08605
Ethernet connection Setup for Z Corporation 3D Printers
Rev B

Description:

This procedure describes how to select and configure the Ethernet connections for a Z Corporation 3D Printer. Hardware connections manual configuration of Windows settings and printer configuration are shown.

Notes:

- Z Corporation 3D printers communicate over Ethernet using the TCP/IP & UDP protocols only.
- You ***must*** have administrator privileges on the Windows computer to make changes to the Windows network configuration.

  Do not make changes to the Customer's Windows setup without their permission! If the Windows machine is on a corporate network, these settings have to be coordinated with the on site network manager.

- This procedure assumes that the Windows network card has already been basically set up (drivers installed etc.), and requires only the changes specifically related to the configuration for the printer.
- This procedure assumes the Z Corporation ZPrint™ Software is installed.
- This document shows Windows 2000 or XP, Windows NT can be set up similarly.

Background:

There are 4 main ways to physically connect the printer to the customer's network. These are as follows:

1) Z Corp Printer connected directly to customer's network.
2) Z Corp Printer locally connected through a hub or switch with uplink to customer's network
3) Z Corp Printer directly connected to Windows computer with no other local network
4) (Windows 2000 & XP only) Z Corp Printer directly connected to Windows Computer, 2 network cards in the Windows computer, one for customer's network, one dedicated to connection to the Z Corp printer connection.

Configuring each of these is slightly different.

The TCP/IP protocol requires that each device on the network have a unique address. For options 1 & 2 above, there are two ways to do this. The TCP/IP address can be automatically assigned; to do this there must be a DHCP server on the network for the Z Corp printer to request the address from. Otherwise, the address must be manually configured (a 'static IP address'). For options 3 & 4, generally there is no choice but to configure the IP addresses manually.

Procedure:

First choose the connection type (see 'Choosing which connection to use').

Follow the instructions in the appropriate section.

Choosing which connection to use:

Each option has advantages & disadvantages. A summary is given here, listed in general order of preference.

1) Z Corp printer connected directly to customer's network:
In normal circumstances, this is the standard, preferred configuration.

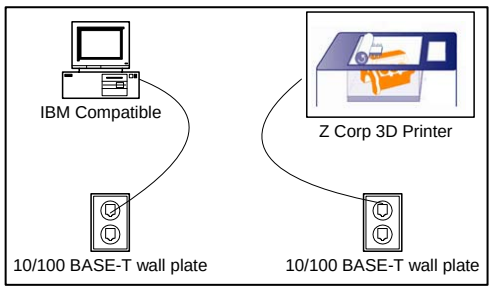


Figure 1: Connect directly to network

Requires:

Pre-existing network infrastructure.

Available network jack.

IP address for the printer, this can be either set up through DHCP or manually.

Advantages:

Potentially the least setup. If a DHCP server is available, it is essentially plug and play. When there is a jack available, this is what we do in house at Z Corp.

Disadvantages:

If a network jack isn't available, it may require running new cable a long way.

Requires coordination with the customer's IT personnel.

Customer may have security concerns.

Heavy network traffic and other network glitches may cause errors during builds.

If the network does not use DHCP, will require coordination with the local IT manager to assign an IP address; this will then have to be configured on the printer.

2) Z Corp printer locally connected through a hub or switch with uplink to the customer's network:
Use this method if there is only one network jack available, but there are other network devices to attach.

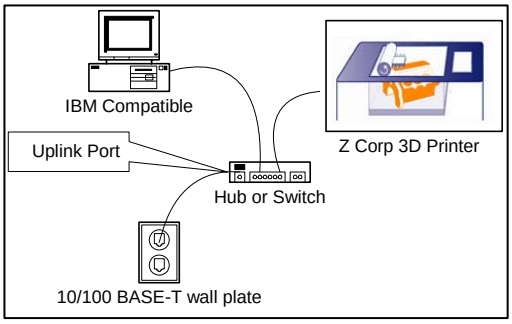


Figure 2: Connect with a hub or switch

Requires:

A network hub or switch (not supplied by Z Corp) with at least 3 connections, for the computer, the printer, and the uplink port. Hubs are inexpensive (<$100), switches cost a bit more, but have certain advantages.

IP address for the printer, this can be either set up through DHCP or manually.

Advantages:

Allows a single network jack to be shared.

If static IP addresses are used, it can be used even when isolated, either because the main network is down or there isn't any other network.

If a switch is used, heavy network traffic shouldn't interfere with printer communication.

Disadvantages:

Requires extra hardware (the Hub).

Adding hubs to a network can cause problems, there is a limit to how many may be daisy chained together on a single network.

Still requires coordination with customer's IT personnel, unless the connection will be kept isolated from the rest of the network.

Heavy traffic can still interfere with communication if a Hub is used (a switch can remedy this).

3) Z Corp Printer directly connected to Windows computer with no other network:
Use this method if there is no pre-existing network available.

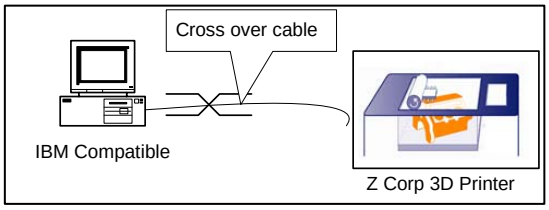


Figure 3: Direct connection

Requires:

A network card with drivers in the host computer.

A cross over cable.

Manual configuration of the IP addresses for both the Windows computer & the printer.

Advantages:

Closest to a serial port connection, least amount of hardware if there is no pre-existing local network at all.

Disadvantages:

Configuration must be handled manually.

Cannot add any other network devices or connect to a shared network.

Requires a special cross over Ethernet cable, not supplied by Z Corporation.

