

Programmes After Market Services NPL-1 Series Cellular Phones

1 – General Information

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The Product

The NPL-1 is a triple band handportable mobile telephone for the E-GSM 900, GSM 1800 and GSM 1900 networks, automatically switching between 900, 1800 and 1900MHz bands; automatic handover between 900 & 1800 MHz bands. It is both GSM 900 phase 2 power class 4 transceiver (2W) and GSM 1800/1900 power class 1 (1W) transceiver.

The NPL-1 has additional features as defined below:

- Integrated Bluetooth
- Wallet for mobile commerce
- GPRS (General Packet Radio Service)
- WAP including the new version 1.2.1
- Voice commands and recording features
- E-mail over SMS
- PC suite version 4.8
- To-do list
- Stopwatch
- Countdown Timer
- Games
- MIDP Java

Technical specification

General Specifications of NPL-1	
Temperature range	-10C to +55C
Size (L x W x D)	129 x 47 x 17 ... 21 mm
Weight	110 g
Display	96 x 65 pixels
Volume	97 cc
Standard battery	BPS-2 1100 mAh, Li-Polymer
Standby Time	Up to 18 days (without Bluetooth and GPRS being activated)
Minium Talk time	3.25 h (GSM 900/1800), 4 h (GSM1900)
Operating time	Variation will occur depending on SIM card, network and usage settings, style and environments. Bluetooth module will consume power when turned on, reducing the phone's operating times.

Electrical Specifications			
Parameter	GSM 900	GSM 1800	GSM 1900
Cellular system	EGSM	PCN	PCS
RX frequency	925 - 960 MHz	1805 - 1880 MHz	1930.2 - 1939.8 MHz
TX frequency	880 - 915 MHz	1710 - 1785 MHz	1850.2 - 1909.8 MHz
Output power	+5 .. +33 dBm / 3.2 mW .. 2 W	+0 .. +30 dBm / 1.0 mW .. 1 W	+0 .. +30 dBm / 1.0 mW .. 1 W
Duplex spacing	45 MHz	95 MHz	80 MHz
Number of RF channels	174	373	299
Channel spacing	200 kHz	200 kHz	200 KHz
Number of TX levels	15	16	16
Sensitivity, static channel	-102 dBm/BER <2.439‰	-100 dBm/BER <2.439‰	-102 dBm/BER <2.439‰
Frequency error, static channel	< 0.1 ppm	< 0.1 ppm	< 0.1 ppm
RMS phase error	< 5°	< 5°	< 5°
Peak phase error	< 20°	< 20°	< 20°

