

Programmes After Market Services NPE-4 Series Cellular Phones

5 - Service Tools

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Service Tools

Supported Operating Systems

Windows 95, 98, 2000, ME and NT 4.0 (SP4).

Hardware requirements

Minimum:

Processor 233 MHz, RAM memory 64 MB, Disk space 50-100 MB.

Recommended for Windows 2000:

Processor 700 MHz, RAM memory 512 MB, Disk space 50-100 MB.

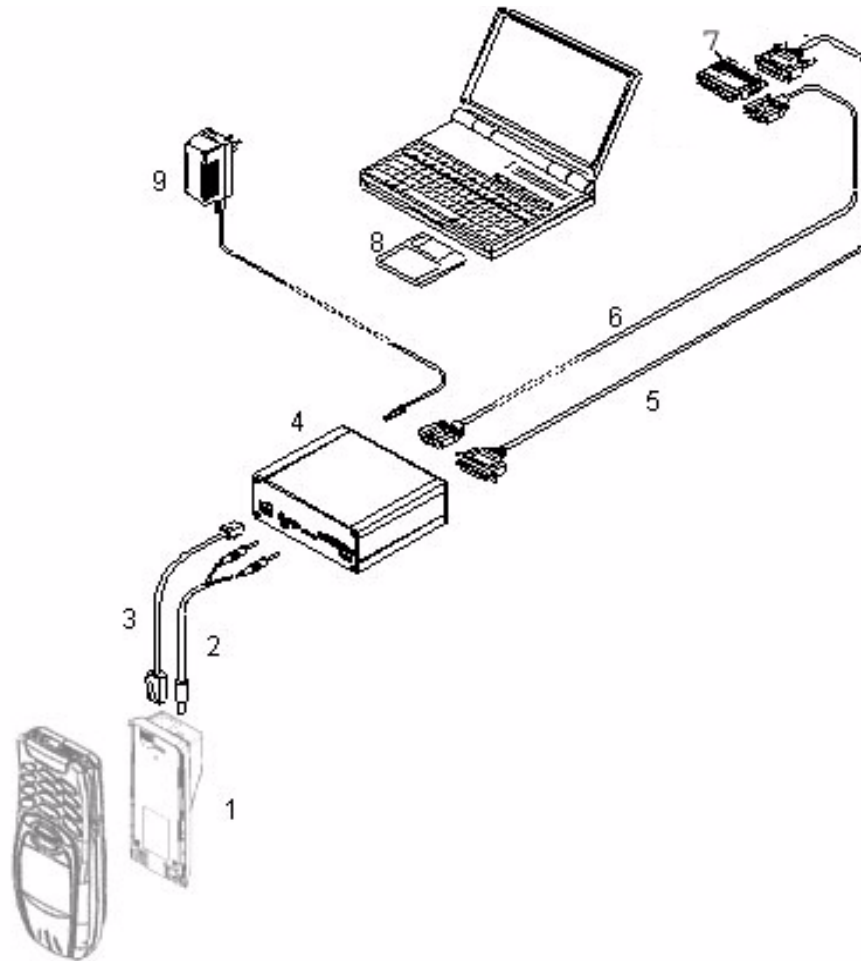
List of service tools

The table below gives a short overview of service tools that can be used for testing, error analysis and repair of product NPE-4, refer to various set-ups.

| Type designator | Description | Part code |
|-----------------|---|-----------|
| FLA-22 | Point of sale flash adapter | 0775299 |
| DAU-9S | Service MBUS cable | 0730108 |
| FLC-2 | Power cable | 0730185 |
| PCS-1 | DC power cable | 0730012 |
| SCB-3 | DC cable | 0730114 |
| XCS-1 | Service cable | 0730218 |
| XCS-4 | Modular cable | 0730178 |
| XRE-2 | BT cable | 0730237 |
| XRC-1b | RF antenna cable | 0730128 |
| FLS-4 | POS flash dongle for E/A area | 0081483 |
| | POS flash dongle for APAC area | 0081481 |
| FPS-8 | Parallel flash prommer box | 0080396 |
| | Printer cable (inc. in FSP-8 sales pack) | 0730029 |
| FPS-8C | Flash prommer box | 0080321 |
| AXS-4 | D9 cable (inc. in FPS-8 & FPS8C sales pack) | 0730090 |
| PKD-1 | Software protection key | 0750018 |
| | Phoenix Service SW | 8409031 |
| | Phoenix Service SW in CD-ROM | 0775311 |
| | NPE-4 Flash SW data | 8410149 |
| | NPE-4 Flash SW data in CD-ROM | 0775320 |
| ACP-8 | AC charger (inc. in FPS-8 sales pack) | 0680032 |
| JBT-9 | BT Test box | 0770336 |
| JBV-1 | Docking station | 0770298 |
| MJF-9 | Docking station adapter | 0775298 |
| MJS-40 | Module jig | 0770385 |
| HCA-1 | Cable support part | 0770433 |

