

NOKIA 32



SUPPORT GUIDE FOR
INSTALLING NOKIA 32

NOKIA





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1. INTRODUCTION

This document goes through the settings that are mandatory when installing the Nokia 32 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 32 terminal 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°C and the humidity between 20 - 75%.



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 32 TERMINAL 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 Nokia 32 should be more than 1 meter. The distance between Nokia 32 terminals should be more than 0,3m. In case of interferences, increase the distance.
- If the multi-pair cable is used, the unused pairs should be grounded from one end.
- Connect only pins 1,3 and 4 (trunk) and 3&4 in extension interface
- Use twisted pair cable to minimize disturbances.
- Use only the RJ11 6/6 connectors.



Tip: If the Nokia 32 terminal 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 32 TERMINAL TO GSM NETWORK

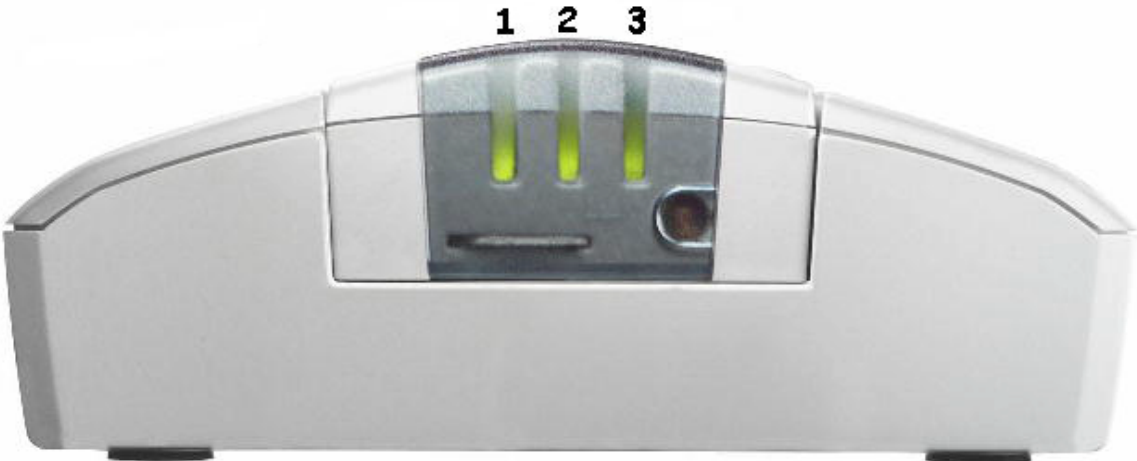
Check the field strength on the installation site. If the signal quality is poor, use an external antenna.



Note: The terminal shows the signal strength immediately after it has registered to network (when Nokia 32 terminal is powered up). The field strength is shown with the terminal leds for ten seconds time. (see light indicator table for details).

After the Nokia 32 terminal is turned on, check that the LED 3 lights up. If not, use the Nokia 32 configurator software and select the operator manually.

Depending on the PBX interface where the Nokia 32 terminal is installed, check that the corresponding LED will turn on. (Led2 = Trunk mode, Led1 = Extension mode).



Nokia 32 light indicators states 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

