



# Generator Tool for Microread Configuration File

Document Type:	Functional Specification
Reference:	FRS_NFC_0910-129 Version 0.5 (10217)
Release Date:	May 20, 2011
File Name:	FRS_NFC_0910-129 Generator Tool for Microread Configuration File v0.5.pdf
Security Level:	General Business Use

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## History

Version	Date	Comments
0.1	Oct. 30, 2009	First Version
0.2	Feb. 1, 2010	Add generation of Header file
0.3	Dec. 8, 2010	Updating the document template.
0.4	Feb. 16, 2011	Updating the document license.
0.5	May 20, 2011	Renaming the document from MAN_NFC_0910-129 into FRS_NFC_0910-129.

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## 1 Introduction

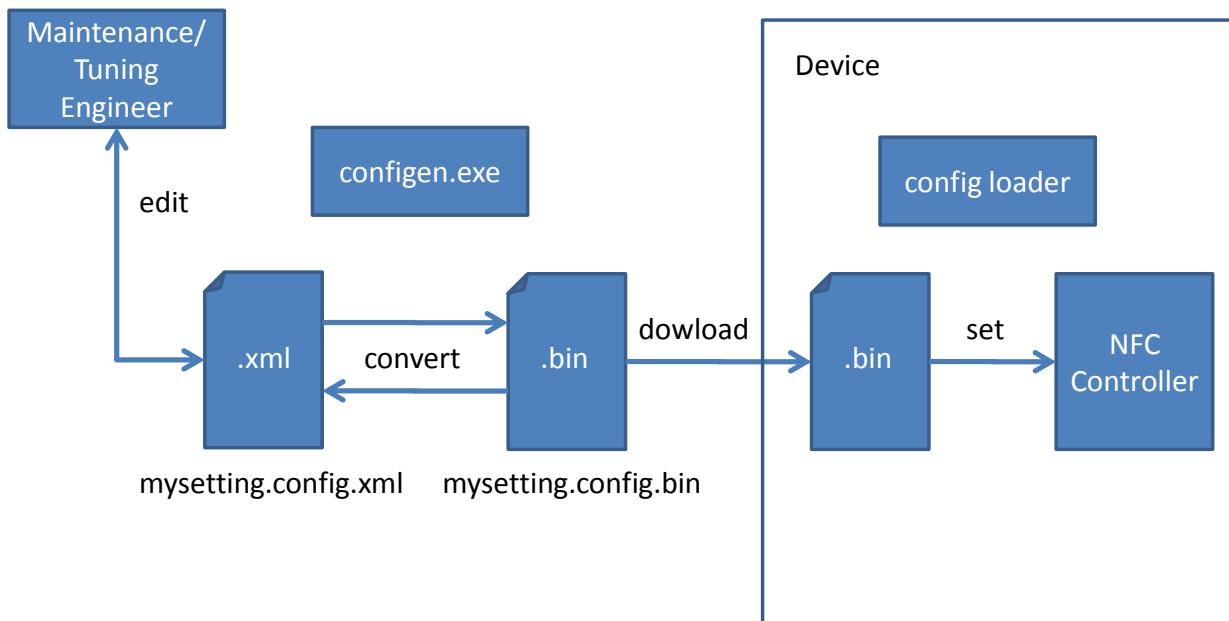
The Generator Tool for Microread Configuration File converts XML configuration files into binary configuration file, or to C header file. This document includes:

- the specification of the tool,
- the specification of the configuration loader on the device,
- the specification of the XML configuration file, and
- the specification of the binary configuration file.

The configuration file may be used to perform one or several of the following commands:

- Install a new loader
- Install a new firmware
- Set the loader parameters
- Set the firmware parameters

The workflow of the configuration file is the following:



## 2 Generator Tool Specification

The configuration generator tool is a PC command line executable with the name "configen.exe".

The configen.exe tool implements two main functions:

- Convert an XML configuration file into a Binary configuration file.
- Convert a Binary configuration file into XML configuration file.

