

## Flexi Multiradio System Module recovery with Restore Factory Settings

### User Guide 1.39

#### Radio Networks

Flexi Multiradio BTS WCDMA  
 Flexi Multiradio BTS LTE  
 Flexi Multiradio BTS TD-LTE  
 Flexi Multiradio 10 BTS EDGE  
 Flexi Multiradio BTS Single RAN  
 Flexi Lite BTS WCDMA  
 Flexi Zone WCDMA BTS  
 Flexi Zone BTS TD-LTE  
 Flexi Zone BTS

This document contains following type of information	
Informative	X
Preventive	
Corrective	
Additional categorization	
Urgent	X
Security	
Release Upgrade	
SW Update	
Parameterization	
Information is classified as	
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### Contact:

Contact your local Nokia Solutions and Networks support

### Summary of changes:

04-Sep-2014	1.0	Approved for RFSToolv3 v1.05
18-Nov-2014	2.0	Approved for RFSToolv3 v1.07
27-Nov-2014	3.0	Approved for RFSToolv3 v1.08
15-Jan-2015	4.0	Approved for RFSToolv3 v1.09
02-Jul-2015	5.0	Approved for RFSToolv3 v1.27
07-Oct-2015	6.0	Approved for RFSToolv3 v1.30
05-Nov-2015	7.0	Approved for RFSToolv3 v1.32
18-Nov-2015	8.0	Approved for RFSToolv3 v1.34
27-Nov-2015	9.0	Approved for RFSToolv3 v1.36
04-Dec-2015	10.0	Approved for RFSToolv3 v1.37
07-Dec-2015	11.0	Approved for RFSToolv3 v1.38
20-Jan-2016	12.0	Approved for RFSToolv3 v1.39

## Changes between issues 1.0 and 2.0

RFSToolv3 application 1.07

- FSIH support added.

## Changes between issues 2.0 and 3.0

RFSToolv3 application 1.08

- RL70 allowed in recovery procedure.

## Changes between issues 3.0 and 4.0

RFSToolv3 application 1.09

- WCDMA-LTE RF sharing IP address scheme support added.  
WCDMA = 192.168.255.1 / .129 & LTE = 192.168.255.5 / .127

## Changes between issues 4.0 and 5.0

RFSToolv3 application 1.27

- LAN settings requirements changed, use IP address 192.168.255.130 instead of 192.168.255.126 (to connect with FSMF running 2G BTS SW)
- Support for GSM to other RAT SW updated added.
- Flexi Zone BTS support added.

## Changes between issues 5.0 and 6.0

RFSToolv3 application 1.30

- Workaround of TS-BTS-HW-0031  
Chapter added for deploying FSMF serial console workaround  
WCDMA license handling corrected to avoid mounting error.
- Flexi Multiradio BTS Single RAN support added.
- Flexi Zone WCDMA BTS support completed.

## Changes between issues 6.0 and 7.0

RFSToolv3 application 1.32

- Corrected connectivity issues with Flexi Zone BTS.
- Flexi Multiradio BTS Single RAN support updated.

## Changes between issues 7.0 and 8.0

RFSToolv3 application 1.34

- WBTS16 SW packages accepted.

## Changes between issues 8.0 and 9.0

RFSToolv3 application 1.36

- FSME/D/C support added.
- Latest WBTS16 / TLC16 SW packages accepted to recovery routine.
- Target unit ping problem corrected.
- Change Ethernet Security Tool 3.0 added (ChangeEthernetSecurityTool2.zip) to avoid Java problems.

## Changes between issues 9.0 and 10.0

RFSToolv3 application 1.37

- FSME extension unit support added.
- Added restore vendor certificate handling
- Added handling Local Account
- Added handling Service Account
- Improved Ethernet port security disabling and unit information reading scenario.

## Changes between issues 10.0 and 11.0

RFSToolv3 application 1.38

- Occasional WCDMA FSME problem fixed in reading unit information.

## Changes between issues 11.0 and 12.0

RFSToolv3 application 1.39

- NOLS release.

## Purpose

This document contains generic information about products. These can be instructions that explain problem situations in the field, instructions on how to prevent or how to recover from problem situations, announcements about changes or preliminary information as requirements for new features or releases.

