

After Sales Technical Documentation

NHE/K-5/6 SERVICE SOFTWARE INSTRUCTIONS

NHE/K-5/6 SERVICE SOFTWARE INSTRUCTIONS

Contents

Introduction	Page 6
General	Page 6
Minimum Required Servicing Equipment	Page 6
Mechanical Connections	Page 7
Start Up Procedure	Page 8
Introduction to Service Software Package User Interface	Page 9
Service Software/Hardware Environment	Page 9
Service Software Environment	Page 9
Service Software Executables	Page 10
Command Line Parameters	Page 10
Common Properties of the User Interface	Page 11
Login Dialog	Page 11
Main Window	Page 12
Menu Bar	Page 14
Product	Page 14
Configure	Page 15
Tuning	Page 15
Testing	Page 15
Software	Page 16
Dealer	Page 17
View	Page 17
Phone Identity Window	Page 18
Help	Page 18
Mouse Cursors	Page 19
Reserved Keys	Page 19
Short Cut Function Keys	Page 19
Alt Hot Keys	Page 19
Ctrl Hot Keys	Page 19
Shift Hot Keys	Page 20
Key Strokes	Page 20
Help Functions	Page 21
Dialog boxes	Page 22
Common Dialog boxes	Page 22
Note Message Box	Page 22
Query Message Box	Page 22
Error Message Box	Page 23
Custom Dialog boxes	Page 24
Buttons	Page 24
Reporting Status	Page 25

NHE/K-5 & NHE/K-6 Specific Features	Page 26
Menu Bar	Page 26
Product	Page 26
New command	Page 26
Open... command	Page 26
Close command	Page 26
Initialize command	Page 27
Normal Mode	Page 27
Local Mode	Page 27
Faultlog	Page 27
Exit command	Page 28
Configure	Page 29
Options... command	Page 29
Directories... command	Page 29
Faultlog... command	Page 30
Tuning	Page 31
AFC... command	Page 31
RSSI (AGC)... command	Page 32
TX Power... command	Page 35
TX I/Q... command	Page 37
Battery A/D... command	Page 39
Charger A/D... command	Page 40
LCD A/D... command	Page 40
LCD Display... command	Page 40
Testing	Page 42
Quick Testing (RF)... command	Page 42
RSSI Reading... command	Page 47
Self Tests... command	Page 48
ADC Readings... command	Page 50
Audio... command	Page 51
Display... command	Page 52
Call Simulation.. command	Page 53
Noise Sensitivity... command	Page 54

 Technical Documentation

Software	Page 56
Phone Identity... command	Page 56
Product Profile... command	Page 57
NHE/K-5 Product Profile Settings	Page 58
NHE/K-6 Product Profile Settings	Page 58
Start Up Self-tests... command	Page 59
Set Default Values... command	Page 60
Network Settings... command	Page 61
HW Settings... command	Page 62
NHE/K-5 Settings:	Page 63
Warranty State... command	Page 64
Service Numbers... command	Page 65
Dealer	Page 66
Short Code Memory... command	Page 66
User Settings... command	Page 67
SCM & User Settings... command	Page 69
Set UI/DEV Default Values... command	Page 70
View	Page 71
Quick/RF Info... command	Page 71
Phone Identity... command	Page 72
Help	Page 73
Index command	Page 73
General help command	Page 73
Using Help command	Page 73
About... command	Page 73
Initialization File	Page 74
Appendix 1, Vocabulary	Page 75

Introduction

General

The NHE/K–5 NHE/K–6 Service Software is specially designed to facilitate the servicing of sixth generation cellular telephones.

The software can be used to control the phone according to the user's requirements merely by entering commands via the keyboard or mouse of a PC connected to the phone.

This section refers to the Service Software Version 2.3. NMP After Sales will notify service personnel about future upgrades via Technical Bulletins. Software upgrades will be available from your local NMP outlet.

Minimum Required Servicing Equipment

- Computer: Intel 386/33 MHz or compatible with one unused serial port (COM1 or COM2*), one parallel port (LPT1), hard disk recommended.
- Memory: 4 MB or more
- Operating System: DOS Version 5 & Microsoft Windows 3.11 or later
- Display: VGA based display (640 x 480)
- PC Locals program: for 3.5" disk (product code: 0774034)
- Software Protection Key PKD–1 (product code 0750018)
- M2BUS interface cable DAU–4S (product code 0730057)

*) Note: A number of PC's of an older generation use the Intel, National Semiconductor, or United Microelectronics IC 8250 as the serial port UART. This is a comparatively inefficient circuit for current purposes and does not necessarily support the M2BUS adapter at 9600 baud. The newer UART's NS16450 and NS16550AF of National Semiconductor offer solutions for these problems.

Mechanical Connections

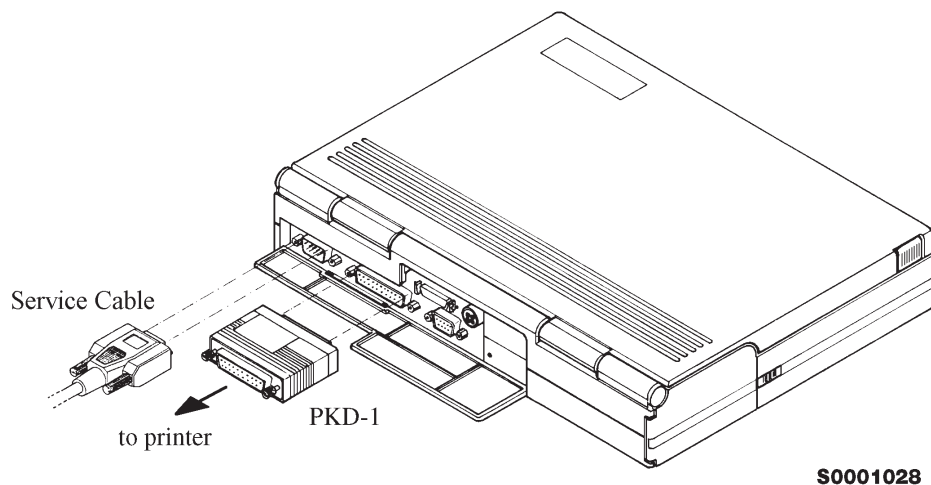
Caution: Ensure that you have switched off the PC and the printer before making connections !

Caution: Do not connect the PKD-1 to the serial port. This could damage the PKD-1 !

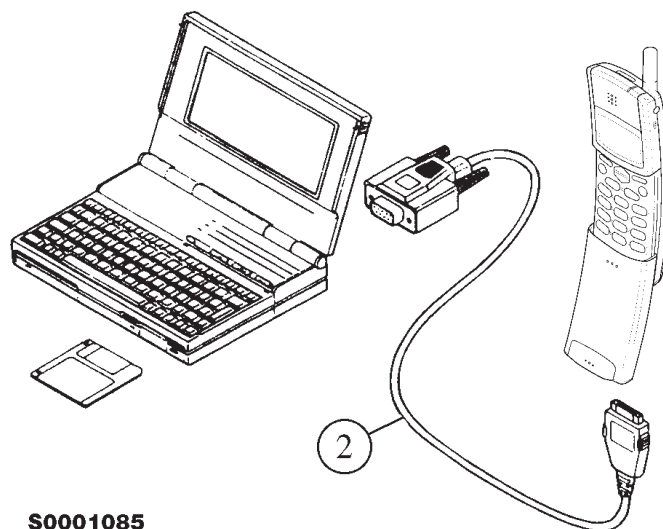
The software controls the phone via a separate adapter connected to the serial port of the PC and to the telephone's M2BUS (DAU-4S and XCM-1).

Attach the protection key PKD-1 to parallel port one (25-pin female D-connector) of the PC. When connecting the PKD-1 to the parallel port be sure that you insert the PC end of the PKD-1 to the PC (male side). If you use a printer on parallel port one, place the PKD-1 between the PC and your printer cable.

The PKD-1 should not effect devices working with it. If some errors occur (errors in printing are possible) please try printing without the PKD-1. If printing is OK without the PKD-1 please contact your dealer. We will offer you a new PKD-1 in exchange for your old one.



Attach one end of the M2BUS interface cable, DAU-4S (2), to the PC serial port and the other end to the bottom connector of the phone.



S0001085

Start Up Procedure

Start the phone by pressing the power-on button of the handset. Switch PC power on.

To installing software, proceed as follows:

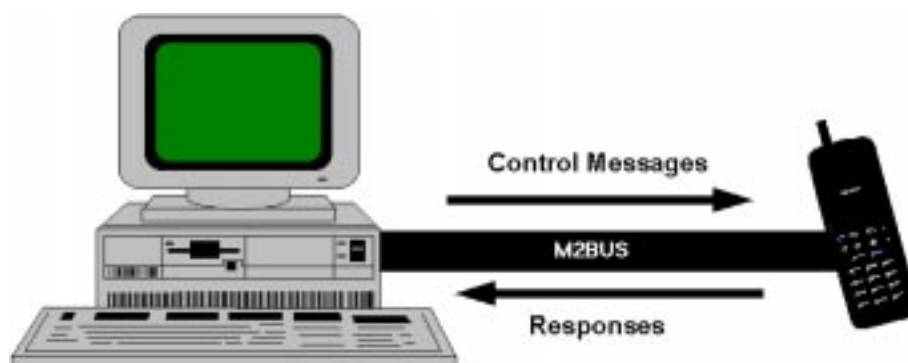
1. Insert Service Software disk into drive A of your PC
2. Start Windows: **type *WIN* and press *Enter***
3. Start Installing program: **select *File* → *Run* from Program Manager menu, then type *A:INSTALL* and press *OK* button**
4. Follow Installation Software instructions

Introduction to Service Software Package User Interface

This chapter gives a short description of the Service Software properties.

Service Software/Hardware Environment

To run the Service Software, a parallel port software protection device (PKD-1) has to be connected. The user can use the Service Software functions for testing all supported Phone Types. The functions send messages from the PC to the phone, receives results and show them on the PC display. The messages are sent via a low level NMP proprietary bus protocol. An example bus is an M2BUS interface, which needs M2BUS adapter (DAU-2) connected to the PC RS-232 port and special M2BUS cable.



The recommended minimum hardware standard to run the Service Software package is any computer which is 386 33Mhz or greater with at least 4 MB of memory and VGA type display (640x480). This assumes that only the Service Software package is active, i.e. other Windows packages are not running in the background.

Note: if the Service Software is to be run on a laptop, the power saving feature MUST be switched off.

Service Software Environment

Service Software user interface is intended for Microsoft Windows 3.1x environment running in enhanced mode. For those who are familiar with Windows environment this application will be easy to use. Detailed information about Windows and application usage can be found from Ref 3- Microsoft Windows Version 3.1 Users Guide chapter one (Windows Basics) and chapter two (Application Basics).

As an ordinary Windows application, the main idea in the user interface is that selections are made with menus, push buttons and shortcut keys. Selections can be done by using keyboard and/or mouse. When messages from phone

are received, they cause display updating in special display windows. There is always a status bar displayed at the bottom of the main window which contains information about current actions.

Service Software Executables

Only one executable is needed – WinTesla.

For NHE/K-5/6 there are two DLL's:

- Functionality DLL is NHEK56.DLL
- User Interface DLL is NHEK56EN.DLL or NHK5EN.DLL

Command Line Parameters

There are NO command line parameters.

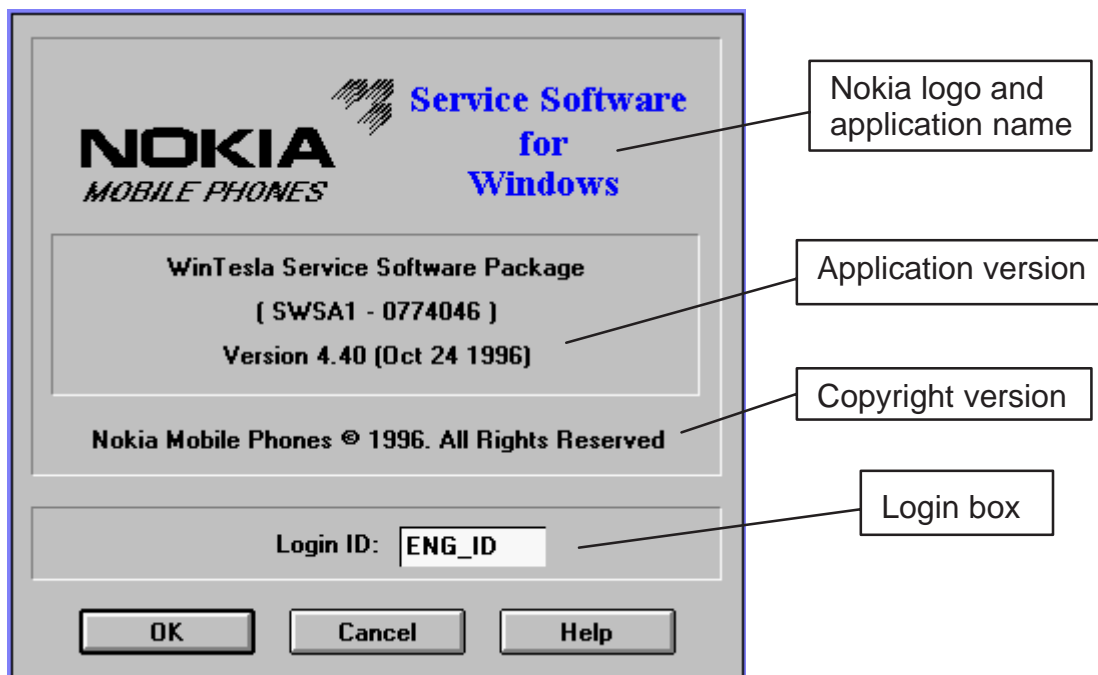
Common Properties of the User Interface

This chapter describes how the User Interface CLF must appear to the user.

The User Interface **MUST** be capable of being driven without the use of a mouse, as the service engineer rarely has space on the bench to use a mouse.

Login Dialog

When the Service Software application is invoked, by checking on the Service Software icon, the **Login** dialog box will be displayed on the screen.



Nokia logo and application name bitmap (–)

Displays Nokia logo and name of the application.