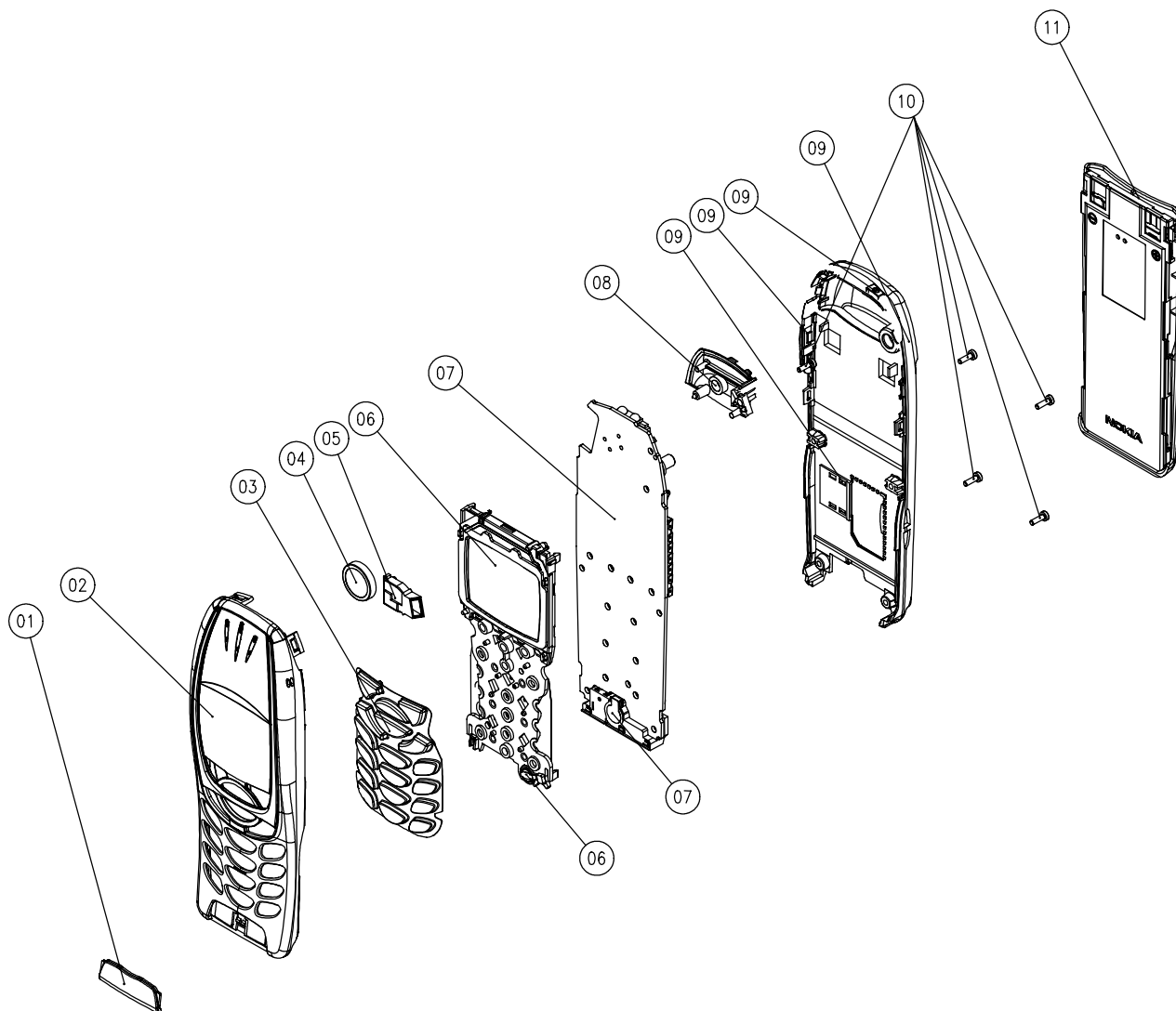


Figure 1 Exploded view of NPL-1

Table 1: List of main components

Item	Description	NMP code
01	Logo Badge	9430274
02a	A-cover Assembly Jet Black, EURAF/APAC	9451928
02b	A-cover Assembly Lightning Silver, EURAF/APAC	9482222
02c	A-cover Assembly Mistral Beige, EURAF/APAC	9452190
03	Keymat	979.....
04	Speaker	5140233
05	Buzzer Assembly	5140209
06	Lightguide Assembly,	4850163

Table 1: List of main components

Item	Description	NMP code
07	Microphone + Boot Assembly	5140225
08	Antenna – Internal Antenna Plated	0660251
09a	B-cover Assembly	9458087
09b	Not applicable	-----
09c	On/off key	9790412
09d	Volume key	9790385
10	Screw M1.6 x 5.5	6150025
11	Battery BPS-2	0670354

Integrated BLUETOOTH

Bluetooth is a global standard for wireless connectivity, however, some countries do not allow the use of Bluetooth frequencies e.g. Israel. Bluetooth technology is based on a low-cost, short-range radio link that operates in the globally available ISM (Industrial Scientific Medical) frequency band at 2.4 GHz.

As a widely adopted open standard, Bluetooth is intended for use in mobile phones, laptops, printers, digital cameras and other devices.

Bluetooth in the NPL-1

The integrated Bluetooth module (containing a Bluetooth transmitter and receiver) allows the user to connect wirelessly to other Bluetooth devices within a range of 10 meters, without the need of line of sight. The main uses of the Bluetooth module in the NPL-1 are:

- Synchronisation of phonebook and calendar information between the NPL-1 and a compatible PC. Calendar synchronisation works between the phone and, for example, Microsoft Outlook or Lotus Notes using Nokia PC Suite.
- Wireless data (dial-up) connections. Laptop users can access the Internet and handle e-mail by connecting the laptop to a computer network via Bluetooth and the NPL-1. The phone will work as a wireless modem.
- Wireless audio based on Bluetooth, allowing users to be wireless with Nokia Bluetooth audio accessories (headset and car kit).
- Sending of business cards and calendar notes to e.g. another NPL-1.

WALLET

The new wallet feature in the NPL-1 enables users to make on-line transactions via a WAP browser, using your credit card to pay for books and tickets, for instance. The wallet is a password-protected "locker" in your phone containing your credit card information and other private information. When you want to buy something via WAP and are asked for your credit card data, you only need to select wallet and give your password, instead of keying in all of the information manually.

