MotoTally Networking Guide

Windows XP

Introduction

This networking guide will show you how to configure your computers on a network so you can run multiple instances of MotoTally on multiple computers, all sharing off the same database. You might want to do this for various reasons, but the primary reasons would be for allowing multiple points of data entry for signup or enduro scoring.

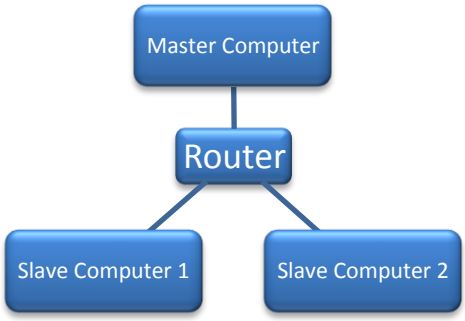
There are essentially three different recommended ways of connecting multiple computers together for this purpose. All of them involve some type of wired Ethernet connection between the laptops (wireless connections are not recommended). One computer will serve as the *master* and all other computers will be *slaves*. In other words, one computer will hold your MotoTally database, and all other computers will connect to that database across the network.

Option 1 – Crossover Cable

If you need to connect no more than two computers together, then by far the easiest way to do so is with something called a crossover cable. It is similar to a standard Ethernet cable, but it has a few wires crossed in it, which allows two computers to be connected directly without the need for a hub/switch or router.

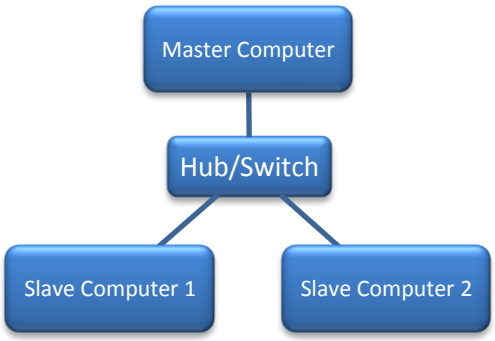
Option 2 – Router

If you need more than two computers connected, then one option is to use a router and standard Ethernet cables to connect them all together. Using this option is somewhat of a double edged sword. It is the easiest to configure, *if everything goes right*, but is the hardest to troubleshoot if anything goes wrong or isn't configured properly.



Option 3 – Hub/Switch

A hub or switch is basically a "dumb" router. They allow you to connect multiple computers together, but require a little more configuration on your part. I believe this is a good thing. The configuration process, while not automatic, is at least more easily in our control, and easier to troubleshoot! Note that for our purposes, a hub and a switch are the same thing; they just go by different names.



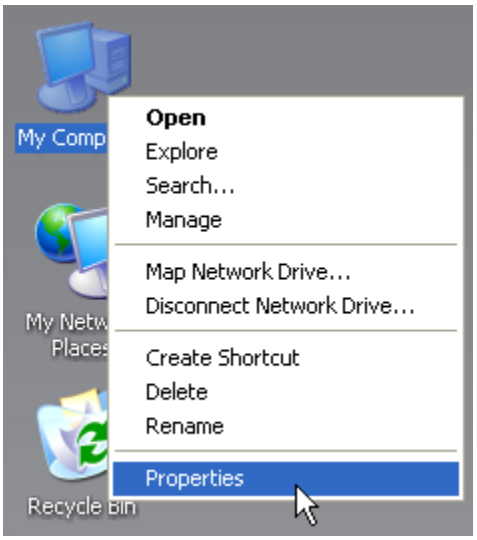
Workgroups and Computer Names

Two terms you should understand are *Workgroups* and *Computer Names*. Probably the easiest way to describe the function of these two things is with an analogy. Think of *Workgroups* as your last name, and *Computer Names* as your first name. All computers in the same *Workgroup* are in the same family (just like persons with the same last name). Computers in the same workgroup "trust each other". Each computer in that family must have a different first name (or *Computer Name* in this case). Set up all of your computers with the **same** *Workgroup*, and **different** *Computer Names* and everyone gets along fine and knows how to identify one another.

