Hypertherm®

MicroEDGE® Pro CNC

Replacement Parts

Field Service Bulletin

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Environmental stewardship is one of Hypertherm's core values, and it is critical to our success and our customers' success. We are striving to reduce the environmental impact of everything we do. For more information: www.hypertherm.com/environment.

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Introduction

<table>
<tr>
<td rowspan="2">[warning symbols: electric shock and person being shocked]</td>
<td>WARNING!
ELECTRIC SHOCK CAN KILL</td>
</tr>
<tr>
<td>

Disconnect electrical power before performing any maintenance.

All work requiring removal of the power supply cover must be performed by a qualified technician.

See the safety information provided with your product for more safety precautions.

</td>
</tr>
</table>

This FSB is provided with the following kits. Replacement instructions for each kit are included in this FSB.

Kit Number	Description
228812	Kit: Surge PCB, 230 V
228813	Kit: HASP hardware key
228814	Kit: Hard drive, 250 GB, SATA
228815	Kit: Power distribution PCB
228816	Kit: SERCOS II utility, and serial isolation PCB
228817	Kit: 4-Axis MCC, utility, and serial isolation PCB (Picopath, HyPath) **Note: For proper use of this replacement part, Phoenix® Version 9.76.4 or higher control software update is required.**
228818	Kit: 4-Axis servo PCB (HyPath)
228819	Kit: 24 I/O PCB (HyPath)
228820	Kit: Motherboard
228821	Kit: SERCOS II PCI master
228822	Kit Analog PCB (Sensor THC-equipped configurations only)
228823	Kit: USB cable, 0.5 m (20 in)
228824	Kit: AC input module
228825	Kit: Power switch
228826	Kit: Internal or external fan, 12 V
228827	Kit: ATX power supply
228834	Kit: 4-Axis servo, 5 V encoder PCB (Picopath)
228836	Kit: Wireless network PCB and antenna
228838	Kit: 2-Axis MCC, utility, and serial isolation PCB (Picopath) **Note: For proper use of this replacement part, Phoenix® Version 9.76.4 or higher control software update is required.**
228839	Kit: 2-Axis servo, 5 V encoder PCB (Picopath)
228847	Kit: Analog breakout PCB (Picopath, Hypath)
428072	Kit: SERCOS III PCI master

Part locations

Common MicroEDGE Pro parts
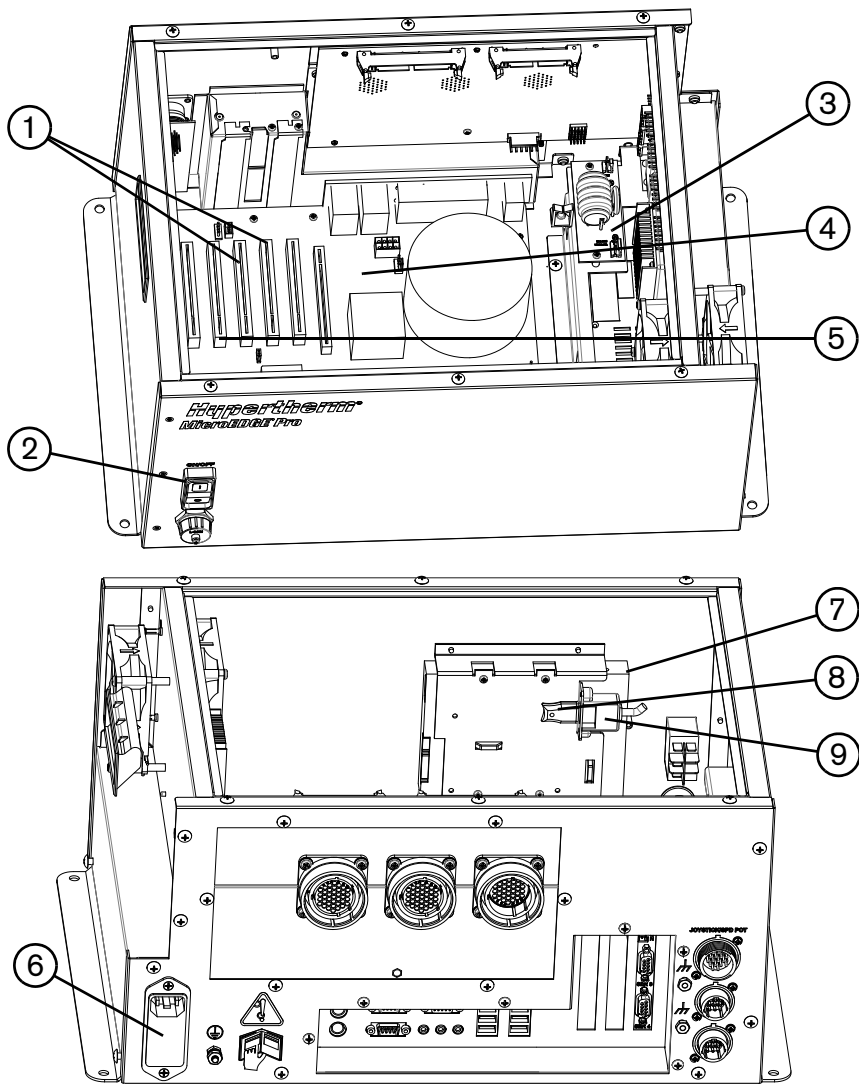
Item	Part Number	Description	Qty.
1	228836	Kit: Wireless card and extension cable (141223)	1
2	228825	Kit: Power switch	1
3	228812	Kit: 230 V surge board (141134)	1
4	228820	Kit: Motherboard (141110)	1
5	228822	Kit: Analog board (141125)	1
6	228824	Kit: AC input module	1
7	228814	Kit: Hard drive, 250 GB, SATA	1
8	228813	Kit: Hasp hardware key	1
9	228823	Kit: USB cable, external panel mount, and internal HASP	1