### Command line:

```
configen.exe [command] [-l license file] [-i inputfile] [-o output file]
```

Where command is one of the following:

- convert Convert a file. The type of conversion is based on the file extension.
- help Display this help

### Conversion XML to Binary

The tool shall perform all the verifications required by the Schema file and the additional verifications required in the chapter "0 **Setting Loader Parameters**

The procedure is identical to the firmware parameter except that the configuration loader shall enter in the loader mode before setting the parameters and exit the loader after setting the parameters.

XML Configuration File". All the errors shall be explicitly displayed, with the nature and the location of the error in the XML file.

The XML file containing the firmware is checked for the meta information included in the header of the file, for example the firmware version.

A warning is displayed if the build number or the interface number is missing.

The generation of the license identifier is RFU.

### Conversion Binary to XML

Extract all information including the license identifier and the firmware content. Generate separate XML files with the firmware content.

### Conversion XML to C Header file

The tool shall perform the same operations as for "Conversion XML to binary", except that the result is a C Header file.

### 3 Configuration Loader Specification

The configuration loader is a module embedded in the NFC software stack. This module receives a binary configuration and executes the command included in this configuration.

#### Header Verification

The configuration loader checks the magic number, the version and the license identifier of configuration file.

The verification of the license identifier is RFU.

#### Section Identification

Then the loader scans each section following the order in the configuration file. For each section, the loader checks if at least of the target matches the current configuration.

The matching algorithm is the following:

Steps	Current	Target	Action
1 - Hardware Version	unknown		stop loading
	X	Y != X	check next target
	X	X	continue
2 - Loader Version	unknown		stop loading
	X	Y != X	check next target
	X	X	continue
3 - Firmware Version	unknown	Y	check next target
	unknown	any	continue
	X	Y != X	check next target
	X	X	continue
	X	any	continue
4 - Interface Version	unknown	Y	check next target
	unknown	any	Target is valid
	X	Y != X	check next target
	X	X	Target is valid
	X	any	Target is valid

If none of the section matches the current configuration, an error is returned. Otherwise the first section matching the configuration is executed and the other are ignored.

#### Execution

Several consecutive commands may be executed. For example, the section may contain the download of a loader patch, the setting of loader parameters, the download of a firmware and the setting of the firmware parameters.

There is no rollback mechanism so if an error occurs during the execution of a section, the execution stops.

#### Downloading a Firmware

The download procedure does not check the interface number of the firmware. After the firmware download, no parameter is set.

#### Downloading a Loader Patch

The procedure is identical to the download of a firmware.

### **Setting Firmware Parameters**

The parameter section includes several “set parameter” commands. Each command modifies one parameter. The commands shall be executed in the order specified in the file. There are two types of commands:

- The “set value” command sets a parameter with a given value.
- The “set value by masking” commands update the value of a parameter using a bit-wise OR operation and a bit-wise AND operation.

### **Setting Loader Parameters**

The procedure is identical to the firmware parameter except that the configuration loader shall enter in the loader mode before setting the parameters and exit the loader after setting the parameters.

## 4 XML Configuration File

This section describes the version 1.0 of the XML Configuration file format. The XML configuration files are XML files post fixed with “.config.xml”. The schema file for the XML configuration file is “configuration\_file\_10.xsd”.

The following information is not present in the formal rules of the schema file:

The license identifier element is only informative. This element is generated from the value included in a configuration binary file. When a configuration binary file is generated the tool uses the value given in the command line to generate the license identifier. If the license identifier element is present in the XML file, the tool checks that the value of this element is identical to the value provided in the command line. If this is not the case a simple warning is displayed.

The “file” attribute of a firmware section shall contain the path of a valid XML firmware file. The path is relative to the portion of the XML configuration file.

The length in bytes of the values in the attributes “andMask” and “orMask” of the element “parammask” shall be equal.

## 5 Binary Configuration File

This section describes the version 1.0 of the Binary Configuration file format. The XML configuration files are XML files post fixed with “.config.bin”.