Application version static text (–)

Contains the name and version of the application.

Copyright notice static text (–)

Copyright is informed as: “**Nokia Mobile Phones (c) 1996. All Rights Reserved**”.

Login Box edit box (–)

The user Login ID edit box, where the user enters his faultlog user name. (See Faultlog User Guide)

OK button (default key)

The user name is stored in memory and the dialog box is closed. When the dialog box is closed, the application starts.

Cancel button (ESC)

The Dialog box is closed and application is started, but the Faultlog feature is disabled.

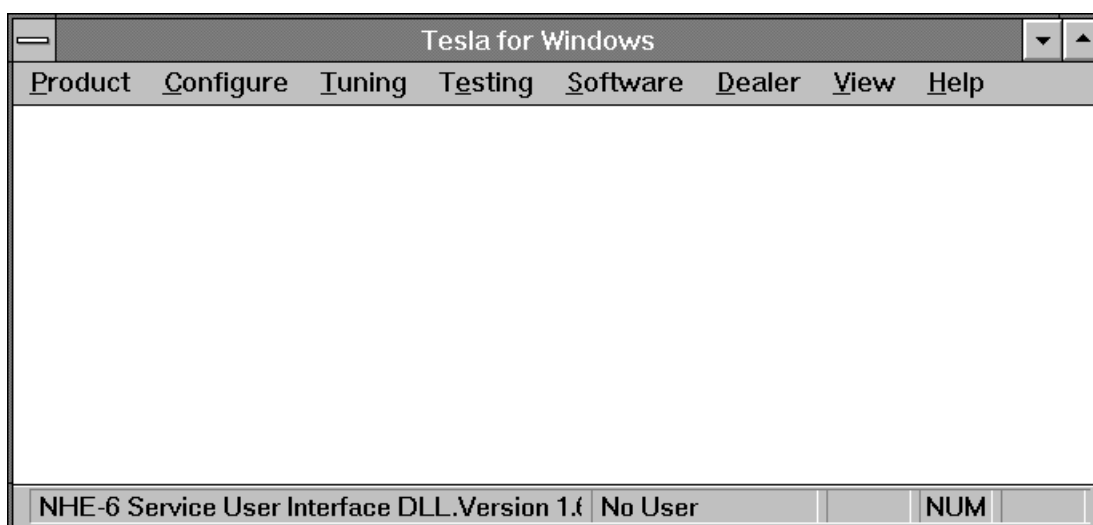
Help button (F1)

Activates the Windows Help application and displays context sensitive Help.

Main Window

The application supports a *Multiple Document Interface (MDI)*. However, the service software interface will present a *Single Document Interface (SDI)* appearance.

Note: MDI is to allow for future expansion, e.g. R&D features.



Title bar

The *title bar* is located at the top of the window.

A title bar contains the following elements:

- Application Control–menu button
- Maximise button
- Minimise button
- Name of the application
- Restore button

The properties of these elements and their usage is described in Ref 3– Microsoft Windows Version 3.1 Users Guide chapter one (Windows Basics) and chapter two (Application Basics).

Menu bar

The *menu bar* is below the title bar and contains all available menu selections. The menu bar is a dynamic element and is dependent on the dongle type fitted, and whether a phone is connected.

Underlined characters in menu names and options indicates that the menu selection can be done by pressing *Alt+ underlined character*. Options can also be selected by activating menu bar with *Alt-* key (or *F10* key) and using arrow-keys to highlight the desired menu. In that case, selection is done by pressing *Enter*.

Menus can also be selected by using the mouse as described in Ref 3-Microsoft Windows Version 3.1 Users Guide

Status bar

The *status bar* is displayed at the bottom of the Service Software main window. The status bar contains information about the menu selections and events.

The left area of the status bar describes the actions of menu items as the user uses the arrow keys to navigate through menus.

The status bar texts are explained in detailed in each of command's description.

The right areas of the status bar indicate which of the following keys are latched down:

Indicator	Description
USER	Entered Login ID.
CAP	The Caps Lock key is latched down.
NUM	The Num Lock key is latched down.
SCRL	The Scroll Lock key is latched down.

Tool bar

The *tool bar* is NOT defined and will not be implemented until specified by this document.

Configure

The Configure menu contains the following menu items:

- Options...
- Directories...
- Faultlog...
- Phone Type Specific configuration items (where applicable)



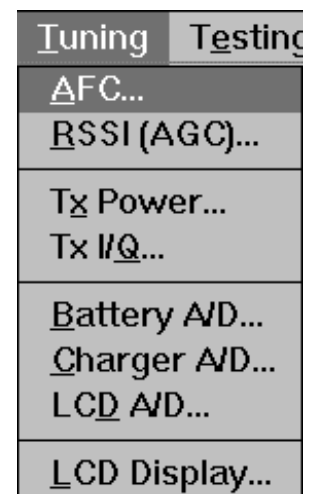
Tuning

The Tuning menu contains the following menu sections:

- Receiver
- Transmitter
- Voltages
- Phone Type Specific tuning items (where applicable)

An example Tuning menu is shown below:

- AFC...
- RSSI (AGC)...
- Tx Power...
- Tx I/Q...
- Battery A/D
- Charger A/D...
- LCD A/D...
- LCD Display...



Additional menu items may be added within the sections according to the phone type being tuned, e.g. a Charger tuning menu item will be added after the Battery tuning item, but not in the Transmitter tuning section.

Testing

The Testing menu contains the following menu sections:

- Quick Tests
- Digital
- User Interface Flexi
- Transmitter
- Receiver
- Automatic Tests
- Phone Type Specific testing items (where applicable)

An example Testing menu is shown below:

- Quick Testing (RF)...
- RSSI Reading ...
- Self Tests
- ADC Readings
- Audio
- Display
- Call Simulation...
- Noise Sensitivity...

<u>T</u> esting	<u>S</u> oftware	<u>D</u> ealer
<u>Q</u> uick Testing (RF)...		
<u>R</u> SSI Reading...		
<u>S</u> elf Tests...		
<u>A</u> DC Readings...		
<u>A</u> udio...		
<u>D</u> isplay...		
<u>C</u> all Simulation...		
<u>N</u> oise Sensitivity...		

Additional menu items may be added within the sections according to the phone type being tested.

Where a menu item consists of more than one test, a pop-up menu may be added to identify the appropriate sub-tests, e.g. there may be two receiver tests required for a particular phone type (Bit Error Rate and RSSI Monitoring). These will be shown as a popup from the Receiver menu item.

Software

The Software menu contains the following menu sections:

- Phone Identity/Numbers
- Flashing
- Phone Type Specific software items (where applicable)

An example Software menu is shown below:

- Phone Intity
- Product Profile...
- Start Up Self-tests...
- Set Default Values
- Network Settings...
- HW Settings...
- Warranty State...
- Service NumBers...

<u>S</u> oftware	<u>D</u> ealer	<u>V</u> iew
<u>P</u> hone <u>I</u> ntity...		
<u>P</u> roduct Profile...		
<u>S</u> tart Up Self-tests...		
Set Default <u>V</u> alues		
<u>N</u> etwork Settings...		
<u>H</u> W Settings...		
<u>W</u> arranty State...		
Service Num <u>B</u> ers...		

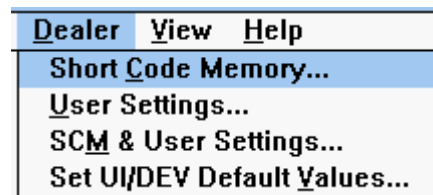
Ddealer

The Ddealer menu contains the following menu sections:

- Phone UI Data Editors
- Phone UI Data Transfer
- Phone Re-Initialization Functions
- Subscriber Data
- Phone Type Specific dealer items (where applicable)

An example Ddealer menu is shown below:

- Short Code Memory
- User Settings
- SCM & User settings ...
- Set UI/DEV Default Values ...



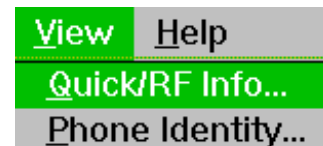
View

The View menu contains the following sections:

- Service Windows
- Production Windows (where applicable)
- R&D Windows (where applicable)

An example View menu is shown below:

- Quick/RF Info...
- Phone Identity...



Phone Identity Window

The Phone Identity window should contain, as a minimum, the following data:

- Software Version(s)
- Hardware Version(s)
- Serial Number(s)
- Product Code

This window will only be used as a display window and therefore will not allow editing of the displayed data. This window will not contain any controls other than a scroll bar.

Help

The Help menu contains the following menu items:

- Index
- General Help
- Using Help
- About WinTesla



<u>H</u> elp	
<u>I</u> ndex	
<u>G</u> eneral Help	F1
<u>U</u> sing Help	
<u>A</u> bout WinTesla	

Mouse Cursors

The standard Windows pointer will be used as the mouse cursor.

During time consuming tasks e.g. communication to phone, an hour glass will be shown informing the user that a task is in progress. The application uses the hour glass cursor to inform user that the application has taken the control and any actions from user will be ignored.

When a function is initiated, the hour glass will be displayed and when the function has finished the mouse pointer will return to normal.

Reserved Keys

The following Hot keys and Short Cut keys are reserved either as Microsoft standard keys or as part of the Common Look and Feel specified by this document.

Short Cut Function Keys

Key	Description	Defined by
F1	Context Sensitive Help	Microsoft
F5	Normal Mode	NMP
Shift+F5	Local Mode	NMP
F9	Activate Faultlog	NMP
F10	Goto Menu Bar	Microsoft
Ctrl+F4	Close Active Window	Microsoft

Alt Hot Keys

Key	Description	Defined by
Alt+F4	Exit Active Application	Microsoft
Alt+H	Help	Microsoft

Ctrl Hot Keys

Key	Description	Defined by
Ctrl+N	<u>F</u> ile – <u>N</u> ew	Microsoft
Ctrl+O	<u>F</u> ile – <u>O</u> pen	Microsoft
Ctrl+P	<u>F</u> ile – <u>P</u> rint	Microsoft
Ctrl+R	<u>P</u> roduct – <u>N</u> ew	NMP

Shift Hot Keys

Key	Description	Defined by
Shift+F5	Local Mode	NMP

Key Strokes

Key	Description	Defined by
Alt+P	<u>P</u> roduct Menu	NMP
Alt+P,N	<u>N</u> ew	NMP
Alt+P,O	<u>O</u> pen	NMP
Alt+P,C	<u>C</u> lose	NMP
Alt+P,I	<u>I</u> nitialize Pop-up	NMP
Alt+P,I,N	<u>N</u> ormal Mode	NMP
Alt+P,I,L	<u>L</u> ocal Mode	NMP
Alt+P,F	<u>F</u> aultlog Pop-up	NMP
Alt+P,F,A	<u>A</u> ctivate Faultlog	NMP
Alt+P,F,E	<u>E</u> dit Faultlog	NMP
Alt+P,E	<u>E</u> xit Application	NMP
Alt+C	<u>C</u> onfigure	NMP
Alt+C,O	<u>O</u> ption	NMP
Alt+C,D	<u>D</u> irectories	NMP
Alt+C,F	<u>F</u> aultlog	NMP
Alt+T	<u>T</u> uning Menu	NMP
Alt+T,A	<u>A</u> FC	NMP
Alt+T,R	<u>R</u> SSI(AGC)	NMP
Alt+T,X	<u>T</u> x Power	NMP
Alt+T,Q	Tx I/ <u>Q</u>	NMP
Alt+T,B	<u>B</u> attery	NMP
Alt+T,C	<u>C</u> harger	NMP
Alt+T,D	LCD <u>A</u> /D	NMP
Alt+T,L	<u>L</u> CD Display	NMP
Alt+E	<u>T</u> esting Menu	NMP
Alt+E,Q	<u>Q</u> uick Testing RF	NMP
Alt+E,R	<u>R</u> SSI Reading	NMP

 Technical Documentation

Alt+E,S	<u>S</u> elf Tests	NMP
Alt+E,A	<u>A</u> DC Readings	NMP
Alt+E,U	<u>A</u> udio	NMP
Alt+E,D	<u>D</u> isplay	NMP
Alt+E,C	<u>C</u> all Simulation	NMP
Alt+E,N	<u>N</u> oise Sensitivity	NMP
Alt+S	<u>S</u> oftware Menu	NMP
Alt+S,I	Phone <u>I</u> ntity	NMP
Alt+S,P	<u>P</u> roduct Profile	NMP
Alt+S,S	<u>S</u> tart-up Self Tests	NMP
Alt+S,V	Set Default <u>V</u> alues	NMP
Alt+S,N	<u>N</u> etwork Settings	NMP
Alt+S,H	<u>H</u> W Settings	NMP
Alt+S,W	<u>W</u> arranty State	NMP
Alt+S,B	Service Num <u>B</u> ers	NMP
Alt+D	<u>D</u> ealer Menu	NMP
Alt+D,C	Short <u>C</u> ode Memory	NMP
Alt+D,U	<u>U</u> ser Settings	NMP
Alt+D,V	Set UI Default <u>V</u> alues	NMP
Alt+V	<u>V</u> iew Menu	NMP
Alt+V,Q	<u>Q</u> uick/RF Info	NMP
Alt+V,P	<u>P</u> hone Identity	NMP
Alt+H	<u>H</u> elp Menu	Microsoft
Alt+H,I	<u>I</u> ndex	Microsoft
Alt+H,G	<u>G</u> eneral Help	Microsoft
Alt+H,U	<u>U</u> sing Help	Microsoft
Alt+H,A	<u>A</u> bout WinTesla	Microsoft

Help Functions

The Help User Interface will be the standard Windows help tool called WinHelp.

The context sensitive help is activated with **F1**-key. Help contains also Using Help which describes how to use help facility. Refer to the Windows manual for detailed description on the Windows Help.

Dialog boxes

The Service Software application uses many different dialog boxes. Dialog boxes are used to display data and prompt the user for input.

Dialog boxes are opened from menus or with shortcut keys. Dialog boxes have different properties but some features are common.

All service dialog boxes must be modal, that is, the user will not be able to start another operation without first closing the present dialog box.