Common MicroEDGE Pro parts, continued
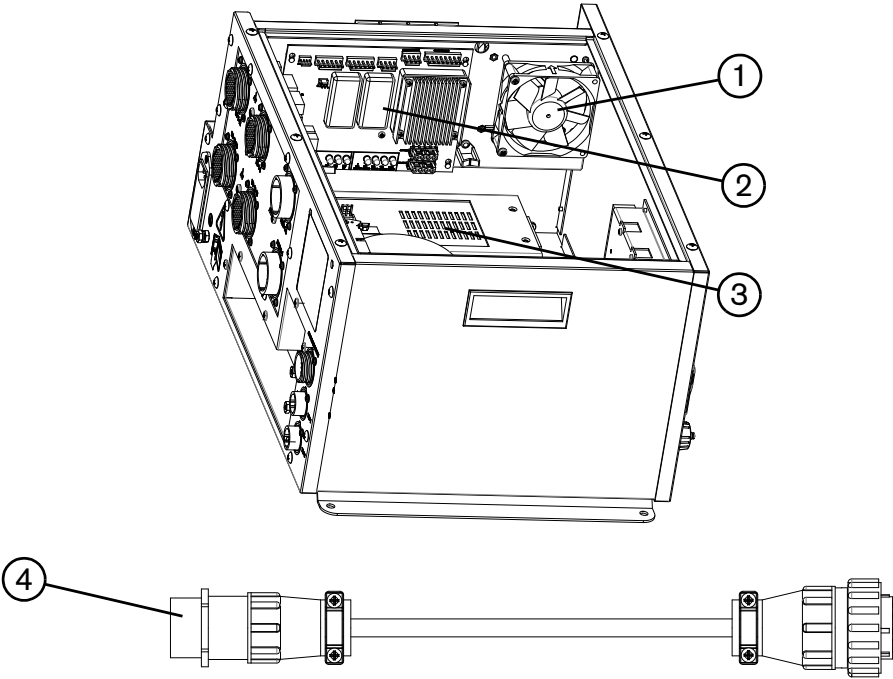
Item	Part Number	Description	Qty.
1	228826	Kit: Sub chassis fan, 12 V, internal or external (229417)	1
2	228815	Kit: Power distribution PCB (141153)	1
3	228827	Kit: ATX power supply	1
4	223252	Kit: MicroEDGE adapter cable	1
	108834	Connector: Remote on/off connector (not shown)	1

Picopath MicroEDGE Pro parts
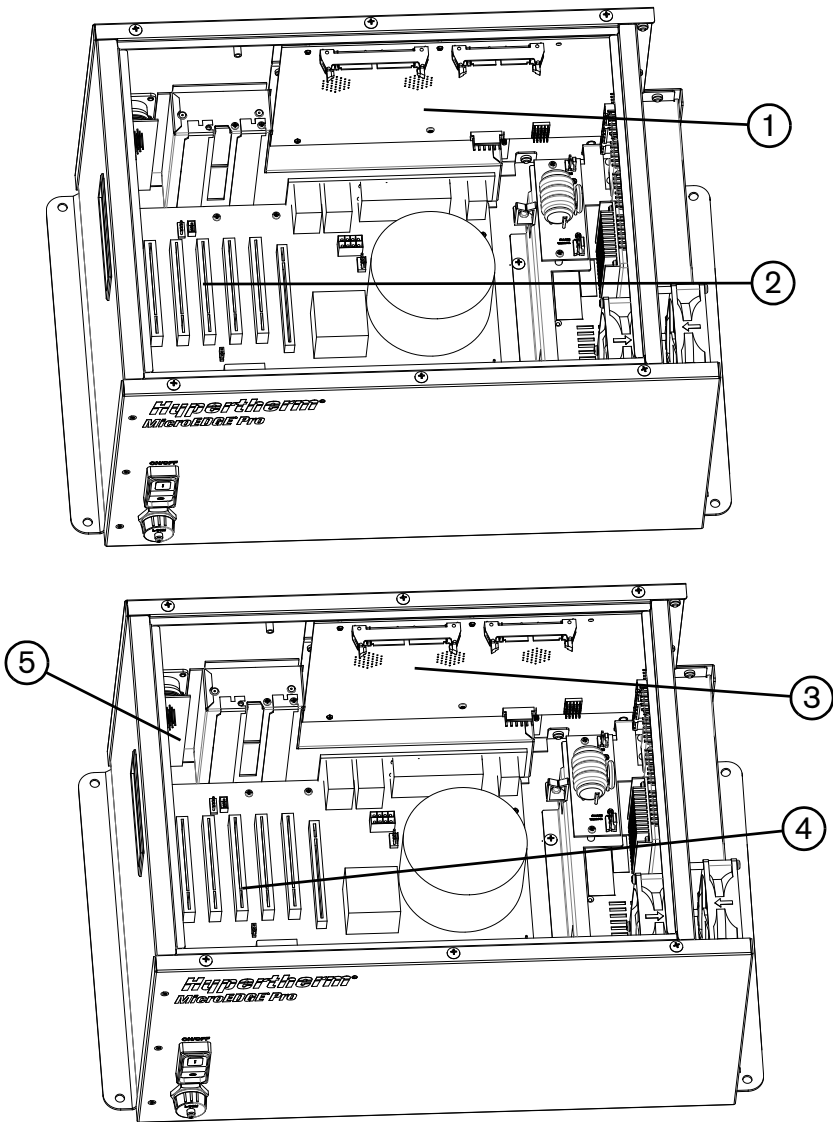
Item	Part Number	Description	Qty.
1	228834	Kit: Picopath 4 Axis servo, 5 V encoder PCB (141122)	1
2	228817	Kit: 4-axis MCC, serial isolation, and utility PCB (141222) **Note: For proper use of this replacement part, Phoenix® Version 9.76.4 or higher control software update is required.**	1
3	228839	Kit: Picopath 2-axis servo, 5 V encoder PCB (141254)	1
4	228838	Kit: Picopath 2-axis MCC, serial isolation, and utility PCB (141256) **Note: For proper use of this replacement part, Phoenix® Version 9.76.4 or higher control software update is required.**	1
5	228847	Kit: CPC analog breakout PCB (141210)	1