No matter which of the three network connectivity methods you are using, all computers need to go through the process of setting the *Workgroup* and *Computer Name* properties. The following section shows you how to do this:

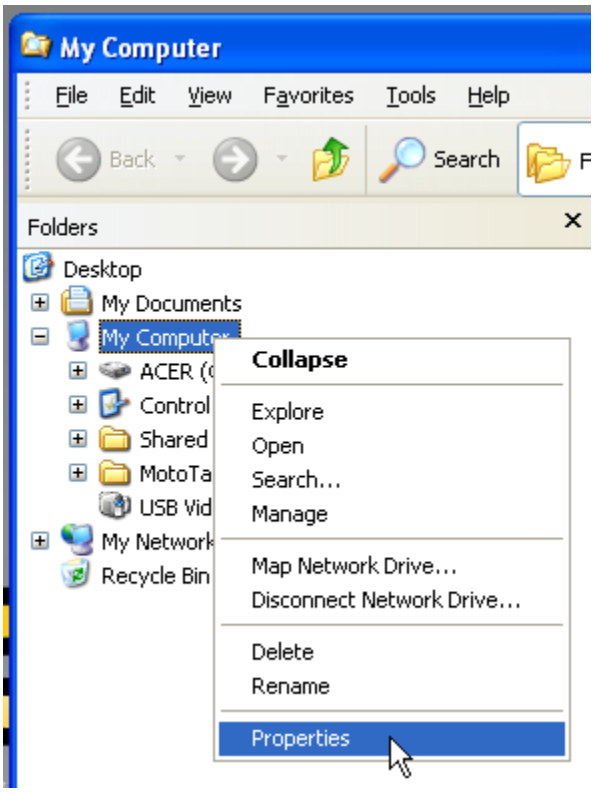
Step 1a: Open System Properties

If you have a *My Computer* icon on your desktop, **right click** it and select *Properties.* Otherwise, try Step 1b.



Step 1b: Open System Properties

If you DO NOT have a *My Computer* icon on your desktop, open Windows Explorer. The easiest way to do this is by hitting Win+E (hold down the Windows key (usually located between Ctrl and Alt in the lower right hand corner of your keyboard), and press E). Then **right click** on *My Computer* and select *Properties*. If you don't have the *Folders* view enabled, you might not see *My Computer.* Either click the Folders button, or click View → Explorer Bar → Folders.

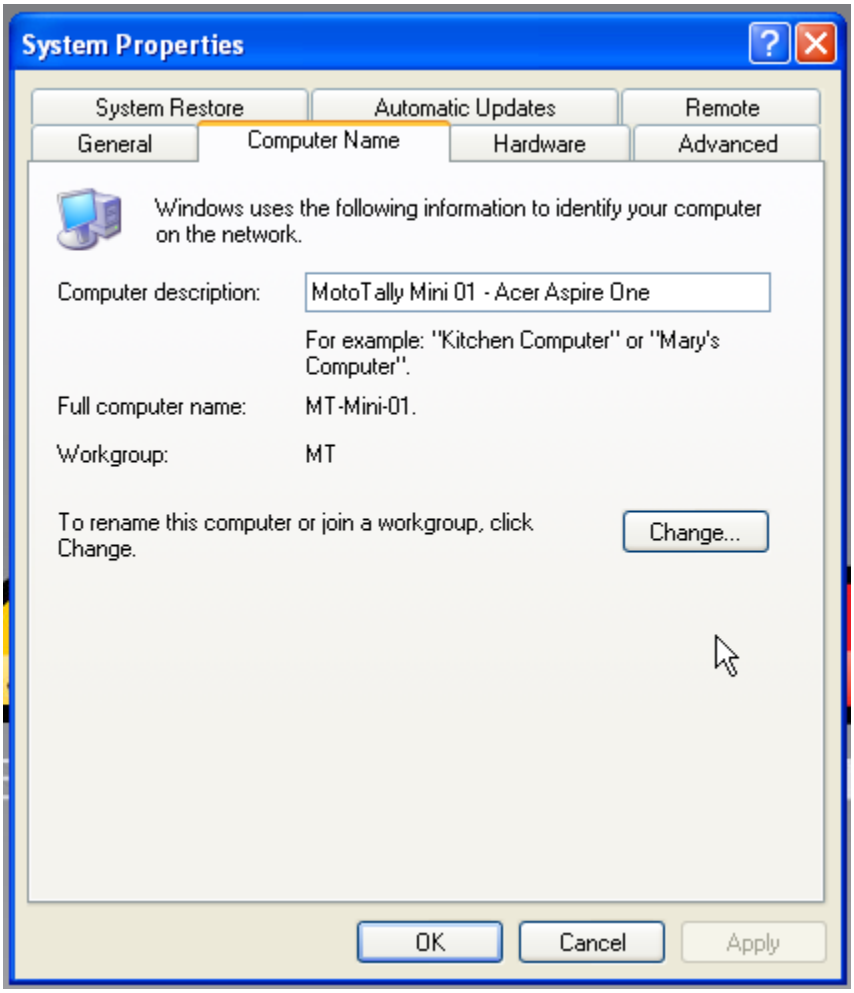


Step 2: System Properties

Select the *Computer Name* tab to show your computer name and workgroup settings.

