There is a wrong value in an FBlockID or FktID.
  This warning is generated, in case an FBlockID or FktID is empty, or contains invalid characters. XML Import will not stop, but the respective values are set to 0. Valid characters are "0x", "0-9", "A-F", and "a-f".

- There is a wrong value in Exponent of TNumber.
  The exponent of a TNumber object has a wrong value. This value will then be set to 1.

- There is a wrong value in Length of TBitfield.
  The length of a TBitfield object has a wrong value. This value will then be set to 1.

- There is a wrong value in Length of TStream.
  The length of a TStream object has a wrong value. This value will then be set to 1.

- There is a wrong value in MaxSize of TString.
  The length of a TString object has a wrong value. This value will then be set to 1.

- There is a wrong value in NElements of TRecord.
  The amount of elements in a TRecord object has a wrong value. This value will then be set to 0.

- There is a wrong value in NMax of TArray.
  The length of a TArray object has a wrong value. This value will then be set to 1.

- There is a wrong value in RangeMax of TNumber.
  The max range of a TNumber object has a wrong value. This value will then be set to the maximum value available for the respective number.

- There is a wrong value in RangeMin of TNumber.
  The min range of a TNumber object has a wrong value. This value will then be set to 0.

- There was no corresponding node to append stream case in FindPosTail.
  If a TStream with a PosDescription has no corresponding node (where it should be appended), this message will be printed and the node will be appended to the previously inserted node.

- There were more branches than expected. Only the first 1000 will be used.
  When translating an Enumeration into a syntax tree file, all Enumerations must be inserted (expanded) into the tree explicitly. In case of nested Enumerations, or Enumerations in direct succession, this behavior leads to an inefficient size of the tree. Therefore, the expanding stops after 1000 branches. Stopping of expansion is indicated by this message.

- There were no relevant nodes in input file.
  The input file contains no data expected in an XML file according to the current DTD of the MOST Corporation.

- Two arrays and one record in one parameter are not allowed!
  Two arrays and a record in one parameter are not allowed by MOST Specification.
3.9 Shortcut Keys

Currently, no shortcut keys are defined in XML Import. The only keys required for accessing all functions are:

- Tab
- Space
- Return

The Tab key can be used for navigating between the buttons. Space or Return has the same effect on the selected buttons like a click with the left mouse button.