

## ***USB Hardware Setup***

USB setup is very easy: simply use a standard USB cable to connect the jack on the G-REX main board (not the core module!) to a USB hub or spare USB port on the PC. Plug in the G100 power supply cable.

## ***USB IP Address***

The USB connection is point-to-point. Unlike Ethernet, there is no possibility of an IP address conflict since there can only be two hosts on a point-to-point link. It is possible that a given IP address may not be usable owing to conflicts with other, pre-existing, addresses that either end may already know about. For example, the G-REX could not use the same IP address that it is using for its Ethernet port, for the USB connection. Thus, there needs to be a mechanism for both ends to negotiate a mutually agreeable address.

The G-REX takes the approach of requesting an IP address of 192.168.0.2, plus it suggests the host PC uses 192.168.0.1 for its end. This will normally be satisfactory, since the 192.168 range of IP addresses is reserved for private networks. In some cases, this might conflict with the host PC's other network ports. In such cases, it is possible for the host PC to be configured to use other, non-conflicting, addresses on the USB port. The G-REX will always accept addresses specified by the host PC.

The IP address of the G-REX, using the USB interface, is thus 192.168.0.2, unless changed by the host PC configuration.

## ***USB Networking Setup***

Since the G-REX uses the FTDI FT245BM chip for the USB interface, you will need to install the latest drivers available from FTDI. The drivers are available from [www.ftdichip.com/FTDrivers.htm](http://www.ftdichip.com/FTDrivers.htm)

When installing the USB driver from FTDI, make sure that you select the "Virtual COM Port" option (VCP).

After verifying that the installation was successful, power up the G-REX and connect it to the PC (or USB hub). Note down the name of the COM port that is created. This may be something like "COM3" or "COM5" depending on how many legacy serial ports are already in your machine. The COM port number also depends on whether you have any other USB/serial converters or adapters attached to the USB hub. In any case, if the G-REX was the most recent device added, then the COM port will probably be the highest numbered. Don't worry too much about this, since the available COM ports will be presented in a menu when you set up networking, as described below.

Start up the "Network Connections" panel (Start -> Control Panel -> Network Connections).

Double-click on "New Connection Wizard". Hit "Next" (1) then select "Set up an advanced connection" (2). Hit "Next" again, then select "Connect directly to another computer" (3). Hit "Next" (4), and select "guest". Hit "Next" and then enter the name that you wish to use to identify the connection. May as well make this "G-REX" (5). Hit "Next".