All dialog boxes will contain the following entities:

- Help button
- Title bar
- At least one button other than Help
- Application Control–menu Button

Common Dialog boxes

This sections describes the common dialog boxes used in the Service Software package, and the context in which they will be used.

Note Message Box

When the user has made an illegal selection, a *note message box* dialog will be opened and message text is displayed. The message box is also opened when the program has some information for the user. The size of the dialog box may vary. An information dialog box is recognized by the !–icon.



The dialog box will also contain an OK button and a Help button.

OK button (default key):

Acknowledge displayed information and continue. The dialog box is closed after selection.

Help button (Alt+H):

Opens context sensitive help as F1–key does.

Query Message Box

Confirmations and questions are asked in a *query message box*. A query dialog box is recognized by the ?–icon.



The dialog box will also contain a Yes button, a No button, and a Help button.

Technical Documentation

Yes button (Alt+Y or Y) (default key):

Accepts confirmation or question.

No button (Alt+N or N):

Denies confirmation or question.

Help button (Alt+H):

Opens context sensitive help as F1-key does.

The buttons may also be OK and Cancel. The operation of these buttons are the same as in the Note dialog box.

Error Message Box

Error message dialog boxes use the Stop-icon. When a "Stop"-dialog box is shown, the current operation is terminated.

The dialog box has a description about the failed operation and reason. Pressing F1 (Help) application opens the appropriate help topic that gives information about recommended actions.



The dialog box will also contain an OK button and a Help button.

OK button (default key):

Acknowledges displayed information and terminate current operation. The dialog box is closed after selection.

Help button (Alt+H):

Open context sensitive help as F1-key does.

Custom Dialog boxes

All custom dialog boxes will contain the predefined buttons as defined below in the section – *Buttons*. However, it is recognised that features may require additional button types, but the addition of these non-standard buttons should be carefully considered to minimise any inconsistencies between implementations.

The buttons will be positioned down the right-hand side of the dialog boxes. The default action will be **OK**, except where that default action could result in an irretrievable failure.

All tuning dialogs that contain tuning results, will display the old tuned data read from the phone before the tuning was performed, as well as the newly tuned data.

List boxes will be used to display lists of data, such as tuning data, test results etc.

The use of Radio buttons should be limited and carefully considered. The use of radio buttons defines the number of possible choices available to the user, which may be acceptable for one project, but not for another.

Buttons

All buttons must be the Microsoft style of buttons.

In general, the default button will be the OK button, the Close button or the Yes button, but this will depend on the context of the dialog box that the button is associated with.

OK button:

Accepts and validates entered settings and values and closes the dialog. If the values have not been changed, then no action will be taken. The status bar will reflect the status. The user should only be queried, if the settings or values accepted will over-write data that CAN NOT be reproduced.

A greyed **OK** button indicates that settings selected by the user are not acceptable.

Close button:

Closes the current dialog box. Does not send or store anything and closes the dialog. The Close button is only used for dialogs that do not set or change any data.

Cancel button (Esc):

Cancel operation. Does not send or store anything and closes the dialog box.

A greyed **Cancel** button indicates that it is not possible to quit from this dialog box.

Technical Documentation

Yes button (ALT+Y or Y):

Replies Yes to a question asked of the user.

No button (ALT+N or N):

Replies No to a question asked of the user.

Help button (ALT+H):

Opens context sensitive help as F1-key does.

Reporting Status

The status bar will be used to report the present status to the user. When a feature is initiated, the status bar will be updated with a brief description of the function. The status bar will also be updated at key points in a time consuming function.

If an error is to be reported to the user, it will be displayed in the status bar as well as displayed in a common error dialog box. This will mean the user is not delayed from progressing on to the next operation unless an error occurs, in which case, the user will have to acknowledge the error by pressing the OK button.

NHE/K-5 & NHE/K-6 Specific Features

Menu Bar

The Service Software's menus adopts the menu structure specified by CLF.

Product

New command

Activation	Status Bar Text
Alt, P, N Ctrl+R	Rescan a new phone

This command scans a new product. When phone is found a product specific functionality module is loaded. If no phone or wrong phone/cellular type is detected, functionality is unloaded and user is informed.

This function is also started automatically when the application is started. The user can also specify a regular poll which enables the WinTesla application to scan the new phone periodically. If the phone is still the same, no changes are done. If the phone is changed (with same phone type only the serial number is changed), the phone will be initialized to a normal mode. If the phone is changed to a different phone type, the current dlls are unloaded and new ones are loaded for that phone.

The initialization routine checks the phone's cellular type (GSM/PCN), and if an unsupported phone is detected, the WinTesla application does not load the dlls.

If quick info view is open, the window will be automatically updated.

If phone identification view is open, the window will be automatically updated.

Open... command

Activation	Status Bar Text
Alt, P, O	Force load phone specific functionality

Enables the user to force load specific phone's WinTesla dll's.

Close command

Activation	Status Bar Text
Alt, P, C	Close loaded functionality

Closes loaded functionality and sends reset to phone if dlls are loaded by Open command.

Technical Documentation

Initialize command

Activation	Status Bar Text
------------	-----------------

Alt, P, I	–
-----------	---

Opens a submenu which contains the following options:

Normal Mode

Activation	Status Bar Text
------------	-----------------

Alt, P, I, N F5	Initializes phone to normal mode
--------------------	----------------------------------

When normal mode has been activated or program has been started, self-test results will be asked from MCU. If any fault was found in the tests, an error message is shown. If normal mode has been set successfully (no self test error has been found), and paging listening has been started, the used AFC value is requested from MS.

The Initialization routine checks the phone's cellular type (GSM/PCN) and if an unsupported phone is detected, the application unloads the dlls.

If phone identification view is open, the window will be automatically updated. Also if RF Information Window is open it will be updated to quick info view.

Local Mode

Activation	Status Bar Text
------------	-----------------

Alt, P, I, L Shift+F5	Initialises phone to local mode
--------------------------	---------------------------------

Selection will change the MS state to *local*. When local mode is selected the phone is controlled to the local mode so that special actions can be made (for example RF tunings).

Faultlog

Activation	Status Bar Text
------------	-----------------

Alt, P, F	–
-----------	---

Opens a submenu which contains following options:

Activate Faultlog...

Activation	Status Bar Text
------------	-----------------

Alt, P, F, A F9	Activates faultlogging
--------------------	------------------------

Edit Faultlog...

Activation	Status Bar Text
------------	-----------------

Alt, P, F, E	Activates faultlog editing
--------------	----------------------------

Note! This documentation will be updated as soon as WinTesla integration is ready.

Exit command

Activation	Status Bar Text
------------	-----------------

Alt, P, X	Exit application
-----------	------------------

Alt + F4

Double click the application's Control menu button:



This command ends the Service Software session.

Configure

Options... command

Activation	Status Bar Text
------------	-----------------

Alt, C, O	Edit Service Software options
-----------	-------------------------------

The **Options** dialog box contains the following items:

Language drop down list.

Current password edit box:

New Password edit box:

Retype Password edit box:

User ID edit box.

M2BUS Com Port drop down list.

Automatic Rescan edit box.

Note! This documentation will be updated as soon as WinTesla integration is ready.

Directories... command

Activation	Status Bar Text
------------	-----------------

Alt, C, D	Edit directory settings
-----------	-------------------------

The **Directories** dialog box contains the following items:

ID Data edit box:

Logs edit box:

Fault log file(s) edit box:

Data Validation file(s) edit box:

Flash images edit box:

Blow failures edit box:

Note! This documentation will be updated as soon as WinTesla integration is ready.

Faultlog... command

Activation	Status Bar Text
------------	-----------------

Alt, C, F	Edit faultlog settings
-----------	------------------------

The **Faultlog** dialog box contains the following items:

Fault log enabled/disabled radio buttons:

Allow Manual Entry enabled/disabled radio buttons:

Automatic fault log prompting enabled 1/D**isabled 2** radio buttons:

Station identity edit box:

Country of **Repair** edit box:

Warranty period months edit box / drop down list:

Maximum **Time to repair** edit box:

Note! This documentation will be updated as soon as WinTesla integration is ready.

Tuning

The tuning menu offers functions for ME adjustments.

AFC... command

Activation	Status Bar Text
------------	-----------------

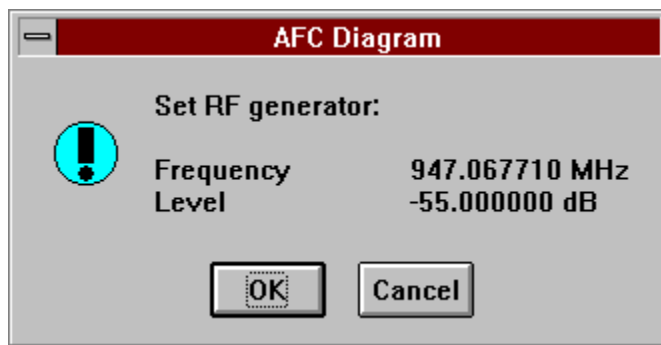
Alt, T, A	Open an AFC diagram dialog box
-----------	--------------------------------

Starts AFC tuning.

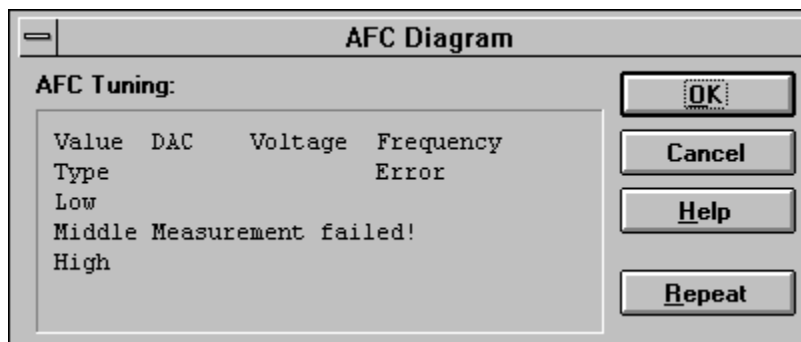
The following are automatically selected when this tuning function is activated:

- Active Unit = RX
- Operation mode = Continuous
- Update RF Information window

Before tuning is started, the user is requested to set signal generator to specified input level (read from .INI file).



The **AFC Diagram** dialog box will open when user accepts request:



The **AFC Diagram** dialog box contains the following items:

Repeat button (Alt+R):

The measurement can be started again by pressing Repeat button.

OK button (Alt+O):

The dialog box is closed, and tuning *is saved* to phone.

Cancel button (Esc):

Dialog is closed and tuning *is not saved* to phone.

The D/A converter range (DAC) is from +1023 to -1024 and voltage range is from 0.3 V to 3.9 V (voltage precision is 0.01 V).

The frequency error range is from -134 kHz to +134 kHz with the precision 0.1 kHz. The rounding is made to the closest value.

After exiting with the Cancel button, the following are reset to the values which were selected before this adjustment.

- Active Unit
- Operation mode
- Update RF Information window

The AFC is also reset to its previous value after exiting with the Cancel button.

RSSI (AGC)... command

Activation	Status Bar Text
------------	-----------------

Alt, T, R Open **RSSI Calibration** dialog box

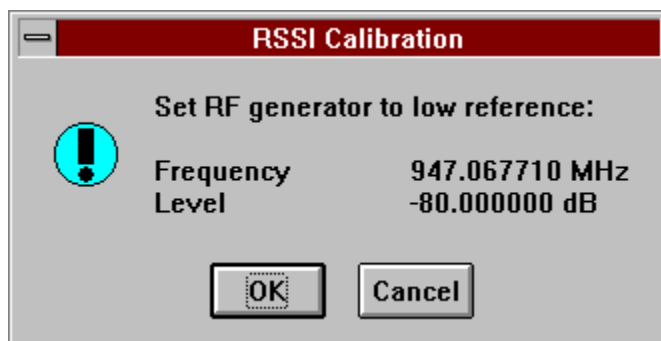
Starts RSSI calibration.

The following are automatically selected when this tuning function is activated:

- Active Unit = RX
- Operation Mode = Continuous
- Update RF Information window

The measurement is started automatically when RSSI calibration is entered. The measurement is done in five steps:

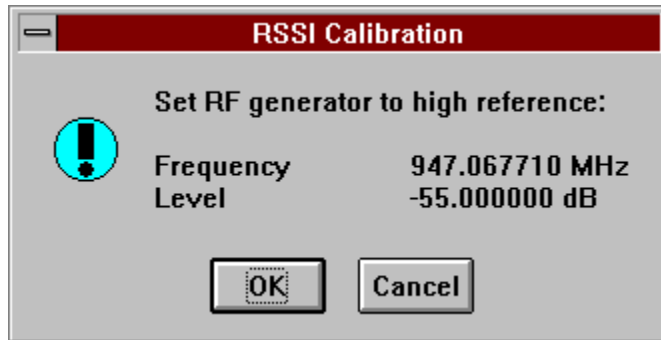
1. The user is requested to set signal generator to low input level (read from .INI file).



2. Measurement with low input level is executed.

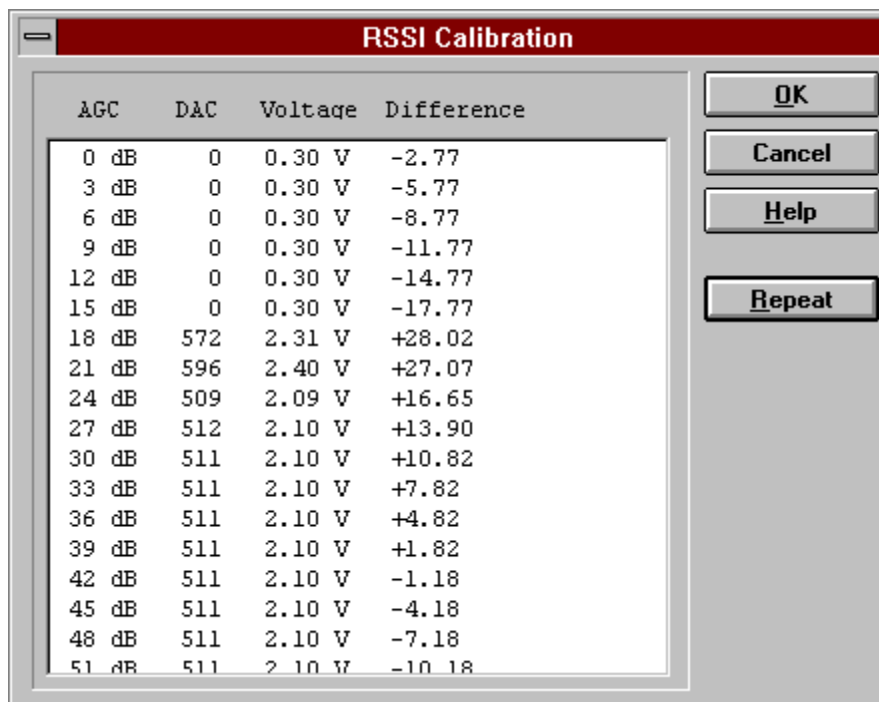
Technical Documentation

3. The user is requested to set signal generator to high input level (read from .INI file).



4. Measurement with high input level is executed.

5. The **RSSI Calibration** dialog box will be updated when previous steps are done.



The **RSSI Calibration** dialog box contains the following items:

AGC List box (Alt+A):

Gain code DAC can have values from 0 to 1023 and voltage from 0.26 V to 3.86 V (voltage precision is 0.01 V). Note that the needed input signal level is also shown.

