Customer Care Services
Technical Documentation

SERVICE MANUAL

[NMP Part No. 0275712]

DTX-3 PBX Connectivity Terminal

NOKIA

Issue 1 4/03

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Amendment Record Sheet

Amendment No	Date	Inserted By	Comments
	05/2003	ViK	Issue 1

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IMPORTANT

This document is intended for use by qualified service personnel only.

Company Policy

Our policy is of continuous development; details of all technical modifications will be included with service bulletins.

While every endeavour has been made to ensure the accuracy of this document, some errors may exist. If any errors are found by the reader, NOKIA MOBILE PHONES Ltd should be notified in writing.

Please state:

Title of the Document + Issue Number/Date of publication

Latest Amendment Number (if applicable)

Page(s) and/or Figure(s) in error

Please send to: Nokia Mobile Phones Ltd
CCS Technical Documentation
PO Box 86
FIN-24101 SALO
Finland

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Warnings and Cautions

Please refer to the phone's user guide for instructions relating to operation, care and maintenance including important safety information. Note also the following:

Warnings:

1. CARE MUST BE TAKEN ON INSTALLATION IN VEHICLES FITTED WITH ELECTRONIC ENGINE MANAGEMENT SYSTEMS AND ANTI-SKID BRAKING SYSTEMS. UNDER CERTAIN FAULT CONDITIONS, EMITTED RF ENERGY CAN AFFECT THEIR OPERATION. IF NECESSARY, CONSULT THE VEHICLE DEALER/ MANUFACTURER TO DETERMINE THE IMMUNITY OF VEHICLE ELECTRONIC SYSTEMS TO RF ENERGY.
2. THE HANDPORTABLE TELEPHONE MUST NOT BE OPERATED IN AREAS LIKELY TO CONTAIN POTENTIALLY EXPLOSIVE ATMOSPHERES EG PETROL STATIONS (SERVICE STATIONS), BLASTING AREAS ETC.
3. OPERATION OF ANY RADIO TRANSMITTING EQUIPMENT, INCLUDING CELLULAR TELEPHONES, MAY INTERFERE WITH THE FUNCTIONALITY OF INADEQUATELY PROTECTED MEDICAL DEVICES. CONSULT A PHYSICIAN OR THE MANUFACTURER OF THE MEDICAL DEVICE IF YOU HAVE ANY QUESTIONS. OTHER ELECTRONIC EQUIPMENT MAY ALSO BE SUBJECT TO INTERFERENCE.

Cautions:

1. Servicing and alignment must be undertaken by qualified personnel only.
2. Ensure all work is carried out at an anti-static workstation and that an anti-static wrist strap is worn.
3. Ensure solder, wire, or foreign matter does not enter the telephone as damage may result.
4. Use only approved components as specified in the parts list.
5. Ensure all components, modules screws and insulators are correctly re-fitted after servicing and alignment. Ensure all cables and wires are repositioned correctly.

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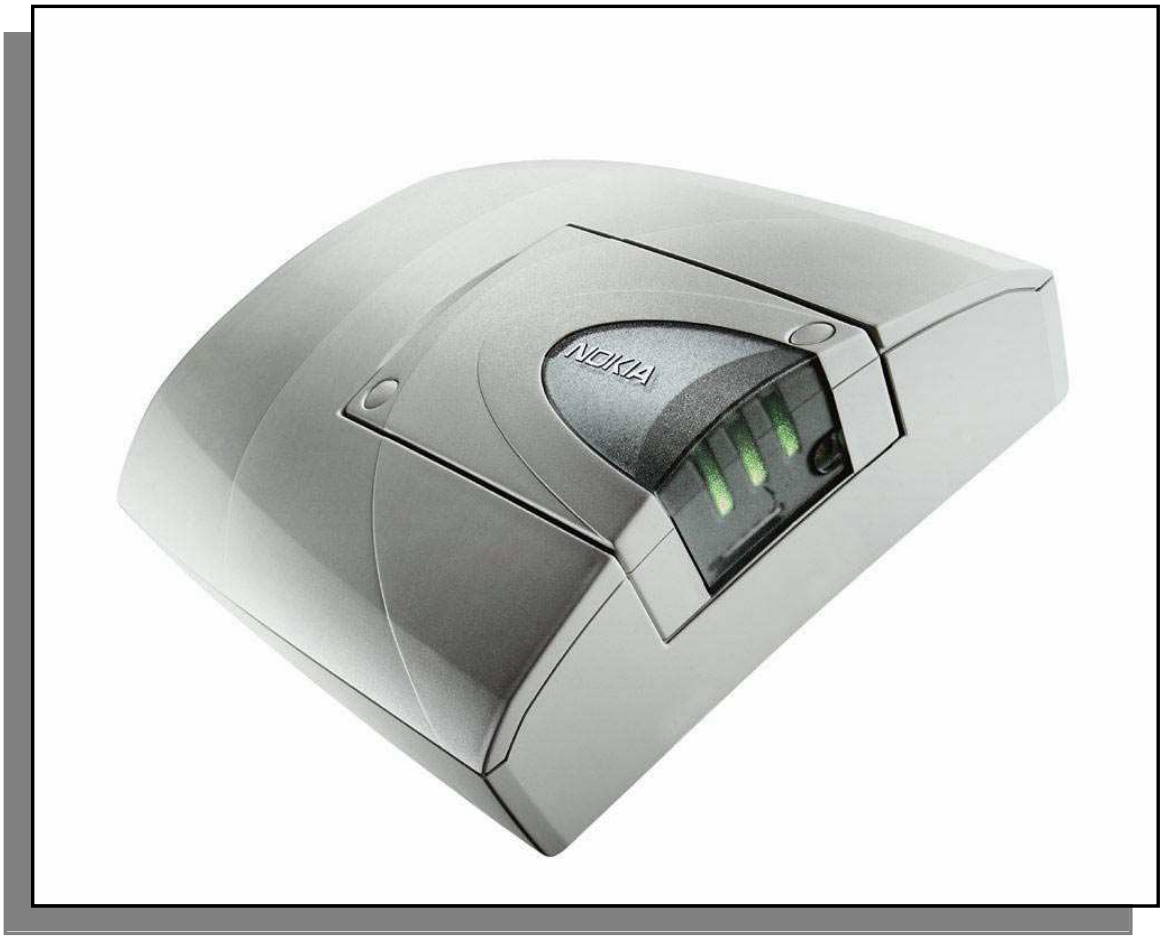
DTX-3 Series Transceivers

General Information



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Introduction to DTX-3 (Nokia 32)

Nokia 32 PBX Connectivity Terminal includes two modules:

1. Nokia TME-3 or Nokia TME-4 GSM transceiver

2. Nokia DTX-3 application module.

The Nokia TME-3 is a Class 4/5 (EGSM900) and Class 1/2 (EGSM1800) dual band GSM terminal. The Nokia TME-4 is a GSM850/1900 dual band terminal.

The DTX-3 provides an analogue two-wire connection for a landline telephone set or PBX (Private Branch eXchange) trunk or extension connection.

The main purpose of the Nokia 32 is to provide direct GSM connection for companies using fixed line PBX.

Calls targeted to the GSM network can be diverted via Nokia 32. Thus the company gets a direct connection to a GSM network from the internal fixed line telephones without the costly interconnection fee between fixed and GSM networks.

Product Concept Generally

Nokia 32 PBX connectivity terminal is a GSM device for PBX (Private Branch Exchange) connections. Nokia 32 has interfaces for PBX trunk and extension connections and the trunk connection can be also used for normal landline telephone connection substituting fixed telephone line. The terminal also supports data connections with CSD, HSCSD and GPRS.

The telephone line connections for Nokia 32 are provided with standard two-wire connection through RJ-11 connectors. Each connection method, trunk and extension, have their own dedicated RJ-11 ports. The data connection is provided via RS-232 connection over a D9 female connector. In addition, Nokia 32 has interfaces for power supply and external antenna adapter. Nokia 32 internal antenna is used when there is no need for an external antenna.

The main purpose of Nokia 32 is to use it as a GSM router beside a company PBX. Company calls to GSM numbers are routed via Nokia 32 in order to gain cost savings in GSM-to-GSM calls and the fixed telephone line is bypassed. Nokia 32 also gives the opportunity to use GSM network features in landline environment.

Concept

(For list of abbreviations kindly refer to the manual section Modules.)

1. The Nokia 32 is connected to an analogue trunk interface of a PBX.

2. The Nokia 32 is connected to an analogue extension interface of a PBX.

The Nokia 32 is attached either to an analogue trunk (fig. 1) or an analogue extension

(fig. 2) line of the PBX.

Figure 1: Nokia 32 connected to a Trunk Interface of a PBX

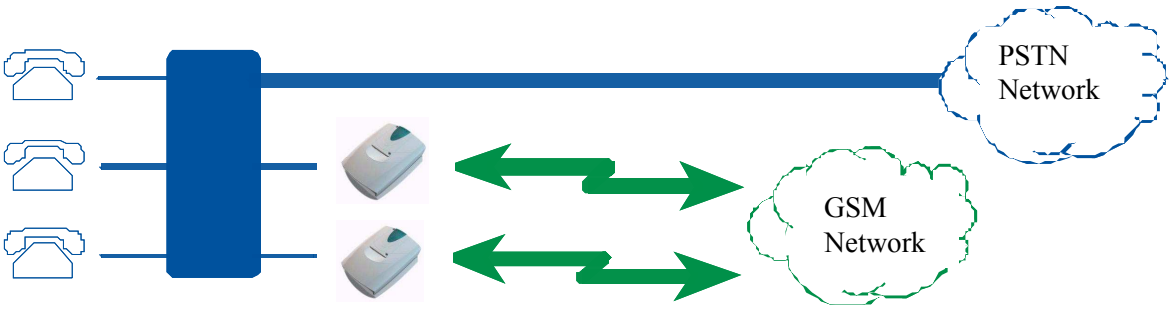
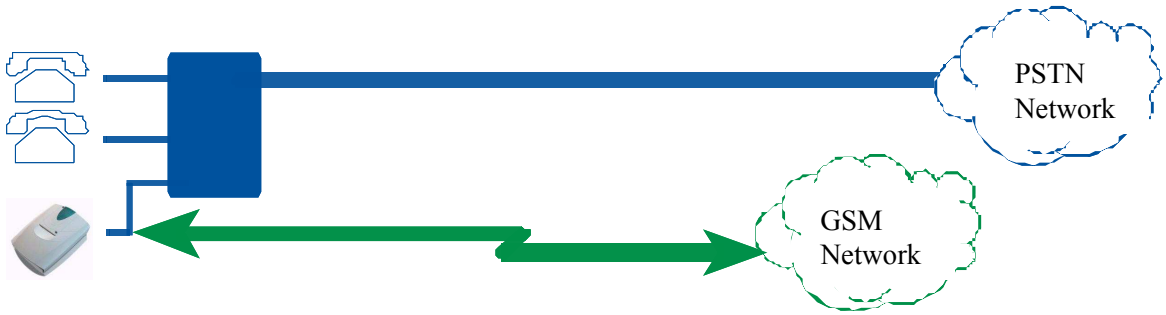


Figure 2: Nokia 32 connected to an analog extension interface of a PBX



After the Nokia 32 has been connected to a PBX, the PBX may require reconfiguration to route mobile targeted calls via the Nokia 32. This reconfiguration requires special know-how about the PBX. In order to perform successful installation, further information must be asked from the PBX supplier. In no conditions it is recommended to do the installation without adequate know-how and tools.

When Nokia 32 is connected to the extension side of the PBX, the originator of call affects to the routing by calling to the extension where Nokia 32 is connected and then keys in the targeted mobile number.

