



*Aprisa* **FE**



# Ordering Guide

Products and Services

Standard Terms and Conditions of Sale Apply

October 2015

Version 1.1.1

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# 1. Product and Services Overview

4RF Limited offers a complete menu of products and services for the Aprisa FE product range. A summary of our offerings is illustrated below.

Products		
Radios	Aprisa FE	<p>The Aprisa FE is available in the 135, 320, 400, 450, 896 and 928 MHz frequency bands.</p> <p>The channel sizes of 12.5 kHz, 25 kHz and 50 kHz are software selectable.</p>
	Aprisa FE Options	<p>The Aprisa FE is available in two chassis options for internal / external mount of duplexers. See 'Chassis vs Duplexer Options' on page 12 .</p>
Accessories	<p>A range of accessories including power supplies, cables and product manuals are shown in</p> <p>Accessories on page 16.</p>	
Network Management	<p>All 4RF products support the Simple Network Management Protocol (SNMP). Network management options include standard off the shelf network managers or MIB integration support. Details are shown in Network Management on page 17.</p>	

Services	
Service Options	<p>4RF offers a wide range of services.</p> <p>These comprise training, technical support, radio link and network engineering, factory acceptance testing, network integration, installation and commissioning, repair and return, extended warranties and customized service level agreements.</p>



## 2. Aprisa FE Product Ordering

### Aprisa FE Radios

#### Branding and Product Identification

Aprisa FE radios are ordered and configured according to the part numbering protocol specified below. The first two characters identify the product branding. The second two characters identify the product Aprisa FE.

Please follow this part numbering protocol when ordering Aprisa FE radios.

**APFE-ZBBB-CCC-DD-PP-AAOO**

Branding (AP)

Product Identifier (SQ)

Radio Configuration (Z)

See details on page 6

Frequency Band (BBB)

See details on page 7

Channel Size (CCC)

See details on page 8

Product options (OO)

See details on page 14

Compliance Body (AA)

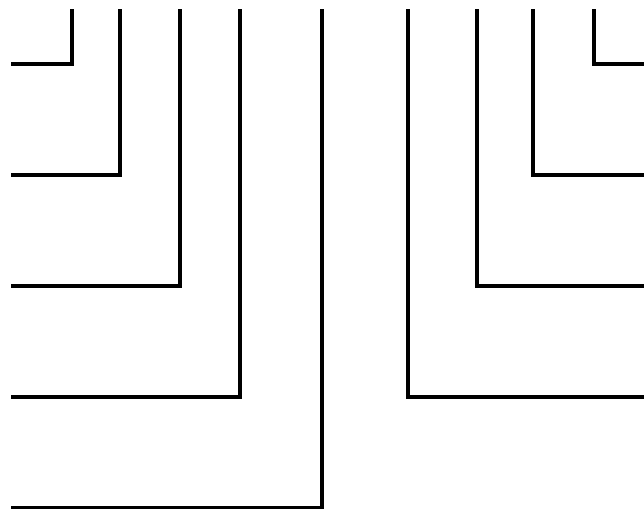
See details on page 14

Chassis Options (PP)

See details on page 11

Duplexer Options (DD)

See details on page 11



## Radio Configuration (Z)

The Aprisa FE is currently available in one radio configuration.

Option (Z)	Description
N	Aprisa FE Non-protected radio for local or remote locations. Each radio contains an embedded web server application, SuperVisor, to enable element management using a web browser, such as Mozilla Firefox and Microsoft® Internet Explorer.



Option (Z)	Description
R	Aprisa FE Protected Station, for local or remote locations. The Aprisa FE Protected Station comprises two Aprisa FE radios and a protection switch. The single antenna FE protected station includes a rack mounted shelf with one duplexer and two RF cables. The dual antenna FE protected station includes a rack mounted shelf with one two duplexers and four RF cables.



Replace Z in the part number with the required radio configuration.

## Frequency Band (BBB)

The Aprisa FE is available in the following frequency bands:

Option (BBB)	Frequency Band	Frequency Tuning Range
135	135 MHz	135-175 MHz
320	320 MHz	320-400 MHz
400	400 MHz	400-470 MHz
450	450 MHz	450-520 MHz
896	896 MHz	896-902 MHz
928	928 MHz	928-960 MHz

The Aprisa FE tunes over the full frequency range.

