



QUADERA®

Understanding IP Addressing

As used by the PC, QUADERA, the QMG 220 and the GSD 320

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Introduction

QUADERA, the QMG 220 and the GSD 320 use an Ethernet TCP/IP network for communications.

In order for devices to communicate over a TCP/IP network, they must all use a common base IP Address, which defines the network, and a unique host address. The IP Address is divided into 4 octets, each separated by a period, as shown in this example:

192.168.1.103

This can be interpreted as a network of 192.168.1 with a host (i.e. a device) of address 103. Note that your network may be divided differently than this example shows. The 4 octet number can be divided at the bit-level to broaden the host addresses allowed on the network. Consult your Network Administrator for this information if necessary.

The IP Address can be assigned manually (using a program to type in the address) or dynamically (by a protocol called DHCP - Dynamic Host Configuration Protocol).

A standalone QMG 220 is shipped from the factory with DHCP enabled, meaning it will automatically acquire an IP Address when plugged into a network. This IP Address should allow it to immediately be found by QUADERA and used.

A GSD 320 (and its internal QMG 220) is shipped from the factory with DHCP disabled and a set of fixed IP Addresses assigned, which allowed the system to be tested. These addresses are:

QMG 220	192.168.1.101
GSD 320	192.168.1.102

Note: 192.168.x.x is a generally used Private Network Address. It is highly unlikely that these addresses will work when plugged into a network because networks generally do not use this address range. Therefore, the IP Addresses of the QMG 220 and GSD 320 must be changed before they are connected to a network.

The instructions for changing these IP Addresses **specifically** for the GSD 320 system are found in Chapter 7 of the Operating Instructions for the “OmniStar™ ThermoStar™ Gas Analysis System GSD 320”. For more general instructions on changing IP Addresses, continue on with the document you are now reading.

The following sections describe how to configure the PC, QMG 220 and GSD 320 IP Addresses properly so that all devices can communicate over the same network. The PC IP Address can be set from Windows, the QMG 220 IP Address can be set from QUADERA, and the GSD 320 IP Address must be set from the instrument front panel. Once the GSD 320 IP Address is set, the IP Address must be read and verified by QUADERA.



About the GSD 320 System

This section provides a general understanding of the GSD 320 system.

The GSD 320 system contains a QMG 220, a GSD 320 control board and an Ethernet switch. The QMG 220 and GSD 320 control board are each connected to the Ethernet switch via dedicated Ethernet cables. The Ethernet switch is connected to the RJ-45 connector on the back panel of the GSD 320, providing one Ethernet connection for the entire system.

Use of the Ethernet switch eliminates the need for two Ethernet cables between the PC and the GSD 320. One cable can be used from the GSD 320 to the PC (or network connection).

There is a dedicated connection (non-Ethernet) between the GSD 320 control board and the QMG 220 that allows the GSD 320 control board to verify which QMG 220 (based on its IP Address) is within its enclosure. This verification step is required in order to run the GSD 320 from QUADERA. Using a Fixed IP Address on the QMG 220 insures this verification step only need be executed once.

Setting the PC IP Address

Using DHCP

This section provides a general understanding of DHCP.

Most Personal Computers (PCs) are configured to acquire their IP Address automatically from a server using DHCP (Dynamic Host Configuration Protocol). DHCP will assign an available address at the time the PC connects to the network. This configuration protocol allows for IP addresses to be recycled and reused by a network.

A PC configured to use DHCP will show the following information for its Network Connection properties (Fig 1).

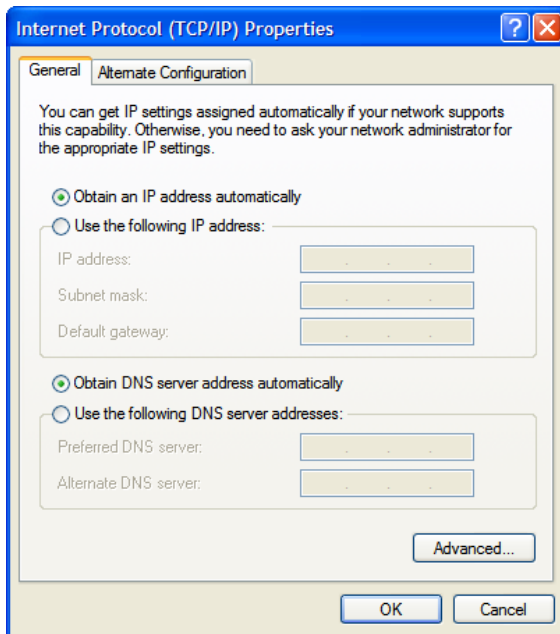


Fig 1: Network Connection properties

While DHCP is convenient for setting an IP Address on a PC, it does not show the actual IP Address for the PC in the properties because it changes, sometimes on a daily basis.