Nokia 32 Sales package contents

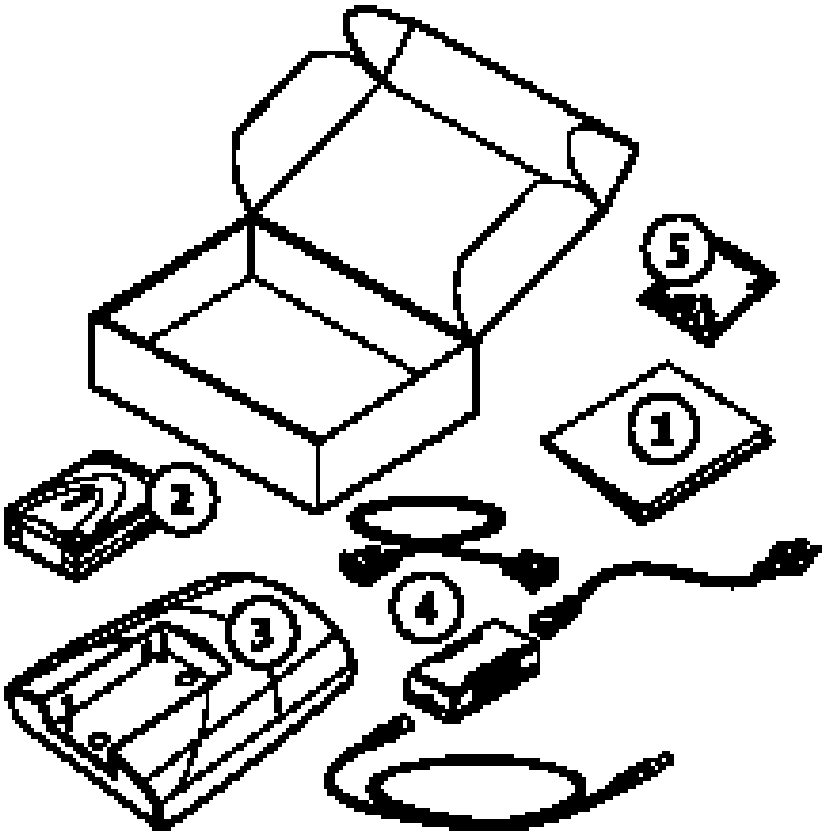


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Table 1: Nokia 32 sales package contents

Item	Name	Type code	Material code
1	User's Guide		
2	Connectivity Terminal	TME-3 TME-4	0600344 0600342
3	Application Module	DTX-3	0630596
4	Power Supply	ACW-5B	0630526
4	Power Cord alternatives	Euro: PCW-5 UK: PCW-5X US: PCW-5U	0730248 0730247 0730246
4	DC Cable	AKD-2A	0730248
5	Installation Kit		0262959

Technical Specifications

Mechanical Characteristics

Unit	Dimensions (mm)	Weight (g)	Notes
TME-3 terminal	84 x 53 x 26	65	Without power supply
DTX-3 Application Module	121 x 158 x 45	174	Without power supply

Technical specifications

Data Standard RS-232.

All applicable ITU-T V.25ter, ETSI GSM 07.07 and ETSI GSM 07.05 commands are supported.

HSCSD max 43.2kbits/s (Depending on operator services).

GPRS multi-slot class 6 (3+1, 2+2, 2+1).

User Interface Features

User Interface consist of three two-colour light indicators that show the state/mode of the TME-3 or TME-4 and DTX-3. Some user interface functionality is contained in the software application running in the host computer.

Environmental Conditions

Parameter	Ambient temperature (degrees Celsius)	Ambient humidity (relative)
Max operation	-10 to +55	20 to 75%
Storage	-40 to +85	5 to 95%, non condensing

TME-3/TME-4 is not protected against ingress of water. DTX-3 may be instantaneously subjected to dripped or condensed water. Longer term contact with water will cause permanent damage.

TME-3/TME-4 and DTX-3 do not break mechanically after a free fall from 100cm (about 40 inches) height to a concrete floor.

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Modules

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Glossary of Terms

ACCIf	Accessory Interface block of MAD2WD1
AIF	Application Interface
ASIC	Application Specific Integrated Circuit
BB	Baseband
CCONT	Power management IC for digital phones
CIS	PCMCIA Card Information Structure
COBBA_GJP	DCT3 RF-interface and audio codec ASIC with serial MAD interface
CSP	Chip Scale Package
DB	Dual band
DCS1800	Digital Cellular system at 1800 MHz
DCT3	Digital Core Technology, 3rd generation
DSP	Digital Signal Processor
EMC	Electromagnetic compatibility
EMI	Electromagnetic Interference
FBUS	Asynchronous Full Duplex Serial Bus
GSM	Global System for Mobile communications
HSCSD	High Speed Circuit Switched Data
MBUS	1-wire half duplex serial bus
MCU	Micro Controller Unit
MDI	MCU-DSP Interface
MAD	**M**CU+**A**SIC+**D**SP asic, common name for whole family
MAD2PR1	Modified MAD2 asic, pin count 144 instead of 176
MAD2WD1	**M**CU+**A**SIC+**D**SP with HSCSD specific changes

PA	Transmit Power Amplifier
PBX	Private Branch Exchange
PC	Personal Computer
PWB	Printed Wiring Board
PCM	Pulse Code Modulation
PCM SIO	Synchronous serial bus for PCM audio transferring
PCMCIA	PC Memory Card International Association
PSTN	Public Switched Telephone Network
RF	Radio Frequency
SIM	Subscriber Identity Module
SMART	PCMCIA interface ASIC
Sulo	PCMCIA interface ASIC for RPM-3
UI	User Interface
VCXO	Voltage Controlled Crystal Oscillator
VCTCXO	Voltage Controlled Temperature Compensated Crystal Oscillator.

Functional Description of DTX-3

Circuit Description

The DTX-3 application module connects the TME-3/TME-4 with the fixed telephone network and/or with any unmanned connection, e.g. telemetry, remote control, security systems, remote data retrieval.

The Data module baseband blocks provide the MCU, DSP, external memory interface and digital control functions in the UPP ASIC . Power supply circuitry, charging, audio processing and RF control hardware are in the UEM ASIC.

The purpose of the RF block is to receive and demodulate the radio frequency signal from the base station and to transmit a modulated RF signal to the base station.

Product and Module List

Name of module	Type code	Material code	Notes
Application module	DTX-3	0630596	
Transceiver	TME-3	0600344	
Assembly parts	A-cover B-cover	9458825 9458911	Assembly parts must be ordered as separate spare parts
Transceiver	TME-4	0600342	

Interfaces and Connectors

Telephone interface /PBX Trunk interface:

Signals	Value
High Impedance Mode	50V
Ringing Voltage	70VAC
Line Impedance	600 Ω

Telephone interface /PBX Extension interface:

Signals	Value
Off-Hook AC impedance	600 Ω
On-Hook AC impedance	150k Ω
On-Hook DC resistance	10M Ω
Loop DC current	Min. 15 mA, max. 120mA

Connector Name
RJ-11 Trunk/Extension Connector
M2M System Connector
RS232 connector
Power connector
Antenna connector

RJ-11 Trunk/Extension Connectors

This interface is a standard analog 2-wire interface for analog PBX trunk or analog land-line telephone, or for analog PBX extension.

M2M System Connector

Custom pin header 2x25 for connection between GSM and PBX Application module.

RS 232 Data Connector

D9 female connector for standard level RS 232 data.

Power Supply Connector

Connector for ACW-5B power supply.

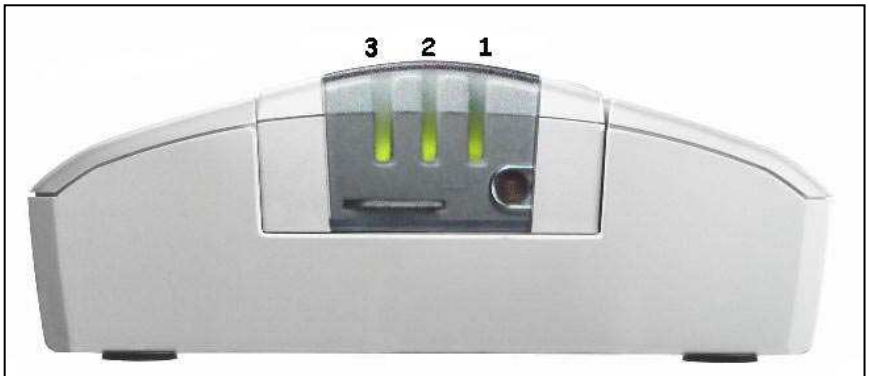
Antenna connector

TME-3 external antenna connector.

Nokia 32 LED Indicators

TME-3 comprises three indicator LEDs:

Figure 1: Indicator LEDs



LED Indicator status:

Table 1: Nokia 32 LED indicator status during start-up

LED 1	LED 2	LED 3	Description	
-	-	-	Power off	
Green scan	Green scan	Green scan	Power on, connecting to network	
-	Red blink	-	PIN query/ new PIN query	
-	Red blink	Red blink	PUK query	
			Intensity of Field Strength	
Red blink	-	-	Unacceptable	<- 105 dBm
Green blink	-	-		-105 ... -100 dBm
Green			Weak	-100 ... -95 dBm
Green	Green blink			-95 ... -90 dBm
Green	Green		Moderate	-90 ... -85 dBm
Green	Green	Green blink		-85 ... -80 dBm
Green	Green	Green	Good	>-80 dBm

Table 2: Nokia 32 LED indicator status during normal operation

LED 1	LED 2	LED 3	Description
	Green	Green	In service, trunk mode
Green		Green	In service, extension mode
*	*	Green blink	Call on
*	*	Green blink	Incoming call
*	*	Green/Red blink	Message received/ Voice mail in box
*	*	Red blink	Message storage full

*) Led state due to current mode (trunk/extension) of the Nokia 32 terminal

Table 3: Nokia 32 LED indicator status in special situations

LED 1	LED 2	LED 3	Description
Green/Red blink	Green/Red blink	Green/Red blink	Insert SIM card
Red blink	Red blink	Red blink	Failure, contact service
Yellow	Yellow	Yellow	Initialising

"SMS message received" signal will be resetted by off-hook, which also clears the message from the message box.

Signal tones

Tone sequence	Description
- - - - - - - - - - - - - - - - - -	Insert SIM card
- _ _ - _ _ - _ _	Enter PIN code
_ _ _____ _____	Enter PUK code
- - - -	Error tone ()
_____ _____	Ok
-- -- -- -- -- --	SMS received

Key Sequences

These sequences have to be entered using a normal landline telephone set connected to the trunk connector of Nokia 32

Table 4: Nokia 32 button sequences used in trunk mode.

Sequence	Functionality	Response
PIN#	PIN code input	Tone
PUK#	PUK code input	Tone
0**value	Volume control, louder. 'Value' from 1 to 10.	Tone
555**#	System reset	Tone
	CONFIGURATION STATE	
####	Configuration state	Tone / Light indication
	Acces code query state	PIN Query tone and light
1234#	Acces code enter. Default acces code. Acces code can be changed or query can be disabled	Tone / Light indication
2**XXXX#	XXXX = interruption time in milliseconds. XXXX= 0 = LI disabled. Default 400ms. Back to configuration state	Tone / Light indication
3**XXXX#	XXXX = Reversal time in milliseconds (999 => polarity reversed whole call time)	Tone / Light indication
4#	Entry code to CLI mode changing	Query state flashing
4**XXX#	XXX= 000 = ETSI FSK (default) 001 = DTMF 010 = DTMF_DK 111 = None	Tone / Light indication
5#	Entry code to operator selection. If roaming user can select the operator entering operator code. If 000 operator will be selected automatically.	Query state flashing
5**XXX#	XXX = operator number 000 = default (automatic selection)	Network searching. Tone and light indication about the succes.
5#	Entry code to ...	
444*OLD PIN*NEW PIN#	Change PIN code	Tone / Light indication
888*OPERATOR CODE#	Change Operator if roaming	Tone / Light indication

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DTX-3 Parts List

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Variants of DTX-3 Nokia 32

Transceiver Variants

Table 1:

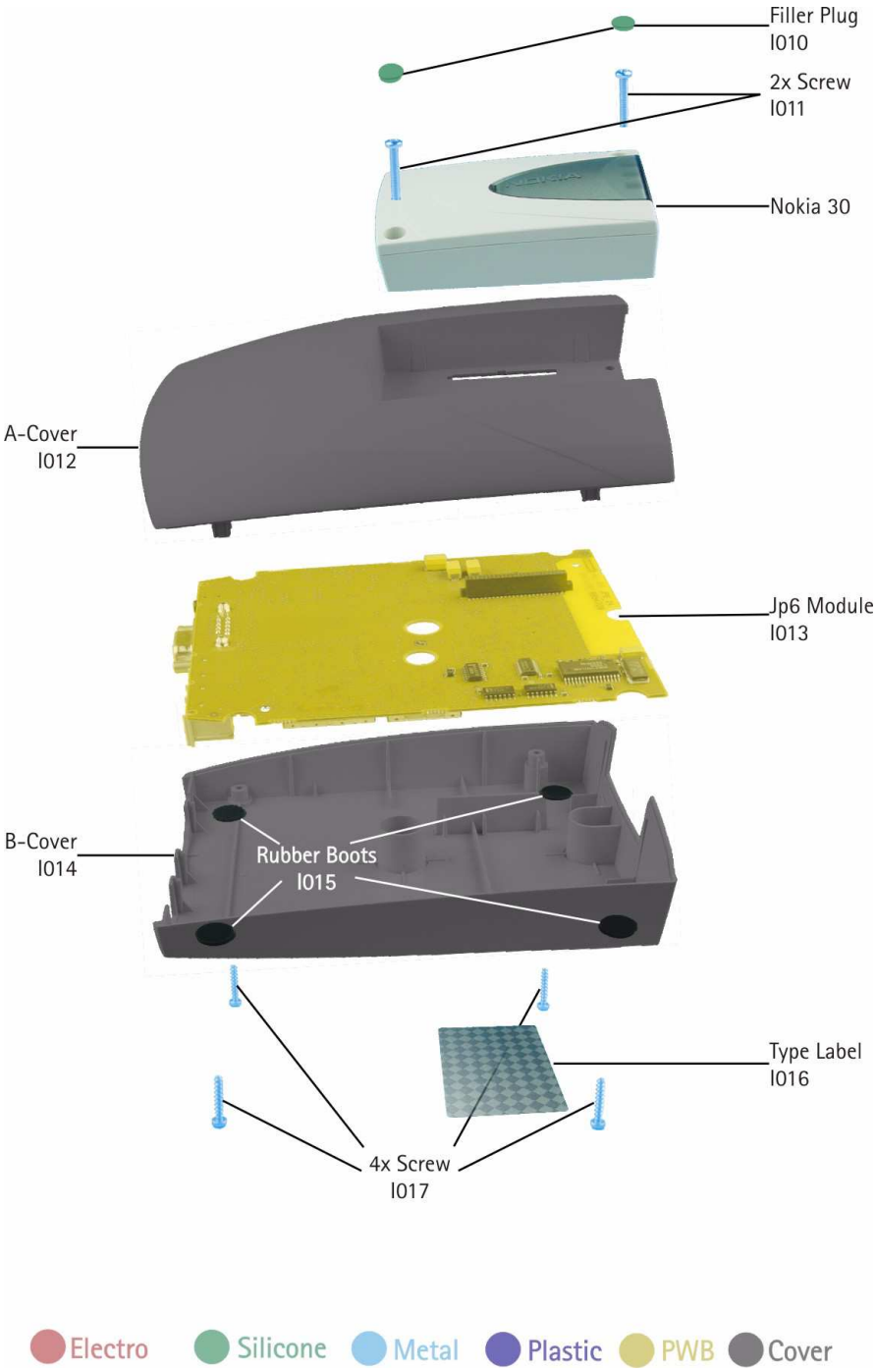
Name	Type des.	Code
Transceiver TME-3	TME-3	**0600344**
Transceiver TME-4	TME-4	**0600342**

Country-specific settings

The country code allows different country-specific settings to be activated in SWAP-module. Choose Software -> Line Adapter -> Settings.

DTX-3 Exploded Diagram

The following picture shows the exploded view of DTX-3 module.



The application module consists of two injection moulded plastic parts, frame and bracket for the Application Interface connector (pin header) and a PWB inside the module.

DTX-3 Assembly Parts List

Table 2:

Part Number in Exploded View	Qty	Part Name	Material Code
I010	2	Filler plugs	
I011	2	Screws 3x18 T10	6150081
Nokia 30/Nokia31	1	TME-3	0600344
I012	1	A-cover	9458825
I013	1	JP-6	0201946
I014	1	B-cover	9458911
I015	4	Rubber Boots	xxx
I016	1	Type Label	9370625
I017	4	Screws 2.5x12 T8	6290141

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Service Software

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General

To run the Service Software, a software protection device (PKD–1) has to be connected to the parallel port. TDF–4 box must connected to PC for flashing purposes.

Note: if this software is to be run on laptops, the power saving feature MUST be switched off.

Hardware requirements for Windows 98/NT

The recommended minimum hardware standard to run Service Software is any computer which has a Pentium processor, memory 8 MB and meets HW requirements recommended by Microsoft.

Software Environment of the Support Modules

The Service Software user interface is intended for the following environments: Microsoft Windows 3.11 (enhanced mode), Windows 95/98 and Windows NT. 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 the Microsoft Windows Users Guide.

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. There is always a status bar displayed at the bottom of the main window which contains information about current actions.

Installation

Mechanical Connections

Caution: Make sure that you have switched off the PC and the printer before making connections.

Caution: Do not connect the PKD–1 key to the serial port. You may damage your PKD–1 !

Please refer to *service setup* in this chapter for information regarding different flash setups.

Attach the dongle PKD–1 to the parallel port 1 (25–pin female D–connector) of the PC.

When connecting PKD–1 to the parallel port, be sure that you insert the computer side of the PKD–1 to the PC (male side). If you use a printer on parallel port 1, install the PKD–1 between the PC and your printer cable.

The PKD–1 should not affect 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.

Installing the Service Software on PC Hard Disk

The program is delivered on a diskette and is copy protected with a PKD–1 dongle. It must be present in parallel port when using Service Software.

The program must be installed on the hard disk before use.

Keep the original diskette safe to enable upgrading of the program !

Flash Prommer (FPS-4)

Installation instructions can be found at the following intranet address:-

http://www.nmp.nokia.com/sasw/projects/prommer/manual/manual.htm

First time installation of WinTesla:

Do the following to make a complete WinTesla installation with support for DTX-3:

Insert the WinTesla software diskette into the floppy drive on your computer (i.e. Drive A:)

For Windows 3.1 and 3.11:

Start Windows, type *win <Enter>*

Open the File manager, open Main window and start File manager.

Select the floppy drive and:

Start installation, double–click the *wt_inst.exe* file.

Follow the instructions on the screen. Write down the directory where WinTesla is installed on your hard disk.

When installation has finished remove the WinTesla software disk from your floppy drive.

Insert the Dongle driver diskette into your floppy drive.

Select the floppy drive and:

Start installation, double–click the *dk2wn16.exe* file.

Follow the instructions on the screen.

When installation has finished remove the dongle driver software disk

from your floppy drive.

Continue with the support modules installation.

For Windows 98 and NT:

Open Microsoft Explorer, Select *Start –Programs – Explorer*

Select the floppy drive and:

Start installation, double–click the *wt_inst.exe* file.

Follow the instructions on the screen. Write down the directory where WinTesla is installed on your hard disk.

When installation has finished remove the WinTesla software disk from your floppy drive.

Insert the Dongle driver diskette into your floppy drive.

Select the floppy drive and:

Start installation, double–click the *dk2wn32.exe* file.

Follow the instructions on the screen.

When installation has finished remove the dongle driver software disk from your floppy drive.

Continue with the support modules installation.

Installation of DTX-3 support modules (WinTesla already installed):

To install the new Service Software Program, follow the steps below:

Insert the new Service software diskette into the floppy drive on of your computer (i.e. Drive A:)

CCS homepage

Service Software can also be downloaded from the following address:

http://calns01net.europe.nokia.com/nmp/rd/pams/softrel.nsf/sr2

For Windows 98 and NT:

Open Microsoft Explorer, select *Start –Programs– Explorer*

Select the floppy drive.

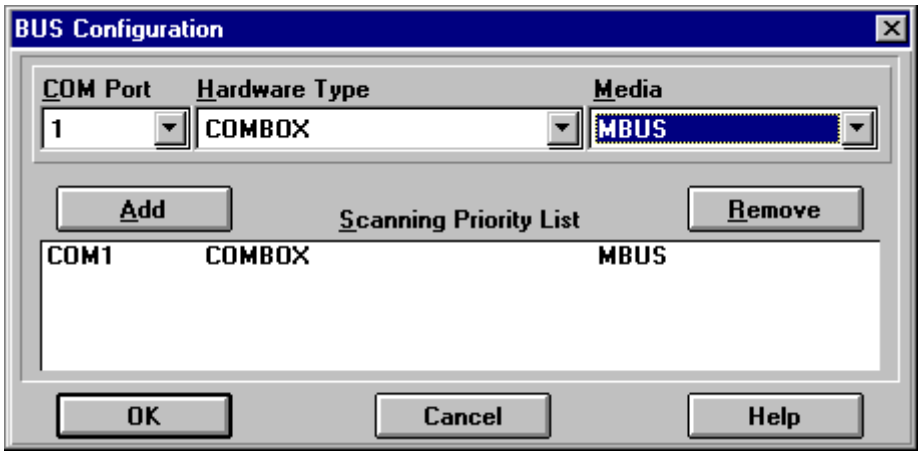
Start installation, double–click the *asinstall.exe* file.

Follow the instructions on the screen.

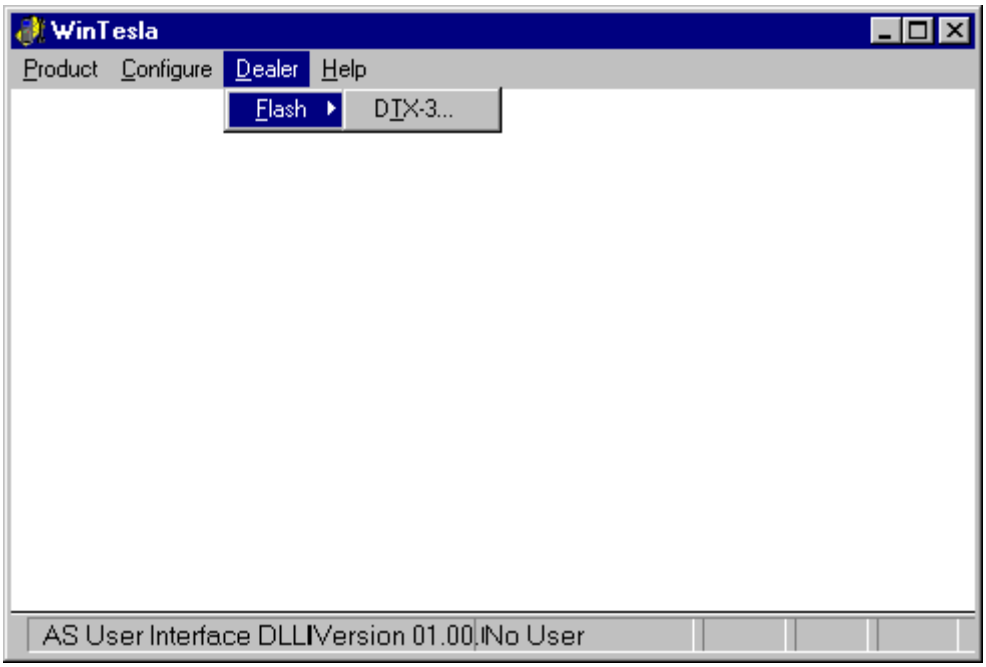
Flash Instructions for DTX-3

The Nokia 32 PBX Connectivity application module is flashed in the following way:

1 For flashing the DTX-3 application module, the Bus configuration must be changed to COMBOX. Select Configure -> Buses.

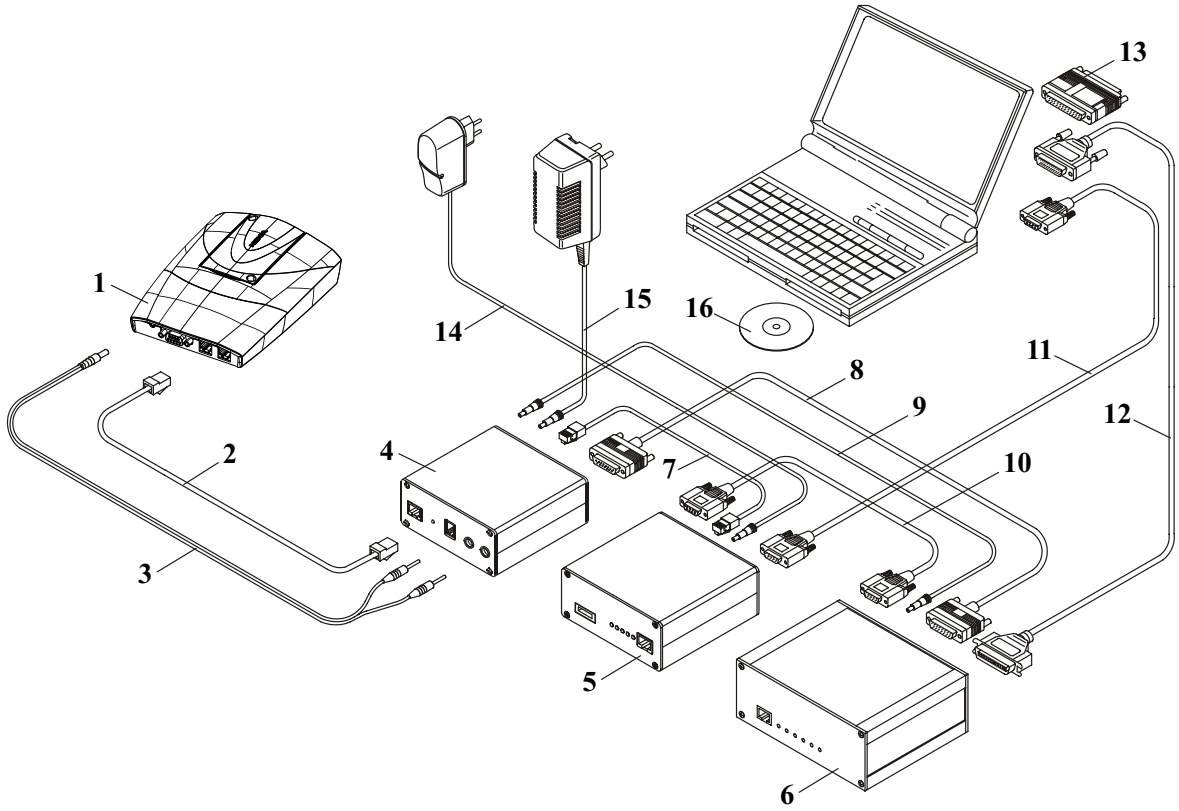


2 Select Product -> Product Open -> DTX-3. Select Yes to open the Flash Menu and select Dealer -> Flash -> DTX-3.



Flash Concept for DTX-3

Note! DKT-6A Flash Cable is connected to trunk connector.