## 1. VALIDITY

Product	Product code	Core Module
Flexi Multiradio 10 System Module, FSMF	472181A	084792A
Flexi Multiradio 10 System Module, FSIH	472567A	085570A
Flexi Multiradio System Module, FSME	471469A	083833A
Flexi Multiradio System Module, FSMC	471402A	083780A
Flexi Multiradio System Module, FSMC	471401A	083761A
Flexi Lite BTS WCDMA, FQGA	472467A	085449A
Flexi Lite BTS WCDMA, FQFA	472751A	086923A
Flexi Zone WCDMA BTS, FWGL	473233A	
Flexi Zone WCDMA BTS, FWGM	473234A	
Flexi Zone WCDMA BTS, FWGN	473235A	
Flexi Zone WCDMA BTS, FWFE	473236A	
Flexi Zone WCDMA BTS, FWFF	473237A	
Flexi Zone WCDMA BTS, FWFG	473238A	
Flexi Zone BTS TD-LTE, FWHE	472939A	
Flexi Zone BTS TD-LTE, FWHF	472940A	
Flexi Zone BTS TD-LTE, FWNA	473152A	
Flexi Zone BTS TD-LTE, FWNB	473153A	
Flexi Zone BTS TD-LTE, FWNC	473154A	
Flexi Zone BTS TD-LTE, FWND	473122A	
Flexi Zone BTS TD-LTE, FWHD	472852A	
Flexi Zone BTS TD-LTE, FWHT	473531A	
Flexi Zone BTS, FWGB	472851A	
Flexi Zone BTS, FWIB	472899A	
Flexi Zone BTS, FWHA	472897A	
Flexi Zone BTS, FWFA	473040A	
Flexi Zone BTS, FWEA	472898A	
Flexi Zone BTS, FWHN	473148A	
Flexi Zone BTS, FWHO	473149A	
Flexi Zone BTS, FWEB	472941A	
Flexi Zone BTS, FWIC	472942A	
Flexi Zone BTS, FWID	473150A	
Flexi Zone BTS, FWIE	473151A	
Flexi Zone BTS, FWHC	472938A	
Flexi Zone BTS, FWHG	472945A	
Flexi Zone BTS, FWHH	472946A	
Flexi Zone BTS, FWHI	473143A	
Flexi Zone BTS, FWGI	473140A	
Flexi Zone BTS, FWGJ	473141A	
Flexi Zone BTS, FWGK	473142A	
Flexi Zone BTS, FWFB	473041A	
Flexi Zone BTS, FWFC	473138A	
Flexi Zone BTS, FWFD	473139A	
Flexi Zone BTS, FWEC	473135A	
Flexi Zone BTS, FWED	473136A	
Flexi Zone BTS, FWEE	473137A	
Flexi Zone BTS, FWHM	473147A	

Product	System level	BTS Software
Flexi Multiradio WCDMA BTS	RU30 RU40 RU50 WBTS16	WN7.0 3.0 WN8.0 WN9.0/WN9.1 WBTS16
Flexi Multiradio LTE BTS	RL40 RL50 RL60 RL70 FL15A FL16	LN4.0 LN5.0 LN6.0 LN7.0 FL15A FL16
Flexi Multiradio TD-LTE BTS	RL25 RL35 RL45 RL55 TL15A TL16	LNT2.0 LNT3.0 LNT4.0 LNT5.0 TL15A TL16
Flexi Multiradio BTS Single RAN	SRAN16.2	SBTS16.2
Flexi Multiradio 10 BTS EDGE	RG30 EP1 RG40	GF1.0 GF16
Flexi Lite BTS WCDMA	RU30 RU40 RU50	WL7.0 2.0 WL8.0 WL9.1
Flexi Zone WCDMA BTS	WCDMA15FZ	WZ9.1
Flexi Zone BTS TD-LTE	RL55FZ TL15A TL16 TL16	LNZ5.0 TLF15A TLF16 TLC16
Flexi Zone Controller		
Flexi Zone BTS	RL50FZ RL70FZ FL15A FL16 FL15A	LNF5.0 LNF7.0 FLF15A FLF16 FLC15A
Flexi Zone Controller		

## 2. COMPATIBILITY / DEPENDENCIES TO OTHER PRODUCTS

Restore factory settings – RFSToolv3 version 1.39 supports a variety of Flexi BTS modules. This release replaces all the previous RFSToolv3 versions. ‘*And later*’ means any SW release published after BTS SW listed in the table (column – Target BTS SW).

RFSToolv3 1.39					
Module	Unit (sub-unit)	Active BTS SW	Target BTS SW	Target BTS SW	Restore supported
Flexi Multiradio 10 System Module	FSMF (FTIF) (FBBA) (FBBC)	WCDMA	WCDMA LTE TD-LTE SRAN	WN7.0 3.0 / LN4.0 / LNT2.0 / SBTS 16.2 and later	YES
		LTE			
		TD-LTE			
		SRAN			
		GSM			
		FDSW1.1			
	FDSW1.0	-	-	-	NO <sup>3)</sup>
Flexi Multiradio System Module	FSIH (FBIH)	TD-LTE	TD-LTE	LNT4.0 and later	YES
	FSME FSMD FSMC	WCDMA (WN9.1 and later)	WCDMA	WN9.1 and later	YES
			LTE	WN9.0 and later	NO <sup>2)</sup>
		WCDMA (WN6.0 ... WN9.0)	WCDMA	LN4.0 and later	NO <sup>2)</sup>
			WCDMA	WN9.1 and later	NO <sup>2)</sup>
			WCDMA	WN6.0 ... WN9.0	YES
			LTE	LN4.0 and later	NO <sup>2)</sup>
	FSME	LTE	WCDMA	WN6.0 and later	NO <sup>1)</sup>
			WCDMA	WN9.1 and later	NO <sup>2)</sup>
			LTE	LN4.0 and later	NO <sup>4)</sup>
Flexi Lite BTS WCDMA	FQGA FQFA	WCDMA	WCDMA	WL7.0 2.0 and later	YES
Flexi Zone BTS	FWGL, FWGM FWGN, FWFE FWFF, FWFG	WCDMA LTE	WCDMA LTE	WZ9.1 / FLF15 and later	YES
	FWNA, FWNB FWNC, FWND FWHD	TD-LTE	TD-LTE	LNZ5.0 1.0 and later	YES
	FWHE, FWHF	TD-LTE	TD-LTE	LNZ5.0 and later	YES
	FWGB, FWIB FWHA	LTE	LTE	LNF5.0 and later	YES
	FWEB, FWIC FWID, FWIE FWHC, FWHG FWHH, FWHI	LTE	LTE	LNF7.0 and later	YES
	FWFA, FWFA FWHN, FWHO	LTE	LTE	LNF5.0 2.0 and later	YES
	FWGI, FWGJ FWGK, FWFB FWFC, FWFD FWEC, FWED FWEE, FWHM	LTE	LTE	LNF7.0 2.0 and later	YES
Flexi Multiradio GSM/EDGE System Module	ESMB ESMC	GSM	N/A	Configuration reset	NO

