

Application Note

GE IP (GE Fanuc) I/O and Proficy Machine



This document guides you through the setup of proprietary vendor specific software installed on your PC. Your supervisor may provide you with additional or alternative instructions.

The document consists of standard instructions that may not fit your particular solution. Please visit our support website for latest revisions of documentation and firmware:

<http://www.secomea.com>

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Prerequisites for This Guide

This guide will assist you to setup a remote and online connection to the GE Intelligent Platforms Remote I/O CPU placed on the customer site using the Proficy Machine software installed on your PC.

This guide discusses a **GE Intelligent Platforms Remote I/O Series 9030 (CPU IC693 / CPU313)** and connection via **Proficy Machine Edition 8.0**.

Other GE controllers or program editions (such as Versapro) may work, but has not been verified.

Also note the Appendix B, which briefly explains possible steps to adapt to older GE equipment and software.

Prerequisites for this guide are:

- You have an operational LinkManager build 13094 or later installed on your PC with a GateManager certificate that allows you to connect to the SiteManager agents.
- You have the Proficy Machine software installed on your PC.
- You have the GE device agent installed and configured on the SiteManager with FW 13495 or later at the remote site, and there is access between the SiteManager and the GE device, by either Serial and/or Ethernet. The corresponding agent in the SiteManager will be as one of the agents depicted here:

GateManager Agents						
Using 2 of 2 agents						
Status	Disable	S/N	Device Name	Device Type	Device Type	Device IP & Parameters
IDLE	<input type="checkbox"/>	#01	Series 9030 Ethernet	GE IP	Ethernet	192.168.0.160
IDLE	<input type="checkbox"/>	#00	Series 9030 Serial	GE IP	Serial	

Save SNMP >>

If any of these prerequisites are not met, you should contact the person / department responsible within your own company or at the company responsible hereof.

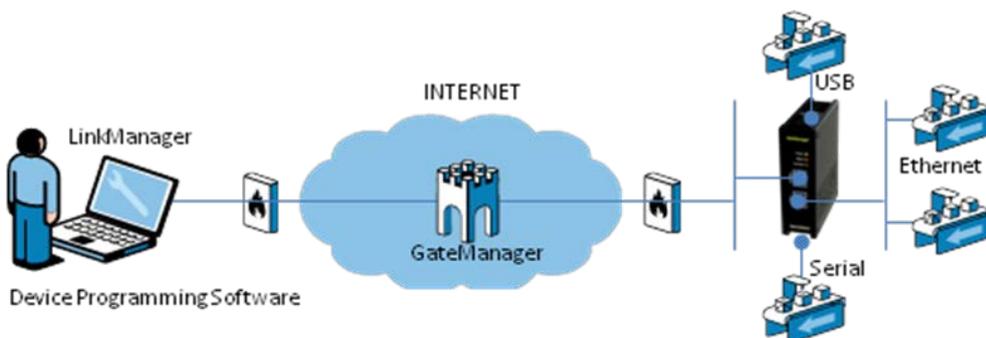
System Overview

The communication path is as follows:

Proficy Machine → **LinkManager** → GateManager → SiteManager → PLC.

This guide will elaborate on the components marked with **bold**.

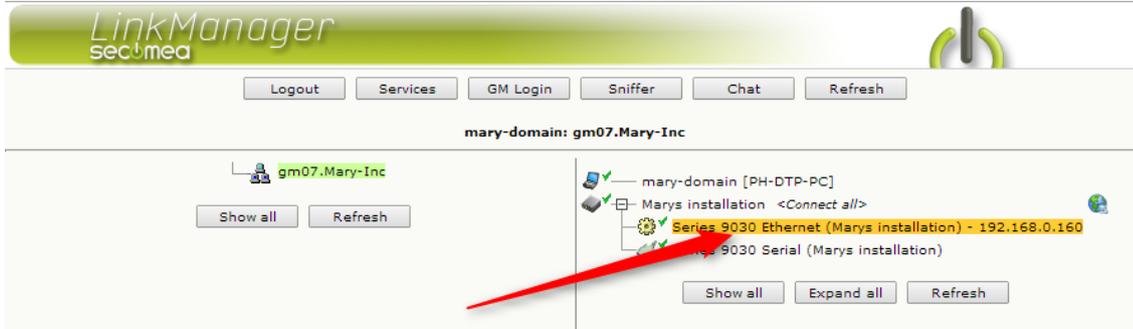
The following system overview depicts a SiteManager 1029 at the customer location:



1. Ethernet Access

Note: The network attached PLC must be configured with agent device type **GE IP / Ethernet** on the SiteManager with minimum firmware version 13495

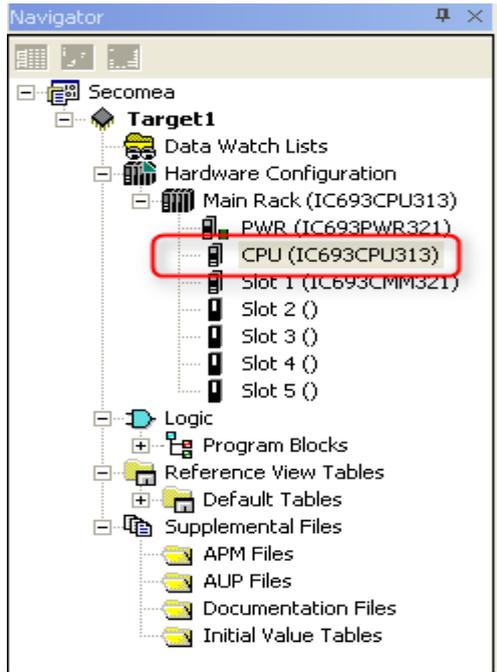
1. Locate the agent that represents you Ethernet attached GE IP, and click the text to connect to it



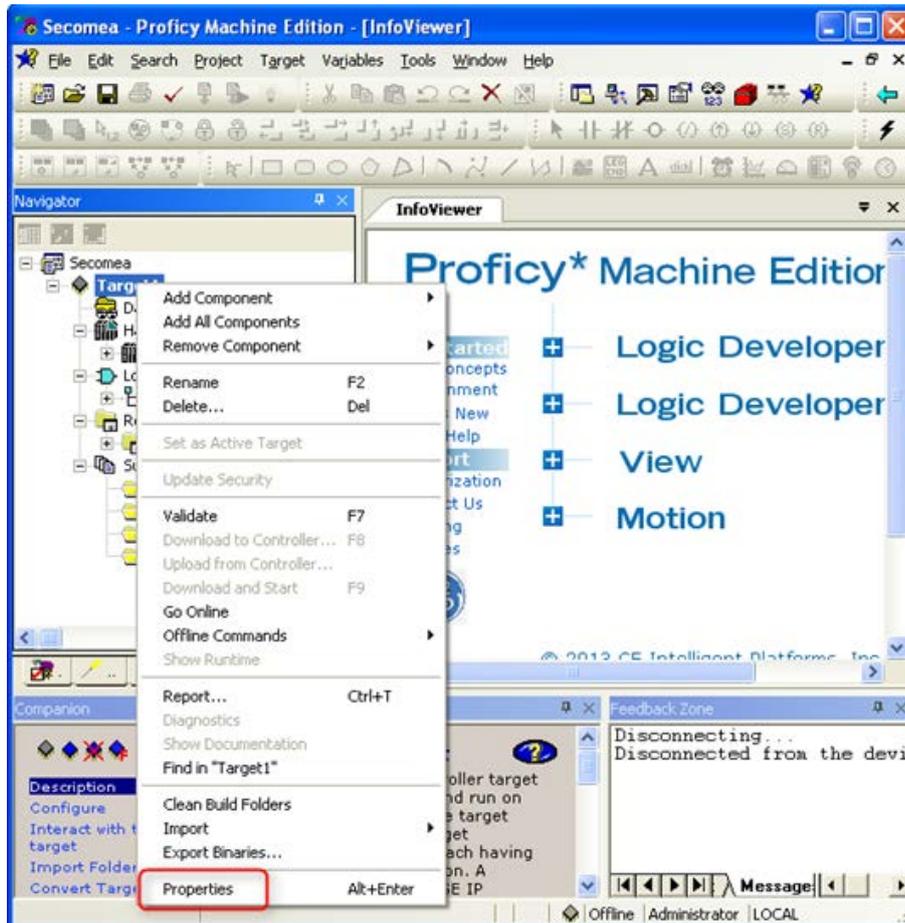
2. You will not see any activity on it yet. This only starts when you connect to the PLC via your project (Make a note of the IP address of the PLC):



