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Subject: Connecting via Ethernet

APPLICATION NOTE

www.triomotion.com

1. Connecting to an Ethernet Coordinator

Coordinators such as the MC464 and the EURO209 use Ethernet as their primary form of communications over Port 0. This application note discusses how to connect to these and fault finding techniques for difficulties in connection.

2. Connection Schemes

2.1. Point to Point

The Coordinator can be directly connected to a spare Ethernet port on your PC as in Figure 1. When using this configuration the PC Ethernet port **MUST** have a fixed IP address and you **MUST** use a separate Subnet to any other Ethernet connections on the PC.

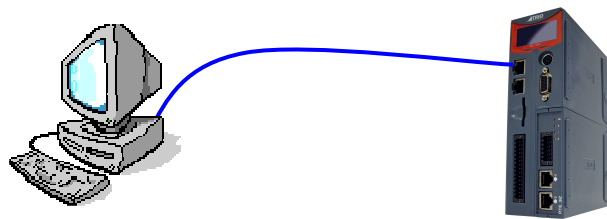


Figure 1 Point to Point connection

2.2. Through a Switch or Hub network

The coordinator may be connected through a network, multiple users then have access to the coordinator. You should remember though that if you try to connect using MP2 to a coordinator that is in use the other user will have their session terminated and you will take control.

In the example in Figure 2 both PC's have access to either controller. The primary Ethernet connection allows multiple connections to the coordinator, so one PC could be connected through Motion Perfect 2 and the other through Trio PCMotion Active X.

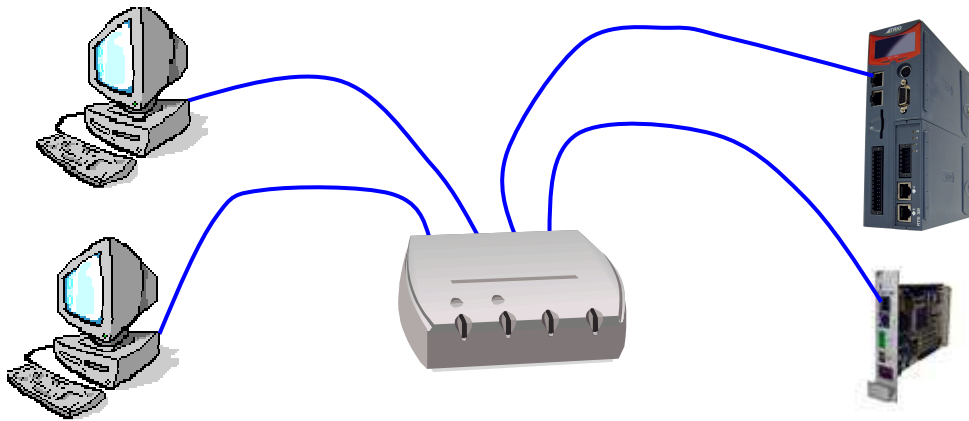


Figure 2 Network Connection

2.3. Cables

The connection is a standard RJ45 Ethernet cable and this can be plugged into your office network. If you are using the coordinator in an electrically noisy environment you may wish to use a shielded cable.

Unlike the P296 Ethernet Daughterboard you can connect directly from a PC using either a straight (standard) or a “Null Modem” cable. The P296 requires that the “Null Modem” cable is used in this situation.

3. Making the connection

3.1. Default addresses

By default the coordinator is set with IP Address 192.168.0.250 and a Subnet Mask of 255.255.255.000 which allows any host PC to communicate. Both the IP Address and the Subnet can be changed, please refer to the ETHERNET command in the Technical Reference Manual which can be downloaded from www.triomotion.com

3.2. Checking for available IP Address

Before connecting the coordinator to your network it is a good idea to check that no other device is using the IP Address. You should check with your network manager on the availability of addresses. You can also check if an address is in use through PING command in windows command prompt.

The windows command prompt can usually be found under start/ all programs/ accessories. Simply start this program and type:

Ping 192.168.0.250 (or whatever address you wish to check)

If the address is not in use you will receive a “request timed out” as in Figure 3. You should remember that a device may still be set to use this address; it might just be turned off!