Computer description is good for nothing except describing the computer in human friendly terms. You can set it or leave it blank, it makes no difference.

If we want to change the computer name or workgroup then we need to click the *Change…* button.

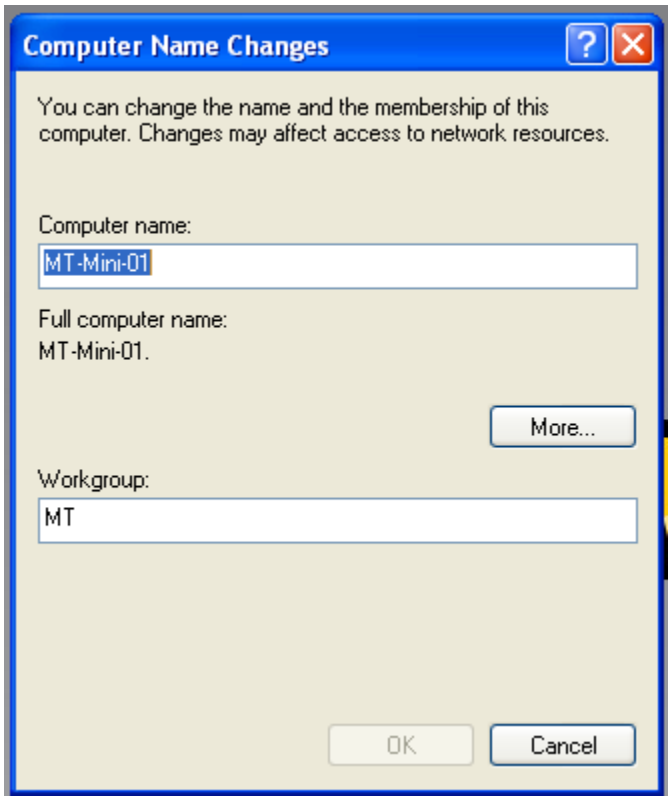


Step 3: Computer Name Change

Remember that you want all of your networked computers to have **different *Computer Names*** and the **same *Workgroup***.

I would recommend something simple and easy to remember on all of these settings. I abbreviated MotoTally and used that for my *Workgroup* name, and then used that same abbreviation with a number to specify my *Computer Names* (e.g. MT-Mini-01 and MT-Mini-02, etc.) You could also use the descriptive words Master and Slave in the computer names if that will make it easier to remember which is which (e.g. MT-Master, MT-Slave-01, MT-Slave-02, etc.)

After changing any of these settings, and accepting them all, a reboot will be required.



Configuring Network Connections

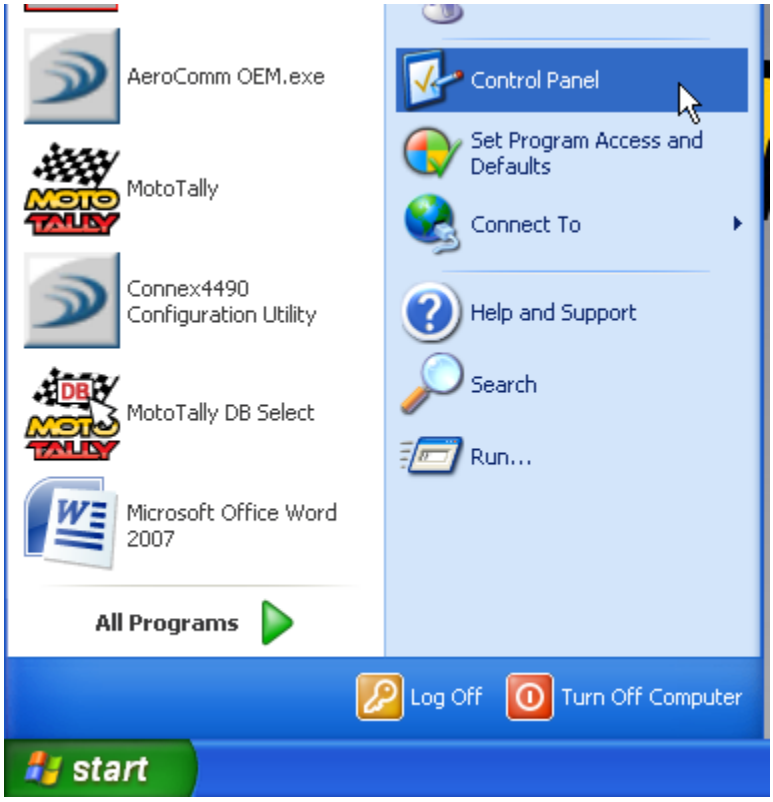
As stated previously, I highly recommend a wired Ethernet connection when using MotoTally to connect to a database on another computer. There are two reasons for this. First of all, a wired connection is much more reliable and less susceptible to interruption. ***Very bad things*** can happen if the following two things happen at the exact same moment in time: 1) the network connection is abruptly lost, and 2) a networked computer was ***updating*** the database. Usually what results is a corrupted database. Granted, it is pretty difficult to time these two events exactly, as database updates usually only take a matter of a few milliseconds, but the chance is there, and if you can eliminate or reduce the chances of an network connection being lost, then that is the one big thing you can do to make sure you never corrupt your database. A second reason for using a wired connection is that they are faster and have less latency. This means that slave computers connected to your MotoTally database via the network will run faster on a wired vs. wireless.

