

PAMS Technical Documentation

Chapter 5

RPE-1 SERVICE SOFTWARE INSTRUCTIONS

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Introduction to Service Software

General

The RPE-1 Service Software is specially designed to facilitate the servicing of RPE-1 cellular card phones.

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 current Service Software version. NMP After Sales shall 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)
 - PCMCIA slot (Intel PCIC compatible) Not needed if the Flash memory is not updated
- Service Software program: for 3.5" disk (product code: 077???)
- Software Protection Key PKD-1 (product code 0750018)
- M2BUS interface cable DAU-9P (product code 0730109)
- JBT-8 adapter card (product code 0770099)
- ACH-6 AC charger for JBT-8 (product code 0675084)

*) 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.

Required Extra Servicing Equipment for Flash Programming

The following pieces of extra equipment are needed for Flash programming:

- TDF-4 Flash Security box (product code: 0770106)
- SCH-5 cable (product code 0730098)
- AXS-4 RS232 interface cable (product code 0730090)

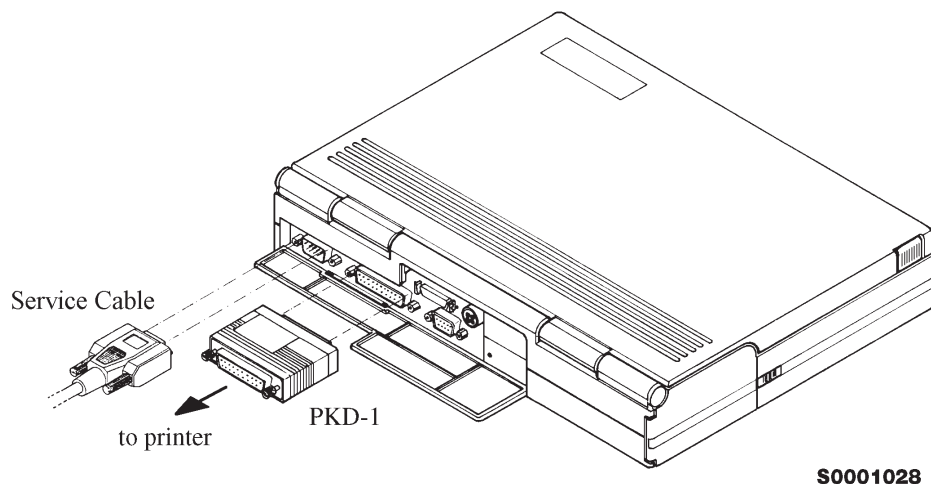
Mechanical Connections

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 !

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.

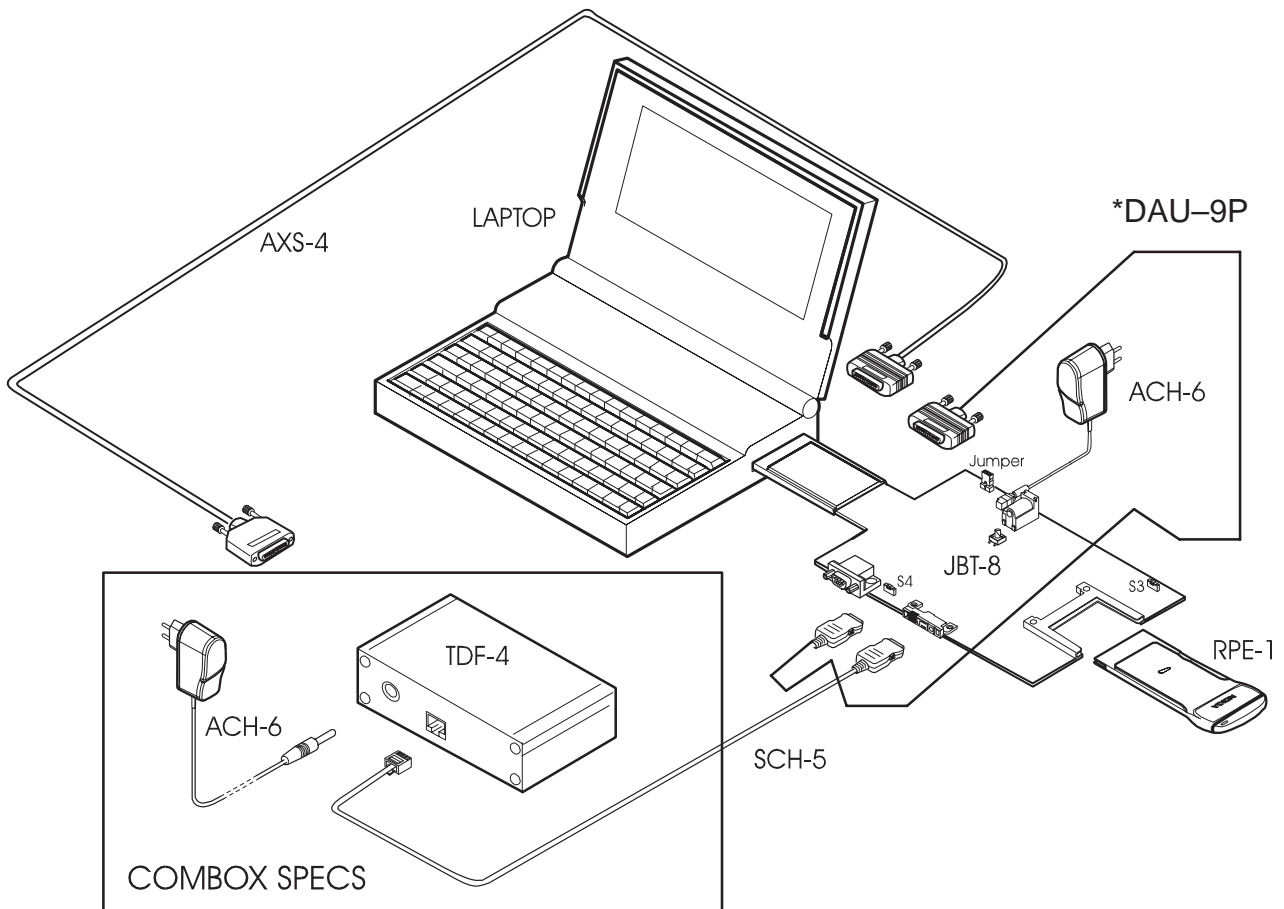


Equipment setup

Attach one end of the M2BUS interface cable, DAU-9P to the PC serial port and the other end to the bottom connector of the JBT-8.

If the flashing setup is used, connect one end of the RS-232 cable AXS-4 to the PC serial port and the other end to the b"SERIAL INPUT" connector of the TDF-4. Also connect the MBUS cable SCH-5 between the "SERVICE CABLE" connector of the TDF-4 and the bottom connector of the JBT-8.

Note: Switch 'FLASH ENABLE' inside the TDF-4 must be in 'N' position



**Note: If you want to operate only using Wintessa to do tunings etc., you just need to connect the DAU-9P from the PC serial port to the bottom connector of the JBT-8.*

Start Up Procedure

Start the phone by applying the Vcc and pushing the reset button on the JBT-8.

Switch the PC power on.

To install the software, proceed as follows:

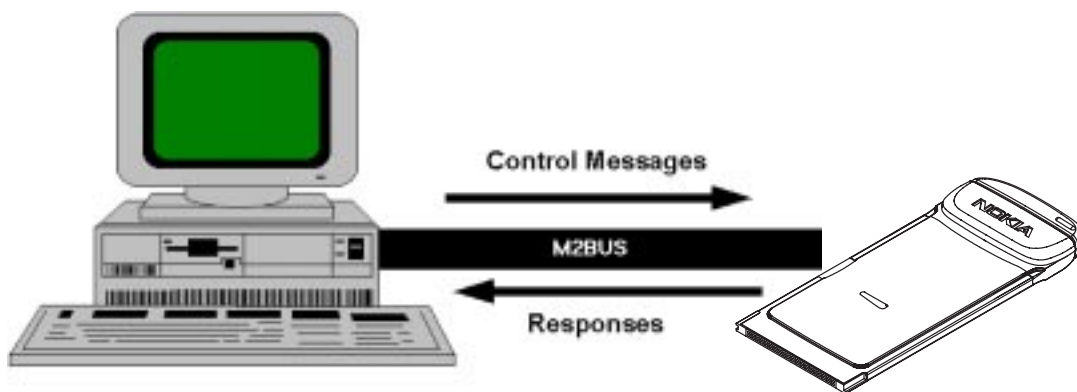
1. Insert Service Software disk into drive A of your PC
2. Start Windows: **type *WIN* and press *Enter***
3. Start Installing program: **select *File* → *Run* from Program Manager menu, then type *A:INSTALL* and press *OK* button**
4. Follow Installation Software instructions

Introduction to Service Software Package User Interface

This chapter gives a brief description of the Service Software features.

