

Requesting Technical Support

Denford Customer Services provides unlimited telephone and e-mail Technical Support on this upgrade to registered users. Please note that additional on-site visits by our engineers may be chargeable.

Before contacting Denford for support, please read your hardware and software manuals and check the Denford websites for support. Internet (access technical support and FAQ sections):

Denford UK: <http://www.denford.co.uk>

Denford USA: <http://www.denford.com>

When you request support, please be at your CNC machine and computer, with your hardware and software documentation to hand. To minimise delay, please be prepared to provide the following information:

- CNC Machine Serial Number (from the machine ID panel).
- Registered user's name / company name.
- The CNC machine control software name and version number.
- The wording of any error messages that appear on your computer screen, if applicable.
- A list of the steps that were taken to lead up to the problem.
- A list of any maintenance work that has been carried out on the CNC machine.

Contact Details:

Denford Customer Services,

Birds Royd, Brighouse, West Yorkshire, HD6 1NB, UK.

Telephone: 01484 722733

Fax: 01484 722160

ISDN: 01484401157;01484401161

E-mail: customerservices@denford.co.uk

Technical Support: Monday to Friday 8.30am - 4.30pm GMT

For international dialling: +44 and remove first 0 in each city code.



DENFORD

Total Commitment to Education and Training WorldWide.

DenStep to NextStep Motion Controller Upgrade Guide

About this Guide

Disclaimer

Due to nature of hardware developments, be aware that specifications and features of the products featured in this guide can change without notice. No liability can be accepted by Denford Limited for loss, damage or injury caused by any errors in, or omissions from, the information supplied in this guide. During the upgrade procedure, this guide should be used as an addition to your CNC Machine User's Manual. This guide is not be used as a machine operating manual in its own right.

Please note that any photographs are used for explanation purposes only.

Screenshots

This guide is written using European English.

Language

Any comments regarding this guide should be referred to the following e-mail address: customerservices@denford.co.uk

Contact

This guide outlines how to safely replace the DenStep card with the new NextStep card in your CNC machine motion controller unit.

Information regarding your new NextStep card should be used in place of any DenStep referenced documentation contained in your CNC Machine User's Manual.

Denford Customer Services

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Specific enquiries concerning this

documentation can be forwarded to the

Denford technical offoring team using the

contact details listed opposite.

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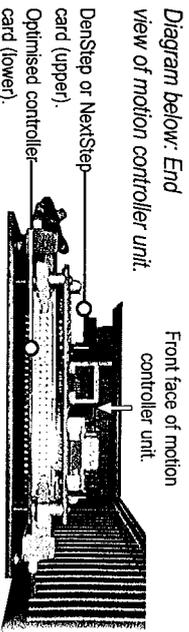
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About the Procedure

Note
Your optimised controller card may be labelled as a Balltor optimised control card.

The DenStep card, in conjunction with the optimised controller card onto which it is mounted, combine to form the motion controller unit in your CNC machine.

Diagram below: End view of motion controller unit.



The motion controller is used to process any axis movement signals sent from your computer (via the VR CNC control software). These signals are sent to the motors that drive the CNC machine axes. This guide will show you how to safely remove the upper DenStep card and replace it with your new NextStep card.

Before starting any work

Safety is very important when working with all forms of machinery but particularly when working with CNC equipment, due to the hazardous voltages, speeds and forces that exist in the hardware.

General Safety Precautions to follow during this upgrade procedure:

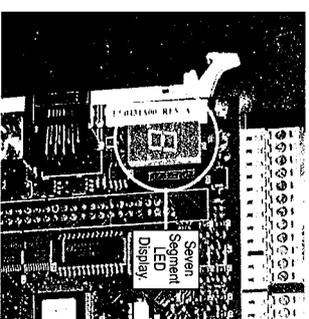
- Wear clothing suitable for the procedure being undertaken and follow the safe working practices in place at your establishment.
 - Ensure the mains power is off (position "0") at the machine isolator switch. Additionally, switch off the mains power supply at the wall and remove the plug from the socket.
 - Post a notice informing others not to use the CNC machine since it is undergoing maintenance.
 - Hazardous voltages can still exist immediately after switching off the mains power. If the CNC machine has previously been switched on, wait at least 5 minutes before attempting to access any electronic hardware systems.
 - The electronic components fitted to the card are sensitive to electrostatic damage - ensure components and/or personnel are suitably earthed to minimise any risk of damage.
- Tools required:
- Hex keys to remove the cover plate, or door key to open the control box, in order to gain access to the electrical panel.
 - Small flat bladed screwdriver.
 - Small philips screwdriver.

