

# ISDN2 NT1, Model S5

User Guide for:

- changing ISDN cabling if the NT1 was connected by KPN Telecom
- connecting the NT1 in conjunction with the 'ISDN2 Doe-Het-Zelf pack' (Self-installation pack)



# ISDN



## Pack contents

Check the contents of the pack before reading the User Guide.



If a KPN Telecom technician connects the NT1 for you, you will receive:

- this User Guide
- a power cord complete with plug



If you have purchased the 'ISDN2 Doe-Het-Zelf' pack, you should find the following inside the pack:

- the ISDN2 NT1, model S5
- a connecting lead complete with 2 modular plugs (RJ11 modular plugs)
- a power cord complete with plug
- a loose telephone plug
- 2 screws and 2 fixing plugs
- a sticker bearing the words **ISDN NT1-aansluitpunt** for labelling the main telephone socket
- a drilling template
- this User Guide.

### Important

The NT1 remains the property of KPN Telecom.



## Overview of the NT1, model S5

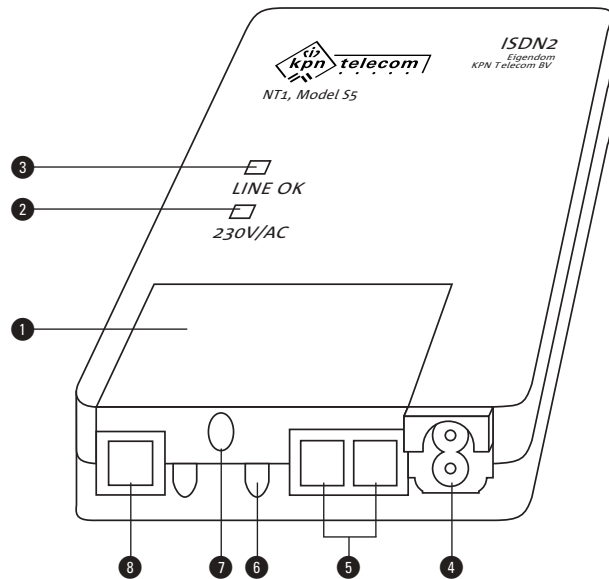


Figure 1: Front view of the NT1 with flap closed

### Front view of the NT1 with flap closed

- ❶ Flap for connection compartment
- ❷ **230V/AC** Indicator light for 230 Volt mains voltage (yellow) \*)
- ❸ **LINE OK** Indicator light for connection to the telephone network (green) \*)
- ❹ Connection point for power cord
- ❺ 2 connection points for ISDN cabling with modular plug
- ❻ Opening for ISDN cabling without modular plug
- ❼ Screw for connection compartment
- ❽ Connection point for exchange line (for a connecting lead with modular plug)

### Front view of the NT1 with flap open

- ❾ **S15** 2 mini-switches for switching the terminating resistance on and off
  - ON** Terminating resistance switched on
  - 1 en 2** Terminating resistance switched off
- ❿ 2 connection points for ISDN cabling (for ISDN cables with modular plug)

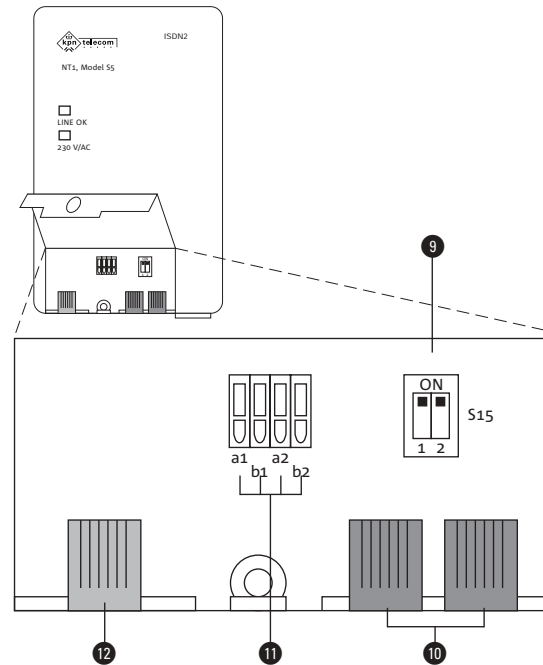


Figure 2: Front view of the NT1 with flap open

- ❿ **a1, b1, a2, b2** Connection point for ISDN cabling in the form of 4 cage clamps (for an ISDN cable without modular plug)
- ❿ Connection point for exchange line in the form of a modular jack (for a connecting lead with modular plug)

### \*) Indicator lights

|                             |                                               |
|-----------------------------|-----------------------------------------------|
| <b>LINE OK</b> (green) on   | The NT1 is connected to the telephone network |
| <b>230 V/AC</b> (yellow) on | and 230 Volt mains voltage is present         |

|                              |                                               |
|------------------------------|-----------------------------------------------|
| <b>LINE OK</b> (green) on    | The NT1 is connected to the telephone network |
| <b>230 V/AC</b> (yellow) off | and 230 Volt mains voltage is not present     |

|                              |                                                   |
|------------------------------|---------------------------------------------------|
| <b>LINE OK</b> (green) off   | The NT1 is not connected to the telephone network |
| <b>230 V/AC</b> (yellow) off |                                                   |

### Important

230 Volt mains power may still be present even if **230 V/AC** is off.

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The NT1 complies with the stipulations of the following EU guidelines: Electromagnetic Compatibility Guideline (89/336/EEC; radio interference) and Low-Voltage Guideline (73/23/EEC; electrical safety).

The NT1 complies with the safety regulations of the IEC and EN60950.

### Guarantee

The NT1 forms part of the ISDN2 service and remains the property of KPN Telecom, on the basis of the General Conditions applicable to the ISDN2 service. In the event of a fault, the NT1 will be replaced by KPN Telecom.

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## † ✘ About this User Guide

This User Guide contains all the information you need in order to change over to ISDN. At the end of this User Guide, you'll find technical data, an overview of the requirements for each type of ISDN cabling, a list of terms and a space for notes where you (or someone else) can fill in your ISDN details.

### When should it be used?

You can refer to this User Guide in two situations:

- † *ISDN installed by a KPN Telecom technician*  
If a KPN Telecom technician implemented the changeover to ISDN, you may wish to change the ISDN cabling in your home or office. This User Guide explains how to modify the ISDN cabling in that case. All the information in this User Guide that applies to your situation is indicated by the symbol † in the margin.
- ✘ *ISDN installed using the 'ISDN2 Doe-Het-Zelf' pack*  
This User Guide explains how to make all the preparations for the changeover to ISDN yourself with the 'ISDN2 Doe-het-Zelf' pack. All the information in this User Guide that applies to your situation is indicated by the symbol ✘ in the margin.