<sup>1)</sup> SW upgrades are supported with RFSToolv2; refer to TS-SRAN-SW-0023.

<sup>2)</sup> SW upgrades are supported with BTS Site manager.

<sup>3)</sup> SW update to RAT SW is required first, then RAT SW RFS compatibility applies.

<sup>4)</sup> Under construction.

### 3. KEYWORDS

Restore Factory Settings, System Module Recovery, RFSToolv3

### 4. TERMINOLOGY

The following terminology is used in this document:

FSMF	Flexi Multiradio 10 System Module
FSME	Flexi Multiradio System Module
FSIH	Flexi Multiradio 10 System Module Indoor
FTIF	Transport sub-module (for FSMF)
FBBA	Extension baseband sub-module (for FSMF)
FBBC	Extension baseband sub-module (for FSMF)
FBIH	Extension baseband sub-module (for FSIH)
FPFD	Power distribution sub-module (for FSMF)
FQxx	Flexi Lite BTS WCDMA
FWxx	Flexi Zone BTS/Flexi Zone BTS TD-LTE/Flexi Zone WCDMA BTS
RFM	Flexi Multiradio RF module / Remote Radio head
FSM	Flexi System Module / target unit
RAT	Radio Access Technology
SRAN	Single RAN

## 5. QUICK GUIDE

Scenarios where restore factory setting can help:

- a) Problems during installation and commissioning, example HW exchange
- b) No access via BTS Site Manager
- c) SW mismatch between differed kind of modules
- d) Failure during SW update
- e) Commissioning is going wrong or not possible
- f) Deletion of double target ID
- g) Restore Vendor Certificate
- h) Restore Local Account
- i) Restore Service Account

### Equip RFSToolv3 application with target BTS SW release(s)

- 1) Deflate RFSToolv3 delivery package to local directory (e.g. C:\Temp), if not done yet
- 2) PC's network properties shall be specified to match the following settings: IP address as 192.168.255.126 (192.168.255.130 for 2G FSMF) & subnet mask as 255.255.254.0.
- 3) Store target SW (in zip format) to directory.\RFSToolv3\BTSSW\

### Prepare FSM unit for restore procedure

- 4) Power up FSM
- 5) Connect LMP cable - check ping response at 192.168.255.1/.127/.129/.131
- 6) Connect BTS Site manager - Save backup SCF if applicable

### Start recovery

- 7) Confirm to save/clear current LK/Target ID (only in WCDMA)
- 8) Restore vendor certificates (optional)
- 9) Select BTS SW (one or more stored in .\RFSToolv3\BTSSW\)
- 10) Confirm to execute recovery

To install target SW for both partitions, recovery procedure needs to be run twice.

For typical recovery scenario, refer for more information at chapter 6.

If RFSToolv3 cannot login be to target unit, the connection problem is indicating software or hardware failure that requires a repair. Also if Local/Service account has been changed and if changed account information cannot be given during unit identification, RFSToolv3 cannot continue.



## 6. SOLUTION / INSTRUCTIONS

### 6.1 Restoring with RFSToolv3

With the RFSToolv3, FSMx/FSIH/FQxx/FWxx (FSM) is restored in factory delivered condition from SW management point of view.

As a result, configuration databases are cleaned and recreated and target unit is started with a given target SW release in un-commissioned state. Now the FSM in un-commissioned state can be integrated again to BTS site and set to operational state with SW update and commissioning steps.

Restore procedure is not related to any BTS HW or SW configuration and thus can be executed for BTS site without removing the FSM module. Furthermore, any standalone FSM can be operated with RFSToolv3, which enables recovering modules in warehouses and stocks as well on test bed and pre-installation locations.

Restore factory setting procedure is not related to any hardware configuration

- No working BTS Site manager connection is required.
- RFS recovery requires a successful ping response at 192.168.255.1/.127/.129/.131. Recovery can be started when system module is up and running, or at the very same time as system module is started.
- Typically there is no need to remove any of the power/optical cabling in the existing BTS setup when using recovery tool.

#### 6.1.1 Time required

The total time needed for recovery procedure depends on the amount of files to be uploaded to FSM unit. Typical recovery time for FSM unit is from 2 to 6 minutes.

- Varying amount and size of files to be deleted.
- Varying amount of files to be uploaded.
- Difference in storing new files due to varying flash memory hardware

Note that the following activation of new target SW may take several minutes and multiple resets can be observed, up to 15 minutes.

#### 6.1.2 When to use

Restore procedure is expected to recover all fault states described below, unless they are not caused by more severe fault e.g. HW failure in a FSM module/subunit.