HyPath MicroEDGE Pro parts
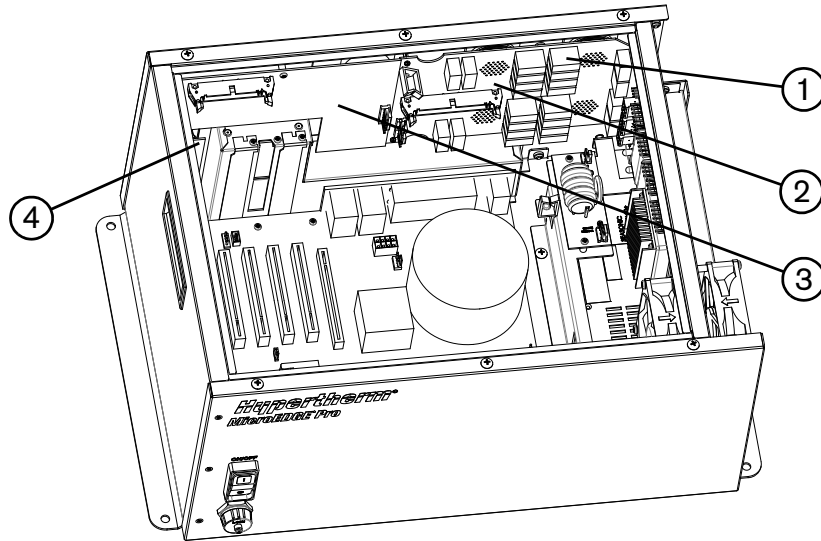
Item	Part Number	Description	Qty.
1	003179	Relay contact	1
2	228819	Kit: 24 I/O PCB (141070)	1
3	228818	Kit: HyPath 4-axis servo board (141197)	1
4	228847	Kit: CPC analog breakout PCB (141210)	1

SERCOS II and SERCOS III MicroEDGE Pro parts
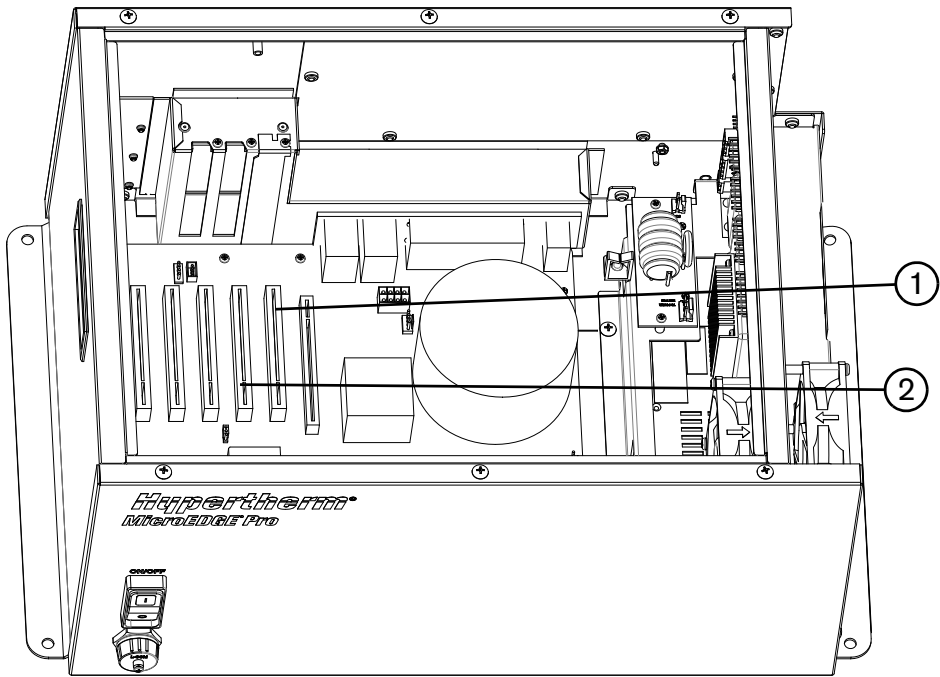
Item	Part Number	Description	Qty.
1	228816	Kit: Serial isolation and utility PCB (SERCOS II) (141194/141307)	1
2	228821	Kit: SERCOS II PCI master (SERCOS II configuration only) (141116)	1
	428072	Kit: SERCOS III PCI master (SERCOS III configurations only) (141310)	1

Replacing parts

Use the instructions in the following sections to replace parts in the MicroEDGE Pro CNC.

Use common safety precautions when replacing parts in the CNC:

■ Turn off electrical power to the CNC before opening the enclosure.

■ Use common safety precautions when handling printed circuit boards.

■ Store PC boards in anti-static containers.

■ Wear a grounded wrist strap when handling PC boards.

Accessing parts

The cover of the CNC can be removed to give you access to the parts inside. Depending on the part you are replacing, you may have to remove the back panel, as well.

■ To open the cover, remove the 8 screws; 6 on the top of the panel and the 2 screws at the bottom, on the side.

■ To open the rear panel, remove the 7 screws around the outside of the panel.

Replacing common MicroEDGE parts

Surge PCB (228812)

Follow the steps in *Accessing parts* to remove the CNC cover.

To remove the Surge board:

1. Disconnect the cables from the power entry module and power supply.

2. Remove the screws from the standoffs.

3. Lift the board off the spring loaded standoffs.

To replace the Surge board:

1. Remove the replacement board from the packaging.

2. Snap the board on the spring loaded standoffs.

3. Replace and fasten the two screws in the standoffs.

4. Plug in the cables for the power entry module and power supply.

HASP hardware key (228813)

Follow the steps in *Accessing parts* to remove the cover of the CNC.

To remove the HASP key:

1. Remove the zip tie that secures the HASP to the hard drive bracket.

2. Remove the USB memory device from the USB port on the hard drive bracket.

To replace the HASP key:

1. Remove the replacement HASP from the packaging.

2. Insert the USB memory device in the USB port on the hard drive enclosure.

3. Secure the USB memory device with a new zip tie.

Hard drive (228814)

Follow the steps in *Accessing parts* to remove the cover of the CNC.