To see the actual IP Address assigned by DHCP, run the IPCONFIG command from the command line:

A) Select Start>>Run from the Start menu to show the Run dialog (Fig 2).

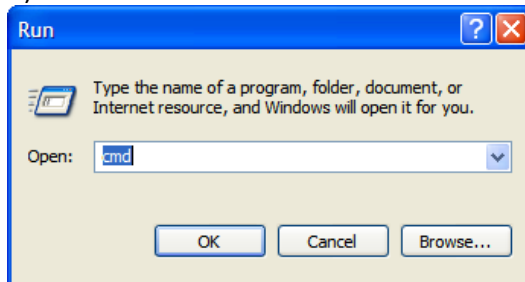


Fig 2: Run dialog showing cmd entered

B) Enter 'cmd' in the Open line and press OK (Fig 2). This will open the Command line dialog (Fig 3).

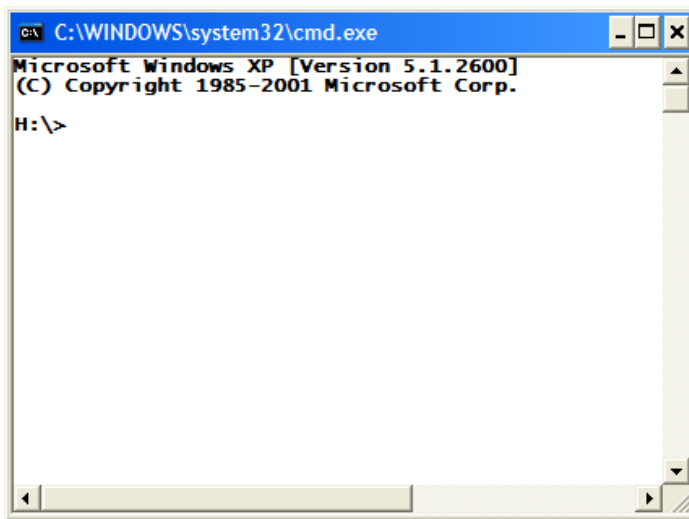


Fig 3: Command line dialog

C) Enter 'IPCONFIG' and press return. This will show the IP Addresses configured for the PC (Fig 4). This is important to know when setting IP Addresses for the other devices.

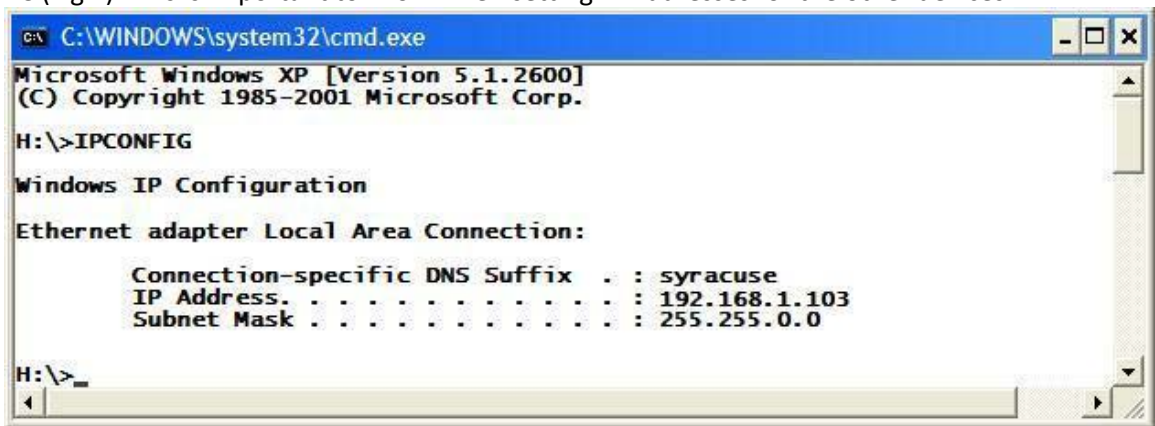


Fig 4: IPCONFIG output

Using a Fixed IP Address

This section provides general instructions on how to configure a Fixed IP Address. Administrative rights may be required to set this Fixed IP Address.

