NC200, NC400, and NC900
Network Computer

Parallel Port Installation Guide

Version 4.0

Copyright

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General Safety Summary

Review the following safety precautions to avoid injury and prevent damage to this product or any products connected to it.

Only qualified personnel should perform service procedures.

Injury precautions

Use proper power cord

To avoid fire hazard, use only the power cord specified for this product.

Ground the product

This product is grounded through the grounding conductor of the power cord. To avoid electric shock, the grounding conductor must be connected to earth ground.

Do not operate in wet/damp conditions

To avoid electric shock, do not operate this product in wet or damp conditions.

Do not operate in an explosive atmosphere

To avoid injury or fire hazard, do not operate this product in an explosive atmosphere.

Avoid exposed circuitry

To avoid injury, remove jewelry such as rings, watches, and other metallic objects. Do not touch exposed connections and components when power is present.

Product damage precautions

Use proper power source

Do not operate this product from a power source that applies more than the voltage specified.

Provide proper ventilation

To prevent product overheating, provide proper ventilation.

Do not operate with suspected failures

If you suspect there is damage to this product, have it inspected by qualified service personnel.

Safety terms and symbols

Terms in This Manual

These terms may appear in this manual:

WARNING: ***Warning statements identify conditions or practices that can result in personal injury or loss of life.***

CAUTION: ***Caution statements identify conditions or practices that can result in damage to the equipment or other property.***

Terms on the Product

These terms may appear on the product:

DANGER indicates a personal injury hazard immediately accessible as one reads the marking.

WARNING indicates a personal injury hazard not immediately accessible as you read the marking.

CAUTION indicates a hazard to property including the product.

Symbols on the Product

The following symbols may appear on the product:

DANGER high voltage

Protective ground (earth) terminal

ATTENTION – refer to manual

Parallel Port Installation

Introduction

Use these instructions to install the parallel port board in your NC200, NC400, or NC900 network computer. After you check the contents of the kit and read the electrostatic precautions, begin the installation procedure.

Kit contents

This field installation kit includes the following:

- One parallel port board;
- One ribbon cable;
- Two jacknuts;
- One self-adhesive clear plastic insulation bumper; and
- These installation instructions.

Tools required

Installation of the parallel port kit requires these tools:

- #2 phillips screwdriver;
- 3/16" nutdriver; and
- small diagonal cutters.

Electrostatic precautions

This product contains components that are highly sensitive to electrostatic discharge. To protect these components from damage and to maintain product reliability, take the following precautions when handling the circuit boards:

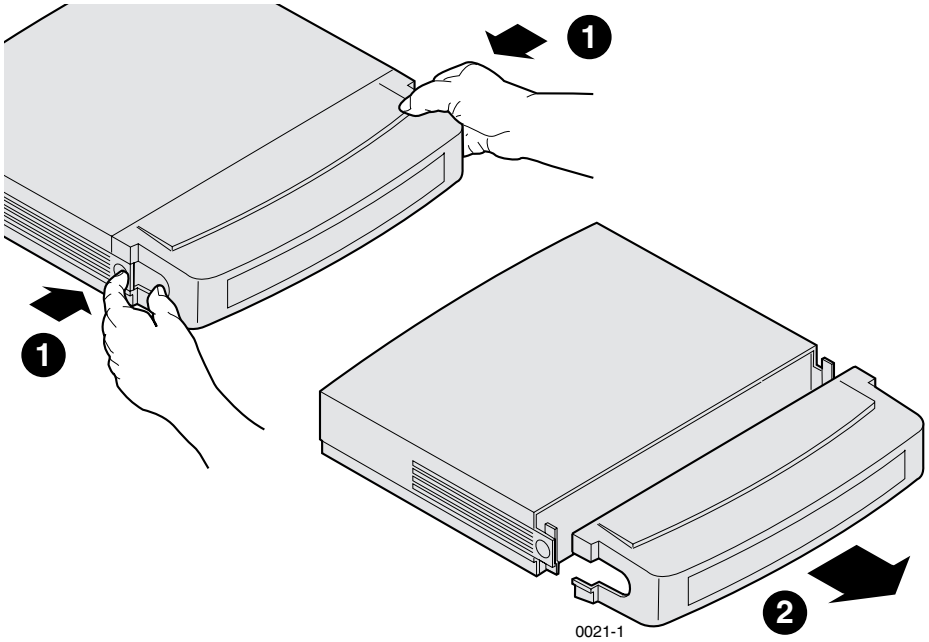
- Leave the board in its static-shielded bag until you are ready to install it.
- Handle all circuit boards in a static-protected area capable of controlling static charge on conductive materials, people, and non-conductive materials. Static-protected areas include non-static table tops and non-static floor mats.
- Use the anti-static wrist strap, if available.
- Handle the circuit boards only by the edges. Avoid touching the printed wires on the back of any circuit board as much as possible.