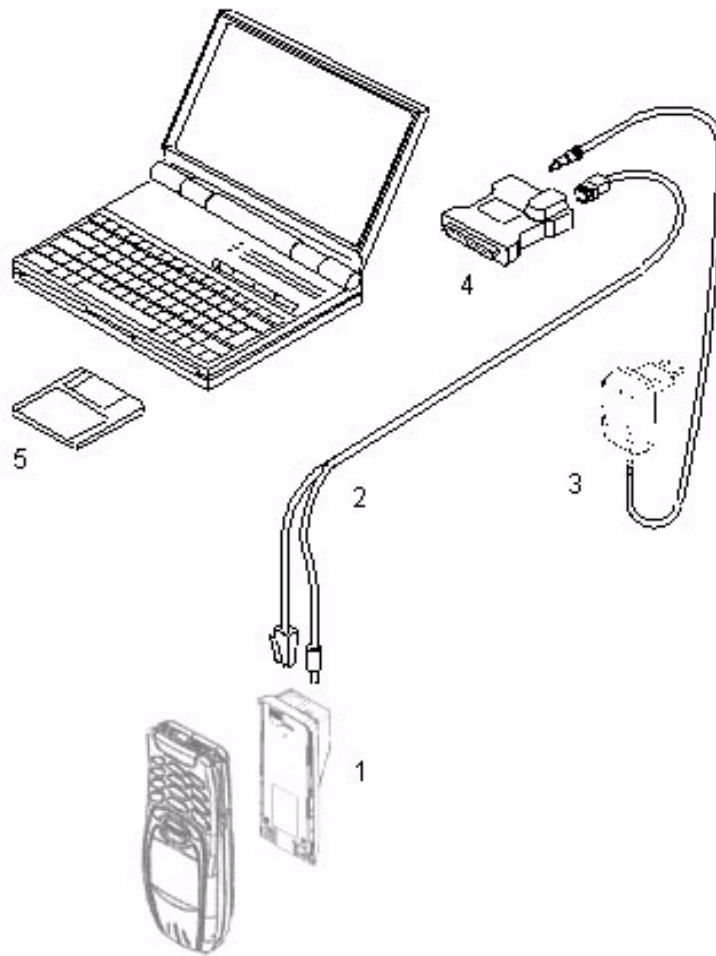
Setup Instructions

Flash Concept



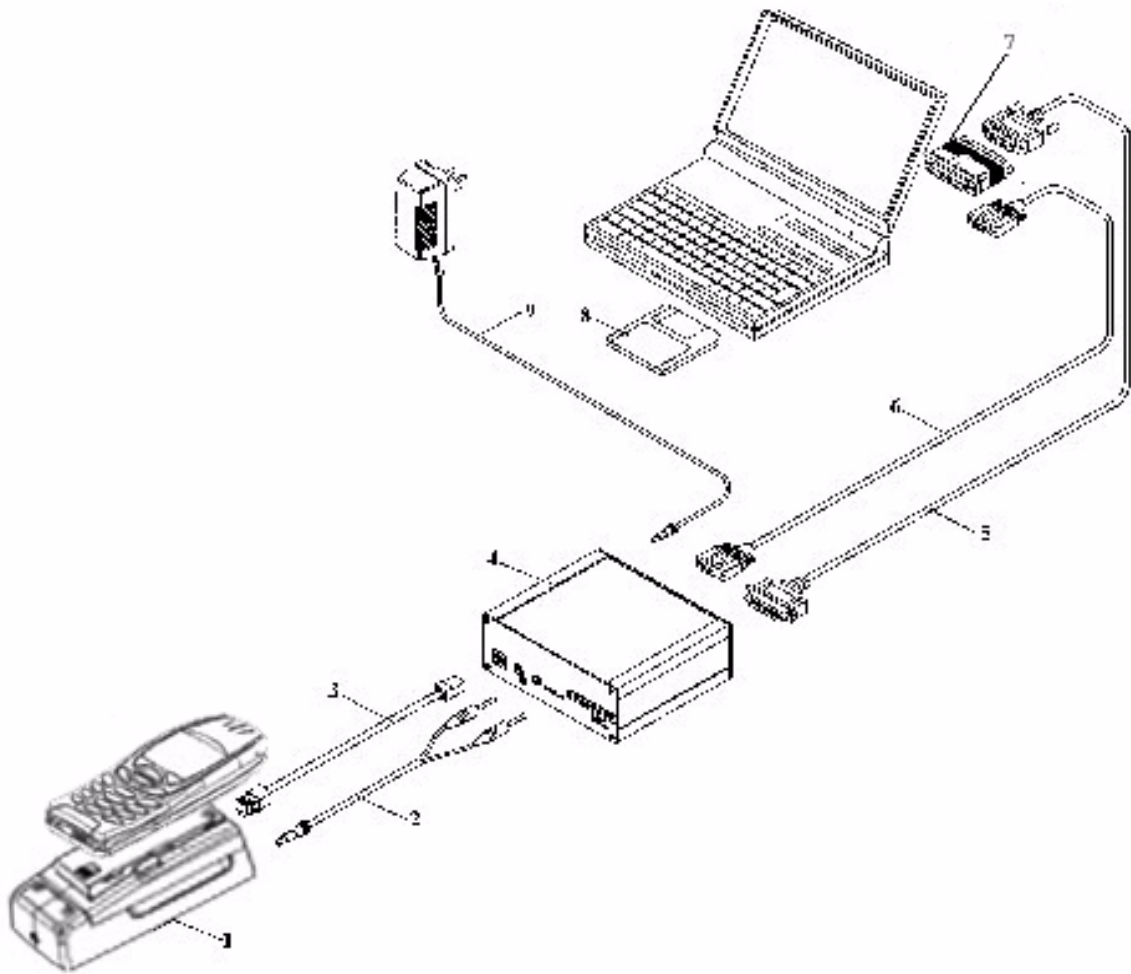
| Item: | Service accessory: | Product code: |
|-------|--|--|
| 1 | FLA-22, Point of sales flash adapter | 0775299 |
| 2 | FLC-2, DC power cable | 0730185 |
| 3 | XCS-4, Modular cable | 0730178 |
| 4 | FPS-8, Flash prommer box | 0080321 |
| 5 | Printer cable, incl. in FPS-8 sales pack | 0730029 |
| 6 | AXS-4, D9 cable, incl. in FPS-8 sales pack | 0730090 |
| 7 | PKD-1, Software protection key | 0750018 |
| 8 | Phoenix Service SW Phoenix Service SW in CD-ROM NPE-4 Flash SW data NPE-4 Flash SW data in CD-ROM | 8409031 0775311 8410149 0775320 |
| 9 | AC Charger, incl. in FPS-8 sales pack | 0680032 |

Flash Concept - POS (Point of Sale)



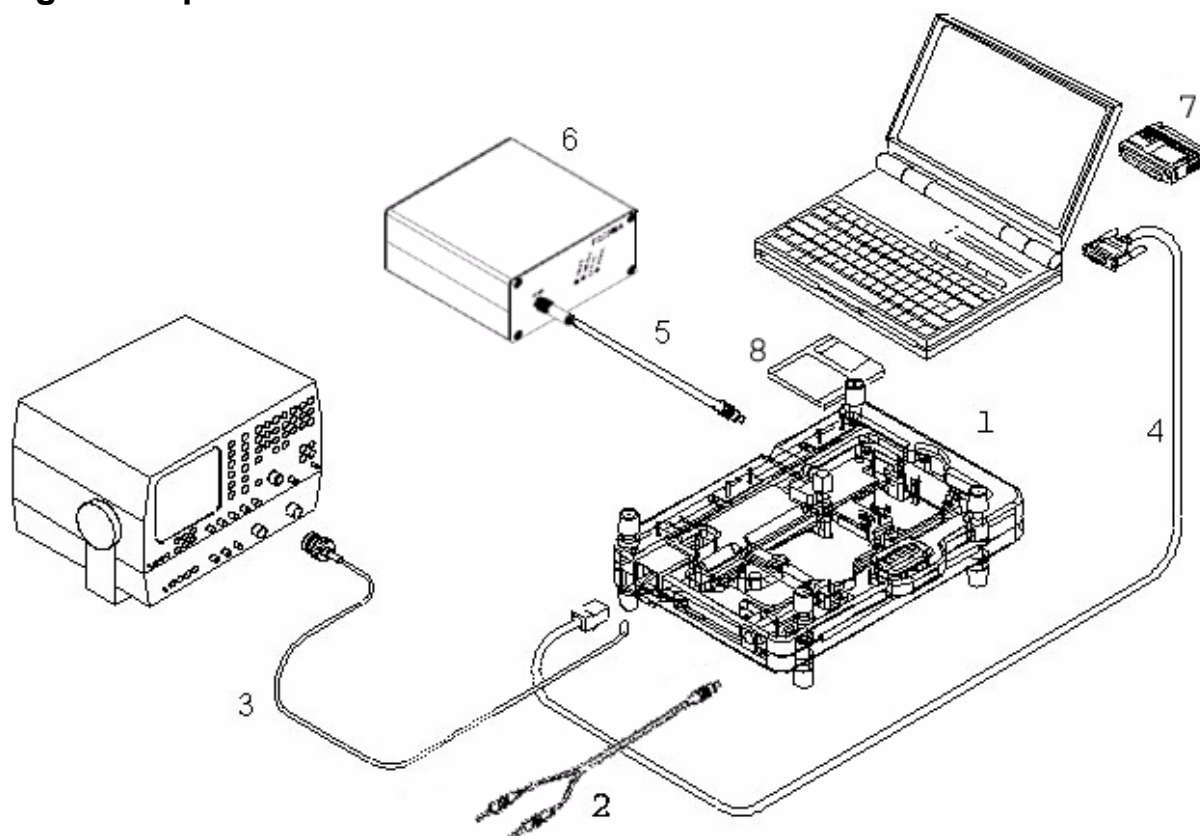
| Item: | Service accessory: | Product code: |
|-------|--|--|
| 1 | FLA-22, Point of sales flash loading adapter | 0775299 |
| 2 | XCS-1, service cable | 0730218 |
| 3 | ACP-8 AC Charger | 0770298 |
| 4 | FLS-4, POS flash dongle for E/A area FLS-4, POS flash dongle for APAC area | 0081483 0081481 |
| 5 | Phoenix Service SW Phoenix Service SW in CD-ROM NPE-4 Flash SW data NPE-4 Flash SW data in CD-ROM | 8409031 0775311 8410149 0775320 |