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 elements DAU-9P, JBT-8, ACH-6E connected to the PC RS-232 port.



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 RPE-1 there are two DLL's:

- Functionality DLL is RPE1.DLL
- User Interface DLL is RPE1EN.DLL

Command Line Parameters

There are NO command line parameters.

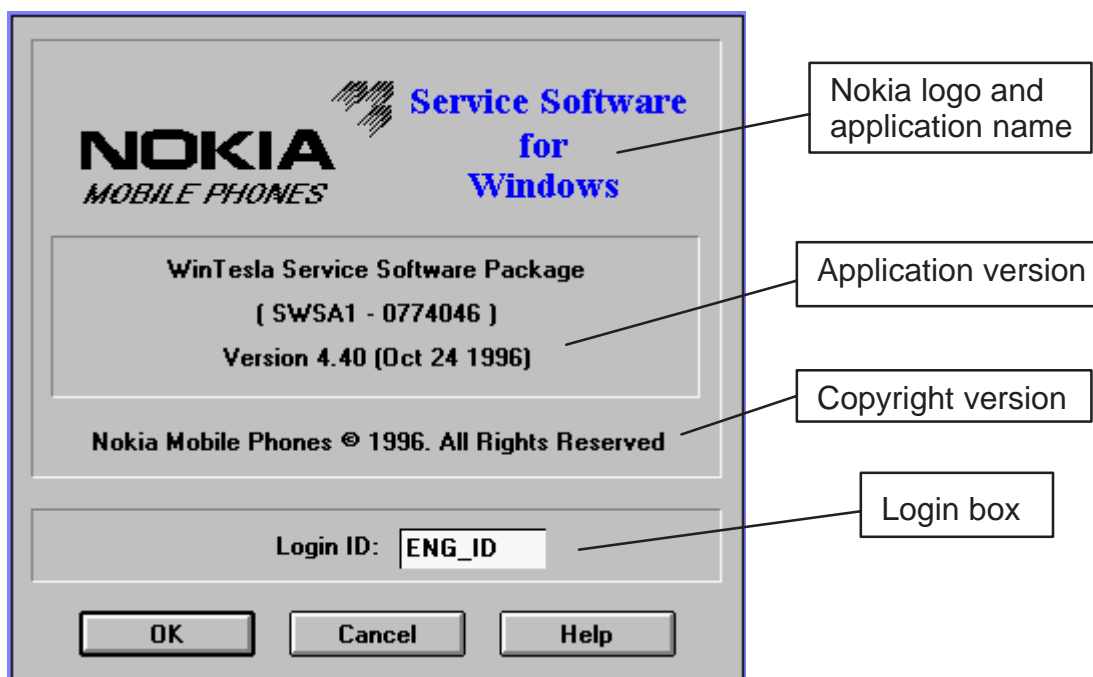
Common Properties of the User Interface

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.

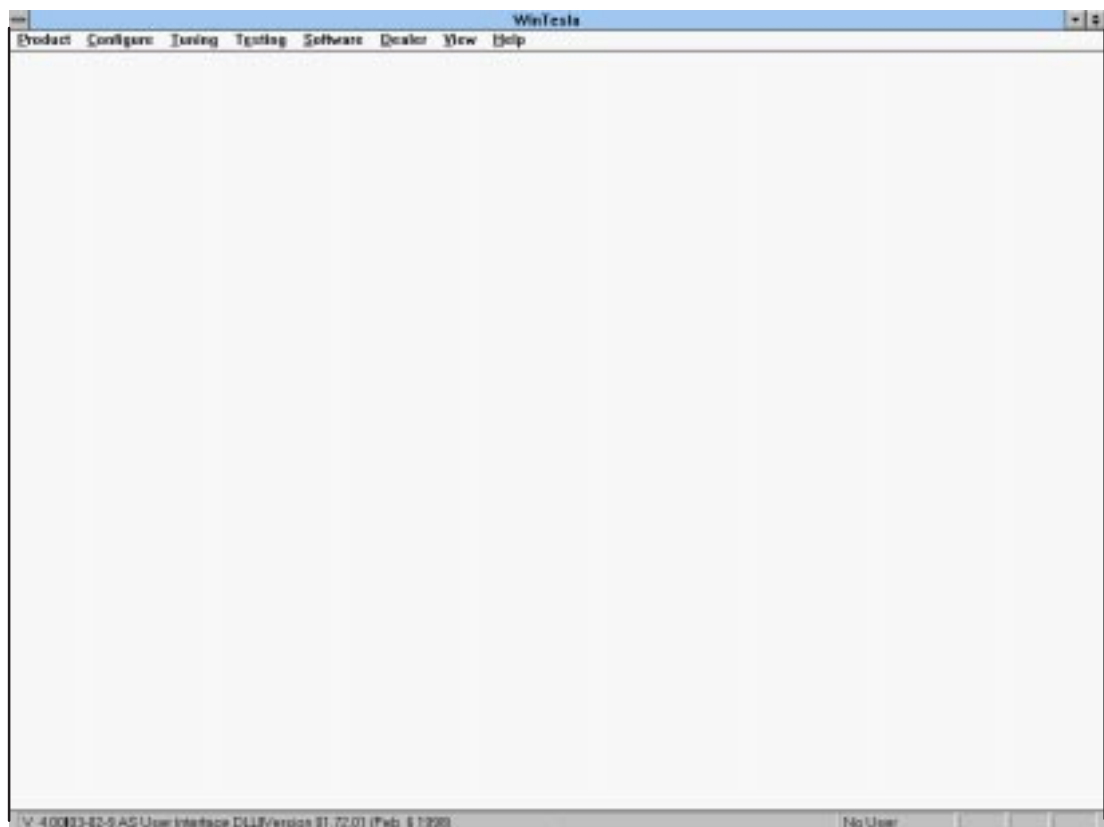
Help button (F1)

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.



Title bar

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

A title bar contains the following elements:

- Application Control–menu button
- Maximize button
- Minimize 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 SW protection key 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.

- Faultlog
- Directories...
- GPIB Instruments...

Tuning

The Tuning menu contains the following menu sections:

- RX Calibration
- TX Power
- TX I/Q

Testing

The Testing menu contains the following menu sections:

- RF Controls.....
- RSSI Reading....
- Self Tests...
- Call Simulation...
- Noise Sensitivity

Software

The Software menu contains the following menu sections:

- Product Profile...
- Start Up Self-tests
- Set Factory Values...
- Phone Identify...
- Warranty state...
- Production Data Edit...

Dealer

The menu contains the following menu sections:

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

View

The View menu contains the following sections:

- Quick/RF Info...
- Phone Information..

Help

- Index
- General Help
- Using Help
- About WinTesla
- About AS Locals

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+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,R	<u>R</u> X Calibration	NMP
Alt+T,P	Tx <u>P</u> ower	NMP
Alt+T,Q	Tx I/ <u>Q</u>	NMP
Alt+E	<u>T</u> esting Menu	NMP
Alt+E,R	<u>R</u> F Controls	NMP
Alt+E,S	<u>S</u> elf Tests	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,P	<u>P</u> roduct Profile	NMP
Alt+S,S	<u>S</u> tart-up Self Tests	NMP
Alt+S,V	Set Factory <u>V</u> alues	NMP
Alt+S,I	Phone <u>I</u> dentify	NMP
Alt+S,W	<u>W</u> arranty State	NMP
Alt+D	<u>D</u> ealer Menu	NMP
Alt+D,M	<u>S</u> CM & User Settings	NMP
Alt+D,S	<u>S</u> hort Code Memory	NMP
Alt+D,U	<u>U</u> ser Settings	NMP
Alt+D,V	Set UI/DEV Default <u>V</u> alues	NMP
Alt+D,R	<u>R</u> estore User Defaults	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 Information	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
Alt+H,S	About <u>A</u> S Locals	NMP

Help Functions

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.

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.

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 recognized that features may require additional button types, but the addition of these non-standard buttons should be carefully considered to minimize 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

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.

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.