To remove the hard disk drive:

1. Disconnect the power cable from the hard drive.

2. Disconnect the SATA cable connector at the hard drive.

3. Remove the four screws from the hard drive bracket.

4. Slide the hard drive assembly from the bracket and remove the cables. Set the assembly aside.

To replace the hard disk drive:

1. Remove the replacement board from the packaging.

2. Slide the hard drive assembly back into the bracket on the board.

3. Refasten the four screws in the hard drive bracket.

4. Reconnect the cables to the hard drive.

Power distribution PCB (228815)

Follow the steps in *Accessing parts* to remove the CNC cover.

To remove the board:

1. Remove all cables from the connectors on the board.

2. Remove the screw in the center of the board.

3. Push the board down toward the bottom of the enclosure and lift it off the standoffs.

To replace the power distribution board:

1. Remove the replacement board from the packaging.

2. Fit the large end of the 4 keyhole-shaped holes in the board over the standoffs.

3. Slide the board up, toward the top of the enclosure, to move the small end of the key-shaped holes over the standoffs.

4. Fasten the screw in the center of the board.

5. Plug the cables into the appropriate connectors on the board.

Motherboard (228820)

![warning triangle]	**CAUTION!**
![static hand]	**Static electricity can damage circuit boards. Use proper precautions when handling printed circuit boards.** **Store PC boards in anti-static containers.** **Wear a grounded wrist strap when handling PC boards.**

If possible, before you remove any parts from the CNC, save the system files to a USB memory stick. These files are needed for correct operation after you replace the motherboard. If the CNC will not start, old system files or system files from the machine supplier can be used, but you need to modify these files for any changes that have been made since your last save.

1. Insert the USB memory stick in the USB port on the back of the CNC.

2. Press Files > Save to Disk > Save System Files to Disk > Save all to zip.

To remove the motherboard:

Follow the steps in *Accessing parts* to open the front and side panels of the CNC enclosure.

1. To replace the motherboard, use the appropriate procedures in this FSB to remove the PCBs in the PCI stack.

   Record the location of each board and the sequence in which you remove them.

2. Disconnect all cables from the motherboard.

3. Remove cables and USB memory devices from the I/O panel on the outside of the unit.

4. Remove the 7 screws that fasten the rear panel to the rear edges of the enclosure.

5. Remove the 5 screws from the standoffs.

6. Pull the motherboard from the standoffs.

7. Lift the motherboard from the enclosure.

To replace the motherboard:

1. Remove the replacement board from the packaging.

2. Align the standoff holes with the standoffs in the enclosure.

3. Snap the motherboard onto the spring-loaded standoffs.

4. Install the 5 screws on the standoffs.

5. Align the I/O connectors with the I/O cutouts, and then install the rear panel with the 7 screws.

6. Reconnect all cables.

7. Use the appropriate procedures in this FSB to install the PCBs in the PCI stack.

    Make sure that you install the PCBs in the correct order and location. If you did not record this information when you removed the PCBs, you can find the information in the *MicroEDGE Pro Instruction Manual* (807290).

To enter the 7MOREDAYS password:

After you replace the motherboard, the CNC requires a HASP 4 password. If you do not have a password, you must contact Hypertherm Technical Service and request a new HASP 4 password. See *To request a new HASP 4 password:* on page 16. You can use the 7MOREDAYS password while you wait for your new password.

1. Connect the power cord and power ON the CNC.

2. Disable all drives and motors.

3. Wait for the Looking for Hardware Key... message to disappear.

4. Connect a USB keyboard.

5. Press Enter to accept the copyright notice.

6. When the HASP 4 window displays, take a screen shot.

    You will need the screen shot when you request a new HASP 4 password.

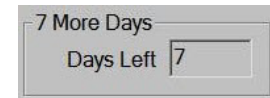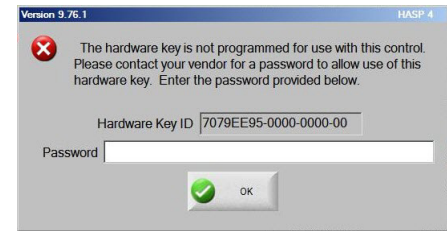**7.** Enter 7MOREDAYS in the HASP 4 window.

> 📄 You can use the 7MOREDAYS password 7 times. After that, you will not be able to operate the CNC.

> 📄 To find how many more times you can use the 7MOREDAYS password, see the top of the HASP 4 window or the 7 More Days timer on the Control Information screen.

> 📄 You must request a new HASP 4 password. See *To request a new HASP 4 password:*.

8. Press Enter twice.

> 📄 If the HASP 4 window displays again, the 7MOREDAYS password has expired. You must have a HASP 4 password to operate the CNC.

To request a new HASP 4 password:

1. Attach the Phoenix.zip file and the screen shot of the HASP 4 window to an email.

2. Send the email to your local Hypertherm Technical Service email address, listed in the front of this FSB.

3. Hypertherm Technical Service sends a Password.txt file with the password.

To enter the new HASP 4 password:

1. Save the Password.txt file that you receive from Hypertherm Technical Service to the root of a USB memory stick.

2. Insert the USB memory stick into a USB port on the CNC.

3. If the CNC is OFF, use the following steps. If the CNC is ON, go to *step 4*.

  a. Connect the power cord and power ON the CNC.

  b. Disable all drives and motors.

  c. When the HASP 4 window displays, make sure that the password in the window matches the password in the Phoenix.txt file. If it does, choose OK.
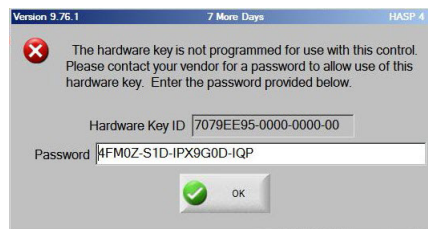
4. If the CNC is ON, use the following steps.

  a. Disable all drives and motors.

b. Select Setups > Passwords and enter ENABLEHASP.

c. When the HASP 4 window displays, make sure that the password in the window matches the password in the Phoenix.txt file. If it does, choose OK.
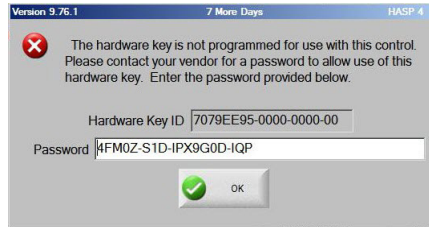
If the HASP 4 window closes, the new password is correct.