If you are going to use a router (Option B), then much of the following configuration will be unnecessary. All you will need to do is make sure your router is setup with DHCP enabled, which means the router will tell the computer what IP address it supposed to use. At the same time, you will need to make sure each computer is configured to receive its IP address automatically. It is beyond the scope of this document to tell you how to configure your router. They are all different! I will assume that if you choose the router option, then you are savvy enough to figure out how to configure the router on your own.

If you are using a crossover cable (Option A) or a hub/switch (Option C), then you will need to configure each computer in your network with its own IP address. An IP address is just a way for computers to know how to send information to one another. Each computer on a network must have a unique IP address, which is a sequence of four numbers separated by dots (periods). Each of the numbers must be less than 255. Here is an example of an IP address: 10.1.2.3. This number literally is an address, and helps one computer find another. You could think of it much like a postal address. In my example IP address, the 10 would be the “country”, the 1 would be the “state”, the 2 would be the “city” and the 3 would be the “street address”. For our purposes, all of the computers on the network must share the same country, state, and city in order to be able to talk to one another. So all of our computers’ IP addresses should start with the same three numbers, and then have a different fourth number. Using the number 10 as the “country” also has a special meaning, in that it is a non-routable address, or in layman’s terms, an address that is to be used locally only (does not use the internet). I prefer to use IP addresses of the following format just for simplicity: 10.1.1.x.

Step 1: Open the Control Panel

Click Start → Control Panel



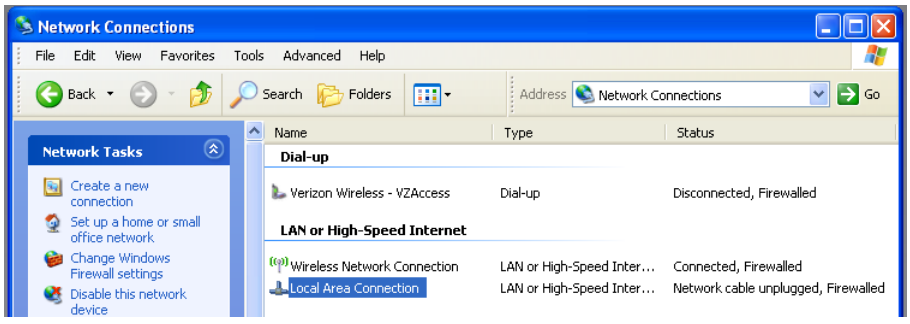
Step 2: Open Network Connections

Your screen may not match these screen shots exactly, depending on your Control Panel settings. If you have category view enabled, then they will look like these. Select *Network and Internet Connections* then *Network Connections*. If you have category view disabled, then just double click *Network Connections*.