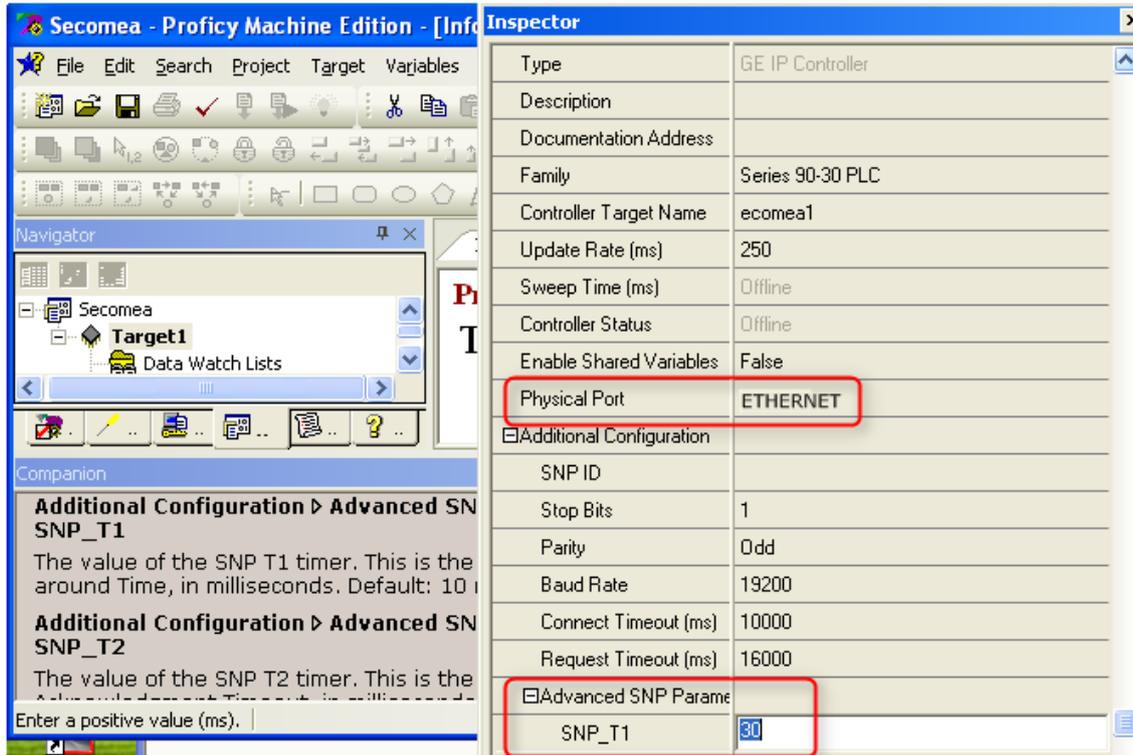
3. Make sure the Proficy Machine Edition 8.0 software is set for the correct CPU type.



4. Set the Target Connection type:



- Set the Physical port to Ethernet and set the SNP_T1 parameter to 30 or higher (Minimum Turn-around Time)



- Configure the IP address to be the local address of the GE IP (in this example 192.168.0.160), and connect to it.