JBV-1 Flash Concept



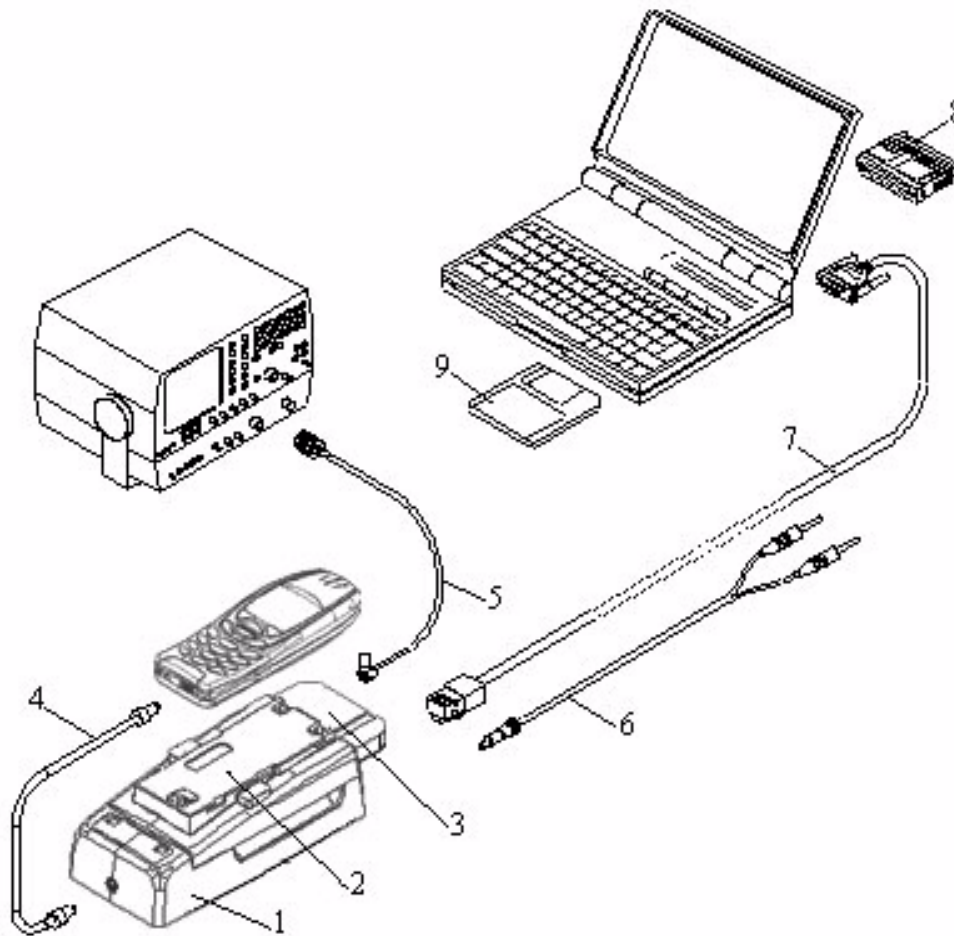
| Item: | Service accessory: | Product code: |
|-------|--|---------------|
| 1 | JBV-1, Docking station | 0770298 |
| | MJF-9, Docking station adapter | 0775298 |
| 2 | PCS-1, DC power cable | 0730012 |
| 3 | XCS-4, Modular cable | 0730178 |
| 4 | FPS-8, Flash prommer box | 0080321 |
| 5 | Printer cable, incl. in FPS-8C sales pack | 0730029 |
| 6 | AXS-4, D9 ? D9 cable, incl. in FPS-8C sales pack | 0730090 |
| 7 | PKD-1, Software protection key | 0750018 |
| 8 | Phoenix Service SW | 8409031 |
| | Phoenix Service SW in CD-ROM | 0775311 |
| | NPE-4 Flash SW data | 8410149 |
| | NPE-4 Flash SW data in CD-ROM | 0775320 |
| 9 | AC Charger, incl. in FPS-8 sales pack | 0680032 |

Jig Concept



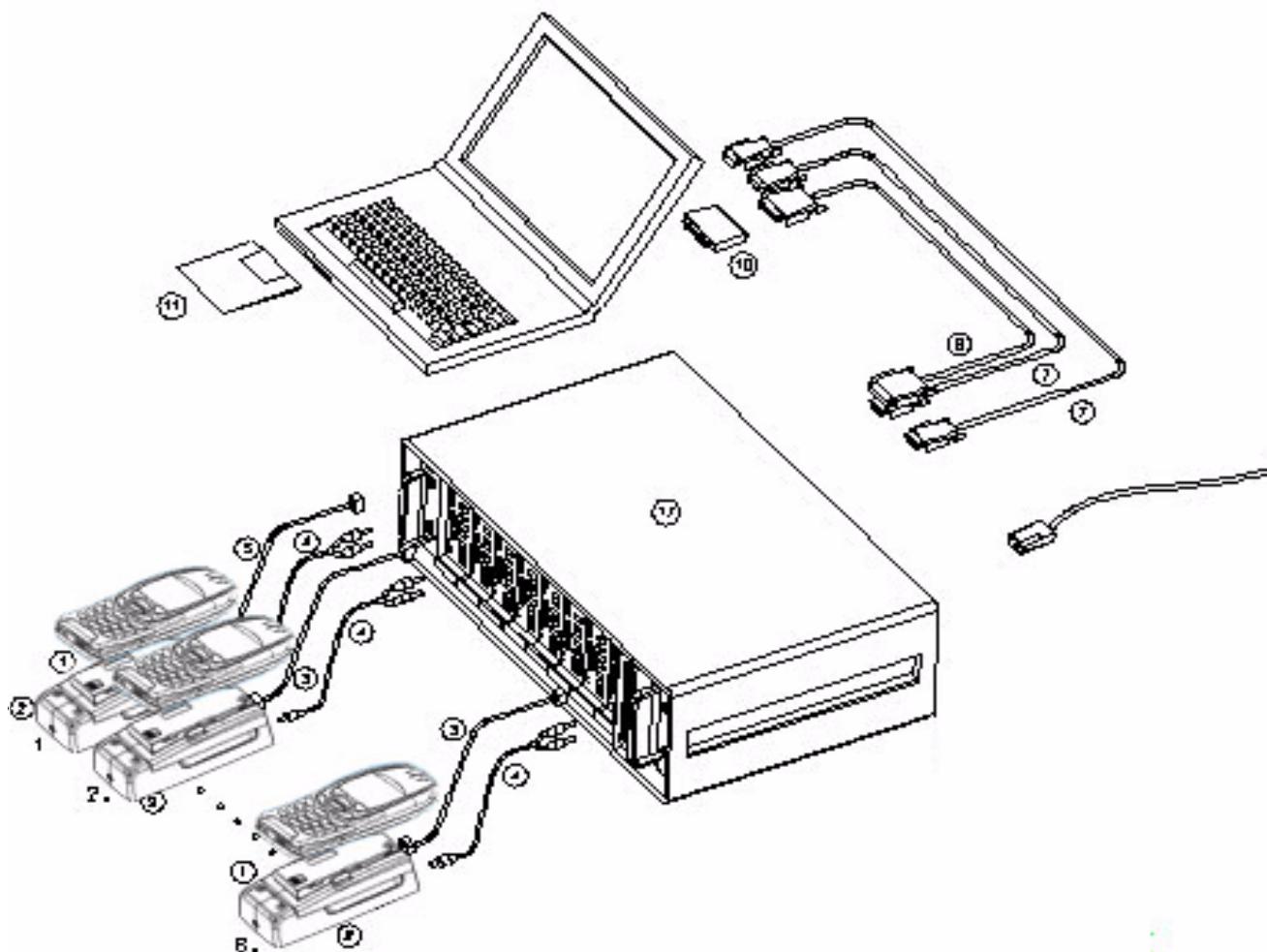
| Item: | Service accessory: | Product code: |
|-------|--|--|
| 1 | MJS-40, Module jig | 0770385 |
| 2 | PCS-1, DC power cable | 0730012 |
| 3 | XRC-1b, RF antenna cable | 0730128 |
| 4 | DAU-9S, Service MBUS cable | 0730108 |
| 5 | XRE-2, BT cable (optional also antenna available) | 0730237 |
| 6 | JBT-9, BT-Test-Box (optional for BT test) | 0770336 |
| 7 | PKD-1, Software protection key | 0750018 |
| 8 | Phoenix Service SW Phoenix Service SW in CD-ROM NPE-4 Flash SW data NPE-4 Flash SW data in CD-ROM | 8409031 0775311 8410149 0775320 |

MJF-9 Service Concept



| Item: | Service accessory: | Product code: |
|-------|--|--|
| 1 | JBV-1, Docking station | 0770298 |
| 2 | MJF-9, Docking station adapter | 0775298 |
| 3 | HCA-1, Cable support part | 0770433 |
| 4 | SCB-3, DC?DC cable | 0730114 |
| 5 | XRC-1b, RF antenna cable | 0730128 |
| 6 | PCS-1, DC power cable | 0730012 |
| 7 | DAU-9S, Service MBUS cable | 0730108 |
| 8 | PKD-1, Software protection key | 0750018 |
| 9 | Phoenix Service SW Phoenix Service SW in CD-ROM NPE-4 Flash SW data NPE-4 Flash SW data in CD-ROM | 8409031 0775311 8410149 0775320 |

Parallel Flash Concept



| Item: | Service accessory: | Product code: |
|-------|--|--|
| 1 | MJF-9, Docking station adapter | 0775298 |
| 2 | JBV-1, Docking station | 0770298 |
| 3 | XCS-4, Modular cable | 0730178 |
| 4 | PCS-1, DC power cable | 0730012 |
| 7 | AXS-4, D9 ? D9 cable, incl. in FPS-8C sales pack | 0730090 |
| 8 | Printer cable, incl. in FPS-8C sales pack | 0730029 |
| 10 | PKD-1, Software protection key | 0750018 |
| 11 | Phoenix Service SW Phoenix Service SW in CD-ROM NPE-4 Flash SW data NPE-4 Flash SW data in CD-ROM | 8409031 0775311 8410149 0775320 |
| 17 | FPS-8C, Parallel flash prommer | 0080396 |