Warning
Do not use magnetic tipped screwdrivers, since they may cause damage to the sensitive electronic components in your CNC machine.

NextStep LED Status and Fault Display

Note
This page replaces any references to the DenStep controller in your CNC Machine User's Manual.

The status of the motion control can be determined from the LED display, mounted on the left side of the NextStep board. Errors are all shown with a flashing dot in the bottom right corner of the LED display.



Whilst NextStep is powering up:

- Indicates FPGA has booted successfully.
- Indicates FPGA 'walking ones' test on FPGA scrapload has failed. HALT.
- Indicates pseudo random number test on all of RAM has failed. HALT.
- Indicates CAN controller 'reset' has failed. HALT.
- Indicates 'walking ones' test on the CAN controller has failed. HALT.
- Indicates that power up test did not find any valid Firmware in Flash device.
- Indicates that new firmware is being loaded into the NextStep control.

When NextStep has powered up:

- Normal indication that card is powered up. Figure 2 is the default card NODE number.
- Axes disabled normally after downloading Mint (MEX) file for the first time, before starting Denford SW.
- Flashing E whilst Flash memory is being erased and mint (MEX) file is being downloaded.

When Mint is running and Denford Software is connected:

Note that these figures relate to axis 0 specifically (ie. the X axis).

- Axis is enabled.
- Flashing E: A general error has occurred (possible Mint failure).
- A SPLINE move is being executed.
- A circular move is being executed.
- A Flying shear (used in lathe threading moves) is being executed.
- Axis is in homing sequence.
- Axis is performing a positional linear move.
- Flashing sequence: Emergency Stop has been pressed. On Denford SW this is a solid S symbol.

Reconfiguring your CNC Machine

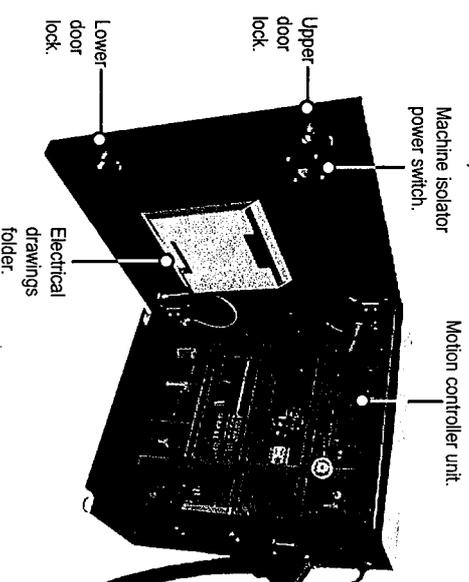
- 1) On CNC machines equipped with a separate electrical control box, close and lock the main control box door. On CNC machines with integrated electronics, refit and tighten the electrical panel cover plate.
Refit any other components originally removed during the card upgrade procedure. If necessary, reconnect the computer used to drive the CNC machine.
Power up the CNC machine.
- 2) In order for the computer to successfully communicate with the new NextStep card fitted to your CNC machine, you must install an updated version of the VR CNC control software. The VR upgrade software is supplied with this package on CD-ROM. Power up your computer.
- 3) Do not uninstall your original VR CNC control software. Place the VR CNC control software CD-ROM in your CD-ROM drive. If the installation program does not automatically start, browse to your CD-ROM folder and manually run the setup program.
- 4) Install the new software using any folders and pathnames identical to your original VR CNC control software. The only exception is when you are asked to select the driver for the default CNC machine.
Choose the option relating to the name of your CNC machine (this can be found on your CNC machine ID panel) but with an "NS" suffix, to indicate the presence of the NextStep card.
For example, if your original CNC machine was a "Denford Microrouter" using the "Router V3" driver, choose "Router V3 NS" from the CNC machine driver list.
- 5) Restart your computer, then establish a connection with your CNC machine as described in the supplied VR CNC control software documentation or the VR CNC control software helpfile.