The multi-byte integer values stored in the file are encoded with the little endian convention. There is no padding byte nor alignment of the values.

Offset	Length	Field	Description
0x00	0x04	MAGIC_WORD	Constant value: 0x23D61F9B
0x04	0x01	VERSION	Constant value for version “1.0” : 0x10
0x05	0x04	FILE_SIZE	The total size of the file in bytes
0x09	0x10	LICENSE	The license identifier
0x19	0x01	SECTION_NUM	The number of sections
0x1A	0x01	TITLE_LENGTH	The length in bytes of the title. May be zero.
0x1B	TITLE_LENGTH	TITLE	The title of the file. ASCII string [0x20, 0x7E].
0x1B + TITLE_LENGTH	-	-	The list of the sections

The mapping of the sections is the following:

Offset	Length	Field	Description
0x00	0x04	SECTION_SIZE	The total section size in bytes
0x04	0x01	TARGET_NUM	The number of targets (minimum 1)
0x05	N	-	The target sections (see below). N is TARGET_NUM * size of a target.
0x05 + N	-	-	The list of firmware and parameters configurations (see below)

The mapping of a target is the following:

Offset	Length	Field	Description
0x00	0x03	HARWARE_VER	The required hardware version.
0x03	0x03	LOADER_VER	The required loader version.
0x06	0x03	FIRMWARE_VER	The required firmware version. Set to zeros if no specific firmware version is required.
0x09	0x01	INTERFACE_VER	The required interface version. Set to zeros if no specific interface version is required.

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The mapping of a firmware download section is the following:

Offset	Length	Field	Description
0x00	0x01	TYPE	The section type: 0x01
0x01	0x04	LENGTH	The length in bytes of the section after this field.
0x05	0x03	VERSION	The version of the firmware
0x08	0x04	BUILD	The build number of the firmware
0x0C	0x01	INTERFACE	The interface number of the firmware
0x0D	LENGTH-12	FIRMWARE	The firmware content.
LENGTH+1	0x04	CRC	The parameters for the "check CRC" command

The mapping of a loader patch download section is the following:

Offset	Length	Field	Description
0x00	0x01	TYPE	The section type: 0x02
0x01	0x04	LENGTH	The length in bytes of the section after this field.
0x05	0x03	VERSION	The version of the loader
0x08	0x04	BUILD	The build number of the loader patch
0x0C	0x01	INTERFACE	The interface number of the loader
0x0D	LENGTH-12	FIRMWARE	The loader patch content.
LENGTH+1	0x04	CRC	The parameters for the "check CRC" command

The mapping of a normal parameters section is the following:

Offset	Length	Field	Description
0x00	0x01	TYPE	The section type: 0x03
0x01	0x04	LENGTH	The length in bytes of the section after this field.
0x05	LENGTH	-	The parameter to set.

The mapping of a loader parameters section is the following:

Offset	Length	Field	Description
0x00	0x01	TYPE	The section type: 0x04
0x01	0x04	LENGTH	The length in bytes of the section after this field.
0x05	LENGTH	-	The parameter to set.

The mapping of a set parameter section is the following:

Offset	Length	Field	Description
0x00	0x01	TYPE	The section type: 0x05
0x01	0x04	LENGTH	The length in bytes of the section after this field.
0x05	0x01	SERVICE	The service constant identifier
0x06	0x01	PARAMETER	The parameter identifier
0x07	LENGTH - 2	VALUE	The value to set in the parameter

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The mapping of a mask parameter section is the following:

Offset	Length	Field	Description
0x00	0x01	TYPE	The section type: 0x06
0x01	0x04	LENGTH	The length in bytes of the section after this field.
0x05	0x01	SERVICE	The service constant identifier
0x06	0x01	PARAMETER	The parameter identifier
0x07	(LENGTH-2)/2	OR_MASK	The OR mask value to apply to the parameter
-	(LENGTH-2)/2	AND_MASK	The AND mask value to apply to the parameter