4RF

Aprisa SR+

Software Release Notes

Version 1.2.5a

May 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 8

4.1. Major Enhancements 8
4.2. Minor Enhancements 8

5. Hardware Enhancements 10

5.1. Major Enhancements 10
5.2. Minor Enhancements 10

6. Known Issues 10

7. Software Bug Fixes 10

7.1. Major Bug Fixes 10
7.2. Minor Bug Fixes 10

8. Radio Software Upgrade 12

8.1. Network Software Upgrade 13
8.2. Single Radio Upgrade 14
8.2.1. Single Radio Upgrade File Transfer Method 14
8.2.2. Single Radio Upgrade Boot Method 15

1. Introduction

This release note details the functionality and key features supported in this 1.2.5 release.

Introduction

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

Software Version	Release Date
1.2.2	14th April 2014

This release of Aprisa SR+ software is:

Software Version	Release Date
1.2.5	16th May 2014

This document covers the major changes, product enhancements, new functionality, and bug fixes since Aprisa SR+ software version 1.2.2.

2. Released Files

Release Files

The following is a list of files released for Aprisa SR+ 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 SR+ product release version 1.2.5 has the following features. For more information, see the Aprisa SR+ User Manual 1.2.5.

3.1. New Features

New Alarms	A new Radio Network alarm to indicate a radio network alarm An Informational Event if the TX Power setting is out of limits for the current modulation An Informational Event if an invalid Channel Access mode is selected
Modem Mode	Compliance Mode has been replaced with Modem Mode in SuperVisor Radio > Radio Setup.
Multiple Management Session Detection	A 'Multiple Management Sessions popup' has been added to SuperVisor to show if there is more than one user logged into the same radio. The popup shows the user names and IP addresses of the users.
Frequency Tracking	A 'Frequency Tracking' setting has been added to SuperVisor > Maintenance > Advanced which enables the receiver to track any frequency drift in the transmitter to maintain optimum SNR and radio link performance over the full temperature range. When enabled, remote stations adjust their receive frequency to the frequency of the incoming packet rate and the base station notifies remote stations if their transmit frequency requires adjustment.

3.2. Existing Features

Frequency Bands

Five frequency band products software selectable over the entire frequency band:

VHF 220	215-240 MHz	FCC / IC compliance
UHF 320	320-400 MHz	ETSI compliance
UHF 400	400-470 MHz	ETSI / FCC / IC compliance
UHF 450	450-520 MHz	ETSI / FCC compliance
UHF 928	928-960 MHz	FCC / IC compliance

Channel Sizes

Software selectable channel sizes of 12.5, 25 kHz and 50 kHz.

Gross Radio Capacity

Maximum gross radio capacity with 12.5 kHz and 25 kHz channel sizes:

12.5 kHz	60 kbit/s (ETSI)
25 kHz	120 kbit/s (ETSI)

Software selectable channel size of 50 kHz for 220 / 928 MHz FCC / IC bands and 320 MHz ETSI band for Austria.

The maximum gross radio capacity for a 50 kHz channel size is:

ETSI	240 kbit/s (320 MHz band for Austria)
FCC / IC	216 kbit/s

Compliance

ETSI compliance for the 320 MHz band

ETSI / FCC / IC compliance for the 400 MHz band.

FCC / IC compliance for the 220 MHz band

FCC compliance for the 928 MHz band part 101.

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.

AR channel access has higher channel efficiency than LBS in a spontaneous message scheme (report by exception).

MHSB 1+1 Protected Station	The Aprisa SR+ 1+1 MHSB Protected Station (PS) supports: • Operating modes of Base, Base-repeater, Repeater and Remote station • Protection types of Monitored Hot-standby and redundant • Ethernet / IP mode: Bridge or Router modes both with Virtual IP support for smooth fail switchover • Multiple Antenna and Duplexer options: single antenna with / without a duplexer and dual antenna with / without a duplexer (dual or single TNC port) • Active and standby RF ports monitored in 'monitor hot-standby' protection type
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. 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. When the RF path is healthy (no fading), modulation coding is increased and the FEC code rate is decreased to maximize the data capacity. If the RF path quality degrades, modulation coding is decreased and the FEC code rate is increased for maximum robustness to maintain path connectivity. 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.
KEK	Enhanced Key Encryption Key (KEK) based on RFC 3394, for secure Over The Air Re-keying (OTAR) of encryption keys
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. 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

4.2. 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 remote station is not registered and receiving packets from base station, then the RX LED will pulse green. If it tries to send a registration packet, then the TX LED will pulse green.