RPE-1 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
<p>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.</p> <p>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 dll:s are unloaded and new ones are loaded for that phone.</p> <p>If quick info view is open, the window will be automatically updated.</p> <p>If phone identification view is open, the window will be automatically updated.</p>	

Open... command

Activation	Status Bar Text
Alt, P, O	Force load phone specific functionality
<p>Enables the user to force load specific phone's WinTesla dll's.</p>	

Close command

Activation	Status Bar Text
Alt, P, C	Close loaded functionality
<p>Closes loaded functionality and sends reset to phone if dll:s are loaded by Open command.</p>	

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.

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	Initializes 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.

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 **D**ata edit box:

Logs edit box:

Fault log file(s) edit box:

Data **V**alidation file(s) edit box:

Flash **i**mages 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:

Country of **Origin** edit box:

Repair **Technique** : drop down list:

Service **Centre No:** edit box

Product Code: 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.

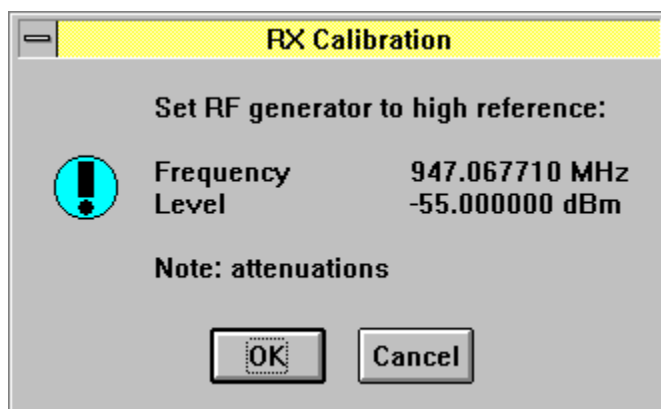
RX Calibration... command

Activation Status Bar Text

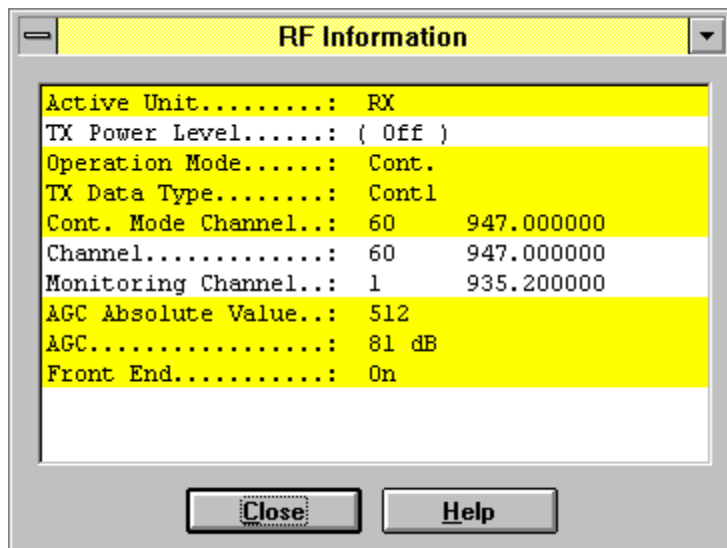
Alt, T, R Open an RX Calibration dialog box

Starts RX calibration.

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



The **RF Information** dialog box will open when user accepts request: (Sample screen)



The **RF Information** dialog box contains the following items:

Cancel button (Alt+C):

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

Help button (Alt+H):

Help window shall be opened

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.

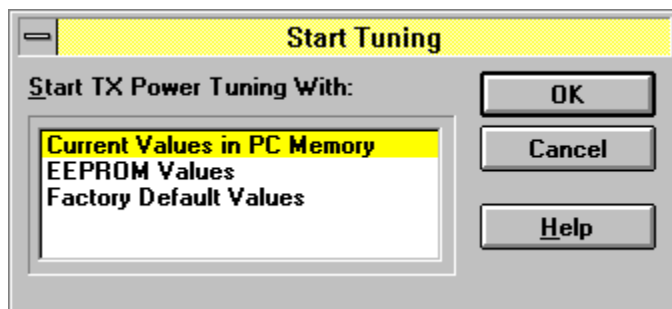
TX Power... command

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

Alt, T, X	Open TX Power... 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.

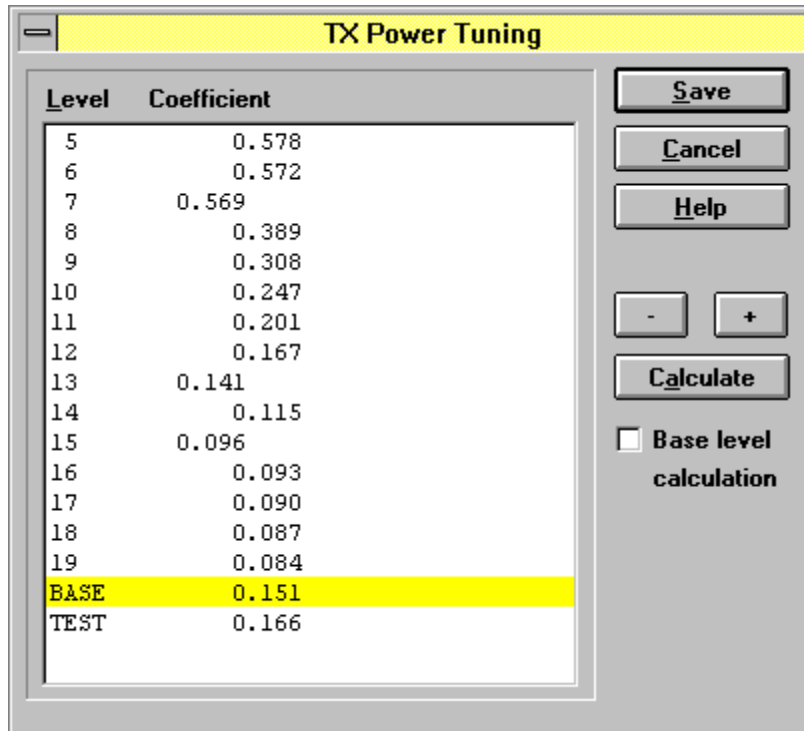
Factory Default Values

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. (Sample screen)



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

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

The power is presented in GSM values (7..15). 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.

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.

+/- 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

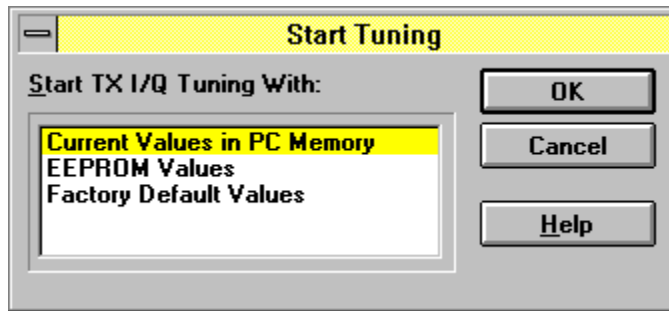
Operation Mode = Burst

TX Power Level = 10

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

Update RF Information window

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



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

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.

Help button (Alt+H):

Activates the Windows Help application and displays context sensitive Help.

Testing

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

RF Controls... command

Activation

Status Bar Text

Alt, E, R

Open RF Control dialog box

The command is used for setting RF control values, and opens the **RF Controls** dialog box: (Sample screen)

The **RF Controls** dialog box contains the following items:

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:**Continuous** radio button (Alt+C):

When *continuous* selection is used,

Synthesizer is set to constant frequency

Synthesizer 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 synthesizer is controlled by using the receiving/transmission/measuring synthesizer. Control sequence synthesizer 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 power value (7..15) or select the test val-

ue, 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 value. When the TX power is tuned with test value (smallest value), the TX Power has the value *TEST*.

Continuous Mode Channel edit box (Alt+C):

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

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.

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.

AGC Absolute edit box (Alt+A):

??

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.