Installing the parallel port board

1. Set the standby/on or power switch to standby or 0.
2. **NC200/NC900:** Remove the cable cover from the rear of the logic module as shown in *Figure 1.*

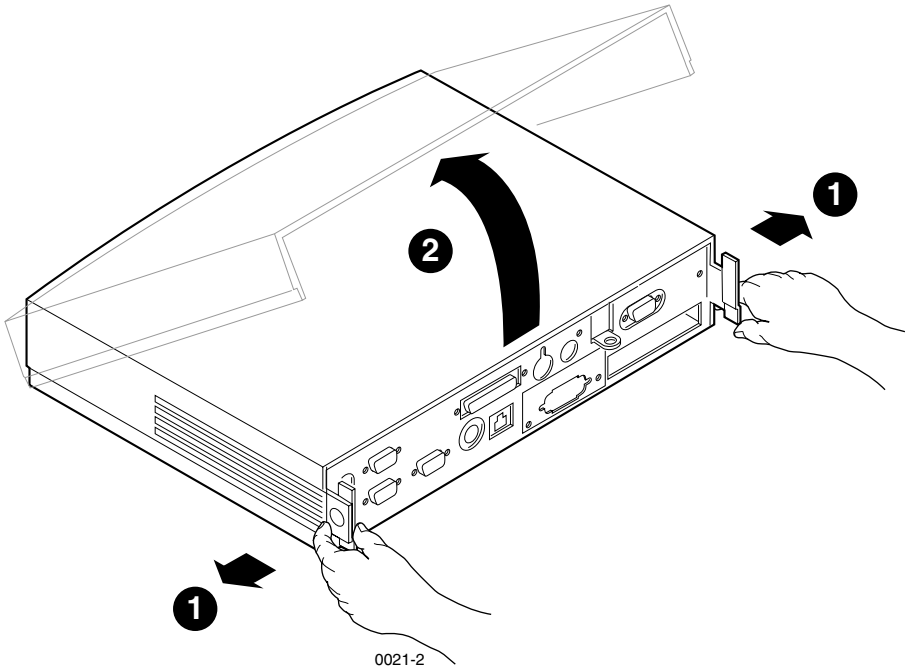
CAUTION: ***The standby/on switch on the NC200/NC900, when set to standby, does not turn off the power to the circuitry inside. To avoid the possibility of damage to the circuitry, be sure to disconnect the AC line cord to the power supply before doing any work inside the logic module.***