##### **1) A problem happened during installation/commissioning phase when new/replacement unit has been installed to network.**

Recovery procedure will replace existing BTS configuration database and will update BTS SW to FSM module. There is no need to remove FSM from BTS Site in order to attempt recovery.

##### **2) BTS Site Manager connection cannot be established.**

Recovery procedure will remove existing configuration and database files and will upload new ones during recovery scenario. BTS will be restarted with new information.

- 3) **SW mismatches between different Flexi BTS HW modules. SW download progress may not start at all or is partly downloaded to BTS but not completely. BTS SW will refuse to allow any further actions. Power may have been switched off-on between upgrade attempts and BTS cannot fully recover.**

Recovery procedure removes existing BTS SW configuration and will upload and flash new BTS SW files to FSM memory.

- 4) **Commissioning steps cannot be successfully completed. BTS cannot become operational with normal re-commissioning steps. Active SCF file may prevent further re-commissioning attempts or some Flexi BTS module cannot reach operational state or there is a fake Flexi BTS module visible.**

Saving backup commissioning file is highly recommended. Recovery procedure removes existing hardware configuration and site commissioning file(s). FSM and whole BTS s set to not commissioned state.

- 5) **FSM cannot be reused in another BTS site due to existing site configuration and licensing configuration.**

Optionally RFSToolv3 can remove existing Target Id and the related Last Used Timestamp - value from FSM. After network protocol time is retrieved to BTS, new Target Id value is generated for FSM unit.

- 6) **FSM needs to be reused in another technology.**

RFSToolv3 can perform a SW update to another BTS SW technology within minutes (if applicable).

- 7) **Set local account used to default settings.**

RFSToolv3 can set local account to default settings (Nemuadmin/nemuser). User must be able to provide current password in order to complete recovery procedure.

- 8) **Set service account to default settings.**

RFSToolv3 can set service account to default settings (toor4nsn). User must be able to provide current password in order to complete recovery procedure.

- 9) **Restore vendor certificates.**

RFSToolv3 can remove vendor certificates from active and/or passive partition to prepare target unit to start over Plug and Play scenario.

### 6.1.3 When not to use

Application does not make analysis on reported alarm history or events store to FSM unit. Restore procedure may be concluded successfully. However, it is likely that the more severe fault state may not recover. FSM unit is set to factory settings only from SW management point of view.

#### **1) No ping response from target unit. Restore procedure cannot login to unit.**

Recovery procedure cannot be started in case TCP connections cannot be created at 192.168.255.1/129 or 192.168.255.127 (LTE FSMF/FSME in WCDMA-LTE RF sharing) or 192.168.255.131 (FSMF in GSM).

Despite 192.168.255.1 may be responding to ping requests, restore procedure cannot be launched without TCP connections to TRS functionality in 192.168.255.129.

#### **2) Fault ID is reported that can be connected to more severe failure**

Refer to existing BTS alarm documentation / BTS Site Manager Online Help for further information on BTS fault descriptions and to be able identify fault ID's that are caused by real HW failure.

#### **3) Fault ID is reported again and BTS functionality / service is affected despite of successful recovery**

Since restore application does not make analysis during FSM during recovery session, it is possible that problem situation can reproduce after FSM unit has been once restored. In this case further troubleshooting activities are needed to identify possible product SW problem / HW failure.

## 6.2 Functional description

After confirming to start recovery procedure in step 2, RFSToolv3 executes the rest of steps automatically. Restore progress information is displayed while recovery procedure continues.

The total time required by the recovery procedure cannot be controlled by user. If RFSToolv3 is interrupted, execution does not resume from here. Instead, whole recovery scenario needs to be restarted.

### **FSMF/FSIH/FQxx/FWxx**

#### **STEP 1**

- Establish TCP connection to FSM module
- Authorize TCP connections to FSM module
- Check unit identification and active SW versions

#### **STEP 2**

- Check License Key and Target ID status (optionally clear/save LK's/Target ID, in WCDMA only)
- Restore vendor certificate
- Restore Local Account (shown only if non-default account identified)
- Restore Service Account (shown only if non-default account identified)
- Select target SW for restore use, select BTS SW release supporting target unit
- Confirm to start restore procedure

#### **STEP 3**

- Clear existing BTS configuration, and BTS SW files from passive partition
- Upload new BTS SW release to passive partition
- Verify stored BTS SW files in passive partition
- Complete optional items selected at step 2

#### **STEP 4**

- Create and save report of conducted actions
- Display total time used for restoration
- Activate new BTS SW – ask user to confirm the FSM reset
- Notify user to close application

### **FSME/D/C**

#### **STEP 1**

- Establish TCP connection to FSM module
- Authorize TCP connections to FSM module
- Check unit identification and active SW versions

#### **STEP 2**

- Run sanity check

#### **STEP 3**

- Check License Key and Target ID status (optionally clear/save LK's/Target ID, in WCDMA only)
- Clear TRS commissioning (optional)
- Select target SW for restore use, select BTS SW release supporting target unit
- Confirm to start restore procedure

## STEP 4

- Detect and prepare FSM subunits

## STEP 5

- Clear existing BTS configuration, and BTS SW files from passive partition
- Upload new BTS SW release to passive partition
- Verify stored BTS SW files in passive partition

## STEP 6

- Create and save report of conducted actions
- Display total time used for restoration
- Activate new BTS SW – ask user to confirm the FSM reset
- Notify user to close application

## ESMB/ESMC

### STEP 1

- Establish TCP connection to FSM module
- Authorize TCP connections to FSM module
- Check unit identification and active SW versions

### STEP 2

- Confirm to start restore procedure (configuration reset).  
Both active and passive BTS commissioning files are removed.