The alternative to using DHCP for setting the IP Address is to use a Fixed IP Address on the PC. A Fixed IP Address is an address reserved for the PC, to be used until such time that it is manually changed or no longer required. A Fixed IP Address must be assigned by the Network Administrator and reserved on the server, so that it cannot be automatically assigned by DHCP to another PC, if the PC being assigned a Fixed IP Address will be on a network.

A fixed IP Address on the PC works best when connecting the PC (via a network cable) directly to the GSD 320 (and QMG 220).

To set a Fixed IP Address on the PC, do the following:

A) Acquire an IP Address from the Network Administrator and ensure that it has been reserved on the server, so that DHCP cannot assign it to another PC.

B) Open Network Connections from the Start>>Settings menu (Fig 5).

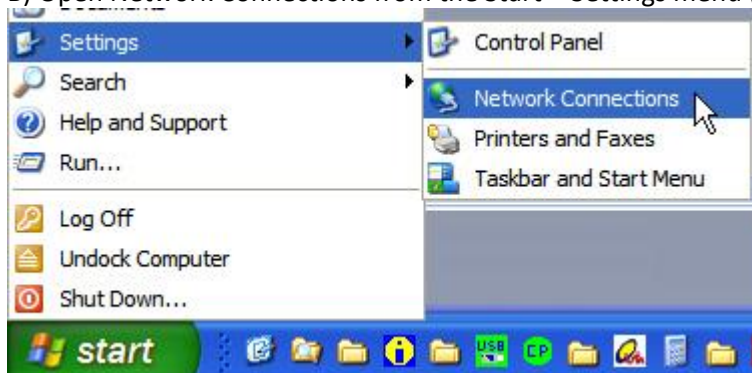


Fig 5: Network Connections

C) Highlight the network connection (Local Area Connection) and select Properties from the context menu (Fig 6).

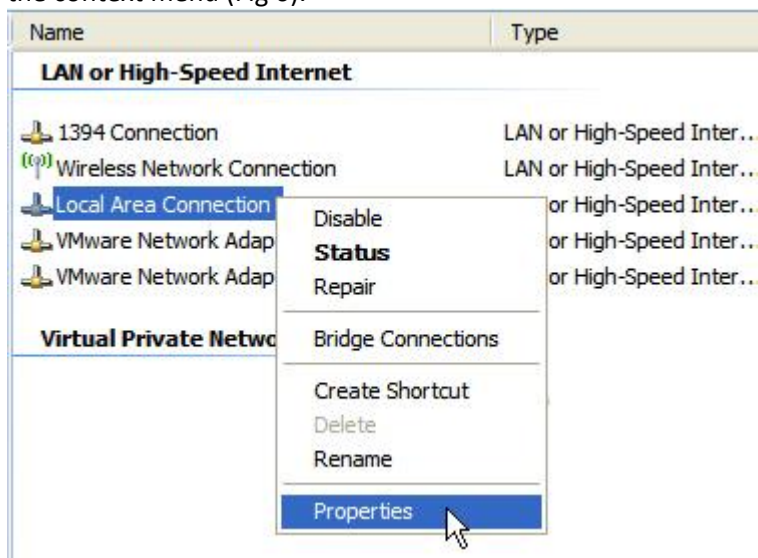


Fig 6: Local Area Connection Properties

D) From the Local Area Connection Properties dialog, highlight Internet Protocol (TCP/IP) and select Properties (Fig 7).

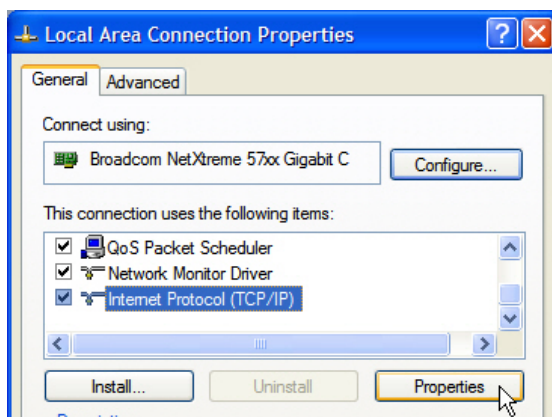


Fig 7: IP Properties

E) Select 'Use the following IP address', enter the IP Address (and Subnet mask) assigned to you from the Network Administrator and press OK (Fig 8).