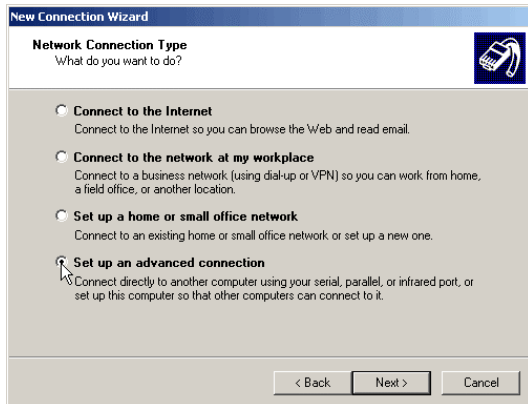


Fig. 2

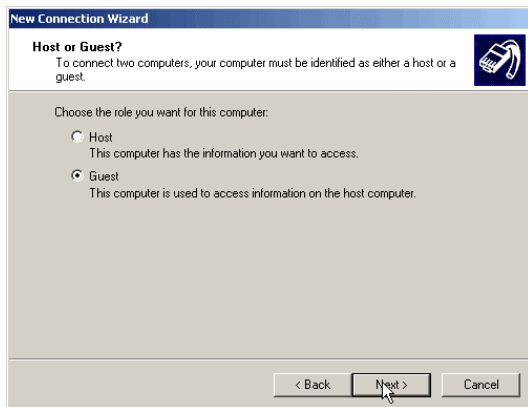


Fig. 4

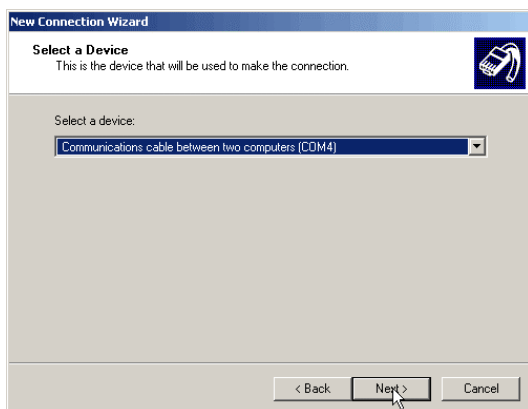


Fig. 6



Fig. 1

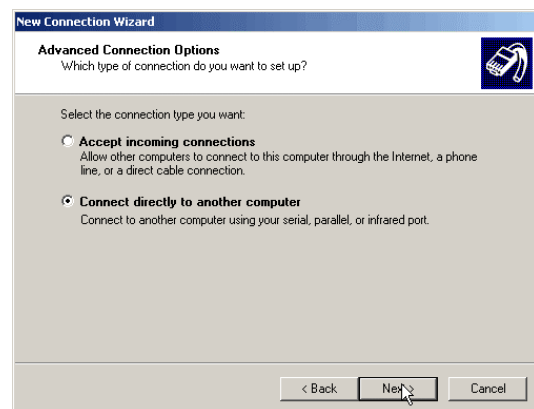


Fig. 3

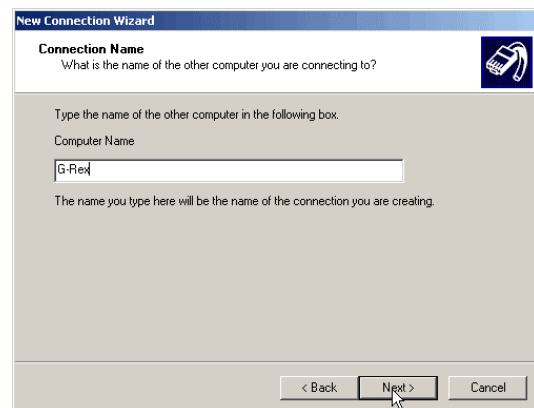


Fig. 5

The next panel (6) is where you specify the appropriate serial port connection. Of course, it's not really a serial port, but as far as networking support goes, it looks and acts like one. Select the appropriate COM port. If you recently plugged the G-REX into the USB hub, then it is probably the highest numbered COM port.

Select this in the combo box. Click "Next" and then "Finish" to dismiss the wizard (7). The next panel to appear will be the "Connect" panel. You can ignore the user id and password fields, since the G-REX requires neither. But before you hit that "Connect" button, we are not quite ready for that, so hit the "Properties" button instead (8).



Fig. 8

A panel (9) will appear called "G-REX Properties" (or whatever name you selected for the connection).