Figure 1. Removing the NC200/NC900 cable cover



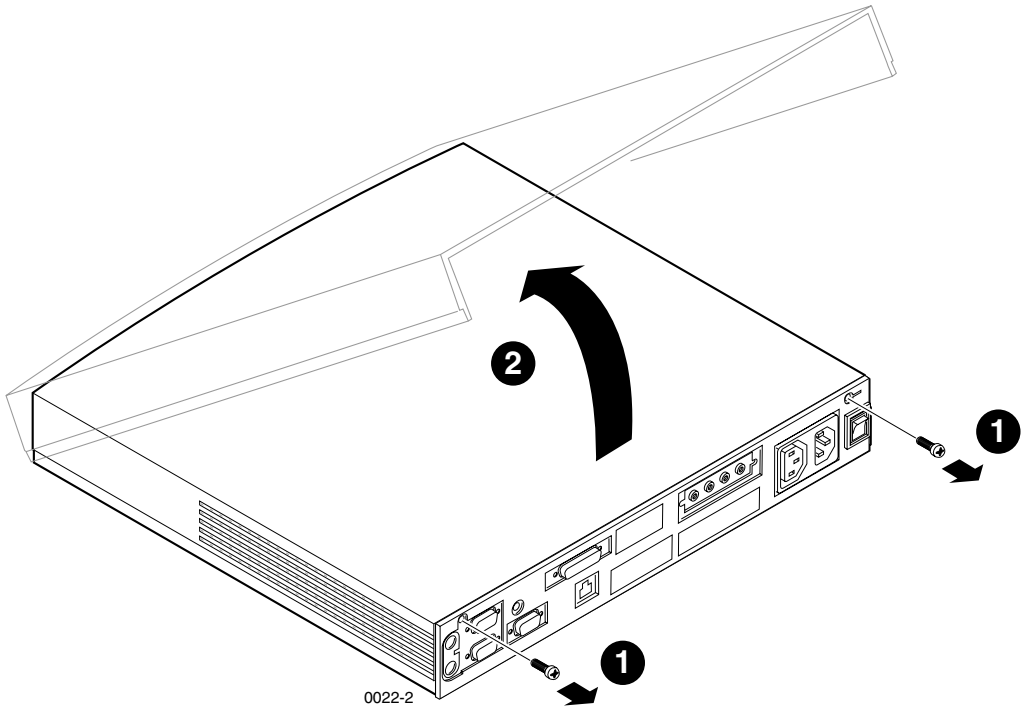
3. Disconnect the AC power. **NC200/NC900:** Unplug the power supply from the AC power outlet, then disconnect the power supply connector from the rear panel. **NC400:** Unplug the AC line cord from the rear panel.
4. Disconnect as many other cables as necessary to easily reach the rear of the logic module.

Figure 2. Removing the NC200/NC900 logic module cover



5. Remove the logic module cover as shown in *Figure 2* above (NC200/NC900) or as shown in *Figure 3* below (NC400).

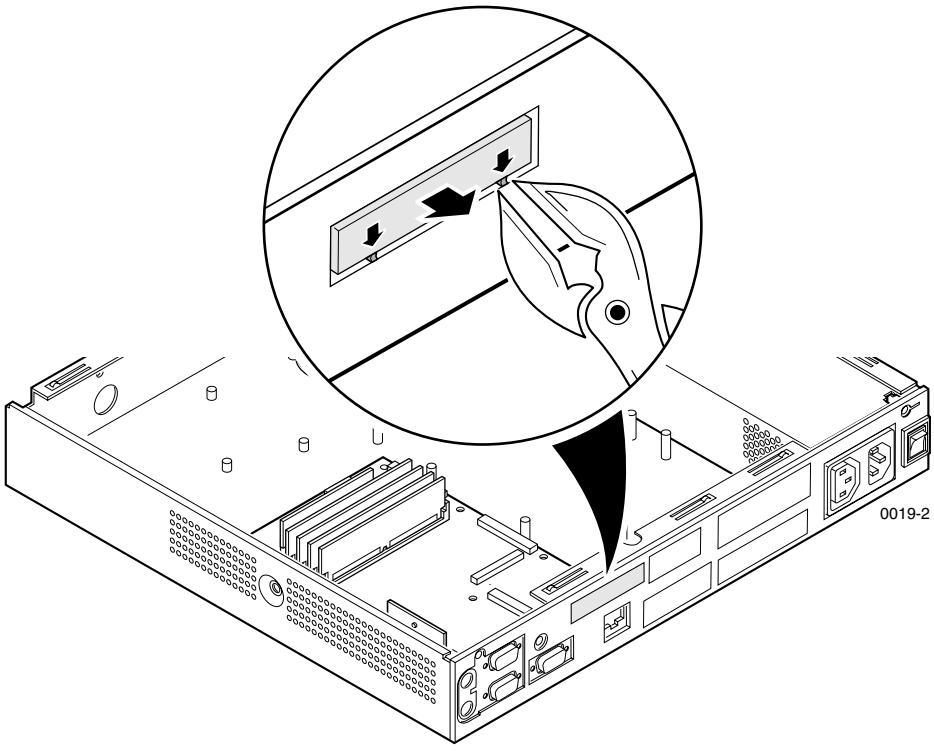
Figure 3. Removing the NC400 logic module cover



6. **NC400:** Remove the plastic blank that covers the cabinet opening for the parallel port board as shown in *Figure 4*. Use a pair of thin diagonal pliers to cut the bridges that support the blank cover.