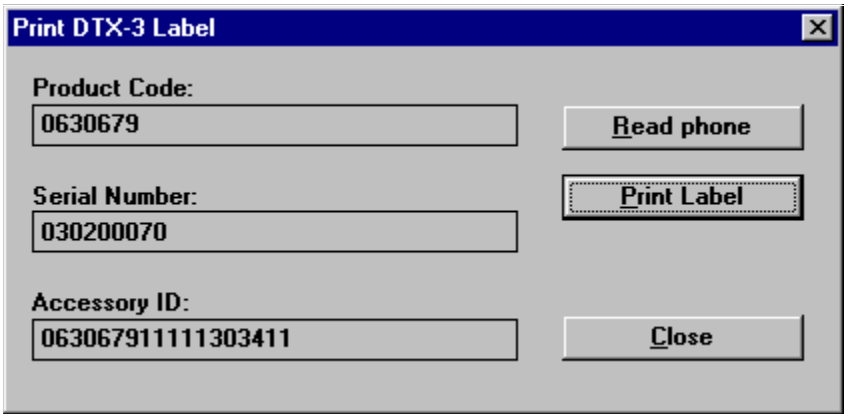


1	DTX-3	Application Module	0630596
2	DKT-6A	Flashing Cable	0730213
3	PCC-1B	DC Power Cable	0770050
4	FLA-7	Flash Loading Adapter	0770119
5	TDF-4	Flash Security Box	0770106
6	FPS-4	Flash Prommer	0750090
7	XMS-3	Service Cable	0730174
8	AXS-5	D15 - D15 Cable	0730091
9	SCF-7	DC Power Cable	0730141
10	AXS-4	D9 -D9 Cable	0730090
11	AXS-4	D9- D9 Cable	0730090
12		Printer Cable	0730029
13	PKD-1	Software Protection Key	O750018
14	ACH-6E	Charger	0675084
15	ACS-6E	Charger	0680016
16		Service SW for DTX-3 can be downloaded from:	
		http://www.nmp.nokia.com/nmp/ccsweb.nsf	
		(software selection)	

Label printing

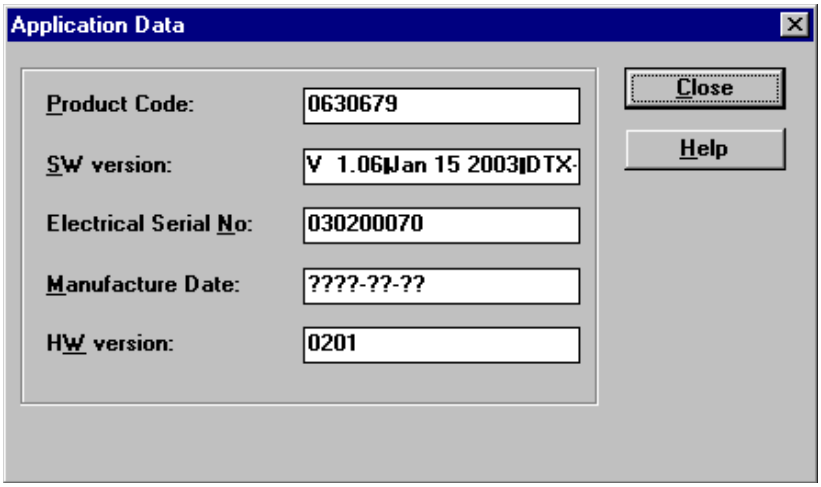
The label printing function is like N22 label printing function, but it contains only the application module label. GSM terminal labels are removed. With N32 it is possible to read the product codes directly from the application module. With N22 the product code is entered manually.

Choose Software -> Print Label



Identification

Choose Software -> Production Data



The information should be readable, not editable.

Product code

The product code is shown same way as in N22 service application.

SW version

The SW version is shown same way as in N22 service application.

PSN

The electrical serial number can be read same way as in N22 service application.

Manufacture date

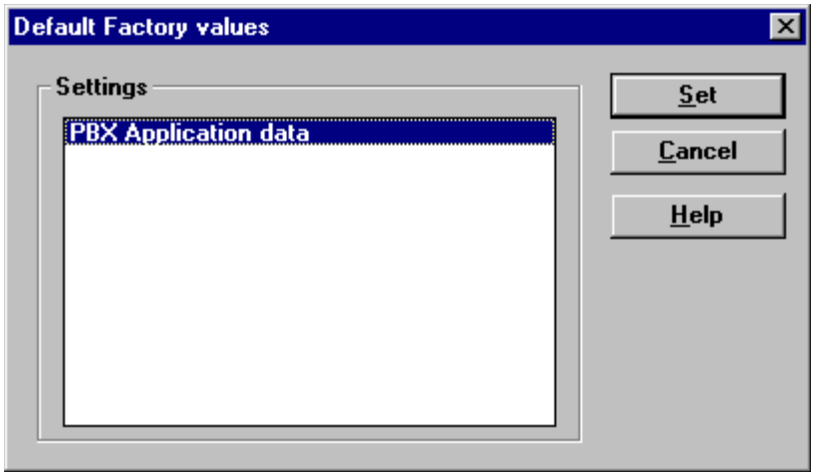
This information is set by manufacturing site. Date should be stated in format YYYY-MM-DD. It is essential for warranty period information.

HW version

The HW version is shown same way as in N22 service application.

Default factory values

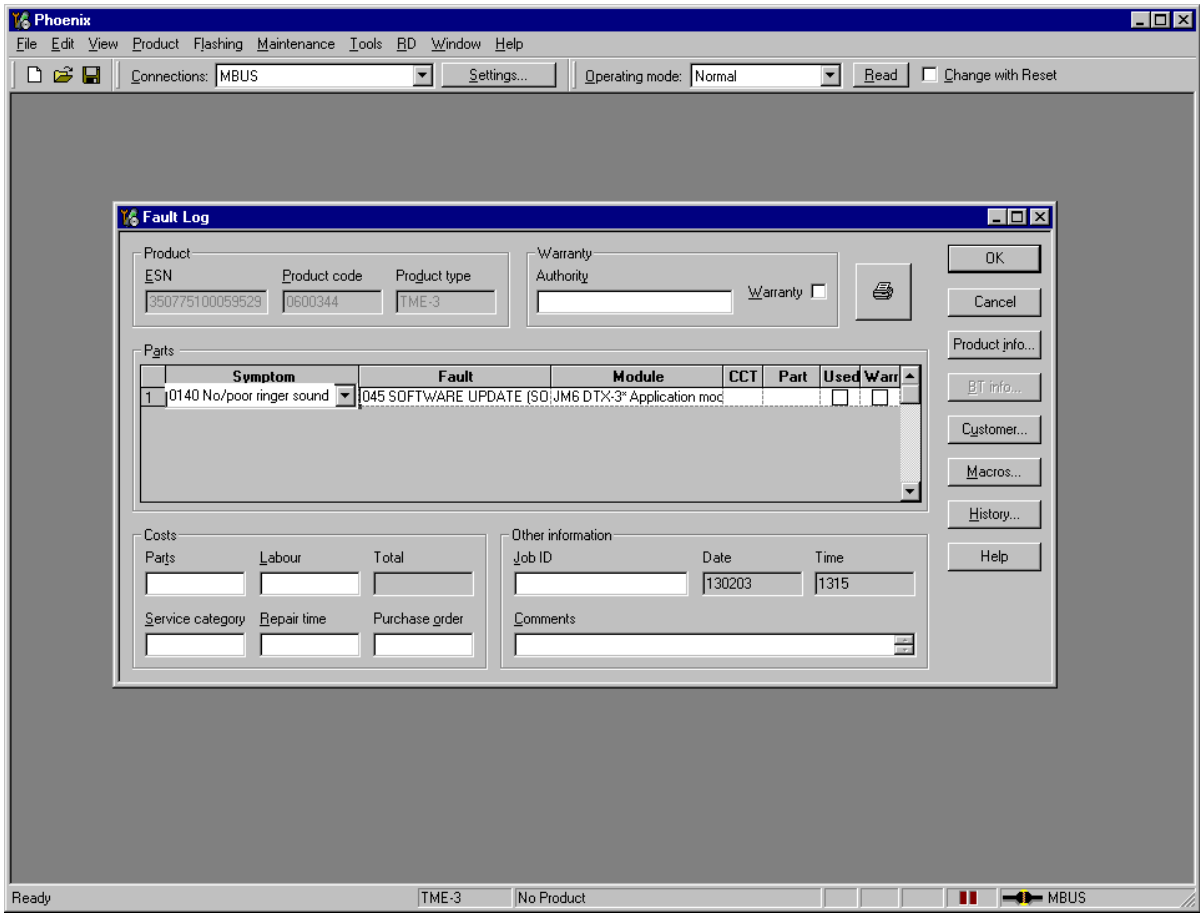
Figure 1: Choose Software -> Set Factory Values



This command is used for re-setting factory values to the EEPROM of the Application Module.

Fault logger

The N32 PBX Connectivity application module fault logger works in TME-3/4 Phoenix. New module "reason" is PBX Application Module DTX-3, needs to be added to TME-3/4 Phoenix.



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Service Tools

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Flash Loading Adapter FLA-7

The flash loading adapter FLA-7 is used in MCU SW upgrade. Service cable DKT-6A is also needed.

Power is supplied to FLA-7 from ACH-6E charger. Power for the FPS-4 can be connected via FLA-7 by SCF-7 DC power cable.

The adapter is connected to the flash prommer FPS-4 by the AXS-5 cable and to the security box TDF-4 by the XCM-1 cable.

Product Code

Flash Loading Adapter FLA-7: 0770119

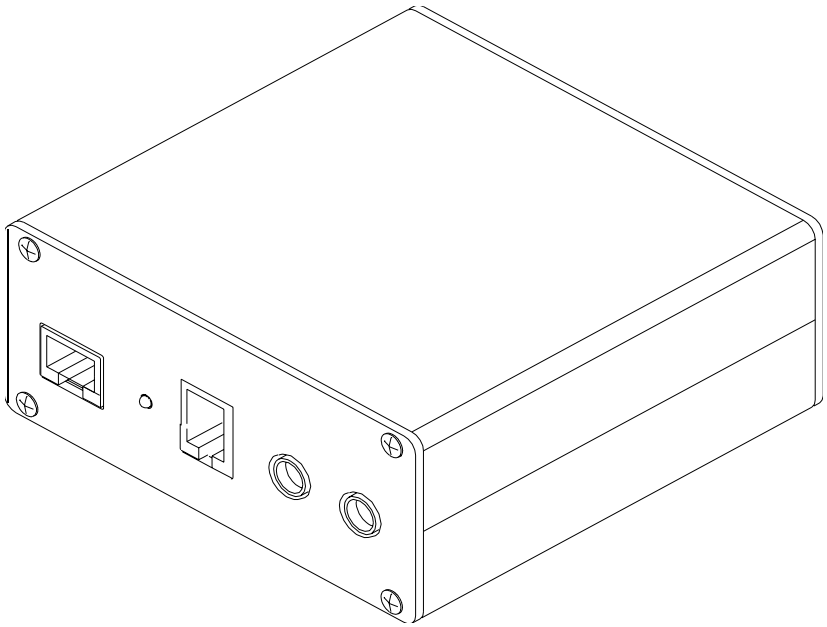


Figure 1: View of FLA-7

Flash Prommer FPS-4 (Sales Pack)

The flash prommer FPS-4 is used to update the main software of the phone. Updating is done by first loading the new MCU software from the PC to the flash prommer, and then loading the new SW from the prommer to the phone. When updating more than one phone in succession, the MCU soft ware only needs to be loaded to the prommer once.