If you want to make sure that the password is correct, go to the Control Information screen. If you cannot see the 7 More Days timer, the new password is correct. If you can see the 7 More Days timer, the new password is not correct. Contact your local Hypertherm Technical Service.

5. Enable the drives and motors.

To calibrate the touch screen:

1. When the Preview Window displays, select Setup > Diagnostics > System (or press F4, F6, then F8) to calibrate the touch screen.

2. Follow the instructions on the screen to complete the calibration.

Analog PCB (228822)

Follow the steps in Accessing Parts to remove the CNC cover.

You must remove the MCC, utility, and serial isolation board (228838 or 228817) or the SERCOS board (228816) before you can remove the analog board. Refer to the appropriate procedures in this FSB for more information.

📄 **For proper use of this replacement part (228838 or 228817), Phoenix® Version 9.76.4 or higher control software update is required.**

To remove the Analog board:

1. Unplug the ribbon cable for THC1 and THC2.

2. Remove the standoffs at the front of the board.

3. Pull the board from the PCI slot on the motherboard.

To replace the Analog board:

1. Remove the replacement board from the packaging.

2. Insert the PCB connector into PCI slot 4 on the motherboard and position the holes at the front of the board over the standoffs.

3. Fasten the standoffs.

4. Reconnect the THC cables.

5. Replace any PCBs that you removed from the PCI stack according to the appropriate procedures in this FSB.

USB cable (228823)

Follow the steps in Accessing Parts to remove the CNC cover.

To remove the USB cable:

1. Remove the cover, hex nut, and black plastic washer around the external USB port on the front of the CNC.

2. Remove the rubber lanyard for the cover and the lock washer.

3. Pull the port to the inside.

4. Remove the HASP and set it aside.

5. Remove the screws from the HASP USB port that is mounted on the hard drive bracket.

6. Cut the zip ties on the cable.

7. Disconnect the cable from the motherboard and remove the cable.

To replace the USB cable:

1. Remove the replacement cable from the packaging.

2. Connect the cable to the motherboard.

3. Align the flat side of the external USB connector with the flat side of the opening in the front panel and pass it through.

4. Replace the lock washer, lanyard, plastic washer, and hex nut over the USB connector. Tighten the hex nut to 3.95 newton meters (35 pound inch).

5. Fasten the HASP USB port to the hard drive bracket so that the white, rectangular key inside is on the right, toward the interior of the enclosure.

6. Reinstall the HASP.

7. Secure the cable and the HASP with zip ties.

AC input module (228824)

Follow the steps in Accessing Parts to remove the CNC cover.

To remove the AC input module:

1. Remove the surge board according to the procedure in this FSB.

2. Unfasten the 6 screws from the I/O panel on the back of the enclosure and remove the panel without disconnecting any cables. Set the panel aside.

3. Disconnect the cable from the module to connector J1 on the surge board.

4. Remove the ground nut on the inside rear of the enclosure and remove the ground wire.

5. On the rear panel of the enclosure, remove the screws above and below the AC input module.

6. Pull the module and wires from the enclosure.

To replace the AC input module:

1. Remove the replacement board from the packaging.

2. Pass the wires and power module through the opening in the rear of the enclosure.

3. Fasten the screws that attach the module to the enclosure.

4. Connect the ground wire to the ground stud and hand-tighten the nut.

5. Plug the power input cable from the module into connector J1 on the surge board.

6. Replace the I/O panel and fasten the 6 screws.

Power switch (228825)

Follow the steps in *Accessing parts* to remove the CNC cover.

To remove the power switch:

1. Unplug the cable from the MCC, utility, and serial interface board (228838 or 228817).

2. Depress the four tabs on the top and bottom of the assembly inside the enclosure.

3. Pull the assembly through the front of the panel.

To replace the power switch:

1. Remove the replacement switch from the packaging.

2. Snap the switch into the opening through the front panel. Make sure that the green light with the ON symbol is on top.

3. Connect the cable to the MCC, utility, and serial interface board.

Internal or external fan (228826)

Follow the steps in Accessing Parts to remove the CNC cover.

To remove the internal fan:

1. Unplug the cable from the power supply harness.

2. Remove the screws from the two holes in the left corners of the fan housing.

3. Pull the fan housing from the standoff.

To replace the internal fan:

1. Remove the replacement fan from the packaging.

2. Fit the hole in the upper right corner of the fan housing over the standoff. Verify that the arrow on top of the housing points toward the enclosure wall.

3. Fasten screws through the left corners of the fan housing.

4. Plug the cable into the power supply harness.

To remove the external fan:

1. Unplug the cable from the power supply harness and pull it and the rubber grommet to the outside of the enclosure.

2. Remove the screws from the two holes in the right corners of the fan housing.

3. Pull the fan housing from the standoff.

To replace the external fan:

1. Remove the replacement fan from the packaging.

2. Fit the hole in the upper left corner of the fan housing over the standoff. Verify that the arrow on right side of the housing points toward the enclosure wall.

3. Fasten screws through the right corners of the fan housing.

4. Pass the cable through the hole and install the grommet.

5. Plug the cable into the power supply harness.

ATX power supply (228827)

Follow the steps in Accessing Parts to remove the CNC cover.