Then…

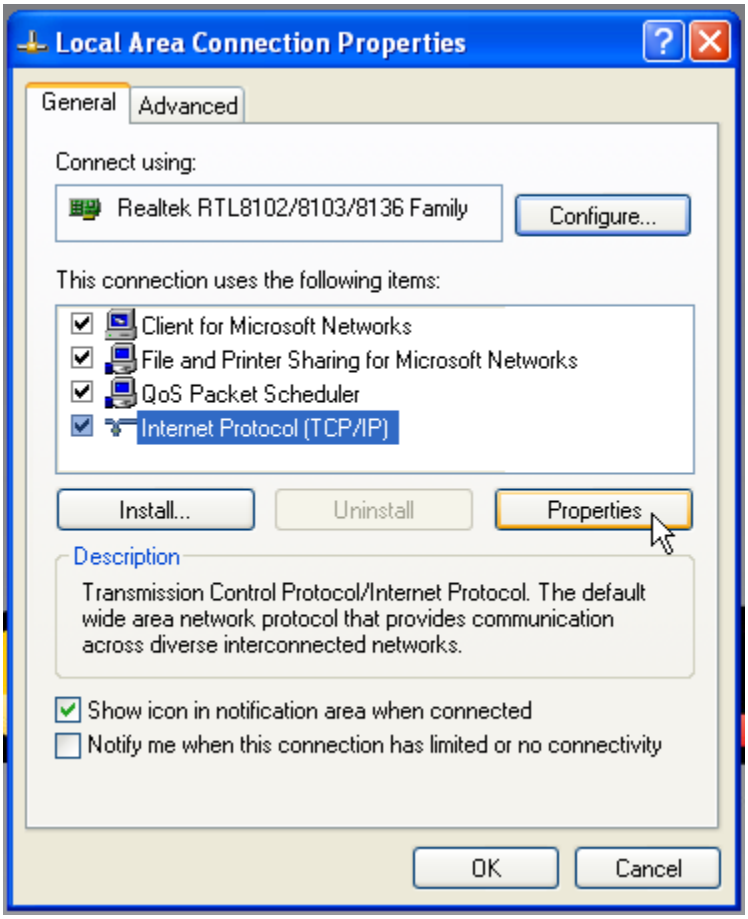
Step 3: Local Area Connection

We want to modify the configuration of the *Local Area Connection*. In rare cases, this might be named something else. Just know that we want to configure the wired Ethernet connection (not a wireless or dial up connection). **Double click** the connection you want to modify.



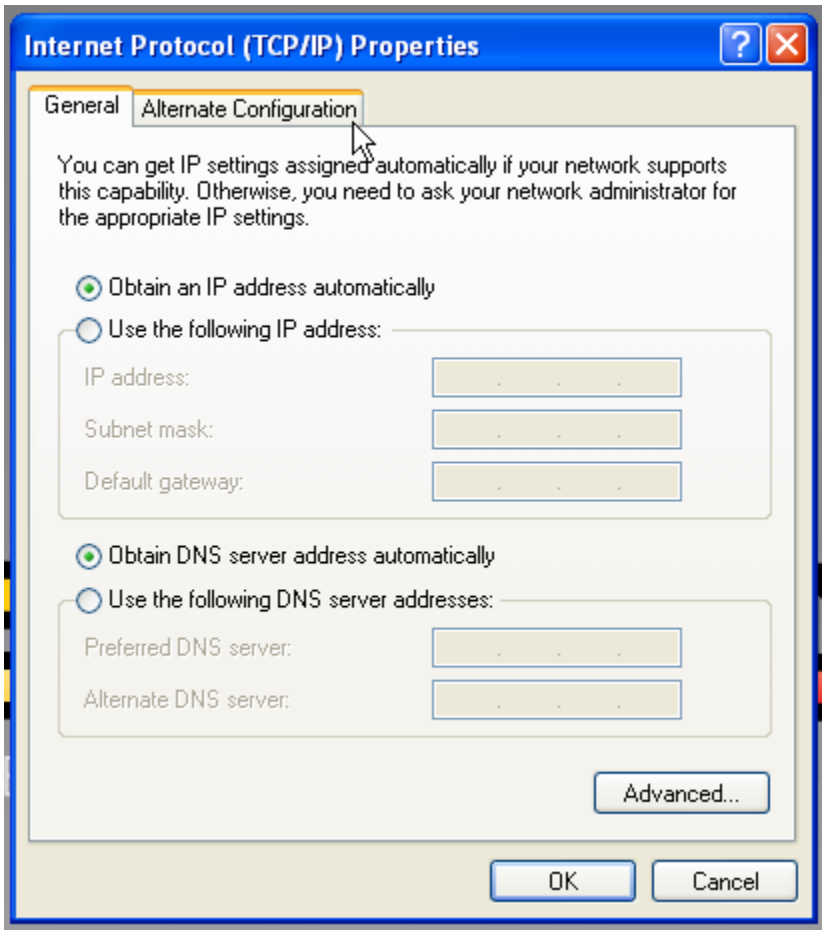
Step 4: Configure TCP/IP

In the *Local Area Connections Properties*, select *Internet Protocol (TCP/IP)* and click Properties.



