4RF

Aprisa SR+

# Software Release Notes

## Version 1.2.1

April 2014

# Contents


**1. Introduction ..... 2**

**2. Released Files ..... 2**

**3. Product Features ..... 3**

3.1. New Features ..... 3
3.2. Existing Features ..... 4

**4. Software Enhancements ..... 7**

4.1. Major Enhancements ..... 7
4.2. Minor Enhancements ..... 7

**5. Hardware Enhancements ..... 8**

5.1. Major Enhancements ..... 8
5.2. Minor Enhancements ..... 8

**6. Software Bug Fixes ..... 9**

6.1. Major Bug Fixes ..... 9
6.2. Minor Bug Fixes ..... 9

**7. Known Issues ..... 10**

**8. Radio Software Upgrade ..... 11**

8.1. Network Software Upgrade ..... 12
8.2. Single Radio Upgrade ..... 13
8.2.1. Single Radio Upgrade File Transfer Method ..... 13
8.2.2. Single Radio Upgrade Boot Method ..... 14

# 1. Introduction

This release note details the functionality and key features supported in this 1.2.1 release.

## Introduction

The previous Aprisa SR+ software version release relevant to this release is:

| Software Version | Release Date |
|---|---|
| 1.1.6 | 16th January 2014 |

This release of Aprisa SR+ software is:

| Software Version | Release Date |
|---|---|
| 1.2.1 | 4th April 2014 |

This document covers the major changes, product enhancements, new functionality, and bug fixes since Aprisa SR+ software version 1.1.6.

# 2. Released Files

## Release Files

The following is a list of files released for Aprisa SR+ Software Version 1.2.1

| 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 SR+ product release version 1.2.1 has the following features. For more information, see the Aprisa SR+ User Manual 1.2.1.

## 3.1. New Features

| | |
|---|---|
| MHSB 1+1 Protected Station | The Aprisa SR+ 1+1 MHSB Protected Station (PS) supports:<br>• Operating modes of Base, Base-repeater, Repeater and Remote station<br>• Protection types of Monitored Hot-standby and redundant<br>• Ethernet / IP mode: Bridge or Router modes both with Virtual IP support for smooth fail switchover<br>• Multiple Antenna and Duplexer options: single antenna with / without a duplexer and dual antenna with / without a duplexer (dual or single TNC port)<br>• Active and standby RF ports monitored in 'monitor hot-standby' protection type |
| New SR+ Products | New frequency band products, software selectable over the entire frequency band. The compliance states are as follows:<br>UHF 450 450-520 MHz ETSI / FCC compliance |
| RS-485 Port | Optional: Additional RS-485 port via USB converter |
| KEK | Enhanced Key Encryption Key (KEK) based on RFC 3394, for secure Over The Air Re-keying (OTAR) of encryption keys |

## 3.2. Existing Features

| | |
|---|---|
| Frequency Bands | Two frequency band products software selectable over the entire frequency band:<br>UHF 320 320-400 MHz ETSI compliance<br>UHF 400 400-470 MHz ETSI / FCC / IC compliance |
| Channel Sizes | Software selectable channel sizes of 12.5 and 25 kHz. |
| Gross Radio Capacity | Maximum gross radio capacity with 12.5 kHz and 25 kHz channel sizes:<br>12.5 kHz 60 kbit/s<br>25 kHz 120 kbit/s |
| Compliance | ETSI compliance for the 320 MHz band<br>ETSI / FCC / IC compliance for the 400 MHz band.<br>Also RoHS, WEEE and HazLoc class 1 div 2. |
| Operating Mode | Operating modes of base, base-repeater, repeater and remote stations. |
| RF Operation | One or two frequency half duplex RF operation which eliminates the need for external duplexers. With the dual antenna port option, an external duplexer can be used for filtering. |
| Channel Access Modes | Channel access modes of Access Request (AR) and Listen Before Send (LBS) / CSMA for radio channel management.<br>AR channel access has higher channel efficiency than LBS in a spontaneous message scheme (report by exception). |
| Adaptive Coding Modulation and Forward Error Correction | Adaptive Coding Modulation (ACM) which maximizes the use of the RF path to provide the highest radio capacity available.<br>ACM automatically adjusts the modulation coding and FEC code rate in the remote to base direction of transmission over the defined modulation range based on the signal quality and / or errored packets for each individual remote radio.<br>When the RF path is healthy (no fading), modulation coding is increased and the FEC code rate is decreased to maximize the data capacity.<br>If the RF path quality degrades, modulation coding is decreased and the FEC code rate is increased for maximum robustness to maintain path connectivity.<br>ACM can be disabled and fixed modulations of 64 QAM, 16 QAM or QPSK used with Min / Max FEC per modulation. |