Fig. 7

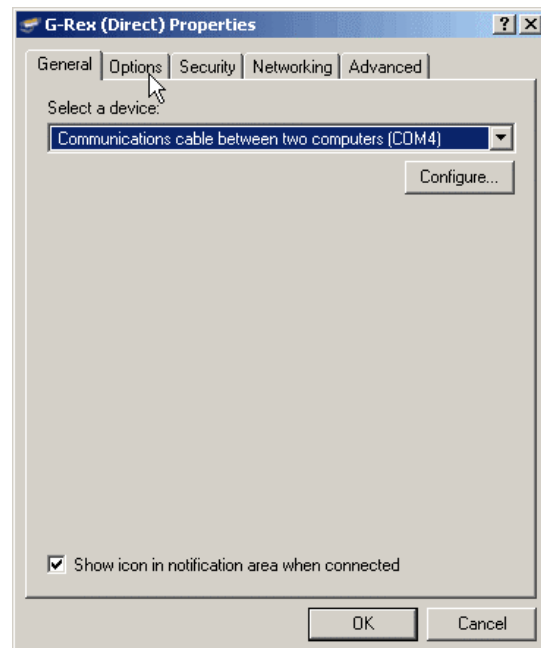


Fig. 9

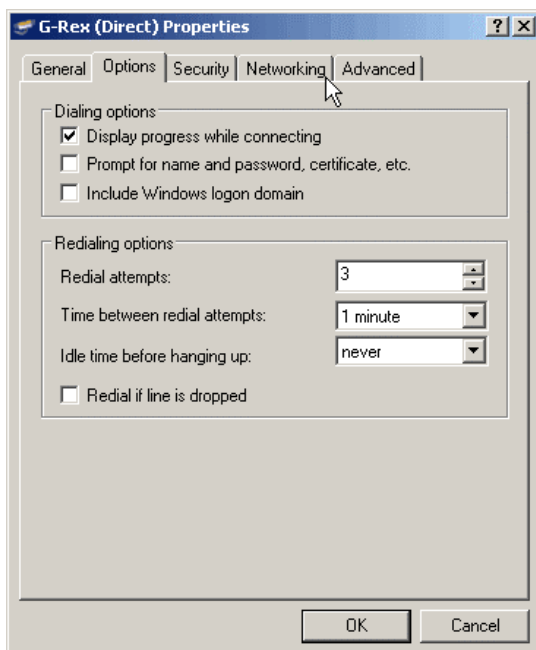


Fig. 10

Click on the "Options" tab, and de-select the "prompt for name and password" checkbox, since that will save an unnecessary step when connecting (10).

Click on the "Networking" tab (11). Make sure that the type of dial-up server is set to "PPP". In the "items" table, de-select everything that it lets you change, except "Internet Protocol (TCP/IP)". Then highlight "Internet Protocol (TCP/IP)" and click on the "Properties" button.

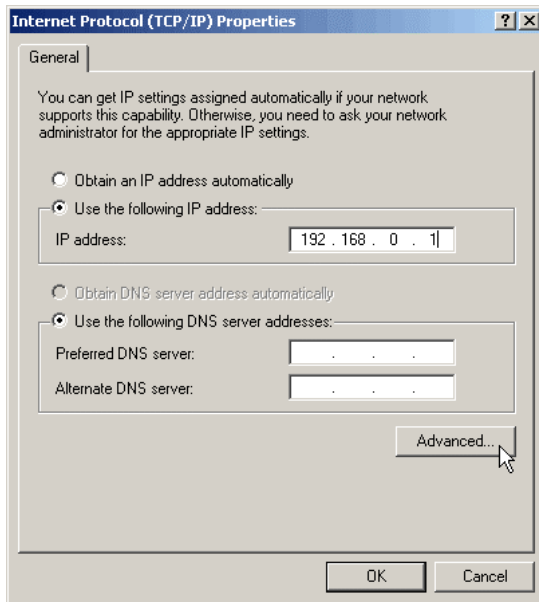


Fig. 12

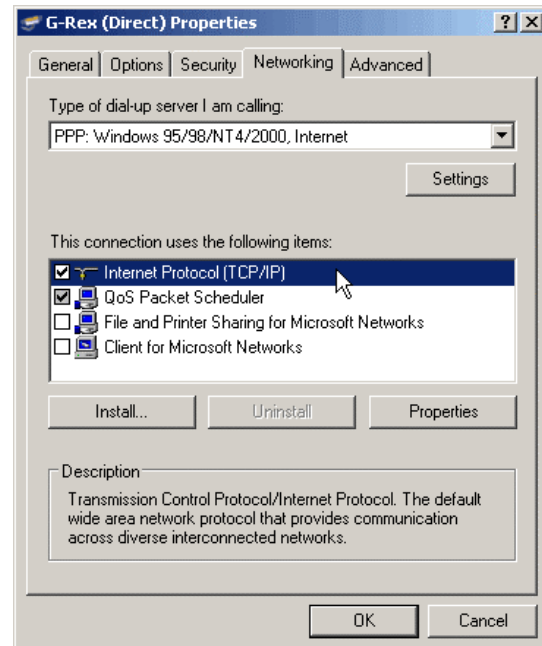


Fig. 11

In the panel that appears (12), check the "Use the following IP address" radio button, and enter "192.168.0.1" as the IP address. Also, click on the "Advanced" button (13). De-select both checkboxes ("use default gateway" and "use IP header compression"). Finally, click OK on all outstanding panels to save the settings.

