



Aprisa **FE**



Software Release Notes

Version 1.2.5a

May 2014

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1. Introduction

Introduction

The previous Aprisa FE software version release relevant to this release is:

Software Version	Release Date
1.1.7	13 th February 2014

This release of Aprisa FE software is:

Software Version	Release Date
1.2.5	16 th May 2014

This document covers the major changes, product enhancements, new functionality, and bug fixes since Aprisa FE software version 1.1.7.

2. Released Files

Release Files

The following is a list of files released for Aprisa FE Software Version 1.2.5

File Name	File Type	File Function
asrapp	Upgrade App Code	Used to initiate radio software upgrade
asrboot	Bootloader	Used to initiate radio software startup
asrmain	Application Code	Main radio system software
asrrootfs	Root File System	Catalog of system files
asrver	Version File	Release build version
version.txt	Public Version File	Release information

3. Product Features

The Aprisa FE product release version 1.2.5 has the following features. For more information, see the Aprisa FE User Manual 1.2.5.

Frequency Bands	<p>Four frequency band products software selectable over the entire frequency band:</p> <table> <tr> <td>UHF 320</td><td>320-400 MHz</td></tr> <tr> <td>UHF 400</td><td>400-470 MHz</td></tr> <tr> <td>UHF 450</td><td>450-520 MHz</td></tr> <tr> <td>UHF 928</td><td>928-960 MHz</td></tr> </table>	UHF 320	320-400 MHz	UHF 400	400-470 MHz	UHF 450	450-520 MHz	UHF 928	928-960 MHz
UHF 320	320-400 MHz								
UHF 400	400-470 MHz								
UHF 450	450-520 MHz								
UHF 928	928-960 MHz								
Channel Sizes	Software selectable channel sizes of 12.5 kHz, 25 kHz and 50 kHz.								
Gross Radio Capacity	<p>Maximum gross radio capacity with 12.5 kHz, 25 kHz and 50 kHz channel sizes:</p> <table> <tr> <td>12.5 kHz</td><td>60 kbit/s</td></tr> <tr> <td>25 kHz</td><td>120 kbit/s</td></tr> <tr> <td>50 kHz</td><td>240 kbit/s</td></tr> </table>	12.5 kHz	60 kbit/s	25 kHz	120 kbit/s	50 kHz	240 kbit/s		
12.5 kHz	60 kbit/s								
25 kHz	120 kbit/s								
50 kHz	240 kbit/s								
RF Operation	Two frequency full duplex transmission mode with internal or external duplexer product options supplied in two depths of chassis.								
Adaptive Coding Modulation and Forward Error Correction	<p>Adaptive Coding Modulation (ACM) which maximizes the use of the RF path to provide the highest radio capacity available.</p> <p>ACM automatically adjusts the modulation coding and FEC code rate f transmission over the defined modulation range based on the signal quality and / or errored packets for each individual remote radio.</p> <p>When the RF path is healthy (no fading), modulation coding is increased and the FEC code rate is decreased to maximize the data capacity.</p> <p>If the RF path quality degrades, modulation coding is decreased and the FEC code rate is increased for maximum robustness to maintain path connectivity.</p> <p>ACM can be disabled and fixed modulations of 64 QAM, 16 QAM or QPSK used with Min / Max FEC per modulation.</p>								
OTA Data Encryption	OTA data encryption using Advanced Encryption Standard (AES) 128, 192 or 256.								
OTA Data Authentication and Integrity	OTA data authentication and data integrity using Cipher Block Chaining Message Authentication Code (CBC-MAC) using Advanced Encryption Standard (AES) 128, 192 or 256.								