Flash adapter FLA-22

Flash adapter FLA-22 is designed for regional Service Centers and POS (Point of Sales) to replace phones own battery when flashing the phone. Furthermore it can be used as a dummy battery. Features:

- Normal mode operation
- Powered by charger or external power supply
- Over current protection
- Over voltage protection
- Voltage polarity protection
- BSI connected to prommer

List of Modules

Table 1: List of Modules

| Name of modules | NMP type | NMP code | Notes |
|-----------------|----------|----------|-----------------------------|
| Flash adapter | FLA-22 | 0775299 | Flash adapter for AMS usage |

Technical Specifications

DC Characteristics

Table 2: Electrical ratings

| Parameter | Min | Nom | Max | Note |
|-------------------------------|-------|------|-------|-----------------|
| Input voltage (charger) | 5.5V | - | 16V | |
| Supply voltage (power supply) | 3.0V | - | 4.2V | |
| Vbatt (charger) | 3.9V | 4.0V | 4.1V | Regulated |
| Vbatt (power supply) | 3.0V | - | 4.2V | No regulation |
| Vbatt current (charger) | 210mA | - | 300mA | Limited |
| Vbat protection current | 2A | | | Resettable fuse |
| BTEMP Normal mode | | 47k | | Resistor |
| BSI Normal mode | | 39k | | Resistor |

Modes of operation

Flash adapter FLA-22 can be used in two operation modes:

Normal mode (startup in normal mode, power key press needed to flash)

Local mode (can be forced to local mode in Phoenix)

Mechanical Characteristics

Table 3: Mechanical Characteristics

| Unit | Dimensions (mm) (W x H x D) | Weight (g) | Material |
|--------|--------------------------------|---------------|----------|
| FLA-22 | 45,3x25.0x103,9 | 200 | PC/ABS |

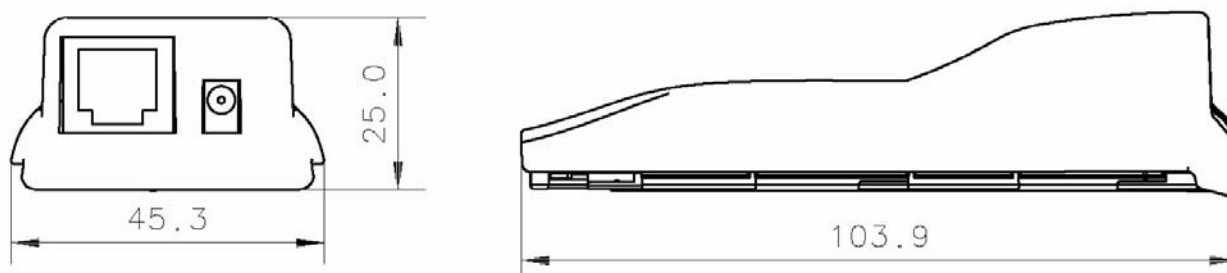


Figure 1. Main dimensions of FLA-22.

Environmental Conditions

Temperature Conditions

Table 4: Allowed Ambient Temperatures

| | Ambient temperature (degrees Celsius) |
|-----------------------|--|
| Operating temperature | +5...+35 |
| Storage temperature | -30...+60 |
| Humidity RH | Max. 90% |

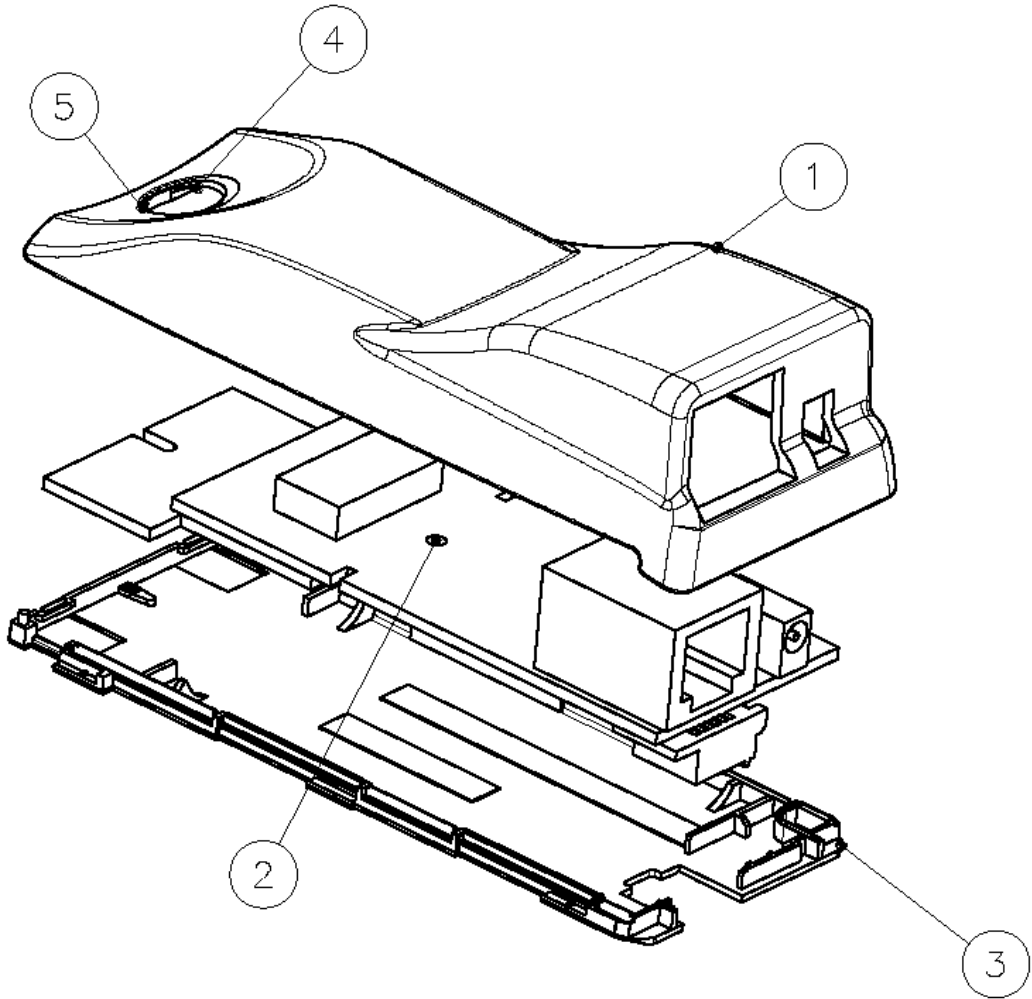


Figure 2. Exploded view of FLA-22

JBT-9 Bluetooth Test & Interface box (Sales Pack)

The JBT-9 testbox is a generic device to perform Bluetooth Bit Error Rate testing and doing cordless FBUS connection via Bluetooth. An ACP-8x charger is needed for BER testing and AXS-4 cable in case of cordless testing interface usage.

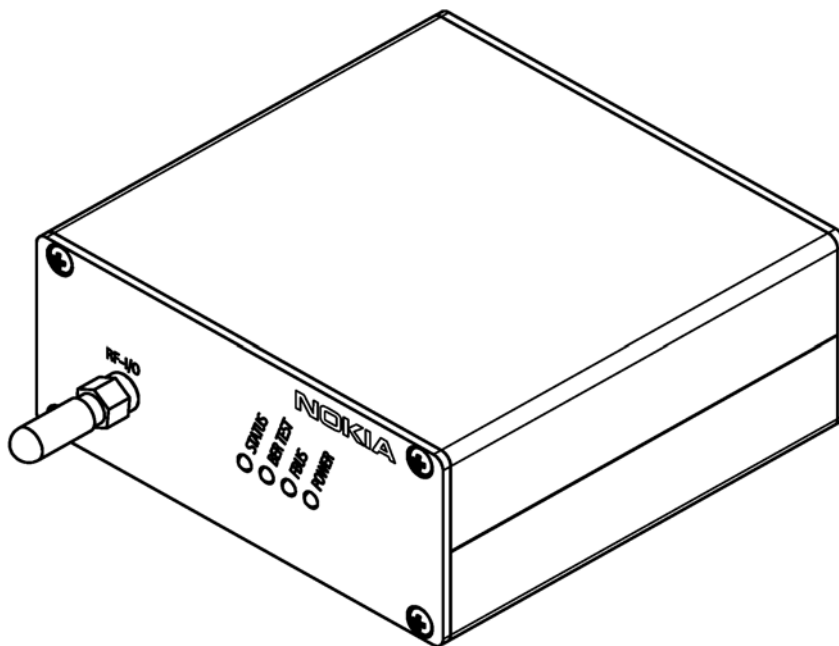
Sales package includes:

- JBT-9 testbox 0770336
- SMA stub antenna 066P056
- Installation and warranty information9360613

Product Code

JBT-9 sales kit code: 0081490

View of JBT-9 with antenna



Hardware needed to use JBT-9

- JBT-9 Bluetooth testbox
- SMA stub antenna (part of sales kit)
- ACP-8x charger (x denotes region, e.g. ACP-8E for Europe)
- AXS-4 serial cable (0730090)

Use of JBT-9 Stand-alone

The JBT-9 Box can be used **without** any PC connection as loop-back device for BT testing. To verify the products BT functionality, a Bit Error Rate test needs to be performed against JBT-9. The test is controlled and executed by Phoenix service software.