4) Z Corp Printer directly connected to Windows Computer, 2 network cards in the Windows computer, one for customer's network, one dedicated to connection to the Z Corp printer connection.
Use this method only if there is a pre-existing network but there is a need to keep the printer isolated from it for some reason. This option is not available for Windows NT.

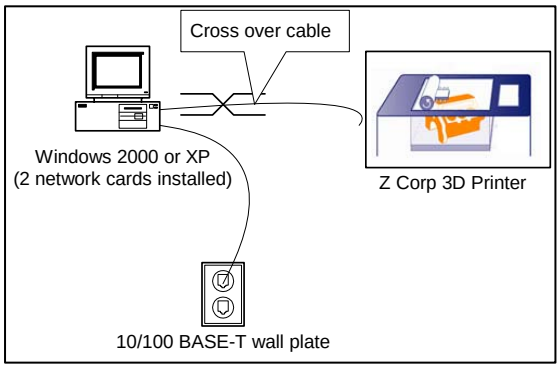


Figure 4: Workstation with 2 connections

Requires:

Two network cards with drivers in the host computer.

A cross over cable.

Manual configuration of the IP addresses for both the Windows computer & the printer.

Advantages:

Allows the Windows computer to be connected to the network, but keeps the printer isolated.

Minimized interaction of the printer with the host network, useful when the main network is heavily loaded, has restrictions on what may be plugged in, or is running protocols (such as Netware) that may not support TCP/IP.

Disadvantages:

Most complex setup. (It would not be hard to screw up the customer's computer or software.)

Requires opening the user's Windows computer and adding a second network card.

Configuration must be handled manually and carefully, it is important to configure the correct network card on the Windows computer and avoid causing problems with the primary network card.

Requires a special cross over Ethernet cable not supplied by Z Corporation.

Requires a network card not supplied by Z Corporation.

Some copy protected software is locked to the network card. Adding a second network card to the computer may confuse such software so that it will not run.

Configuring Ethernet:
Option 1, Z Corp Printer connected directly to local network

a) Hardware setup (see figure 1):

Connect the printer to a 10/100 base T hub, switch, or wall jack used for the company local area network with a standard category 5 Ethernet cable from the jack at the rear of the printer. The workstation that will be used to run the printer should also be connected to the company network. In this configuration, there is no direct physical connection between the printer and the Windows workstation; the connection is made through TCP/IP over the network cabling.

b) Software setup can use either DHCP (automatic configuration of network settings with Dynamic Host Control Protocol) or static (manual) settings.

i) Using DHCP:

The Windows computer should not need any configuration.

The printer should be configured as follows (see Appendix B for detailed instructions):

INI Entry	**Notes:**
USE_NETWORK 1	1 means use the network; 0 means use the serial port
PRINTER_NAME Zmodel_serial	This name is used to ID the printer; it should be unique
PRINTER_ADDRESS	This entry should be either not present or blank. If using the printer's own INI editor, this should be set to 'default'.
SUBNET_MASK	This entry should be either not present or blank. If using the printer's own INI editor, this should be set to 'default'.
GATEWAY_ADDRESS	This entry should be either not present or blank. If using the printer's own INI editor, this should be set to 'default'.
DNS_ADDRESS	This entry should be either not present or blank. If using the printer's own INI editor, this should be set to 'default'.

ii) Using a static IP address:

The Windows computer should be pre-configured using either a static or dynamic IP address (see customer's system adminstrator).

Printer configuration:

FIRST: Obtain a static IP address and Subnet mask from the local system administrator. *This step is important! IP address conflicts will cause problems on the customer's network!*

The printer should be configured as follows (see Appendix B for detailed instructions):

INI Entry	**Notes:**
USE_NETWORK 1	1 means use the network; 0 means use the serial port
PRINTER_NAME Zmodel_serial	This name is used to ID the printer; it should be unique
PRINTER_ADDRESS xx.xx.xx.xx	This entry should have the IP address assigned by the local system administrator. It takes the form of 4 numbers (0-255) separated by periods.
SUBNET_MASK xx.xx.xx.xx	This entry should have the subnet mask assigned by the local system administrator. It

	takes the form of 4 numbers (0-255) separated by periods. Generally it will look be 255.255.255.0 or 255.255.0.0, but other values are possible.
GATEWAY_ADDRESS xx.xx.xx.xx or 0.0.0.0	If local system administrator does not give you a value to for this, fill in 0.0.0.0.
DNS_ADDRESS 0.0.0.0	The local system administrator may give you a value for a domain name service address, however this can be all zeroes, the printer does not need this service.

c) Assuming the Windows computer is connected to the network and properly configured, no additional setup is needed except to load the ZPrint desktop software. If the Windows computer is not configured, see the local system administrator. Use the ZPrint software's 'Find' option to connect to the printer. If you are using a static IP address and 'Find' does not work, then double check the subnet mask. The printer and the computer must be on the same subnet. Then be sure to use the 'Save printer as Default' option for the convenience of the user.

d) The system administrator may ask for the printers 'MAC' or hardware network address. This is shown on the diagnostic screen on boot up. To see it you will have to plug a monitor into the diagnostic video port of the printer temporarily. On successful initialization of the network hardware, the IP address and hardware address will be shown. See below:

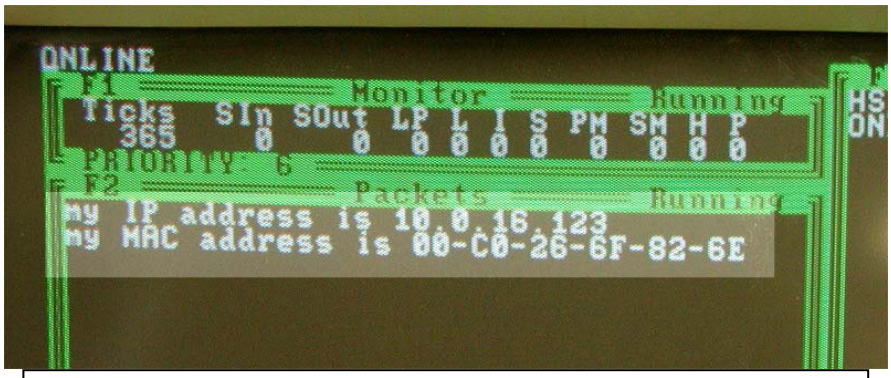


Figure 5: Diagnostic boot screen showing IP and MAC addresses

Configuring Ethernet:
Option 2, Z Corp Printer locally connected through a hub or switch to local network

a) Hardware setup (see figure 2)

Connect the printer to the 10/100 base T hub or switch using a standard category 5 cable. Connect the Windows computer to the hub or switch. Connect the uplink port of the hub to the rest of the network using a third cable.

b) Software settings are the same as option 1.