| | |
|---|---|
| OTA Data Encryption | OTA data encryption using Advanced Encryption Standard (AES) 128, 192 or 256. |
| OTA Data Authentication | 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 and serial payload compression to increase the narrow band radio capacity. |
| Header Compression | Ethernet header and IP/TCP/UDP ROHC header compression to increase the narrow band radio capacity. |
| Antenna Port Options | Software selectable dual / single antenna port options (dual antenna port for external duplexers or filters using dual frequency). |
| Data Interface Port Options | Multiple data interface port options for combinations of Ethernet and RS-232 serial for a total of four interface ports i.e. port options of 2E2S, 3E1S or 4E0S, where E=Ethernet, S=Serial port.<br>Optional: Additional RS-232 / RS-485 port via USB converter. |
| Pseudo Peer to Peer | Pseudo peer to peer communication between remote stations through base-repeater or repeater stations. |
| Terminal Server | Terminal server operation for transporting RS-232 / RS-485 traffic over IP or Ethernet. |
| 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 and sub-network (base-repeater-remotes) 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. |
| Multi Repeater | Multi repeater, where the Network Radius = 1 (i.e. the multi repeater is in the first hop from the base station) in AR and LBS channel access mode. |
| Daisy Chain | Daisy chain used for daisy chain repeaters when remote stations are very far from base station coverage. Daisy chain repeaters can only be used in LBS channel access mode. |
| 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. Software Enhancements

## 4.1. Major Enhancements

| | |
|---|---|
| ACM Control | Previously, the Aprisa SR+ had one enabled mode of Adaptive Code Modulation.<br>Software version 1.2.1 has two enabled modes of Adaptive Code Modulation; Fast and Standard.<br>Fast Mode<br>The ACM will switch down one ACM level if an errored packet is received.<br>The ACM will switch up when the link quality exceeds the performance threshold.<br>This option maintains the highest network speeds for as long as possible.<br>Standard Mode<br>The ACM will switch down one ACM level if the link quality degrades in advance of the level where errored packets would be expected and will switch to the lowest ACM level if an errored packet is received.<br>The ACM will switch up when the link quality exceeds the performance threshold.<br>This option preserves packet integrity but reduces network speeds.<br>See Aprisa SR+ User Manual 1.2.1 SuperVisor > Radio > Radio Setup > ACM Control. |

## 4.2. Minor Enhancements

None

# 5. Hardware Enhancements

## 5.1. Major Enhancements

None

## 5.2. Minor Enhancements

None

# 6. Software Bug Fixes

## 6.1. Major Bug Fixes

None

## 6.2. Minor Bug Fixes

| | |
|---|---|
| Firefox v27 HTTPS Operation | Previously, Firefox v27 could not communicate with the SR+ when using HTTPS protocol.<br>In software version 1.2.1, Firefox v27 can now communicate with the SR+ when using HTTPS protocol.<br>Issue # 3094; version 1.2.0 |
| Telnet Setting Change | Previously, a software 'Software Restart Required' event was not raised when Telnet was enabled or disabled from SuperVisor > Security > Setup. This is Alarm to indicate that a configuration has changed that requires a software reboot.<br>In software version 1.2.1, a software 'Software Restart Required' event is raised when Telnet is enabled or disabled.<br>Issue # 3069; version 1.2.0 |
| Forward Power Display | Previously, the 'Last Transmitted Forward Power' incorrectly displayed the difference between the set transmit power and the forward power.<br>In software version 1.2.1, the 'Last TX Packet Forward Power' displays the actual forward power in dBm.<br>Issue # 3064; version 1.2.0 |
| RF Interface MAC Address | Previously, the 'RF Interface MAC address' (SuperVisor > Maintenance > Advanced) was available for the standard SR+ radio. This parameter is only applicable when the radio is part of a Protected Station.<br>In software version 1.2.1, the 'RF Interface MAC address' is only available when the radio is part of a Protected Station.<br>Issue # 3124; version 1.2.0 |
| Supervisor Loading Page | Previously and intermittently, Supervisor would reload the current page when the user was attempting to go back to the 'Network Status' page.<br>In software version 1.2.1, this bug has been corrected.<br>Issue # 2999; version 1.1.6 |

# 7. Known Issues

| | |
|---|---|
| PVIP Alarm Clearance | Issue<br>When setting up a protected station, an alarm ‘Protection Station IP Address(0.0.0.0) not valid alarm’ will occur. To clear this alarm, the 'Protected Station Virtual IP Address’ (PVIP) will need to be set to a valid IP address in SuperVisor under 'Networking > IP setup'.<br>However, when the address is set, the alarm will not clear. This is a known issue and will be fixed in a later software version release.<br>Workaround<br>To clear the alarm, after setting a valid PVIP address, the protected station will need to be rebooted.<br>Issue # 3113; version 1.2.0 |

# 8. Radio Software Upgrade

Upgrade Type

A software upgrade can be performed on a single radio or an entire Aprisa SR+ network.