OTA Data Compression	Ethernet payload compression to increase the narrow band radio capacity.
Header Compression	Ethernet header and IP/TCP/UDP ROCH header compression to increase the narrow band radio capacity.
Chassis Options	<p>The standard Aprisa FE chassis has a depth of 300 mm and can mount the 320 MHz and 400 MHz duplexers externally.</p> <p>The full depth Aprisa FE chassis has a depth of 440 mm and can accommodate the 320 MHz and 400 MHz duplexers internally.</p>
Ethernet Data Interface Ports	Four Ethernet interface ports.
L3 Router Mode	L3 Router mode with standard static IP route for simple routing network integration.
L2 Bridge Mode	L2 Bridge mode with VLAN aware for standard Industrial LAN integration.
VLAN Support	IEEE 802.1Q VLAN support with single and double VLAN tagged and add/remove VLAN manipulation to adapt to the appropriate RTU / PLCs.
QoS Support	QoS support using IEEE 802.1p VLAN priority bits to prioritize and handle the VLAN / traffic types.
L2/3/4 Filtering	L2/3/4 filtering for blocking security attacks and blocking unwanted traffic avoiding narrow band radio network overload.
Hardware Alarm Inputs / Outputs	Two hardware alarm inputs and two hardware alarm outputs mappable to any radio alarm event.
SCADA Protocol Support	Transparent to all common SCADA protocols; e.g. Modbus, IEC 60870-5-101/104, DNP3 or similar.
SuperVisor Web Management	SuperVisor web management support for element management.

Secure SuperVisor	HTTPS secure SuperVisor web access management using SSL secure protocol.
SNMP and NMS	SNMPv1/2/3 MIB supports for 4RF NMS SNMP manager or third party NMS SNMP agent network management.
SNMP Security	SNMPv1/2/3 encryption and authentication using HMAC-MD5 or HMAC-SHA for secure NMS / SNMP access and management transactions.
SNTP	Simple Network Time Protocol (SNTP) for accurate wide radio network time and date.
Alarm and Event Parameter Logging	Alarm event parameters can be configured for all alarm events. All active alarms for configured alarm events will be displayed on the SuperVisor Parameters page. The last 1500 events are stored in the radio and the complete event list can be downloaded to flash drive via the radio USB host port.
Software Upgrades	Over-the-air software distribution and upgrades.

4. Errata Information

Frequency Bands

The following frequency band products are future developments:

ETSI / FCC / IC Compliant

Broadcast Band	Frequency Band	Frequency Tuning Range	Synthesizer Step Size
VHF	135 MHz	135-175 MHz	2.5 kHz

Protected Station

There is a future development of an Aprisa FE Protected Station.

5. Software Enhancements

5.1. Major Enhancements

None

5.2. Minor Enhancements

TX and RX LEDs During Registration

Previously, the TX and RX LEDs flashed red during the registration process.

In software version 1.2.5, they will show the current state of RF path. For example, if the remote radio is not registered and receiving packets from the local radio, then the RX LED will pulse green. If it tries to send a registration packet, then the TX LED will pulse green.

If the remote radio cannot register with the local radio after multiple attempts within 10 minutes, it will automatically reboot. If remote radio is not able to register with local radio in 5 attempts, then a 'Radio Network' alarm event will be raised indicating that the remote is not registered with the local radio or vice versa.

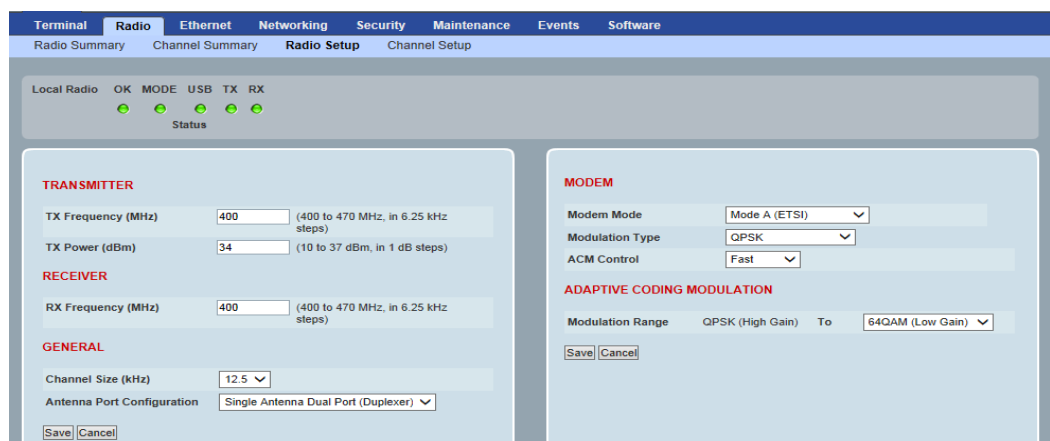
If a remote radio has registered with the local radio but then loses communication, it will automatically reboot within 2 minutes.