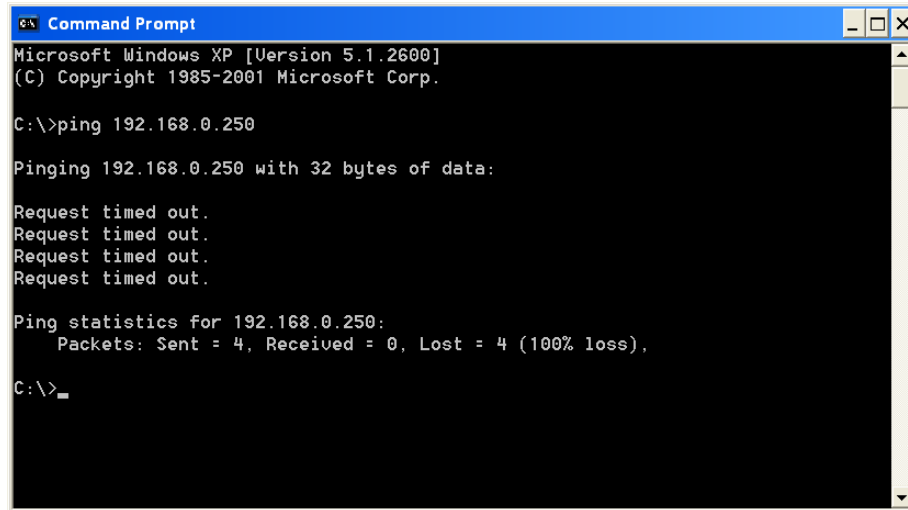


Figure 3 Ping "Request timed out"

3.3. Connecting to Motion Perfect

To connect to Motion Perfect you first have to set up the connection method. From the main window select OPTIONS - COMMUNICATIONS. This will bring up the window in Figure 4.

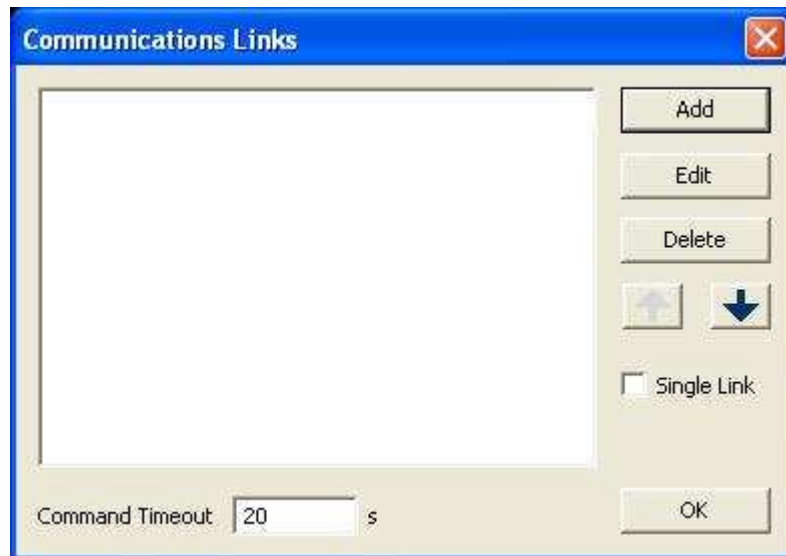


Figure 4 Communications window

From this window you should add another Communication Link by pressing the add button, this brings up the dialogue in Figure 5.