Replace BBB in the part number with the required frequency band.

## Channel Size (CCC)

The channel size on the Aprisa FE is software selectable:

Option (CCC)	Description
SSC	Software Selectable Channel Size 12.5 kHz, 25 kHz and 50 kHz

## Gross Radio Capacities

The Aprisa FE Gross Radio Capacities are dependent on compliance body, channel size and modulation. The capacities shown are the gross radio link capacity data rate available.

### ETSI Compliant

135 / 320 / 400 / 450 MHz Bands

No Forward Error Correction

Channel Size	Gross Radio Capacity			
	64 QAM	16 QAM	QPSK	4-CPFSK
12.5 kHz	60.0 kbit/s	40.0 kbit/s	20.0 kbit/s	9.6 kbit/s
25 kHz	120.0 kbit/s	80.0 kbit/s	40.0 kbit/s	19.2 kbit/s
50 kHz	240.0 kbit/s	160.0 kbit/s	80.0 kbit/s	38.4 kbit/s

Minimum Coded Forward Error Correction

Channel Size	Gross Radio Capacity less FEC			
	64 QAM	16 QAM	QPSK	4-CPFSK
12.5 kHz	52.0 kbit/s	23.1 kbit/s	11.6 kbit/s	8.4 kbit/s
25 kHz	103.9 kbit/s	46.2 kbit/s	23.1 kbit/s	16.7 kbit/s
50 kHz	207.8 kbit/s	92.5 kbit/s	46.2 kbit/s	33.4 kbit/s

Maximum Coded Forward Error Correction

Channel Size	Gross Radio Capacity less FEC			
	64 QAM	16 QAM	QPSK	4-CPFSK
12.5 kHz	45.6 kbit/s	17.3 kbit/s	8.7 kbit/s	4.1 kbit/s
25 kHz	91.2 kbit/s	34.6 kbit/s	17.3 kbit/s	8.3 kbit/s
50 kHz	182.4 kbit/s	69.3 kbit/s	34.6 kbit/s	16.5 kbit/s



**FCC / IC Compliant**

135 / 400 / 450 MHz Bands

No Forward Error Correction

Channel Size	Gross Radio Capacity			
	64 QAM	16 QAM	QPSK	4-CPFSK
12.5 kHz	54.0 kbit/s	36.0 kbit/s	18.0 kbit/s	9.6 kbit/s
25 kHz	96.0 kbit/s	64.0 kbit/s	32.0 kbit/s	19.2 kbit/s
50 kHz	216.0 kbit/s	144.0 kbit/s	72.0 kbit/s	38.4 kbit/s

Minimum Coded Forward Error Correction

Channel Size	Gross Radio Capacity less FEC			
	64 QAM	16 QAM	QPSK	4-CPFSK
12.5 kHz	46.8 kbit/s	20.8 kbit/s	10.4 kbit/s	8.4 kbit/s
25 kHz	83.1 kbit/s	37.0 kbit/s	18.5 kbit/s	16.7 kbit/s
50 kHz	187.1 kbit/s	83.2 kbit/s	41.6 kbit/s	33.4 kbit/s

Maximum Coded Forward Error Correction

Channel Size	Gross Radio Capacity less FEC			
	64 QAM	16 QAM	QPSK	4-CPFSK
12.5 kHz	41.0 kbit/s	15.6 kbit/s	7.8 kbit/s	4.1 kbit/s
25 kHz	73.0 kbit/s	27.7 kbit/s	13.9 kbit/s	8.3 kbit/s
50 kHz	164.2 kbit/s	62.4 kbit/s	31.2 kbit/s	16.5 kbit/s

## 896 / 928 MHz Bands

## No Forward Error Correction

Channel Size	Gross Radio Capacity			
	64 QAM	16 QAM	QPSK	4-CPFSK
12.5 kHz	60.0 kbit/s	40.0 kbit/s	20.0 kbit/s	9.6 kbit/s
25 kHz	96.0 kbit/s	64.0 kbit/s	32.0 kbit/s	19.2 kbit/s
50 kHz	216.0 kbit/s	144.0 kbit/s	72.0 kbit/s	38.4 kbit/s