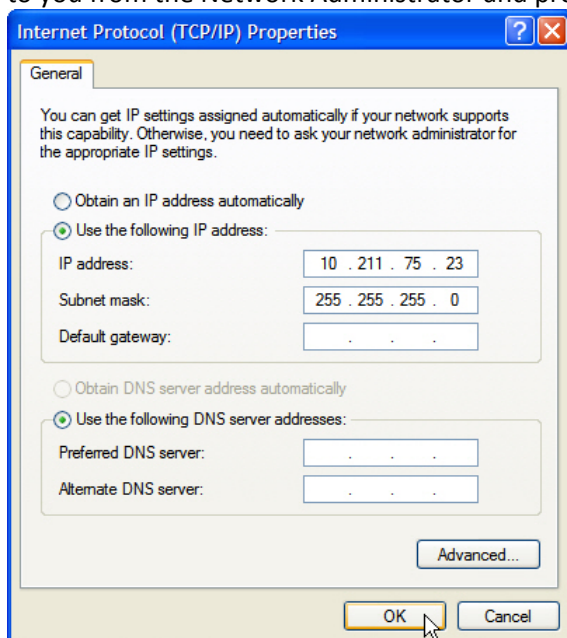


Fig 8: Entering a Fixed IP Address

F) The PC has now been assigned a Fixed IP Address.

Setting the QMG 220 IP Address from QUADERA

This section provides instructions on how to set the QMG 220 IP Address from QUADERA.

The QMG 220 IP Address can be set automatically (using DHCP) or manually (with DHCP disabled).

It is recommended that DHCP be disabled when using the QMG 220 on a network or when using a GSD 320. Disabling DHCP allows for each QMG 220 to have a unique IP Address that will not change over time. If DHCP remains enabled, then setup is required in QUADERA any time a new IP Address is assigned to the QMG 220.

Setting the IP Address

To set the QMG 220 IP Address, do the following:

A) Run QUADERA and select Device>>Device Setup from the menu (Fig 9).



Fig 9: Device Setup

B) From the Device Setup dialog, highlight the device and press Configure (Fig 10). (If no device is shown, refer to Appendix I on how to add a device to the system).

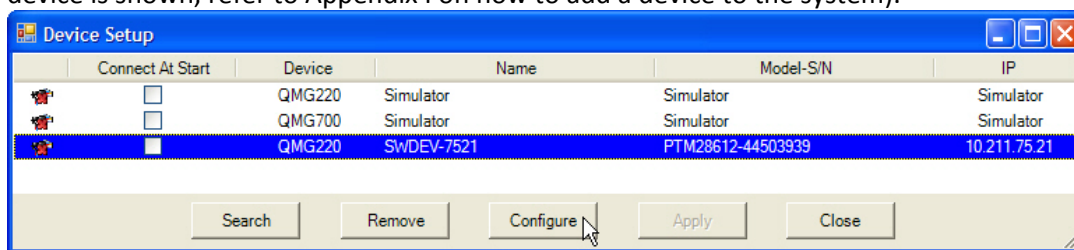
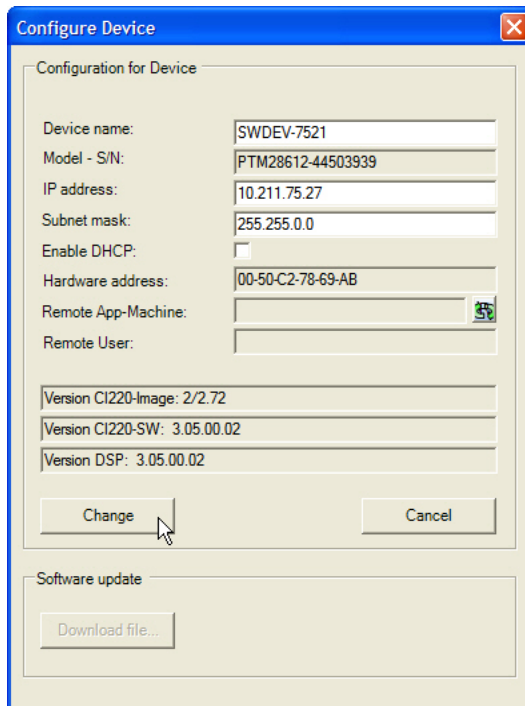