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

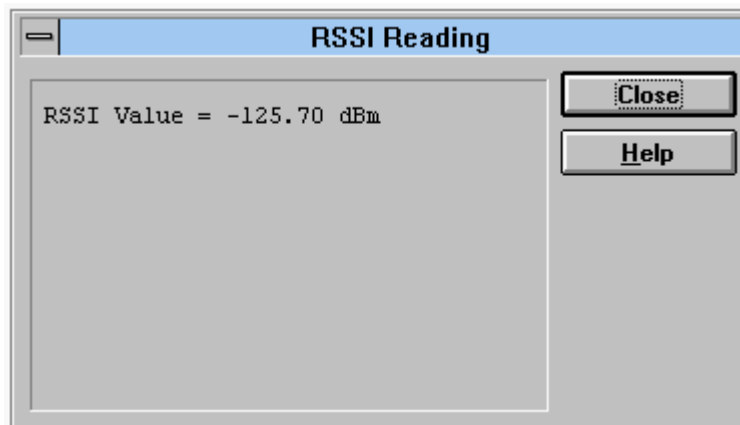
RSSI Reading... command

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

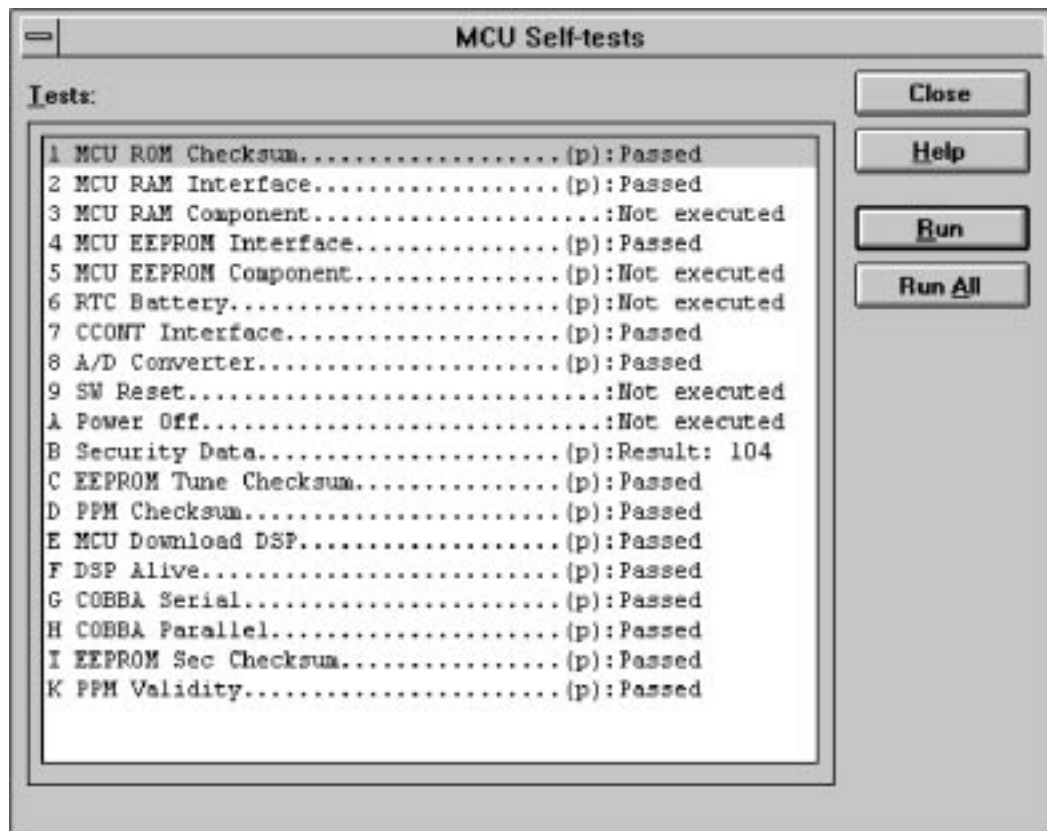
Status Bar Text

Alt, E,S

Open MCU Self-tests dialog box

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 **MCU Self-test** dialog.



Dialog mode: **modal**

MCU Self-test dialog has 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 next:

Passed

Failed

No response

Not executed

Not valid

RUNNING...

Run button (ALT+R):

User can select desired test from list and hit **Run** button. When user selects test to be run the text *RUNNING...* is shown in 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*. Phone is set to local mode if it is not already there.

Run All button (ALT+A):

User can run all listed tests. The text *RUNNING...* is shown in test state field and test is run. When results are received the test state field is updated according to the result. When state field is updated application moves to next test and repeats previous cycle. Phone is set to local mode if it is not already there.

Note:

Power cannot be switched off from RPE-1 using Wintesla.

Supported Self Tests

The following tests are available:

- 1 MCU ROM Checksum.....
- 2 MCU RAM Interface.....
- 3 MCU RAM Component.....
- 4 MCU EEPROM Interface.....
- 5 MCU EEPROM Component.....
- 6 RTC Battery.....
- 7 CCONT Interface.....
- 8 A/D Converter.....
- 9 SW Reset.....
- A Power Off.....
- B Security Data.....
- C EEPROM Tune Checksum.....
- D PPM Checksum.....
- E MCU Download DSP.....
- F DSP Alive.....
- G COBBA Serial.....
- H COBBA Parallel.....
- I EEPROM Sec Checksum.....
- K PPM Validity

Call Simulation.. command

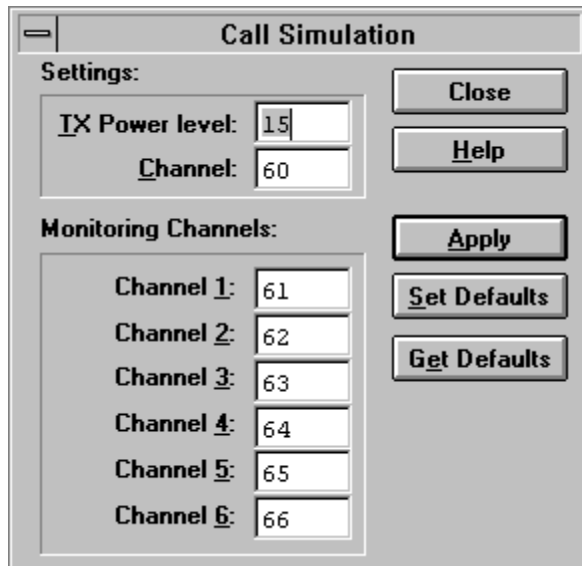
Activation

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. (Sample screen)



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

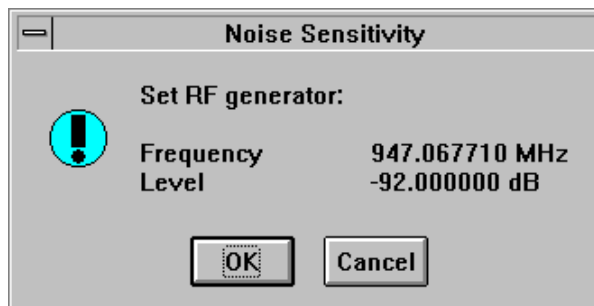
Opens Noise Sensitivity dialog box

The command is used for noise sensitivity measurement.

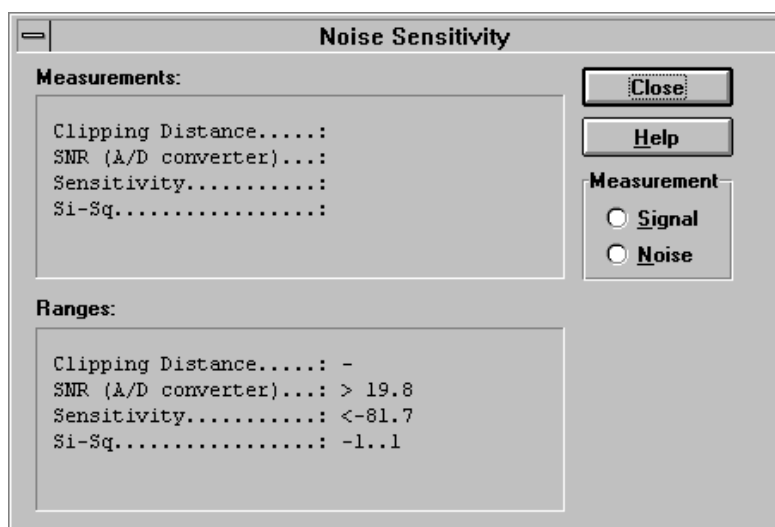
The following are automatically selected when this tuning function is activated:

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

Function opens next a **Noise Sensitivity** dialog box. (Sample screen)



The application then opens the **Noise Sensitivity** dialog box: (Sample screen)