## Minimum Coded Forward Error Correction

Channel Size	Gross Radio Capacity less FEC			
	64 QAM	16 QAM	QPSK	4-CPFSK
12.5 kHz	52.0 kbit/s	23.1 kbit/s	11.6 kbit/s	8.4 kbit/s
25 kHz	83.1 kbit/s	37.0 kbit/s	18.5 kbit/s	16.7 kbit/s
50 kHz	187.1 kbit/s	83.2 kbit/s	41.6 kbit/s	33.4 kbit/s

## Maximum Coded Forward Error Correction

Channel Size	Gross Radio Capacity less FEC			
	64 QAM	16 QAM	QPSK	4-CPFSK
12.5 kHz	45.6 kbit/s	17.3 kbit/s	8.7 kbit/s	4.1 kbit/s
25 kHz	73.0 kbit/s	27.7 kbit/s	13.9 kbit/s	8.3 kbit/s
50 kHz	164.2 kbit/s	62.4 kbit/s	31.2 kbit/s	16.5 kbit/s

## Duplexer Options (DD)

The Aprisa FE is available with the following duplexer options:

See 'Chassis vs Duplexer Options' on page 12.

Option (DD)	Frequency Band	Minimum Split	Passband
N0	135 MHz	4.6 MHz	0.5 MHz
A1	300 MHz	5 MHz	0.5 MHz
B1	400 MHz	5 MHz	0.5 MHz
M0	450 MHz	5 MHz	0.5 MHz
G2	900 MHz	9 MHz	1.0 MHz

Replace DD in the part number with the duplex option.

## Chassis Options (PP)

The Aprisa FE is available in two chassis options.

Option (PP)	Chassis Depth
30	300 mm
44	440 mm

The 300 mm depth chassis can accommodate the smaller duplexer types or mount the duplexer externally.

The 440 mm depth chassis can accommodate some larger duplexer types.

See 'Chassis vs Duplexer Options' on page 12.

Replace PP in the part number with the required data port option.

## Chassis vs Duplexer Options

### 300 mm Chassis Depth - Internal Duplexer



The following duplexers are supplied with a 300 mm depth chassis and mounted internally:

Option (DD)	Frequency Band	Minimum Split	Passband
G2	900 MHz	9 MHz	1.0 MHz

### 300 mm Chassis Depth - External Duplexer



The following duplexers are supplied with a 300 mm depth chassis and mounted externally:

Option (DD)	Frequency Band	Minimum Split	Passband
N0	135 MHz	4.6 MHz	0.5 MHz
A1	300 MHz	5 MHz	0.5 MHz
B1	400 MHz	5 MHz	0.5 MHz
M0	450 MHz	5 MHz	0.5 MHz

## 440 mm Chassis Depth - Internal Duplexer Only



The following duplexers are supplied with a 440 mm depth chassis and mounted internally:

Option (DD)	Frequency Band	Minimum Split	Passband
A1	300 MHz	5 MHz	0.5 MHz
B1	400 MHz	5 MHz	0.5 MHz

## Compliance Body (AA)

The Aprisa FE is designed to be compliant with specifications and standards from the European Telecommunications Standards Institute (ETSI), the Federal Communications Commission (FCC) and Industry Canada (IC) for radio performance and safety.

Option (AA)	Description
EN	Tested and compliant to ETSI, FCC and Industry Canada standards.

Replace AA in the part number with the option for the required compliance body.

## Product Options (OO)

The current Aprisa FE product options are:

Option (OO)	Description
AA	Standard Aprisa FE Radio Standard Aprisa FE Protected Station single antenna operation (includes one duplexer)
DA	Aprisa FE Protected Station dual antenna operation (includes two duplexers)
DB	Aprisa FE Protected Station dual antenna operation (includes two duplexers) and 48 VDC power supply input

Replace OO in the part number with the required product option.