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

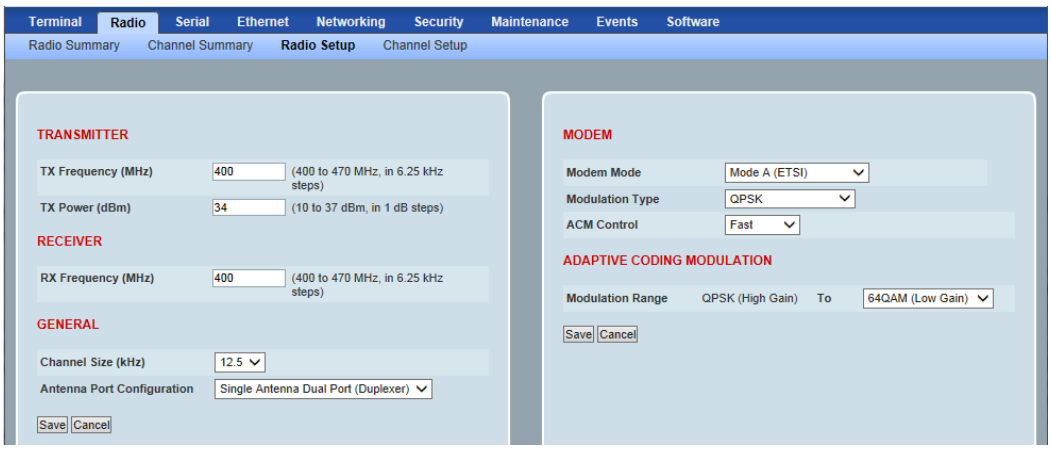
If a remote station has registered with the base station but then loses communication, it will automatically reboot within 2 minutes.

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.



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).
Base Repeater to Remote Network Alarm	Previously, in a base repeater to remote network, if the Channel Access was set to 'Listen Before Send' with Acknowledgements set to OFF, Ethernet traffic would be lost and there was no indication of a problem. 'Listen Before Send' with Acknowledgements set to OFF should not be used in a network with more than 1 repeater or base-repeater and 1 repeater as it causes very degraded performance. In software version 1.2.5, a 'Configuration Not Supported' alarm will be raised to notify the user if such a configuration is detected. Issue # 3175; version 1.2.2

5. Hardware Enhancements

5.1. Major Enhancements

None

5.2. Minor Enhancements

None

6. Known Issues

None

7. Software Bug Fixes

7.1. Major Bug Fixes

None

7.2. Minor Bug Fixes

Protected Station Flow Control Bug	Previously with RS-232 serial Flow Control enabled on both the protected base station and protected remote station, Clear To Send (CTS) went permanently high after a switchover. This corrected after a protected station reboot. In software version 1.2.5, this bug has been corrected. Issue # 3178; version 1.2.2
Last RX Packet SNR Reading	Previously, with a base repeater to remote network, the 'Last RX Packet SNR' reading on the base station was not updating correctly following network traffic. In software version 1.2.5, this bug has been corrected. Issue # 3171; version 1.2.2