If you have an existing network of Aprisa SR+ radios, follow the procedure ‘Network Software Upgrade’.

If you have a single Aprisa SR+ radio requiring upgrade, follow the procedure ‘Single Radio Upgrade’.

See the Aprisa SR+ User Manual 1.2.1 for more information.

## 8.1. Network Software Upgrade

**File Transfer Method**

This process allows customers to upgrade their Aprisa SR+ network from the central base station location without the need for visiting remote sites.

The Software Pack is loaded into the base station with the file transfer process and distributed via the radio link to all remote stations.

When all remote stations receive the Software Pack version, the software can be remotely activated on all remote stations.

**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 base station (see SuperVisor > Software > File Transfer).
4. Remove the USB flash drive from the Host Port .
5. Distribute the software to the entire network of remote radios (see SuperVisor > Software > Remote Distribution).

**Note:** The distribution of software to remote stations 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 entire network of remote radios (see SuperVisor > Software > Remote Activation).

**Note:** When the new software activates on the remote radios, all link communication from the base station to the remote will be lost. The base station will attempt to re-establish connectivity to the remote radios for the new version verification but this will fail. However, when the new software activates on the remote radios, the remote radio will reboot automatically and link communication will restore when the base station 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 base station radio (see SuperVisor > Software > Manager).
8. When the base station restarts with the new software, rediscover the nodes (see SuperVisor > Maintenance > Advanced > Discover Nodes).
9. Check that all remote radios are now running on the new software (see SuperVisor > Network Table).

## 8.2. Single Radio Upgrade

### 8.2.1. Single Radio Upgrade File Transfer Method

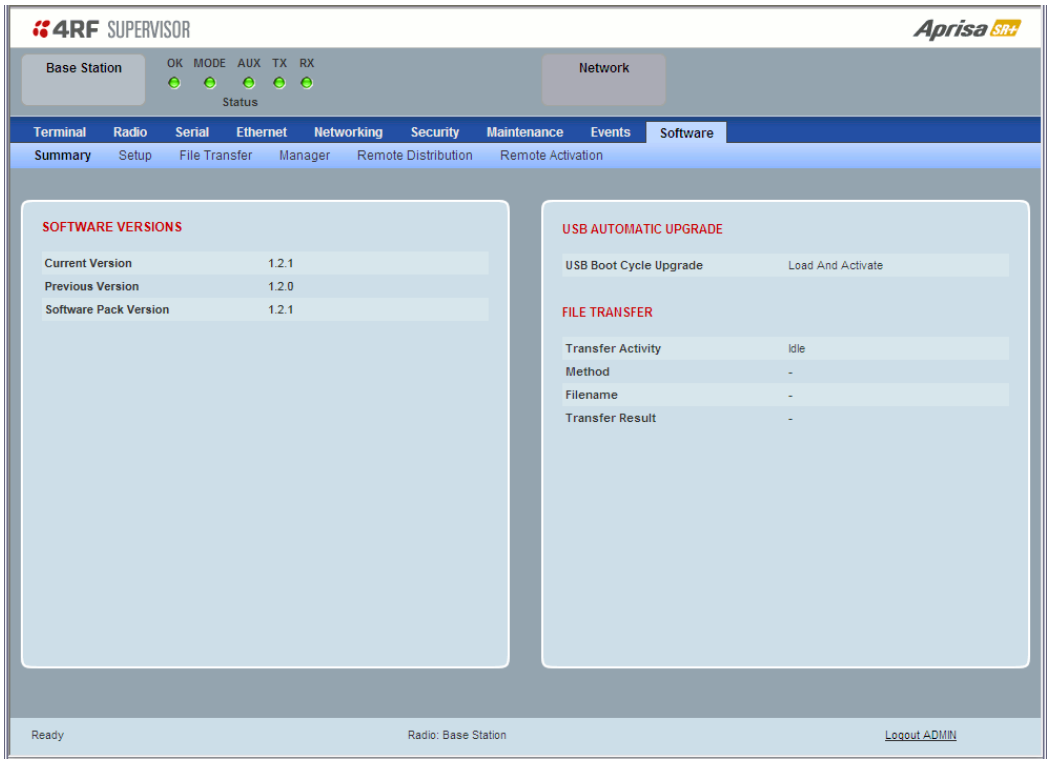
**File Transfer Method**

This process allows customers to upgrade a single Aprisa SR+ 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 verified with SuperVisor > Software > Summary Current Version.




**Upgrade Did Not Start**

If the upgrade process did not start, the Aprisa SR+ 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 AUX 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.