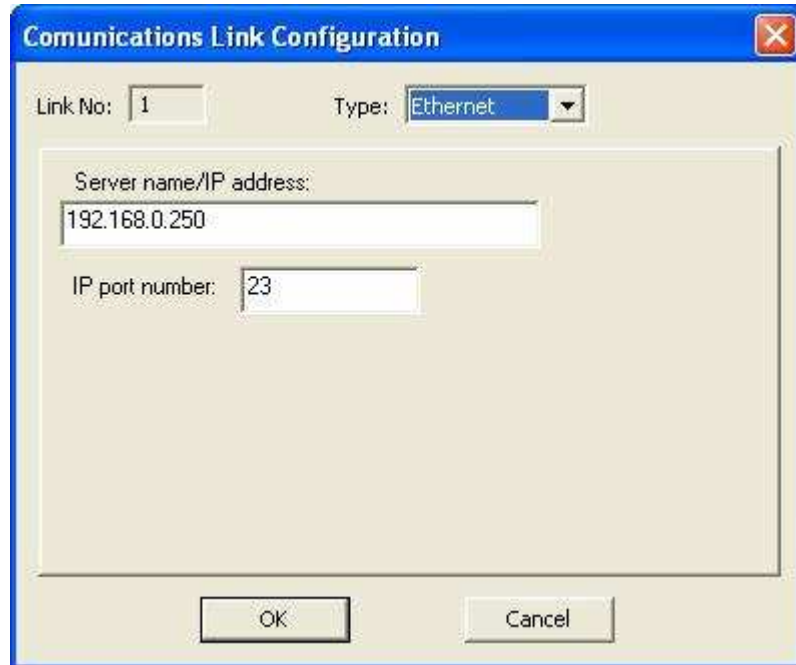


Figure 5 Communication Link Configuration

Select Type as Ethernet and check that the IP address matches that of the coordinator. Ensure that your new Ethernet Link is selected from the Communications Links window and you are then ready to connect.

4. Connection problems

4.1. Step 1

The first thing to do is to check that the coordinator is powered on and connected to the network, this may sound obvious but it is an easy mistake to make. You should then ping the coordinator as in 3.2, if it is connected and powered on it there should be a reply as in Figure 6.

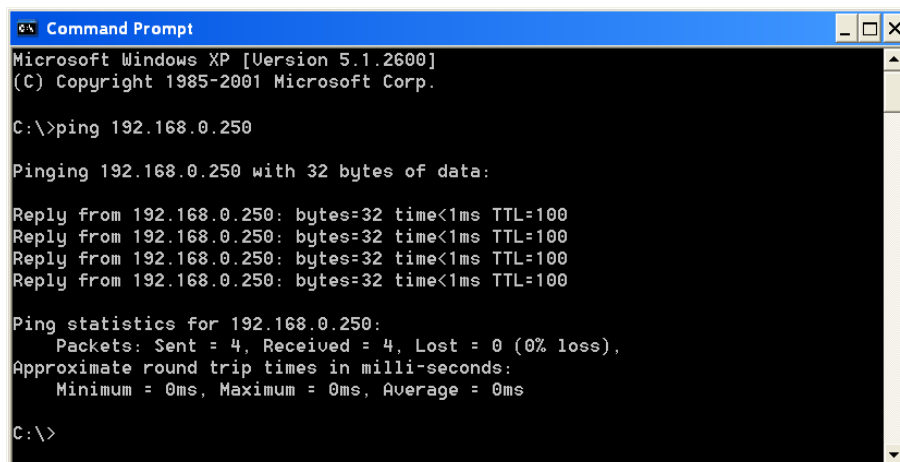


Figure 6 Ping OK

Remember if another device is on the network with the same address it may be replying rather than your coordinator. You can check for this by turning the power off and repeating 3.2. Another indication that your coordinator is responding to the ping is that the orange LED will flash. Please

refer to Figure 7 for the next step

Ping	Orange LED	Green LED	Suggestion
OK	Flashing	ON	Check your communication settings in Motion Perfect 2
Fail	Flashing	ON	Try Step 2
Fail	OFF	ON	Check the coordinator IP address and Subnet mask If you are using point to point check for fixed IP on PC
Fail	OFF	OFF	Check your network cables, and network connections

Figure 7 Diagnostic table

4.2. Step 2

PC operating systems maintain a record of IP address and register them to the devices unique MAC address. If you have replaced a coordinator the IP address may be the same but its MAC address will have changed. The PC will then not communicate with the controller as it is looking for a different MAC Address. You can remove this link by clearing the ARP Cache, this is done by typing 'ARP -D' into the Command Prompt. The controller should then reply to a Ping as in 4.1.

The ARP cache is also reset on start-up of your PC, so if you power cycle your PC when changing coordinator you will not see this problem.

4.3. Connecting to Motion Perfect's terminal window

Unlike a serial connection the terminal window is not connected to the coordinator when opened using Ethernet. To make the connection you should press the carriage return key a couple of times. The command prompt ">>" will be returned when the connection is made. If you do not see this try the steps above.