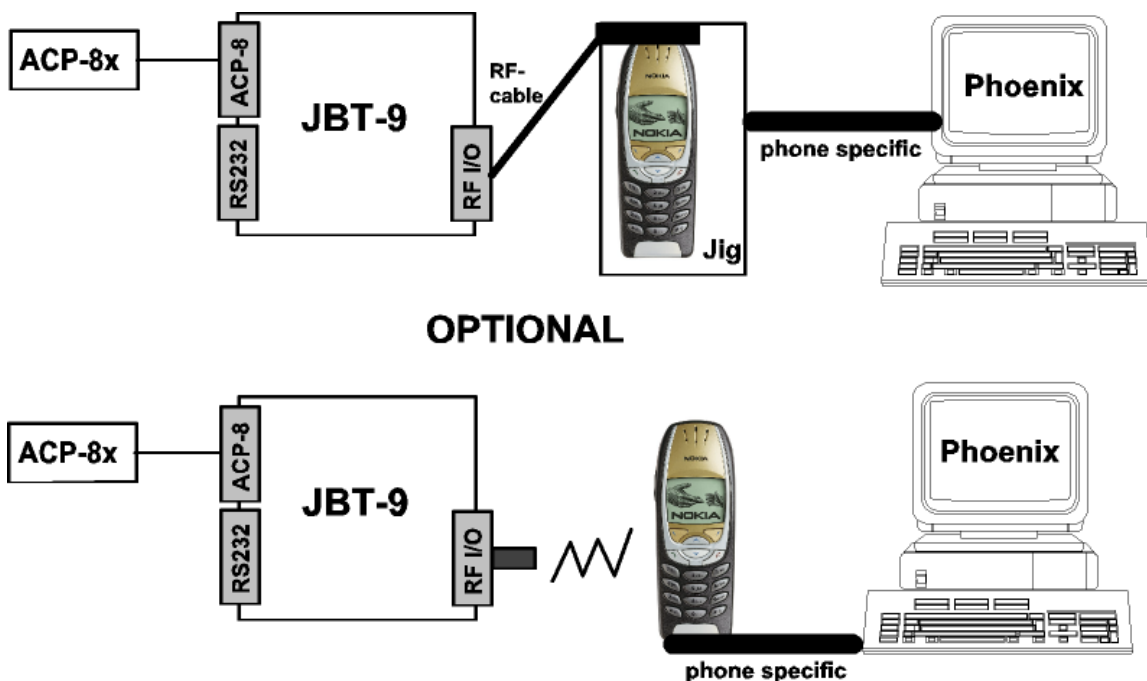
Attenuation settings:

The JBT-9 attenuation is used to reduce the BT RF range. The default factory setting of internal attenuation is **-36dBm (refer to related chapter below)**. This reduces the typical RF range to less than 0.5 m. In case that distance is too short to perform tests over the air, the internal attenuation can be changed as described in the JBT-9 sales package user guide. In case that a service jig is directly connected to the box SMA RF I/O connector, it is recommended to work with the maximum internal attenuation (default factory setting).

PLEASE NOTE:

When the JBT-9 is connected to the PC via AXS-4 serial cable and used as BT service interface, the BT Phoenix driver is controlling the internal attenuation of JBT-9. Details are described in chapter 4.

Setup for BER testing

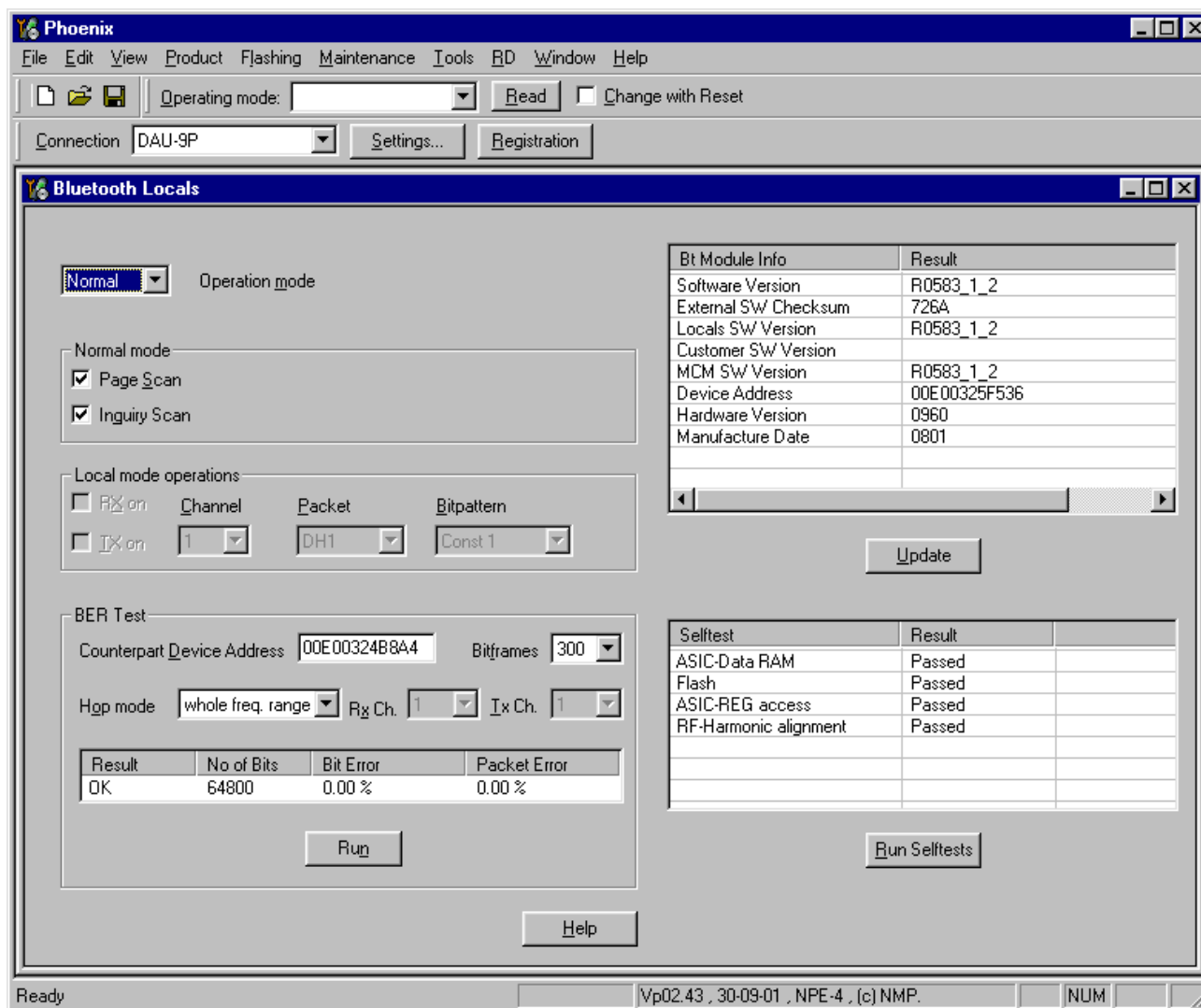


- Connect SMA stub antenna **or** service jigs' BT RF cable to JBT-9's RF/IO connector. Connect ACP-8x charger to JBT-9 power connector.
- Make sure that distance between phone and JBT-9 does **not exceed 5 cm** distance when using default attenuation setting.
- BER test result is OK when BER is less than 0.1%

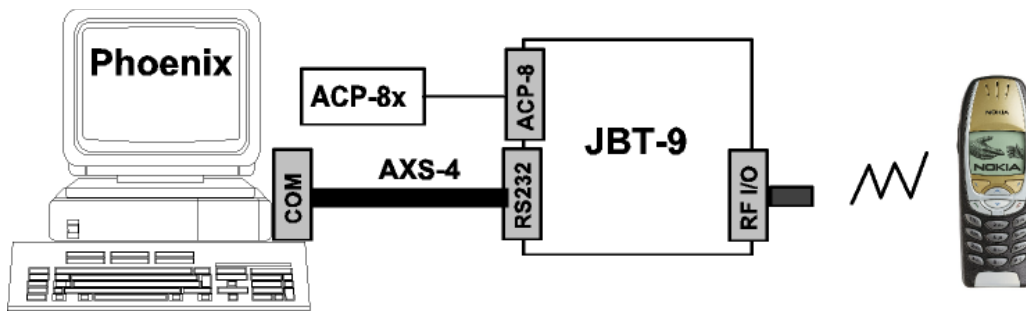
- Note that the phone connection to the PC is specific to the tested phone. For details refer to the related chapter in the service manual.