Fig 10: Configure button

C) From the Configure dialog, enter a new IP Address and press Change (Fig 11). DHCP must be disabled (unchecked) in order to enter a new IP Address. If DHCP is left disabled, then the new IP Address will be used from this point forward for the QMG 220.



Configure Device

Configuration for Device

Device name: SWDEV-7521


Model - S/N: PTM28612-44503939

IP address: 10.211.75.27

Subnet mask: 255.255.0.0

Enable DHCP: ☐

Hardware address: 00-50-C2-78-69-AB

Remote App-Machine: 

Remote User:

Version CI220-Image: 2/2.72

Version CI220-SW: 3.05.00.02

Version DSP: 3.05.00.02

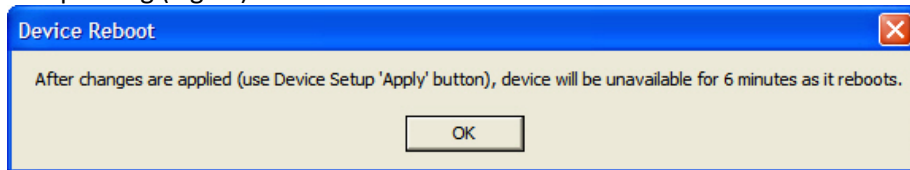
Change Cancel

Software update

Download file...

Fig 11: IP Address change in process

D) Press OK to the informational dialog (Fig 12) and then press Apply on the Device Setup dialog (Fig 13).

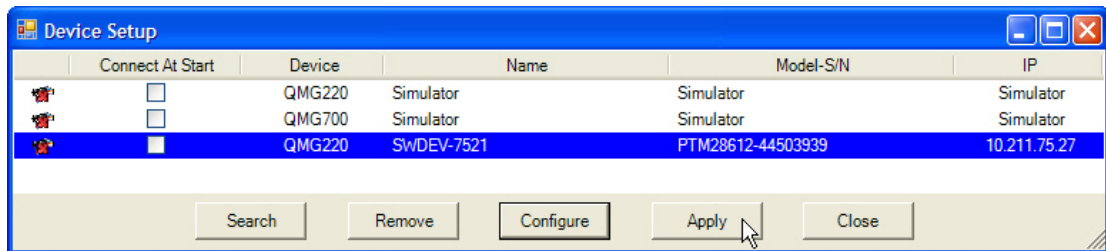


Device Reboot




After changes are applied (use Device Setup 'Apply' button), device will be unavailable for 6 minutes as it reboots.

OK

Fig 12: Information regarding the change



Device Setup

	Connect At Start	Device	Name	Model-S/N	IP
	<input type="checkbox"/>	QMG220	Simulator	Simulator	Simulator
	<input type="checkbox"/>	QMG700	Simulator	Simulator	Simulator
	<input checked="" type="checkbox"/>	QMG220	SWDEV-7521	PTM28612-44503939	10.211.75.27

Search Remove Configure Apply Close

Fig 13: Applying the change

Note that the Device Setup shows the new IP Address before the change has been applied. This is intended to show the new IP Address that will be set when this action takes place. The informational dialog (Fig 12) is still accurate – the device will be unavailable for up to 6 minutes.

E) The QMG 220 IP Address has now been changed.



Disabling DHCP

To disable DHCP, follow the steps shown in Figures 5 – 7 and uncheck the checkbox labeled 'Enable DHCP'. Disabling DHCP will allow the QMG 220 to use the IP Address entered instead of getting a new IP address each time it is power cycled or restarted.

Verifying the GSD 320 IP Address from QUADERA

This section provides instructions on how to verify the GSD 320 system IP Address configuration.

To use the GSD 320 with QUADERA, the QMG 220 and GSD 320 Controller must be configured. Both devices are Ethernet based, so they each require a unique IP Address on the same network. The factory default IP Addresses are:

QMG 220 192.168.1.101
GSD 320 192.168.1.102

The instructions for changing these IP Addresses **specifically** for the GSD 320 system are found in Chapter 7 of the Operating Instructions for the "OmniStar™ ThermoStar™ Gas Analysis System GSD 320".