To remove the power supply:

1. Make sure that the power has been disconnected from the CNC.

2. Remove the cover.

3. Disconnect the AC main power cable from the J1 receptacle on the surge board.

4. Remove the surge board.

5. Remove the two screws that fasten the power supply bracket to the floor of the enclosure.

6. Remove cables from the nearby cable clips.

7. Unplug the cables to the power supply, the motherboard, the power distribution board, the CPU, and both fans.

8. Carefully lift the power supply bracket from the enclosure.

9. Remove the 2 screws that fasten the bracket to the power supply and slide the power supply out.

10. Unplug the power cable.

11. Discard the old power supply, bracket, and wire harness.

To replace the power supply:

1. Remove the replacement power supply from the packaging.

2. Connect the power cable to the power supply.

3. Slide the power supply into the bracket.

4. Fasten the power cable plug in place with the screw in this kit.

5. Plug the other end of the power cable into the J2 receptacle on the surge board.

6. Replace the bracket in the enclosure and align the holes in the tabs over the lines engraved in the bottom sheet metal. Push the frame toward the side wall of the enclosure.

7. Fasten the 2 screws to the floor of the enclosure.

8. Reinstall the surge board.

9. Plug the AC main power cable into the J1 receptacle on the surge board.

10. Install the new wire harness in this kit by connecting the wires from the power supply to the mother board, CPU, power distribution board, and both fans.

11. Neatly tuck cables into nearby cable clips.

Wireless PCB and antenna (228836)

Follow the steps in Accessing Parts to remove the CNC cover.

To remove the wireless PCB and antenna:

1. Disconnect the antennas or antenna cables from the connectors on the back of the CNC.

2. Remove the screw that connects the PCI bracket to the enclosure.

3. Pull the board from the PCI slot on the motherboard.

To replace the wireless PCB and antenna:

1. Remove the replacement board from the packaging.

2. Insert the PCB connector into PCI slot 3 on the motherboard.

3. Fasten the screw through the PCI bracket into the enclosure.

4. Connect the antennas or antenna cables to the back of the network card. For antennas, adjust them so that they click into the 45 degree position.

Replacing Picopath MicroEDGE parts

2- and 4-Axis MCC, utility, and serial interface PCB (228838 and 228817)

📑 **For proper use of this replacement part (228838 and 228817), Phoenix® Version 9.76.4 or higher control software update is required.**

Follow the steps in Accessing Parts to remove the CNC cover.

To remove the MCC, utility, and serial interface board:

1. Remove the I/O and servo cables.

2. Remove the screw from the standoff.

3. Remove the screw that connects the PCI bracket to the enclosure.

4. Remove the PCI bracket from the board by removing the 4 hex head standoffs on either side of the serial ports.

5. Pull the board from the PCI slot on the motherboard.

To replace the MCC, utility, and serial interface board:

1. Remove the replacement board from the packaging.

2. Install the PCI bracket on the side of the board with the 4 hex head standoffs.

3. Insert the PCB connector into PCI slot 3 on the motherboard and position the holes at the front of the board over the standoffs.

4. Fasten the screw in the standoff and the PCI bracket.

5. Plug in the I/O cable and the servo cable.

2- and 4-Axis servo PCB (228839 and 228834)

Follow the steps in Accessing Parts to remove the CNC cover.

To remove the servo board:

1. Disconnect the I/O, servo, and power cables.

2. Remove the 6 screws from the connector panel on back of the CNC.

3. Remove the panel from the inside of the enclosure.

4. Remove the screw from the center bottom of the board.

5. Remove the 4 screws at the corners of the metal shell around each CPC.

6. Lift the PCB off the spring-loaded standoffs.

7. Remove the bottom and top halves of the split panel from the back of the board.

To replace the servo board:

1. Remove the replacement board from the packaging.

2. Align the half circles in the edge of the top panel under the CPCs on the board.

3. Snap the top panel onto the spring-loaded standoffs at the top of the board.

4. Align the half circles in the bottom half of the split panel with the CPCs and slide the edge under the top panel.

5. Snap the panel onto the spring-loaded standoffs.

6. Replace the metal shells over the CPCs and fasten them to the split panel with 4 screws on each one.

7. Replace the split panel and the board assembly in the enclosure and refasten it with the 6 screws.

8. Connect the I/O, servo, and power cables.

Analog breakout PCB (228847)

Follow the steps in Accessing Parts to remove the CNC cover.

To remove the analog breakout board:

1. Remove any PCBs that are installed in the PCI stack using the appropriate procedures in this FSB.

2. Remove the screws from the circular plastic connectors (CPCs) and pull the board away from the rear panel.

3. Remove the ribbon cable from the analog board.

To replace the analog breakout board:

1. Remove the replacement board from the packaging.

2. Replace the ribbon cable from the analog board.

3. Align the circular connectors with the openings in the rear panel and replace the CPCs with 4 screws at each corner.

4. Replace the PCBs in the PCI stack.

Replacing HyPath MicroEDGE parts

4-Axis MCC, utility, and serial interface PCB (228817)

📋 **For proper use of this replacement part (228817), Phoenix® Version 9.76.4 or higher control software update is required.**

Follow the steps in Accessing Parts to remove the CNC cover.

To remove the MCC, utility, and serial interface board:

1. Remove the I/O and servo cables.

2. Remove the screw from the standoff.

3. Remove the screw that connects the PCI bracket to the enclosure.

4. Remove the PCI bracket from the board by removing the 4 hex head standoffs on either side of the serial ports.

5. Pull the board from the PCI slot on the motherboard.

To replace the MCC, utility, and serial interface board:

1. Remove the replacement board from the packaging.

2. Install the PCI bracket on the side of the board with the 4 hex head standoffs.

3. Insert the PCB connector into PCI slot 3 on the motherboard and position the holes at the front of the board over the standoffs.

4. Fasten the screw in the standoff and the PCI bracket.

5. Plug in the I/O cable and the servo cable.

24 I/O PCB (228819)

Follow the steps in Accessing Parts to remove the CNC cover.