Locating your Motion Controller Unit

On CNC machines supplied with a separate electrical control box: Models featured: Novamill, Microrouter, Triac, Novatum, Mirac PC. The motion controller unit is mounted on the electrical panel, housed inside the large, black, rectangular control box, not the white CNC machine cabinet. Using the key originally supplied with your CNC machine, release the two locks located at the top and bottom of the control box door. Note that the door cannot be opened unless the yellow and red isolator switch has been set in the off "0" position. Use your original CNC Machine User's Manual to help locate and access these components.

The motion controller unit is usually located in the top, left corner of the electrical panel, mounted directly onto the optimised controller card, or located in the left side of the rack at the bottom of the control box. The electrical panel layout diagram will help identify the precise location of the DenStep motion controller card. The electrical diagrams are either mounted in a folder fixed against the inside of the control box door, or stored in the separate equipment box originally supplied with your CNC machine.

Diagram below: Accessing the electrical panel (Novamill electrical control box shown).



Warning

Never attempt to access the electrical panel of your CNC machine with the mains power switched ON.

Note that hazardous voltages can still exist immediately after switching off the mains power. If the CNC machine has previously been switched on, wait at least 5 minutes before attempting to access any electronic hardware systems.

Note

Electrical Diagrams - Further electrical schematics are available on request.

Locating your Motion Controller Unit

Warning



Never attempt to access the electrical panel of your CNC machine with the mains power switched ON.

Note that hazardous voltages can still exist immediately after switching off the mains power. If the CNC machine has previously been switched on, wait at least 5 minutes before attempting to access any electronic hardware systems.

Note

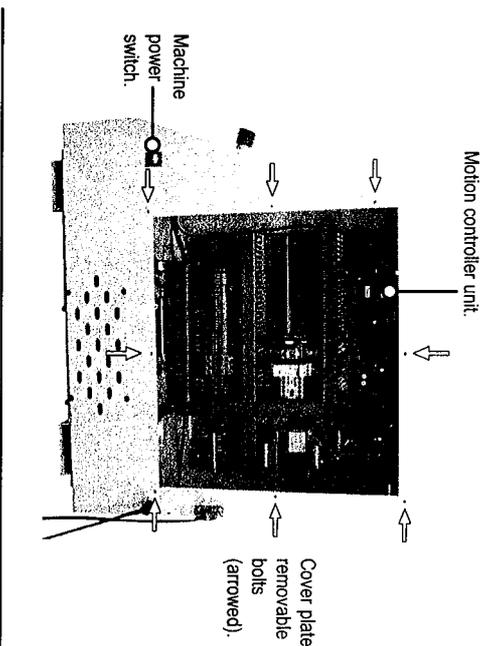
Electrical Diagrams - Further electrical schematics are available on request.

On CNC machines supplied without a separate electrical control box: Models featured: Micromill, Microuter, Triton, Microtum.

The motion controller unit is mounted on the electrical panel, housed at one end of the main CNC machine cabinet. Remove any bolts securing the cover plate to the CNC machine cabinet frame, then carefully withdraw the plate. Use your original CNC Machine User's Manual to help locate and access these components.

The motion controller unit is usually located in the top, left corner of the electrical panel, mounted directly onto the optimised controller card. The electrical panel layout diagram will help identify the precise location of the DenStep motion controller card. The electrical diagrams are stored in the separate equipment box originally supplied with your CNC machine.

Diagram below: Accessing the electrical panel (Microuter shown).



Installing your NextStep Card

Warning



Do not use magnetic tipped screwdrivers, since they may cause damage to the sensitive electronic components in your CNC machine.

Refit the two screws in the top and bottom left corners of the NextStep card. As you pass the screws through each corner hole, do not forget to refit the spacers used to help support the card at the correct height. Take care not to overtighten the screws.

