



NOKIA 22



SUPPORT GUIDE FOR INSTALLING NOKIA 22

NOKIA





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1. INTRODUCTION

This document goes through the settings that are mandatory when installing the Nokia 22 terminal to a Private Branch Exchange (PBX). This document does not contain detailed technical information on fixed line installations. Hints are given on how to avoid problems caused by incorrect installation.

2. INSTALLATION

2.1 INSTALLATION ENVIRONMENT

The Nokia 22 should not be installed very close to a metal ceiling. However, under some circumstances the installation is possible with an external antenna.

The environmental temperature should be between -10°C ... $+55^{\circ}\text{C}$ and the humidity between 20 – 70%.



Caution: In order to comply with RF exposure requirements, install the terminal so that a minimum distance of 20 cm can be maintained between the antenna and all persons. If you use an external antenna, install the antenna so that a minimum distance of 20 cm can be maintained between the antenna and all persons, with antenna gain not exceeding 3 dBi.

2.2 CONNECTING NOKIA 22 AND PBX / TELEPHONE SET

- The wires from the trunk or extension connector should not be installed close to the antenna or other obstacles that might disturb the audio lines.
- The distance between the PBX (or telephone set) and the Nokia 22 should be more than 1 meter. The distance between Nokia 22 terminals should be more than 0.3 m. In case of interference, increase the distance.
- If a multi-pair cable is used, the unused pairs should be grounded from one end.
- Use a twisted pair cable to minimise disturbances.
- Use only the RJ11 6/6 connectors.



Tip: If the Nokia 22 is connected to a PBX, and the B subscriber occasionally hears part of his/her own speech as an echo, tune the microphone sensitivity and/or voice volume.

2.3 CONNECTING NOKIA 22 TO GSM NETWORK

Check the field strength on the installation site. If the signal quality is poor, use an external antenna.

If an external antenna is not used, the Nokia 22 should always be installed so that the antenna can be turned vertically.

After the Nokia 22 is turned on, check that the LED 3 lights up. If not, use the Nokia 22 Configurator software and select the operator manually.

Depending on the PBX interface where the Nokia 22 terminal is installed, check that the corresponding LED will turn on. (Led1 = Trunk mode, Led2 = Extension mode).

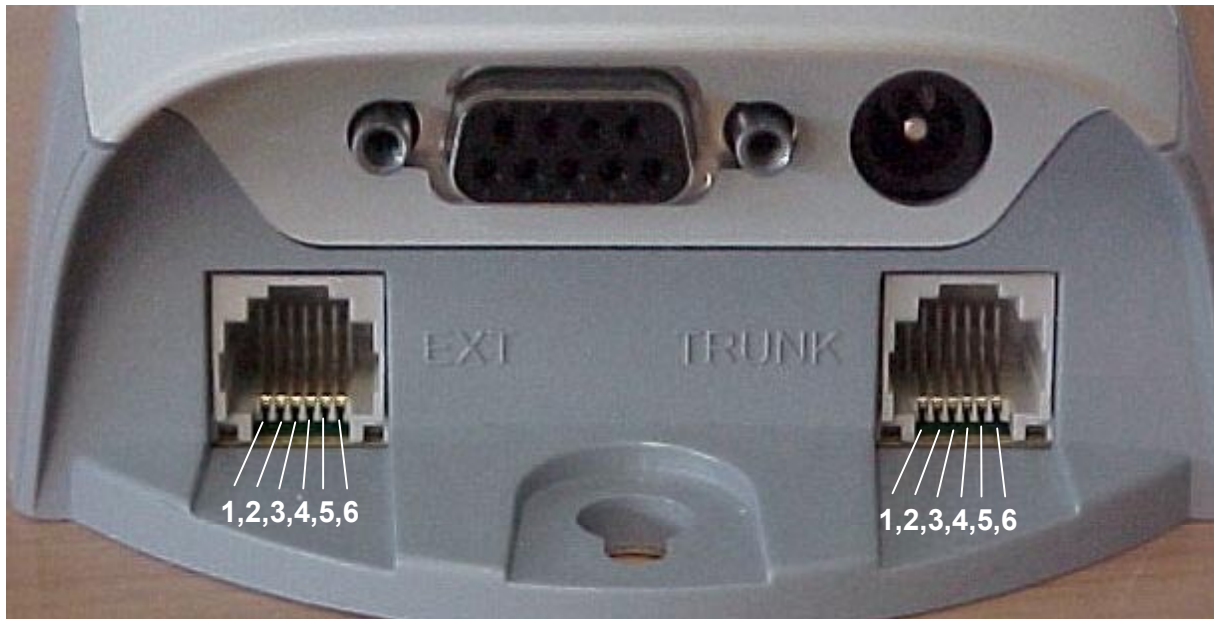


3. INTERFACES

3.1 TRUNK INTERFACE

An analog trunk interface of a PBX, or an analog telephone set can be installed to the trunk connector.