Issue # 2260; version 1.2.0

Modem Mode

Previously, the Compliance Mode was set in SuperVisor Terminal Operating Mode > Compliance Mode.

In software version 1.2.5, this function is now called Modem Mode and is in the Radio > Radio Setup screen. This was to bring together all the radio settings on one screen.



The screenshot displays the 'Radio Setup' screen with the following sections:

- Local Radio Status:** OK, MODE, USB, TX, RX (all green), Status.
- TRANSMITTER:**
 - TX Frequency (MHz): 400 (400 to 470 MHz, in 6.25 kHz steps)
 - TX Power (dBm): 34 (10 to 37 dBm, in 1 dB steps)
- RECEIVER:**
 - RX Frequency (MHz): 400 (400 to 470 MHz, in 6.25 kHz steps)
- GENERAL:**
 - Channel Size (kHz): 12.5
 - Antenna Port Configuration: Single Antenna Dual Port (Duplexer)
- MODEM:**
 - Modem Mode: Mode A (ETSI)
 - Modulation Type: QPSK
 - ACM Control: Fast
- ADAPTIVE CODING MODULATION:**
 - Modulation Range: QPSK (High Gain) To 64QAM (Low Gain)

Buttons: Save, Cancel

Radio Network Alarm

In software version 1.2.5, a Radio Network alarm has been added to the Software Alarm Events. This alarm indicates that there is an alarm in the radio network e.g. a remote radio has not registered.

TX Power Setting Out of Limits Alarm

In software version 1.2.5, if the TX Power setting is higher than the high limit or lower than the low limit supported by the current modulation, an Informational Event (55 Terminal Unit Information) will be raised to notify the user that transmit power has been changed. This only applies to fixed modulation (not ACM).

6. Hardware Enhancements

None

6.1. Major Enhancements

None

6.2. Minor Enhancements

None

7. Known Issues

None

8. Software Bug Fixes

8.1. Major Bug Fixes

None

8.2. Minor Bug Fixes

[Configuration Not Supported Alarm Bug](#)

Previously, a 'Configuration Not Supported' alarm did not get cleared when the condition that caused the alarm cleared.

In software version 1.2.5, a 'Configuration Not Supported' alarm will be raised for every invalid configuration and will be cleared only when all configuration errors are resolved.

It will also raise interim information events when individual configurations errors are corrected.

Issue # 3113; version 1.2.2

[Ethernet Port Access Rights](#)

Previously, management traffic was allowed from a remote radio Ethernet port to the local radio, over-the-air, if the Ethernet port was set to User Only. A user could log into the local radio and manage the radios in the link from the remote radio.

In software version 1.2.5, this bug has been corrected.

Issue # 3208; version 1.2.1

9. Radio Software Upgrade

Upgrade Type

A software upgrade can be performed on a single Aprisa FE radio or an Aprisa FE link.

If you have an existing Aprisa FE link, follow the procedure 'Link Software Upgrade'.

If you have a single Aprisa FE radio requiring upgrade, follow the procedure 'Single Radio Upgrade'.

See the Aprisa FE User Manual 1.2.5 for more information.

9.1. Link Software Upgrade



File Transfer Method

This process allows customers to upgrade an Aprisa FE link from the local radio location without the need for visiting the remote site.