Step 5: IP Address Options

At this point, you have TWO options. I **don't recommend** that you use any laptop that you use for scoring on the internet on a regular basis. That being said, some of you probably will anyway, and you might want to have your master laptop configured so that it can get on the internet so you can upload your database to the MotoTally website. Assuming you have a broadband internet connection (e.g. cable modem) AND you don't connect to your home network wirelessly (i.e. you plug in an Ethernet cable), you will want to still be able to connect to your local home network so you can get on the internet without having to reconfigure anything. Follow the either Step 6a ***OR*** 6b depending on which configuration you prefer.



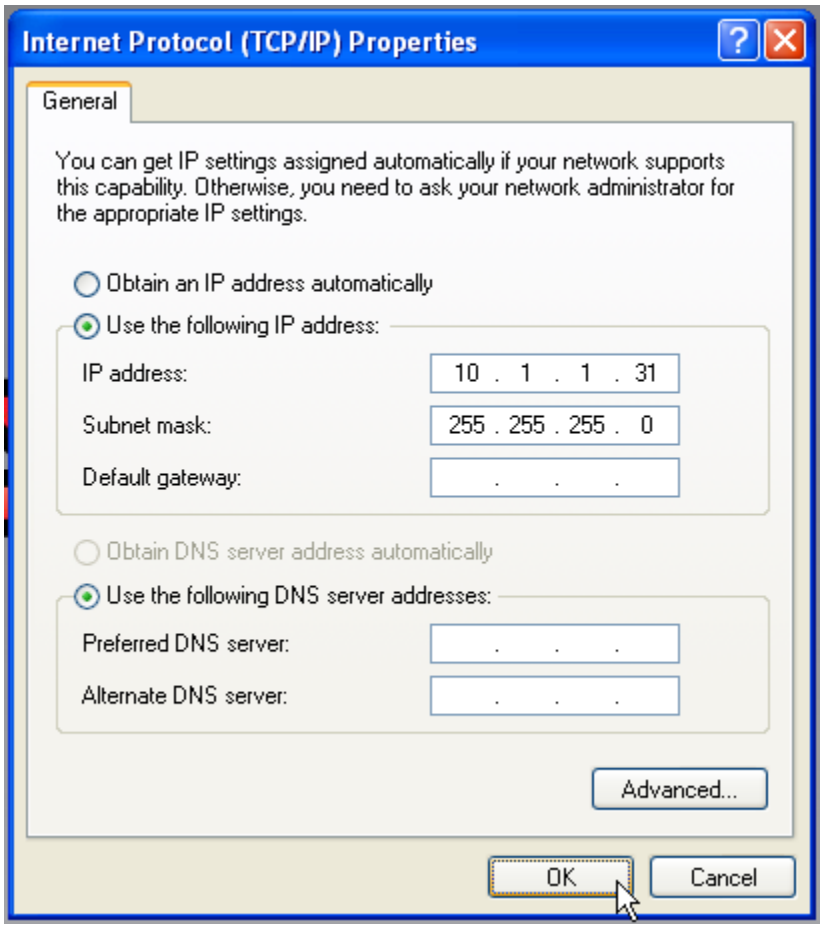
Step 6a: General TCP/IP Setup

This is the recommended configuration for any computer that does not need to connect to the internet through a wired LAN (local area network) when the computer is not being used for scoring.

ALL computers on a LAN must have unique IP addresses. Make all addresses start with 10.1.1 and change the last number for each computer. For example, you could do the following:

- MT-Master, IP = 10.1.1.10
- MT-Slave-01, IP = 10.1.1.1
- MT-Slave-02, IP = 10.1.1.2

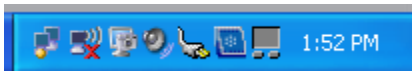
Keep track of what number you are assigning to each computer! You can use whatever numbering convention that you want, but keep it simple. In the screen shot to the right, I've set the IP address to 10.1.1.31. The only other required field is the Subnet mask which should be the SAME on all computers (255.255.255.0)