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

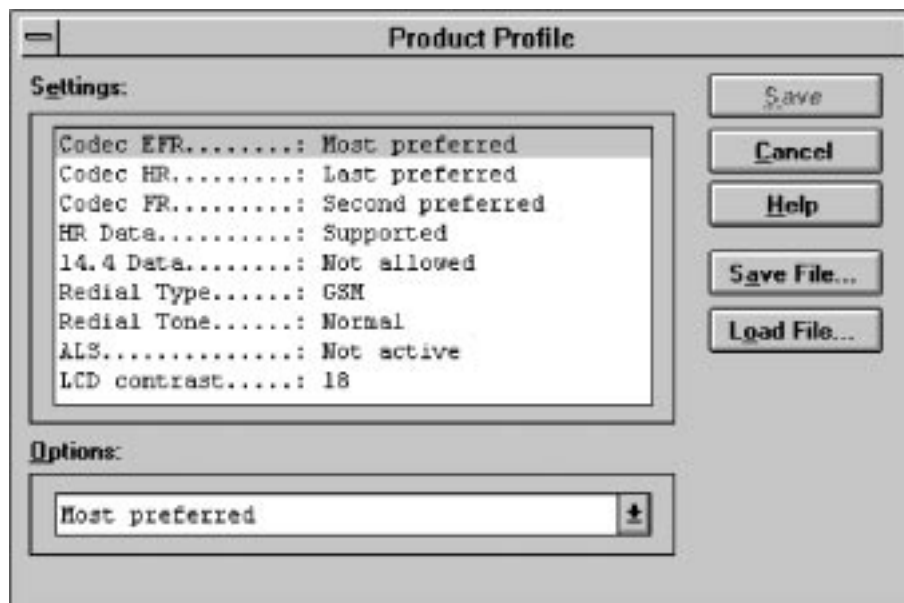
The settings sub menu offers functions for Mobile Equipment mode and memory settings.

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. (Sample screen)



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.

Save button (Alt+S)

Selections are accepted and saved to EEPROM.

Cancel button (ESC)

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

Help button (Alt+H):

Activates the Windows Help application and displays context sensitive Help.

Save File... button (Alt+A)

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

Load File... button (Alt+AO)

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

Start Up Self-tests... command

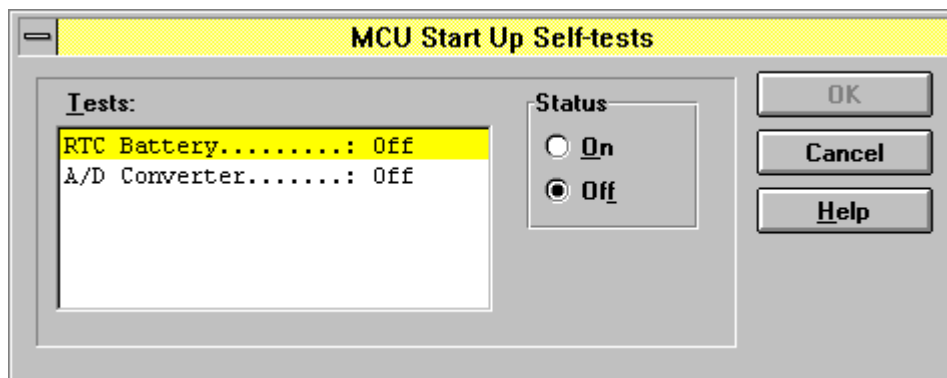
Activation

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 Factory Values... command

Activation

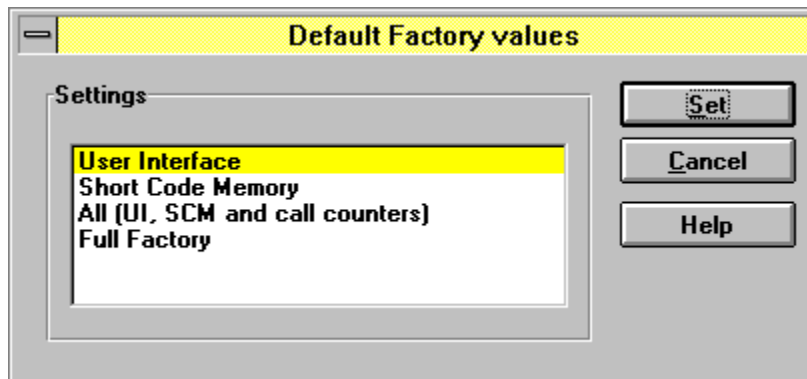
Status Bar Text

Alt, S, V

Set factory default values

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

After selection, the following **Default Factory values** dialog box is opened:



The **Default Factory values** dialog box contains the following items:

Settings list box (Alt+S):

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

Set button (Alt+S)

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

Cancel button (Alt+C)

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

Help button (Alt+H):

Activates the Windows Help application and displays context sensitive Help.

Phone Identity... command

Activation

Status Bar Text

Alt, S,I

Open Phone Identity dialog box for editing

Function is used to edit phone identity. With this dialog IMEI or SIM locks may be changed in following manner:

- current phone information is read from phone
- user edits User Name (and IMEI, Product Code and Product Id, if they were not read correctly from phone)
- dialog information is saved to file, which is sent to secure place where actual programming information may be constructed
- programming information is got from secure place in an other file, which is loaded to dialog
- program checks input values and if they are correct programming information is written to phone

Function opens **Phone Identity** dialog.

Dialog mode: **modal**

Phone Identity dialog has following items:

User Name edit box (ALT+U):

Field where user can enter user identification.

IMEI edit box (ALT+I):

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

This field is automatically filled, if ME is connected to the PC when dialog is loaded.

Product Code edit box (ALT+P):

Field where user can enter Product Code value.

This field is automatically filled, if ME is connected to the PC when dialog is loaded.

MS Id edit box (ALT+M):

Field where user can enter MS Id corresponding programming data. This field is automatically filled, if ME is connected to the PC when dialog is loaded.

Product Id edit box (ALT+R):

Field where user can enter Product Id. This field is automatically filled, if ME is connected to the PC when dialog is loaded.

Data edit box (ALT+A):

Field where user can enter Data entry. This field is automatically filled, when file is loaded or data is saved.

IMEI radio button:

File and ME operations contains only IMEI data.

SIM Lock radio button:

File and ME operations contains only SIM Lock data.

IMEI Programming Data edit box (ALT+I):

IMEI programming data is read from file or entered by user to this field.

SIM Lock Programming Data edit box (ALT+D):

SIM Lock programming data is read from file or entered by user to this field.

Close button (ESC):

Cancels all edits and does not save values to phone.

Help button

Opens a help text.

Write button (ALT+W):

Writes programming data to phone. Actions are selected with Action Selection radio button.

Read button (ALT+R):

Reads identification data from phone and shows it in dialog controls. Needed data is selected by Action Selection radio button.

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

Writes a file containing data needed by security place application to create needed programming data. File is selected with File Save As dialog.

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

Reads a file containing data needed to program selected data. File is selected with File Open dialog.

Production Data Edit... command

Activation

Status Bar Text

Alt, S,P

Open Production Data Edit dialog box

This command is used for programming HW version to phone. Function opens the following **Production Data Edit** dialog box.

The screenshot shows a dialog box titled "Production Data Edit". It features a close button in the top-left corner. The main area contains five input fields, each with a label to its left: "Production Code:", "Order Number:", "Production Ser. No:", "Manufacture Month:", and "HW version:". To the right of these fields are three buttons: "Save", "Cancel", and "Help".

Dialog mode: **modal**

Production Data dialog has the following items:

Production Code edit box (read only):

Displays production code.

Order Number edit box (read only):

Displays order number.

Production Ser. No edit box (read only):

Displays production serial number.

Manufacture Month edit box (read only):

Displays manufacturing month.

HW Version edit box:

User can edit HW version.

OK button (ENTER):

Closes the dialog box and writes HW version to ME.

Cancel button (ESC):

Closes the dialog box and *does not* write HW version to ME.

Dealer

The Dealer sub menu offers functions for Dealer settings.

User Settings... command

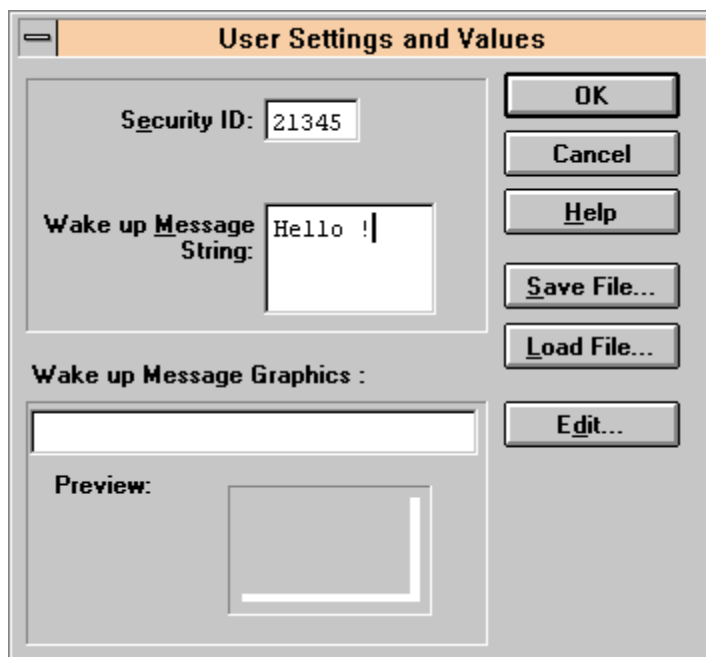
Activation

Status Bar Text

Alt, D,U

Open User Setting dialog box

This command is used to edit user settings.