## 6.3 SW management

FSM unit is restored to user selected target BTS SW. RFSToolv3 can update SW to interim BTS SW release or directly to target BTS SW release.

### Optional sub-units of Flexi Multiradio 10 System Module FSMF

- With FSMF, optional subunits including FTIF and FBBx are updated simultaneously.
- With FSIH, optional subunits including FBIH are updated simultaneously.

### Transmission sub-units of Flexi Multiradio System Module FSME

- With FSME/D/C, transmission subunits is not updated. Active TRS configuration can be cleared.

### Extension system modules / RF modules

- When extension system modules and RF modules are connected, none of them is updated.
- The SW update functionality of restore factory settings makes an update only on FSM.
- Extension system modules shall be treated as standalone FSM units with restore factory settings procedure.

### Some restrictions with SW update

- SW update with RFSToolv3 is one step procedure to install target BTS SW release.
- FSMF can be updated within BTS SW technology directly to any existing release, no difference if FSMF unit is new and used one.
- FSMF BTS SW technology can be changed with single SW update scenario.

- With Flexi Lite BTS WCDMA & Flexi Zone BTS SW update has same approach within supporting BTS SW technologies.
- FSME BTS SW technology change is not possible with RFSToolv3.
- FSME BTS SW updates are limited within system releases based on platform SW changes.

## SW Verification agent – RAN2423/LTE940

RAN2423 SW Verification agent (WCDMA) and LTE940 SW Verification agent (LTE/TD-LTE) have been enabled in RU30/RU40/RL40/RL50/RL25/RL35 BTS SW's and onwards.

RFSToolv3 has built in functionality similar to LTE940 pre-check script that is securing that no severe and harmful implications can occur.

### LTE

- **TS-LTE\_BTS\_FDD-SW-0047** Severe issue - introduction of the LTE940 - SW Verification Agent
- **TS-LTE\_BTS\_FDD-SW-0042** FSMF A102 U-boot downgrade is not possible
- **TS-SRAN-HW-0004** Flexi Multiradio System Module FSMF 472181A.103

### TD-LTE

- **TS-LTE\_BTS\_TDD-SW-0034** Severe issue - introduction of the LTE940 - SW Verification Agent
- **TS-SRAN-HW-0004** Flexi Multiradio System Module FSMF 472181A.103

### WCDMA

- **TS-3GBTS-SW-188** FSME/D to FSMF replacement procedure
- **TS-SRAN-HW-0004** Flexi Multiradio System Module FSMF 472181A.103

## 6.3.1 SW compatibility - FSMF

The following figure displays how FSMF SW updates are supported with RFSToolv3.

- Approximate time required for RFSToolv3 SW update from 2 to 8 minutes. The time varies due to amount of files per each BTS SW release.

	To					
	RAT	LTE	WCDMA	TD-LTE	GSM	SRAN
From	LTE	OK	OK	OK	N/A <sup>2</sup>	OK
	WCDMA	OK	OK	OK	N/A <sup>2</sup>	OK
	TD-LTE	OK	OK	OK	N/A <sup>2</sup>	OK
	GSM	OK	OK	OK	N/A <sup>2</sup>	OK
	FDSW 1.0	N/A <sup>1</sup>	N/A <sup>1</sup>	N/A <sup>1</sup>	N/A <sup>2</sup>	N/A <sup>1</sup>
	FDSW 1.1	OK	OK	OK	N/A <sup>2</sup>	OK
	SRAN	OK	OK	OK	N/A <sup>3</sup>	OK

**Figure 1 Supported SW updates with RFSToolv3**

- SW update using RFSToolv3 from FDSW1.0 to WCDMA/LTE/TD-LTE is not possible; Instead, a BTS Site manager shall be used.
- Utilize Restore Factory Setting -tool to update FSMF from GSM to other RAT SW
- Utilize Restore Factory settings -tool to update FSMF first to e.g. LTE and then apply 2G BTS First Installation Software.

NOTE: SW activation can take up to 15 minutes, meaning system module is in resetting state until ping response is resumed at 192.168.255.129. This is likely to happen when a major system upgrade is executed.

## 6.3.2 SW update examples - FSMF

### How to select BTS SW release supported by RFSToolv3

For example, in RL35, when selected target BTS SW release version is at least the same or newer than LNT3.1\_ENB\_1209\_248\_00, it can be used in restore procedure.

### Restore to factory settings

The factory software information listed in the figure is informative.

It means, the outcome/performance/success rate of the restore procedure is not connected to factory load. When unit is restored to factory settings, it can be done with any desired load.

Used FSMF A.103 with LNT3.0 ENB 1311 519 00

- SW update to LNT3.0 – LNT3.0\_ENB\_1311\_519\_00

### SW update - change BTS SW RAT

Target unit is set to factory settings while making restoration and changing the BTS SW technology.