Configuring Ethernet:
Option 3, Z Corp Printer directly connected to Windows computer with no other local network

a) Hardware setup

Using a special crossover network cable, connect the network port of the printer directly to the network jack on the back of the windows computer. Alternatively 2 standard cables and a small network hub can be used. (see Figure 6).

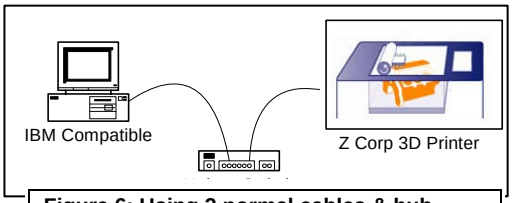


Figure 6: Using 2 normal cables & hub instead of a crossover cable

b) Software setup:

Static IP addresses will be required for both the Windows computer and the printer. Since there are no other network devices on the network, the choice of IP addresses is arbitrary. The following are suggestions, other settings will work.

Windows computer: Set up the Windows computer for a static IP address. Use 192.168.0.10 for the address and 255.255.255.0 for the subnet mask. See Appendix A for detailed instructions on setting up the computer. *Remember:* You will need to have system administrator privileges to make the changes, and they should only be done with the customer's permission.

Printer setup:

The printer should be configured as follows (see Appendix B for detailed instructions):

INI Entry	**Notes:**
USE_NETWORK 1	1 means use the network; 0 means use the serial port
PRINTER_NAME Zmodel_serial	This name is used to ID the printer; it should be unique
PRINTER_ADDRESS 192.168.0.20	Addresses that start with 192.168.0 are used for local networks, which is what this becomes.
SUBNET_MASK 255.255.255.0	This subnet allows addresses that differ only in the lowest number communicate
GATEWAY_ADDRESS 0.0.0.0	The printer does not need a gateway.
DNS_ADDRESS 0.0.0.0	The printer does not use DNS.

c) Reboot the printer (and the Windows computer if necessary), wait for the printer to come on line. Check the link light near the network jack to make sure it's on. If not, double check the cabling; most likely the cable is not the required cross over type.

d) Run the ZPrint software. Go to the 3D print setup dialog box; select the printer using the network option and the FIND box. The printer should show. Be sure to save this printer as the default for the user's convenience.

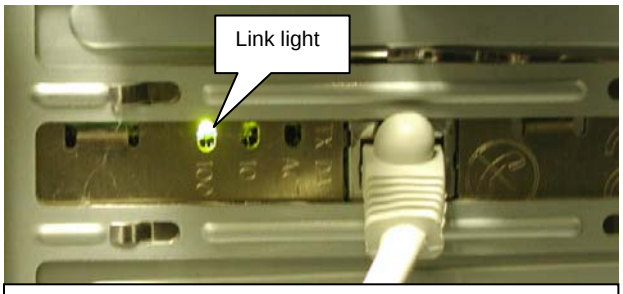


Figure 7 Ethernet link light on a PC

Configuring Ethernet:
Option 4, Z Corp Printer directly connected to Windows Computer, 2 network cards in the Windows computer, one for local network, one dedicated to connection to the Z Corp printer connection.

Notes:

- This procedure involves opening up the user's computer and installing hardware.
- **BEFORE STARTING**: *make sure that you have the customer's permission to do this, as well as the cooperation of any local network administrator*.
- ***Be sure to use appropriate static suppression procedures****; an ESD wrist strap clipped to the case of the customer's PC is highly recommended!*
- The 2 network cards must be on separate sub-nets. If they are on the same subnet, Windows only sends the packets out either one or the other, assuming that both cards connect to the same matrix. Since the two cards don't connect to the same place, neither the network or printer connections will work correctly.
- You must use a cross over network cable to directly connect the printer. This is not a standard Ethernet cable. Don't start if you don't have the correct cable.

a) Hardware setup

i) Before doing anything to the user's computer, boot it up, log in and check the name of the currently installed network card. Do this as follows: From the Windows Desktop pick **START : SETTINGS : Network and Dial-Up Connections**. There will be a list of network cards. Make a note of the ones that are installed. The idea is to NOT change the settings on any of these cards, only the card that will be added!

ii) From the Windows Desktop pick **START : RUN**, type 'cmd' into the dialog box and click **OK**. This will bring up a text box with a command prompt in it. Type 'ipconfig' and press return. Write down the IP addresses and subnet mask as currently configured. If any of the IP addresses given start with 192.168.0, then this procedure will have to be modified.