The sales pack includes:

- Charger ACS-2	4624582
- Printer Cable	0730029
- D9 - D9 Cable AXS-4	0730090
- AXD-1 DC-Cable	0730144
- SW disc	0774228 and 0774043

Note! Due to hardware changes in RPM-3 product installation software has been updated to contain RPM-3 specific files. Make sure that you have newest FPS-4 software before you start setting up SW upgrade equipment.

Product Code

Flash Prommer FPS-4: 00750090

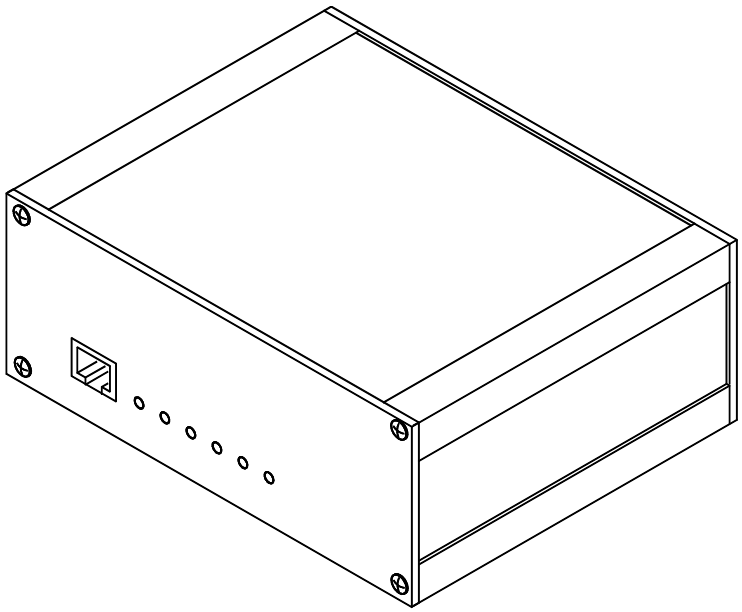


Figure 2: View of FPS-4

Security Box TDF-4

The security box TDF-4 is required for updating MCU software, and infra red testing.

Note: TDF-4 is delivered in de-activated mode.

Fill in the enclosed Activation Request Form, and fax to NMP Salo to get the activation code.

Product Code

Security Box TDF-4: 0770106

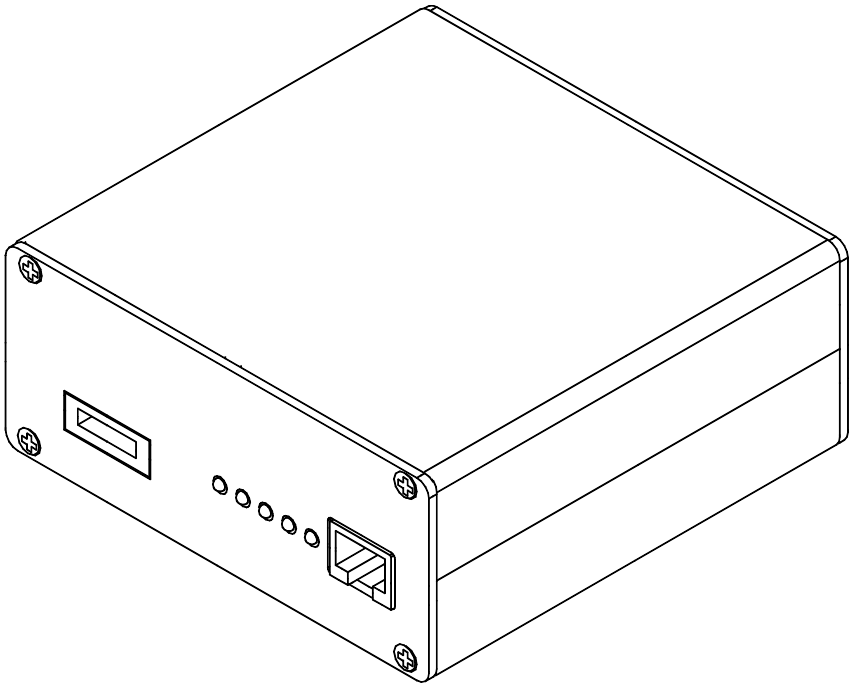


Figure 3: View of TDF-4

DC Power Cable SCF-7

The DC power cable SCF-7 is used for connecting power from ACL-3 charger via FLA-7 to FPS-4.

Product Code

DC Power Cable SCF-7: 0730141

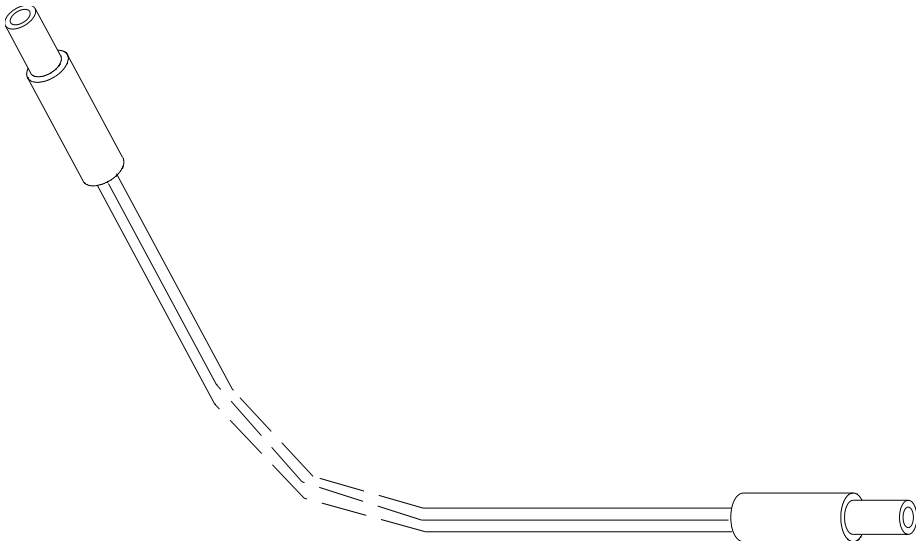


Figure 4: View of SCF-7

D9-D9 Cable AXS-4

The D9-D9 cable AXS-4 is used to connect two 9-pin D-connectors, for example, between PC and TDF-4 security box. The D9-D9 cable AXS-4 is used to connect TDF-4 security box to FPS-4 Flash Prommer.

Product Code

D9 - D9 Cable AXS-4: 0730090

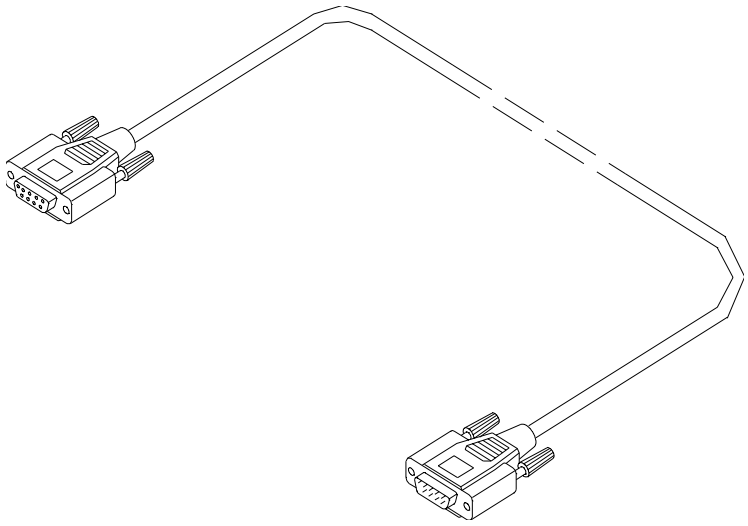


Figure 5: View of AXS-4

D15-D15 Cable AXS-5

The D15-D15 cable AXS-5 is used to connect two 15-pin D-connectors, for example, between FLA-7 and FPS-4.

Product Code

D15-D15 Cable AXS-5: 0730091

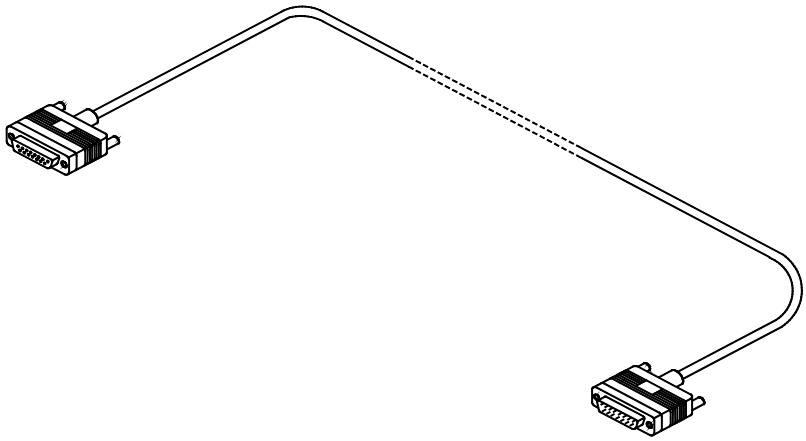


Figure 6: View of AXS-5

Service Cable DKT-6A

Service Cable DKT-6A is used to connect FLA-7 to DTX-3.

One connector a 6-pin modular connector, the other is a 10-pin modular connector.

Product Code

Modular Cable DKT-6A: 0730213

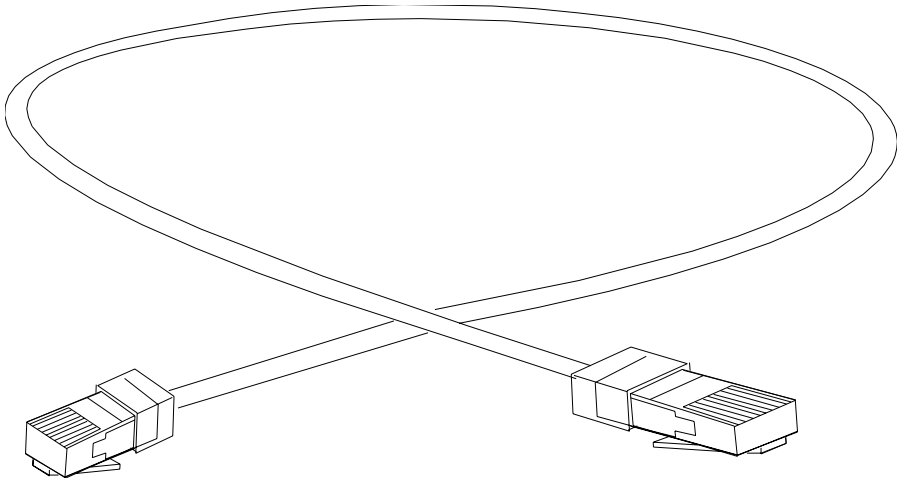


Figure 7: View of DKT-6A

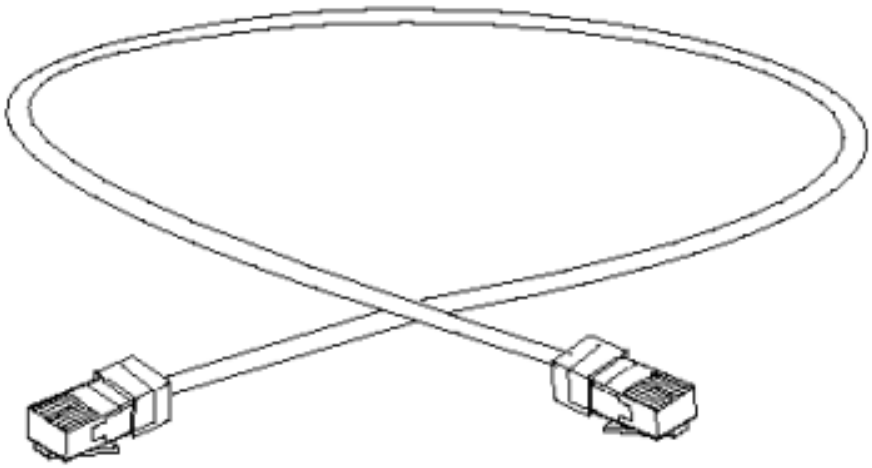
Line Adapter Test cable SCS-24

Line Adapter Test Cable SCS-24 is connected between trunk connector and T-adapter when testing the Nokia 32 Application Module. It consists of 50 cm flat 6-core cable with a 6-pin modular connector at each end

Product Code

Line Adapter Test Cable SCS-24 0730223

Figure 8: View of SCS-24



SW Security Device PKD-1

SW security device is a piece of hardware enabling the use of the service software when connected to the parallel (LPT) port of the PC. Without the dongle present it is not possible to use the service software. Printer or any such device can be connected to the PC through the dongle if needed.

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

Caution: Do not connect the PKD-1 to the serial port. You may damage your PKD-1!