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 (solution for 3113); version 1.2.2
PVIP Alarm Clearance	Previously, when setting up a protected station, an alarm 'Protection Station IP Address (0.0.0.0) not valid alarm' occurred but setting the 'Protected Station Virtual IP Address' (PVIP) in SuperVisor 'Networking > IP setup' did not clear the alarm. In software version 1.2.5, this bug has been corrected. Issue # 3113; version 1.2.0
Network Radius of Repeater	Previously, if you set a radio to an Operating Mode of 'Repeater' without changing the Network Radius to be greater than 1, the radio would start up with only OK, MODE, AUX LEDs Green and the TX and RX LEDs not lit at all, and no alarm condition to indicate that there was a problem. In software version 1.2.5, if the Network Radius is incorrectly set for the Operating Mode, a 'Configuration Not Supported' alarm will be raised to warning the user and the TX and RX LEDs will light green even if an invalid Network Radius is configured. This alarm will clear when the Network Radius is corrected to match repeater mode. Issue # 3167; version 1.2.0
Protection Station Ethernet Port Status	Previously, on a protection station, the primary and secondary radio Ethernet port status indicators on SuperVisor > Ethernet > Summary could not correctly indicate the port status as there was only one indicator per port for both primary and secondary radios. In software version 1.2.5, the Ethernet port status indicators on SuperVisor > Ethernet > Summary have been separated to indicate the Ethernet port status for both the primary and secondary radios. Issue # 3049; version 1.2.0
Ethernet Port Access Rights	Previously, management traffic was allowed from a remote station Ethernet port to the base station, over-the-air, if the Ethernet port was set to User Only. A user could log into the base station and manage the radios in the network from the remote station. In software version 1.2.5, this bug has been corrected. Issue # 3208; version 1.2.1

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 1.2.5 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