Benefits

- Fast, convenient and secure on-line transactions via WAP
- Secure storage for your personal information inside the phone, e.g. for user names, passwords and numbers
- Protected storage inside the phone using the Wallet code for access
- Easy-to-use
- One step towards a Personal Trusted Device

GPRS (GENERAL PACKET RADIO SERVICE)

Mobile on-line

GPRS is a new feature in the existing GSM network. GPRS sends and receives your data in 'packets' - small packages of data that are sent across the network and then reassembled at the destination.

GPRS is different from traditional circuit switched services because the information is broken down into IP (Internet Protocol) packets. IP Packet data is more efficiently routed across the network and uses less network resources, which reduces the cost to the end user.

GPRS enables users to have an always online mobile access to operator services and the Internet. The main use for GPRS in the beginning will be as a bearer for WAP services, but GPRS can also be used for data (dial-up) connections and for SMS messaging.

The charging (billing) will be based on how much data you send and receive and not on how long time you have been connected.

Benefits with GPRS

- you can be always online
- data are more efficiently routed across the network
- you are charged according to the amount of data that you send and receive
- immediate access to WAP services

Before you can use GPRS

- you need to subscribe to GPRS (for availability and subscription to GPRS, contact your network operator or service provider)
- set up your phone and/or PC to use GPRS

GPRS data speeds

The data transfer speed of a GPRS connection can (at the moment) be up to 40.2 kbps. The speed depends on the network capacity and may change from moment to moment.

Comparisons: Normal WAP connection: 9.6 or 14.4 kbps

Normal GSM data conn.:9.6 or 14.4 kbps

High speed data conn.:up to 43.2 kbps

GPRS WAP connection:up to 40.2 kbps

GPRS data connection:up to 40.2 kbps

WAP

WAP IN THE NPL-1

The WAP feature in the NPL-1 is very much like the WAP feature seen in previous Nokia phones like the Nokia 6210. Main differences are

- GPRS - a new feature that can be used as a data bearer for WAP
- The WAP version is new (version 1.2.1) and it includes new functions

THE NEW FEATURES IN WAP

Push Service message indicator

The NPL-1 can receive a service message with a short header and a link to a specific WAP service. The type of messages that you want to subscribe to can be selected from operators or service providers according to personal interest.

WAP push messages are stored in a dedicated service inbox. This inbox is found in the Services menu. While online, the service inbox is found under the Options. You can any-time connect to the link that is included in a service message.

When a new WAP push message (with priority high or medium) is received, a notification "New service message received" is displayed. You can read the message or discard the notification. You can save 10 messages in the service inbox.

WAP push message is automatically removed from the service inbox when expiry time (set by the content provider) is reached.

Direct calling (WTAI - Wireless Telephony Applications Interface)

WTAI enables interaction between the WAP browser and other parts of the mobile phone. For example it will be possible to call directly from a phone book on a WAP page by selecting the number to call. The WAP page must be designed to support this feature.

Cookies

Works similarly to the Internet cookies. A server can store a text-string in the phone, making it possible for a WAP-service to recognise the user from time to time, creating a more personal and easier browsing. The NPL-1 has memory for 20 cookies, that will be outdated starting from the last used ones.

Downloadable Calendar (vCal) and Contact (vCard) items

Calendar appointments and business cards can be saved to the phone's calendar or phone book. E.g. while browsing you can select a calendar event or a business card on a WAP page to be saved into the phone's memory.

Direct editing

When the cursor is on top of a link to an input box, pressing the numeric keypad will immediately start inputting into the editor. There is no need to press the select key to get to the editor.

Voice commands and recording features

The voice features have been extended with voice commands and a voice recorder.

With voice commands you can operate up to five features (e.g. change profile) by speaking a voice tag of your choice.

The NPL-1 has a voice recorder that can hold a total of 2 minutes of recordings. The recorder can e.g. be used for making spoken memos.

For voice dialling ten phone numbers in the phone book can have a voice tag attached.

MIDP Java

Introduction

This subsection gives an overview of the features a MIDP Java environment offers for applications (so called MIDlets).

The MIDP Java environment offers the following features:

- MIDlets can be downloaded via WAP. Once they are installed in the phone, they can be started at any time.
- MIDlets can draw on the phone screen.
- MIDlets can be operated by using the phone keypad.
- MIDlets can establish HTTP network connections (if allowed by the user).
- MIDlets can store data permanently in the phone.