To remove the 24 I/O board:

1. On the outside of the back panel, remove the screws around each circular plastic connector (CPC).

2. On the inside of the back panel, unplug the cables from the power connectors.

3. Unplug the 50-pin MCC I/O ribbon cable.

4. Remove the screw in the center of the board.

5. Lift the board off the four spring-loaded standoffs.

To replace the 24 I/O board:

1. Remove the replacement board from the packaging.

2. Line up the standoff holes in the board with the spring-loaded standoffs.

3. Line up the CPC connectors on the back of the board with the openings in the rear panel.

4. Press the board into place.

5. Fasten the screw in the center of the board.

6. Plug in the MCC I/O ribbon cable, the field power cable, and the ATX power cable.

7. Fasten the CPC I/O connectors to the outside of the rear panel with screws.

4-Axis servo PCB (228818)

Follow the steps in Accessing Parts to remove the CNC cover.

To remove the 4-axis servo board:

1. Disconnect the cables from the board.

2. Unfasten the 4 screws at the base of each CPC.

3. Unfasten 2 screws from the standoffs at the top of the board.

4. Pull the board from the standoffs.

To replace the 4-axis servo board:

1. Remove the replacement board from the packaging.

2. Place the board over the two standoffs.

3. Replace the 2 screws in the standoffs.

4. Fasten the 4 screws at the base of each CPC.

5. Reconnect the cables to the board.

Analog breakout PCB (228847)

Follow the steps in Accessing Parts to remove the CNC cover.

To remove the analog breakout board:

1. Remove any PCBs that are installed in the PCI stack using the appropriate procedures in this FSB.

2. Remove the screws from the circular plastic connectors (CPCs) and pull the board away from the rear panel.

3. Remove the ribbon cable from the analog board.

To replace the analog breakout board:

1. Remove the replacement board from the packaging.

2. Replace the ribbon cable from the analog board.

3. Align the circular connectors with the openings in the rear panel and replace the CPCs with 4 screws at each corner.

4. Replace the PCBs in the PCI stack.

Replacing SERCOS II and SERCOS III MicroEDGE parts

SERCOS II and SERCOS III utility and serial isolation PCB (228816)

The SERCOS II utility and serial isolation board is always installed in slot 1 of the PCI stack on the motherboard.

Follow the steps in Accessing Parts to remove the CNC cover.

To remove the SERCOS II and SERCOS III utility and isolation board:

1. Remove the cables to the board.

2. Remove the screw that connects the PCI bracket at the side of the board to the enclosure.

3. Remove the board from the standoff.

4. Pull the board from the PCI slot on the motherboard.

5. Remove the PCI bracket from the board by removing the 4 hex head standoffs on either side of the serial ports.

To replace the SERCOS II and SERCOS III utility and isolation board:

1. Remove the replacement board from the packaging.

2. Install the PCI bracket on the side of the board with the 4 hex head standoffs.

3. Insert the PCB connector into PCI slot 1 on the motherboard.

4. Position the holes at the front of the board over the standoff and fasten the screw.

5. Fasten the PCI bracket to the enclosure.

6. Plug in the cables.

SERCOS II PCI master (228821)

Follow the steps in Accessing Parts to remove the CNC cover.

To remove the SERCOS II board:

1. Remove the screw that connects the PCI bracket at the side of the board to the enclosure.

2. Pull the board from the PCI slot on the motherboard.

To replace the SERCOS II board:

1. Remove the replacement board from the packaging.

2. Insert the SERCOS II board into PCI slot 2 on the motherboard.

3. Fasten the screw in the PCI bracket.

SERCOS III PCI master (428072)

Follow the steps in Accessing Parts to remove the CNC cover.

To remove the SERCOS III board:

1. Remove the screw that connects the PCI bracket at the side of the board to the enclosure.

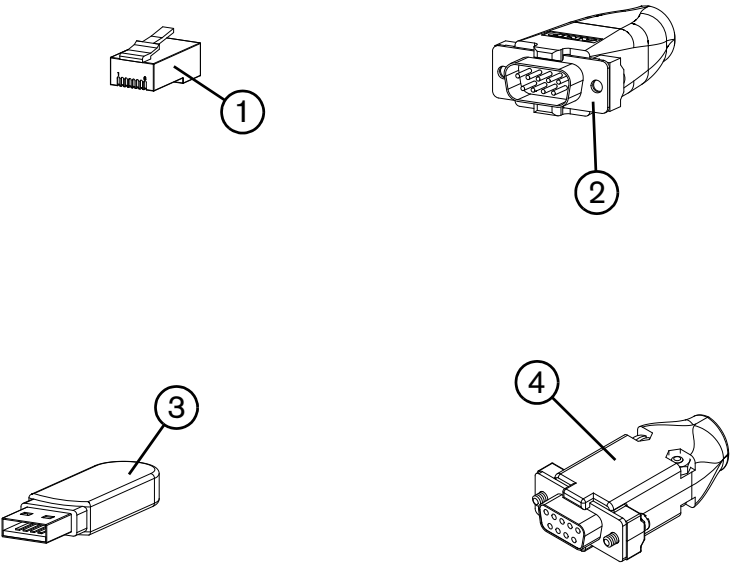2. Pull the board from the PCI slot on the motherboard.

To replace the SERCOS II board:

1. Remove the replacement board from the packaging.

2. Insert the SERCOS III board into PCI slot 2 on the motherboard.

3. Fasten the screw in the PCI bracket.

Test plugs and kits

Common test plugs

The following testers are used for diagnostic testing on all models of the MicroEDGE Pro CNC.