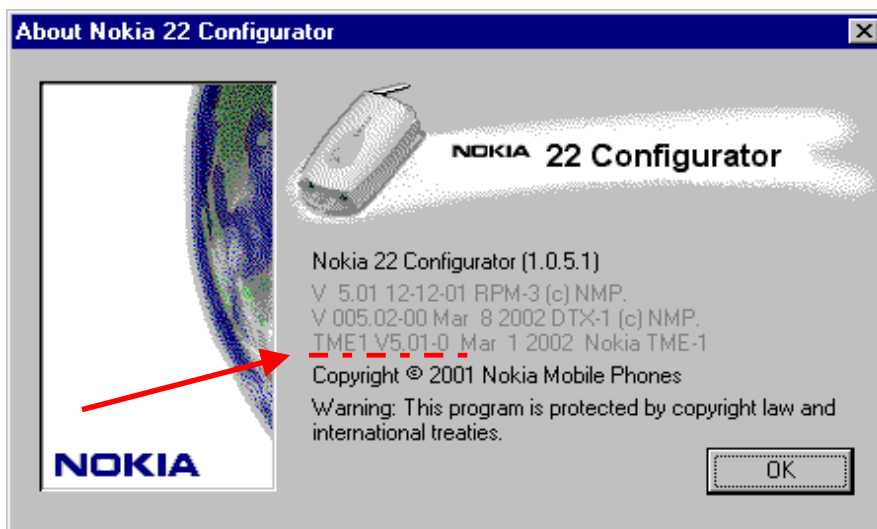
The pin numbers 3 and 4 are TIP and RING. The left most pin of the connector is the ground connector. Connect pin 1 to the ground if the mains voltage might cause interference.



- i** **Note:** In the figure above the pin numbers equal to the physical connector, not the wire itself. After the installation, check with a multimeter the resistance between the ground plate and ground connector of a building. It should be $\sim 0\Omega$.
- i** **Note:** If you connect a landline phone to the trunk connector, check that only the pins 3 and 4 are connected from the Nokia 22 to the telephone set.
- i** **Note:** The installation is NOT complete until you have set the mandatory settings required in the trunk mode. See the following chapters.

3.1.1 GSM start-up mode

Check with the Nokia 22 Configurator software the firmware version of the Nokia 22. You will see the following dialog:





If the TME-1 version is older than V5.01-0, set the GSM start up mode to *Voice mode*.
If the RS-232 interface is not needed, set the start up mode to *Voice mode*.

3.1.2 Selected Line Adapter

Automatic mode or *Trunk mode* can be selected.



Tip: You can also check polarity reversal, loop interruption time, and ringing pattern



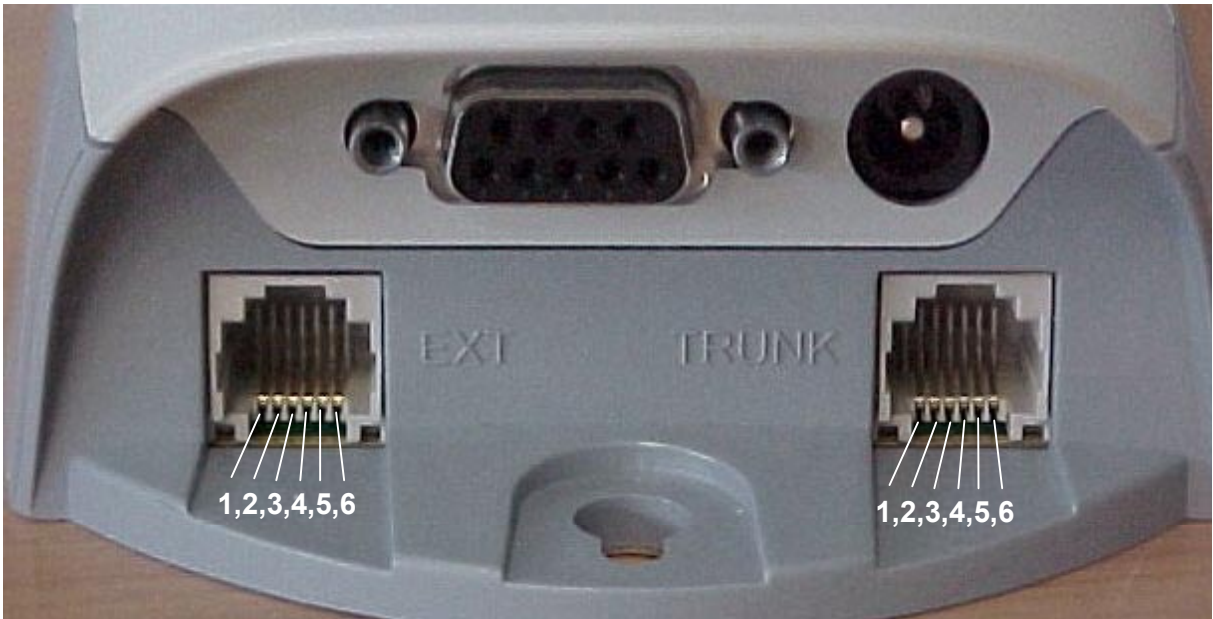
Caution: Remember to define the appropriate emergency number in the General settings dialog.