Product Code

SW Security Device PKD-1: 0750018

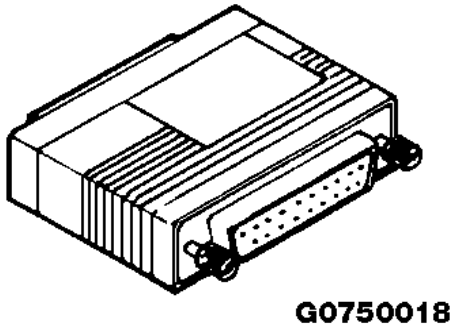


Figure 9: View of PKD-1

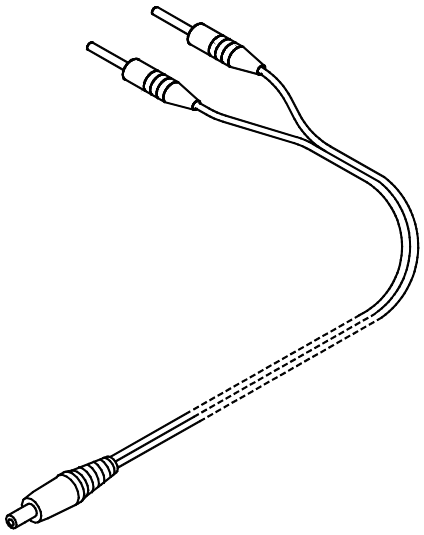
Power Cable PCC-1B

Power Cable PCC-1B is used to connect the DTX-3 application module with the Flash Loading Adapter.

Product Code

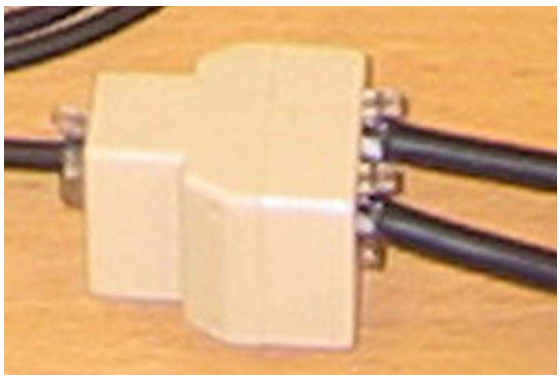
Power Cable PCC-1B: *0770050*

Figure 10: View of PCC-1B



Modular T-Adapter

Modular T-Adapter is used in testing the Nokia 32 Application module. SCS-24 Line Adapter Test Cable from trunk Connector and CA-15DS Line Adapter test cable from extension connector are connected to the T-Adapter during loop test. DKT-7A MBUS Cable is also connected to the T-connector to make the connection to PC.



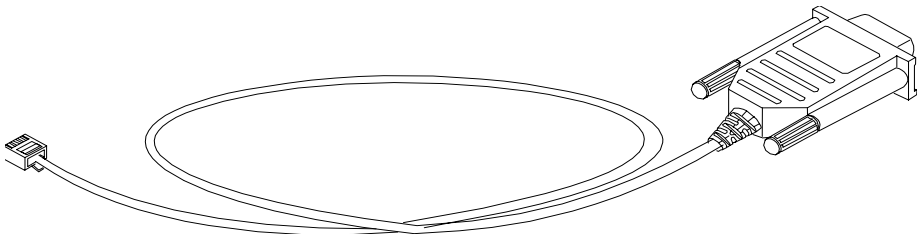
MBUS Cable DKT-7A

Service MBUS cable connects the PC to the T-Adapter when testing the Nokia 32 Application Module.

Product Code

MBUS Cable DKT-7A: *0730211*

Figure 11: MBUS Cable DKT-7A



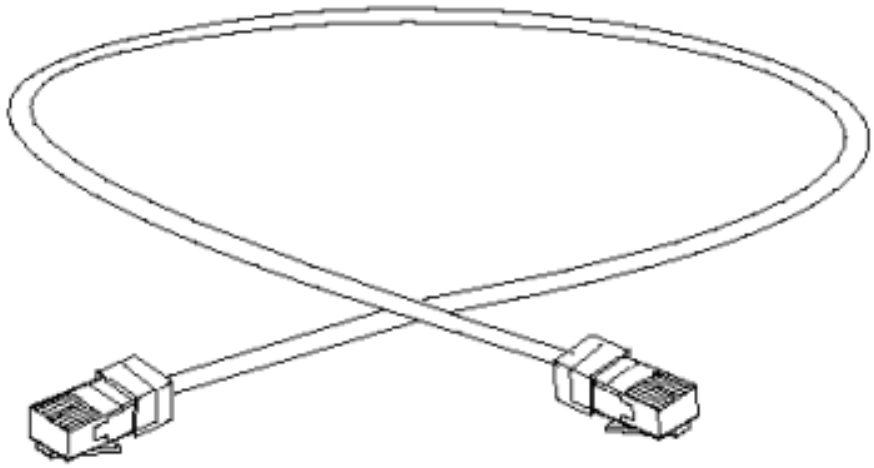
Line Adapter Test Cable CA-15DS

Line adapter test cable CA-15DS is connected between extension and T-connector (4626134) when testing the Nokia 32. It consists of 50cm of flat 6-core cable with 6-pin modular connector at each end.

Product Code

Line Adapter Test Cable CA-15DS: 0730302

Figure 12: Line Adapter test cable CA-15DS



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Customer Care Solutions
DTX-3 Series Transceivers

Disassembly and Troubleshooting

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Introduction

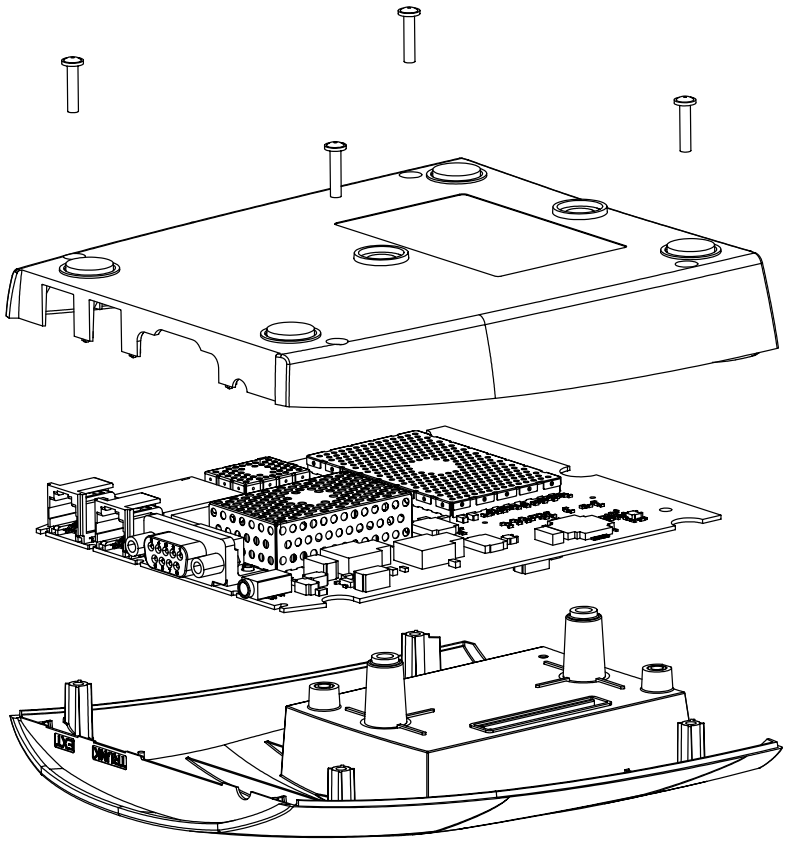
The purpose of this document is to help in hardware troubleshooting of the Nokia 32 PBX Connectivity Terminal.

TME-3/TME-4 troubleshooting is described in the TME-3/TME-4 manual.

DTX-3 module is not designed to be repaired, except for the Application Interface Connector.

Disassembly, DTX-3

Figure 1: DTX-3 disassembly



Troubleshooting

General

The purpose of this document is to help the service point to solve which part of the radio is faulty. The service policy with the Nokia 32 connectivity terminal is, that only the TME-3/TME-4 will be repaired.

Both TME-3 and DTX-3 covers can be replaced if necessary.

Equipment needed:

- SIM card without PIN query
- ACW-5 Adapter
- ACW-5 mains cable
- ACW-5 power cable
- A landline telephone
- A Nokia 32 (including TME-3/TME-4 and DTX-3 modules)
- T-piece
- DKT-7A service cable
- CA-15DS audio test cable
- SCS-24 audio test cable
- Personal computer (PC)

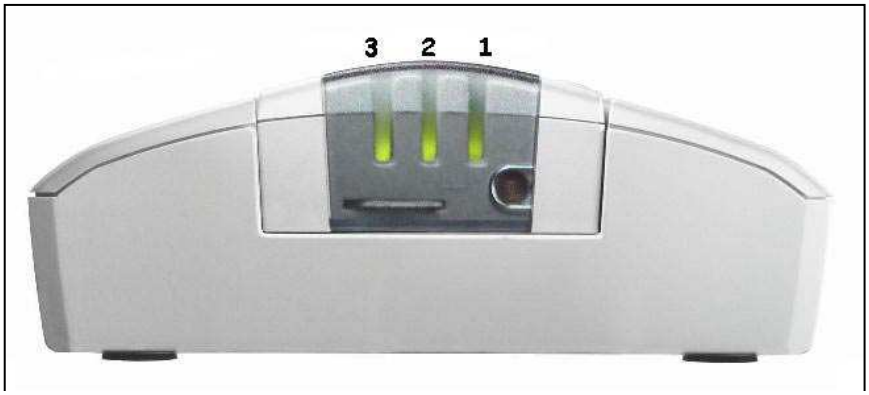
Software needed:

- Wintesla sw for DTX-3

Visual overlook

The LED indicators are split into two parts:

Figure 2: LED indicators



LED indicators 2&3 are used to tell in which mode the line adapter is at the moment. LED indicator 1 is used to tell the state of the embedded GSM terminal. At least one LED indicator from both parts should be on or blinking. If e.g. both LED indicator 2 and LED indicator 3 are off, the fault most probably is in the application module.

Initial connections:

1. Insert SIM card to TME-3/TME-4.

2. Attach DTX-3 to TME-3/TME-4.

3. Connect CA-15DS cable between one input port of T-piece and EXT connector.

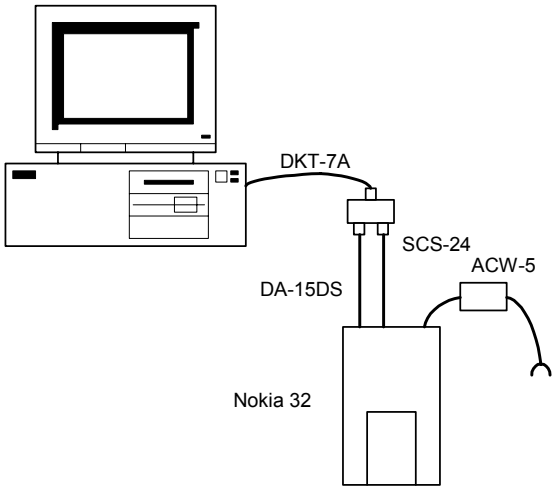
4. Connect SCS-24 cable between the other input port of T-piece and TRUNK connector.