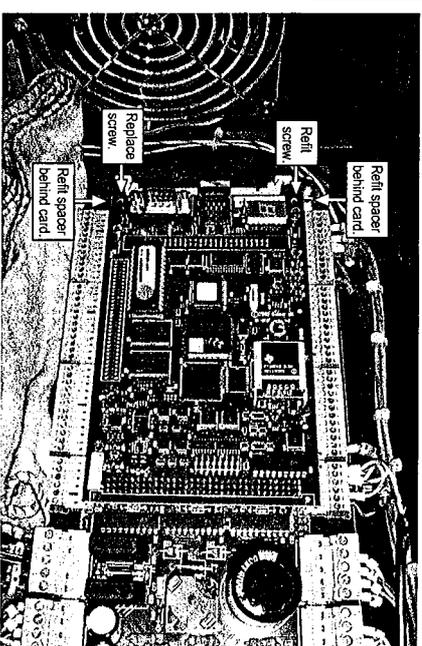


Diagram above: Refitting the screws on the NextStep card.

Align the data signal plug with the socket on the NextStep card, then carefully push the plug into the socket. Refit the two screws securing the data signal plug to the socket on the NextStep card. Take care not to overtighten the screws.

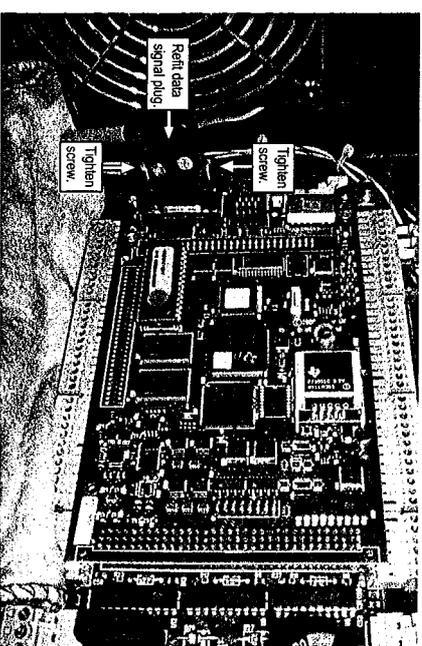


Diagram above: Refitting the data signal plug.

Installing your NextStep Card

Your new NextStep card is fitted in the same orientation as the old DenStep card. Carefully align the pins on the back of the NextStep card with the two sockets fitted to the optimised controller card (shown in the diagram below).

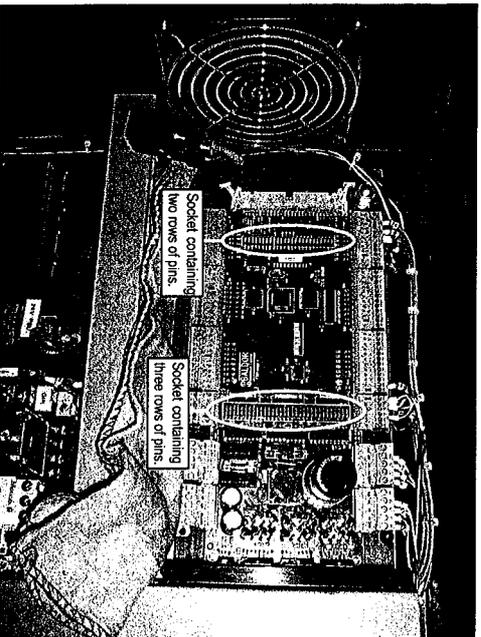


Diagram above: The optimised controller card.

Note that due to the size and layout of the pins, the cards can only be fitted together in one orientation. The left socket on the optimised controller card accepts the end of the NextStep card containing two rows of pins. The right socket on the optimised controller card accepts the opposite end of the NextStep card containing three rows of pins.

Gently push the NextStep card onto the optimised controller sockets, taking care not to bend any pins. Check that all pins have seated correctly in their respective holes.

Removing your DenStep Card

Warning  Do not use magnetic tipped screwdrivers, since they may cause damage to the sensitive electronic components in your CNC machine.

A data signal plug is fitted into a socket mounted on the left end of the DenStep card.

The DenStep card itself is mounted onto the optimised controller card using the two banks of pin connectors under the right and left ends of the DenStep card.

Two additional fixing screws are positioned in the top and bottom left corners of the DenStep card, holding it securely against the optimised controller card.