### And when not?

- In the following situations, it's a good idea to have the NT1 connected by a KPN Telecom technician:
- if you have 2 or more analogue telephone lines;
  - if you have an alarm system that uses the telephone line;

- if you're not sure which is the main telephone socket in your home or office (see also Section 3.1);
- if you have little experience of installing telephone sockets and telephone cables;
- if you wish to position the NT1 somewhere other than directly next to the main telephone socket;
- if you think you need more than 150 m of cabling.

#### *Moving to a new house or office*

If you move to a new house or office and take your ISDN connection with you, you must leave the NT1 behind in your previous home or office. This is because the NT1 is part of KPN Telecom's ISDN network and remains the property of KPN Telecom. You will receive another NT1 in your new home or office.

#### **Instructions**

The instructions in this User Guide are provided in numbered steps (1, 2, 3, etcetera).

The symbol > indicates something that must happen before you can carry out an instruction. The symbol can also indicate what happens after you have carried out an instruction.

#### **Extra brochure**

The brochure 'Teleklusser'® is available from Primafoon®. This brochure contains important information about connection equipment and connecting your ISDN cabling and analogue devices. You should refer to the relevant user instructions before connecting and setting up your ISDN devices.

#### **More information?**

If you have any further questions about the NT1 and the 'ISDN2 Doe-Het-Zelf pack' after reading this User Guide, you can visit the Website of

KPN Telecom's 'GebruikService' ('User Service'). The address is *kpn.com*, keyword 'gebruikservice'. You can also contact 'GebruikService' on telephone number 0900-8642 (call charges apply).

#### **Ordering products?**

If you wish to order products from the Primafoon range, you can call Primafoon Direct, telephone number 0800-1515 (freephone). Products from the Business Center range can be ordered by telephone from Business Center Direct, 0800-0105 (freephone).

#### **Further questions?**

If you have any further questions, you can visit the sales outlet or call KPN Telecom's Consumer Customer Service, telephone number 0900-0244 (call charges apply).

## **† ✕ About ISDN and the NT1**

One of the items you receive from the KPN Telecom technician or in the 'ISDN2 Doe-Het-Zelf' pack, is what is referred to as the NT1, the Network Termination 1.

This is the ISDN main connection point that you can fix to the wall at home. An ISDN2 connection provides you with 2 communication channels amongst other things. One of the benefits of these 2 channels is that you can use them simultaneously and independently of each other; if you're conducting a telephone call on one channel, you can still be contacted via the other channel. You can also use 2 forms of telecommunication simultaneously. For instance, you can make a telephone call and surf the Internet at the same time.

Firstly, the NT1 has to be connected to the exchange line. How this is done depends on your situation:

- † If the KPN Telecom technician implements your ISDN connection, he will connect the NT1 directly to the exchange line. In this case, the connection can only be disconnected by the KPN Telecom technician.
- ✕ If you change over to ISDN by using the 'ISDN2 Doe-Het-Zelf pack', you must connect the NT1 to the exchange line via the main telephone socket (see Figure 3).
- † ✕ Secondly, you connect the NT1 to your ISDN devices, such as an ISDN telephone, a computer with an ISDN PC card or an ISDN terminal adapter. You can connect up to 2 ISDN devices directly to the NT1. By using ISDN cabling, you can connect up to 8 ISDN devices to the NT1.

## Important

You can only connect ISDN devices to the NT1. If you wish to connect analogue devices, you must first connect an ISDN terminal adapter, such as the Quattrovox or Webvox. You can then connect your analogue devices to the ISDN terminal adapter. Analogue devices are devices that you can use without an ISDN connection, such as the telephone handsets, fax machines and modems that you already own (see Figure 3). In most cases, you'll connect an ISDN terminal adapter to one of the NT1's connection points and other ISDN devices to the other connection points.

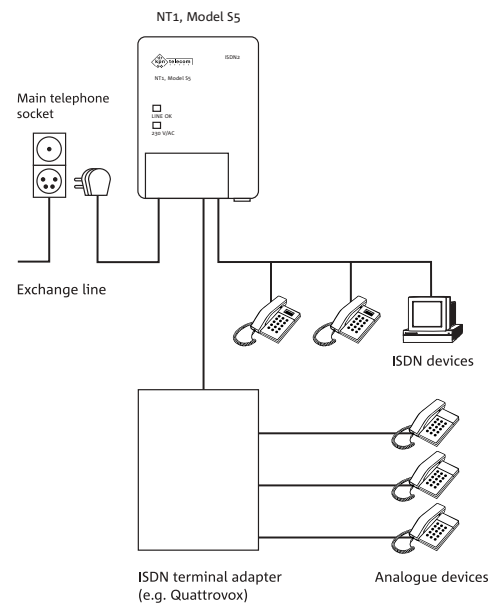


Figure 3: Schematic overview of an ISDN connection

The NT1 is part of KPN Telecom's ISDN network and remains the property of KPN Telecom. The NT1 complies with European guidelines for ISDN (Euro-ISDN).

## 1 † ⚡ Safety and warnings

### 1.1 † ⚡ Safety

Remember that you're working with electricity. Once your telephone connection has been converted to ISDN, a voltage of approximately 100 Volts is present on the exchange line cable. A voltage of approximately 40 Volts is present on the connected ISDN cabling. Consequently, it's a good idea to observe safety measures when working on the exchange line cable or the ISDN cabling. Always remove the ISDN cabling from the NT1 first and use insulated tools.

### Important

Never open the casing of the NT1, except for the flap of the connection compartment. The NT1 is the property of KPN Telecom and does not contain any components that you can repair yourself. In the event of a fault, the NT1 will be replaced by KPN Telecom.

### ⚡ Important

The NT1 in the 'ISDN2 Doe-Het-Zelf'pack is only suitable for connection to the main telephone socket. Direct connection to the exchange line cable is not advisable; cutting through the exchange line cable can cause faults or short-circuits. KPN Telecom cannot be held responsible for the consequences.

### 1.2 † ⚡ Requirements relating to ISDN cabling

The ISDN cabling comprises the complete system of ISDN wallports and ISDN cables. If the ISDN cabling is less than 150 m long, you can connect up to 8 ISDN devices, including up to 4 ISDN devices without their own power supply. You can identify a device with its own power supply by the lead and power plug or lead and adapter. Examples of devices with

their own power supply are ISDN fax machines and ISDN PC cards. ISDN telephones don't usually have their own power supply.