## Spare Parts

Part Number	Description
APFS-FNAN-453-07-02	4RF FE Spare, Fuse, Nano SMF, 453 Series, 7A, 2 items Spare LED board fuses (pair)
APFS-CML2-FEM-01	4RF FE Spare, Connector, Molex 2 pin, Female, 1 item Spare Molex 2 pin female connector for power connection to the Aprisa FE
APFS-XPSW-X40	4RF FE Spare, Protection Switch, 4E0S Includes 2 sets of integral FE Protection Switch Cables 4 Ethernet Ports, 0 Serial Ports No radios
APFS-R135-SSC-FD-40-ENAA	4RF FE Spare, PS, 135-175 MHz, SSC, Full Dup, 4E0S, EN, STD Aprisa FE protected station spare radio, 4 Ethernet ports Point-to-point, full duplex RF operation
APFS-R320-SSC-FD-40-ENAA	4RF FE Spare, PS, 320-400 MHz, SSC, Full Dup, 4E0S, EN, STD Aprisa FE protected station spare radio, 4 Ethernet ports Point-to-point, full duplex RF operation
APFS-R400-SSC-FD-40-ENAA	4RF FE Spare, PS, 400-470 MHz, SSC, Full Dup, 4E0S, EN, STD Aprisa FE protected station spare radio, 4 Ethernet ports Point-to-point, full duplex RF operation
APFS-R450-SSC-FD-40-ENAA	4RF FE Spare, PS, 450-520 MHz, SSC, Full Dup, 4E0S, EN, STD Aprisa FE protected station spare radio, 4 Ethernet ports Point-to-point, full duplex RF operation
APFS-R896-SSC-FD-40-ENAA	4RF FE Spare, PS, 896-902 MHz, SSC, Full Dup, 4E0S, EN, STD Aprisa FE protected station spare radio, 4 Ethernet ports Point-to-point, full duplex RF operation
APFS-R928-SSC-FD-40-ENAA	4RF FE Spare, PS, 928-960 MHz, SSC, Full Dup, 4E0S, EN, STD Aprisa FE protected station spare radio, 4 Ethernet ports Point-to-point, full duplex RF operation

## Accessories

### Power Supplies

Part Number	Description
APSB-P230-030-24-TS	4RF FE Acc, PSU, 230 VAC, 30W, 24 VDC, -10 to +60C
APSB-P230-048-24-TE	4RF FE Acc, PSU, 230 VAC, 48W, 24 VDC, -20 to +75C
APSB-P230-060-24-TS	4RF FE Acc, PSU, 230 VAC, 60W, 24 VDC, -10 to +60C
APSB-P48D-050-24-TA	4RF FE Acc, PSU, 48 VDC, 50W, 24 VDC, 0 to +50C

### Cables

Part Number	Description
APST-IFCA-USB-01	4RF FE Acc, Cable, Interface, USB A to USB micro B, 1m

### Documentation

Part Number	Description
APST-DMAN-XHC	4RF FE Acc, Documentation, User Manual, Hard Copy



## Network Management

4RF offers a range of network management solutions, including server and software options. Options include:

- NMS PC or Server with SNMPc Workgroup pre-configured for basic operation, supporting a single user for small to medium sized networks.
- NMS PC or Server with SNMPc Enterprise pre-configured for basic operation, supporting a scalable multi-user environment.

Part Number	Description
APNM-MBAS	4RF NMS, MIB Integration, Basic A package of the product MIB and supporting documentation with detail to the monitoring (alarm) level only. Includes up to 4 hours of engineering support.
APNM-MADV	4RF NMS, MIB Integration, Advanced A package of on-site engineering support and documentation. Charged per day pro-rata based on number of days required.
APNM-PMPW-NPC	4RF NMS, Pre-configured, SNMPc Workgroup, NMS PC IBM PC (incl. monitor, keyboard, mouse) with SNMPc workgroup edition installed, pre-configured for basic operation, supporting a single user for small to medium sized networks. Limited to 1000 managed elements.
APNM-PMPE-NPC	4RF NMS, Pre-configured, SNMPc Enterprise, NMS PC IBM PC, (incl. monitor, keyboard, mouse) with SNMPc Enterprise edition installed, pre-configured for basic operation supporting a scalable multi-user environment. Includes SNMPc server license, 10 remote console licenses and 10 remote poller licenses.
APNM-PMPE-NSV	4RF NMS, Pre-configured, SNMPc Enterprise, NMS server IBM 19inch rack mount server (incl. monitor, keyboard, mouse) with SNMPc Enterprise edition installed, pre-configured for basic operation supporting for a scalable multi-user environment.
APNM-PMPE-NSB	4RF NMS, Pre-configured, SNMPc Enterprise, NMS server + bu Two IBM 19inch rack mount servers (incl. monitor, keyboard, mouse) with SNMPc Enterprise edition installed, pre-configured for basic operation in a backed up configuration.
APNM-SMPW	4RF NMS, Software, SNMPc Workgroup SNMPc Workgroup edition Single user version for managing small to medium sized networks running on a single system and supports one user. Limited to 1000 managed elements.
APNM-SMPE	4RF NMS, Software, SNMPc Enterprise SNMPc Enterprise edition provides for a scalable multi-user environment. Includes SNMPc server license, 10 remote console licenses and 10 remote poller licenses.