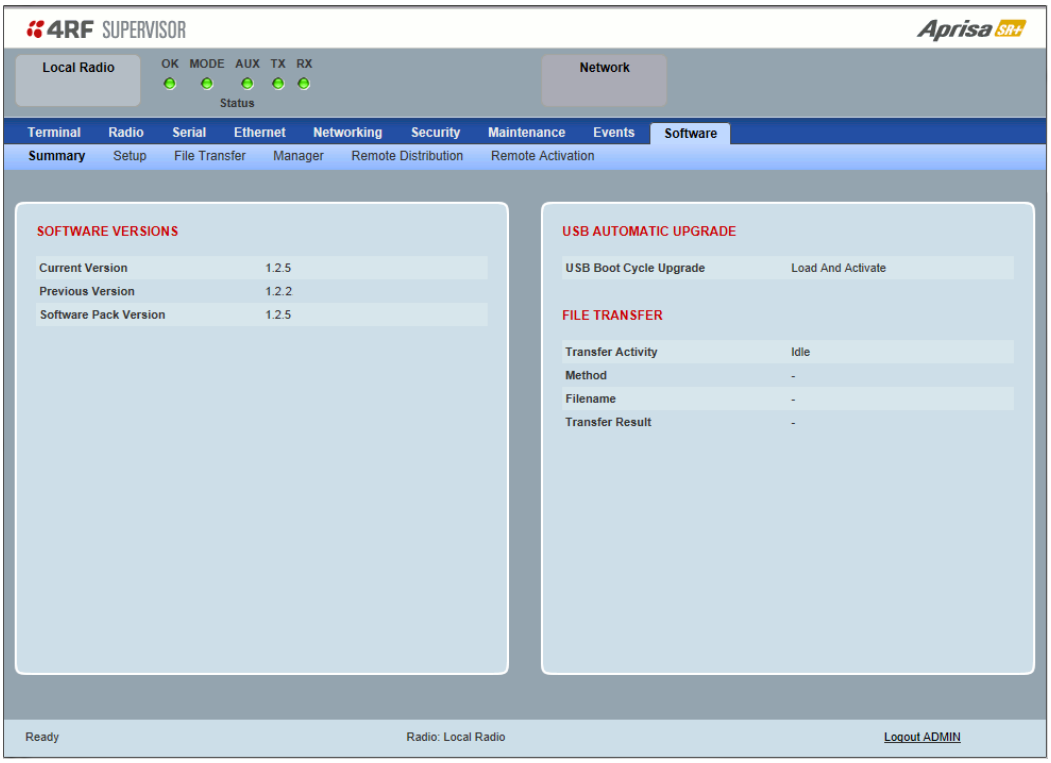
File Transfer Method

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

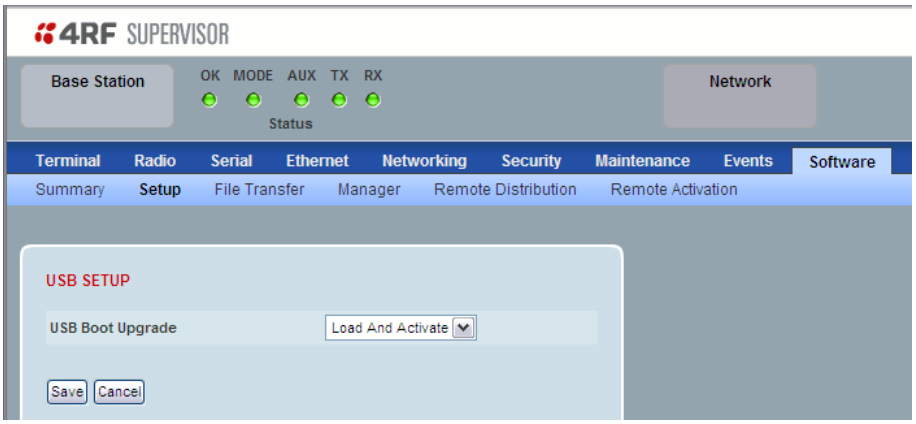
1. Check that the SuperVisor USB Boot Upgrade setting is set to 'Load and Activate' (see SuperVisor > Software > Setup).
2. Unzip the software release files in to the root directory of a USB flash drive.
3. Power off the Aprisa SR+ and insert the USB flash drive into the Host Port .
4. Power on the Aprisa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

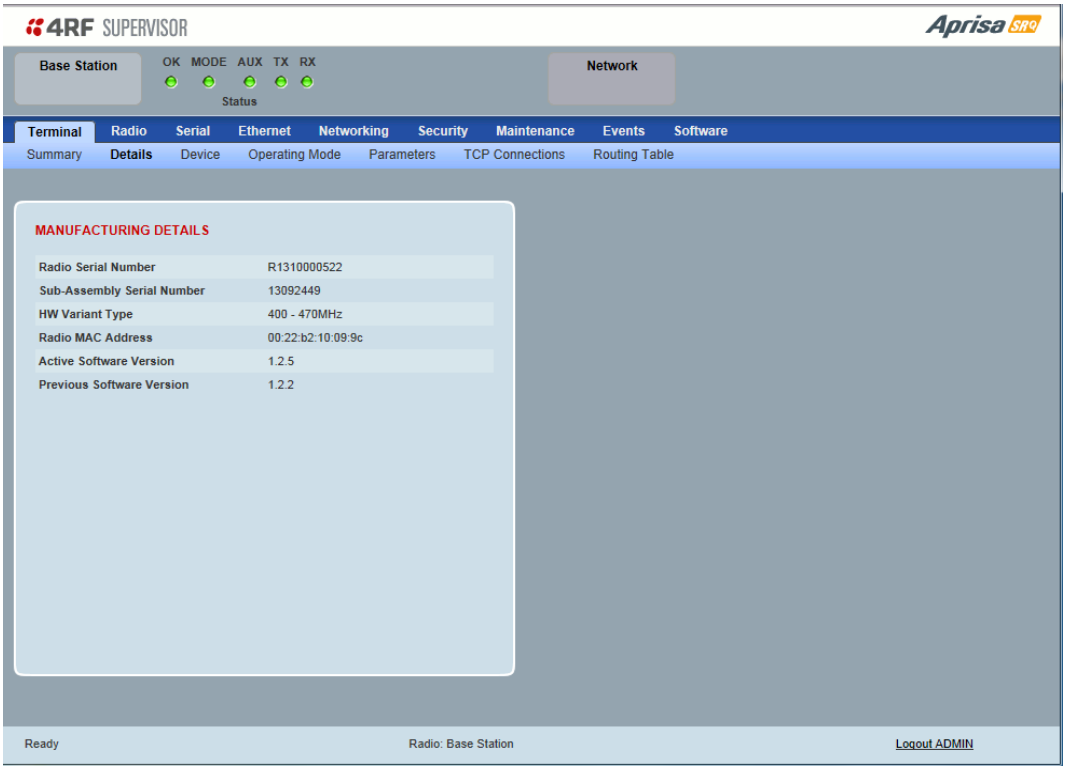
Upgrade Did Not Start

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.