

Nokia Customer Care

1 - General Information



[This page intentionally blank]

Table of Contents

	Page No
RAE-6/RA-4 Product Selection	5
RAE-6/RA-4 features	5
Product and module list	8
Technical Specifications	9
General specifications.....	9
Main RF characteristics	9
Mobile Enhancements	11

[This page intentionally blank]

RAE-6/RA-4 Product Selection

This service manual documents features, functioning and repair of two products, RAE-6 and RA-4, which are variants of the same product.

RAE-6 is a triple band transceiver supporting EGSM900/GSM1800/GSM1900 and RA-4 supporting GSM850/GSM1800/GSM1900. The transceiver supports GPRS, EGPRS, and HSCSD protocols.

Figure 1:View of Nokia 9300



■ RAE-6/RA-4 features

Hardware characteristics

- Speech codecs: HR, FR, EFR, AMR
- *Displays: Cover:* up to 64k color (active matrix) (128 x 128), active area: 27.3 x 27.3 mm, *PDA:* up to 64k color (transflective) (640 x 200), active area: 110 x 34.5 mm
- Clamshell with user changeable A-cover, x-press on™
- Full QWERTY with 8 (1 user configurable) app. shortcut keys
- Small SIM supporting 1.8 & 3.0 V
- Multimedia memory card with “hot swap”

- Integrated hands free speaker (16 mm)
- Ringing tunes: MIDI, WAV, AAC/MP3, AMR (ringing volume: 105 dB from 5cm distance)
- Audio formats: MP3, MPEG-4 (AAC), Real Audio, MIDI
- Video formats: H.263, MPEG-4, Real Video
- Pop-Port™, USB2.0 slave, full speed up to 12Mbit/s

UI features

- Desk structure, grouping in desk main level
- MMS, SyncML device management, presentation editor
- OMA provisioning
- VGA camera (viewfinder in cover, framerate 15 fps)
- User configurable application key
- Opera 6.x browser with smart rendering (HTML 4.01 / xHTML)

Supported bearers

- CSD, HSCSD, GPRS multislots class 10, class B, EGPRS class 10
- Bluetooth, InfraRed (115 kbps)

Messaging

- E-mail (IMAP4, POP3, SMTP, SyncML)
- "Always-on" e-mail/ push experience
- SMS, Fax, MMS

Browsing

- HTML/XHTML (Opera 6.x)
- HTML 4.01
- JavaScript 1.3

Office

- Documents, sheet, presentation (editor also)

PIM & Sync

- Calendar, contacts, to-do
- SyncML 1.1.1, local sync (PC Suite)

Device Management

- SyncML Device Management
- OMA client provisioning, Smart messaging
- Admin module (PC SUITE)

Security

- SSL 3.0 /TLS 1.0
- Remote locking (via SMS)
- Nokia VPN client (on product CD)
- IPv6/IPv4, IPSec
- MMC Lock
- OMA DRM forward lock

PC connectivity (MS and Lotus Notes compatibility)

- Backup / restore, file transfer
- Synchronization (SyncML)
- Admin module
- IP Passthrough

Java

- MIDP 2.0
- Personal profile Java as separate SIS packet (on product CD)

Other/Entertainment/etc.

- Some additional sw by 3rd parties to inbox (e.g. games...)
- End-to-end Alliance Solutions
- *IBM*: Websphere Everyplace Access (WEA) client, Sametime client, Sync email & PIM, device management (IBM Tivoli)
- *Oracle*: Collaboration Suite (OCS), Solution for mobile email, calendar, directory service, contacts

Additional 3rd party solutions/applications possible

- Messaging: BlackBerry, NokiaOne, NMAG, etc.
- PIM&Sync: BlackBerry, NokiaOne, NMAG, etc.
- Database: Citrix ICA client, IBM DB2, Oracle 9iLite
- Office: zip manager, pdf-reader
- Security: Antivirus, FileCrypto
- Device Management:CA Unicenter
- Games (Symbian and Java)
- Dictionaries, calculators
- Multimedia players (MP3 player etc.)
- Planning applications, Maps, Route planning...