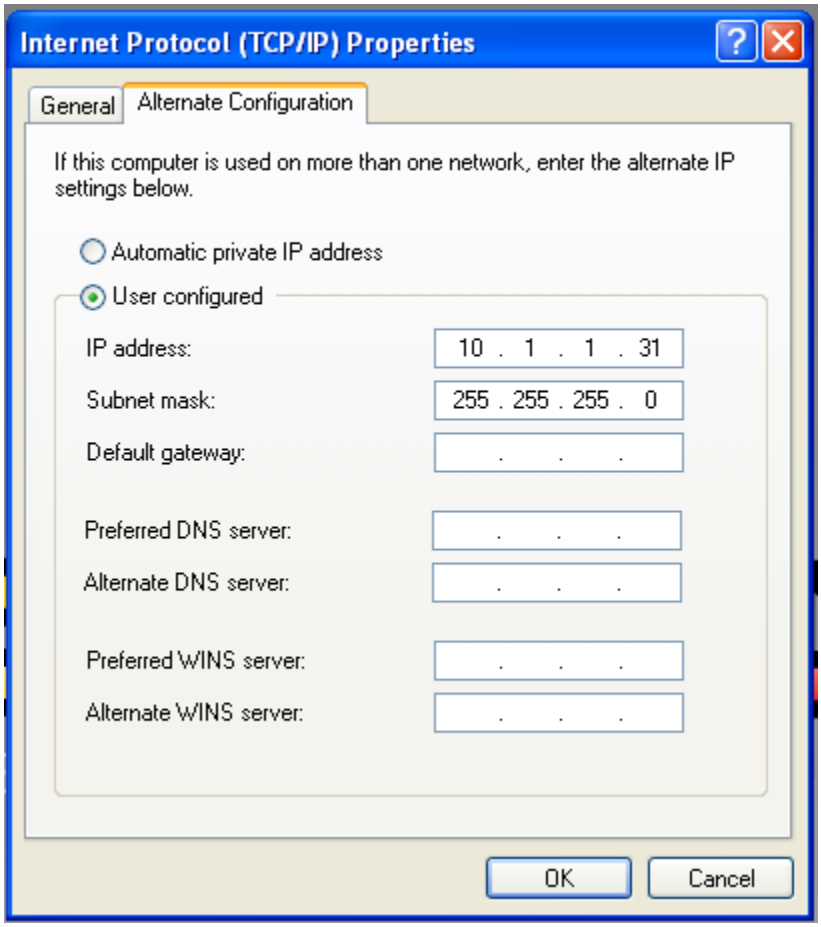


Step 6b: Alternate TCP/IP Setup

If you want the laptop to be able to connect to an existing wired home or work LAN when not being used for scoring, then use this option. Do everything the same as Step 6a, but **do this on the *Alternate Configuration* tab** rather than the *General* tab. You will want to leave the *General* tab at the default automatic settings.

NOTE: Using this alternate configuration method, your computer will first try to get an IP address automatically. This will take a minute or so. After that fails, it will revert to the *Alternate Configuration* settings. See the screen shot below: You know that your computer is still looking for an IP address when the little yellow dot is slowly sliding back and forth. Your computer will not be ready to communicate on the network until connected, so when using this configuration, you will have to wait a bit after booting before opening MotoTally (which will then attempt to connect to the networked database).