The difference column shows the difference between tuned DAC values and mean straight line calculated from part slopes in dBs (see /1/). This can be calculated when all measurement results have been received from phone.

Repeat button (Alt+R):

The measurement can be started again by pressing this button.

OK button (Alt+O):

The dialog box is closed, and tuning *is saved* to phone.

Cancel button (Esc):

The dialog box is closed and tuning *is not saved* to phone.

When calibration is ended, the DAC value check is made, and if it is unsuccessful, an error message is shown. The test checks if all DAC values are in the same order as AGC values in the table.

After exiting with the Cancel button, the following are reset to the values which were selected before this adjustment.

Active Unit

Operation Mode

Update RF Information window

The exit and the use of AGC-control values is done the same way as exit from power level tuning and power coefficient use:

TX Power... command

Activation

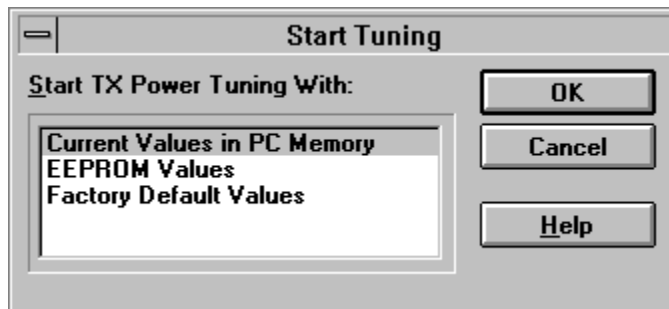
Status Bar Text

Alt, T, X

Open **TX Power Tuning** dialog box

Starts TX power tuning.

The user is first requested to select with which values tuning is started in the **Start Tuning** dialog box.



The **Start Tuning** dialog box contains the following items:

Start Tuning With list box (Alt+S):

Current Values in PC memory

Tuning values are loaded from the program's internal memory.

EEPROM Values

Tuning values are loaded from ME's EEPROM.

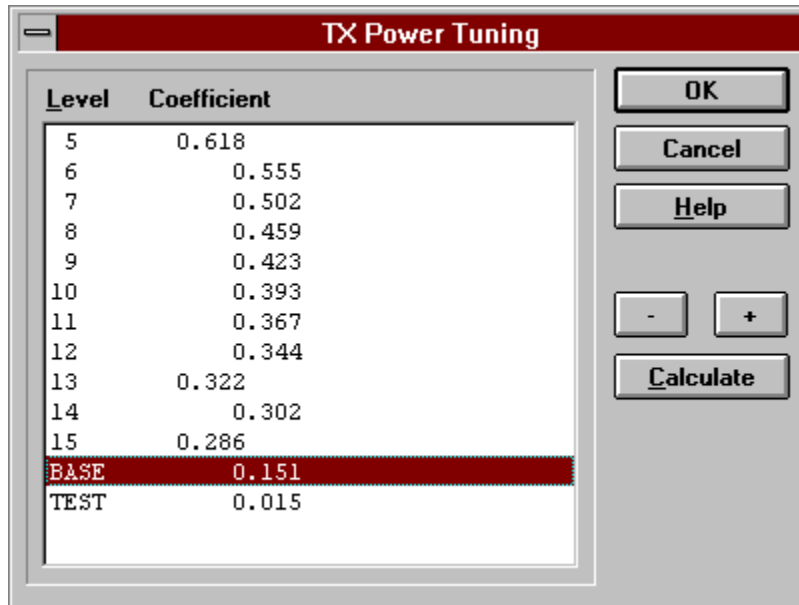
Factory Default Values

Tuning values are loaded from ME's flash.

The following are automatically selected when this tuning function is activated:

- Active Unit = TX
- the BASE power level is selected
- Operation mode = Burst

The **TX Power Tuning** dialog box will be activated automatically after value selection.



The **TX Power Tuning** dialog box contains the following items:

Power Level & Coefficients list box (Alt+P):

The power is presented in GSM values (5..15) or PCN values (0...10). The base power is selected automatically when the dialog box is opened. The test value is reset to 0.035 when the program is started. The test value is not saved to the EEPROM. The test value can be changed during tuning as other power coefficients and the program remembers its value when tuning function is activated later again.

If there are more power levels in the phone than can fit into the window, the window is scrollable. When the phone is initialized, the program asks the number of power levels used in the phone.

Only four power coefficients (Base, biggest, third smallest and smallest) are needed to tune and the rest of them are calculated.

The tuning position is highlighted and can be tuned with +/- keys or left/right cursor keys.

NHE/K-6 Specific: If the application detects a phase 2 phone, the list box will also contain phase 2 power levels.

Calculate button (Alt+C):

The calculation is activated with this button. The power coefficients which are calculated from the tuned coefficients are displayed on the different columns than the others. All values can be tuned if needed.

 Technical Documentation
+/- buttons (+/-):

The + and – buttons will cause power changing by 0.25dB steps (D/A converter control value ratio is 1.0292). When these keys are used, the coefficient value is updated on the tuning window.

OK button (Enter):

The dialog box is closed, and tuning *is saved* to phone.

Cancel button (Esc):

The dialog box is closed, and tuning *is not saved* to phone.

When selections are used, the power value checking is made and if it is unsuccessful, an error message is shown. The test checks that all power coefficients are in descending order (same order as power levels).

If the power tuning function is ended and EEPROM values are not received or EEPROM fault is noticed, an error message is shown.

When all power coefficients have such values that they don't cause any error messages, the dialog box will close. The last selected tuning power will be used after exit.

Because the stored power level range is larger than the number of used power levels, the unused levels should be set to nearest possible power level. (For example in GSM the levels 2–4 are not used, so they are set to same value as level 5).

When this tuning function is ended, the following is automatically selected:

Active Unit = RX

TX I/Q... command

Activation	Status Bar Text
Alt, T, Q	Open the TX I/Q Tuning dialog box

This function is used for tuning TX I and Q branch DC offset, amplitude difference and phase difference.

The function opens the same **Start Tuning** dialog box as with TX Power Tuning.

When this function is activated the following are automatically selected:

Active Unit = TX

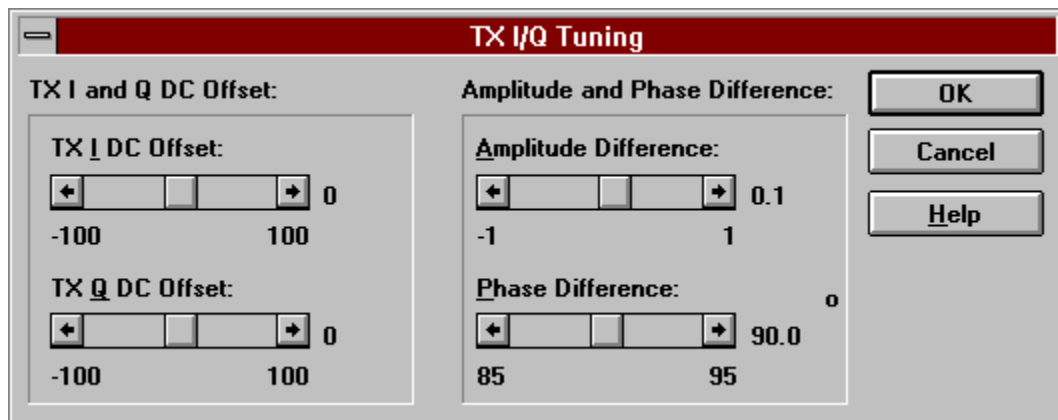
Operation Mode = Burst

TX Power Level = 10(GSM); 5(PCN)

If TX Data Type = RANDOM => TX Data Type = 1

Update RF Information window

The **TX I/Q Tuning** dialog box is opened.



The **TX I/Q Tuning** dialog box contains the following items:

Tune TX I DC Offset scroll bar (Alt+I):

The DC Offset is shown in percent (%) from the \pm maximum value. 0% means that there is no DC. The value range is -100% ... 100% . The value is rounded to the nearest integer value.

Tune TX Q DC Offset scroll bar (Alt+Q):

The operation of this function is the same as one above, except with this selection the Q branch DC Offset is tuned. The value range is -100% ... 100% . The value is rounded to the nearest integer value.

Tune Amplitude Difference scroll bar (Alt+A):

When this selection is made, the user can increase or decrease the amplitude difference in 0.1 dB steps. The value range is -1 ... 1 .

Tune Phase Difference scroll bar (Alt+P):

When this selection is made, the user can increase or decrease the phase difference in 0.5° steps. The current phase difference is shown in the tuning window with numbers and bar figure. The value range is -85 ... 95 .

OK button (Enter):

The dialog box is closed, and tuning *is saved* to phone.

Cancel button (Esc):

The dialog box is closed, and tuning *is not saved* to phone.

After each value change, the new value is sent to the phone.

The following will be automatically selected when the TX I / Q tuning function is ended:

Active Unit = RX

Update RF Information window

Battery A/D... command

Activation	Status Bar Text
------------	-----------------

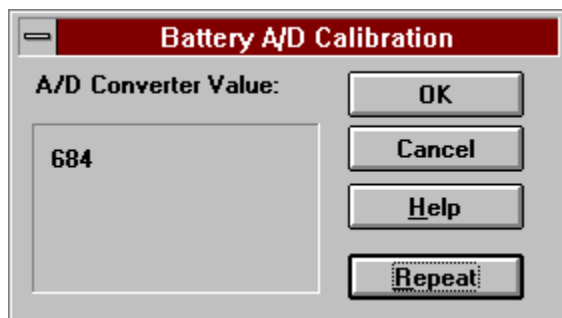
Alt, T, B	Calibrate battery voltage
-----------	---------------------------

This function is for battery a/d tuning.

Before **battery a/d** tuning is started, a voltage setting request is shown to the user:



When an external power is connected, and the user selects OK to continue, the application measures a/d converter and displays the **Battery A/D Calibration** dialog box.



The **Battery A/D Calibration** dialog box contains the following items:

Repeat button (Alt+R):

Makes measurement again.

OK button (Enter):

The dialog box is closed, and tuning *is saved* to phone.

Cancel button (Esc):

The dialog box is closed, and tuning *is not saved* to phone.

Charger A/D... command

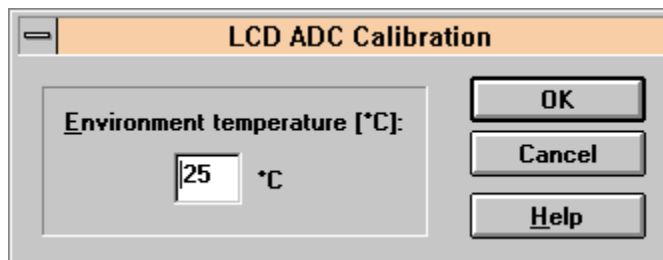
Activation	Status Bar Text
Alt, T, C	Calibrate charger voltage

Works in the same way as the previous Battery A/D calibration.

LCD A/D... command

Activation	Status Bar Text
Alt, T, T, D	Calibrate LCD temperature A/D

This function is for LCD ADC Calibration. Function opens the following dialog box.



The **LCD ADC Calibration** dialog box contains the following items:

Environment Temperature [°C]: edit box:

The user can change the environment temperature in the range 0 – 80°C.

OK button (ENTER):

Closes the dialog box and saves the measured value to EEPROM.

Cancel button (ESC):

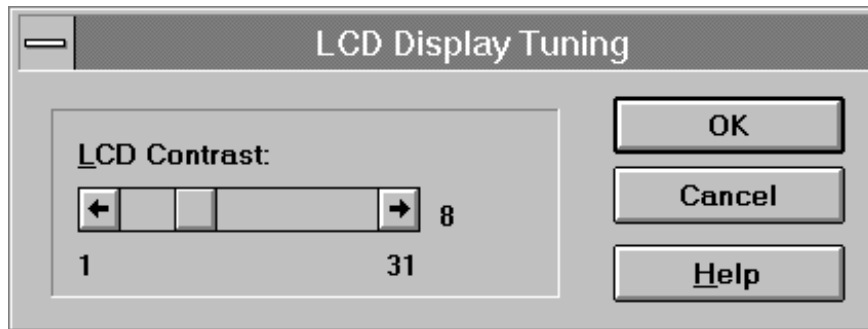
Closes the dialog box and *does not* do any calibrations.

LCD Display... command

Activation	Status Bar Text
Alt, T, T, L	Tune LCD display contrast

This function is used for quick LCD display contrast tuning.

The command opens the **LCD Display Tuning** dialog box, which contains tools for tuning.



The **LCD Display Tuning** dialog box contains the following items:

LCD Contrast scrollbar (ALT+L):

Enables user to tune display contrast between 1 and 31.

OK button (ENTER):

The dialog box is closed and tuning is saved to phone.

Cancel button (ESC):

The dialog box is closed and tuning *is not saved* to phone.

Testing

The **Testing** sub menu offers functions for ME testing.