If the ISDN cabling is more than 150 m long, it's a good idea to have the ISDN cabling installed by a KPN Telecom technician. This is because different requirements apply to ISDN cabling more than 150 m long.

### 1.3 † ⚡ Power failure

If the power fails, the NT1 automatically switches over to emergency power. The yellow **230V/AC** indicator light goes off while the green **LINE OK** indicator light stays on. In this case, you can only make telephone calls with one ISDN telephone. Emergency power must have been activated on that ISDN telephone. It's a good idea to set one ISDN telephone to emergency power when connecting ISDN devices so that you can always be contacted in the event of a power failure. To set emergency power, refer to the User Guide for the relevant ISDN telephone.

The NT1 also switches over to emergency power automatically if the NT1's power plug is accidentally pulled out of the power outlet while the power is still on. In this case, you can still use your other ISDN devices with their own power supply as well as the ISDN telephone that is set to emergency power.

## 2 † ✘ Required parts and step-by-step procedure

### 2.1 † ✘ Required parts

You'll find some of the parts required to connect to ISDN in the pack.

You can purchase the other required parts at Primafoon or Business Center:

- Cable clips.
- Telephone sockets for analogue devices.
- ISDN wallports for ISDN devices.
- One or two terminating plugs or junction blocks with built-in terminating resistance (depending on the type of ISDN cabling in Section 4.4).
- Telephone cable and ISDN cable. If you already have telephone cable at home, you can still use it to connect the analogue devices. You can only use the existing telephone cable for ISDN devices if it has 4 conductors. This is also referred to as 1x4 cable. You can also use ISDN cable instead. ISDN cable is round and consists of 4 conductors coloured orange, blue, white/blue and white/orange.

#### Important

Do not use the flat cable sometimes sold commercially as ISDN cable. This flat cable is unsuitable for ISDN and can cause faults. This flat cable contains differently coloured conductors from the ISDN cable from KPN Telecom.

#### Extra information

A brochure is available from Primafoon that contains important information about ISDN connection equipment, connecting ISDN cables and ISDN wallports and also connecting analogue devices. Ask for the 'Teleklusser'.

## 2.2 † ✘ Step-by-step procedure

### † ISDN installed by a KPN Telecom technician

If a KPN Telecom technician implemented the changeover to ISDN, you may wish to change the ISDN cabling in your home or office.

Modifying your ISDN cabling consists of the following steps:

- 1 Connecting ISDN devices (see Chapter 4).
- 2 Connecting the NT1 to the power supply network (see Section 5.3).

### ✘ ISDN installed using the 'ISDN2 Doe-Het-Zelf' pack

If you purchased the 'ISDN2 Doe-Het-Zelf' pack, connecting to ISDN consists of 10 steps. These steps are shown in Figure 4 on page 16.

#### Important

All the steps apply if you're using the 'ISDN2 Doe-Het-Zelf' pack. These steps are indicated by ✘. If you're installing the NT1 in your new home or office, you should also follow the steps indicated by ✘ but skip steps 3 and 8.

*Preparations for changing over to ISDN (see Chapter 3)*

- ① Identifying the main telephone socket.
- ② Determining the position of the NT1.
- 3 Removing existing analogue devices (not shown).
- 4 Disconnecting existing analogue cabling (not shown).
- ⑤ Mounting the NT1 on the wall.
- ⑥ Connecting analogue devices.

*Connecting ISDN devices (see Chapter 4)*

- ⑦ Connecting ISDN devices.

*Changing over to ISDN (see Chapter 5)*

- 8 Calling KPN Telecom to changeover to ISDN (not shown).
- ⑨ Inserting the NT1's plugs into the sockets.
- 10 Testing the ISDN connection (not shown).

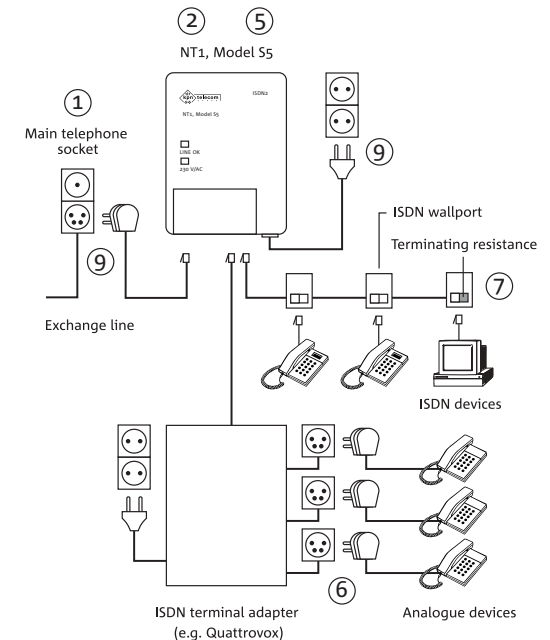


Figure 4: Step-by-step procedure for changing over to ISDN using the 'ISDN2 Doe-Het-Zelf' pack

### 3 ✂ Preparations for changing over to ISDN

#### Important

This Chapter only applies to your situation if you purchased the 'ISDN2 Doe-Het-Zelf' pack.

#### 3.1 ✂ Identifying the main telephone socket

The NT1 can only be connected to the main telephone socket in your home or office. The main telephone socket is the telephone socket that is connected directly to the exchange line. If you have one telephone socket in your home, it is always the main telephone socket. If you have more than one telephone socket in your home, the main telephone socket is usually the telephone socket located in your living room or in the meter cupboard.

In most homes and offices, the main telephone socket consists of a wallport with a cover plate and a telephone socket (see Figure 5, (A)). However, the main telephone socket may also consist of a single telephone socket (see Figure 5, (B)) or a wallport with 2 connection points for modular plugs as shown in Figure 5, (C). Type (C) is only present in the meter cupboard of homes and offices released after March 2000.