Once the IP Addresses have been set for the GSD 320 and QMG 220, a step to verify the setup is required. This verification uses a dedicated connection between the GSD 320 and QMG 220 and is executed from within the QUADERA GSD 320 Add-in. The verification is required by QUADERA before the GSD 320 can be used to collect scan data.

To verify the GSD 320 IP Address from QUADERA, do the following:

- A) Run QUADERA and connect to the QMG 220 configured above.
- B) Launch the GSD 320 Add-in from the QUADERA menu item Tools>>Programming>>Add-in Manager. Check the 'GSD320' checkbox and press Ok (Fig 14).

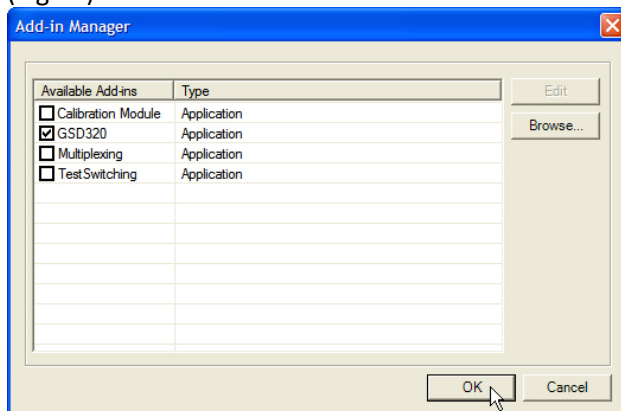


Fig 14: Add-in Manager

C) Select the GSD 320 Device from the Device dropdown and press the Config button to open the Configure dialog.

D) If the IP Addresses shown for the GSD 320 and QMG 220 are incorrect, then they must be edited in the Configure dialog. Press the Edit button to enable editing these addresses (Fig 15). Please note that you are not changing the IP Addresses of the Devices in this dialog; you are simply telling QUADERA what IP Addresses are being used in this GSD 320 system.

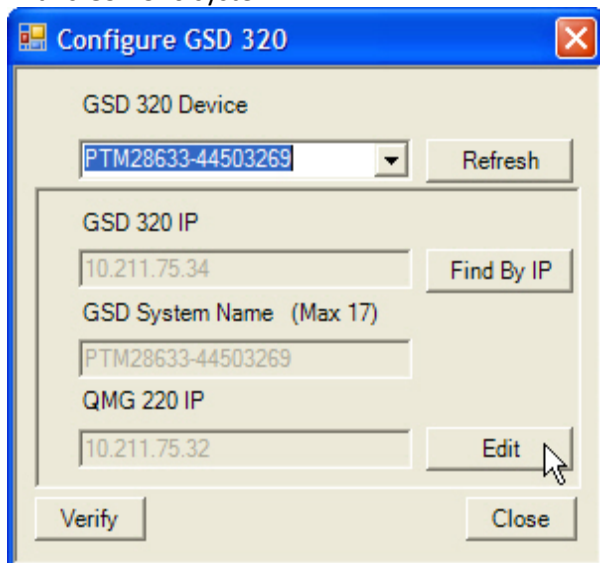


Fig 15: Configure dialog, edit

E) Enter the correct IP Addresses for the GSD 320 and QMG 220 and press the Update button (Fig 16). This will also enable the Verify button.

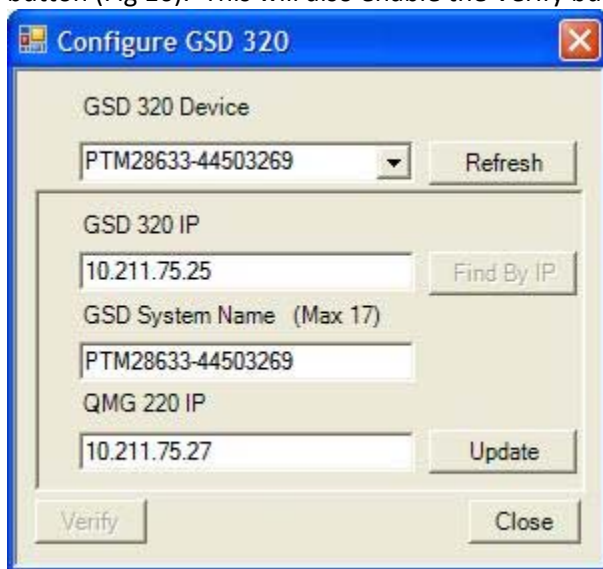


Fig 16: Configure dialog, update



F) Press the Verify button to execute the verification process between the GSD 320 and QMG 220.