Item	Kit Number	Description
	228831	Tester Kit: Common plugs
1		Tester for Hypernet or network
2		Tester for RS-422 serial port on the serial isolation boards
3		Tester for USB
4		Tester for RS-232 serial port on the motherboard

Picopath test plugs

The following testers are used for diagnostic testing on Picopath models of the MicroEDGE Pro CNC.
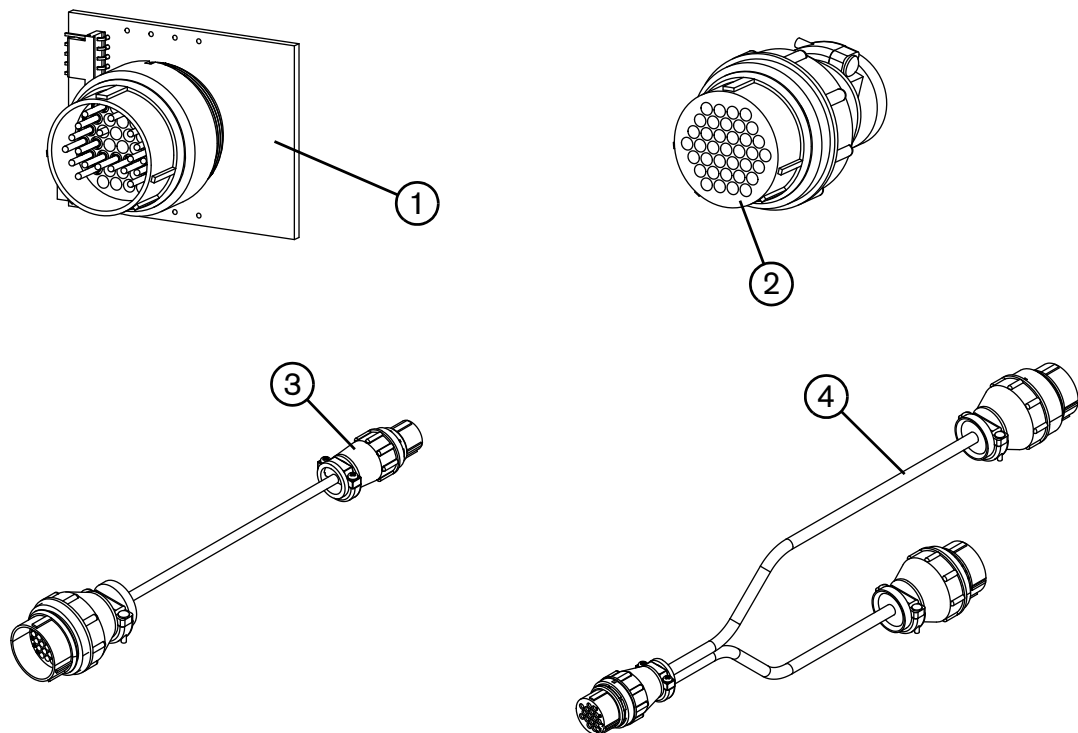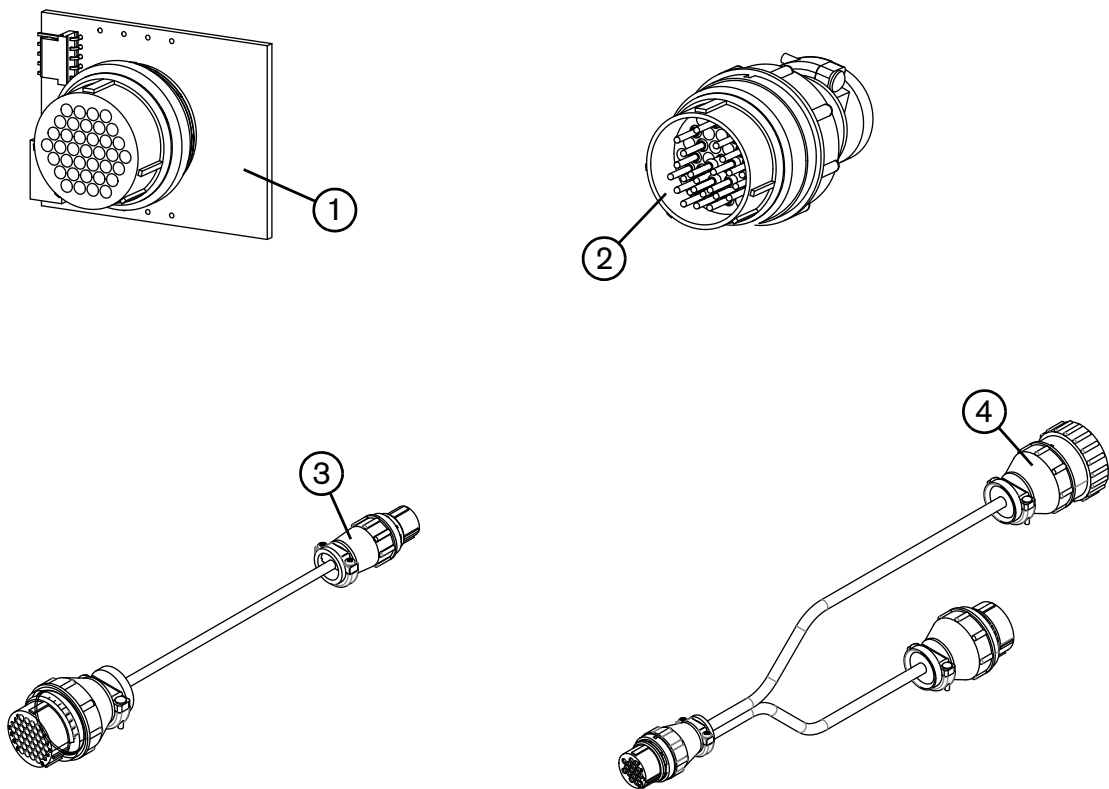

Item	Kit Number	Description
	228833	Tester Kit: Picopath plugs
1		Tester for Picopath axes
2		Tester for Picopath I/O (white stripe)
		Tester for Picopath I/O (orange stripe)
3		Tester for THC (Picopath)
4		Tester for Picopath joystick and speedpot (brown stripe)

Hypath test plugs

The following testers are used for diagnostic testing on HyPath models of the MicroEDGE Pro CNC.

Item	Kit Number	Description
	228832	Tester Kit: HyPath plugs
1		Tester for HyPath axes
2		Tester for HyPath I/O (green stripe)
		Tester for HyPath I/O (red stripe)
3		Tester for THC (Hypath)
4		Tester for Hypath joystick and speedpot (purple stripe)