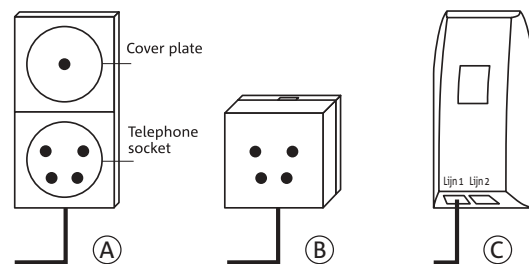


Figure 5: Main telephone socket

#### 3.2 ✂ Determining the position of the NT1

The NT1 is designed to be mounted on a wall. When determining the position of the NT1, take account of the following:

- Due to the length of the power cord, do not position the NT1 more than 1.90 m from a 230 V power outlet.
- Due to the length of the connecting lead with modular plug and telephone plug (1.50 m), position the NT1 close to the main telephone socket.
- Do not position the NT1 in direct sunlight or in a very hot, cold, humid or dusty location.
- Do not position the NT1 in an area where acids, alkalis or other aggressive substances can damage the device.
- Do not position the NT1 in a meter cupboard with an opening to the crawl space due to humidity. You can position the NT1 in a ventilated meter cupboard without openings to the crawl space.
- If you connect the NT1 to the main telephone socket in the meter cupboard, it's best to mount the NT1 approximately 30 cm above the main telephone socket.
- Leave at least 10 cm of free space at the top and bottom of the device and 5 cm of space at the sides for air circulation.

#### 3.3 ✂ Removing existing analogue devices

This section only applies to you if you're changing over from an analogue telephone connection to ISDN at your current address. If you're installing the NT1 in your new home or office, you should continue at Section 3.4. Remove the telephone plugs of all your analogue devices from the telephone sockets. Then connect one of your analogue telephones temporarily to the main telephone socket (see Figure 6). You can then make and receive calls

while you're mounting the NT1 on the wall and connecting the ISDN terminal adapter, analogue devices and/or ISDN devices.

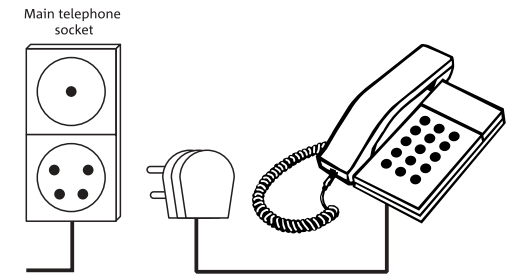


Figure 6: Connecting an analogue telephone temporarily to the main telephone socket

#### 3.4 ✂ Disconnecting existing analogue cabling

If you have more than one telephone socket in your home, you must disconnect the existing analogue cabling from the main telephone socket. In most cases, you can still use this analogue cabling to connect your analogue devices to an ISDN terminal adapter, such as the Quattrovox or Webvox (see Section 3.6).

#### 3.5 ✂ Mounting the NT1 on the wall

- 1 Hold the supplied drilling template against the wall, leaving 5 cm of space to the left and right of the drilling template. Mark the drilling holes.
- 2 Insert the supplied fixing plugs and screws into the wall at the marked points. Do not tighten the screws fully.
- 3 Position the NT1 with the mounting eyes over the screws and carefully slide the device downwards.

#### Important

Do not insert the NT1's power plug into the power outlet or the NT1's telephone plug into the main telephone socket at this stage.



### 3.6 ✂ Connecting analogue devices

Before connecting the NT1, it's a good idea to connect your analogue devices first. Analogue devices have to be connected to an ISDN terminal adapter, such as the Quattrovox or Webvox. Position the ISDN terminal adapter and connect the telephone cables and telephone sockets to it (see Figure 7). You may have to adapt the length of the cabling. Then connect your analogue devices to the telephone sockets and connect the ISDN terminal adapter to the NT1. To connect the ISDN terminal adapter and to connect analogue devices, refer to the User Guide for your ISDN terminal adapter.

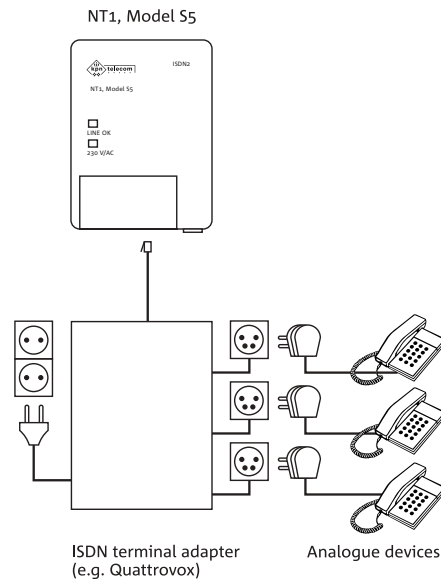


Figure 7: Connecting analogue devices to the NT1 via an ISDN terminal adapter

## 4 † ✂ Connecting ISDN devices

† ✂ You can connect ISDN devices to the NT1 in various ways. Which way you choose depends on the number of ISDN devices that you wish to connect and the length of the ISDN cabling.

### Connecting ISDN devices directly

You can connect up to 2 ISDN devices directly to the NT1 via connecting leads. A connecting lead is usually supplied with the ISDN device. The connecting leads can be up to 10 m long. See Section 4.6.

### Connecting ISDN devices via ISDN cabling

If you wish to connect more than 2 ISDN devices or if you wish to position ISDN devices more than 10 m away from the NT1, you must connect each ISDN device to an ISDN wallport (see Figure 8). An ISDN wallport is a special telephone socket for ISDN devices. The ISDN wallports must be connected to the NT1 by means of ISDN cables. The ISDN cables are connected to each other by means of the ISDN wallports. The complete system of ISDN cables and ISDN wallports is referred to as ISDN cabling. See Sections 4.1 to 4.6 inclusive.

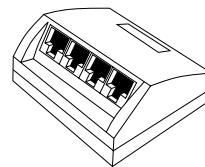


Figure 8: Example of an ISDN wallport

You can also position a junction block at the end of the ISDN cabling instead of an ISDN wallport. A junction block is an ISDN wallport with a built-in terminating resistance (see Figure 10).

However, you must never position a junction block in the middle of the ISDN cabling.

You can also use 4-wire telephone cable instead of ISDN cable. However, you cannot fit modular plugs to 4-wire telephone cable. In the case of 4-wire telephone cable, therefore, you should use ISDN wallports with 2 connection points for modular plugs. This is because they have cage clamps to which the 4-wire cable can be connected.

### 4.1 † ✂ Choosing the type of ISDN cabling

If you wish to connect more than 2 ISDN devices or if you wish to position ISDN devices more than 10 m away from the NT1, you must connect the ISDN devices to the NT1 via ISDN cabling.

#### Types of ISDN cabling

There are 2 types of ISDN cabling. Which type of ISDN cabling you choose depends on the position of the NT1 and the ISDN devices.

##### One ISDN cable to the NT1

This is the type of ISDN cabling that is used most. This type of cabling, also referred to as Short S bus, consists of one long cable up to 150 m long, with the NT1 at the starting point. You can connect up to 8 ISDN devices to this type of cabling (see Figure 10).