MIDP Applications

MIDlet suites

A MIDlet suite is the format in MIDP that is used to distribute MIDlets. A MIDlet suite contains at least one, but can contain several MIDlets (=Java applications). A MIDlet suite consists of two files: the application data itself and the application descriptor.

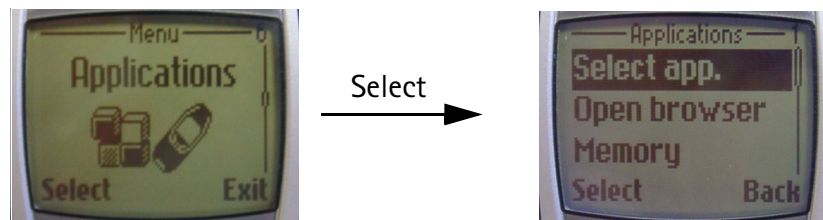
The application data is stored in a so called jar file. A jar file consists of all (packed) Java class-files and resource-files (e.g. icon files, level data for games, sounds, ...) for the MIDlets in that MIDlet suite.

The application descriptor (= jad file) contains information about a particular MIDlet suite, e.g. the name, vendor, version and the amount of memory required for that MIDlet suite. It also contains the URL (= address) of the corresponding jar file. This file is used during the download procedure (see MIDlet suite download & installation).

Application management

The instance in the phone that handles the application download, installation, start and deletion is called the Java application manager (= JAM).

For all features other than the application download, the JAM is the main entry point (see pictures below)



MIDlet suite download & installation

A download is initiated by the user by going to the WAP browser and clicking on a jad file.

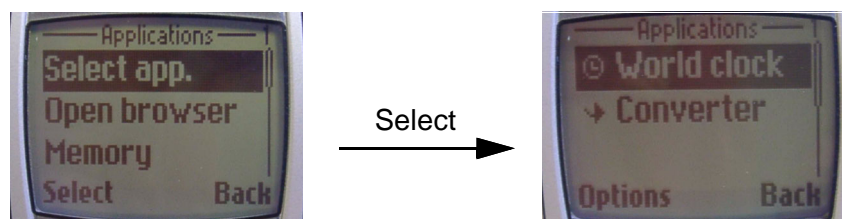
Then the jad file is downloaded and the information in it is verified. If the application fits into the phone and can be run there, the corresponding jar file is downloaded.

After the download is finished, the application is stored in the phones permanent memory. The user can then go to the Java menu in the phone and start the application.

Start and run MIDlets

All installed MIDlet suites can be found in the Java menu in the phone (see pictures below). From there, the user can select a particular MIDlet suite and open it.

Games from Club Nokia can be in Games menu.



If a MIDlet suite contains more than one MIDlet, a list of these MIDlets is presented and the user can select one to start it.

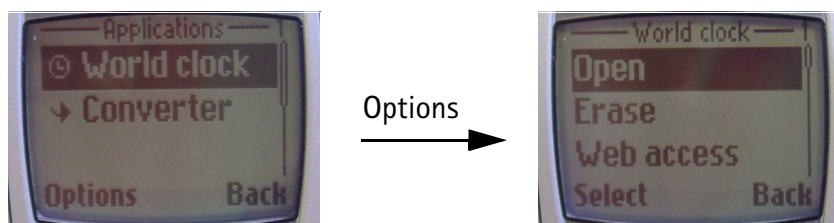
It is possible to start more than one MIDlet at a time, as long as these are in the same MIDlet suite.

Other features

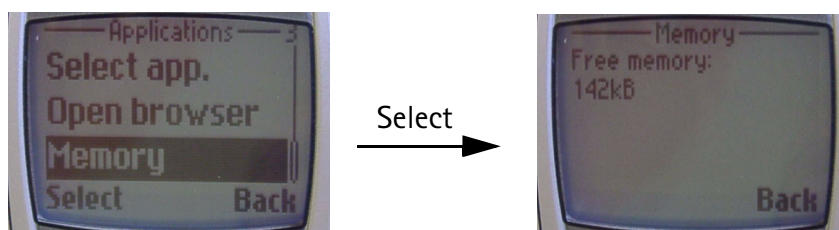
Some other features are available to the user via the MIDlet options list:

- **Application deletion:** Installed applications can be erased from the phones memory. By doing so, all related information and permanent data for the application is lost.
- **Retrieval of information about the installed application:** If the user selects this, then a WAP browser is opened with a URL that can be provided in the jad file.
- **Update check:** The user can check, whether there is a newer version of the application available.
- **Details:** User can see information about the MIDlet.