Nokia 22 light indicators 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

Nokia 32 light 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

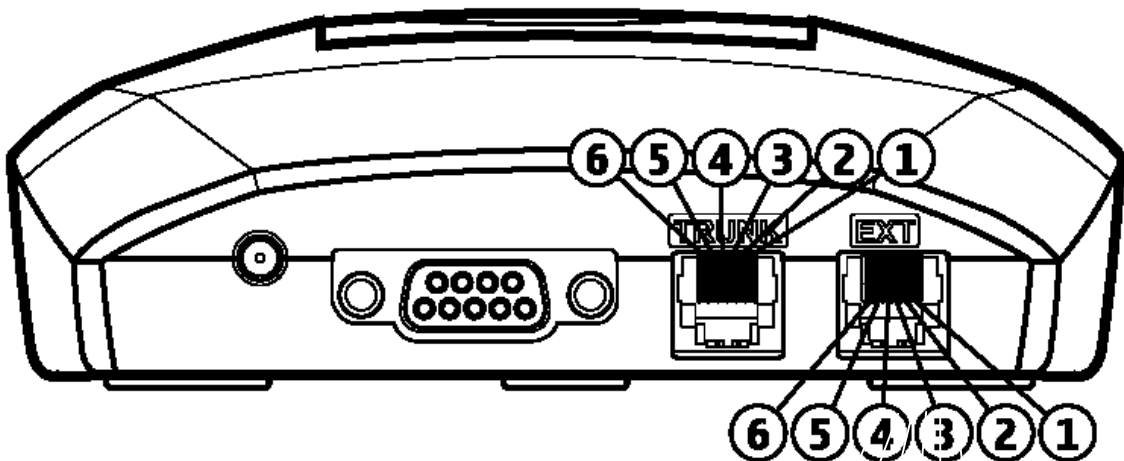


3. INTERFACES

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 number 3 and 4 are TIP and RING. The right most pin of the connector is the ground connector (when the connector is looked from outside of the terminal). Connect pin 1 to the ground if the mains voltage might cause interference.



Note: 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: If you connect a landline phone to the trunk connector, check that only the pins 3 and 4 are connected from Nokia 32 terminal to the telephone set.

3.1.1 To be noted in trunk mode installation



Tip: Check also the need of:

- Polarity reversal
- Loop interruption time

- Ringing pattern



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

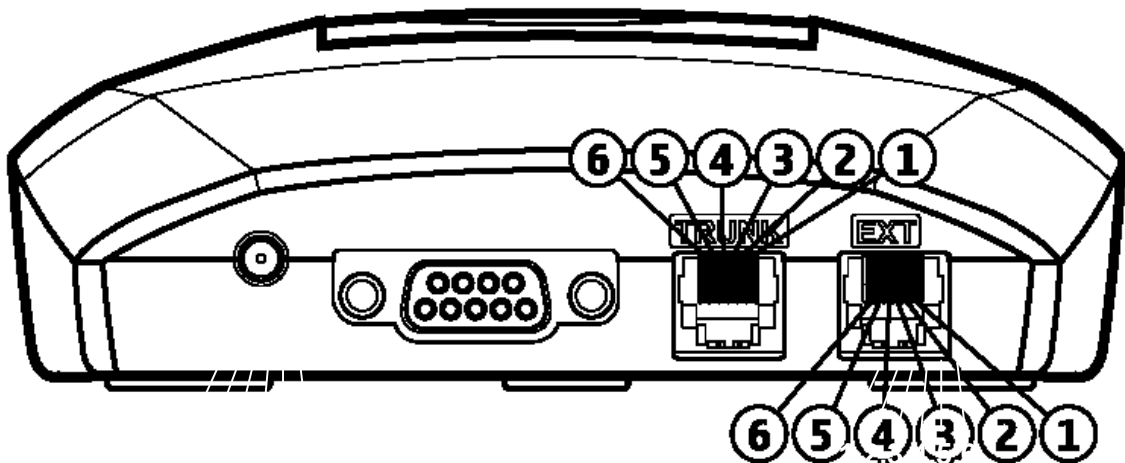


Caution: Remember to set the PIN query to ON, OFF or AutoPIN.