You are now online with the PLC. You can now observe data traffic in the LinkManager:



Basic hints on Proficy setup: To be able to Upload and download a project you need to select the right PWR and CPU. In this example we have set the modules ...321 PWR and ...313 CPU under properties. First try Uploading the project, then set the online command to Programmer Mode then you can download the project again.

2. Serial Access (SNP communication)

Note: The network attached PLC must be configured with agent device type **GE IP / Serial** on the SiteManager with minimum firmware version 13495.

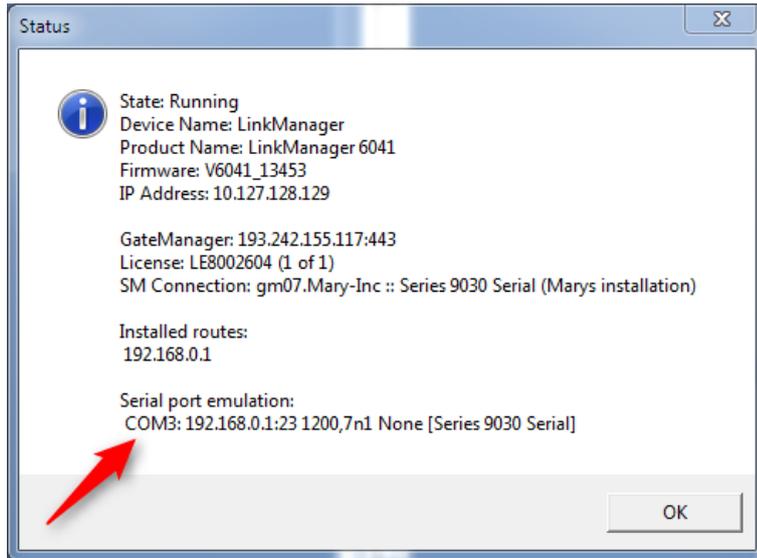
1. Locate the agent that represents your Serial attached GE IP, and click the text to connect to it.



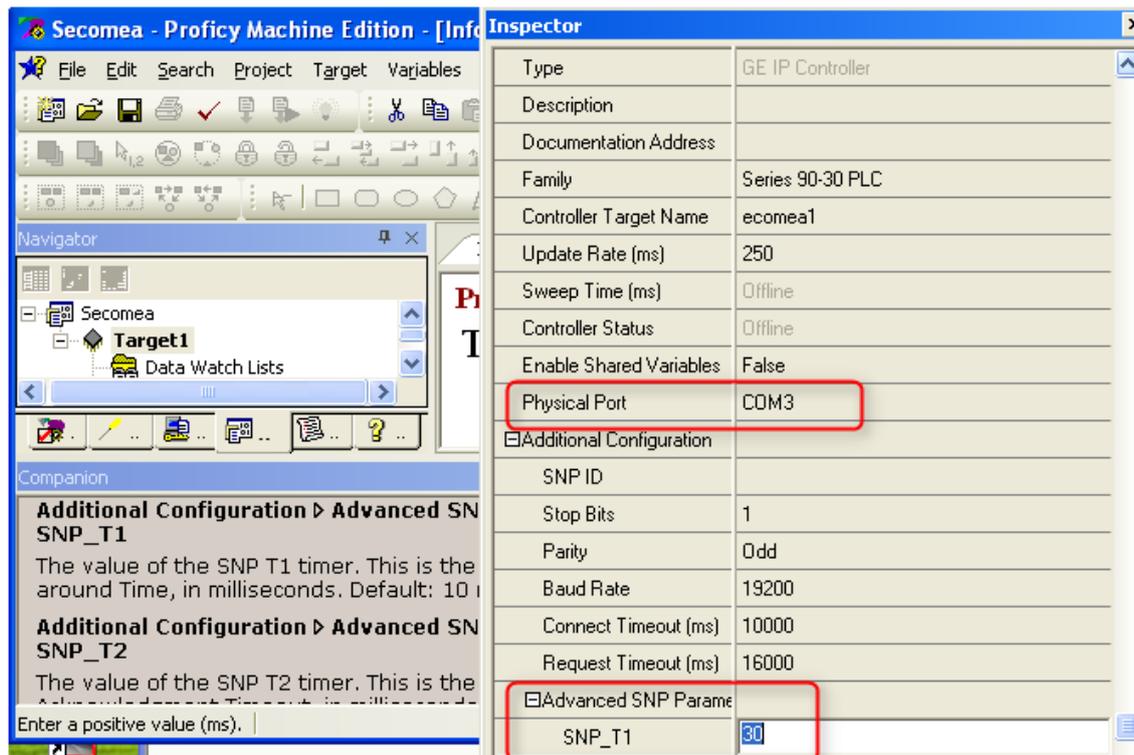
2. When connecting to the agent, you should see some activity in the tray icon area, which is the auto configuring of a virtual serial port. If your SiteManager, and GE IP is correctly attached, you should also see the status of the agent become OK, and a few bytes of traffic:



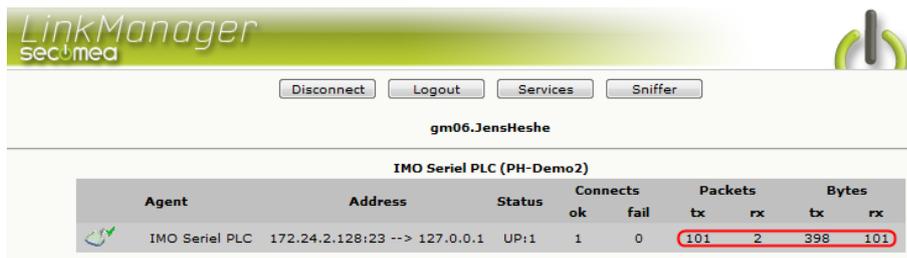
- Now right click the LinkManager system tray icon, and select **Status**. Make note of the Serial port that has been assigned (in this case COM3):



- Enter the Inspector panel for the Target and set the Physical Target port to the same port, and set the SNP_T1 parameter to 30 or higher (Minimum Turn-around Time)



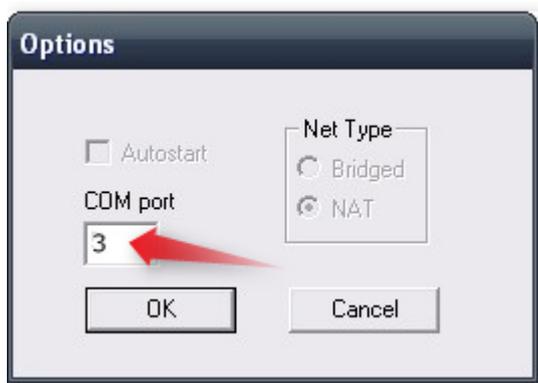
5. Connect, and you should now be online with the PLC. You can now observe data traffic in the LinkManager:



Basic hints on Proficy setup: To be able to Upload and download a project you need to select the right PWR and CPU. In this example we have set the modules ...321 PWR and ...313 CPU under properties. First try Uploading the project, then set the online command to Programmer Mode then you can download the project again.

6. Optionally right click the LinkManager system tray icon again, and select **Options**. Enter the number of the COM port you found under status. This will ensure that you will always get this port in the future.

IMPORTANT: if you change the port you must stop and start the LinkManager.



Note: You can also force another COM port (e.g. COM2). Just ensure in your Windows device manager, that the port is not conflicting with an existing COM port. See Appendix A for info on how to organize COM ports.

2.1. Trouble shooting

If you have trouble connecting, or the connection is instable, it may be because you are running on a slow line. Try increasing the SNP_T1 (Minimum Turn-around Time) and retry.

Note: There may be a limit to how slow a line you can obtain a reliable connection on. If the connection remains unstable or very slow, you may conclude that the setup is not suited for remote access. Try using Ethernet connection instead, which will usually be faster, even on slow connections.