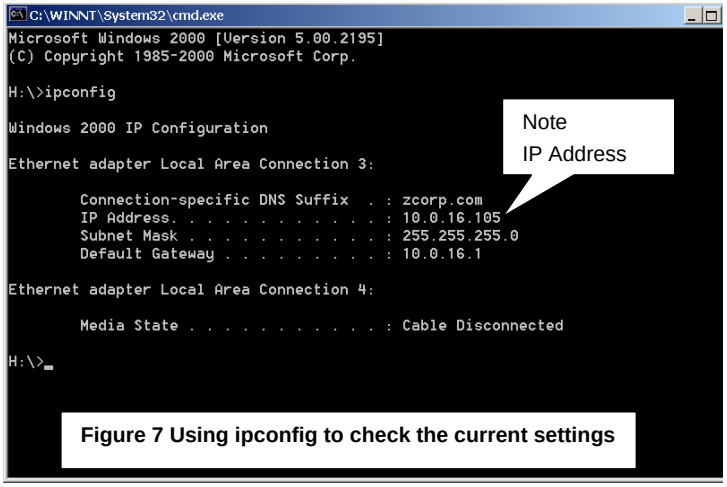


Figure 7 Using ipconfig to check the current settings

iii) Shut down (and shut off) the Windows computer. Unplug it from the wall, then press the power button to discharge any backup voltages inside. Open it according to the manufacturer's instructions for adding a network card. Ground yourself to the case, or clip to a metal part of the case with an ESD wrist strap.

iv) Get out the network card to be installed and mark it with a sharpie or other label. Once it's installed, it may be hard to tell apart from the original.

v) Close the computer back up. Plug in the power and any other cables.

vi) Turn the Windows computer back on & log in. From the Windows Desktop pick **START : SETTINGS : Network and Dial-Up Connections**. The new card should show on the list. If it does not, a driver may need to be installed; follow the instructions that came with the card.

vii) Connect the 3D printer to the Windows computer using a special cross over cable. Connect from the printer's network jack to the network jack on the card that was just installed.

viii) Boot the printer, there should be a link light on the network card connected to the printer.

b) Software setup, setting up a static IP address for the directly connected card.

i) Set up a static IP address for the newly installed card using the procedure in Appendix A. Be sure to select the new card (usually, but not guaranteed to be the last one on the list). **BE CAREFUL NOT TO CHANGE ANY OF THE SETTINGS ON ANY OF THE PREVIOUSLY INSTALLED NETWORK ADAPTERS!!!**

ii) If the IP address recorded in step a(ii) above does NOT start with 192.168.0, then use 192.168.0.10 for the static IP address and 255.255.255.0 for the subnet mask.

iii) If the IP address recorded in step a(ii) above *does* start with 192.168.0, then it is necessary to use a different subnet. Use 192.168.1.10 (note the 1 instead of the 0 in the third place) for the card's IP address. Use 255.255.255.0 for the subnet mask.

c) Set up a static IP address for Printer

Printer setup:

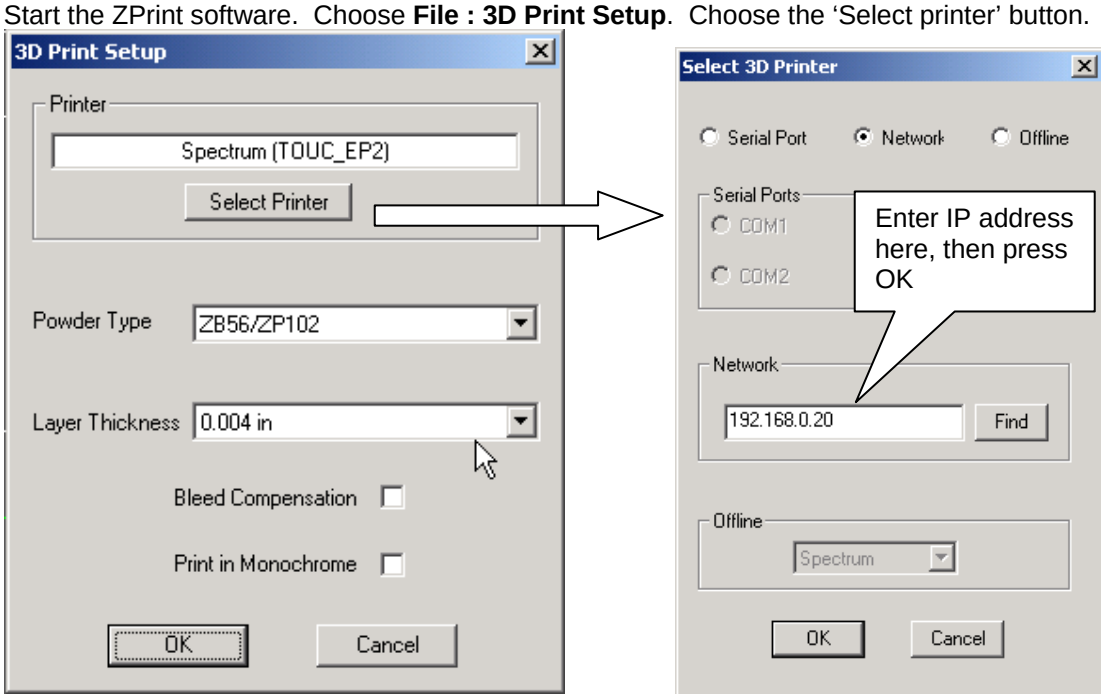
Either using the built in INI editor with a keyboard and monitor attached to the printer, or using the desktop software over a serial connection, edit the INI variables as follows:

INI Entry	Notes:
USE_NETWORK 1	1 means use the network; 0 means use the serial port
PRINTER_NAME Zmodel_serial	This name is used to ID the printer; it should be unique
PRINTER_ADDRESS 192.168.0.20	The first 3 numbers MUST match the Windows computer! If an alternate IP address was used in step (b) above, this address must be modified accordingly. (for example change to 192.168.1.20 using the modification of b(iii)).
SUBNET_MASK 255.255.255.0	This subnet allows addresses that differ only in the lowest number communicate
GATEWAY_ADDRESS 0.0.0.0	The printer does not need a gateway.
DNS_ADDRESS 0.0.0.0	The printer does not use DNS.

d) Setting up the ZPrint software. It is possible that the 'Find' option in print setup won't work. In that case it will be necessary to supply the printer's IP address directly as follows.