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: 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 Nokia 32 terminal is 600Ω and the maximum line current is 120mA

There are some settings that should be programmed to a Nokia 32 terminal:

3.2.1 Call monitoring

When informing of a disconnected call, a PBX uses either a busy tone, silence, or a combination of these. To end the call to the GSM network, the Nokia 32 terminal is able to monitor the busy tone or silence, but not a combination of these signals. You can change the call monitoring settings in the Nokia 32 Extension mode settings. As default, the Nokia 32 terminal monitors the busy tone. As default, the Nokia 32 terminal 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

If the PBX emits a busy tone to indicate, for example, a disconnected call from another extension, the frequency and cadence of this busy tone may vary between different PBX models. The frequency that the Nokia 32 terminal is able to detect is between 360Hz - 440Hz. For this reason, the Nokia 32 terminal contains a feature called Tone Teaching. Tone Teaching is needed to make the Nokia 32 terminal able to monitor the busy tone of the PBX to which it is connected. During installation, the Nokia 32 terminal can be set to the learning mode, whereupon it will take samples from the busy tone to learn the exact cadence.

To activate the learning mode, dial: `Nokia32_ext_num**#####**1234#88**own_ext_num#`

- `Nokia32_ext_num` is the extension number to which you have connected the Nokia 32 terminal
- `Own_ext_num` is the extension number from which you are calling the Nokia 32 terminal

1. Call the extension where the Nokia 32 terminal is installed.

2. After you get the dial tone from the Nokia 32 terminal, dial

`**#####**1234#88**own_ext_num#`

- If you hear a triad tone after dialling `**#####**` => continue the procedure
- If you hear one short beep followed by a triad tone after `**#####**1234#` => continue after the beep, ignore the triad tone
- If you hear one short beep followed by a triad tone after the complete string => continue after the beep, ignore the triad tone

3. Put the receiver down, and wait until the Nokia 32 terminal 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 three beeps, the Nokia 32 terminal has learned the busy tone.

5. Put the receiver down, and wait for 60 seconds. The Nokia 32 terminal will reboot itself and is then ready for use.

3.2.1.2 Silence monitoring

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

3.2.2 Other



Caution: After the loss of mains power, the Nokia 32 terminal usually powers up faster than the PBX. If the Selected Line adapter is set to Automatic, the Nokia 32 terminal will measure the line voltage in the pins 3 and 4 of the EXT connector. If there is no line voltage available, the Nokia 32 terminal will start up in the Trunk mode. To avoid this, the Nokia 32 terminal 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 incoming call: DTMF or pulse dialing



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 ON, OFF or AutoPIN.

4. NOKIA 32 INSTALLATION CHECKLIST



The purpose of this checklist is to be reminder of things to do or check when installing Nokia 32 terminal.

4.1 GENERAL

	Ok	Not ok
Sim card is inserted is in the terminal properly.		
Nokia 32 will be registered to network when powered up (Led three is lit, Nokia 32 is in service)		
GSM field strength is strong enough		
Line adapter mode LED corresponds the installation (ext/trunk)		
Need of grounding.		
No interfering telephone lines near Nokia 32 antenna.		
Check that no GSM interference can be heard in audios (need of ext antenna).		
PBX programming works correctly (routing calls through Nokia 32).		
Check that the emergency number is correct.		

4.2 TRUNK LINE INSTALLATION

	Ok	Not ok
Is there a need to use Loop Interruption (if yes, is it configured).		
Is there a need to use Polarity reversal (if yes, is it configured).		
Is there a need for CLI (Calling Line Identification).		
Is there a need for CAI (Charge Advice Information)		
Audio levels, is there need to tune them?		
Dialing time out, can it be minimized (how does the PBX deliver digits to Nokia 32 (PBX buffers them first, and then sends them one after another, or they are sent immediately when user dials digits).		
How does the PBX handle incoming calls from analog trunk lines (Nokia 32). Is there a need of call divert to SIM		
Country selection		



4.3 EXTENSION LINE INSTALLATION

	Ok	Not ok
How does the PBX indicate call disconnection to an extension line (do 'Tone teaching' in case of busy, configure silence monitoring in case of silence, configure PBX in other cases)		
How should incoming calls be handled? Mode A/Mode B		
Is the Tone teaching activated, what was response. Check ToneTeaching instructions on page 8.		
Audio levels, is there need to tune them?		