Dialog mode: **modal**

User Settings dialog box has following items:

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

User can save user settings to file.

Load File button (ALT+L):

User can load user settings from file.

Ok button (ENTER):

Writes user settings to phone.

Cancel button (ESC):

Closes the dialog box

Note:

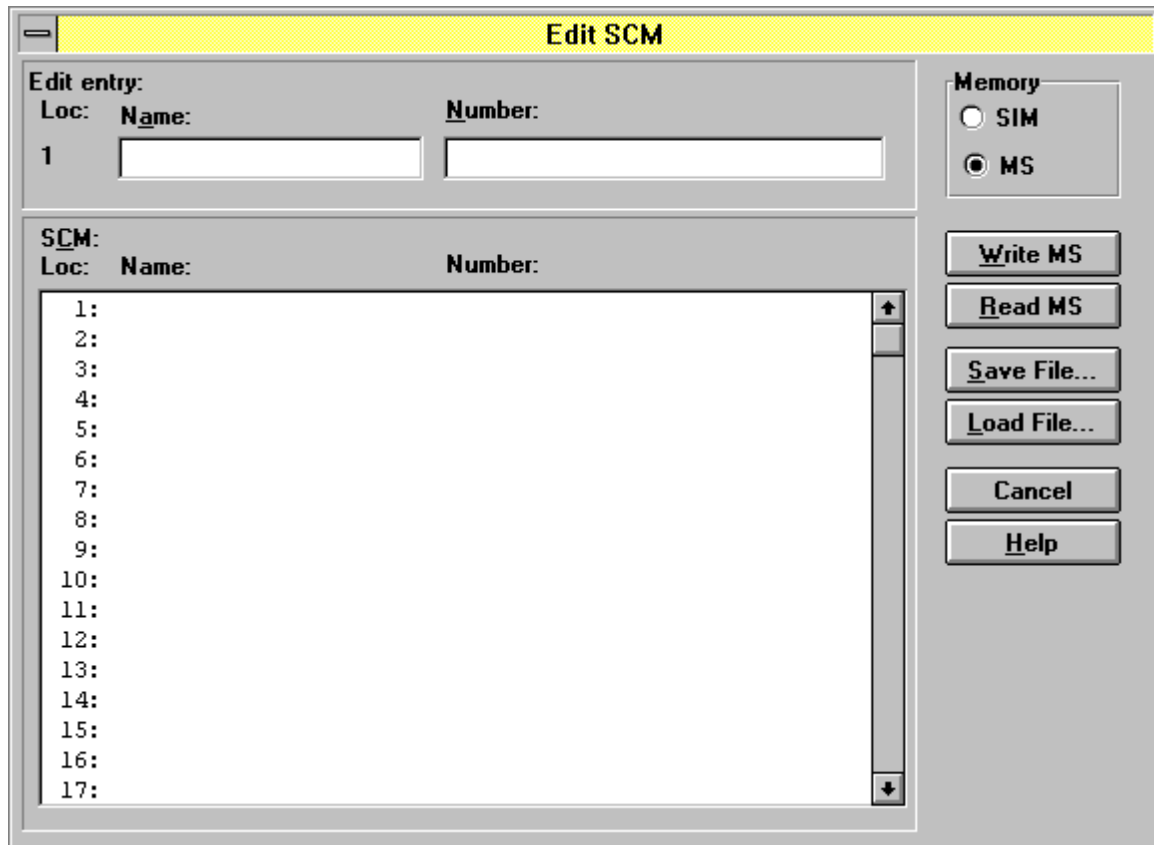
Wakeup message string or graphics are not implemented in RPE-1.

Short Code Memory... command

Activation Status Bar Text

Alt, S, S Open **Edit SCM** dialog box

The function is used to edit the Short Code Memory contents in the **Edit SCM** dialog box.



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

Cancel... button (ESC):

Closes the dialog box.

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

Loads settings from file and writes them to phone.

Read MS... 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.

SCM & User Settings... command

Activation

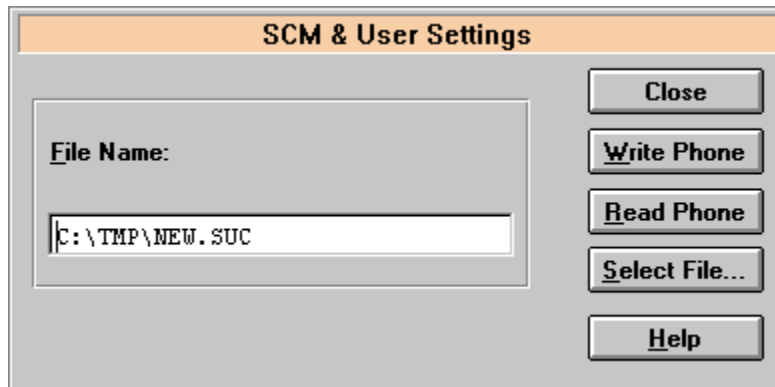
Status Bar Text

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. The following data is loaded/saved with this dialog: all user settings.

When data is written or read phone, waiting dialog is shown to user.



Dialog mode: **modal**

SCM & User Settings dialog box has following items:

File Name edit field (ALT+F):

User can edit file name or select file with Open File dialog. When dialog is opened, it contains name of the previously saved or loaded file.

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

Close button (ESC):

Closes the dialog box.

Set UI/DEV Default Values... command

Activation	Status Bar Text
Alt, D,V	Reset phone to UI and SCM factory settings

After selection application asks confirmation:

“Are you sure you want to set UI to factory settings?”.

If Yes is answered, default settings are resetted to phone.

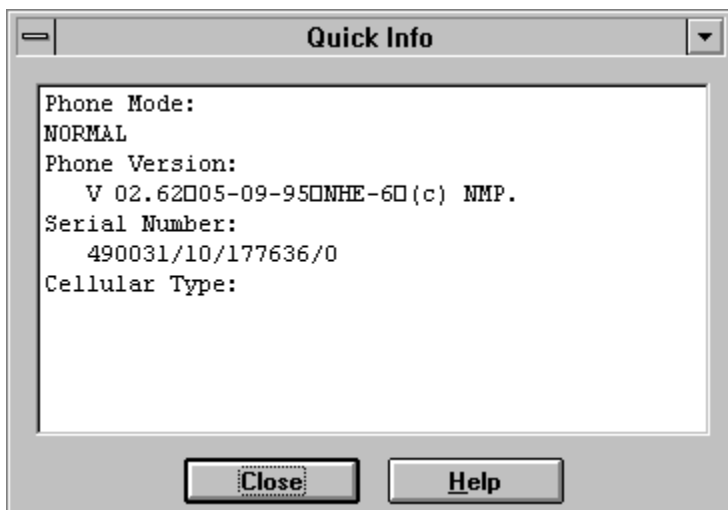
View

Quick/RF Info... command

Activation Status Bar Text

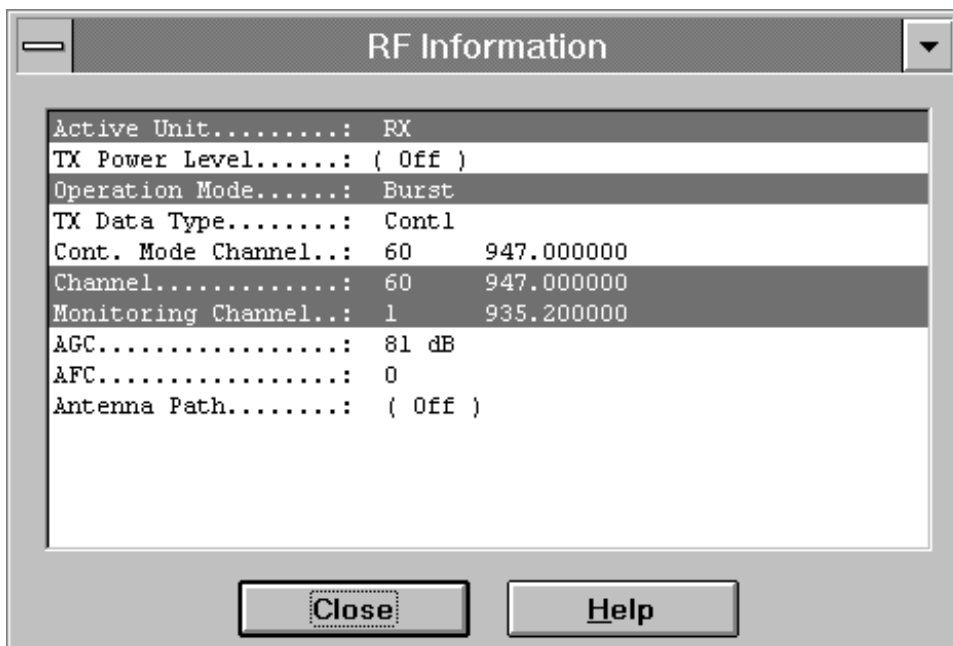
Alt, V, Q View Quick/RF information

If phone is in *normal* mode, the following **Quick Info** is shown:(Sample screen)