### 8.2.2. Single Radio Upgrade Boot Method

**Method**

The Aprisa SR+ radio software is upgraded simply by plugging a USB flash drive containing the new software into the USB A host port on the Aprisa SR+ 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 all radios in the Aprisa SR+ network.

**Process Steps**

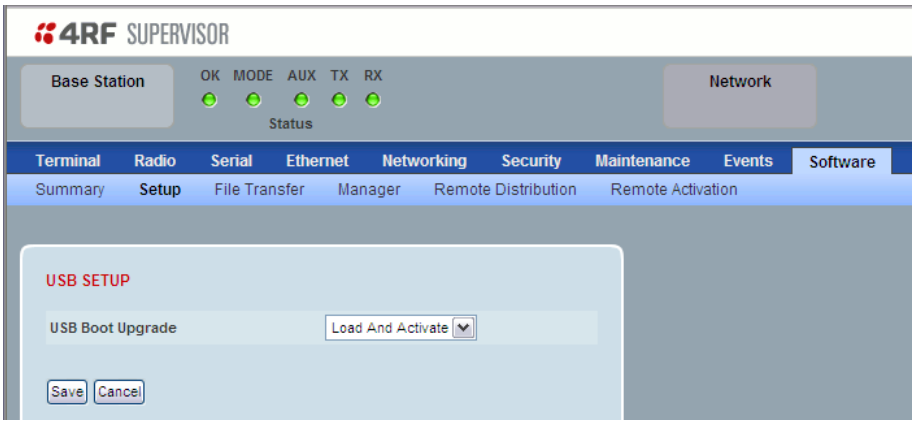
1. Check that the SuperVisor USB Boot Upgrade setting is set to 'Load and Activate' (see SuperVisor > Software > Setup).
2. Unzip the software release files in to the root directory of a USB flash drive.
3. Power off the Aprisa SR+ and insert the USB flash drive into the Host Port .
4. Power on the Aprisa SR+.
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 SR+.

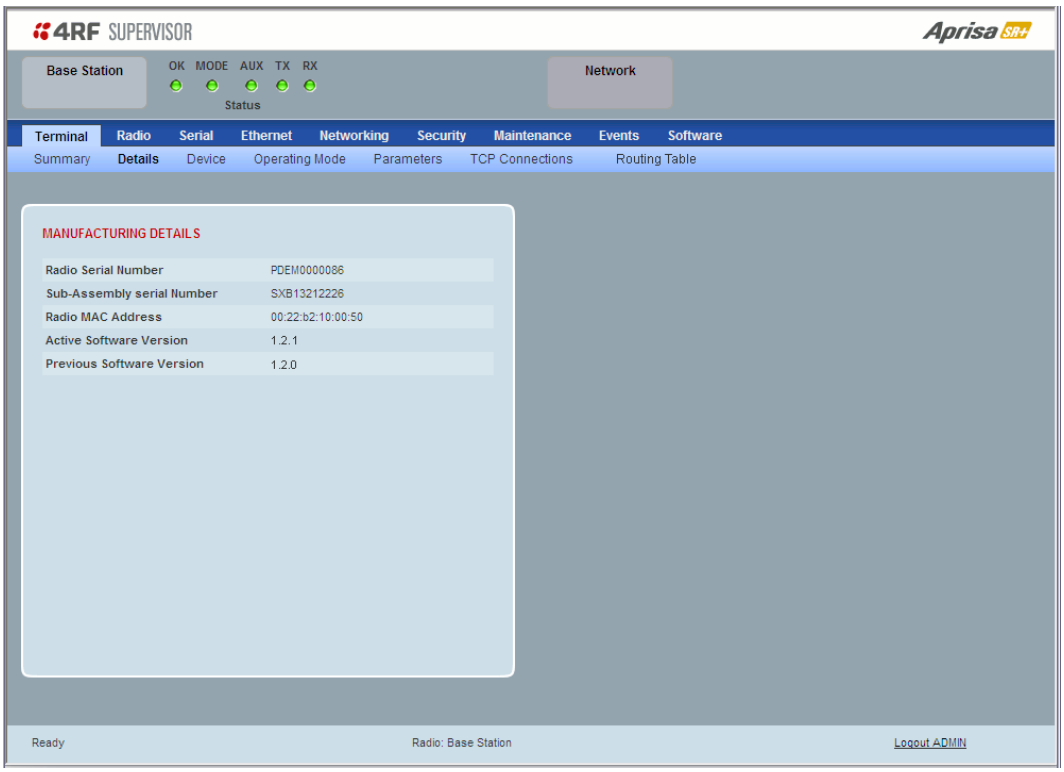
**Upgrade Did Not Start**

If the USB boot upgrade process did not start, the Aprisa SR+ 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 AUX 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.