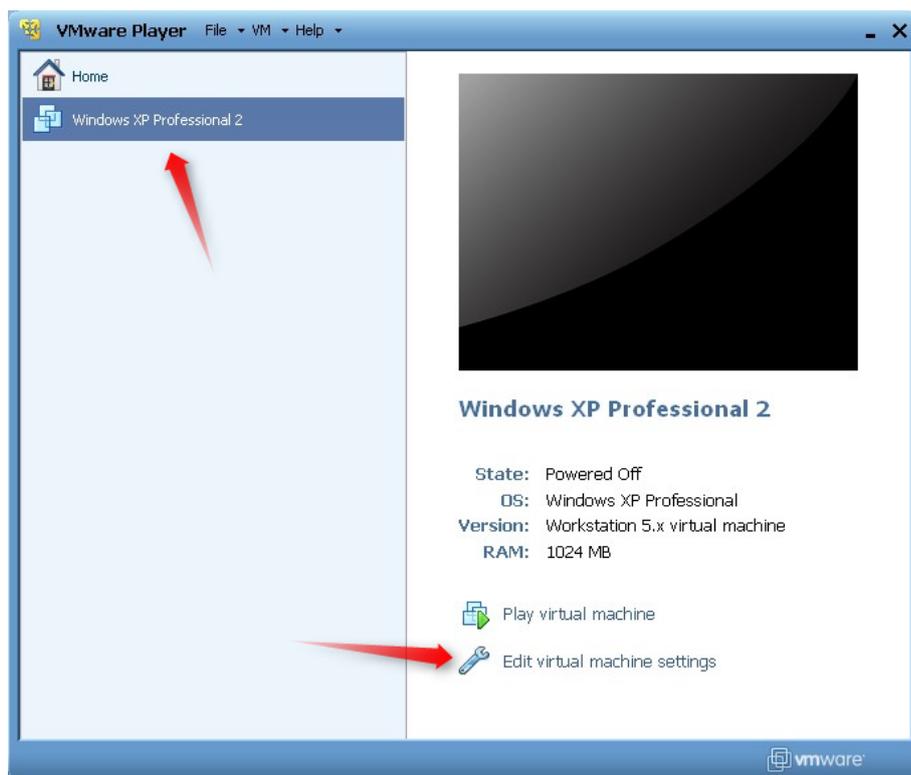
3. Ethernet Connection from Virtual Machine

You can run the Proficy software inside a VMWare or VirtualBox machine, to a GE IP that is Ethernet attached to a SiteManager.

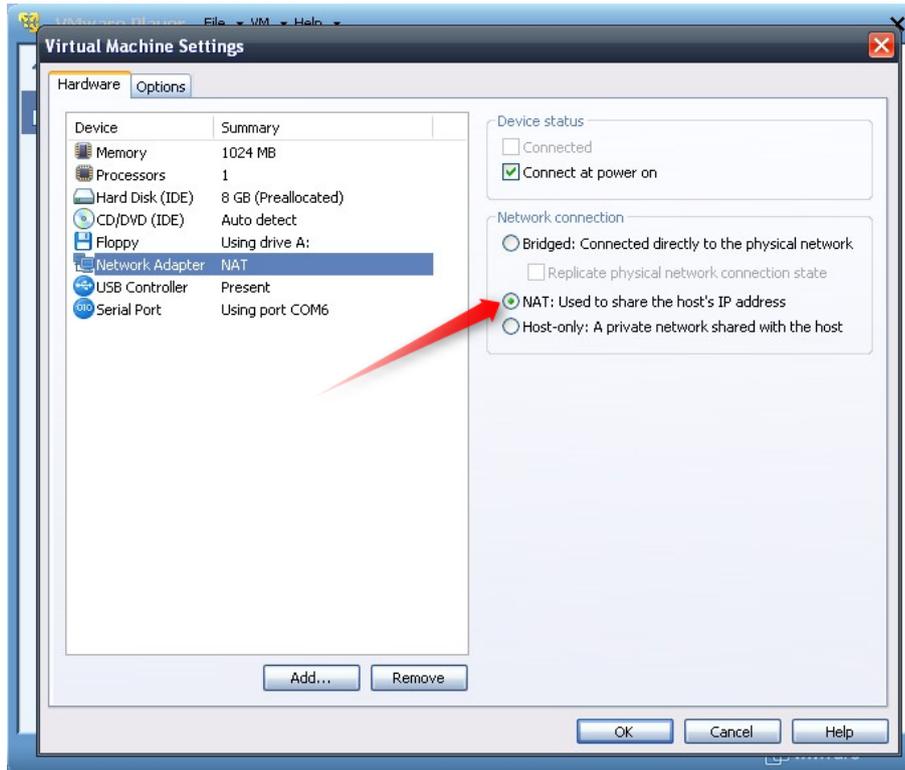
You can choose to run the LinkManager in-side or outside the virtual machine. Note that LinkManager can only run inside the virtual machine if the host OS is Windows 7 or 8 and the PC's CPU has support for virtualization.