SW instructions for BER testing

- Make sure that the phone's product support modules are properly loaded by Phoenix SW.
- Choose "Testing" from the "Maintenance" menu and choose "Bluetooth Locals".
- Enter JBT-9's Ser.No. (12 digits from the type label) in the field "Counterpart Device Address".
- Make sure that whole freq. range is chosen to test all BT channels or use local frequency range
- Choose "300" Bitframes.
- Press the "Run" button to perform the BER test.

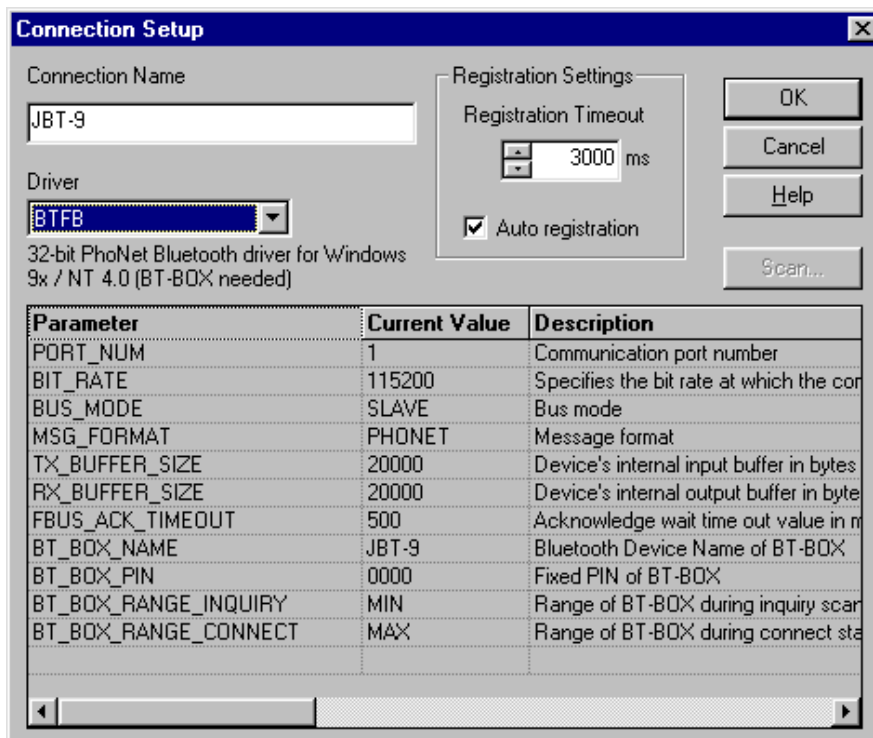


Use of JBT-9 as service interface



The JBT-9 can be connected to a PC by using an AXS-4 serial cable. The Bluetooth wireless technology can be used to establish a FBUS connection without any cables and line of sight. The phone must be switched on with SIM card and all Phoenix functions are working as long as the phone is in normal mode.

PHOENIX connection setup for JBT-9 as service interface



To use JBT-9 as service interface, the "BTFB" driver must be chosen when making the connection configuration.

PROCEDURE:

When choosing a BTFB driver connection, the JBT-9 is starting an inquiry. The inquiry is stopped when **one** other BT product is found. Therefore the **BT_BOX_RANGE_INQUIRY**

should be **MIN** to ensure that only **one** product is in range of JBT-9. The JBT-9 is requesting a connection on the product. To establish the connection, the connection request must be confirmed and the **BT_BOX_PIN** must be entered on the phone. When the connection is established, Phoenix SW is switching the JBT-9 range to **BT_BOX_RANGE_CONNECT**.

Attenuation setting via Jumper

Internal possible settings after JBT-9 boot-up. The precision of the internal attenuation is specified to be +/- 5dBm. During test the attenuation can also be changed via Phoenix SW.

| Default attenuation | GPP10 | GPP11 | Max. RF range | Factory setting |
|---------------------|--------------|--------------|---------------|-----------------|
| 21 dB | Closed (GND) | Open | 1,5 m | |
| 21 dB | Open | Closed (GND) | 1,5 m | |
| 7 dB [MIN] | Open | Open | 8 m | |
| 36 dB [MAX] | Closed (GND) | Closed (GND) | 0,5 m | X |

LED Indication of JBT-9

| ACTION | STATUS-LED | BER TEST-LED | FBUS-LED | POWER-LED |
|-----------|------------|--------------|----------|-----------|
| POWER | | | | ON |
| FBUS | | | ON | |
| INQUIRY | | BLINKING | | |
| CONNECTED | | ON | | |
| BER-TEST | | 1. ON | | |
| LOOP-BACK | | ON | | |
| ERROR | ON RED | | | |
| BOX READY | ON GREEN | | | |

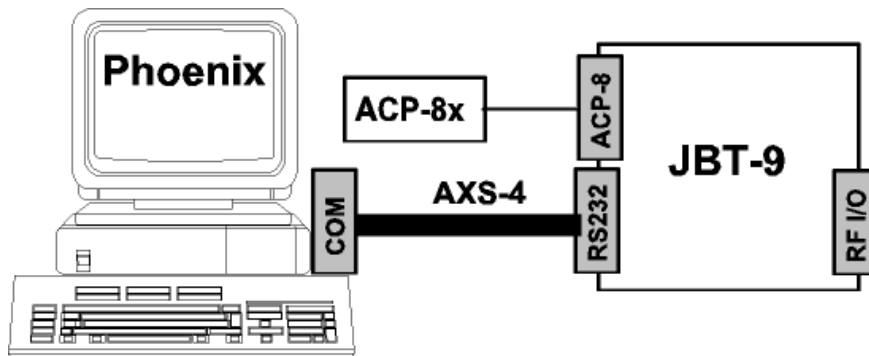
Re-flash of JBT-9

The JBT-9 Box SW can be updated using the Bluetooth Flasher from the "Flashing" menu in Phoenix SW. If the Bluetooth Flasher is not visible in the flashing menu, make sure that a BT product is chosen from the "File" menu.

- Select the COM port where JBT-9 is connected.

- Make use that in the actual selected connection is "NO CONNECTION" in Phoenix SW to avoid any COM port sharing problems.
- Select the "bin" file and start the flashing procedure

The latest "bin" file can be loaded from the Software area at PAMS internet webpage.



Abbreviations

| | |
|------|---|
| BER | = Bit Error Rate |
| BT | = Bluetooth |
| COM | = (serial communication port) |
| FBUS | = (NOKIA proprietary communication bus) |
| IO | = I nput / O utput |
| PAMS | = P rogram A fter M arket S ervices |
| PC | = P ersonal C omputer |
| RF | = R adio F requency |
| SMA | = (sub miniature RF connector type) |
| SW | = S oftware |

MJS-40 repair jig

Introduction

MJS-40 is a production, Aftersales and R & D engine module repair jig for NPE-4.

The purpose of the repair jig is to provide a method of applying voltage from an external power supply when the module is out of its mechanics.

The repair jig provides following functions:

- Fused protection
- Overvoltage protection
- Reverse polarity protection
- ESD protection
- Decoupling capacitors
- Access to exposed components
- BlueTooth coupler

It is intended that the repair jig should be used under all circumstances where an external supply to the phone is required to be applied while the phone is out of its mechanics.

It should be noted that the supply voltage to the repair jig is intended to be the same as normal battery voltage range i.e. 3.0-4.2V.

Nominal supply voltage is 3.6V.

Note: Supply voltage must not exceed 5V! (Fuse will blow)

| Sales package products | Product code |
|------------------------|--------------|
| MJS-40 Module Jig | 0770385 |

The MJS-40 is designed for testing/repairing the engine separately, engine mounted with lightguide assembly or / and with keymat.