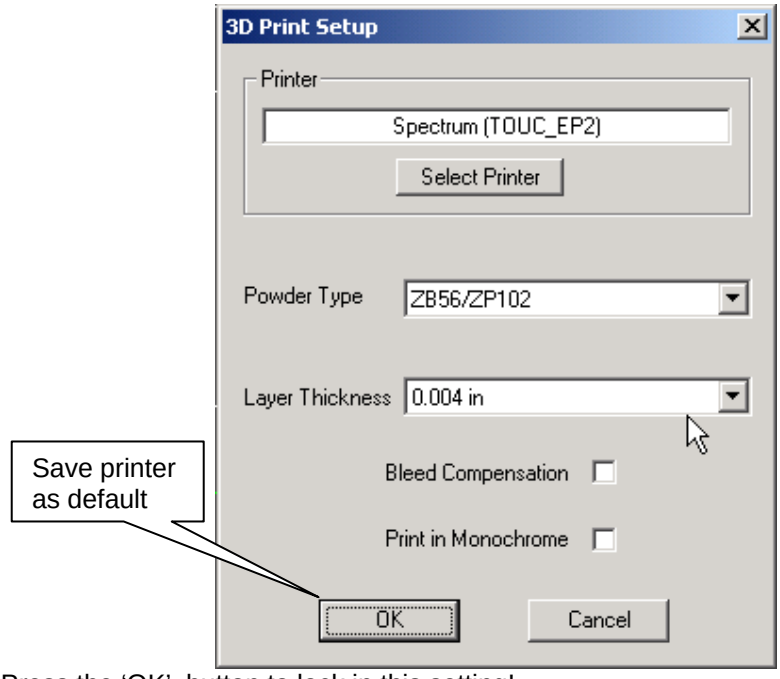
i) Boot the printer. Wait for it to come on line. Check for a link light on the back of the Windows computer.

ii) Start the ZPrint software. Choose **File : 3D Print Setup**. Choose the 'Select printer' button.



This will bring up the printer selection dialog box. Select the 'Network' in the top row of buttons. Type in the IP address of the printer (192.168.0.20, unless using an alternate) and press OK (Do not press 'Find').

iii) If the connection is found, the box will quickly close and the main 3D print setup box will have the printer type showing. If there is a long time out, then there is some kind of connectivity problem that must be resolved; go back and check the network card for a link light. Check the IP addresses and subnet mask numbers for mistakes. Make sure the printer is plugged into the correct network card.



iv) Press the 'OK' button to lock in this setting!

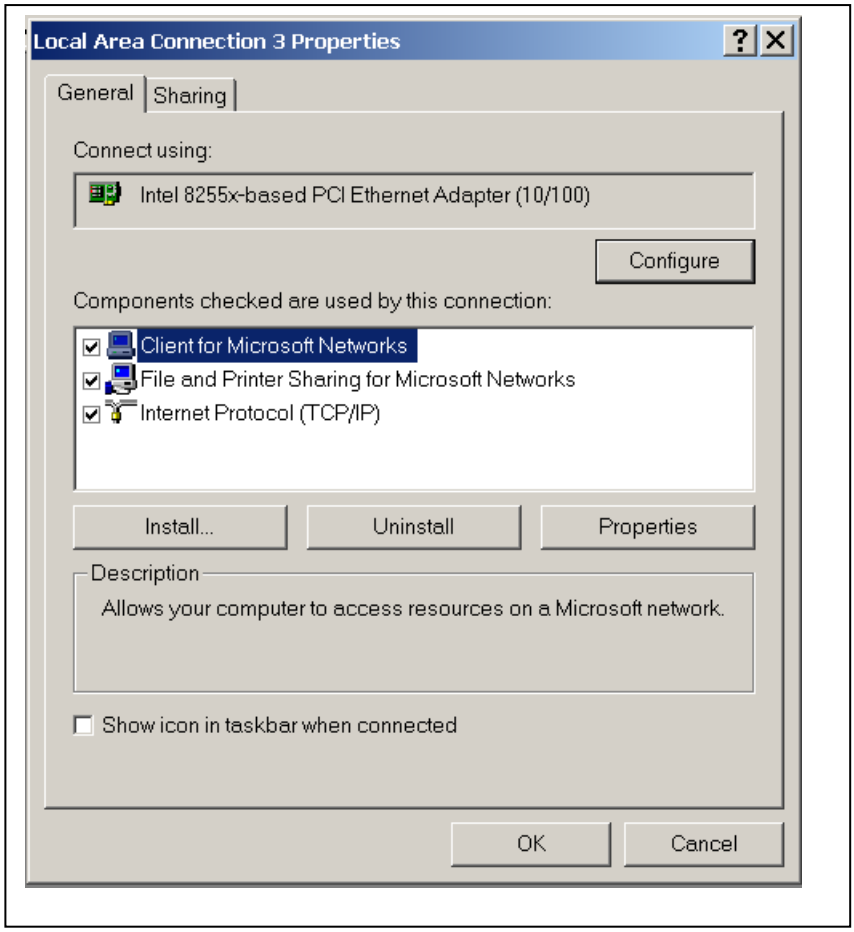
Appendix A: Setting up a Windows 2000 or XP computer for a static IP address:

Notes:

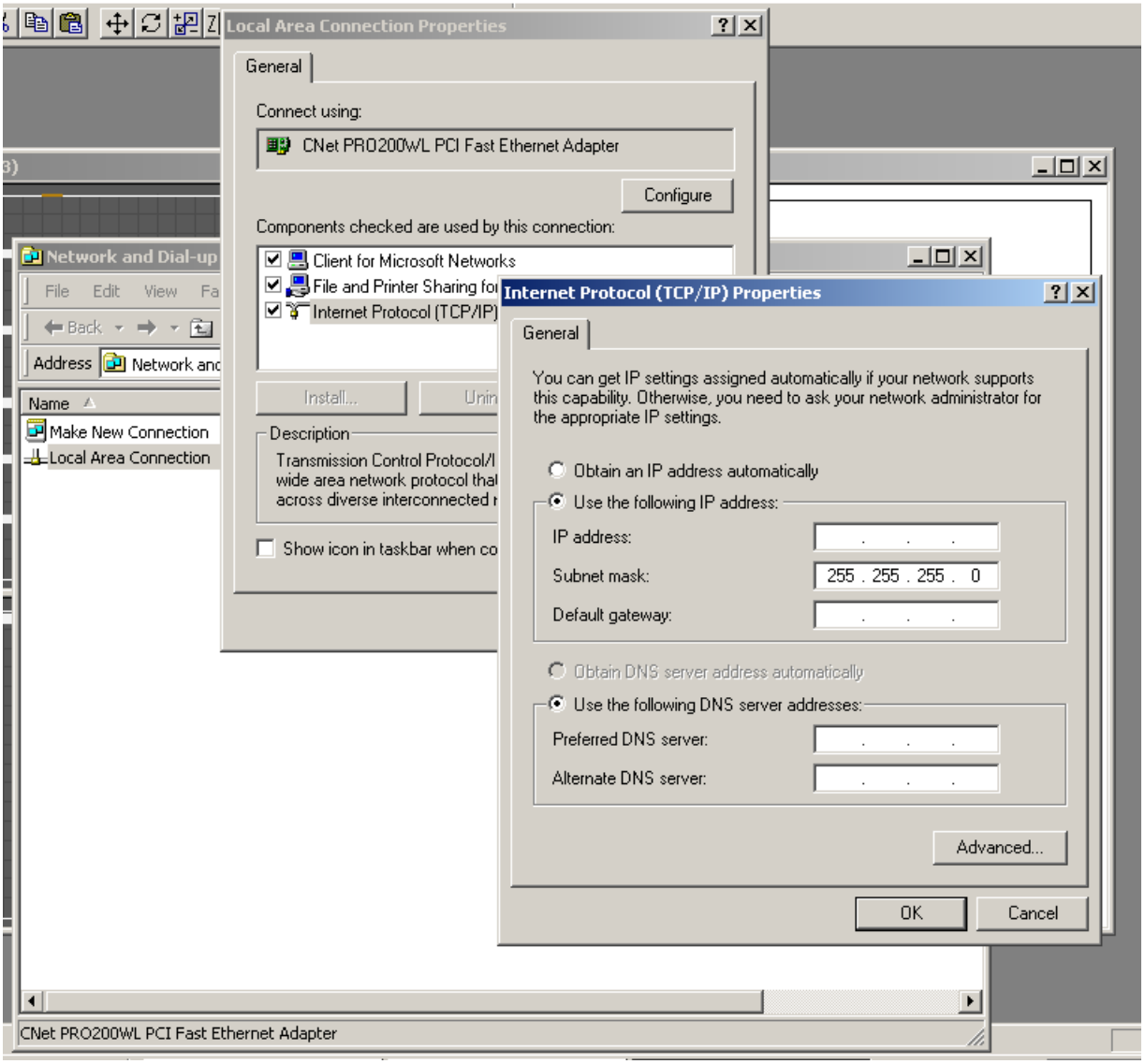
- You ***must*** have administrator privileges on the Windows computer to make changes to the Windows network configuration.

Do not make changes to the Customer's Windows setup without their permission! If the Windows machine is on a corporate network, these settings have to be coordinated with the on site network manager.

1. From the Windows Desktop pick **START : SETTINGS : Network and Dial-Up Connections**.
2. Right click the network card you want to configure and chose **Properties**.
3. In the list, one of the choices should be 'Internet Protocol', if not it will have to be installed.



4. Highlight ‘Internet Protocol’ and press the ‘Properties button. You should get a screen roughly like this:



5. Select the button ‘Use the following IP address’ as shown. Type in the IP address desired. IP addresses consist of 4 numbers, each from 0 to 255. Each connection on the network has to have a unique address. For a stand alone installation, the first 3 numbers of the IP address should match the first 3 numbers of the IP address used for the printer and the fourth number has to be different. For example: Windows machine: 192.168.0.10 with printer set at 192.168.0.20 would work. Corporate networks may use slightly different setups, but it is important that the printer be on the same subnet as any computer it needs to communicate with.
6. Type in the subnet mask in the box below the IP address. (Common values are 255.255.255.0 and 255.255.0.0, use 255.255.255.0 if this is a stand alone installation).
7. If the connection is only going to be used to connect to a printer, leave the other fields blank, otherwise fill them in as instructed by the local network administrator.
8. Press OK. In Windows 2000 the changes take effect immediately; if any installation has been done, you will have to re-boot.

Appendix B: Editing INI settings for Printer Network Configuration

Background:

Normally, editing the printer's INI file is easy using the ZPrint desktop software. The problem is that if the network isn't set up yet, ZPrint can't communicate with the printer to do this. There are 2 ways around this problem. The first is to establish connectivity with a serial port and use the ZPrint software as usual. The second is to attach a keyboard and monitor to the diagnostic ports on the printer and use the built in INI editor.

Using the printer's INI editor:

Requires:

- A VGA compatible monitor
- A PS/2 compatible keyboard

(the keyboard & monitor from the user's workstation will usually do)

Start the INI editor:

Connect the keyboard & mouse to the diagnostic ports of the printer (see user's manual for specific locations).

Shut off the printer, wait 5 seconds, and re-start it.