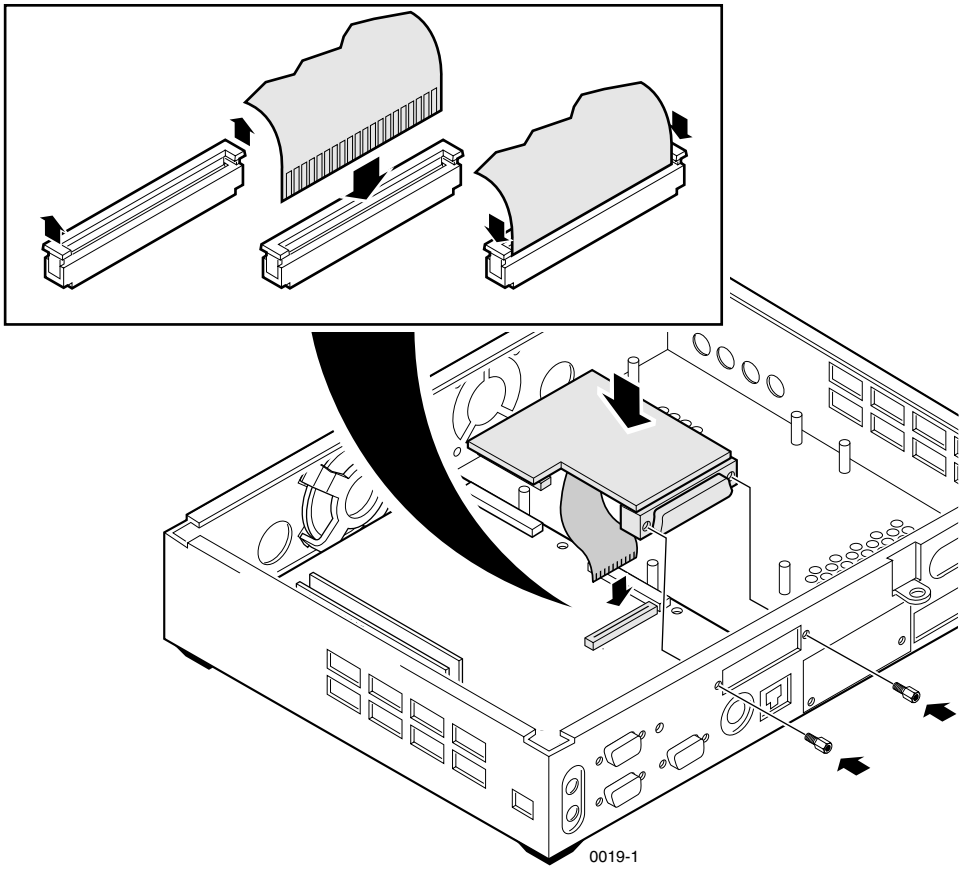
NOTE: ***A few early production models of the NC400 have a foam overlay on the rear panel instead of the molded plastic overlay. To uncover the cabinet opening, peel out the foam plug.***