##### Two ISDN cables to the NT1

A type of ISDN cabling that you can use if you wish to have two cables running through your home from the NT1. The maximum combined length of the ISDN cabling is 150 m. You can connect up to 8 ISDN devices to this type of ISDN cabling, also referred to as Y configuration (see Figure 11).



## ✘ Identifying the type of ISDN cabling

If a technician connected the NT1, you may wish to change your ISDN cabling. You can determine which type of ISDN cabling you currently have with the aid of the flowchart in Figure 9.

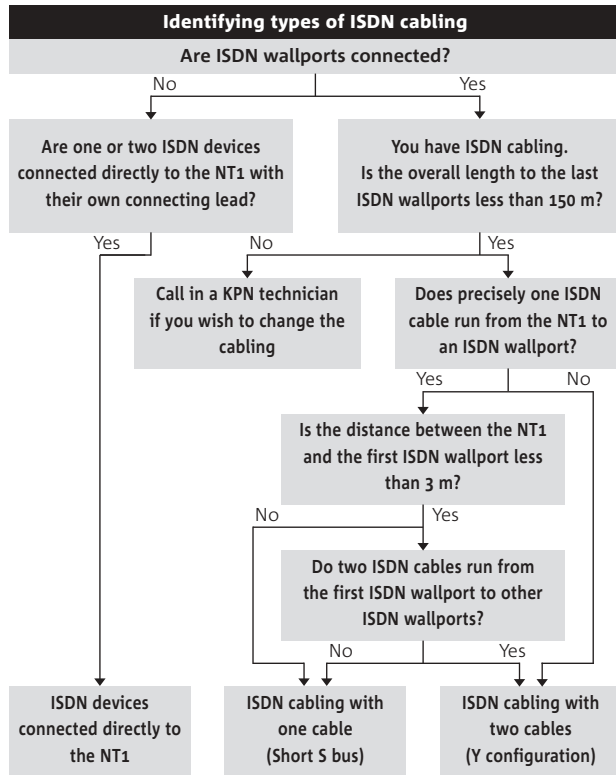


Figure 9: Flowchart for identifying types of ISDN cabling

## 4.2 † ✘ Installing ISDN cabling

ISDN cabling must comply with certain requirements. If you don't observe the following requirements, your ISDN devices may not operate properly or may be damaged. You can find an overview of the requirements for each type of ISDN cabling on page 38 at the back of this User Guide.

There must be no branches in the ISDN cabling. The cable must go from ISDN wallport to ISDN wallport, etcetera.

It's a good idea to make a plan of your home or office in advance. You can indicate on this plan where the ISDN devices and ISDN cables must go. When measuring the cables, always allow 20 cm extra at each end.

### One ISDN cable to the NT1

One end of the ISDN cabling is formed by the NT1 and the other end by a junction block or an ISDN wallport with a terminating plug. From the NT1, one cable with wallports runs through the premises. The maximum length of the ISDN cabling is 150 m. You can connect up to 12 ISDN wallports to the ISDN cabling. You can connect up to 8 ISDN devices to these ISDN wallports, including up to 4 devices without their own power supply (see also Section 1.2). The connecting leads can be up to 10 m long. You can connect 2 of the 8 ISDN devices directly to the NT1, each with a connecting lead up to 10 m long.

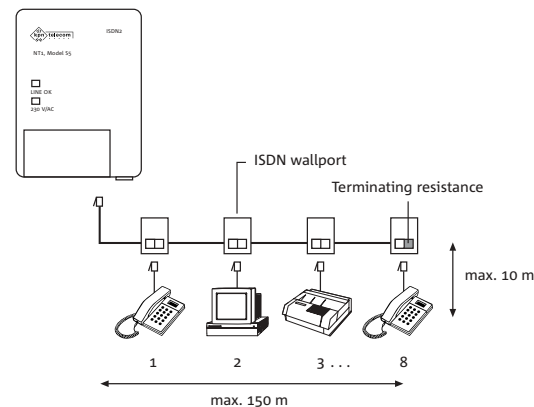


Figure 10: ISDN cabling with one ISDN cable connected to the NT1

### Two ISDN cables to the NT1

From the NT1, 2 cables with wallports run through the premises. Both ends of the ISDN cabling are formed by a junction block or an ISDN wallport with a terminating plug. The maximum combined length of the ISDN cabling is 150 m. You can connect up to 12 ISDN wallports to the ISDN cabling. You can connect up to 8 ISDN devices to these ISDN wallports, including up to 4 devices without their own power supply (see also Section 1.2). The connecting leads can be up to 10 m long. You can connect one of the 8 ISDN devices directly to the NT1, with one connecting lead up to 10 m long.

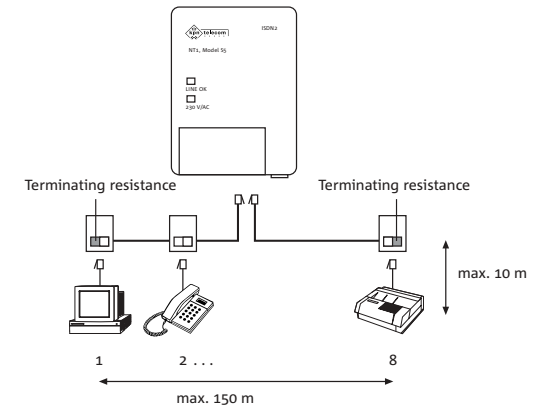


Figure 11: ISDN cabling with two ISDN cables connected to the NT1

## 4.3 † ✘ Connecting ISDN cabling to ISDN wallports

To connect ISDN cable or telephone cable to the ISDN wallports, refer to the 'Teleklusser' and the User Guide of the relevant ISDN wallport.

#### 4.4 † ✂ Terminating ISDN cabling with a terminating resistance

The two ends of the ISDN cabling must be terminated with a terminating resistance. What the ends of the ISDN cabling comprise depends on the number of ISDN cables connected to the NT1.

##### ISDN devices connected directly to the NT1

A terminating resistance is built into the NT1 and is switched on by default: mini-switches 1 and 2 of S15 in the NT1's connection compartment are set to ON. It's a good idea to check this. No further action is needed.

##### ISDN devices connected to the NT1 via ISDN cabling

###### One ISDN cable to the NT1

With this type of ISDN cabling, one end of the cabling comprises the NT1 and the other end an ISDN wallport or junction block. A terminating resistance is built into the NT1 and is switched on by default: mini-switches 1 and 2 of S15 in the NT1's connection compartment are set to ON. It's a good idea to check this. A terminating resistance is also built into junction blocks. If the other end of the ISDN cabling is an ISDN wallport and not a junction block, you must insert a loose terminating plug into the ISDN wallport (see Figure 10).