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. (Sample screen)

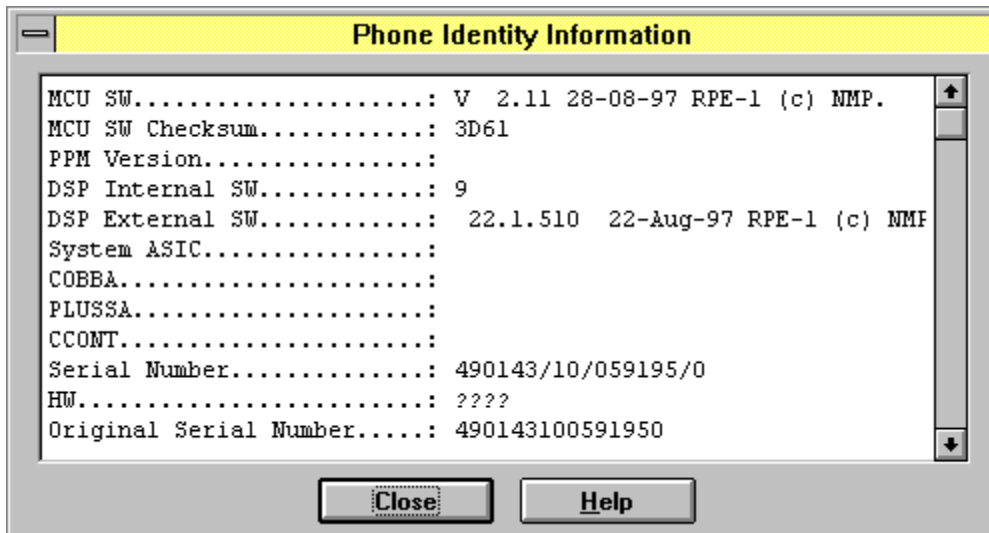


Phone Identity... command

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. (Sample screen)



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>Using Help</u>	Alt, H, U SHIFT F1	Display using help system information

About WinTesla... command

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

See **Login Dialog**.

About AS Locals... command

Activation	Status Bar Text
Alt, H, S	Displays the version number of the AS Locals, PCI and MTI.

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

Channel (Channel =)

Continuous Mode Channel (Cont Mode Channel =)

Monitoring Channel (Monitoring Channel =)

AFC (AFC =)

AGC (AGC =)

Data Type (DataType=)

Power Level (PowerLevel =)

DLL Filenames

User Interface (UserInterface=)

Functionality (Functionality=)

RSSI Dialog box

AFC Level (AfcLevel=)

RSSI Low (RssiLow=)

RSSI High (RssiHigh=)

AFC Level (AfcLevel=)

Flash Software

FLASH software instructions

The purpose of flash update software package is to provide an easy way to update the flash memory contents inside RPE-1 and to run flash authorization after update (i.e. RPE-1 can be used after the flash update). Update software package contains two executables which both are DOS based applications: actual flash update application (rpe1fla.exe) and security application (rpe1sec.exe). Also an easy to use DOS batch file (rpe1 up.bat) to invoke both the executables with right command line arguments is included in the package. There is also a batch file (rpe1fs.bat) for running different factory sets to RPE-1. Those batch files give instructions to the user during the execution.

Flash update application (rpe1fla.exe)

This application updates the flash memory contents of RPE-1 (i.e erases the flash, programs the new image to the flash and finally verifies the flash contents against the flash image file). It's also possible to run some hardware line tests for RPE-1. Application uses PC's PCMCIA port for the communication and during the operation RPE-1 must be in the 'PCMCIA'-mode.

Command line syntax for the application:

- rpe1fla.exe filename [flags]
- filename: file containing the flash image to be updated
- optional flags:
- -p = program flash
- -pn = do NOT program flash
- -pf = forced program
- -e = erase flash
- -en = do NOT erase flash
- -ef = forced erase
- -v = verify flash
- -vn = do NOT verify flash
- -vf = forced verify
- -sa = use PCMCIA slot A
- -sb = use PCMCIA slot B
- -r = read RPE-1 software version
- -iX = use X hex base I/O address for I/O-accesses
- -taX = test HW lines with IRQ line X (X = 3,4,5 or 7)
- -? = help
- default flags: -e -p -v -sa -i240

Notes:

- Command rpe1fla -r can be used to check the connection to RPE-1.
- Forced operations are for test use (e.g. rpe1fla -ef just erases the flash).

—With command `rpe1fla -en -pn -vn -ta5` the following hardware lines will be tested:

- IRQ, PCM (Tx, Rx, Sync and Clock), DTR, RTS, CTS, RI and DCD.
- Right IRQ line to be used in HW line test depends on the PC setup

Security functions application (`rpe1sec.exe`)

This application runs the flash authorization on RPE-1. Also running different factory sets is supported. Flash authorization must be done after flash update otherwise RPE-1 will not be functional any longer. Application uses PC's COM port for the communication and during the operation RPE-1 must be in the 'NON-PCMCIA'-mode (i.e. 'VERTICAL'-mode)

Command line syntax for the application:

`rpe1sec.exe [flags]`

optional flags:

- `-a` = run flash authority ID
- `-an` = don't run flash authority ID
- `-cX` = COMBOX (i.e. TDF-4) is connected to COMX (X = 1 or 2)
- `-fXX` = run 8-bit factory set mask (XX hex):
- X X X X X X X X
- | | | | | | | | |→ b0 = 0
- | | | | | | | | |→ b1 = 1: device data factory set
- | | | | | | | | |→ b2 = 0 (not used)
- | | | | | | | | |→ b3 = 1: UI factory set
- | | | | | | | | |→ b4 = 1: SCM data factory set
- | | | | | | | | |→ b5 = 1: SMS data factory set
- | | | | | | | | |→ b6 = 1: counter reset factory set
- | | | | | | | | |→ b7 = 0
- `-v` = read COMBOX (i.e. TDF-4) version
- `-r` = reset phone before operation
- `-rn` = NO reset to the phone
- `-?` = help

default flags: `-a -c1 -f0 -r`

System requirements

- PC with 386 or higher CPU
- DOS, WINDOWS 3.x or WINDOWS '95 operating system.
- One standard serial port (COM1 or COM2)
- Type II or III PCMCIA slot with Intel PCIC compatible controller
- Memory area D000-D200 exclusion in config.sys:

- device=c:\windows\himem.sys
- device=c:\windows\emm386.exe X=D000-D200
- Nokia TDF-4 flash security box.
- Nokia JBT-8 PCMCIA adapter card
- Nokia AXS-4 RS-232 cable between TDF-4 and PC COM port
- Nokia SCH-5 service cable between TDF-4 and JBT-8
- Two Nokia ACH-6 chargers (one for TDF-4 and one for JBT-8)
- Software protection key (PKD-1 or higher) connected to PC's parallel port
- Update software package (3,5" diskette):
 - 1. rpe1up.bat
 - 2. rpe1fla.exe
 - 3. rpe1sec.exe
 - 4. (rpe1fs.bat)

Notes:

- Update software works only with PCIC compatible PCMCIA controllers
- Absence of lines in config.sys stated earlier may cause various errors.