New FSMF A.102 with LN4.0 ENB 1202 696 00

- SW update to WN8.0 3.0 – WN8.0\_1308\_437\_11
- SW update to LNT3.0 – LNT3.0\_ENB\_1304\_132\_14

New FSMF A.102/A.103 with LN4.0 ENB 1202 781 57

- SW update to WN8.0 3.0 – WN8.0\_1308\_437\_11
- SW update to LNT3.0 – LNT3.0\_ENB\_1304\_132\_14

Used FSMF A.103 with WN8.0 1308 437 11

- SW update to LNT3.0 – LNT3.0\_ENB\_1304\_132\_14
- SW update to LN6.0 – LN6.0\_ENB\_1311\_362\_02

### SW update within BTS SW RAT

Target unit is set to factory settings while making a restoration inside same technology.

New FSMF A.102 with LN4.0 ENB 1202 696 00

- SW update to LN4.0 1.1 – LN4.0\_ENB\_1202\_781\_18

Used FSMF A.103 with WN7.0 1302 375 00

- SW update to WN8.0 3.0 – WN8.0\_1308\_437\_11

## 6.3.3 SW compatibility – FSIH/FQxx/FWxx

All BTS SW releases available in NOLS can be used for restore purposes. Also refer to table in chapter 2.



## 6.3.4 SW compatibility – FSME/FSMD/FSMC

Refer to compatibility table in chapter 2 for supported WCDMA SW update paths included to RFSToolv3.

- Approximate time required for RFSToolv3 SW update from 8 to 20 minutes.  
The time varies due to amount of files included in BTS SW release.

## 6.4 Procedure

Typically less than 6 minutes for FSMF/FSIH/FQxx, less than 3 minutes for FWxx modules and approximately 8 to 10 minutes for FSME/D/C is required for restore tool to complete system module recovery. Variance for process duration is caused by





- Varying amount and size of files to be deleted
- Varying amount of files to be uploaded
- Difference in storing new files due to varying flash memory hardware

Make sure that RFS tool can execute completely without any interruptions. In case of accidentally interrupted session it is anyway worth trying again.

Switching power off-on between attempts may cause unrecoverable condition to system module.

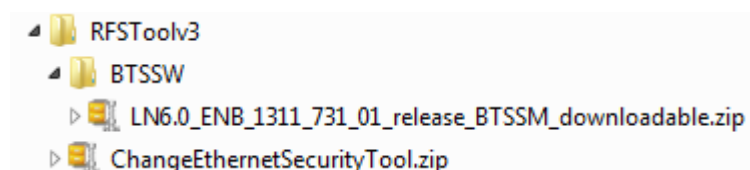
### 6.4.1 User preparations

- 1) When the PC is connected to the system module's LMP port, PC's network properties shall be specified to match the following settings: IP address as 192.168.255.126 & subnet mask as 255.255.254.0. Set IP address as 192.168.255.130 for GSM scenarios.
- 2) Extract RFSToolv3 package to local directory. RFSToolv3 delivery contains the following files and folders.

Name	Type
 BTSSW	File folder
 ChangeEthernetSecurityTool.zip	WinZip File
 RFStoolv3.exe	Application
 RFSToolv3_UserGuide.pdf	Adobe Acrobat Document

**Figure 2 Content of RFSToolv3 delivery**

- 3) Download desired BTS SW compatible BTS Site manager from NOLS.  
Store WCDMA BTS SW to be used in restore procedure



**Figure 3 Target BTS SW located in RFSToolv3 directory**

For example, LN6.0\_ENB\_1311\_731\_01.zip retrieved from NOLS is stored in .\RFSToolv3\BTSSW\.

Restore tool extracts automatically the required files from given BTS SW package.

- 4) Pre-check target unit, save backup SCF/snapshot.
- 5) To start restore factory settings tool, select RFSToolv3.exe / start it from command line window. Update SW to interim BTS SW release or directly to target BTS SW release. Let restore procedure to finish completely.
- 6) Check target unit status via BTS Site manager and make necessary post checks.
- 7) Commission target unit back to use with old/new SCF.

## 6.4.2 BTS preparations

There is no need to remove the system module or any of the power/optical cabling in the existing BTS setup when using restore tool. Recovery is performed on FSM unit only. Therefore, the other Flexi BTS modules can remain in the hardware configuration.

If License Keys and Target ID is to be deleted (this is optional), no RF modules shall be connected to system module during recovery procedure. RFSToolv3 does not clear Target ID stored to RF module memory. New Target ID is created during the following system module startup after successfully completed recovery scenario.

Vendor certificate can be removed during restore procedure.

## 6.4.3 Logs – RFS report

After each execution, a report file in txt format is created that is significant to each system module based on the serial number and current date/time. RFSToolv3 report is stored to .\RFSToolv3\logs. RFSToolv3 report includes in more detailed level the actions and message scenarios between restore tool and target FSM unit.

RFS report file name is specified by the serial number, product code, current date and time (e.g. L6130705629\_084792A.101\_\_20140902\_143756.txt).

When unit identification information cannot be retrieved, meaning the access to system module was not available or system module is not able to provide the requested information, the report file does not specify serial number and product code information (e.g. NA\_NA\_\_201402808\_094948.txt).

After successful recovery, system module has been set to default factory settings. If same problem still exists and BTS cannot reach operational state, system module may have more severe failure that cannot be recovered with recovery tool.