G) All three components of the system – the PC, the QMG 220 and the GSD 320 – are now configured with common network IP Addresses and can be used as a system, either on a network or directly connected.

Appendix I: Adding a Device to QUADERA

This section provides instructions on how to add a Device to QUADERA.

To add a device to QUADERA, do the following:

A) Run QUADERA and select Device>>Device Setup from the menu (Fig AI 1).



Fig AI 1: Device Setup menu selection

B) From the Device Setup dialog, select Search (Fig AI 2).

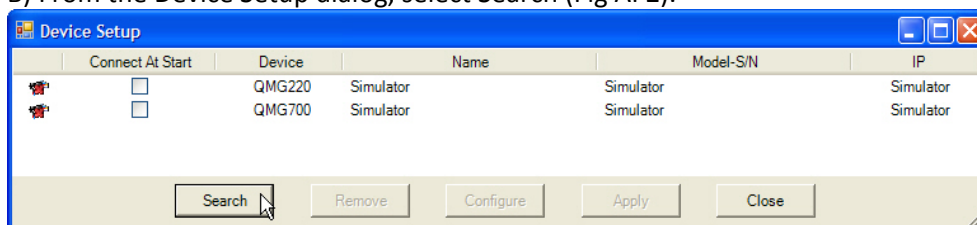


Fig AI 2: Search button

C) Press the Search button to refresh the list of devices found (Fig AI 3). The Search button can be pressed multiple times.

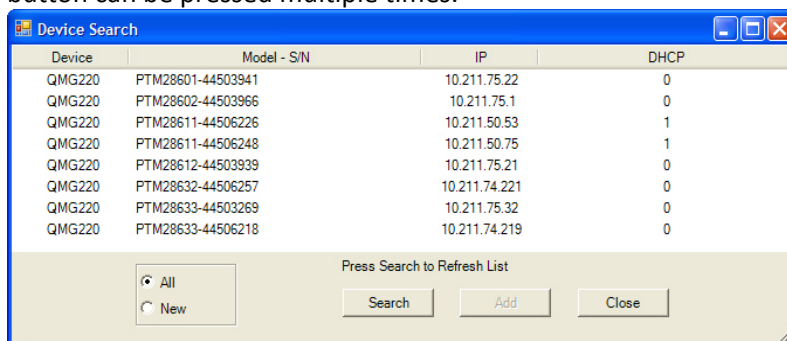


Fig AI 3: Search dialog

Note in Fig AI 3 the different IP Addresses in use for the QMG220 devices. Reserving ranges of IP Addresses for different groups of QMG220 devices is an easy way to differentiate between functional groups of devices. As an example, this figure might show QMG220 devices for a specific laboratory (10.211.75.x), a manufacturing test stand (10.211.74.x), etc...

D) Select the Device to be added and press Add (Fig AI 4). The Device Search dialog will then close.

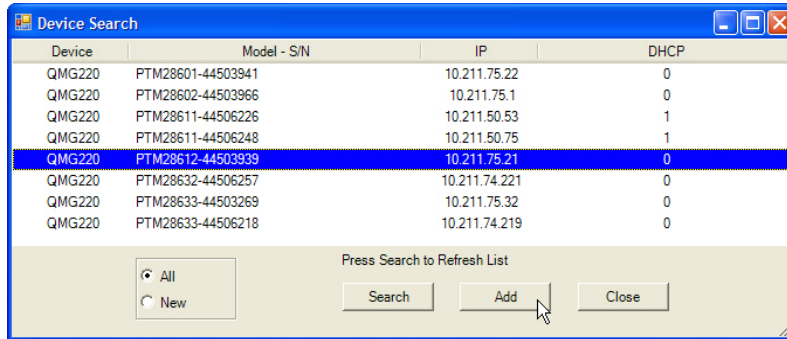


Fig AI 4: Add device

E) The Device added will be shown in the Device Setup as “<unknown>”. Highlight the Device and press Apply (Fig AI 5).