Flash update procedure description

1. Connect the RS-232 cable AXS-4 between the PC's COM1 port and the 'SERIAL INPUT' connector of the TDF-4 back panel.
 - Note:
 - If you want to use COM2 for the security operations the contents of rpe1up.bat and rpe1fs.bat must be changed (use parameter -c2 instead of -c1 for rpe1sec.exe).
2. Connect SCH-5 cable.
 - Normal RPE-1 flashing setup (TDF-4 between JBT-8 and PC) between the 'SERVICE CABLE' connector (TDF-4 front panel) and the DCT3 bottom connector (JBT-8 adapter)
 - Note:In this case the switch 'FLASH ENABLE' inside TDF-4 should be in 'N' position
 - Special phone flashing setup (TDF-4 between FPS-4 and PC) between the 'SERVICE CABLE' connector (FLA-5 front panel) and the DCT3 bottom connector (JBT-8 adapter)
 - Note: n this case the switch 'FLASH ENABLE' inside TDF-4 should be in 'F' position
3. Insert RPE-1 into JBT-8 and JBT-8 into the PCMCIA slot.
4. Connect the charges to 'ACH-6' connectors of TDF-4 and JBT-8.
5. Start RPE1UP.BAT:

- rpe1up.bat flash image file fX
- ...and follow the instructions.
- Note: enter rpe1up.bat command to get information about fX parameter.

Note:

-Use rpe1fs.bat to run just factory sets on RPE-1.

Troubleshooting

To begin with, check the following:

- every cable is connected to the right connectors .
- PKD-1 (or higher) software protection key is connected to PC's parallel port
- PCMCIA controller is PCIC compatible
- Config.sys contains the memory area exclusion.
- JBT-8 and TDF-4 are powered
- RPE-1 is run in the right mode.

Errors from the flash update application (rpe1fla .exe)

Most of the error messages from rpe1fla.exe are formed according to the following pattern:

"Module_Name_Function_Name: textual explanation"

The module name and function name help to localise error in source code, they don't have much use for services purposes.

Following is a list of possible error messages from rpe1fla.exe. Messages are categorized into the four subgroups to help to understand the error message and to localize the error source.

1. Internal errors

These errors normally shouldn't occur (they are internal to the software). If they do occur it's possible that the application software is corrupted.

- FPI_POWDER_connection_info_store: connection info string too long
- FPI_POWDER_connection_info_store: no POWDER defined in connection info string
- FPI_POWDER_connection_info_store: too few parameters in connection info string
- FPI_POWDER_connection_info_store: bad slot ID in connection info string
- FPI_POWDER_connection_info_store: bad flashing rate in connection info string
- FPI_POWDER_program: bad target device code
- FPI_POWDER_connection_info_store: bad type code in connection info string

- FPI_POWDER_connection_info_store: bad PCIC address in connection info string
- FPI_POWDER_connection_info_store: bad memory address in connection info string
- FLASH_IF_file_open: MCU SW file not found
- FLASH_IF_secondary_boot_load: bad boot code signature
- MCU_IF_msg_send: bad length code
- FLASH_IF_erase_flash: bad erase code
- MCU_IF_word_mode_block_transfer: bad length
- MCU_IF_byte_mode_block_transfer: bad length
- FPI_POWDER_version_read: version string too long
- PCMCIA_IF_card_identify: DosMapPhysSeg failed
- FPI_POWDER_connection_info_store: bad IRQ number in connection info string
- FPI_POWDER_pp_test: bad PP-test ID
- PCMCIA_IF_irq_init: IRQ number not supported
- FLASH_IF_algorithm_load: flash device not supported
- FPI_POWDER_define_phone_hw: HW info string too long
- FPI_POWDER_define_phone_hw: too few parameters in HW info string
- FPI_POWDER_define_phone_hw: bad target parameter in HW info string
- FPI_POWDER_define_phone_hw: bad BCR parameter in HW info string
- FPI_POWDER_define_phone_hw: bad FLASH_ID parameter in HW info string,
- Non-implemented feature called

Command line errors

These errors are caused by user giving a bad command line parameter.

- FPI_POWDER_connection_info_store: bad I/O address in connection info string
 - I/O address given is illegal
- PCMCIA_IF_cold_init: I/O address not within 16-byte boundary
 - I/O address given is illegal
- Card not present
 - Card is not inserted in the right PCMCIA slot

Errors caused by faulty hardware

CIS (Card Information Structure) errors:

- PCMCIA_IF_card_identify: unknown card manufacturer
- PCMCIA_IF_card_identify: unknown card
- PCMCIA_IF_card_identify: no product information found from CIS
- PCMCIA_IF_card_identify: bad type code
- PCMCIA_IF_card_identify: no config information found from CIS
- PCMCIA_IF_card_identify: CIS too long (probably corrupted)
- TEST_IF_smart_test: connection to SMART corrupted
 - probable cause: PCMCIA connector – SMART–ASIC interface

HW line test errors:

- TEST_IF_fbus_test: connection failure on FBUS handshaking lines
 - probable cause: control lines (DTR, RTS, DCD, RI or CTS) between SMART ASIC and MAD
- TEST_IF_at_test: IREQ line failure
 - probable cause: IRQ line between SMART ASIC and PCMCIA connector
- TEST_IF_verify_ok: OK–response not received
- TEST_IF_verify_ok: bad OK–response received
- TEST_IF_audio_test: Powder wake–up timeout
- TEST_IF_audio_test: timeout
- TEST_IF_audio_test: audio data looping failed
- TEST_IF_verify_echo: no echo received from Powder
- TEST_IF_verify_echo: bad echo received from Powder
- TEST_IF_at_test: no 'A' echo received from Powder
 - probable cause: FBUS lines or PCM lines between SMART ASIC and MAD

Other hardware errors:

- probable cause: difficult to define the location (base band)
- FLASH_IF_prepare_card: TxD line timeout (MCU probably not powered)
- FLASH_IF_prepare_card: TxD line timeout (MCU not ready)
- MCU_IF_?: TxD line timeout expired
- FLASH_IF_secondary_boot_load: TxD line timeout (boot code length NACK)

- MCU_IF_?: SMART Tx buffer hang up
- FLASH_IF_secondary_boot_load: TxD line timeout (boot code NACK)
- FLASH_IF_secondary_boot_load: TxD line timeout (dummy byte NACK)
- FLASH_IF_secondary_boot_load: TxD line timeout (XRAM test failed)
- FLASH_IF_secondary_boot_load: TxD line timeout (MCU not ready)
- FLASH_IF_receive_configuration: wrong response ID
- MCU_IF_checksum_confirm: bad length code
- MCU_IF_checksum_confirm: bad checksum
- FLASH_IF_algorithm_load: TxD line low before transfer
- FLASH_IF_algorithm_load: TxD line timeout (code not initialized)
- FLASH_IF_algorithm_load: TxD line timeout (MCU not ready)
- MCU_IF_msg_send: TxD line low during message sending
- MCU_IF_msg_send: TxD line timeout
- MCU_IF_config_request_send: TxD line timeout
- FLASH_IF_erase_flash: TxD line timeout
- MCU_IF_programming_status_get: TxD line timeout
- MCU_IF_programming_status_get: wrong response ID
- FLASH_IF_erase_flash: erasing failed
- FLASH_IF_program_flash: TxD line timeout
- MCU_IF_word_mode_block_transfer: TxD line timeout
- FLASH_IF_program_flash: programming failed
- MCU_IF_clk_rate_set: Rx fifo flushing timeout
- MCU_IF_byte_mode_block_transfer: TxD line timeout
- FLASH_IF_verify_flash: TxD line timeout
- FLASH_IF_verify_flash: errors detected

Other errors:

- FLASH_IF_file_open: out of memory (malloc failure)
 - PC has run out of memory
- FLASH_IF_file_open: premature end of MCU SW file
- FLASH_IF_file_open: bad MCU SW file format
- FLASH_IF_?: bad length code in MCU SW file
- FLASH_IF_?: premature end of MCU SW file
- FLASH_IF_?: unable to read MCU SW file
 - Flash image file is corrupted

Errors from the security application (rpe1sec.exe)

There are two basic reasons for errors from rpe1sec.exe:

PC cannot communicate with either RPE-1 (MBUS failure between TDF-4 and RPE-1) or with TDF-4 (serial bus failure between the PC and TDF-4). If rpe1sec.exe gives an error message check the following:

- serial cable between the PC and TDF-4
- MBUS cable (SCH-5) between TDF-4 and JBT-8 (RPE-1)
- functionality of TDF-4

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 Feel
DATA	DATA interface module
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
AGC	Automatic Gain Control

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