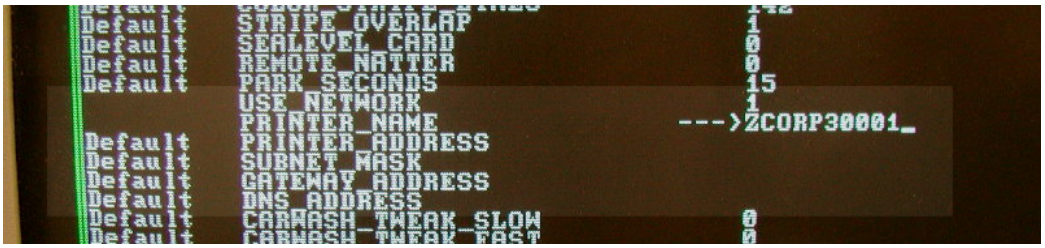
Start tapping the 'Insert' key on the keyboard as soon as the power switch is pressed.

The printer should not start normally, it should bring up a small menu as shown:

Choose option 1 (press the '1' key on the keyboard) to enter the INI editor. This will bring up a long list of possible INI entries. It will be much larger than the list shown by ZPrint, which only shows entries that are different than the defaults.

Use the up and down arrows to select the item to be edited*. Do not change any entries except those covered in this procedure.* The keywords can't be changed and don't need to be typed in, just select from the list. The 'F2' key can be used to set the defaults.

Shown here are the entries that are important to network setup:



To use the serial port, change USE_NETWORK to 0. A value of 1 will select network usage.

The printer name must be unique if there is more than one printer on the network, and is usually related to the serial number of the printer.

PRINTER_ADDRESS is the IP address of the printer. To use DHCP, use the 'F2' key to restore this to the default setting, which will be blank. To use a specific address, type the 4 numbers separated by periods, with no spaces like this: 192.168.0.20 .

SUBNET_MASK is the TCP/IP subnet for the printer. To use DHCP, use the 'F2' key to restore this to the default setting, which will be blank. To use a specific address, type the 4 numbers separated by periods, with no spaces like this: 255.255.255.0 .

GATEWAY_ADDRESS & DNS_ADDRESS can also be set. If the local network administrator gives values for these, type them in as for the IP address & subnet mask, otherwise fill in 0.0.0.0. To use DHCP, use the 'F2' key to restore this to the default setting, which will be blank.

Save the INI settings and reboot:

To save the INI settings, press the 'F4' key. Answer yes (press 'Y') to confirm the save. The printer will restart and the new settings will then be in effect.

Using a serial port connection:

Requires:

- Service person's or customer's desktop computer with ZPrint loaded and a free serial port.
- A null modem cable. (ZCorp part #05140)

Get the printer into serial mode:

There are a number of ways that may work. If none of these methods work then you will have to use the built in INI editor.

- Z™810 printers ship configured for serial port. The idea is for the installing service person to connect with the serial port and edit the INI values according to what is needed. (NOTE: Permanent serial connection is ***not*** recommended for the Z810, the amount of data and the overhead required to transmit it is too large, which can result in 'packet timeout' errors and other communication problems during large, complex builds).
- Smaller format printers made for network connection ship configured for DHCP. If they fail to self configure, they will boot with an error light. Pressing 'Online' will clear the error light and the printer will communicate over the serial port. To force serial port connection in this case, unplug the network cable from the printer and boot it up. The printer will revert to the network connection the next time it is booted unless it is reconfigured to use only the serial port.
- Z810 printers with firmware newer than January, 2003 will behave like the smaller format printers if configured for DHCP and no connection is sensed. They will boot with an error light and the message 'use serial' on the LCD. To use the serial port, press the Online key.
- Network printers with firmware newer than January, 2003 can be forced to use the serial port from the control panel during boot up. To do this, power down the printer. Then press and hold the 'Spread' button on the front panel. Turn on the power with the 'Spread' button still pressed. Keep holding the 'Spread' button until the printer finishes booting. At this point it will be configured to use the serial port until a re-boot is done.

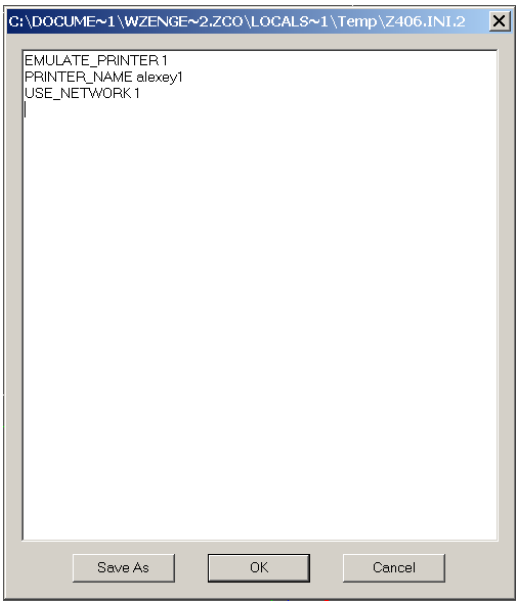
It may not be possible to force a network printer into serial port mode. This can happen if the printer is configured for a static IP address (so it doesn't detect the network disconnect), or doesn't have the fall back code, or doesn't have the code that allows the serial port override from the control panel. In these cases, it will be necessary to use the built in INI editor.

Use the ZPrint software to edit the INI settings:

- Connect the printer and computer with the null modem cable (see user's manual).
- Install and run the ZPrint software.
- Use the '3D Print Setup' dialog to configure the printer for the correct Comm (serial) port.
- Select the 'Edit INI File..' in the printer specific service menu.
- The ZPrint software will upload and display the current INI entries. Only non-default entries will be shown.
- The INI edit box works just like any Windows edit box. You can even copy, cut and paste using the 'ctrl-C', 'ctrl-X', and 'ctrl-V' keyboard short cuts. A 'Save As' button is provided to facilitate saving the entries as a text file for future reference or emailing for diagnostic purposes.
- To add an entry, move the cursor to the end of the last line, click and press 'enter'. Type the new entry exactly as shown below. Use one space between the keyword name and the value. Keyword names never have spaces in them, they use underscore characters instead (shift – hyphen).
- To delete an entry, highlight it with the mouse and press the 'delete' key or backspace over it.
- After the entries have been modified, press the OK button; the INI file will be transmitted back to the printer, and it will reboot. The new settings will take effect after the restart.