Quick Testing (RF)... command

Activation

Status Bar Text

Alt, E, Q

Open the **Quick Testing** dialog box

This function is used for quick RF testing.

The command opens the **Quick Testing** dialog box, which contains data for testing and adjustments.

The **Quick Testing** dialog box contains the following items:

Technical Documentation**Active Unit** group:**RX** radio button (Alt+R):

When *RX* is selected, the next functions are made:

- Data transmission is deactivated
- TX power is deactivated
- If operation mode is continuous,
 - AGC is controlled
 - RX continuous mode channel is activated
- RF Information window is updated

The RX value is always given as default.

Note! The function is activated immediately, Apply is not needed.

TX radio button (Alt+T):

When *TX* is selected, the next functions are made:

- Data transmission is activated
- If operation mode is continuous, TX continuous mode channel is activated
- If operation mode is burst, TX power is activated
- RF Information window is updated

Note! the function is activated immediately, Apply is not needed.

Operation Mode group:**C**ontinuous radio button (Alt+C):

When *continuous* selection is used,

- Synthesiser is set to constant frequency
- Synthesiser channel number is as given with Continuous Mode Channel selection
- If Active Unit is TX, data (selected with TX Data Type) is sent
- transmitter power is not connected
- If Active Unit is RX, AGC is controlled

Note! The function is activated immediately, Apply is not needed.

Burst radio button (Alt+B):

When *burst* selection is used, the synthesiser is controlled by using GSM/PCN receiving/transmission/measuring synthesiser. Control sequence synthesiser channel numbers are as given with Channel/Monitoring Channel selections if Active Unit is TX, data (selected with TX Data Type) is sent, and the TX power is connected

Note! The function is activated immediately, Apply is not needed.

TX Data Type drop list (Alt+D):

This list changes the transmission data type. The list consists of the following options: 0, 1, and Random. After Random, data selection 0 is used. If Operating Mode is *continuous*, TX Data Type Random causes different data sending than in burst mode.

TX Power Level edit box (Alt+T):

With this value it is possible to change the transmission power. The user can give the needed GSM/PCN power value (5..15/0...10) or select the test value, which is tuned with TX power tuning function. The test value is found at the end of the list.

TX Power has the value *OFF* and is disabled (*greyed*) when the active unit is RX or TX power as GSM or PCN value. When the TX power is tuned with test value (smallest value), the TX Power has the value *TEST*.

Channel edit box (Alt+H):

The user can enter here the channel number that is used for both transmission and receiving. The frequency of the selected channel is shown after selection.

Monitoring Channel edit box (Alt+M):

This field selects neighbouring monitoring channel. The frequency of the selected channel is shown after selection.

Continuous Mode Channel edit box (Alt+C):

To this edit box the user can type the continuous mode channel which may have all GSM channel numbers (1..124) or PCN channel numbers (512...885).

The used frequency depends on the Active Unit. If the Active Unit is RX, then RX frequency is used, else TX frequency. The frequency of the selected channel is shown after selection.

Technical Documentation

AGC edit box (Alt+G):

This selection allows user to edit the AGC absolute value (value from A/D converter). The AGC can have values from 0dB to 93dB in 3dB steps in GSM, and from 0dB to 81dB in PCN.

The AGC value is shown only when its value is controlled by the PC. When the Active Unit has value RX and Operation Mode is continuous, AGC is controlled by the PC except when next adjustment functions are activated:

- RSSI Calibration
- AFC Diagram

AFC edit box (Alt+F):

This selection allows the user to edit the AFC D/A converter value. The AFC can have values from -1024 to 1023.

The AFC value is the last measured AFC D/A converter value (11 bit 2-complement value is used with decimal digits). If the AFC results are not received, no text is shown. The AFC value is neither shown in the next situations i.e. when AFC is not controlled by PC:

- AFC Diagram

Apply button (Alt+A):

Accepts entered values and validates them. After validation, the application sends corresponding messages to ME. Closes the dialog box, and updates Info Window.

Note: Active Unit and Operation mode command do not use the Apply button, as they are activated immediately.

Set Defaults button (ALT+S):

Sets current values as default Quick Test values.

Get Defaults button (ALT+E):

Gets default Quick Test values as current values.

NHE/K-6 Specific:**Antenna Path** drop list (ALT+P)

Enables switching for antenna path between normal antenna and system cable.

The following are automatically done when the Quick testing function is ended:

- Active Unit = RX
- Update RF Information window

The next table shows the dialog box's properties in different situations:

ACTIVE UNIT = TX:

TX Data Type: Updated

AGC values: Greyed

Monitoring Channel: Greyed

OPERATION MODE = BURST:

TX Power Level: Updated

Continuous Mode Channel: Greyed

Channel: Updated

OPERATION MODE = CONT.:

TX Power Level: OFF, Greyed

Continuous Mode Channel: Updated

Channel: Greyed

ACTIVE UNIT = RX:

TX Data Type: Greyed

TX Power Level: OFF, Greyed

OPERATION MODE = BURST:

AGC values: Greyed

Continuous Mode Channel: Greyed

Channel: Updated

Monitoring Channel: Updated

OPERATION MODE = CONT:

AGC values: Updated

Continuous Mode Channel: Updated

Channel: Greyed

Monitoring Channel: Greyed

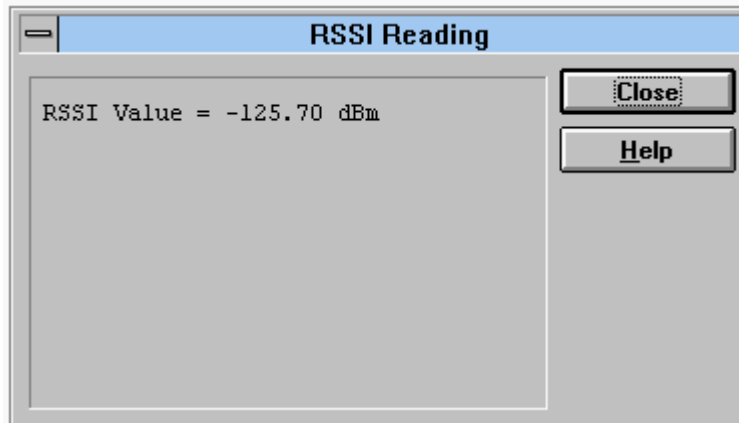
RSSI Reading... command

Activation	Status Bar Text
------------	-----------------

Alt, E, R	Open RSSI Reading dialog box
-----------	------------------------------

The command is used for reading RSSI values.

When the selection is made, the test result will be shown to the user in the **RSSI Reading** dialog box:



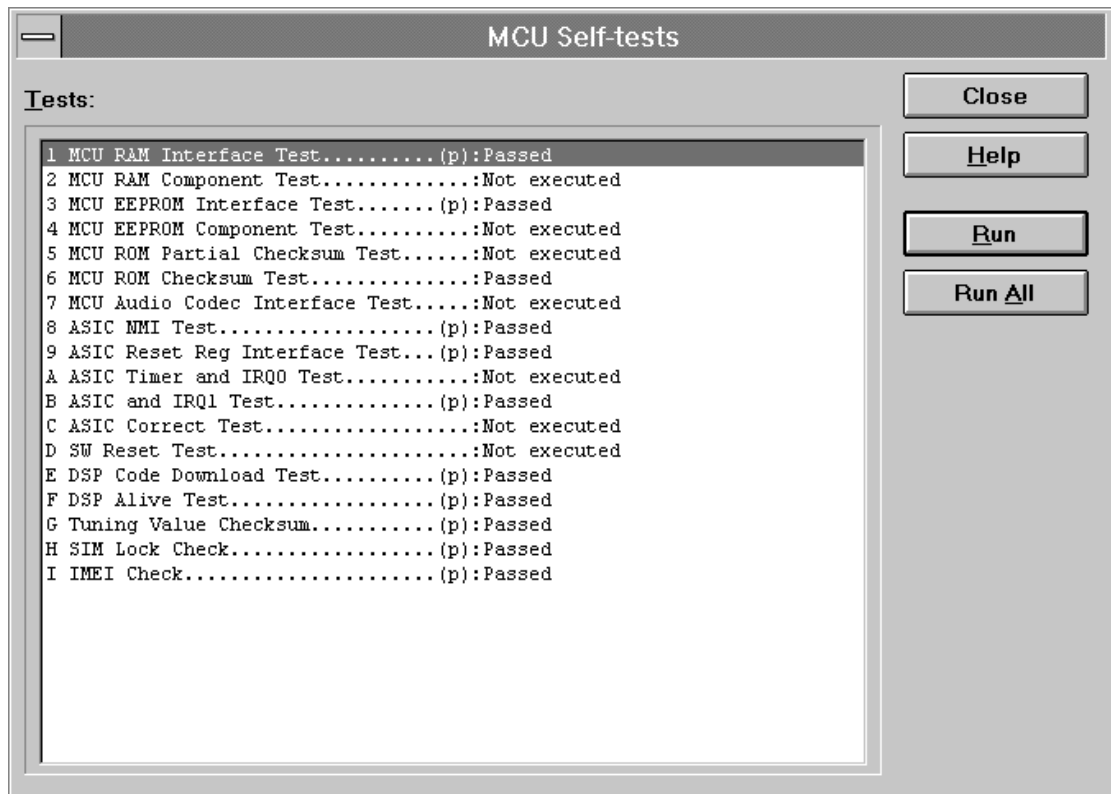
Self Tests... command

Activation Status Bar Text

Alt, E, S Open MCU Self-tests dialog box

The command is used for reading self test results and running self tests.

When the selection is made, the test result is read from ME. The test result will be shown to the user within the **MCU Self-test** dialog box.



The **MCU Self-test** dialog box contains the following items:

Tests list box (Alt+T):

The field "(p)" in the screen example means that the test is also run in power up.

The field "/s)" means that this test is selectable one.

Test states are updated according to results received from the phone. Possible test states will be one of the following:

- Passed*
- Failed*
- No response*
- Not executed*
- RUNNING....*

Technical Documentation**Run** button (Alt+R):

The user can select desired test from list and hit **Run** button. When user selects test to be run, the text *RUNNING...* is shown in the test state field, and test is run. When results are received, the test state field is updated according to the result.

If no response was received in the defined time, a *error message box* will be shown and the test state is changed to *No response*.

Run All button (Alt+A):

The user can run all listed tests. The text *RUNNING...* is shown in the test state field, and test is run. When results are received, the test state field is updated according to the result. When the state field is updated, the application moves to the next test and repeats previous cycle.

Supported Self Tests

- 1 MCU RAM Interface Test.....:
- 2 MCU RAM Component Test.....:
- 3 MCU EEPROM Interface Test.....:
- 4 MCU EEPROM Component Test.....:
- 5 MCU ROM Partial Checksum Test...:
- 6 MCU ROM Checksum Test.....:
- 7 MCU Audio Codec Interface Test..:
- 8 ASIC NMI Test.....:
- 9 ASIC Reset Reg Interface Test...:
- A ASIC Timer and IRQ0 Test.....:
- B ASIC and IRQ1 Test.....:
- C ASIC Correct Test.....:
- D SW Reset Test.....:
- E DSP Code Download Test.....:
- F DSP Alive Test.....:
- G Tuning Value Checksum.....:
- H SIM Lock Check.....:
- I IMEI Check.....:

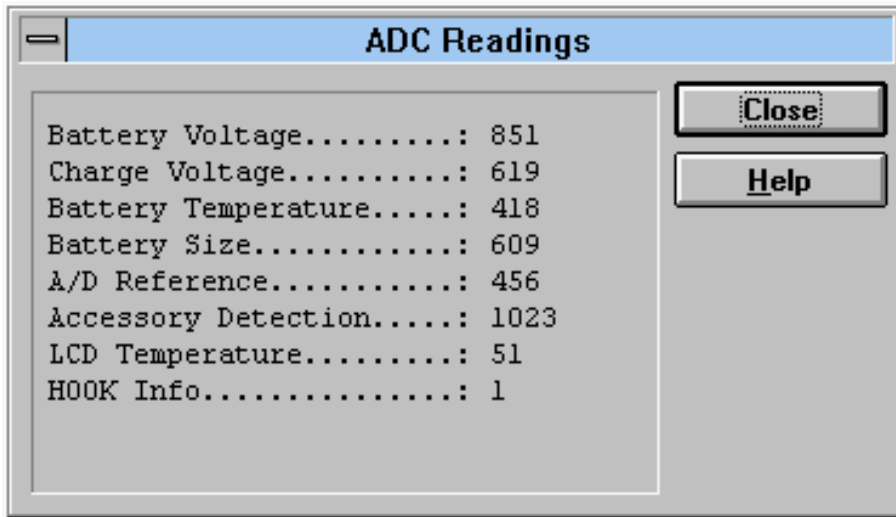
ADC Readings... command

Activation Status Bar Text

Alt, E, A Open the **ADC Readings** dialog box

The command is used to read and show A/D values from phone.

The command opens the **ADC Readings** dialog box:



The **ADC Readings** dialog box has static text fields where measurements are updated to the window every one second.

A/D Readings

The following a/d readings are measured:

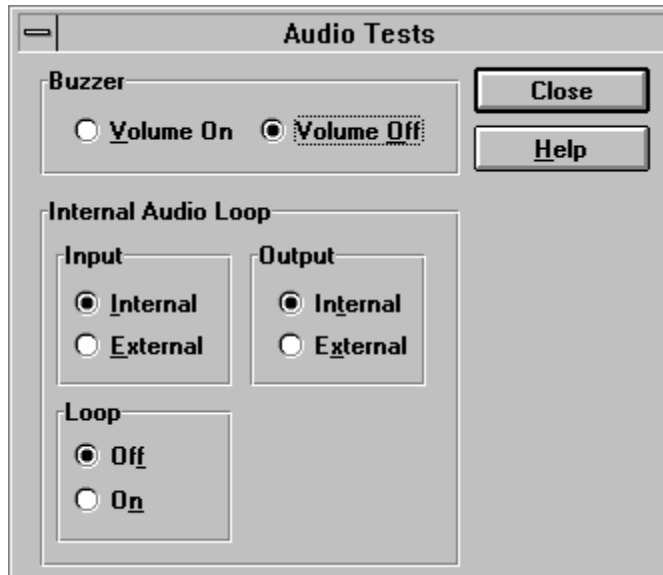
- Battery Voltage :
- Charge Voltage :
- Battery Temperature :
- Battery Size :
- A/D Reference..... :
- Accessory Detection..... :
- LCD Temperature :
- Hook Info :

Audio... command

Activation	Status Bar Text
------------	-----------------

Alt, E, U	Open Audio Tests dialog box
-----------	-----------------------------

The command is used for making audio tests in the **Audio Tests** dialog box.