Caution: Remember to set the PIN query to ON, OFF, or AutoPIN.

3.2 EXTENSION INTERFACE

Only an analog extension interface can be connected to the EXT connector.
Only pins 3 and 4 are used as A and B.



Note: In the figure above, the pin numbers equal to the physical connector, not the wire itself. After the installation, check with a multimeter the resistance between the ground plate and ground connector of a building. It should be $\sim 0\Omega$.



Note: The line impedance of the Nokia 22 is 600Ω and the maximum line current is 120mA.

There are some mandatory settings that should be programmed with Nokia 22 Configurator:



3.2.1 Call monitoring

A PBX uses either a busy tone or silence when informing the Nokia 22 that a call is disconnected. To end the call to the GSM network, set the Nokia 22 to monitor either one of the signals using the *Extension mode settings* dialog.

As default, the Nokia 22 monitors for the busy tone.



Tip: Check the signal used by calling from one extension to another. After the call is answered, the recipient hangs up. Listen whether the PBX provides you a busy tone or silence.

3.2.1.1 Busy tone monitoring

The frequency and the cadence of the busy tone varies between different PBX models. The frequency that the Nokia 22 detects is between 360Hz - 440Hz.

Since the cadence of the busy tone might also vary, the Nokia 22 has a feature called Tone Teaching. The Nokia 22 can be set to the learning mode during the installation, whereupon it will take samples from the busy tone to learn the exact cadence.

After the Nokia 22 has physically been installed to the final position, and other mandatory settings are made, the learning mode can be activated:

1. Call the extension where the Nokia 22 is installed.
2. After you get the dial tone from the Nokia 22, dial ****#####*1234#88*own_ext_number#** (own_ext_number is the extension number where you are calling the Nokia 22 from).
3. After the last digit (#), put the receiver down, and wait until the Nokia 22 calls you back.
4. When the phone in the extension rings, pick up the receiver, and listen to the tone:
 - If you hear a busy tone, the learning did not succeed, and you should repeat the steps.
 - If you hear the command query beep (three beeps), the Nokia 22 has learned the busy tone.
5. Set the hook on, and wait for 60 seconds. The Nokia 22 will reboot itself and is then ready for use.



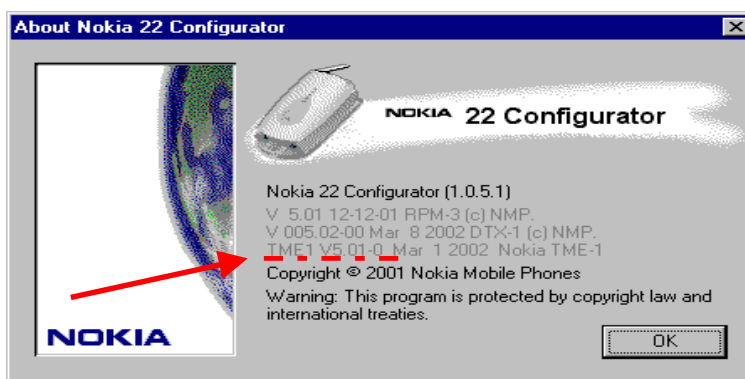
Tip: A document describing how to make the Nokia 22 to learn the cadence is available at www.nokia.com/product support.

3.2.1.2 Silence monitoring

If you selected silence monitoring, define also the *Silent time when disconnected*.

3.2.2 GSM start up mode

Check with Nokia 22 Configurator the firmware version of the Nokia 22. You will see the following dialog:



If the TME-1 version is older than V5.01-0, set the GSM start-up mode to *Voice mode*.
 If the RS-232 interface is not needed, set the start-up mode to *Voice mode*.

3.2.3 Selected Line Adapter

This setting has to be in the *Extension line adapter* mode.



Caution: After the loss of mains power, the Nokia 22 usually powers up faster than the PBX. If the *Selected Line adapter* is set to *Automatic*, the Nokia 22 will measure the line voltage in the pins 3 and 4 of the EXT connector. If there is no line voltage available, the Nokia 22 will start up in the Trunk mode. To avoid this, the Nokia 22 should be programmed into the extension mode solidly to maintain the same mode after the mains power loss.



Tip: You can also check:

- Incoming Call: Mode A or Mode B (Mode A as default)
- Outgoing Call: Mode A or Mode B (Mode A as default)
- Dialing mode in case of an incoming call: DTMF or pulse dialling



Caution: Remember to define the appropriate emergency number in the General settings dialog.



Caution: In case of an incoming call, mode B is recommended. Otherwise the A-subscriber might be able to select a trunk line and set up a call e.g. to some special tariff number.



Caution: Remember to set the PIN query to ON, OFF, or AutoPIN.