The Software Pack is loaded into the local radio with the file transfer process and distributed via the radio link to the remote radio.

When the remote radio receives the Software Pack version, the software can be remotely activated on the remote radio.

Process Steps

1. Unzip the software pack in to the root directory of a USB flash drive.
2. Insert the USB flash drive into the host port .
3. Using File Transfer, load the software pack into the local radio (see SuperVisor > Software > File Transfer).
4. Remove the USB flash drive from the host port .
5. Distribute the software to the remote radio (see SuperVisor > Software > Remote Distribution).

Note: The distribution of software to the remote radio does not stop customer traffic from being transferred. However, due to the volume of traffic, the software distribution process may affect customer traffic.

Software distribution traffic is classified as 'management traffic' but does not use the Ethernet management priority setting. Software distribution traffic priority has a fixed priority setting of 'very low'.

6. Activate the software on the remote radio (see SuperVisor > Software > Remote Activation).

Note: When the new software activates on the remote radio, all link communication from the local radio to the remote radio will be lost. The local radio will attempt to re-establish connectivity to the remote radio for the new version verification but this will fail. However, when the new software activates on the remote radio, the remote radio will reboot automatically and link communication will restore when the local radio software is activated.

When the Remote Activation process gets to the 'Remote Radios On New Version' step, don't wait for this to complete but proceed to step 7

7. Activate the software on the local radio (see SuperVisor > Software > Manager).
 8. When the local radio restarts with the new software, rediscover the nodes (see SuperVisor > Maintenance > Advanced > Discover Nodes).
 9. Check that the remote radio is now running on the new software (see SuperVisor > Remote > Software > Summary).
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9.2. Single Radio Upgrade



9.2.1. Single Radio Upgrade File Transfer Method

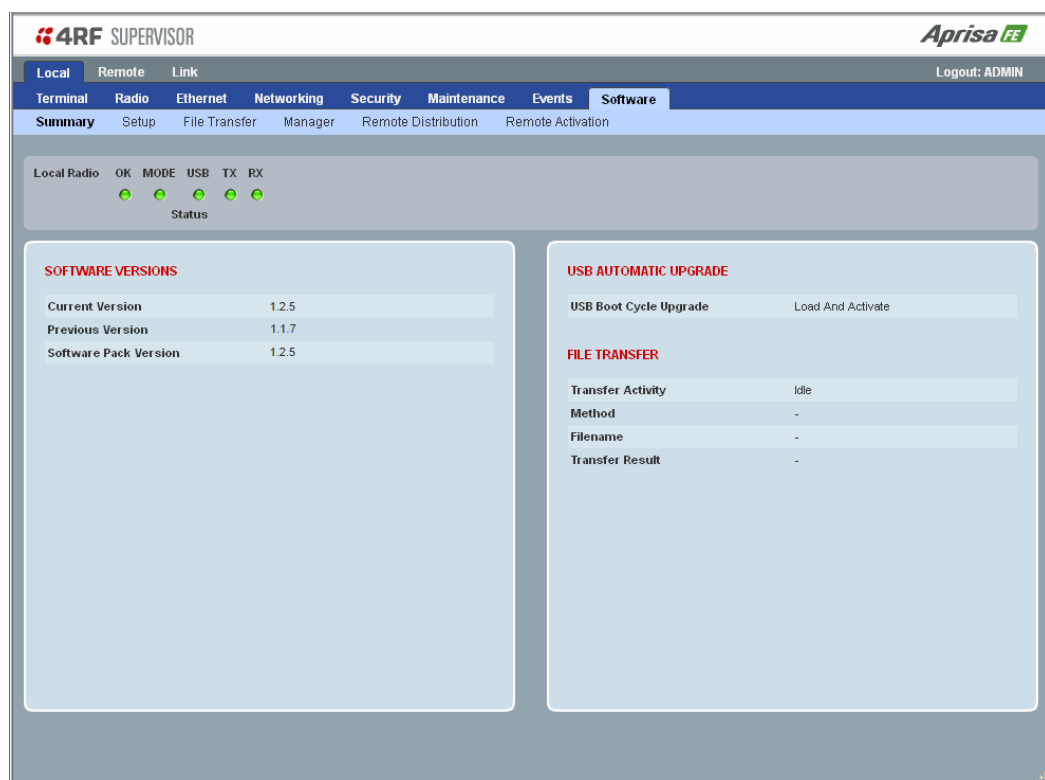
File Transfer Method

This process allows customers to upgrade a single Aprisa FE radio.