Note: Supplier has the warranty of the service tool. If repair of the service tool is necessary, this is agreed between the supplier and the user of the service tool.

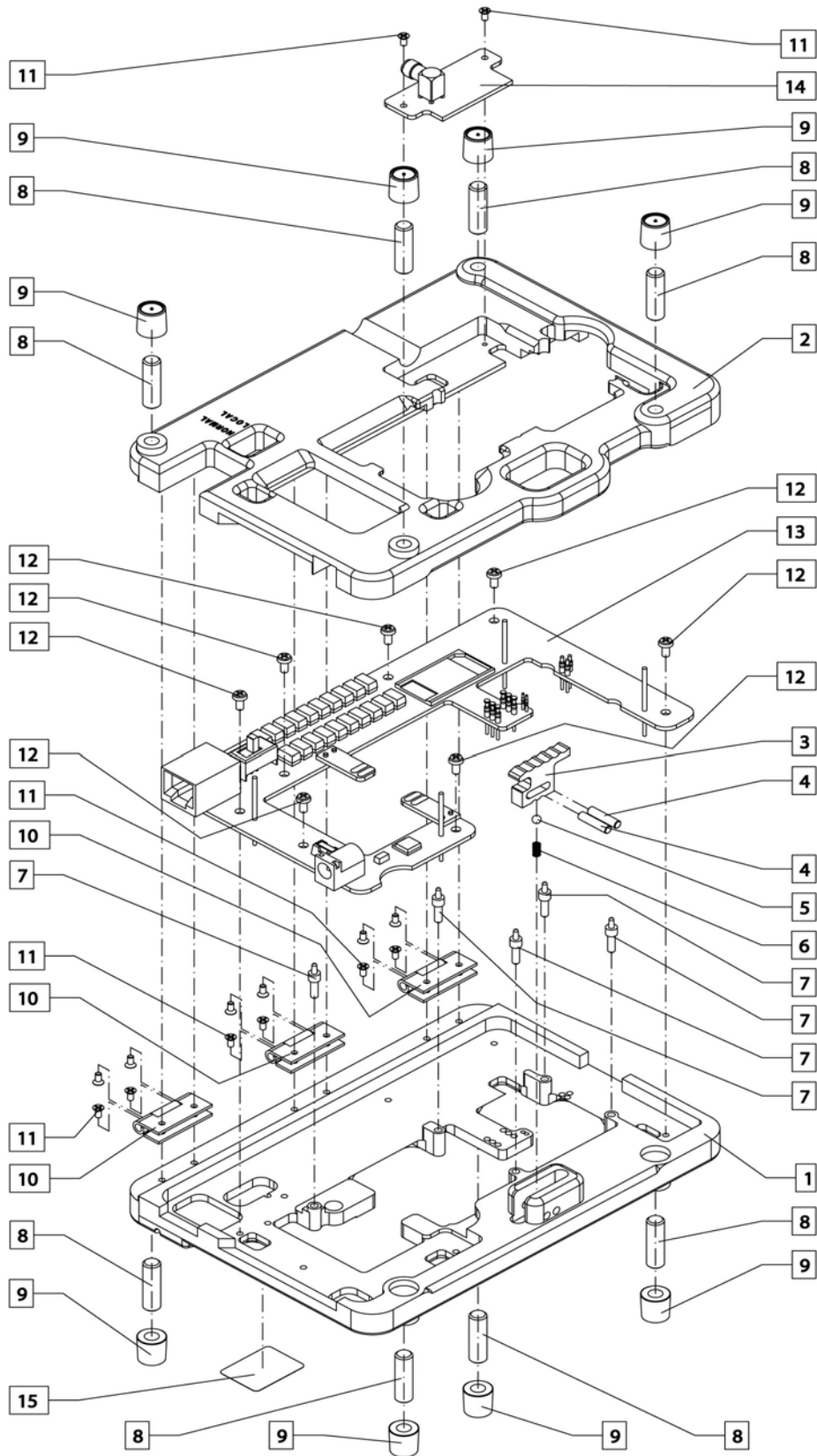
List of mechanical parts

| Part number | Name of Part | Material code | Drawing number | Qty | Notes |
|-------------|------------------------|---------------|----------------|-----|---------------------------------------|
| 1 | Bottom | | SME5S758 | 1 | |
| 2 | Cover | | SME5S756 | 1 | |
| 3 | Latch part | | DMD04393 | 1 | |
| 4 | BN684 3x12 SN12771B | 640B003 | | 2 | |
| 5 | Guide pin plastic | | DMD2558POM | 5 | |
| 5 | Ball SKF/RB-3.0/IV | 640B006 | | 1 | |
| 6 | Spring TFR0.35x3x5.5 | 640B000 | | 1 | |
| 8 | Leck | 9560062 | | 8 | |
| 9 | Bottom foot | 9460224 | | 8 | |
| 10 | Hinge | 6490013 | | 3 | |
| 11 | Screw 965ZNM2.5x8 | | | 12 | |
| 11 | Screw 965ZN M2x4 | | | 4 | |
| 12 | Screw M2.5x6 | 6150411 | | 7 | |
| 13 | LOI2_01 module | | | 1 | |
| 14 | Btant2_01 module | | | 1 | Including 5420025 SMA connector angle |
| 15 | Clamp | 9510389 | | 1 | |
| 16 | Screw M3x10 | 6160191 | | 2 | |
| 18 | Ground pin | | SME9S216 | 4 | |

Packing Material & Marking Material

| Name | Material code | Pcs. |
|---------------|---------------|------|
| Carton | 9650356 | 1 |
| Foaming | 9660112 | 5 |
| Extra fuses | 511A004 | 2 |
| Type label | 9380154 | 1 |
| Warning label | 9380160 | 1 |

Exploded View



MJF-9 Docking station

Introduction

Docking station adapter MJF-9 is designed for adapter between the Docking Station JBV-1 and the transceiver. Docking station adapter MJF-9 has following main electronic function:

- Phone recognizing from BTEMP

With JBV-1 it is possible to calibrate and flash the transceiver.

List of modules

| Name of module | NMP code | NMP code | Notes |
|-------------------------|----------|----------|--------------------------------------|
| Docking station adapter | MJF-9 | 0775298 | Docking station adapter to AMS usage |

Technical Data

DC characteristics

| Parameter | Min | Nom | Max |
|--------------------------------|--------|-------|--------|
| Recognizing voltage from BTEMP | 0,108V | 0,111 | 0,114V |

D- connector signals

D-connector (male) is between MJF-9 and JBV-1.

| | | | |
|-------------------|----|----|------------|
| VBATT | 1 | 14 | VBAT_SENSE |
| VBATT | 2 | 15 | DC+ |
| DC+ | 3 | 16 | +COUP |
| NC | 4 | 17 | NC |
| NC | 5 | 18 | NC |
| NC | 6 | 19 | NC |
| NC | 7 | 20 | NC |
| PHONE_RECOGNIZING | 8 | 21 | BTEMP |
| BSI | 9 | 22 | FBUS/TX |
| FBUS/RX | 10 | 23 | MBUS |
| GND(BUS) | 11 | 24 | VPP |
| GND | 12 | 25 | GND_SENSE |
| GND | 13 | | |

Table 5: D-connector signal description

| Pin | Signal | Description | Min | Max |
|-------|-------------------|---|----------|---------------|
| 1,2 | VBATT | Battery voltage to phone | 3.0V /0A | 4.2V / 1.5A |
| 3, 15 | DC+ | Supply voltage to JBV-1 | | |
| 4 | NC | Not connected | | |
| 5 | NC | Not connected | | |
| 6 | NC | Not connected | | |
| 7 | NC | Not connected | | |
| 8 | PHONE_RECOGNIZING | Phone recognizing from jig. Active low | 0 | +coup (3.3V) |
| 9 | BSI | BSI signal from phone | | |
| 10 | FBUS/TX | FBUS TX signal from modular connector | | |
| 11 | GND(BUS) | GND from modular connector. Not connected to battery GND on JBV-1 | | |
| 12,13 | GND | Battery voltage GND | | |
| 14 | VBATT_SENSE | Battery voltage sense. Used for regulator voltage feedback | | |
| 16 | +COUP | Coupler voltage | 3.0V | 3.3V |
| 17 | NC | Not connected | | |
| 18 | NC | Not connected | | |
| 19 | NC | Not connected | | |
| 20 | NC | Not connected | | |
| 21 | BTEMP | BTEMP signal from phone | | |
| 22 | FBUS/RX | FBUS RX signal from modular connector | | |
| 23 | MBUS | MBUS signal from modular connector | | |