5. Connect cable DKT-7A between output port of T-piece and PC.

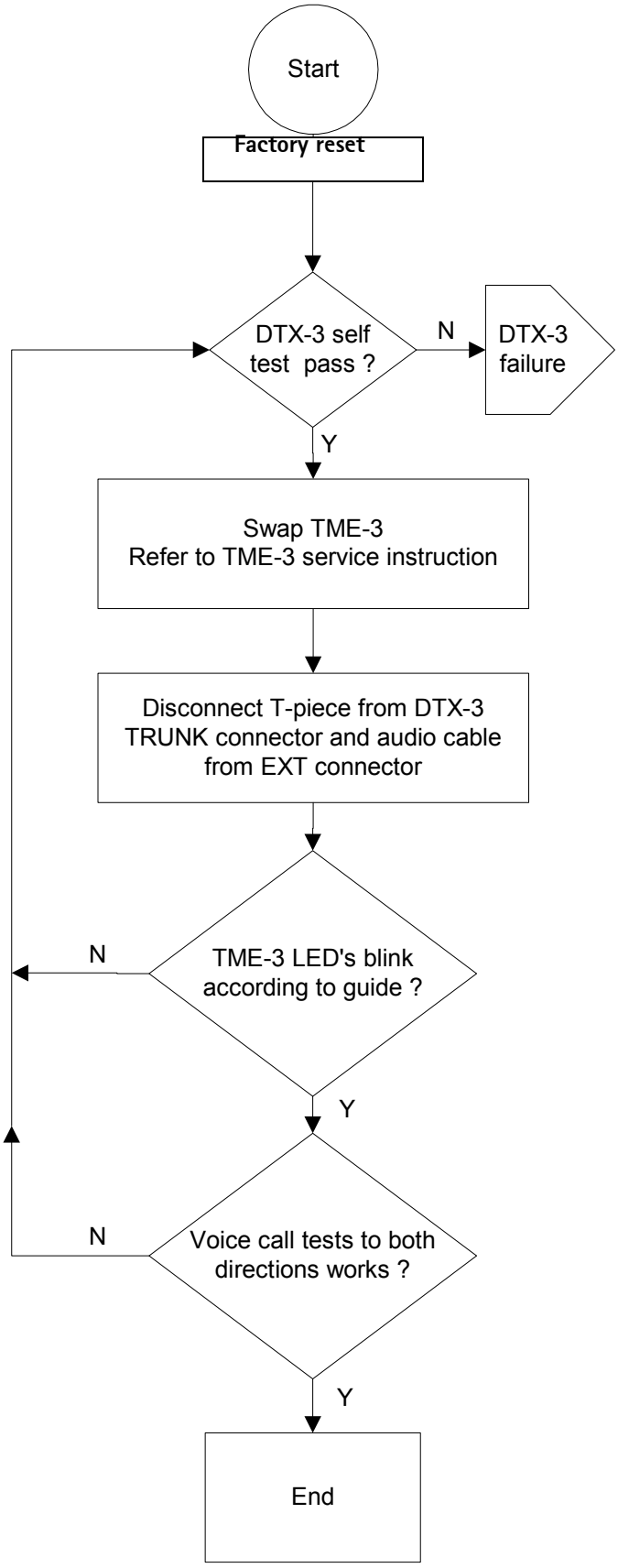
6. Connect power cable between DTX-3 and ACW-5.

7. Connect mains cable between ACW-5 and mains plug. See the instructions on the bottom side of the adapter.

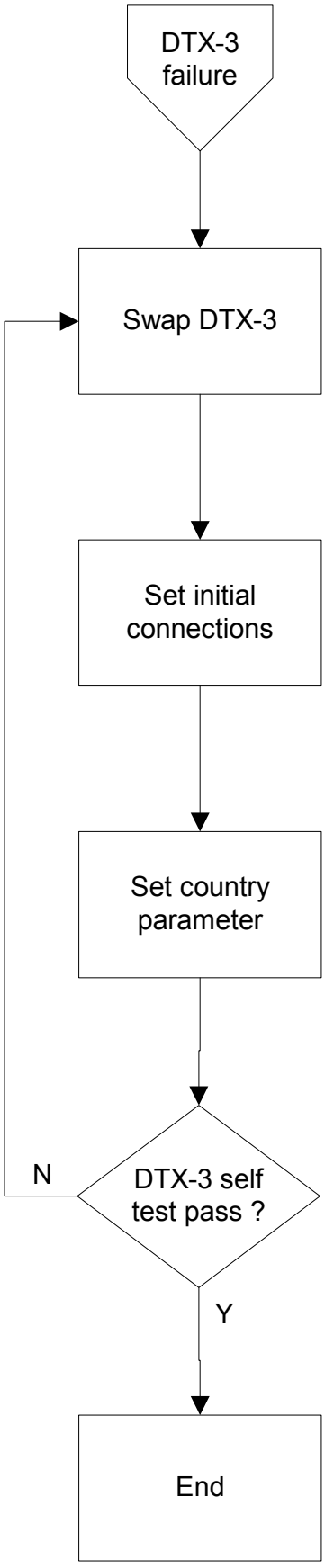
8. Choose Testing -> Self Tests... from Wintesla.



Troubleshooting flowchart for Nokia 32 and TME-3/TME-4



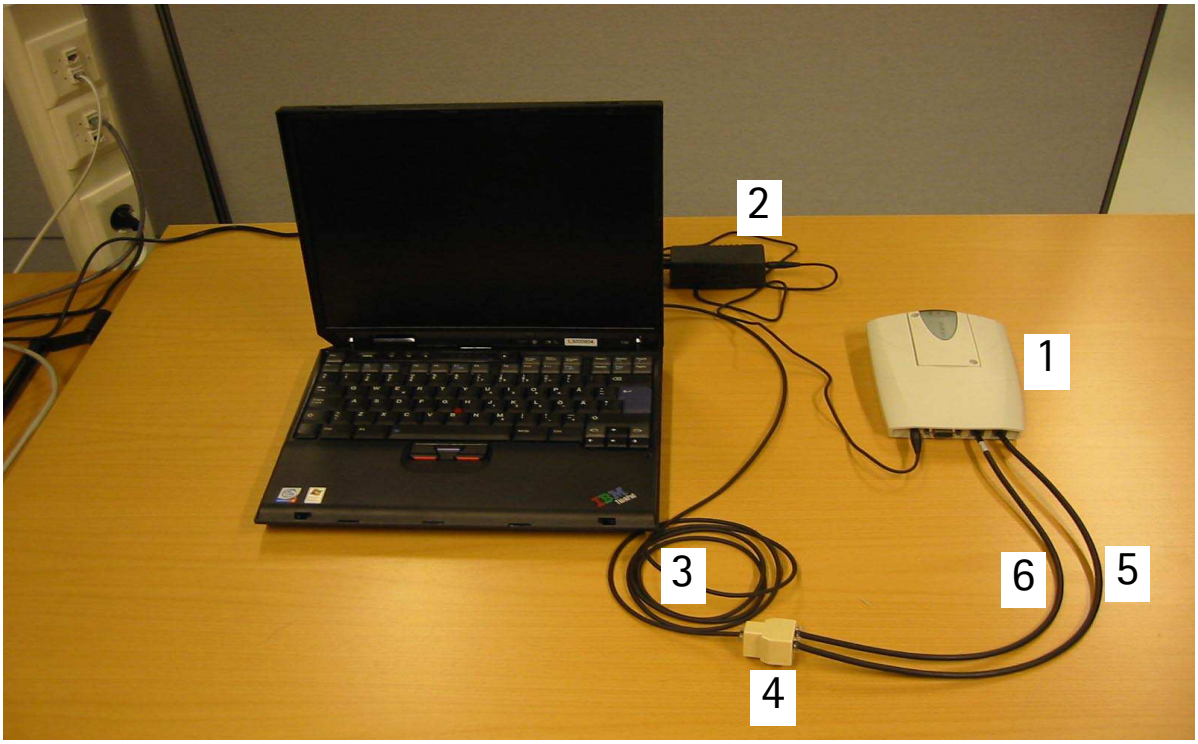
Troubleshooting flowchart for DTX-3



Testing with WinTesla service software

Set the Initial connection setup.

Figure 3: Test equipment set-up



No.	Type	Description	Code
1	DTX-3	APPLICATION MODULE	0630596
2	ACW-5	POWER SUPPLY	0630526
3	DKT-7A	MBUS CABLE	0730211
4		T-CONNECTOR	4626134
5	CA-15DS	LINE ADAPTER TEST CABLE	0730302
6	SCS-24	LINE ADAPTER TEST CABLE	0730223

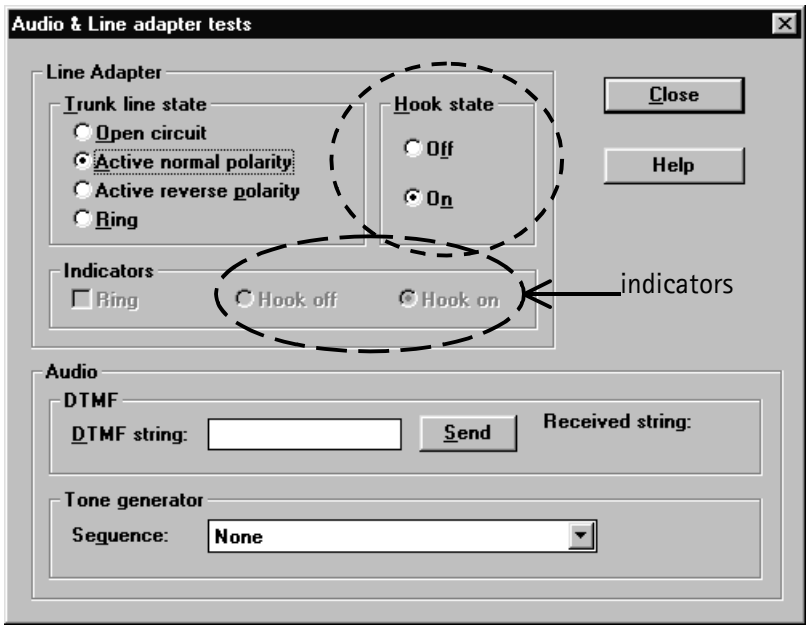
WinTesla tests

Testing of Line adapter circuits

Choose Testing -> Audio -> Line Adapter...

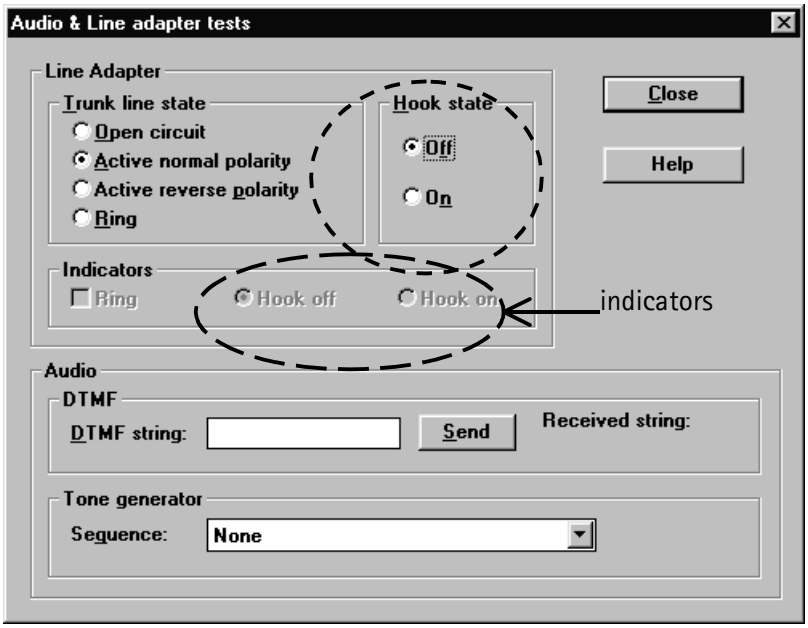
Hook state indicator

Figure 4: Hook on/off test window 1



Check that the Hook off/on indicator state will change when you change the hook state. If not, the DTX-3 is faulty.

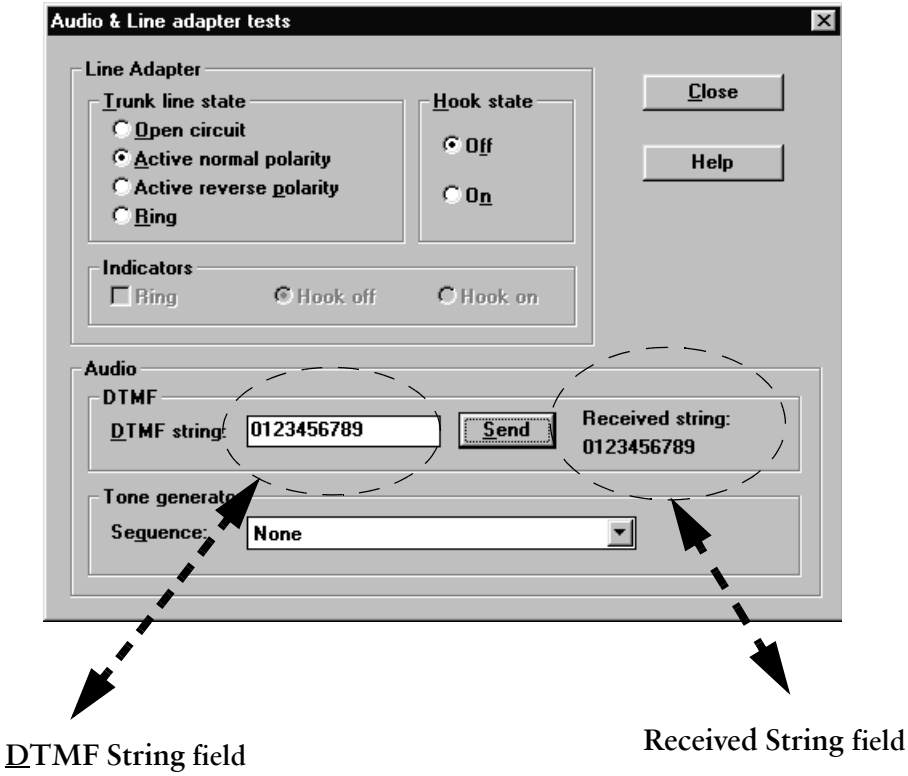
Figure 5: Hook on/off test window 2



DTMF receiving and transmitting

Write some numbers to the **DTMF string** field. Change the hook off state to **'Off'**, press the **Send** button and listen from the earpiece the DTMF tones. Check also from the 'Received string:' row, that all numbers that you just selected were transmitted.