## 6.4.4 Typical recovery - FSMF

- 1) Conclude fault analysis and save related data (BTS Snapshot, backup commissioning file)
- 2) Start *RFStoolv3.exe*

---

Restore Factory Settings, RFStoolv3 [1.39]

Flexi Multiradio BTS LTE	FSMF
Flexi Multiradio BTS TD-LTE	FSMF, FSIH
Flexi Multiradio BTS WCDMA	FSMF, FSME, FSMD, FSMC
Flexi Multiradio BTS Single RAN	FSMF
Flexi Multiradio 10 BTS EDGE	FSMF
Flexi Multiradio GSM/EDGE	ESMB, ESMC
Flexi Lite BTS WCDMA	FQGA, FQFA
Flexi Zone WCDMA BTS	FWGL, FWGM, FWGN, FWFE, FWFF, FWFG
Flexi Zone BTS TD-LTE	FWNA, FWNB, FWNC, FWHE, FWHF, FWND
	FWHD, FWHT
Flexi Zone BTS	FWIC, FWID, FWIE, FWHG, FWHH, FWHI
	FWGI, FWGJ, FWGK, FWFB, FWFC, FWFD
	FWEC, FWED, FWEE, FWEB, FWHC, FWHM
	FWGB, FWIB, FWHA, FWFA, FWHN, FWHO

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---

Optional subunits for FSMF/FSIH and radio modules can be connected to core module while running recovery scenario. SW update is performed only to connected subunits during restore procedure (if applicable).

Recovery procedure is checking internal FSM submodule availability, but does not make any hardware check or improvements.

Recovery procedure is capable of recovering situations that are caused by the operational BTS SW.

If reported fault ID is reproduced after recovery attempt, or recovery cannot be completed, FSM has a more severe failure.

---

STEP 1/X: Establish connections  
Authorization  
Check unit identification & SW versions

---

Typical LAN settings 192.168.255.126/255.255.254.0.  
For 2G set LAN settings as 192.168.255.130/255.255.254.0.

...

**Figure 5 Typical recovery (continued)**

Recovery procedure requires 2 ping responses to attempt login to unit at:

```
192.168.255.1    FSME, FSMC, FSMC (WCDMA)
192.168.255.127 FSMF (LTE in 3G-LTE RF sharing)
192.168.255.129 FSMF (WCDMA/LTE/TD-LTE/SRAN)
                FSME, FSMC, FSMC (WCDMA)
                FSIH (LTE/TD-LTE)
                FQxx (WCDMA)
                FWxx (WCDMA/LTE/TD-LTE)
192.168.255.131 FSMF, ESMB, ESMC (GSM)
```

If login cannot be done to unit, the connection problem is indicating software or hardware failure that requires repair.

---

```
192.168.255.129 responded to ping.
192.168.255.1 responded to ping.
```

```
Do you wish to use
FSM [192.168.255.129] ? (y/n) y
    FSM selected.
```

```
Unit information received successfully.
SSH services enabled successfully.
SSH connection to FCT successful.
SFTP connection to FCT successful.
```

```
Unit name:      FSMF
Product code:   084792A.103
Serial number:  L1124603282
Active SW:      FL15A_ENB_0107_001196_000034
Passive SW:     LN6.0_ENB_1311_478_01
```

```
>>> FSP subunit detected.
```

---

```
STEP 2/4: Check License Key and TargetID status
          Restore vendor certificate
          Check local account settings
          Check service account settings
          Select target BTS SW for restore use
          Confirm to start restore procedure
```

---

```
### BTS Licensing - Logical Target ID for Flexi BTS (RAN1849) ###
```

```
Flexi Multiradio BTS WCDMA
Flexi Lite BTS WCDMA
```

```
The unique Target ID exist in the WBTS consisting system module serial
number and timestamp information <serial number>_<time stamp>
e.g. L6100232744_120551.
If LK and TargetID is deleted, make sure no RF modules are connected to
system module. System module is reset in the end of restore procedure.
The reset causes an immediate update on timestamp stored at system module.
```

```
...
```

**Figure 6 Typical recovery (continued)**

```

Deleting License Key and Target ID is optional.

>>> Target ID / License Key step skipped (Active SW RAT other than WCDMA).

-----

### Certificate management - Restore Vendor Certificate ###

With restore vendor certificate functionality, FSM module can be prepared
to start over Plug and Play scenarios.
Existing vendor certificates can be removed from active/passive partition.

Restoring vendor certificate is optional.
If vendor certificate is not used, select 'n'.

Select 'y' to continue restoring vendor certificate.
Select 'n' to skip this step and continue recovery procedure.

Do you wish to restore vendor certificate? (y/n) y

Select '1' for restore certificate in active partition.
Select '2' for restore certificate in passive partition.
Select '3' for restore certificate both in active and passive partition.

Enter the option to continue (1/2/3): 1
    Scenario 1 selected.

>>> Restore vendor certificate in active partition completed.

-----

### Restore factory settings - BTS software ###

Recovery procedure does not have restrictions with SW update.
All HW versions are treated in similar way.
SW update can be done from any build to another over different system
releases and from technology to another if applicable.

-----

Select BTS SW for FSMF restore factory settings.
Items available in .\RFSToolv3\BTSSW\:

    1: LN6.0_ENB_1311_478_01_release_BTSSM_downloadable.zip
    2: LN7.0_ENB_1407_556_35_release_BTSSM_downloadable.zip
    3: LN7.0_ENB_1407_563_13_release_BTSSM_downloadable.zip

Select SW load for FSMF you wish to use (1-3): 2
    LN7.0_ENB_1407_556_35 selected.

>>> Target SW version is LN7.0_ENB_1407_556_35

-----

...