Digital services

- OTA settings (WDS in Europe)
- Wallpapers, logos, ringing tunes

■ Product and module list

- Basic 9300 sales package
- System module

Technical Specifications

■ General specifications

Unit	Dimensions (mm) (L x W x T)	Weight (g)	Volume (cm ³)
Transceiver with BP-6M 970mAh Li-Po battery pack	132 x 51 x 21	167 (with BP-6M battery)	126

■ Main RF characteristics

RAE-6 (EU variant GSM900/1800/1900) & RA-4 (US variant GSM850/1800/1900)

Parameter	Unit
Cellular system	GSM850/900, GSM1800, GSM1900
Modulation schemes	GMSK, 8-PSK
RX frequency band	GSM850: 824 ... 849 MHz GSM900: 925 ... 960 MHz GSM1800: 1805... 1880 MHz GSM1900: 1930 ... 1990 MHz
TX frequency band	GSM850: 869 ... 894 MHz GSM900: 880 ... 915 MHz GSM1800: 1710... 1785 MHz GSM1900: 1850 ... 1910 MHz
Output power GMSK	GSM850: +5 ... +33 dBm (3.2 mW ... 2 W) GSM900: +5 ... +33 dBm (3.2 mW ... 2 W) GSM1800: +0 ... +30 dBm (1.0 mW ... 1 W) GSM1900: +0 ... +30 dBm (1.0 mW ... 1 W)
Output power 8-PSK	GSM850: +5 ... 27 dBm (3.2 mW ... 0.5 W) GSM900: +5 ... 27 dBm (3.2 mW ... 0.5 W) GSM1800: +0 ... 26 dBm (1.0 mW ... 0.4 W) GSM1900: +0 ... 26 dBm (1.0 mW ... 0.4 W)
Duplex spacing	GSM850: 45 MHz GSM 900: 45 MHz GSM 1800: 95 MHz GSM 1900: 80 MHz
Number of RF channels	GSM 850: 124 GSM 900: 174 GSM 1800: 374 GSM1900: 299
Channel spacing	200 kHz (each band)

Parameter	Unit
Number of TX power levels GMSK	EGSM: 15 GSM 900: 15 GSM 1800: 16 GSM 1900: 16
Number of TX power levels 8-PSK	GSM 850: 12 GSM 900: 12 GSM 1800: 14 GSM 1900: 14
Sensitivity, static channel (+25°C)	EGSM: -102 dBm GSM 900: -102 dBm GSM 1800: -102 dBm GSM 1900: -102 dBm
Frequency error, static channel	< 0.1 ppm
RMS phase error	< 5.0 °
Peak phase error	< 20.0 °

Mobile Enhancements

Table 1: Battery

Battery	Type
Li-Po (970mAh)	BP-6M

Table 2: Chargers

Chargers	Type
Switcher charger (Europe)	ACP-12E
Switcher charger (US)	ACP-12U
Mobile charger (cigarette lighter charger)	LCH-12
Retractable charger	AC-1E

Table 3: Audio accessories

Audio accessories	Type
Mono headset, Boom Headset	HDB-4
Stereo headset	HDS-3
Fashion stereo headset	HS-3
Retractable headset	HS-10
Standard headset	HS-5
Wireless Headset	HDW-2
Wireless Clip-on Headset	HS-3W
Wireless Headset	HS-4W
Loopset	LPS-4
FM Radio Headset (Pop-port)	HS-2R
TTY adapter	HDA-10

Table 4: Connectivity accessories

Connectivity accessories	Type
Desk stand with sync.	DT-5
Memory Card	DTS-64
Memory Card	DTS-128
Connectivity cable	DKU-2

Table 5: Car kits

Car kits	Type
Basic Car Holder	CR-5
Antenna Coupler	AD-14
Full Car Kit	CARK-126
Full Car Kit	Nokia 610
Full Car Kit	Nokia 616
Wireless Car Kit	CARK-112
Wireless Car Kit	CK-1W
Headrest handsfree	BHF-1
BHF Headrest handsfree	BHF-3

Table 6: Other accessories

Other accessories	Type
Observation camera	PT-2
Digital Pen	SU-1B
Image viewer	SU-2
Image frame, operates via IR	SU-4
Image Frame with GSM module	SU-7
Medallion, operates vi IR	RX-3
Medallion 2, operates via IR	RX-4
Kaleidoscope	RX-11