If all goes well, you should now be able to connect to the G-REX over USB.

**Note:** there is a problem with Windows and/or the FTDI drivers: if the G-REX is powered off, or the USB cable disconnected, while a network connection is established (over USB) then you might not be able to reconnect later. An indication that this has happened is if the correct COM port refuses to show up in the G-REX Properties panel. The only known work-around is to reboot Windows. You can avoid this problem by making sure that you tell Windows to disconnect before powering off or unplugging the G-REX.

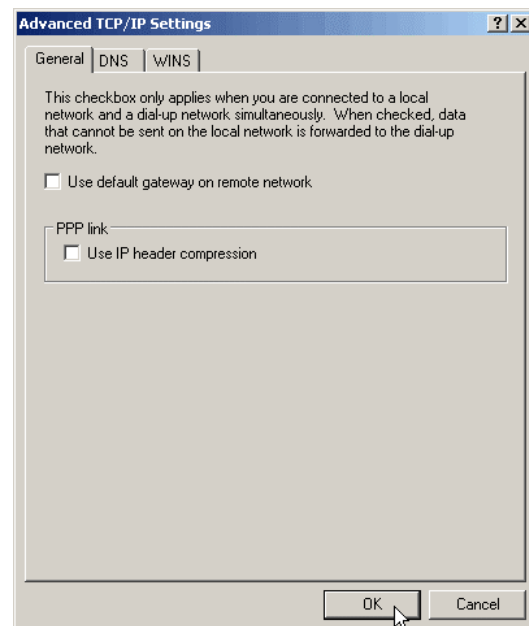


Fig. 13

Having configured networking, it is easy to start and stop the connection. Double-click the "G-REX (Direct)" icon on your Windows desktop. Once connected, you can also quickly edit the connection properties if you right click on the icon and select "status". From there, select "properties", then "configure" and then change the "Maximum speed (bps):" to 115,200.



Fig. 14

## Opening a Web Browser Connection

The next step after setting up the hardware and software network configuration is to establish a web browser connection to the G-REX. Any browser may be used, including Firefox, Mozilla, Opera, Internet Explorer, etc., provided that the browser supports HTTP uploads. This means that the browser version must not be incredibly ancient.

You have already determined the IP address of the G-REX, following the previous steps. For ease of explanation, we assume this address is 192.168.0.2. Obviously, substitute the actual IP address that you determined.

Now, start up the web browser, and enter the following URL: <http://192.168.0.2> (15).

This is a normal URL, except that we use a numeric address rather than typing in a domain name like "www.fooobar.com".