The **Audio Tests** dialog box contains following items:

Buzzer group:

The next two different values can be selected for Buzzer volume:

Volume On radio button (ALT+V):

Turns buzzer on.

Volume **O**ff radio button (ALT+O):

Turns buzzer off.

Internal Audio Loop group:**I**nput group:

The next two different values can be selected for input:

Internal radio button (Alt+I):

Switches to internal input.

External radio button (Alt+I):

Switches to external input.

Output group:

The next two different values can be selected for output:

Internal radio button (Alt+T):

Switches to internal output.

External radio button (Alt+X):

Switches to external output.

Loop group:

The next two different values can be selected for loop:

Off radio button (Alt+F):

Turns audio loop off.

On radio button (Alt+N):

Turns audio loop on.

When the dialog box is closed, the Buzzer Volume is always switched off. The internal audio loop is also turned off.

Display... command

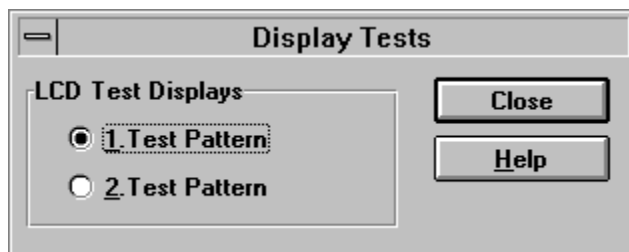
Activation

Status Bar Text

Alt, E, D

Open Display Tests dialog box

This command is used for making display tests in the **Display Tests** dialog box.



The **Display Tests** dialog box contains the following items:

1. Test Pattern radio button (Alt+1):

In test display 1 half of the indicators are displayed, and the display is filled with chessboard letters.

2. Test Pattern radio button (Alt+2):

In test display 2 the remainder (from test 1) of the indicators are displayed, and the display is filled with inverse chessboard letters.

When the dialog box is closed, the phone LCD display is cleared.

Call Simulation.. command

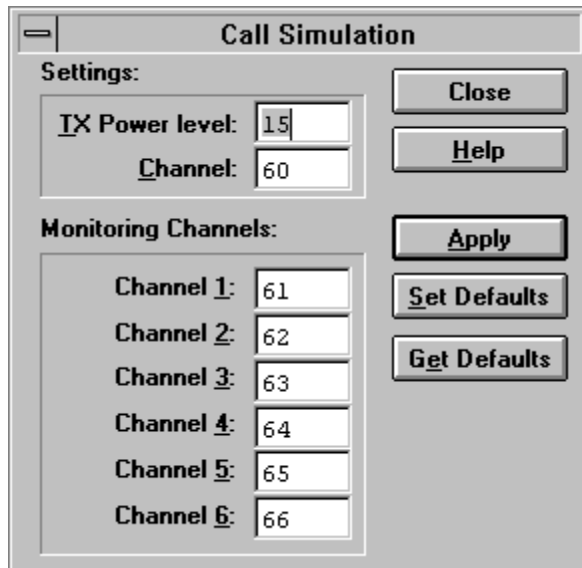
Activation

Status Bar Text

Alt, E, C

Open Call Simulation dialog box

The command is used for making call simulation. The function opens the **Call Simulation** dialog box.



The **Call Simulation** dialog box contains the following items:

TX Power Level edit box (Alt+T):

All power levels can be selected. This updates same parameter as **TX Power Level** in the **RF-Controls** dialog box. Note that TEST value cannot be selected. If TEST value was in use when Call simulation menu selected, power level is changed to smallest value.

Channel edit box (Alt+C):

This tells the normal operating RF channel number. Normal GSM/PCN channel numbers can be selected. Same channel is used both for transmission and receiving. This updates same parameter as **Channel** in the **RF-Controls** dialog box.

Monitoring Channels group:

Channel 1,2,3,4,5,6 edit box (Alt+1,2,...):

Channels for monitoring are specified with these six selections. All GSM/PCN channel numbers can be used. If more than one selection has same number, the monitoring channel list (neighbour list) will have less than 6 selected channels. The minimum number of monitoring channels is one (all channels have same value). The monitoring channel can also have same value as normal operating channel.

The first monitoring channel updates the same parameters as **Monitoring Channel** in the **RF-Controls** dialog box.

Apply button (Alt+A):

Validates and sends entered data to ME.

Set Defaults button (ALT+S):

Sets current values as default Call Simulation values.

Get Defaults button (ALT+E):

Gets default Call Simulation values as current values.

Noise Sensitivity... command

Activation

Status Bar Text

Alt, E, N

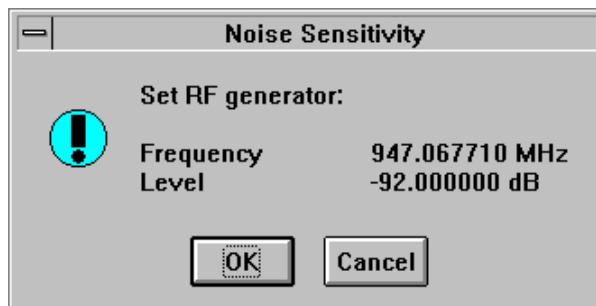
Opens Noise Sensitivity dialog box

The command is used for noise sensitivity measurement.

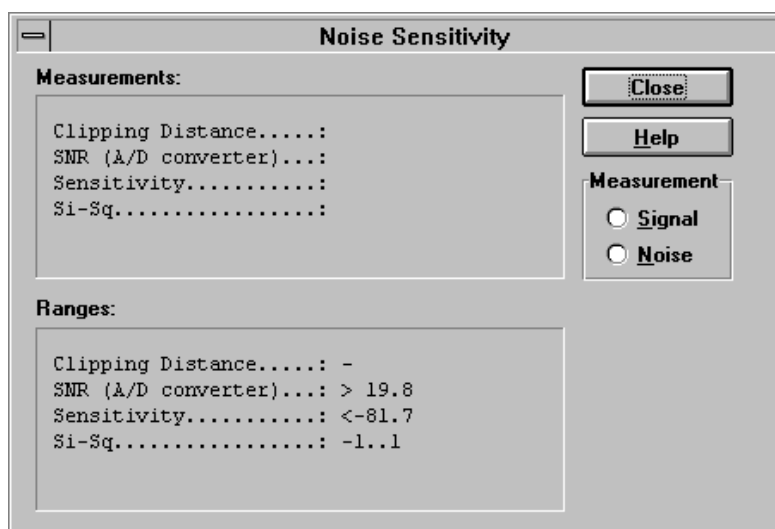
The following are automatically selected when this tuning function is activated:

- Active Unit = RX
- Operation mode = Continuous
- AGC = 81 dB

Function opens next a **Noise Sensitivity** dialog box.



The application then opens the **Noise Sensitivity** dialog box:



 Technical Documentation

The **Noise Sensitivity** dialog box contains the following items:

Measurements group:

Clipping distance is the difference to the signal clipping value. SNR is measured in the AD converter.

Clipping distance = clipping level (66) – signal value + comp_factor1
 SNR = signal value – noise value + comp_factor1

Sensitivity = –92 dBm + 8 dB + comp_factor2 – SNR (for GSM)

Sensitivity = –90 dBm + 8 dB + comp_factor2 – SNR (for PCN)

The last value on the display is signal power difference between I and Q branch. The numbers are shown in 0.1dB accuracy. The error messages, "OUT OF RANGE", are shown only if the SNR and/or amplitude difference values are not acceptable (SNR <= 18 dB + comp_factor2 – 0.5 dB(= accuracy) ; Sensitivity >= –100 dBm + 0.5 dB ; |Si – Sq| > 1 dB).

Signal/Noise button (Alt+S/Alt+N):

When the buttons are pressed, the RX I and Q burst data is asked, text "SIGNAL MEASURING..." or "NOISE MEASURING..." will appear in the measurement group window. The power level value should be –92 dBm during signal measurement.

When signal data is received, distance to clipping signal level is shown as dBs on the display. When either signal or noise measurement results are received "MEASURING" text is removed and measurements are updated to screen. When both measurements (signal and noise) are done at least once, the signal to noise relation and difference are also shown on the display.

After exiting the dialog box, the following are set to the values which were selected before this adjustment.

- Active Unit
- Operation mode
- AGC value

Compensation factors:

comp_factor1 = 4.64 dB (Compensation factor for 67.71 kHz signal, because ASIC filter attenuates 67.71 kHz signal 4.64 dB)

comp_factor2 = 2.27 dB (Compensation factor for real and calculated noise bandwidth difference. Real noise bandwidth is 80 kHz and calculated bandwidth is 135 kHz)

Software

The settings sub menu offers functions for Mobile Equipment mode and memory settings.

Phone Identity... command

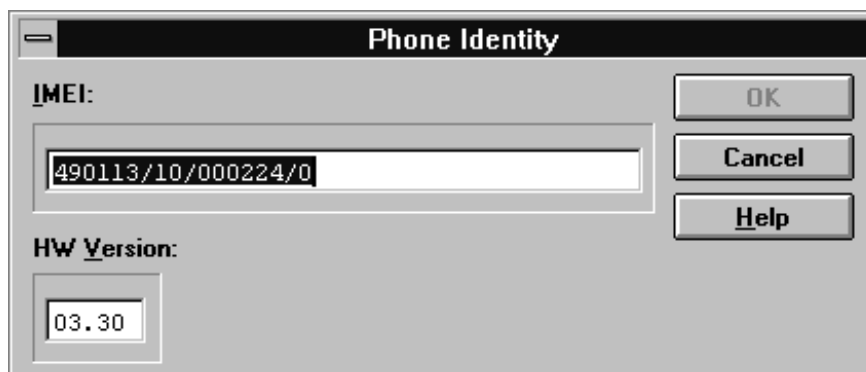
Activation

Status Bar Text

Alt, S, I

Opens the **Phone Identity** dialog box for editing

The function is used to edit phone identity. The function opens the **Phone Identity** dialog box:



The **Phone Identity** dialog box contains the following items:

IMEI edit box (Alt+I):

Field where the user can enter current IMEI value. Field can contain up to 40 digits.

HW Version edit box (Alt+V):

Field where user can enter current HW version. Field can contain four digits and one dot. Dot is not sent to ME.

OK button (Enter):

Checks if some values are changed and if IMEI was modified, asks for confirmation. After confirmation, it writes values to phone.

Cancel button (Esc):

Cancels all edits and does not save values to phone.

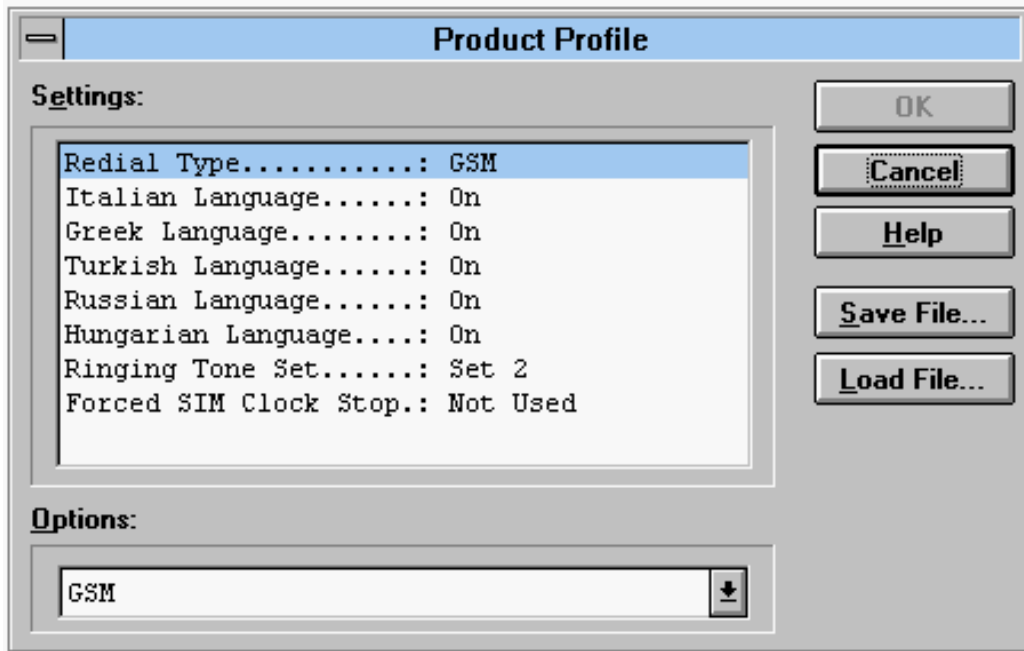
Product Profile... command

Activation Status Bar Text

Alt, S, P Open **Product Profile** Settings dialog box

The function is used for making product profile settings.

When the command is activated, the product profile information is read from the EEPROM and **the Product Profile** dialog box is opened.



The **Product Profile** dialog box contains the following items:

Settings list box (Alt+E):

A list where the user can select desired setting.

The user can toggle settings with following **O**ptions drop list, or by double clicking the desired setting in list box.

Options drop list (Alt+O):

List allows user to set options to each setting listed in the **S**ettings list box. Possible options per setting are:

OK button (ENTER)

Selections are accepted and saved to EEPROM.

Cancel button (ESC)

Selections are ignored and control is returned back to main menu.

Save File... button

Allows the user to save settings to file. Opens a standard windows **File Save** dialog box.

Load File... button

Allows the user to load the settings from a file. Opens a standard windows **File Open** dialog box.

NHE/K-5 Product Profile Settings

The following settings are available:

Russian Language	On/Off
Italian Language	On/Off
Greek Language	On/Off
Turkish Language	On/Off
Keypad Type	Nokia Design 1/2/OEM
Redial Type	GSM, Non GSM
CO SMS Appearance	Normal/Enhanced
Service Numbers	Available/Not Available
Forced SIM Clock stop	On/Off

See the NHE-5/NHK-5 Product Profile Specification for more info.