The Software Pack is loaded into the radio with the file transfer process and activated.

Process Steps

1. Unzip the software pack in to the root directory of a USB flash drive.
2. Insert the USB flash drive into the host port .
3. Using File Transfer, load the software pack into the radio (see SuperVisor > Software > File Transfer).
4. Remove the USB flash drive from the host port .
5. Activate the software on the radio (see SuperVisor > Software > Manager). This can take up to a few minutes.
6. The new software version can be verified with SuperVisor > Software > Summary Current Version.




Upgrade Did Not Start

If the upgrade process did not start, the Aprisa FE could already be operating on the version of software on the USB flash drive. This will be indicated by flashing display panel OK LED and then the OK, MODE and USB will light steady green.

If any display panel LED flashes red or is steady red during the upgrade process, it indicates that the upgrade has failed. This could be caused by incorrect files on the USB flash drive or a radio hardware failure.

9.2.2. Single Radio Upgrade Boot Method

Method



The Aprisa FE radio software is upgraded simply by plugging a USB flash drive containing the new software into the USB A host port  on the Aprisa FE front panel and power cycling the radio.

Procedure

To minimize disruption of link traffic and prevent your radios from being rendered inoperative, please follow the procedures described in this section together with any additional information or instructions supplied with the upgrade package.

The radio software must be identical on both radios in the Aprisa FE link.

Process Steps

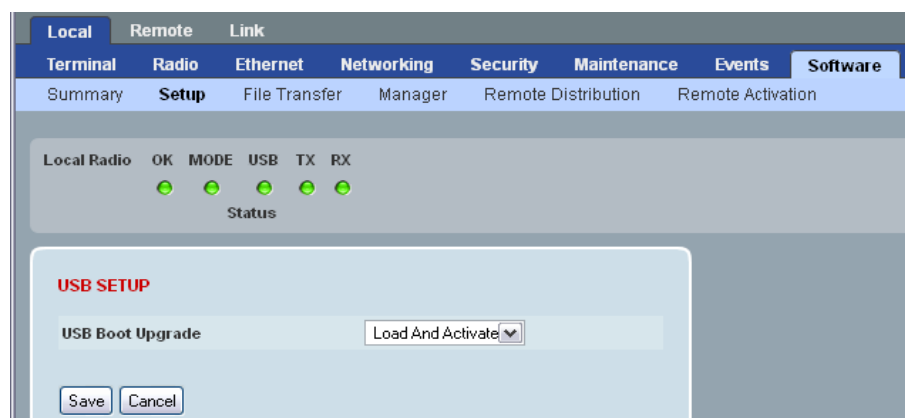
1. Check that the SuperVisor USB Boot Upgrade setting is set to 'Load and Activate' (see SuperVisor > Software > Setup).
2. Unzip the software release files in to the root directory of a USB flash drive.
3. Power off the Aprisa FE and insert the USB flash drive into the host port .
4. Power on the Aprisa FE.
5. The software upgrade process is complete when the OK LED lights solid orange. This can take about 2 minutes.
6. Remove the USB flash drive from the host port .
7. Power cycle the Aprisa FE.

Upgrade Did Not Start

If the USB boot upgrade process did not start, the Aprisa FE could already be operating on the version of software on the USB flash drive. This will be indicated by flashing display panel OK LED and then the OK, MODE and USB will light steady green.