Like all coordinators you can stop the auto run on power up by pressing a key during power-up. If you repeatedly press a key to make the Ethernet connection you may stop the auto run on power up. If this happens you can type 'AUTORUN' in the command prompt to start the programs.

5. Lost/ changing IP Address

The coordinators with a graphic display show the IP address on power up. On the coordinators with out this option there is a switch that resets the IP address back to the default 192.168.0.250.

5.1. IP Address reset slide switch

To reset the IP address to the default 192.168.0.250 slide the switch to the ON position (see controller hardware information in manual for details). Power on the controller, you should be able to connect now on the default IP address. You should not use the coordinator with the switch in the ON position so once you have verified that you can connect please disconnect, power off and slide the switch to the off position.

5.2. IP Address button

To reset the IP address to the default 192.168.0.250 press the button while powered on. Cycle power to the coordinator and it will then use the default value.

5.3. Displaying the IP Address on the serial port

Rather than resetting the IP address to the defaults you can use the SD card start-up program to display the IP address through the RS232 serial port on connector B. You should connect this to the PC using a standard grey serial lead (P350) and connect to the Motion perfect terminal window using

standard speed defaults. Alternatively you can connect to any terminal program using the following settings:

Baud =9600
 Data Bits = 7
 Parity = Even
 Stop Bits = 2
 Flow Control = None

The following program should be saved with the file name “TRIOINIT.bas” so that it will run on start-up.

```

=====
' Application: SD CARD Ethernet address identification
' Module:      TRIOINIT.BAS
' Platform:    Any with SD Card support
=====
' Author:      AJH
' Modified:    31st March 2008 AJH
=====
'
' Copyright 2008 Trio Motion Technology Ltd
'
' Trio Motion Technology Ltd.
' Shannon Way, Tewkesbury, Glos. GL20 8ND
' Tel: (01684) 292333 Fax: (01684) 297929
' Email: triotech@triomotion.com
=====
' Revision Record
' V1.0 Initial Release
=====

SETCOM(9600,7,2,2,1,0)
WA(20)
OUTDEVICE=1
PRINT "IP ADDRESS = ";
ETHERNET(0,-1,0)
PRINT ""
PRINT "SUBNET MASK = ";
ETHERNET(0,-1,2)
PRINT ""
PRINT "DEFAULT GATEWAY = ";
ETHERNET(0,-1,8)
PRINT ""
PRINT "Starting programs... Please connect to Ethernet"
OUTDEVICE=0

```

5.4. Changing the IP Address

The IP address provided as default may conflict with another device on your network, or you may wish to change it for another reason. If you can connect to the coordinator you can change it using the ETHERNET command, see the Technical reference Manual for more detail. If you cannot connect due to some network reason, or just for convenience you can use the SD card start-up program to set the IP address. The values below are the defaults but you can change them to suit your application.

The following program should be saved with the file name “TRIOINIT.bas” so that it will run on start-up.

```
'=====
' Application:  SD CARD Ethernet address setting
' Module:      TRIOINIT.BAS
' Platform:    Any with SD Card support
'-----
' Author:      AJH
' Modified:    31st March 2008 AJH
'
'-----
'              Copyright 2008 Trio Motion Technology Ltd
'
'              Trio Motion Technology Ltd.
'              Shannon Way, Tewkesbury, Glos. GL20 8ND
'              Tel: (01684) 292333   Fax: (01684) 297929
'              Email: triotech@triomotion.com
'-----
' Revision Record
'   V1.0      Initial Release
'
'=====

'Change the following line to your required IP address
ETHERNET(1,-1,0,192,168,0,250)

'Change the following line to your required Subnet Mask
ETHERNET(1,-1,2,255,255,255,0)

'Change the following line to your required Default Gateway
ETHERNET(1,-1,8,192,168,0,225)

DISPLAY = 0
FOR x=0 TO 1000:INVERT_IN(0,ON):WA(100):INVERT_IN(0,OFF):WA(100):NEXT x
```

When LED starts to flash power down the coordinator, remove the SD Card and power up. You can then connect using the new settings