## 3. Services

### General

4RF Limited has a world class services team and can offer a vast range of services to facilitate the best possible linking solution for your needs. Services include:

- RF design, Path profile analysis and engineering reports
- Customer site engineering surveys, audits and support
- Training courses from basic introduction to advanced
- Project management, installation and commissioning services
- Network Management System (NMS) solutions, including design, engineering and training

Please contact 4RF or your local 4RF sales director to discuss options and pricing on these services or any other service orientated work.

Full details of the terms and conditions for all engineering services are provided in 4RF's Terms and Conditions.

### Training

Part Number	Description
APSV-XTRA-SRF-OF	4RF Service, Training, SR 2-day, at 4RF (max 8 trainees)
APSV-XTRA-SRF-CU	4RF Service, Training, SR 2-day, at Customer Site (max 8 trainees)
APSV-XTRA-NMS-OF	4RF Service, Training, NMS Standard 2-day, at 4RF (max 8 trainees)
APSV-XTRA-NMS-CU	4RF Service, Training, NMS Standard 2-day, at Customer Site (max 8 trainees)
APSV-XTRA-STU	4RF Service, Training, Additional Trainee

#### Notes:

1. For courses held at customer premises all 4RF trainer expenses are charged additionally including travel, freight and equipment, accommodation, meals, and local transport.
2. For courses held at 4RF, all trainee / student expenses are the responsibility of the customer.
3. The courses are for a maximum of 8 trainees. For course sizes in excess of 8 trainees, an additional fee applies per trainee.

Full conditions of all training courses are given in 4RF's Engineering Services Terms and Conditions.

## Technical Support

The following discountable charges are to be read in conjunction with the Technical Support terms and conditions.

Part Number	Description
APSV-XTEC-OFF-HR	4RF Service, Tech Support, Office, per hour
APSV-XTEC-OFF-DY	4RF Service, Tech Support, Office, per day
APSV-XTEC-FLD-DY	4RF Service, Tech Support, Field, per day
APSV-XTEC-EMG-DY	4RF Service, Tech Support, Emergency Field, per day

### Notes:

1. Field or Site visits are charged per day or part thereof.
2. If resolution of the issue identifies faulty 4RF equipment, charges may be refunded as described in the terms and conditions.
3. 4RF Engineer expenses are charged additionally including travel, accommodation, meals, local transport, equipment and freight.

## Engineering Services

### Services

Part Number	Description
APSV-XENG-RFE-HR	4RF Service, Engineering, RF, per hour
APSV-XENG-RFE-DY	4RF Service, Engineering, RF, per day
APSV-XENG-NET-HR	4RF Service, Engineering, Network, per hour
APSV-XENG-NET-DY	4RF Service, Engineering, Network, per day
APSV-XENG-FAT-DY	4RF Service, Engineering, Factory Acceptance Test, per day
APSV-XENG-ICO-DY	4RF Service, Engineering, Inst. & Commissioning, per day
APSV-XENG-NMO	4RF Service, Engineering, Network Monitoring
APSV-XENG-PMG-DY	4RF Service, Engineering, Project Management, per day
APSV-XENG-EXP-DY	4RF Service, Engineering, Expenses, per day
APSV-XENG-EXP-TR	4RF Service, Engineering, Expenses, Travel
APSV-XENG-TRA-DY	4RF Service, Engineering, Travel, per day
APSV-XENG-TRA-AF	4RF Service, Engineering, Travel, Airfares

#### Notes:

1. 4RF Engineer expenses are charged additionally including travel, accommodation, meals, local transport, equipment and freight.