###### Two ISDN cables to the NT1

With this type of ISDN cabling, the NT1 sits in the middle of the ISDN cabling and does not form one end. Consequently, you must switch the terminating resistance in the NT1 off. You do this by setting mini-switches 1 and 2 of S15 in the NT1's connection compartment to 1 and 2 (see Figure 12). At the two ends of the

ISDN cabling, you must install either an ISDN wallport with a terminating plug or a junction block (see Figure 11).



Figure 12: Switching off the terminating resistance in the NT1

#### 4.5 † ✂ Connecting ISDN cabling to the NT1

You can connect ISDN cables to the NT1 in 2 ways. If the ISDN cable has a modular plug, you can insert it into one of the 2 modular jacks. If your ISDN cable doesn't have a modular plug, or if you're using a 4-wire telephone cable, or if you wish to connect 2 further ISDN devices to the modular jacks, you must connect the ISDN cable to the 4 cage clamps in the connection compartment.

##### Connecting an ISDN cable with modular plug

Insert the modular plug of the ISDN cable into one of the NT1's 2 modular jacks.

##### Connecting an ISDN cable without modular plug

- 1 Remove approximately 12 mm of the cable sheath from the end of the ISDN cable with wire strippers.
  - > You'll see a blue wire, a white/blue wire, an orange wire and a white/orange wire. If, apart from the blue wire and the orange wire, you see a red wire, a white wire and a bare copper wire, continue with step 2 of 'Connecting 4-wire telephone cable without modular plug'.
- 2 Remove approximately 5 mm of the insulation from the ends of the coloured wires.
- 3 Open the connection compartment of the NT1 with a screwdriver.

- 4 Insert the screwdriver into cage clamp a1 (see Figure 13, A).

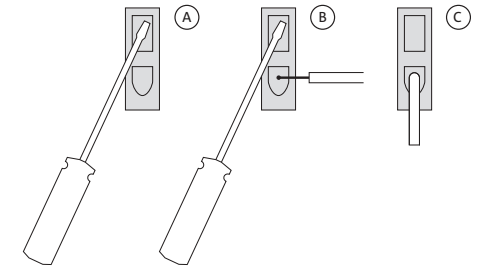


Figure 13: Connecting cables to cage clamps

- 5 Press the cage clamp down slightly and insert the copper end of the blue wire into the round opening (see Figure 13, B). Release the cage clamp (see Figure 13, C).
- 6 Connect the other wires of the ISDN cable to the other cage clamps in the same way: the white/blue wire to cage clamp b1, the orange wire to cage clamp a2 and the white/orange wire to cage clamp b2, as shown in Figure 14.

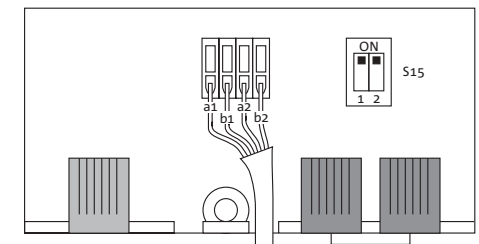


Figure 14: Connecting ISDN cables or telephone cables to the NT1

## Connecting 4-wire telephone cable without modular plug

- 1 Remove approximately 12 mm of the cable sheath from the end of the telephone cable with wire strippers.
- > You'll see a red wire, a blue wire, an orange wire, a white wire and a bare copper wire. If, apart from the blue wire and the orange wire, you see a white/blue wire and a white/orange wire, go back to step 2 of 'Connecting ISDN cable without modular plug'.
- 2 Remove approximately 5 mm of the insulation from the ends of the coloured wires.
- 3 Open the connection compartment of the NT1 with a screwdriver.
- 4 Insert the screwdriver into cage clamp **a1** (see Figure 13, **A**).
- 5 Press the cage clamp down slightly and insert the copper end of the red wire into the round opening (see Figure 13, **B**). Release the cage clamp (see Figure 13, **C**).
- 6 Connect the other wires of the telephone cable to the other cage clamps in the same way: the blue wire to cage clamp **b1**, the orange wire to cage clamp **a2** and the white wire to cage clamp **b2**, as shown in Figure 14.
- 7 Bend the bare copper wire inwards and cut it off. Make sure that this wire is not touching the other wires. You don't need to use this wire.

## 4.6 † ✂ Connecting ISDN devices

### Connecting ISDN devices directly

You can connect up to 2 ISDN devices directly to the NT1. The connecting leads can be up to 10 m long. Connect each connecting lead to one of the NT1's modular jacks (see Figure 15).

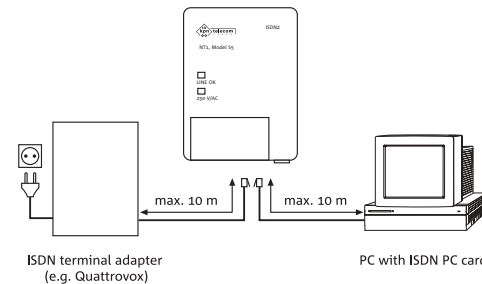


Figure 15: Connecting ISDN devices directly to the NT1

### Connecting ISDN devices via ISDN cabling

Connect your ISDN devices to the ISDN wallports with connecting leads. The connecting leads can be up to 10 m long.

## 5 † ✂ Changing over to ISDN

### Before you begin

You have mounted the NT1 on the wall. The NT1 is not yet connected to the 230 V power outlet or the main telephone socket. But you have connected your ISDN devices and/or an ISDN terminal adapter to the NT1. Your analogue devices are connected to the ISDN terminal adapter.

### 5.1 ✂ Calling KPN Telecom to change-over to ISDN

This section only applies to you if you're changing over from an analogue telephone connection to ISDN at your current address. If you're installing the NT1 in your new home or office, you should continue at Section 5.2. Before you can use the NT1 and your ISDN connection, you must ask KPN Telecom to change your exchange line over to ISDN. You can make this request from the analogue telephone that you connected temporarily to the main telephone socket. You can only make the request on the date stated in the letter of confirmation that you received from KPN Telecom.

### Important

From the time that you call KPN Telecom, it will not be possible to contact you by telephone for up to 2 hours. This means that you will be unable to make or receive telephone calls.