```

**Figure 7 Typical recovery (continued)**

### ### Restore Factory Settings - Recovery ###

The existing BTS configuration and databases are removed.  
 FSMF unit is updated to new BTS SW and defaulted to not commissioned state.  
 New BTS SW is installed to passive partition and is activated in the end  
 of restore factory settings procedure. Existing active partition is not  
 updated. To recover both partitions requires another execution of restore  
 factory settings procedure. Target unit must be reset in between.

It is advisable to create a backup commissioning file.

When recovery step has started, make sure it can run until completion.  
 Do not disturb RFSToolv3 when continued from here.  
 Interruption is likely to cause a permanent failure.

Do you wish to restore FSMF unit? (y/n) y  
 Restore selected.

```
-----
STEP 3/4: Clean existing files
          Upload new files
          Verify new files
          Complete optional items
-----
```

RFSToolv3 [1.39]

	FSMF	Status
Clean	214/214	OK
Upload	94/94	OK
Verify	10/10	OK

>>> LN7.0\_ENB\_1407\_556\_35 is now uploaded and stored successfully.

```
-----
STEP 4/4: Write report & activate new BTS SW
-----
```

Restore time used: 3 minutes 41 seconds

Do you wish to reset FSMF unit? (y/n) y

>>> Restore factory settings procedure completed.

#### NOTE

The activation of new target SW may take up to 15 minutes and multiple FSM  
 resets can be observed.

When major system upgrade/RAT change is executed (for example from LTE  
 to TD-LTE), SW activation may require more time than usual. When ping  
 response is resumed at 192.168.255.129, SW activation phase is completed.

...

**Figure 8 Typical recovery (continued)**

```
Do not disconnect any unit, power during SW activation procedure.
Any interference during SW activation phase may cause connection to
target unit to be lost permanently.

In all cases the IP addresses previously used by FSMF are defaulted to
192.168.255.1 / 192.168.255.129

Log file is saved here due to missing administrative rights.
C:\Temp\logs\L1124603282_084792A.101__20151204_094616.txt

Press 'ENTER' to exit
```

**Figure 9 Typical recovery (continued)**

Recovery tool does not control system module after BTS SW activation reset has been set. Let system module unit to reach reset phase completely without any interruptions – all LEDs are turned off temporarily. Some SW upgrades can introduce long activation period. Multiple resets can be noticed, fan speed varying up and down. When ping response is resumed at 192.168.255.129, SW activation has been completed.

After successful recovery, system module has been set to default factory settings. If same problem still exists and BTS cannot reach operational state, system module may have more severe failure that cannot be recovered with Restore Factory Settings.

## 6.5 Sanity check

For FSME/D/C a scenario called 'Sanity Check' (SC) can be optionally executed. SC is a routine which may identify further reasoning why FSM unit is not working properly. The faults and notifications reported in SC results can indicate for example if one of the FSPC subunits or one of the DSP's are not responding to SC routine.

After sanity check routine, SW installation can be done to complete restore procedure. If FSM unit still do not function properly after SW update, refer to SC findings (faults/notification) to identify if SC is able to specify more detailed reasoning.

## 6.6 Troubleshooting

### **Before recovery, no ping responses available at 192.168.255.1/127.129.131**

If no ping response is available at 192.168.255.1/127.129.131, restore factory settings procedure cannot be executed successfully.

### **After successful recovery, no ping responses available at FSM.**

After successful recovery scenario, occasionally ping response at 192.168.255.129 may not be resumed. This may happen when FSM RAT is changed during restore procedure. If LED's of 'FAN' is solid green and 'STATUS' is solid yellow and LED's for optical ports 'RF/EXT1', 'RF/EXT2' and 'RF/EXT3' have solid yellow indicated, additional power cycle is required to regain access to FSM unit.

### **Restore Factory Settings application problem**

Contact your local Nokia Networks and Solutions support.

### **Java errors displayed and recovery routine cannot complete**

Check that ChangeEthernetSecurityTool2.zip (62MB file) is available in RFS root directory. Version 1.39 can be used only with ChangeEthernetSecurityTool2. ChangeEthernetSecurityTool2 does not work with versions < 1.36.

### **All other errors**

RFSToolv3 application is guiding what needs to be done to be successful in restore factory settings procedure.

In case of a recovery procedure is not fully completed or it is discontinued, retry to run RFSToolv3 recovery procedure.

## **7. REFERENCES**

TS-SRAN-HW-0080, Flexi Multiradio 10 System Module recovery with Restore Factory Settings

TS-3GBTS-SW-0120, Feature RAN1849: BTS Licensing – Logical Target ID for Flexi BTS

TS-SRAN-SW-0023, System module recovery with Restore Factory Settings tool

TS-SRAN-HW-0108, FDSW1.0 as new factory load for FSMF core module version 084792A.104

TS-SRAN-SW-0046, Instructions for first 2G BTS SW installation to FSMF unit



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