Figure 4. Removing the blank cover from the rear panel overlay



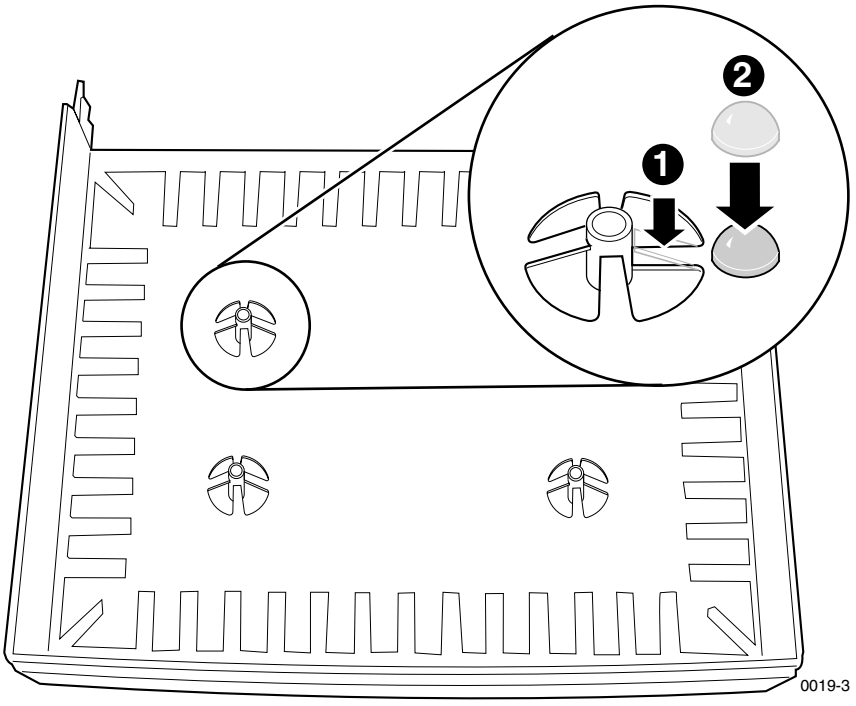
7. Use available anti-static precautions.
8. Remove the circuit board from the protective package.
9. Plug the ribbon cable into the socket on the main logic board as shown in the *Figure 5* inset.
10. Attach the parallel port board to the rear panel as shown in *Figure 5*. Use the 3/16" nutdriver to tighten the jacknuts. The figure shows installation in the NC200/NC900; installation in the NC400 is essentially the same.

Figure 5. Installing the parallel port board



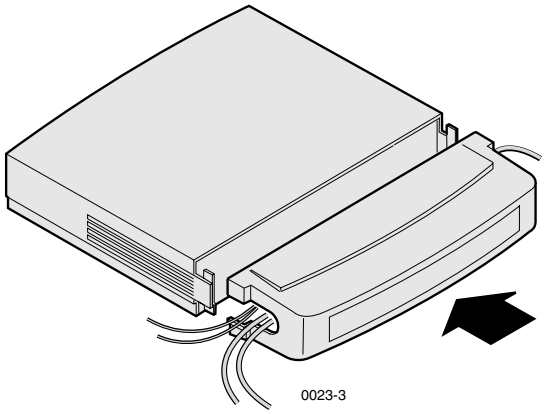
11. For NC200/NC900 models, attach the clear plastic insulation bumper to the underside of the chassis cover to prevent the parallel port board from rubbing against the cover's metal frame. To do this, flip the chassis cover upside-down, as shown in *Figure 6*.
12. Use the nutdriver or a similar tool to flatten the one tab near the indicated knob on the underside of the chassis cover ❶. (The other tabs will not affect the parallel port.) Make sure that the tab is flush with the rest of the sheet metal.
13. Peel off the protective backing from the self-adhesive insulating bumper and press the bumper onto the metal underside of the chassis cover near the flattened tab ❷. Placement of the insulating bumper does not have to be precise; anywhere within a finger's width of the flattened tab will suffice.

Figure 6. Installing the plastic insulating bumper



14. Re-install the logic module cover.
15. Connect the cable from the printer or other parallel device to the parallel port.
16. Connect all cables to the rear panel that were disconnected at the beginning of the procedure. Connect the power supply to the logic module before plugging it into the AC power outlet.
17. **NC200/NC900**: Replace the cable cover, routing the cables out the slots in the cover sides as shown in *Figure 7.*

Figure 7. Installing the NC200/NC900 cable cover



18. Verify the installation using the procedure that follows.

Verification

To verify that the thin client is operating correctly after installing the parallel port board:

1. Set the standby/on or on/off switch to on (1) and watch for the *Boot Monitor* screen to appear.
2. Press any keyboard key before the thin client completes the boot process.