Note! When forced SIM Clock Stop is switched ON, stand-by time is increased considerably

NHE/K-6 Product Profile Settings

The following settings are available:

Redial Type	GSM, Non GSM
Italian Language	On/Off
Greek Language	On/Off
Turkish Language	On/Off
Russian Language	On/Off
Hungarian Language	On/Off
Ringtone Set	Default Set/Set 1
Forced SIM Clock stop	On/Off

See the NHE-6/NHK-6 Product Profile Specification for more info.

Note! When forced SIM Clock Stop is switched ON, stand-by time is increased considerably

Start Up Self-tests... command

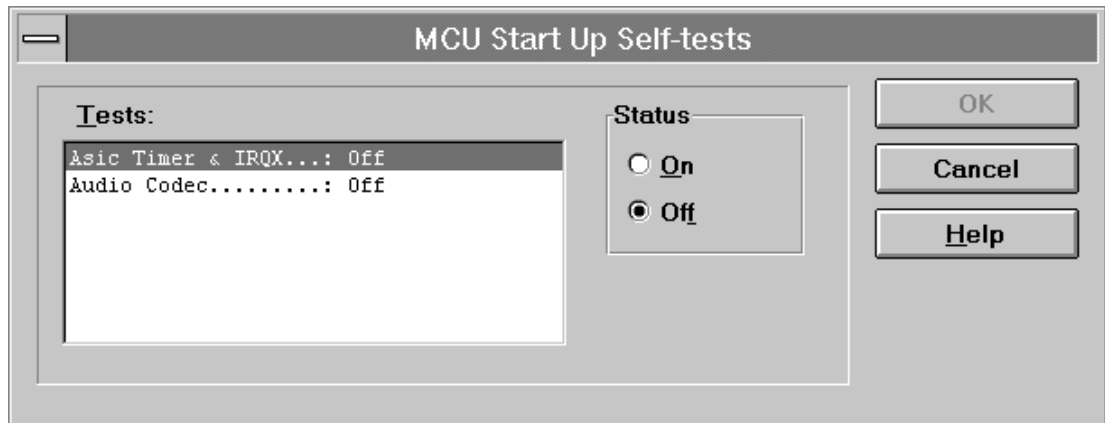
Activation

Status Bar Text

Alt, S, S

Open **MCU Start Up Self-tests** dialog box

The function is used for changing the state of the EEPROM selectable tests in the **MCU Start Up Self-tests** dialog box.



The **MCU Start Up Self-tests** dialog box contains the following items:

Tests list box (Alt+T):

When dialog box is opened, the previous values will be read from the MCU EEPROM and shown on the list box.

Status group:

When radio button **On** is selected, the test will be run every time when automatic start up self-tests are activated (e.g. in power up).

OK button (Enter)

Selections are accepted and saved to EEPROM. A power up routine is made to phone.

Cancel button (Esc)

Selections are ignored and control is returned back to main menu.

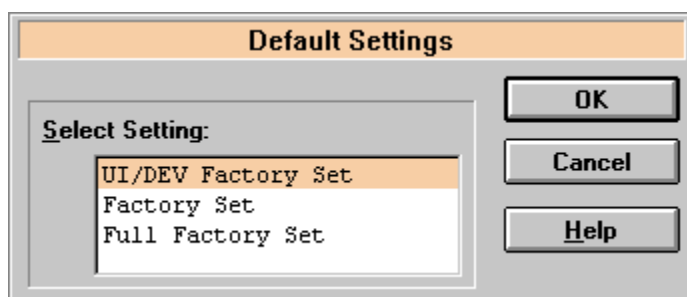
Set Default Values... command

Activation Status Bar Text

Alt, S, V Set factory default values

The command is used for resetting default values to phone's EEPROM.

After selection, the following Default Settings dialog box is opened:



The **Default Settings** dialog box contains the following items:

Select Settings list box (Alt+S):

Enables user to select set to be reset: UI/DEV Factory Set, Factory Set or Full Factory Set.

OK button (Enter)

Closes the dialog box and writes the selected set to the EEPROM of the phone.

Cancel button (Esc)

Closes the dialog box and *does not* write settings to the phone.

Network Settings... command

Activation Status Bar Text

Alt, S, N Open **Network Settings** dialog box

After selection the following **Network Settings** dialog is opened:

The **Network Settings** dialog contains the following items:

NSPS Settings group:

Min Time edit box (ALT+M):

Minimum time for NSPS.

Max Time edit box (ALT+X):

Maximum time for NSPS.

Control drop list (ALT+C):

NSPS Control values:

- Stop by send key
- Stop by any key
- No key control
- NSPS not supported

Custom Operator Name group:

Country Code:

Specified country code

Network Code:

Specified network code

Name:

Name of the operator matching with country and network code. Length for operator name is 8 characters for NHE/K-5, and 10 characters for NHE/K-6.

HW Settings... command

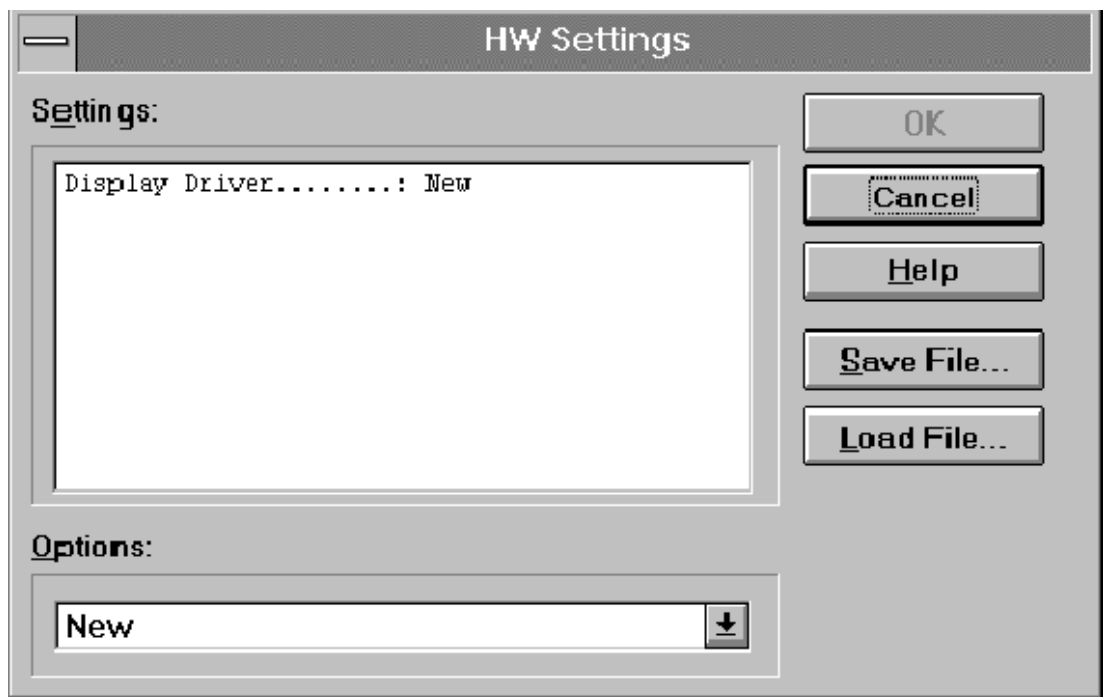
Activation

Status Bar Text

Alt, S, H

Opens the **HW Settings** dialog box.

This command is used for toggling HW settings. The function opens the following **HW Settings** dialog box.



The **HW Settings** dialog box contains the following items:

Settings text area (ALT+E):

Displays current HW Settings and their state.

Options drop down list (ALT+O):

Enables user to toggle settings state.

Technical Documentation**Save File...** button (ALT+S):

Opens the default Windows **File Save As** dialog box and asks as filename where to save HW Settings values.

Load File... button (ALT+L):

Opens the default Windows **File Open** dialog box and asks a filename where from to load HW Settings values.

OK button (ENTER):

Closes the dialog box and saves the HW Settings to the phone.

Cancel button (ESC):

Closes the dialog box and *does not* save the settings to the phone.

NHE/K-5 Settings:

The following settings are available:

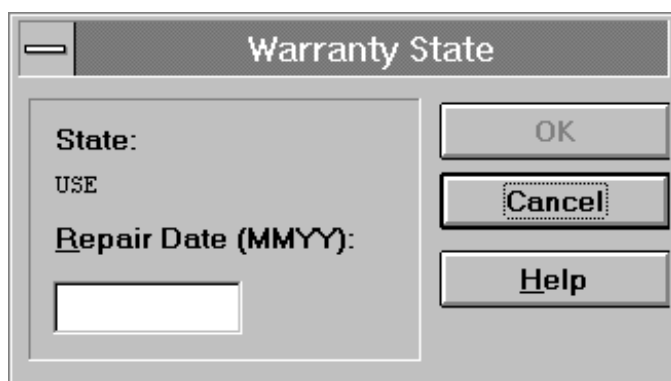
Display Driver : New/Old

Warranty State... command

Activation Status Bar Text

Alt, S, W Opens the **Warranty State** dialog box.

This command is used for setting the Phone's Warranty State. The function opens the following **Warranty State** dialog box.



The Warranty State dialog box contains the following items:

State: static text:

USE

For normal phones.

DEFECTIVE

For phones which are being swapped. Warranty and other information is transferred to the working phone.

EXCHANGE

For phones which are already repaired from DEFECTIVE ones.

Repair Date edit box (Alt+R):

Format is MMYT (Where MM is month and YY two last digits of the year). The date is read from PC's clock. This is enabled only if state is DEFECTIVE.

OK button (ENTER):

Closes the dialog box, and saves the Warranty State to the phone. This button should be enabled only when phone is DEFECTIVE and repair date is entered.

Cancel button (ESC):

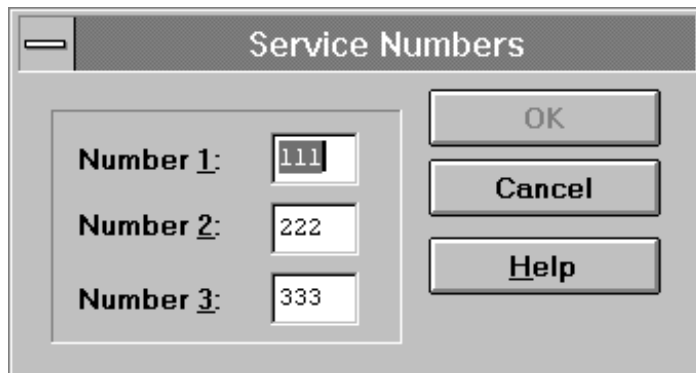
Closes the dialog box, and does not save the Warranty State to the phone.

Service Numbers... command

Activation	Status Bar Text
------------	-----------------

Alt, S, B Opens the **Service Numbers** dialog box.

This command is used for setting the phone's Service Numbers. This feature is available only in few countries. The function opens the following **Service Numbers** dialog box.



The **Service Numbers** dialog box contains the following items:

Number 1,2,3 edit fields:

Contains Service Numbers which can be called by pressing 1,2 and 3 numbers in keypad for prolonged time period. Service numbers are 3 digits long.

OK button (ENTER):

Closes the dialog box, and saves the numbers to the phone.

Cancel button (ESC):

Closes the dialog box, and *does not* save the numbers to the phone.

Dealer

The dealer sub menu offers functions for Mobile Equipment settings for dealers.

Short Code Memory... command

Activation Status Bar Text

Alt, D, C Opens the **Edit SCM** dialog box.

This command is used for reading, storing and modifying the SCM values. The function opens the following **Edit SCM** dialog box:

The **Edit SCM** dialog box contains the following items:

Loc static text:

Displays current location.

Name edit box (ALT+A):

Edit the Name.

Number edit box (ALT+N):

Edit the number.

SCM list box (ALT+C):

List for available names and numbers.

Technical Documentation

Write Phone... button (ALT+W):

Write SCM values to phone and checks the validity of names and numbers.

Read Phone... button (ALT+R):

Read SCM values from phone.

Save File... button (ALT+S):

Opens a default Windows **File Save As** dialog box, and asks for a filename where to save SCM values.

Load File... button (ALT+L):

Opens a default Windows **File Open** dialog and asks for a filename where from to load SCM values. Checks the validity of names and numbers.

User Settings... command

Activation

Status Bar Text

Alt, D, U

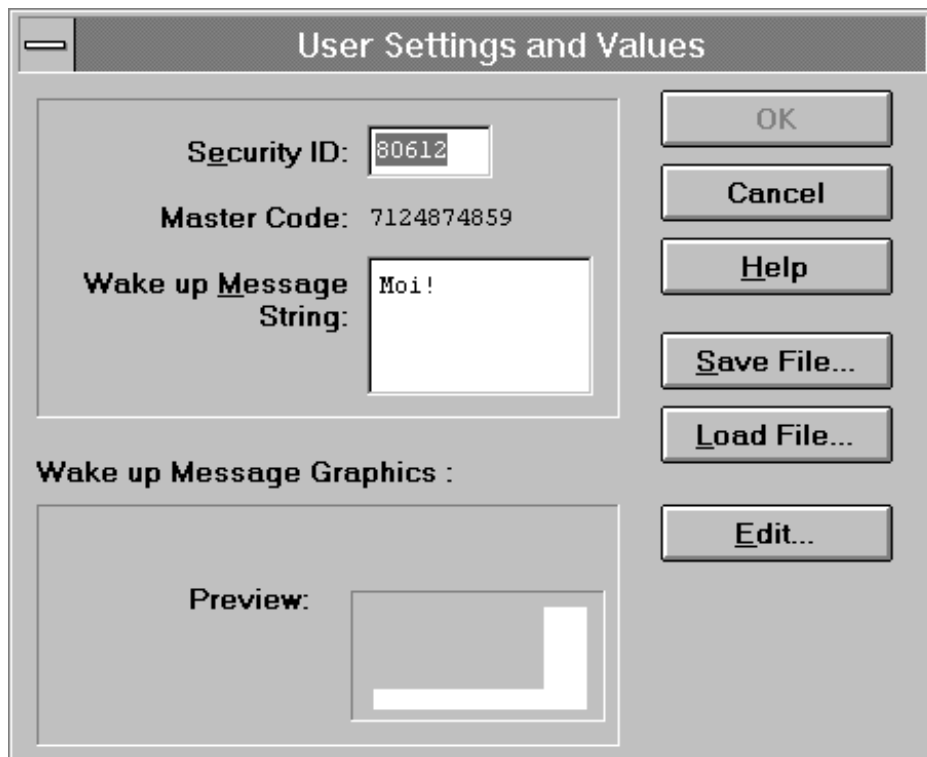
Open **User Settings and Values** dialog box

This command is used to read, store, and modify the user settings and values.