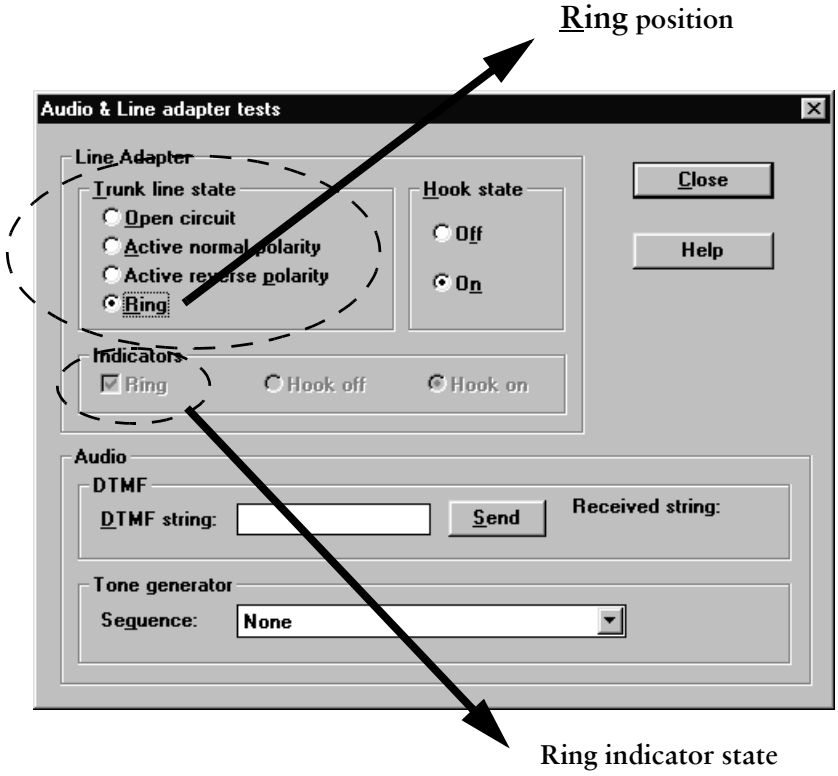
Figure 6: DTMF test window



Ringing Voltage Indicator

Change the 'Trunk line state' selection to the **Ring** position.

Figure 7: Audio&Line Test window



Check that also the state of the Ring indicator changes (it might take few seconds). If the indicator will not change it's position, change the 'Trunk line state' choice to it's original setting, and try again couple of times. If the indicator will not change it's position, the DTX-3 is probably broken.

Activate the HF-state from the land-line telephone, or take the earpiece to listen the signal tones. From the **Tone generator** field you can select different tones to be listened.

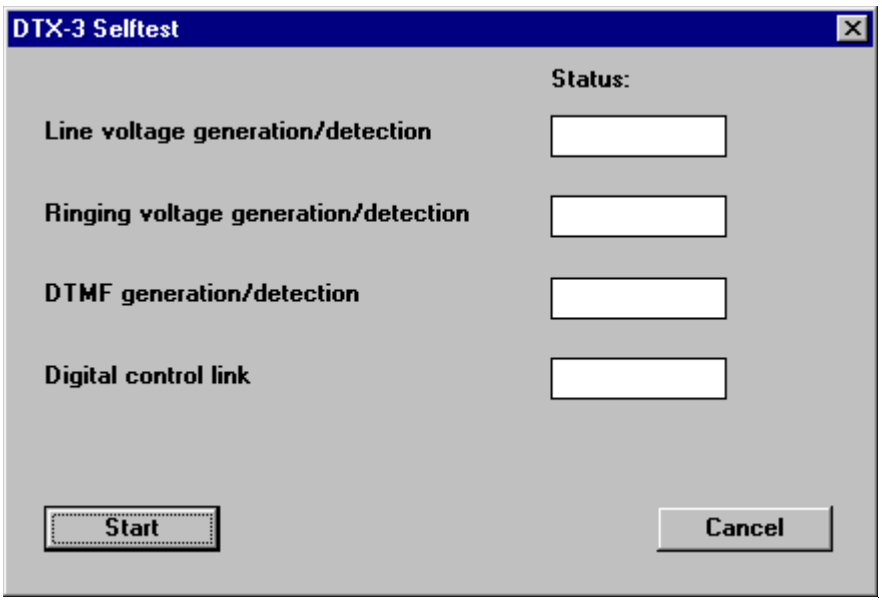
Self tests

The following build in selftests will be supported by Nokia 32 in addition to Nokia 22 selftests:

- Line voltage
- Ringing generation/detection
- DTMF generation/detection
- GSM link test

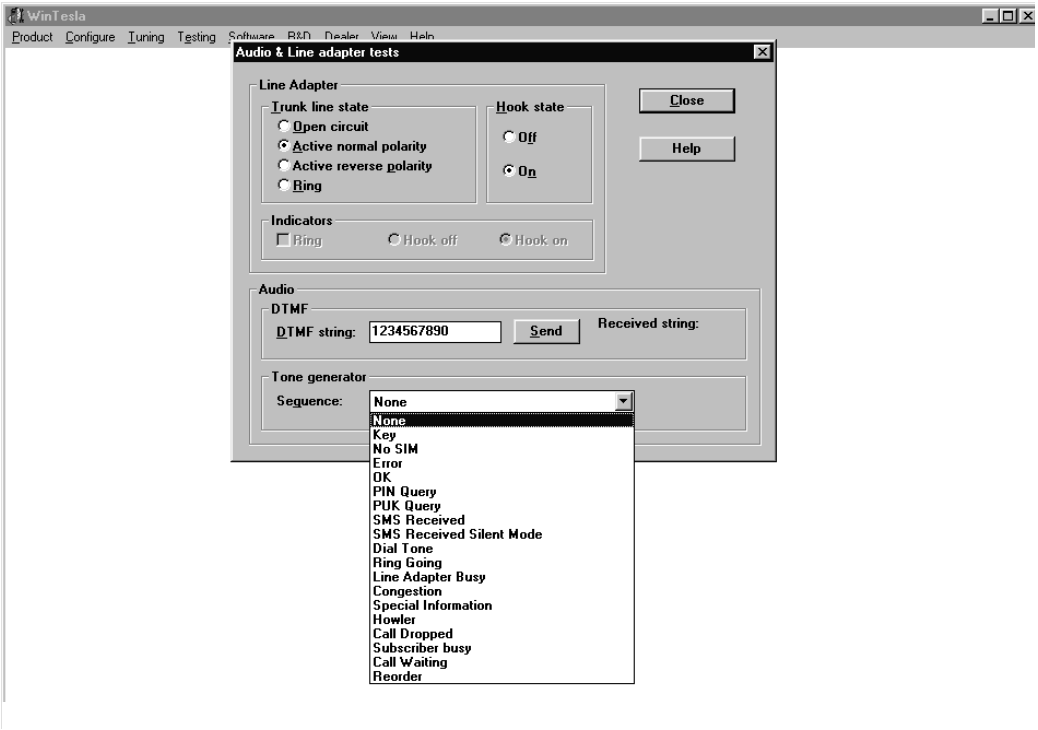
For more detailed information see Ratti SW Selftest Functional Specification .

A dialog box should be developed to start selftests.



The result of individual selftest should be stated clearly with passed/failed/not executed and the overall result as well.

Figure 8: Audio codec Test window



If you can not hear these tones, the audio codec is probably faulty.

Try to make also a test call with the land line telephone.

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Accessories

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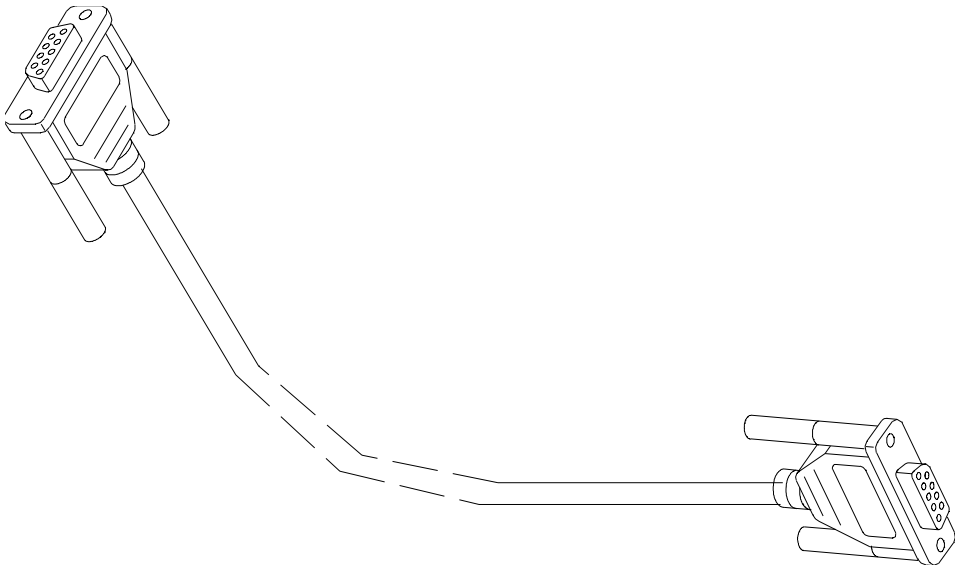
RS-232 Data Cable

For sending and receiving of SMS, PC-Fax, file transfer, e-mail and internet access a standard RS-232 Data Cable is needed

Product Code

RS-232 Data Cable	0730029

Figure 1: RS-232 Data Cable



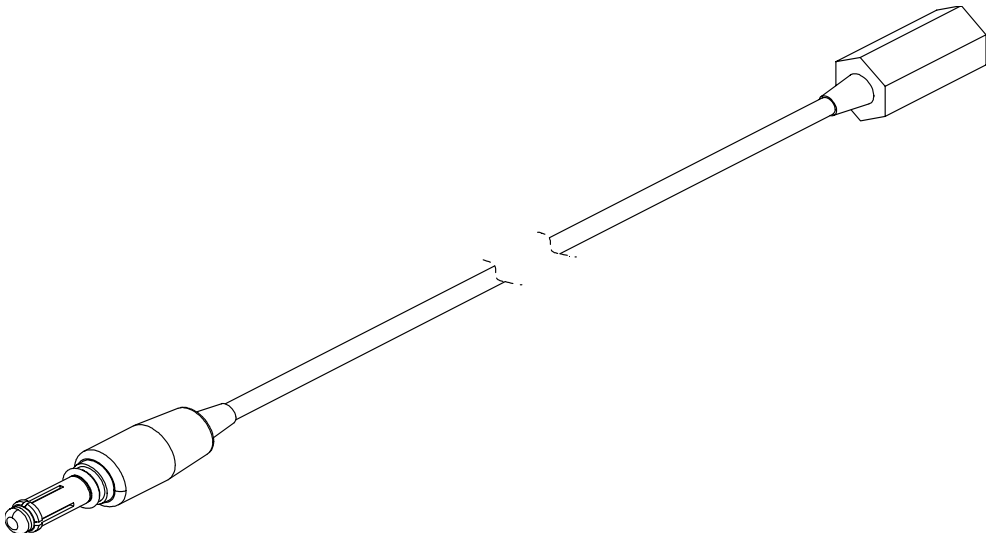
Antenna Cable XRP-3

This adapter cable can be used to connect a standard FME antenna connector to TME-3.

Product Code

Antenna Cable XRP-3: 0730206

Figure 2: Antenna Cable XRP-3



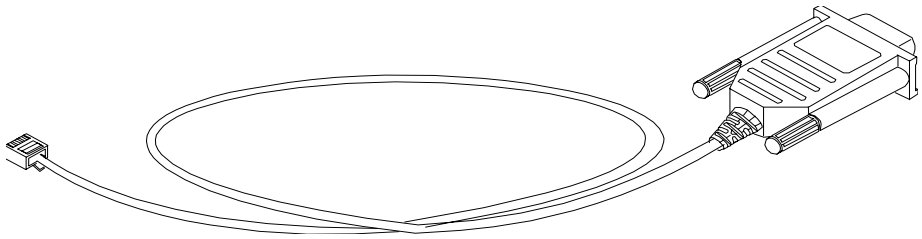
MBUS Cable DKT-7A

Service MBUS cable to connect PC to DTX-3 (trunk connector). It comprises a D9 connector and a modular 6-pin connector.

Product Code

MBUS Cable DKT-7A: 0730211

Figure 3: MBus cable DKT-7A



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