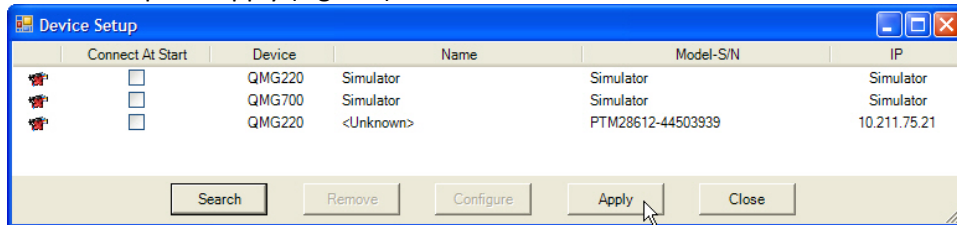


Fig AI 5: Apply added device

F) QUADERA will then connect to the “<unknown>” Device (Fig AI 6), read the configuration information and then disconnect from the Device (now known as SWDEV-7521 for this example). (Fig AI 7). It is mandatory that QUADERA execute this step or the QMG 220 will not be able to be used in QUADERA.

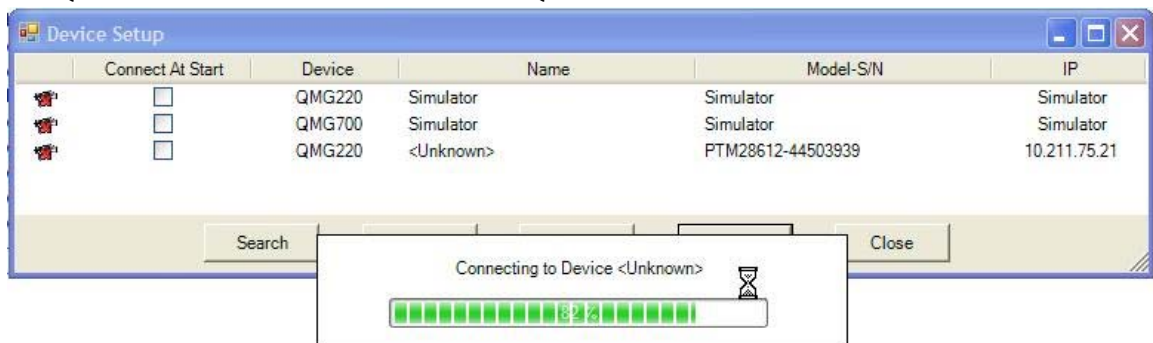


Fig AI 6: Connect to newly added device

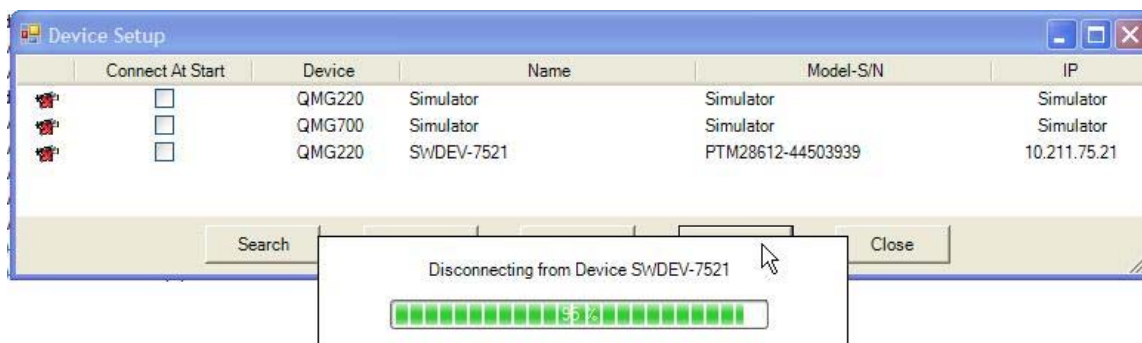


Fig AI 7: Disconnect from newly added device

G) The QMG 220 Device is now added to the QUADERA system.

Note: The network shown in this document – 10.211.x.x – is an INFICON network and should not be used when configuring a PC, QMG 220 or GSD 320 outside of INFICON.