After menu selection, the program responds with a *query* dialog box: "Read user settings from phone?". If user answers **Yes**, all needed user settings will be read from the ME, including menu settings. If a reading error happens, an *error* dialog box is shown. If reading is successful, the **User Settings and Values** dialog box is opened:

For NHE/K-5:



For NHE/K-6:

The **User Settings and Values** dialog box contains the following items:

Security ID edit box (Alt+E):

Edit the security code which is saved to the ME memory together with other user settings and values. Only digits are accepted for Security code. Length must be 5 digits.

Master Code static:

Code is 10 digits length and it is read only.

Wake up Message edit box (Alt+M):

Edit Wake up message. The wake up message name can have up to 16 characters.

Save File... button (Alt+S):

Opens a default Windows **File Save As** dialog box and asks filename where to save user settings and values.

Load File... button (Alt+L):

Opens a default Windows **File Open** dialog box and asks filename where from load user settings and values.

Technical Documentation

For NHE/K-6:**Preview image:**

This image area shows the current wake up message graphics bit-map.

Edit button (ALT+E):

The user can launch the MS Windows Paint Brush application with current bmp file and edit it.

Data entered in the dialog box is checked for validity before it is sent to the phone. If the application finds wrong characters from the Wake up message, the application will inform the user, and request correction. The information window is shown during writing. The window tells how much time it will approximately take to write values.

When all values are sent and responses received, waiting window is removed and **User Settings and Values** is back in control. The waiting state can be broken with **Cancel** (Esc) button. If writing to the ME is broken, only part of the values in the ME may be changed.

Both save file and load file function has default name which is previously used name. For instance if user data was saved to file USERA.USR and read function is activated the default value is USERA.USR.

SCM & User Settings... command

Activation

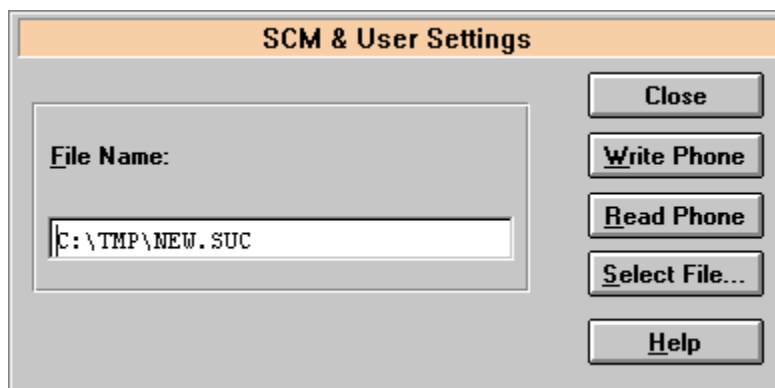
Status Bar Text

Alt, D, M

Open SCM & User Settings dialog box.

This command is used to get SCM and user settings from phone to file and vice versa. When settings are read from the phone, all user settings are read from the phone and saved to file, in NHE/K-6 phones the graphical wake up message and SCM are also saved. When settings are written to the phone, all user settings except master code are loaded from file, in NHE/K-6 phones graphical wake up message and SCM are also loaded.

When data is written to or read from the phone, a waiting dialog box is shown.



The **SCM & User Settings** dialog box contains the following items:

File Name edit box (ALT+F):

The user can edit the file name or select another file with the Open File dialog box. When the dialog box is opened, it contains the name of the previously saved or loaded file. Note that for NHE/K-6 phones the graphical wake up message is saved in its own file. If for example other settings are saved to the file **c:\tmp\default.suc**, then the graphical wake up message is saved to file **c:\tmp\default.bmp**.

Close... button (ESC):

Closes the dialog box.

Write Phone... button (ALT+W):

Loads settings from file and writes them to phone.

Read Phone... button (ALT+R):

Reads settings from phone and writes them to file.

Select File... button (ALT+S):

Opens the Open File dialog box, with which the user can select the file that contains the data to be loaded to ME, or the file to which data is saved from ME. If the user selects OK button, the name of the selected file is copied to the File Name edit field.

Set UI/DEV Default Values... command

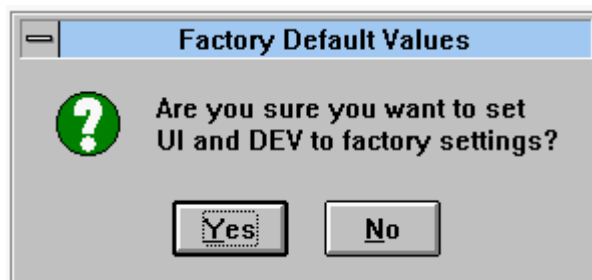
Activation

Status Bar Text

Alt, D, V

Reset phone to UI and DEV factory settings

After selection, the application asks for confirmation: "Are you sure you want to reset UI and DEV to factory settings?". If Yes is answered, default settings are reset to the phone.



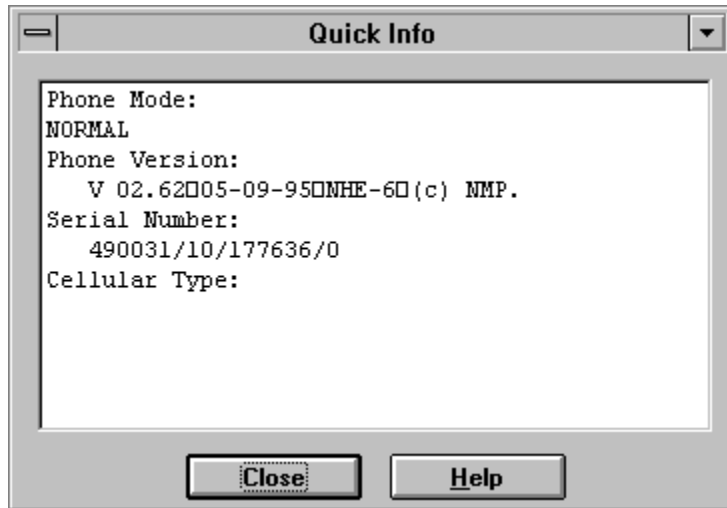
View

Quick/RF Info... command

Activation Status Bar Text

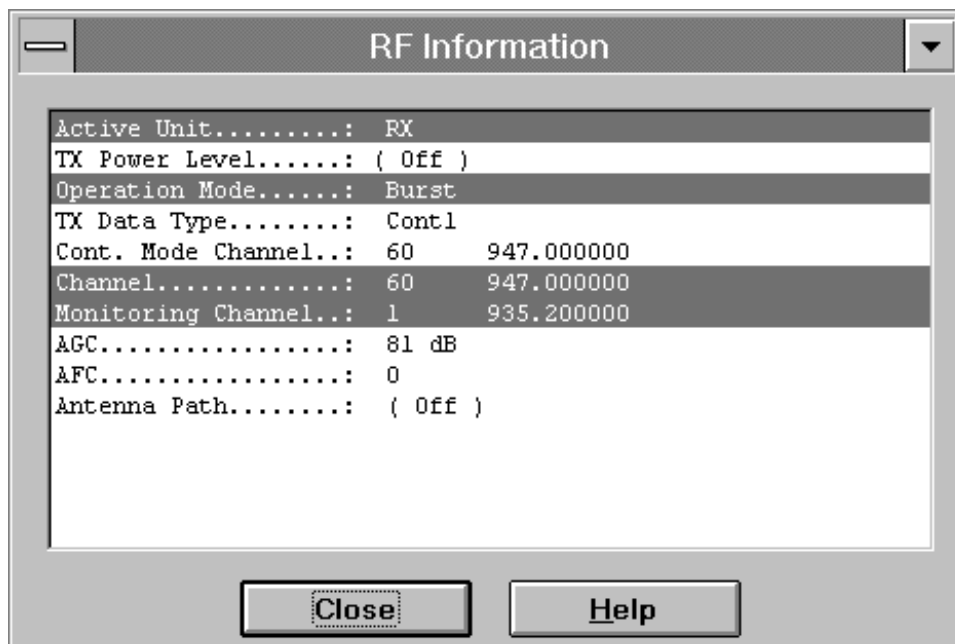
Alt, V, Q View Quick/RF information

If phone is in *normal* mode, the following **Quick Info** is shown:



Note! Special conditions (For example, if the phone's SIM lock is ON) cause this dialog box to change color to make this special condition clear to the user.

If the phone is in local mode, the following **RF Information** is shown. Information is shown in a modeless dialog box which may be left open during other operations. It is also updated when ever needed.

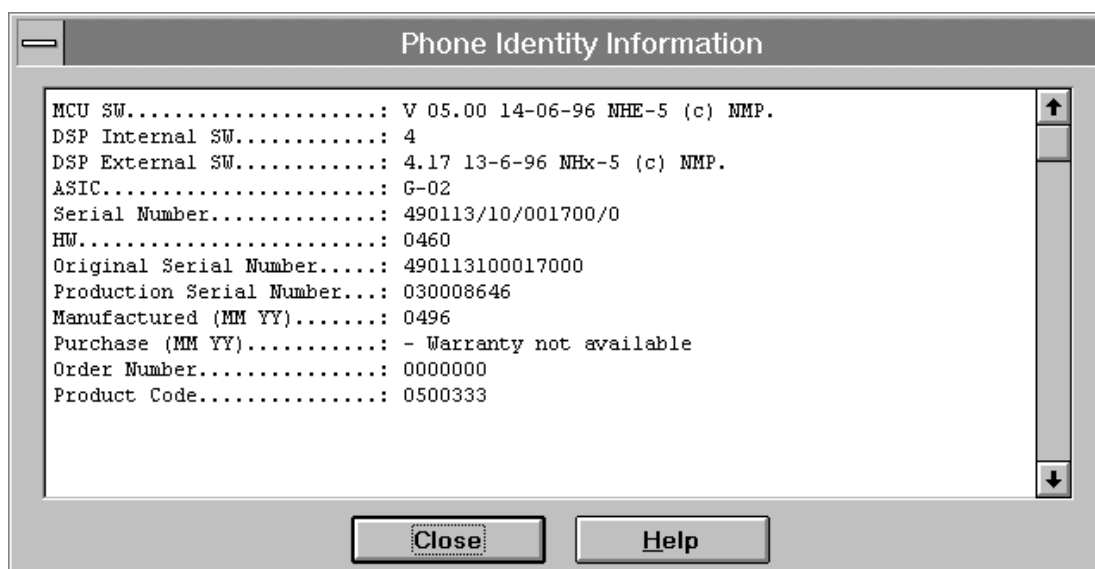


Phone Identity... command

Activation Status Bar Text

Alt, V, P View phone identity

The command opens the **Phone Identity Information** dialog box, which shows identification information. Information is shown in a modeless dialog box, which may be left open during other operations. It is also updated when ever needed.



Help

The Help menu offers commands which provide assistance with this application:.

Index command

Activation	Status Bar Text
Alt, H, I	Provide general instructions on using help
The command displays the opening screen of Help. From the opening screen, the user can jump to step-by-step instructions for using Service Software and various types of reference information.	
Once Help is opened, the user can click the Contents button whenever he wants to return to the opening screen.	

General help command

Activation	Status Bar Text
Alt, H, G	General help

Using Help command

Item	Activation	Status Bar Text
<u>U</u> sing Help	Alt, H, U SHIFT F1	Display using help system information

About... command

Activation	Status Bar Text
Alt, H, A	Displays the version number of this application

See **Login Dialog**.

Initialization File

The service software has its own initialization file which has the extension .INI. The Initialization file is TESLA.INI and includes all the following selections (in mentioned menus or dialog boxes) and parameters:

RF Controls dialog box ([NHE/K-5 RF])

Channel (Channel =)

Continuous Mode Channel (Cont Mode Channel =)

Monitoring Channel (Monitoring Channel =)

AFC (AFC =)

AGC (AGC =)

Data Type (DataType=)

Power Level (PowerLevel =)

DLL Filenames (NHE-5 and identical NHE-6)

User Interface (UserInterface=)

Functionality (Functionality=)

RSSI Dialog box (NHE-5LEVELS and identical NHE-6LEVELS)

AFC Level (AfcLevel=)

RSSI Low (RssiLow=)

RSSI High (RssiHigh=)

AFC Level (AfcLevel=)

Appendix 1, Vocabulary

Appreviation	Description
API	Application Programming Interface
ASIC	Custom circuit which for instance controls communication between MCU and DSP
CLF	Common Look and Field
DATA	DATA interface module
DAU-4S	M2BUS – RS-232 adapter
DCT2	Digital Core Technology Second Generation
DLL	Dynamic Link Library
DSP	Digital signal processor which controls radio interface and speech coding/decoding
EEPROM	Memory for adjustment parameters (Electrically Erasable and Programmable Read Only Memory)
IMEI	International Mobile Equipment Identification code
M2BUS	Serial communication bus which can be connected to accessory devices and test PC
MCU	Master Control Unit processor
MDI	MCU DSP Interface; message interface via ASIC registers
ME	Mobile Equipment
MFC	Microsoft Foundation Class library
MS	Mobile Station
MTI	Message Transfer Interface
PC	IBM PS/AT or compatible personal computer
PCBOX	Local Net driver SW for PC
PCI	Phone Controlling Interface SW for PC
PKD	Parallel Port Software Protection Device
RF	Radio Frequency parts
RFI	Radio Frequency Interface circuit
SW	Software
UI	User Interface

This page intentionally left blank.