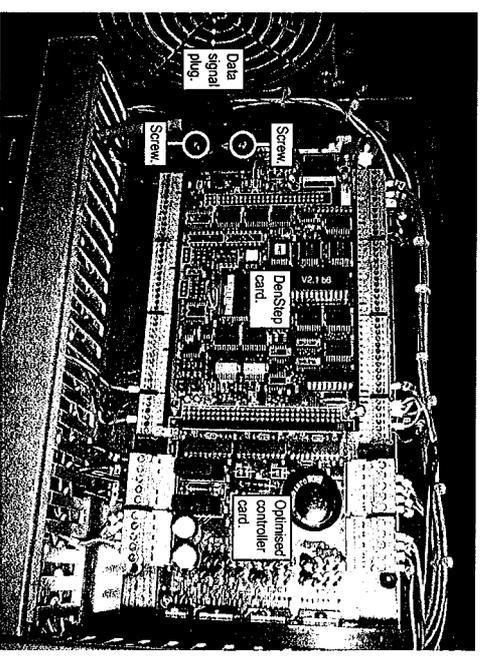


Diagram above: Removing the Data Signal Plug.

Release the two screws securing the data signal plug to the DenStep card, then carefully pull the plug away from the DenStep card.

Removing your DenStep Card

Warning



Do not use magnetic tipped screwdrivers, since they may cause damage to the sensitive electronic components in your CNC machine.

Before attempting to unplug the DenStep card from the optimised controller card, you must remove the two screws positioned in the top and bottom left corners, as shown below.

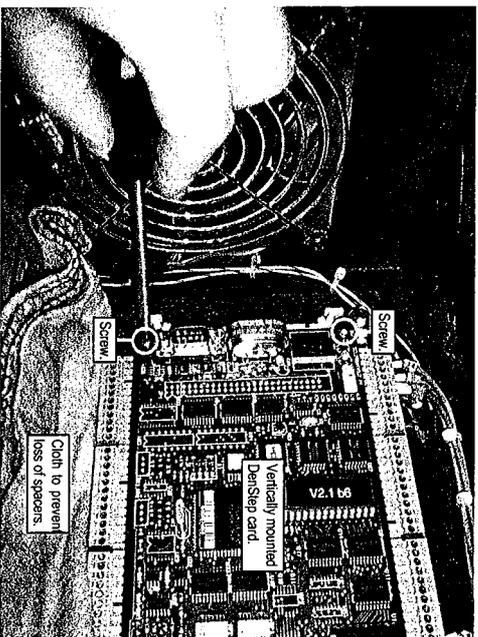


Diagram above: Removing the two DenStep securing screws.

Spacers are used in conjunction with the screws to support the DenStep card at the correct height. If you are removing a DenStep card that is mounted vertically, ensure that a cloth is placed directly under this area - this will prevent the spacers from falling into any of the plastic wiring loom channels.

Diagram below:

Location of spacers.

Front face of motion controller unit.



Unpacking and Handling Electronic Cards

Remove the NextStep card from the electrostatic packaging.

Caution - The electronic components fitted to the card are sensitive to electrostatic damage - ensure components and/or personnel are suitably earthed to minimise any risk of damage. Only remove the NextStep card from its antistatic packaging when you are ready to fit the card into the machine.

Do not touch any part of the circuitboard or the electronic components with your bare hands and always handle the card by its edges only. Save the antistatic packaging to wrap and protect the DenStep card when it is removed from the machine.

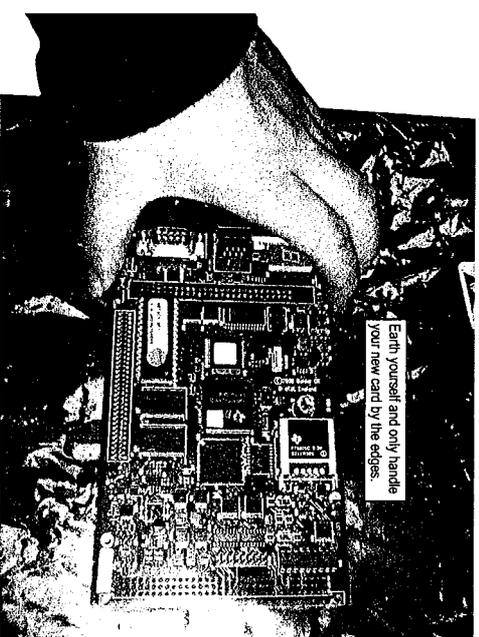


Diagram above: Handling your NextStep card.