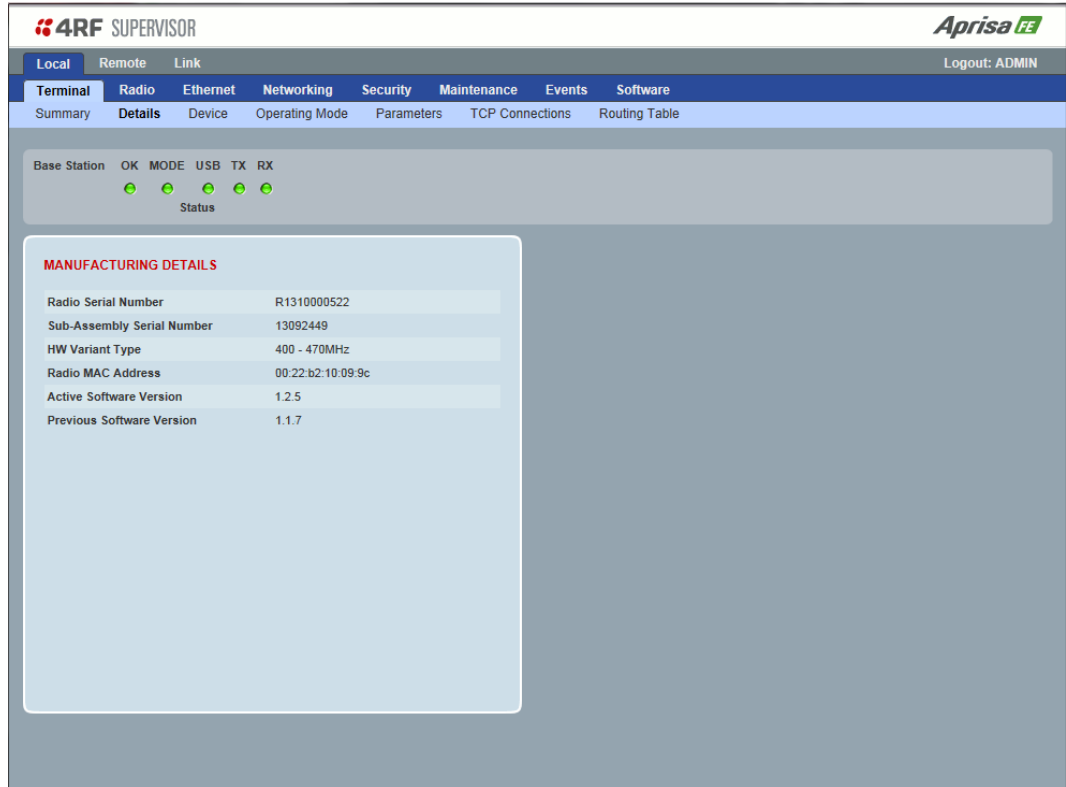
If any display panel LED flashes red or is steady red during the upgrade process, it indicates that the upgrade has failed. This could be caused by incorrect files on the USB flash drive or a radio hardware failure.

Check that the SuperVisor USB Boot Upgrade setting is set to 'Load and Activate'.



Check the
Result

Login in to SuperVisor and select Terminal > Details to view the Active and Previous software versions.



The screenshot shows the 4RF SUPERVISOR web interface. The top navigation bar includes 'Local', 'Remote', and 'Link' tabs. The main navigation menu has 'Terminal', 'Radio', 'Ethernet', 'Networking', 'Security', 'Maintenance', 'Events', and 'Software'. The 'Terminal' tab is selected, and the 'Details' sub-tab is active. The page displays the following information:

- Base Station: OK, MODE, USB, TX, RX (all status indicators are green)
- MANUFACTURING DETAILS
 - Radio Serial Number: R1310000522
 - Sub-Assembly Serial Number: 13092449
 - HW Variant Type: 400 - 470MHz
 - Radio MAC Address: 00:22:b2:10:09:9c
 - Active Software Version: 1.2.5
 - Previous Software Version: 1.1.7