

***ND X-Terminals  
NCD 17c and NCD 19  
4 Mbyte Memory Upgrade  
Installation Description***

***ND-891087EN1***

## Before you begin....

This kit (ND 111269) contains four 1 Mbyte SIMMs (Single In-line Memory Modules) to upgrade the memory on the following X-terminals available from Norsk Data:

	Product number
• NCD 17c	ND 111172
• NCD 19	ND 111171

The memory system of the NCD 17c and NCD 19 has eight slots for SIMMs. Depending on the number and size of the SIMMs, the possible memory configurations are 2.0, 4.0, 5.0 or 8.0 Mbytes.

As delivered by Norsk Data, each of these X-terminals has 2.0 Mbytes of installed memory consisting of eight 256 Kbyte (0.25 Mbyte) SIMMs.

With this installation kit you can upgrade the memory of the NCD 17c or the NCD 19 to 5 Mbytes. This is done by replacing four of the eight 256 Kbyte SIMMs with four SIMMs, each with 1 Mbyte.

You can upgrade the memory still further, to 8.0 Mbytes, by using a second kit to replace the remaining four 256 Kbyte SIMMs.

In order to have access to the electronic module where you will install the SIMMs, you will need:

- a cross-bladed (Philips) screwdriver.
- a grounding wriststrap, a static-proof mat or some other suitable precaution against static-electric discharge.

If you are not comfortable working with tools or electronics, or if you do not feel qualified to attempt this installation, contact your Norsk Data service representative.

## Procedure

1. From the X-Windows **Main Menu**, click on **Diagnostic Session**.
  - In the lower portion of the window, find the amount of **Memory Installed** (written in Kbytes).
  - Convert this to Mbytes (divide by 1024) and write down the amount of Mbyte memory. You will need this information later (step 8).
  - If you have 8.0 Mbytes of memory, STOP! You already have the maximum memory possible for this X-terminal.
  - Switch off the terminal.
2. Disconnect all cables from the display monitor and the base unit.
3. *If the display monitor is attached to the base unit*, turn the entire assembly upside down and place it on a flat surface so that it is stable.

*If the display monitor is not attached to the base unit*, turn the base unit upside down so that you can see the metal casing.
4. Tilt the base unit down (toward the back) so that it is as stable as possible.

**Caution!**

Static electricity may damage the electronic module contained in the base unit. When handling the module or its components, rest the assembly on a static-proof mat or wear a grounding wriststrap. If this is not possible, touch a metal part of the base unit before handling the module.

5. Use a cross-bladed (Philips) screwdriver to remove the two screws near the front edge of the metal casing of the electronic module (contained in the base unit).
6. Remove the electronic module as follows:
  - Grasp the "feet" at the front edge of the metal casing (next to the screw holes).
  - Raise the electronic module upward at an angle, about 3 cm (or 1¼ inches), until you can see that the front of the metal casing clears the front of the plastic casing.
  - Firmly pull the electronic module toward the front to release it from the plastic retaining tabs at the back of the casing.
7. Turn the electronic module up so that you can see the internal components and so that the eight SIMM slots are in the lower left corner when the module is facing you.

*If you have an NCD 17c, the slots are labeled J7 through J14.*

*If you have an NCD 19, the slots are labeled J6 through J13.*

Depending on the amount of memory you have in your X-terminal, the slots may be empty or may have SIMMs in them.

This means that in the steps which follow you may be inserting the SIMMs from this upgrade kit into empty slots or you may be removing and replacing existing SIMMs.

8. Determine which slots you are going to use to insert the 1 Mbyte SIMMs.

- From the note you made in step 1, make sure you know the amount of memory currently installed in the X-terminal.
- Verify the number of upgrade kits you are going to install.
  - If you install **one** kit, you will insert four **1 Mbyte SIMMs**.
  - If you install **two** kits, you will insert **eight 1 Mbyte SIMMs**.
- If you have **2.0 Mbytes of current memory**, install one kit and:
  - if you have an **NCD 17c**, you will insert the SIMMs in slots **J8, J10, J12 and J14**.
  - if you have an **NCD 19**, you will insert the SIMMs in slots **J7, J9, J11 and J13**.

*If you have 2.0 Mbytes of current memory and install two kits:*

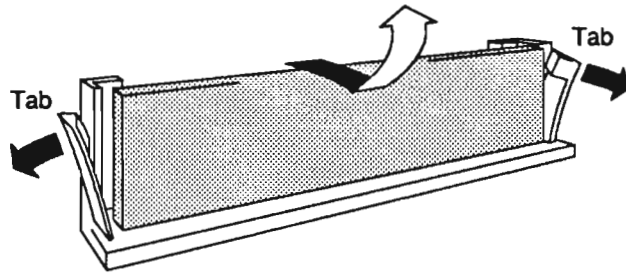
- you will insert one 1 Mbyte SIMMs in each of the eight slots.

*If you have 4.0 or 5.0 Mbytes of current memory, install one kit and:*

- if you have an **NCD 17c**, you will insert the SIMMs in slots **J7, J9, J11 and J13**.
- if you have an **NCD 19**, you will insert the SIMMs in slots **J6, J8, J10 and J12**.

9. If there is a SIMM in the slot you are going to use, remove it. Otherwise go to step 10.

- Look at the locking tabs on each side of the SIMM's slot. They should be similar to those shown below and should be **facing you**. (You may need to turn the electronic module.)



- Use your fingernails or a small **plastic** flat-bladed tool to press the tabs away from the SIMM until you hear a click or feel that the tab releases the module.
- Grasp the SIMM at the top corners and gradually but firmly tilt it forward (as shown above) until you can feel that it is released at the bottom and you can pull it out.
- Set the SIMM aside but be careful not to mix it up with the new SIMM you are inserting. (You may want to label it and keep it for future use if necessary.)
- Repeat this step until the slots you need (step 8) for the new 1 Mbyte SIMMs are empty.

#### 10. Insert a 1 Mbyte SIMM.

**Note!**

Take special care to ensure that the chips on the new SIMM clear the edge of the SIMM in the slot in front, if there is one. In this case, when you start to insert the SIMM it will be almost (but not quite) vertical.

- Grasp the 1 Mbyte SIMM by the top corners (the connector fingers are at the bottom).
- Slowly lower it, at an angle, into the slot, pressing firmly until it will go no further. (You need to press firmly but **not** forcefully. If you can't lower the SIMM it may be backwards; turn it around and try again.)
- Press firmly at the top corners of the SIMM and tilt it backward until you hear the tabs click and feel them lock in position.
- Repeat this step until you have inserted all the 1 Mbyte SIMMs you are installing with this upgrade.

#### 11. Reassemble the X-terminal. Remember to:

- Make certain the SIMMs are securely fastened and (from step 8) that they are in the correct slots.
- Slide the electronic module back into position, then use the two screws to fasten it to the base unit.
- Reconnect all cables. (Tighten the connectors by hand, if possible, to avoid overtightening.)
- Start the terminal. Note that at startup a message tells you the amount of memory installed. It should be greater than the value you wrote down in step 1.

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