Mechanical characteristics

| Unit | Dimensions (mm) (W x H x D) | Weight (g) | Material |
|-------|-----------------------------|------------|----------|
| MJF-9 | 71,5 x 30,8 x 119,6 | 155 | ABS/PC |

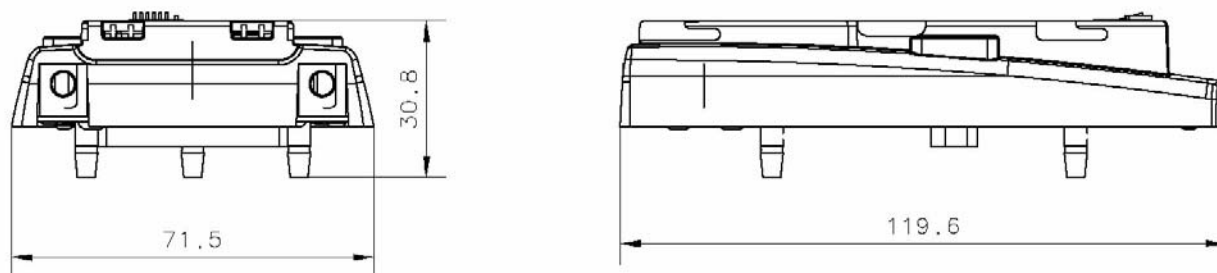


Figure 3. Main dimensions of MJF-9

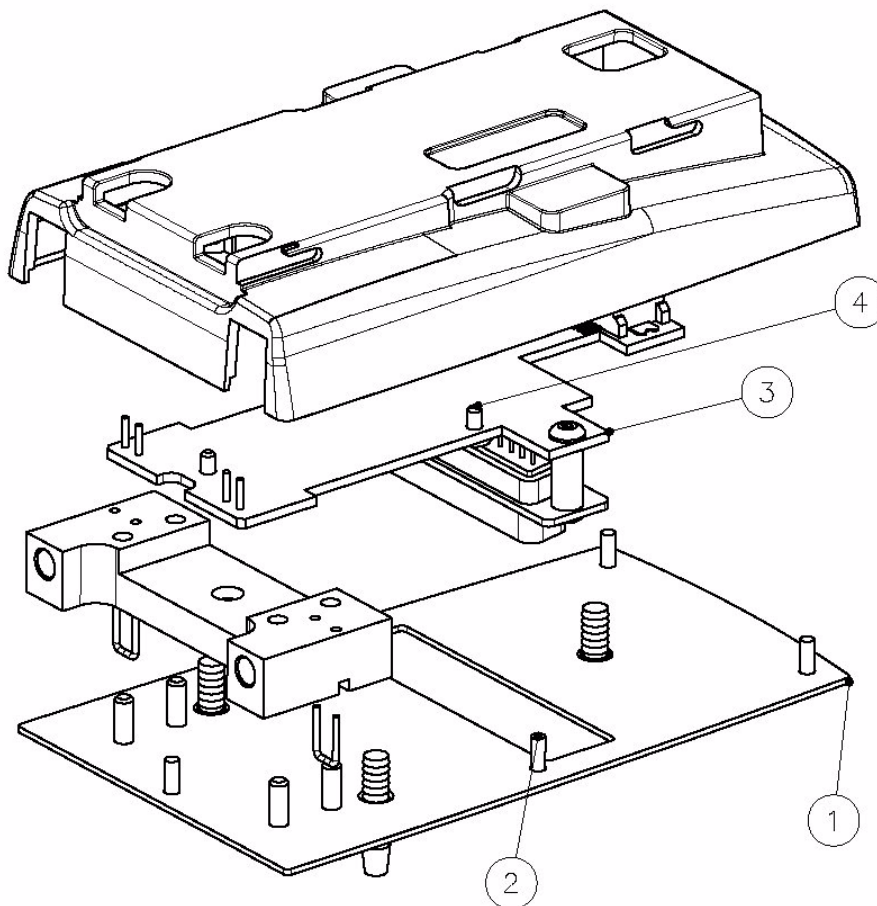
Environmental Conditions

Temperature Conditions

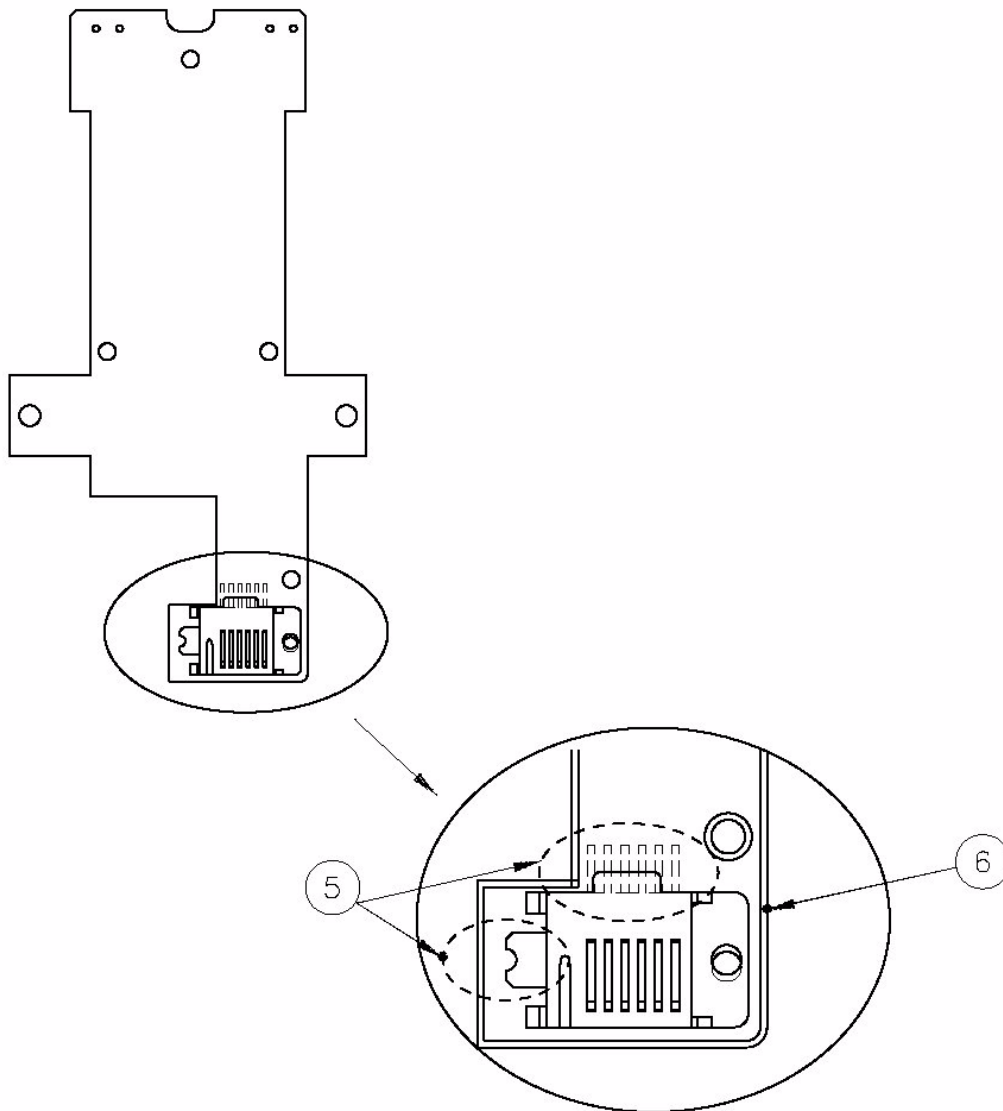
Allowed ambient temperatures

| | Ambient temperature (degrees Celsius) |
|-----------------------|--|
| Operating temperature | +5...+35 |
| Storage temperature | -30...+60 |
| Humidity RH | Max. 90% |

Instruction of MBUSIBI connector changing



1. Open the MJF-9 cover (1.) by screwing off 5 screws (2.)
2. Remove the PCB (3.) by screwing off these 4 screws (4.)



- 2 Remove solder from MBUSIBI connector's 6 pins and GND pin (5.)
- 3 Remove the connector and install new one on PCB
- 4 Ensure that the new MBUSIBI connector's hole is against PCB's hole (6.) and the pins are in middle of pads
- 5 Solder the connector to its place

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