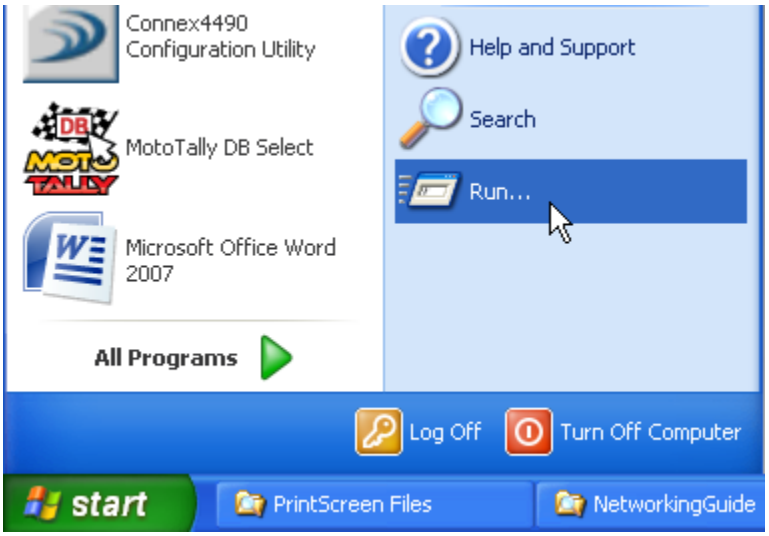




Troubleshooting Network Connections

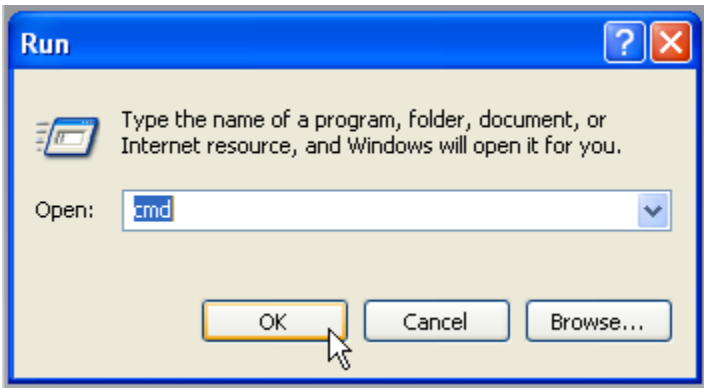
Step 1: Open the Run Dialog

Click Start → Run…



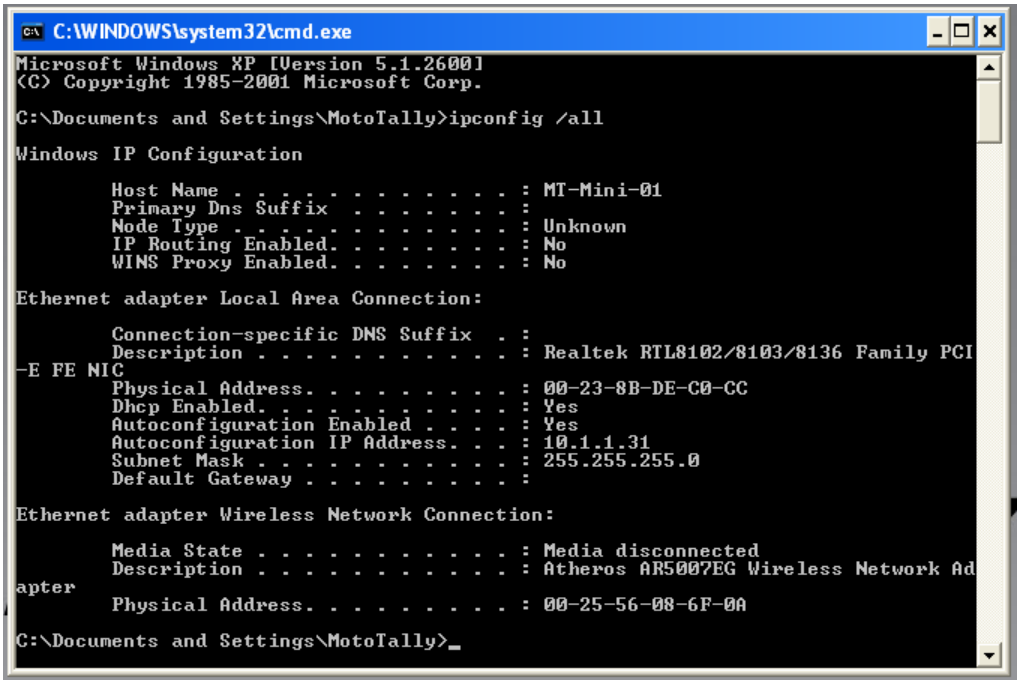
Step 2: Open the CMD Shell

In the Open: box, type `cmd` then click OK.



Check IP Confiuration

Type `ipconfig /all` and hit enter to check your IP configuration settings. You will notice that this shows configuration settings for all Ethernet adapters. Notice that under *Windows IP Configuration* that the Host Name should match the computer name that you assigned to the computer. Also notice that under *Ethernet adapter Local Area Connection* the IP Address and Subnet Mask matches what we assigned.



Check connectivity

Use the *ping* command to test connectivity between two computers. Just type ping followed by an IP address to send a few packets to that address and see if we get anything back.

The first screen shot was done from mt-mini-01 (IP: 10.1.1.31). I was checking connectivity with mt-mini-02 (IP: 10.1.1.32). As you can see, I got 4 replies with no packet loss, and the round trip only took 1 or 2 milliseconds!

In the second screen shot, you can see that instead of pinging an IP address (10.1.1.32), I tried pinging the computer name, and it worked as well (which means name resolution is working properly.

In the third screen shot, I disconnected one of the network cables, and tried again. This time you can see that I got a *Destination host unreachable* message, which means that a computer at IP: 10.1.1.32 couldn't not be found (i.e. there is a connection problem).