The following illustrates VMWare Player, which can be downloaded from <http://www.vmware.com/support/product-support/player/>, and for LinkManager running outside the virtual machine (i.e. on the host OS system)

1. Locate your Windows VM that has the Proficy software installed, and enter **Edit virtual machine settings**.



2. Make sure the Network Adapter settings is set to **NAT**:



3. Start the VMWare engine and on the host PC start LinkManager.
4. Follow the procedure of section 1 **Ethernet Access** to get access to the PLC via LinkManager

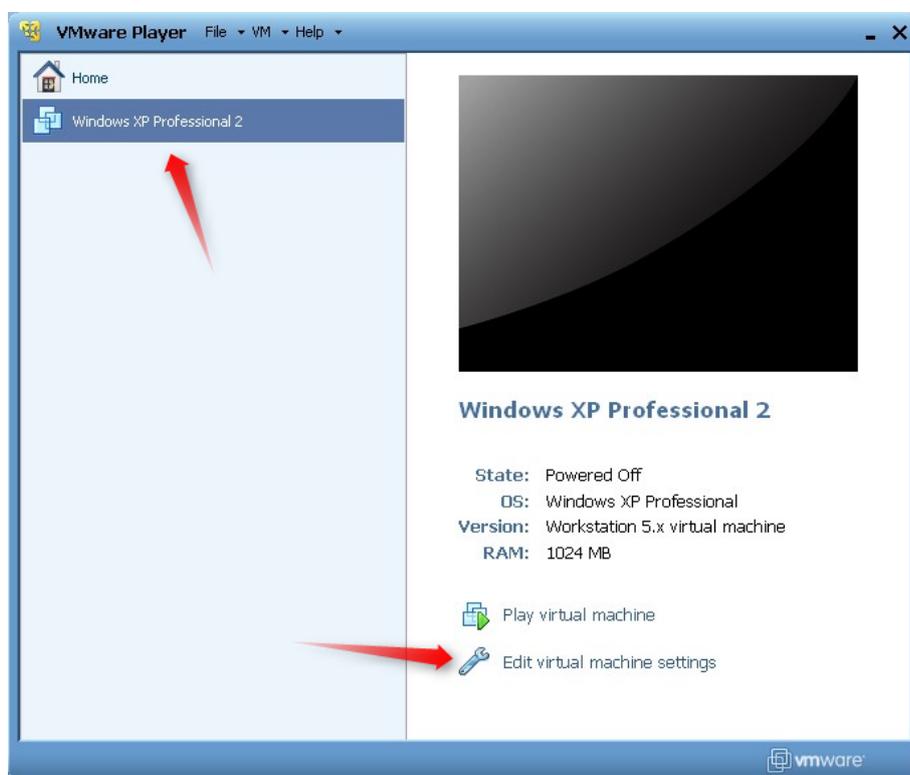
4. Serial connection from Virtual Machine

You can run the Proficy software inside a VMWare or VirtualBox machine, to a GE IP PLC that is attached to a SiteManager via a Serial cable.