## Path Profiles

Part Number	Description
APSV-XENG-PTH-P1	4RF Service, Engineering, Path Profiles, <10 profiles
APSV-XENG-PTH-P2	4RF Service, Engineering, Path Profiles, 10-30 profiles
APSV-XENG-PTH-P3	4RF Service, Engineering, Path Profiles, >30 profiles

### Notes:

1. The charge covers the individual path profiles and the associated report, detailing the following:
  - A plot of each individual path profile.
  - A full link budget indicating the theoretical availability according to the ITU standard recommendations.
  - A summary listing the main components and performance expectation for the link.
  - Additional information or observations specific to each path which can include:
    - Potential reflection and multi-path analysis.
    - Recommendations on alternate radio variants, antennas and feeder systems.
2. 4RF will produce the most accurate report possible based on the supplied information however we are not responsible for differences in actual performance compared with the expected performance as detailed in the report.
3. 4RF does not warrant or guarantee the performance defined in path reports produced without an associated 4RF site and path survey. A 4RF site and path survey can considerably improve the accuracy of the report and resultant performance predictions.

## Repair and Return

### General

The following charges and notes are to be read in conjunction with the Repair Terms and Conditions (supplied on request) and Standard Terms and Conditions of 4RF. Where there is a difference between the two documents, the Repair Terms and Conditions apply.

#### Notes:

1. Extended warranty is for 4RF manufactured products. Extended warranties for products not manufactured by 4RF will be considered on a case by case basis at 4RF's sole discretion.
2. The customer is responsible for freight to 4RF (DDU).
3. All items returned for repairs require a completed RMA form and if 'out-of-warranty' a customer purchase order.
4. Units returned to 4RF will be extensively tested. Any units found to be 'No Fault Found' will be charged for as listed.
5. Expedited repair and standard advanced replacement services are dependent on materials availability and are provided at 4RF's discretion.
6. Items may be assessed beyond economic repair (BER) by 4RF. Customers will be notified and work ceased pending a decision on replacement or extended repair price.

### Extended Warranty

The standard warranty for the Aprisa FE is 15 months from date of shipment; additional, extended warranty periods are available to purchase at time of order.

Part Number	Description
APSV-XREP-EWR-PS-Y3	4RF Service, Repair, Ext Warranty Aprisa SR, Protected Station, 3 Years
APSV-XREP-EWR-PS-Y1	4RF Service, Repair, Ext Warranty Aprisa SR, Protected Station, 1 Year
APSV-XREP-EWR-BR-Y3	4RF Service, Repair, Ext Warranty Aprisa SR, BR, 3 Years
APSV-XREP-EWR-BR-Y1	4RF Service, Repair, Ext Warranty Aprisa SR, BR, 1 Year

### Aprisa FE Repair

Part Number	Description
APSV-XREP-ASR-RD	4RF Service, Repair, Aprisa SR, Radio
APSV-XREP-ASR-PW	4RF Service, Repair, Aprisa SR, Protection Switch

## General Repair Services

Part Number	Description
APSV-XREP-EXR	4RF Service, Repair, Expedited Repair (additional fee)
APSV-XREP-NFF-TR	4RF Service, Repair, No Fault Found, Terminal

## Standard Advanced Replacement Service

Part Number	Description
APSV-XREP-ADV-TR	4RF Service, Repair, Advanced Replacement, Terminal

## Guaranteed Advanced Replacement Service (GARS)

Part Number	Description
APSV-XREP-GAR	4RF Service, Repair, Guaranteed Replacement Service (per item listed on the schedule, per annum)

## Service Level Agreements

Part Number	Description
APSV-XSLA-L00	4RF Service, Service Level Agreement, Bronze
APSV-XSLA-L01	4RF Service, Service Level Agreement, Silver
APSV-XSLA-L02	4RF Service, Service Level Agreement, Gold
APSV-XSLA-L03	4RF Service, Service Level Agreement, Platinum

As standard, all our customers are entitled to our 'Bronze' service level agreement. Upgrading to silver, gold and platinum service level agreements enable customers receive additional and preferential levels of service

Please refer to 4RF's Engineering Services Terms and Conditions for details of service level agreements.