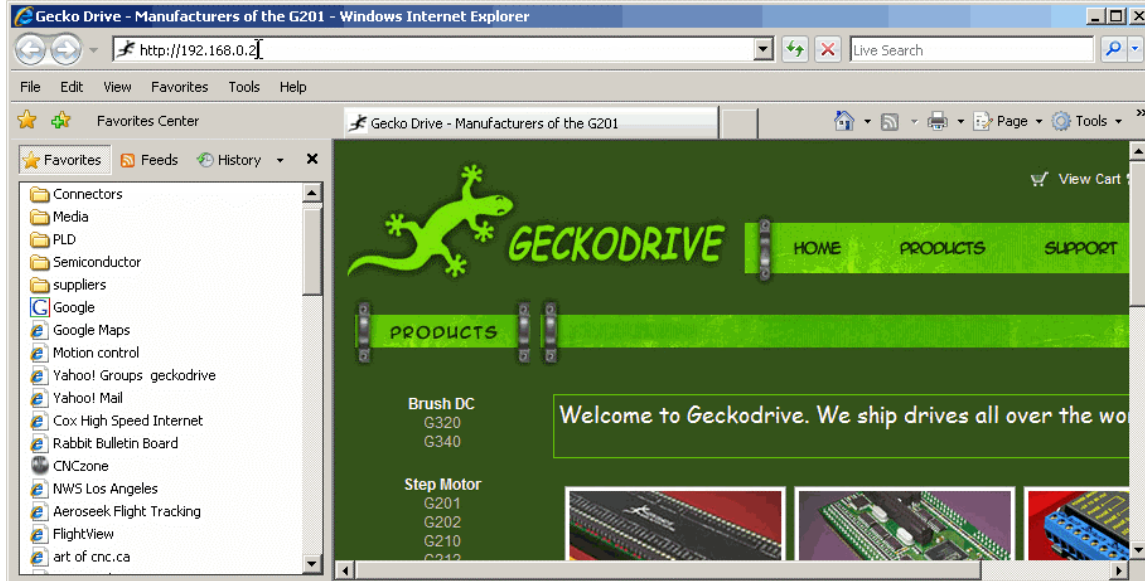


Fig. 15

## Configuring the Download Manager

The G100 Download Manager Home Page should open in your browser (16). The G-REX main page is divided into sections. The first section is titled "Current Download Manager Settings". In this section you can fill in and submit a form that allows several things to be configured:

### Default FPGA Config:

You can upload up to 6 FPGA configuration files, numbered 1-6. This field indicates the default config to load when starting the DLP firmware. If left at zero, the lowest numbered config is used.

### Auto Boot Time:

If you enter a value above 3 seconds in this field, then the G-REX will automatically start running after this amount of time on power-up. You must connect to the G-REX with a web browser within this amount of time to access the Download Manager. A minimum timeout is required to give you time to connect in order to change the G100 firmware or FPGA configuration.

The G-REX will wait indefinitely in the download manager when the setting is zero. In this case, you will need to start a web browser session to the G-REX, and then press the "Run Firmware" button in order to start the G100 firmware.

It is recommended that you set this to 0 when trying out new firmware. When happy with it, set the value to 3 or more so that the new firmware starts automatically.

**Current Download Manager Settings**

Vendor: (C) 2005 Xarach Controls  
Datecode: 060210  
Default FPGA config:   
Auto-boot time (s):   
Firmware size (bytes): 43780  
Free space on flash (bytes): 991232  
Current Eth. IP address: 169.254.190.183  
Current netmask: 255.255.0.0  
New Eth. IP address:   
New netmask:   
DHCP timeout:   
Core: RCM3720/RCM3750  
Action:

If the default FPGA config is set to zero, then the lowest numbered configuration will be used. This configuration is loaded before running the firmware. If the default is set to -1, then the firmware will be run without any FPGA config loaded.

Auto-boot time specifies the amount of time that this download manager will wait before automatically starting up the firmware (if any) after power-up. If set less than 3, then it will wait indefinitely. If a browser connection is established within this timeout period, then the firmware will not be run until the browser commands it.

The New Ethernet IP Address, netmask and DHCP fields will not take effect until the download manager is powered off/on. Note that the IP address parameters used by the firmware may be completely independent of these settings.

The DHCP timeout specifies the number of seconds to wait for a DHCP server to respond. Set this to 0 if not using DHCP.

You can view the latest [download manager log](#).

Fig. 16

## ***Running the DLP Firmware***

The second section of the G-REX home page is titled "Actions". In this section, you can start the current G100 firmware, and upload new FPGA configurations and firmware.

In the "Run Firmware" sub-heading, pressing the RUN button immediately starts the current G100 firmware. Optionally, you can fill in a parameter field to pass commands to the firmware.

Normally, you don't need to put anything in the parameter field unless the instructions which came with the DLP firmware indicate that you should do so. The factory default firmware does not use any of these parameters. They are provided mainly for 3rd party firmware suppliers.

If there is no firmware loaded (maybe because a previous upload attempt was interrupted) then pressing the "Run" button will have no effect other than show an error message in the log.