- 1 Contact KPN Telecom via your analogue telephone as indicated in the instructions in the letter of confirmation and say that you wish to change over to ISDN. The KPN Telecom employee will ask you for your customer details and the reference on the letter of confirmation.

- > As from this time, it will not be possible to contact you by telephone for up to 2 hours.
- 2 Remove the telephone plug of the analogue telephone from the main telephone socket.
- 3 Connect the NT1 at the time agreed with KPN Telecom (for connection, see Sections 5.2 and 5.3).

## 5.2 ✂ Connecting the NT1 to the main telephone socket

How you connect the NT1 is determined by the type of main telephone socket in your house or office (see Figure 5 on page 17).

### Main telephone socket, type (A) or (B)

- 1 Attach the **ISDN NT1-aansluitpunt** sticker to the main telephone socket.
  - 2 Insert one modular plug of the connecting lead into the modular jack for the exchange line on the NT1.
  - 3 Insert the other modular plug of the connecting lead into the loose telephone plug supplied.
  - 4 At the time agreed with you, insert the telephone plug into the main telephone socket.
- > The green **LINE OK** indicator light on the NT1 comes on continuously. If the light does not come on, the NT1 is not yet connected to the telephone network.

### Main telephone socket, type (C)

- 1 Attach the **ISDN NT1 aansluitpunt** sticker to the main telephone socket.
- 2 Insert one modular plug of the connecting lead into the modular jack for the exchange line on the NT1.
- 3 At the time agreed with you, insert the other modular plug of the connecting lead into the left-hand **LIJN 1** connection point of the main telephone socket.

- > The green **LINE OK** indicator light on the NT1 comes on continuously. If the light does not come on, the NT1 is not yet connected to the telephone network.

## 5.3 † ✂ Connecting the NT1 to the power supply network

### Important

You only need to connect the NT1 to the power outlet if you have connected ISDN devices without their own power supply to the NT1 or the ISDN cabling. ISDN devices without their own power supply, such as most ISDN telephones, do not have a cord with a power plug or an adapter. These ISDN devices must be powered from the NT1.

- > The green **LINE OK** indicator light is on continuously.
- 1 Insert the modular plug of the power cord supplied into the NT1.
  - 2 Insert the power plug of the power cord into the power outlet.
- > The yellow **230 V/AC** indicator light on the NT1 comes on continuously.
  - > If **230 V/AC** does not come on but **LINE OK** does, the NT1 is not connected to the power supply network.

## 5.4 ✂ Testing the ISDN connection

The change over to ISDN is complete when you can make telephone calls. If you cannot make telephone calls, first check that the telephone plug or the modular plug of the NT1 has been inserted into the main telephone socket. See also Section 6.2, Trouble-shooting.

# 6 † ✂ Tips in the event of problems

## 6.1 Maintenance

You can clean the NT1 with a slightly damp or anti-static cloth. Do not use wax polish or other chemical agents since they may damage the material.

## 6.2 Trouble-shooting

| Problem      | The green <b>LINE OK</b> indicator light on the NT1 is off.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|--------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Solution (1) | Check that the telephone plug of the NT1 is inserted into the main telephone socket.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Problem      | You cannot make telephone calls with your ISDN devices.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Solution (1) | First check the User Guide for the relevant ISDN device.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Solution (2) | Check that you have connected the NT1 properly (see Chapter 3). <ul style="list-style-type: none"> <li>– Have the ends of the ISDN cabling been terminated with a terminating resistance (see Section 4.4)?</li> <li>– Has the ISDN cabling been installed and connected correctly (see Chapter 4)?</li> <li>– Have mini-switches 1 and 2 of S15 in the NT1's connection compartment been set to the correct type of ISDN cabling (see Section 4.4)?</li> <li>– Has the NT1's power plug been inserted into the power outlet (see Section 5.3)?</li> <li>– Has the maximum number of ISDN devices been exceeded (see Section 1.2)?</li> </ul> |
| Solution (3) | If a personal computer with an ISDN PC card has been connected to the ISDN cabling, check that the computer has been connected to an earthed 230 Volt power outlet.                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Solution (4) | Install an extra terminating resistance or switch the terminating resistance in the NT1 on by setting mini-switches 1 and 2 of S15 to <b>ON</b> (see Section 4.4).                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |

### Important

Never open the casing of the NT1, except for the flap of the connection compartment. The NT1 is the property of KPN Telecom and does not contain any components that you can repair yourself. In the event of a fault, the NT1 will be replaced by KPN Telecom.

If you are unable to rectify the problem, you can visit the Website of KPN Telecom's 'GebruikService' ('User Service'). The address is [www.kpn.com](http://www.kpn.com), keyword 'gebruikservice'. Or call KPN Telecom's 'GebruikService' on telephone number 0900-8642 (call charges apply).

If you are unable to make or receive calls due to a fault on the exchange line, you can call 0800-0407 (free of charge) from another telephone connection.

## Technical data

|                        |                                   |
|------------------------|-----------------------------------|
| Standard               | The NT1 is suitable for Euro-ISDN |
| Dimensions (l x w x h) | 108 x 150 x 47 mm                 |
| Weight                 | 430 gram                          |
| Power supply           | 230 V/AC                          |
| Power consumption      | <15 VA                            |
| Operating temperature  | 5-40°C                            |
| Air humidity           | 5-85%                             |

### Connection of wires to the NT1's cage clamps and ISDN wallports

| Aansluitklem NT1                                                    | a1        | b1         | a2        | b2           |
|---------------------------------------------------------------------|-----------|------------|-----------|--------------|
| <b>NT1 cage clamp</b>                                               | <b>a1</b> | <b>b1</b>  | <b>a2</b> | <b>b2</b>    |
| <b>ISDN cable</b>                                                   | blue      | white/blue | orange    | white/orange |
| <b>Telephone cable (4-wire)</b>                                     | red       | blue       | orange    | white        |
| <b>Cage clamp of ISDN wallport/ RJ45 modular plug <sup>1)</sup></b> | 4         | 5          | 3         | 6            |

<sup>1)</sup> You can only attach an RJ45 modular plug to an ISDN cable, not to a 4-wire telephone cable.