   Pressing any key before the boot process is complete stops the process and transfers control to the *Boot Monitor*. The following message appears on the display:

   ```
   Type HELP for a list of commands
   BOOT> _
   ```

3. At the `BOOT>` prompt type **report** and verify that "parallel" is listed in the options. If it is not listed in the options, check the installation of the board as follows:

   - make sure contacts on the flat cable face in the proper direction.
   - make sure the cable is inserted fully in the socket and the clip pushed all the way down.
   - check both ends of the flat cable.

   If, after checking the installation, "parallel" is still not listed in the reported options, contact your NCD representative.

4. Proceed to *Using a local printer* on page 10, which explains the software changes required to set up the parallel printer port.

Using a local printer

NOTE: ***The information in this section requires editing the*** *xp.cnf* ***or*** *ts.tcf* ***file, which is a system administration function.***

This section briefly explains how to configure the host and the thin client to operate a local printer.

To use a local printer:

1. Set up a local print queue for the spooler using the following commands in the remote configuration file (*xp.cnf or ts.tcf*). When printing, a printer queue on the host forwards the print request to a local queue on the thin client.

   ```
   enable_print_spooler
   spooler_size
   spooler_local_queue
   ```

   Refer to Chapter 2*, Remote Configuration*, in the *Network Computer Reference Manual,* or the *Remote Configuration* topic in the ThinStream Administration help system for information about these commands.

2. Reboot the thin client to read and update the new print queue and serial port settings.
3. On the host, create a new queue pointing to the thin client's local print queue. If your host has a specialized system administration tool (such as IBM's SMIT or Hewlett-Packard's SAM), use it to add the queue. Refer to your host documentation for information about creating print queues.

Example

The following example shows the steps for setting up a local print queue on a network computer and UNIX host that does not have a specialized system administration tool.

1. Set up the local print queue on the network computer using the following *xp.cnf* commands.

   ```
   enable_print_spooler   YES
   spooler_size           8096
   spooler_local_queue    lp PP0
   ```

2. Reboot the network computer to read and update the *xp.cnf* file.

3. On the host, edit the */etc/printcap* file to create a new queue pointing to the network computer's local print queue. If your host has a specialized system administration tool (such as Hewlett-Packard's SAM and IBM's SMIT), use it to add the queue.

   Using the **lp** queue specified in the `spooler_local_queue` command above, the entry in */etc/printcap* would look like this:

   ```
   user1_queue:\
       :lp=:\
       :rm=sierra:\
       :rp=lp:\
       :sd=/usr/spool/lpd/user1_queue:\
       :mx=8096:\
       :lf=/usr/spool/lpd/ERRORLOG:
   ```

   In this example, the queue name is *user1_queue*, the remote printer queue is *lp*, the network computer name is sierra, the location of the spooler queue is */usr/spool/lpd/user1_queue*, the **spooler** size is 8096 bytes, and the error file name is ERRORLOG. Refer to the printcap man page for details about each line and other settings that can be used.

4. Make a new sub-directory for the new queue. In this example, the new sub-directory is *user1_queue* in */usr/spool/lpd*:

   ```
   # mkdir  /usr/spool/lpd/user1_queue
   ```

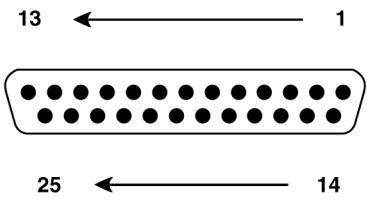
   Be sure to enable permissions as needed. Once the queues are set up and the printer is connected to the appropriate port, print requests can be sent.

Parallel port pinouts

The parallel port is a Centronics-compatible 25-pin female connector. *Figure 8* shows the pin numbers and their respective signal names.

Figure 8. Parallel port pin numbers and signal names

Pin number	Signal name
Pin 1	Strobe~
Pins 2-9	DATA 0-7
Pin 10	ACK~
Pin 11	BUSY
Pin 12	PERROR
Pin 13	SELECT
Pin 14	AUTOFD~
Pin 15	ERROR~
Pin 16	INIT~
Pin 17	SELECTIN~
Pins 18-25	GROUND



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