The following pictures show some items of the MIDlet options list:



- **Information about the system:** The user can check, how much memory he has available for Java applications (see pictures below)



Security

This section shows some of the potential security issues and summarizes briefly what measures have been taken in order to reduce these risks.

Security risks

The following potential risks can be identified regarding Java in mobile phones:

- **Phone blocking:** One application could completely block the phone in a way that normal phone functionality (e.g. emergency calls) is not available anymore.
- **Phone data access:** If an application had (uncontrolled) access to phone data (e.g. IMEI, encryption keys, warranty data, settings, calibration parameters, ...), it could either modify/corrupt this data in a way that e.g. phone calls are not possible anymore or it could be exposed to someone else.
- **User data access:** If an application had (uncontrolled) access to user data (e.g. calendar entries, phonebook entries, messages, data from other installed applications, ...), it could either modify/corrupt this data or it could be exposed to someone else.
- **Active network connections without knowledge of the user:** An application could open a network connection or send SMS's without the user knowing about that. Firstly, the user would not notice, that he pays for this at that time and secondly, sensitive data could be transferred.

Measures to reduce the risks

Generally speaking, MIDP Java in general and the Nokia specific implementation specifically have been designed with all potential risks in mind and very effective measures have been taken to reduce the risks nearly to zero.

- **MIDlet suite encapsulation:** A MIDlet in a certain MIDlet suite can't access any data from other MIDlet suites. Furthermore, it does not even know, that other suites are installed.
- **Sandbox:** A MIDlet can't access any phone resource directly. It always has to use the defined APIs.
- **Limited set of APIs:** There are no APIs defined to access any data in the phone (e.g. serial number, phone book, SMS storage, settings, ...). Furthermore, it is not possible for a MIDlet to get any information about other running MIDlets.
- **Start of MIDlets by the user:** MIDlets always have to be started by the user. It is not possible for MIDlets to start automatically (e.g. after a timeout) or to start other MIDlets.
- **MIDlet termination:** The user can always easily cancel an application and free all resources taken by that application.
- **Network connection confirmation:** The user is always asked (can be configured by the user), before the MIDlet is allowed to establish a network connection.

- **Network activity indicator:** An indicator in the status bar shows, when data is transferred via the network.
- **Security testing:** During development, special security tests have been performed to ensure that all security measures are in place and work correctly.

Application development

Application development for MIDP devices differs from "normal" Java development as the target platform is not the development platform. I.e. a PC or workstation is used to write and compile the application code, but the target platform where the application is executed is e.g. a mobile phone.

In order to simplify the application development, there are simulators for the target devices available. These run on the platform where the application is develop and allow to write, compile and test the MIDP applications on one platform. Ideally, just final tests must be performed on the target platform.

Accessories

Accessory	Type No.
Chargers	
Multivoltage (Travel) Charger	ACP-7
Standard Charger	ACP-8
Standard Charger	ACP-12
Cigarette Lighter Mobile Charger	LCH-8
Mobile Charger	LCH-9
Batteries	
LI-Ion 1050 mAh Slim Battery	BLS-2N
LI-Ion Battery	BLS-2S
LI-Ion 1500 (1600) mAh Extended Battery	BLS-4
Li-Pol 600 mAh Ultra Slim Battery	BPS-1
Li-Pol 1100 mAh Ultra Slim Battery	BPS-2
Ni-MH 900 mAh Standard Battery	BMS-2S
Desktop Stand (one slot)	DCH-8
Connectivity Desktop Stand	DCH-8D
Desktop Stand	DCH-9
Handsfree Desktop Charging Stand	DCH-12K
Car Accessories	
Advanced HF Car kit	CARK-91
Advanced HF Car kit	CARK-91H
Audio Handset	HSU-1
Phone Holder	MBC-1

Accessory	Type No.
Personal Accessories	
Dual band ext. antenna set for 900/1800	AMD-2
Carrying Case	CSL-17
Leather Pouch	CSP-1
Data cable	DLR-3P
Headset	HDC-9P
Headset kit	HDE-1
Carrying Case	LSL-G10x0
Mobile Inductive Loopset	LPS-1
External Antenna Cable	XRC-1
Nokia PC Suite	Ver. 4.80, 4.81
Bluetooth Accessories	
Wireless Car Kit	CARK-112
Nokia PC Connectivity Card	DTL-4
Headset	HDW-1

See "Section 8 - Accessories" for further details.