### Setting of the NT1's mini-switches to the type of ISDN cabling

| Type of ISDN cabling                         | Position of mini-switches |                         |                         | Standard |
|----------------------------------------------|---------------------------|-------------------------|-------------------------|----------|
|                                              | S15                       | S15                     | S16 <sup>4)</sup>       |          |
|                                              | <b>1</b>                  | <b>2</b>                | <b>2</b>                |          |
| Direct connection of ISDN devices            | <b>ON <sup>2)</sup></b>   | <b>ON <sup>2)</sup></b> | <b>2</b>                | <b>X</b> |
| One ISDN cable to the NT1 (Short S bus)      | <b>ON <sup>2)</sup></b>   | <b>ON <sup>2)</sup></b> | <b>2</b>                | <b>X</b> |
| Two ISDN cables to the NT1 (Y configuration) | <b>1 <sup>3)</sup></b>    | <b>2 <sup>3)</sup></b>  | <b>2</b>                |          |
| Long S bus/point-to-point <sup>4)</sup>      | <b>ON <sup>2)</sup></b>   | <b>ON <sup>2)</sup></b> | <b>ON <sup>5)</sup></b> |          |

<sup>2)</sup> Terminating resistance in NT1 switched on.

<sup>3)</sup> Terminating resistance in NT1 switched off.

<sup>4)</sup> This switch must only be set by a KPN Telecom technician.

<sup>5)</sup> This setting must only be carried out by a KPN Telecom technician.

NB: Mini-switch **1** of **S16** is not used.

## 🔧 Overview of ISDN cabling

### Requirements

|                                                    | One ISDN cable to the NT1 (Short S bus)               | Two ISDN cables to the NT1 (Y configuration)          |
|----------------------------------------------------|-------------------------------------------------------|-------------------------------------------------------|
| One end of cabling                                 | NT1                                                   | Junction block or ISDN wallport with terminating plug |
| Other end                                          | Junction block or ISDN wallport with terminating plug | Junction block or ISDN wallport with terminating plug |
| Minimum length of cabling                          | No minimum requirement                                | No minimum requirement                                |
| Maximum length of cabling                          | 150 m                                                 | 150 m                                                 |
| Maximum number of ISDN wallports                   | 12                                                    | 12                                                    |
| Maximum number of ISDN devices                     | 8, including up to 4 without their own power supply   | 8, including up to 4 without their own power supply   |
| Maximum length of connecting leads                 | 10 m                                                  | 10 m                                                  |
| Terminating resistance in the NT1                  | Switched on                                           | Switched off                                          |
| Mini-switch 1 of S15 in NT1 connection compartment | ON                                                    | 1                                                     |
| Mini-switch 2 of S15 in NT1 connection compartment | ON                                                    | 2                                                     |

## 🔧 List of terms

### Analogue devices

Devices that you can use without an ISDN connection on an ordinary (analogue) telephone line, such as an analogue telephone, analogue fax machine, analogue answering machine or modem. You can continue to use your existing analogue devices via the ISDN network with the aid of an ISDN terminal adapter.

### Cage clamp

A connection point on the NT1 to which a cable without modular plug can be connected. The NT1 has a cage clamp for an ISDN cable or an ISDN device.

### Connection point

A point on the NT1 to which a cable with or without a modular plug can be connected. The NT1 has one connection point for the exchange line and 3 connection points for ISDN cables or ISDN devices.

### Exchange line

The cable forming the connection between the NT1 and KPN Telecom's public ISDN network.

### ISDN

Integrated Services Digital Network, KPN Telecom's digital network. ISDN makes it possible to make or receive telephone calls and surf the Internet or send or receive faxes at the same time. ISDN2 provides you with 2 communication channels which can be compared to 2 analogue telephone lines. If one of the 2 communication channels is busy, you can still make calls via the second communication channel.

### ISDN cabling

The complete system of ISDN wallports and the cables that interconnect them. ISDN cabling is also referred to as S bus. You can choose from 2 types of cabling, i.e. ISDN cabling where one ISDN cable is connected to the NT1 (also referred to as Short S bus) and ISDN cabling where two ISDN cables are connected to the NT1 (also referred to as Y configuration).

### ISDN device

A device that is suitable for ISDN, i.e. an ISDN telephone, ISDN PC card, ISDN fax, ISDN terminal adapter, etcetera.

### ISDN terminal adapter

An ISDN device that allows you to continue to use your existing analogue devices via the ISDN network. Examples of ISDN terminal adapters comprise the Quattrovox and Webvox from KPN Telecom.

### ISDN wallport

A special telephone socket for connecting ISDN devices. An ISDN wallport has cage clamps to which 4-wire cables can be connected.

### Main telephone socket

The telephone socket that is connected directly to the exchange line. If you have one telephone socket in your home, it is always the main telephone socket. If you have more than one telephone sockets in your home, the main telephone socket is usually the telephone socket located in your living-room or in the meter cupboard.

### Modular jack

Connection point on the NT1 to which a cable with modular plug can be connected. The NT1 has one modular jack for the exchange line and 2 modular jacks for the ISDN cabling.

### Modular plug

A small plug on the end of a connecting lead or telephone cable. Modular plugs are used to connect these leads and cables to analogue devices and ISDN devices. Modular plugs for ISDN devices are also referred to as RJ45 modular plugs. They are larger than modular plugs for analogue devices, which are also referred to as RJ11 modular plugs.

### NT1

Network Termination 1, i.e. the ISDN main connection point that forms the boundary between the public ISDN network and the connection in your home or office. The NT1 ensures good signal transfer between the ISDN network and your ISDN devices.

### PC

Personal Computer.

### Quattrovox

An ISDN terminal adapter from KPN Telecom.

### S bus

See ISDN cabling.

### Short S bus

This is the type of ISDN cabling that is used most. The Short S bus consists of one long cable up to 150 m long with the NT1 at the starting point. You can connect up to 8 ISDN devices to the Short S bus.

### 'Teleklusser'

A publication from KPN Telecom that contains information about installing ISDN cables, ISDN wallports and terminating resistances and about connecting analogue devices. 'Teleklusser' is available from Primafoon.

### Terminating resistance

A necessary component at the start and end of the ISDN cabling. A terminating resistance is incorporated in terminating plugs, junction blocks and the NT1.

### Webvox

An ISDN terminal adapter from KPN Telecom

### Y configuration

A type of ISDN cabling that you can use if you wish to have two cables with ISDN wallports running through your home from the NT1.

The maximum combined length of the ISDN cabling is 150 m. You can connect up to 8 ISDN devices to the Y configuration.

## Details of your ISDN connection

### ISDN telephone numbers (MSNs)

Main number

1st MSN

2nd MSN

3rd MSN

4th MSN

5th MSN

6th MSN

7th MSN

### Cabling type

Devices connected directly

One cable (Short S bus)

Two cables (Y configuration)

Cabling more than 150m long

### Terminating resistances

Terminating resistance in the NT1

On/Off

Position of 1st terminating resistance

Position of 2nd terminating resistance