The INI entries used to control the network setup are shown here:

USE_NETWORK 1
PRINTER_NAME Zmodel_serial
PRINTER_ADDRESS 192.168.0.20
SUBNET_MASK 255.255.255.0
GATEWAY_ADDRESS 0.0.0.0
DNS_ADDRESS 0.0.0.0



Appendix C:

Configuring the Spectrum Z510 using the LCD and keypad.

Configuration mode is entered by holding the ONLINE key pressed when the printer is powered up.

Configuration mode is indicated by the LCD displaying:

NETWORK SETTINGS

Main menu consists of 5 selections:

NETWORK SETTINGS
RESTORE FIRMWARE
DIAGNOSTIC MODE
SAVE AND EXIT
DISCARD AND EXIT

< Build UP > and < Build DN > keys are used to select an item to edit.

When desired function is displayed, < Feed UP > key will select the item, and the LCD display will change.

Selecting

NETWORK SETTINGS

displays:

NETWORK SETTINGS USE NETWORK? YES

< Build UP > and < Build DN > keys toggle YES/NO

Note: NO means the serial port will be used

< Feed UP > key will display:

DHCP/STATIC IP USE DHCP? YES

< Build UP > and < Build DN > KEYS toggle YES/NO

If “NO” is displayed, and < Feed UP > is selected, LCD displays:

IP ADDRESS 0. 0. 0. 0.

< Feed UP > key will move the cursor to the right.

< Feed DN > key will move the cursor to the left.

< Build UP > and < Build DN > keys will change the value at the cursor.

If the cursor is at the RIGHTMOST field, and the < Feed UP > Key is pressed, displayed is:

If the cursor is at the LEFTMOST field, and the < Feed DN > key is pressed, displayed is:

DHCP/STATIC IP: USE DHCP? NO

< Build UP > and < Build DN > keys toggle YES/NO

If “YES” is displayed, and < Feed UP > is selected, MAIN MENU is displayed

If “NO” is displayed, and < Feed UP > is selected, LCD displays:

SUBNET MASK 0. 0. 0. 0.

< Feed UP > key will move the cursor to the right.

< Feed DN > key will move the cursor to the left.

< Build UP > and < Build DN > keys will change the value at the cursor.

If the cursor is at the RIGHTMOST field, and the < Feed UP > key is pressed, the MAIN MENU is displayed.

If the cursor is at the LEFTMOST field, and the < Feed DN > key is pressed, displayed is:

Selecting | RESTORE FIRMWARE | displays:

RESTORE FIRMWARE
RESTORE FIRMWARE? NO

< Build UP > and < Build DN > keys toggle YES/NO

Note: YES means the printer will use the firmware previously to that which was just loaded.

If < Feed UP > is pressed, MAIN MENU is displayed

Selecting | DIAGNOSTIC MODE |

DIAG MODE?
DIAG MODE? NO

< Build UP > and < Build DN > keys toggle YES/NO

Note: NO is normal operation.

YES will skip rezero (fast and slow axis, and pistons) for the current session, also causes the pistons to rezero on next powerup.

If < Feed UP > is pressed, MAIN MENU is displayed.

Selecting | SAVE AND EXIT |

If < Feed UP > is pressed, configuration menu terminated.

Selecting | DISCARD AND EXIT |

If < Feed UP > is pressed, configuration menu terminated.

Appendix D: Verifying network connections for 3D Printer communication

Proper network connections can be verified by use of the "ping" command. This is a command used from either the DOS command line, or START>RUN> from windows.

1. To use the DOS command line method (recommended technique):
   Open a DOS command prompt.
   At the C:\ prompt, type: ping 10.0.16.94 <ENTER>
   Simulating that 10.0.16.94 is the IP address of the printer

2. To use the START>RUN> method:
   Click START>RUN in windows.
   When the run box opens, type: ping 10.0.16.94 <ENTER>
   Simulating that 10.0.16.94 is the IP address of the printer

Either method will result in one of two possible responses:

Response 1: CORRECT

Pinging 10.0.16.94: bytes=32 time < 32ms TTL60
Pinging 10.0.16.94: bytes=32 time < 32ms TTL60
Pinging 10.0.16.94: bytes=32 time < 32ms TTL60
Pinging 10.0.16.94: bytes=32 time < 32ms TTL60

This is the proper response, as it indicates the hardware and software is properly connected and configured for network communications. The result itself means that 32 bytes were sent over the network to the device with an IP address of 10.0.16.94, and the device echoed the bytes sent in less then 32 milliseconds. The 32 bytes were sent and echoed four times. When this response is received, verify that the IP address is the one assigned to the printer. If the IP address is not the one assigned to the printer, the device which this IP address has been assigned to will respond.

Response 2: INCORRECT

Request timed out.
Request timed out.
Request timed out.
Request timed out.

This response indicates that there is something wrong with either the hardware or software configuration. The device addressed failed to respond four times.

Response 2 should require the technician to verify the following:

- Ethernet cable not connected on either side of connection
- Incorrect CAT 5 cable connected Crossover Eternet cable vs. Network patch cable
- Incorrect IP address configured on the customer PC or within 3D Printer ini. file

Revision History:

Original: 8605 Static IP setup.doc	whz	3/2002	Covered only static IP addressing (unreleased)
Rev A:	whz	1/2/2003	Greatly expanded & revised; name changed to reflect expanded scope
Rev B:	wcp	1/13/2005	Added Appendix C which details using the keypad and LCD for network setup. Added Appendix D which details use of the 'ping' command to verify network connections Used current ZPrint software for screen capture images.