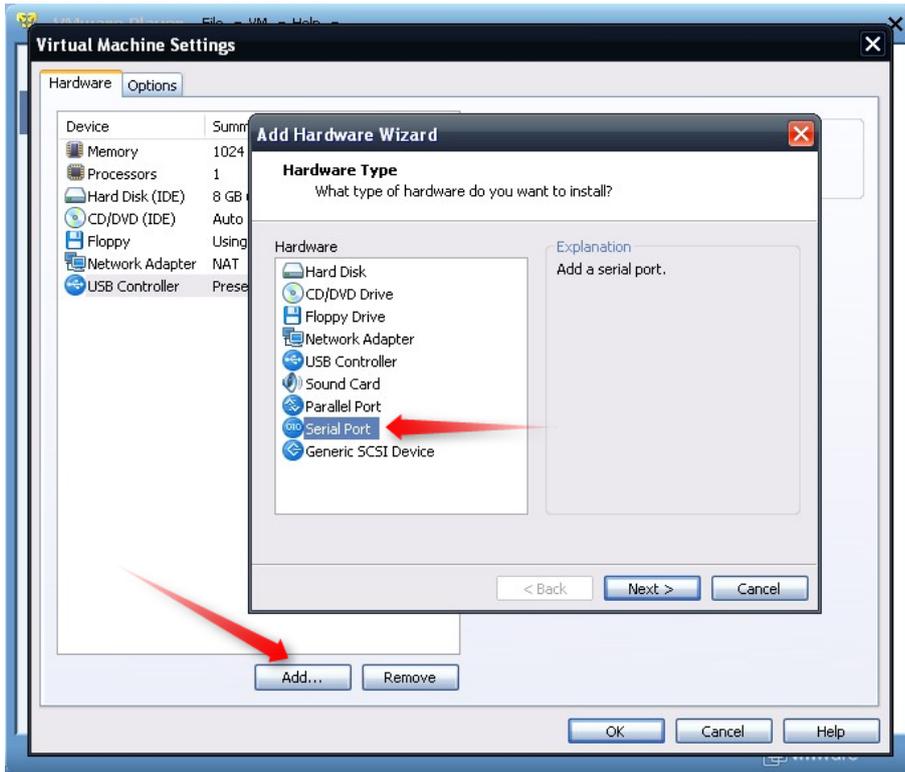
You can choose to run the LinkManager in-side or outside the virtual machine. Note that LinkManager can only run inside the virtual machine if the host OS is Windows 7 or 8 and the PC's CPU has support for virtualization.

The following illustrates VMWare Player, which can be downloaded from <http://www.vmware.com/support/product-support/player/>, and for LinkManager running outside the virtual machine (i.e. on the host OS system)

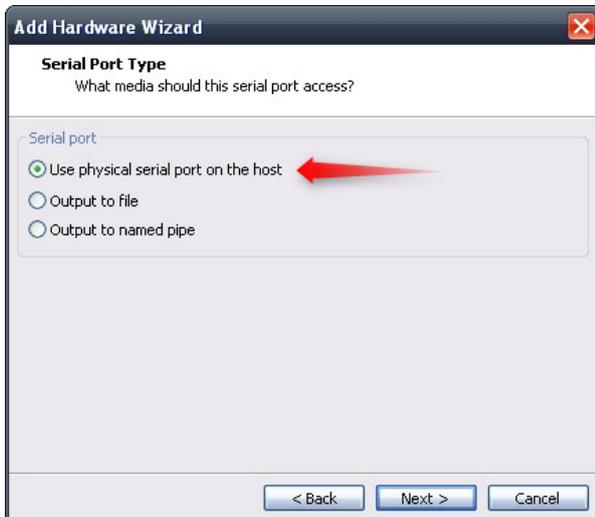
1. Follow the steps in section 0. This will create a COM port even if the PC does not have a physical COM port.
2. Locate your Windows VM machine that has Proficy software installed, and without starting it, enter **Edit virtual machine settings**.



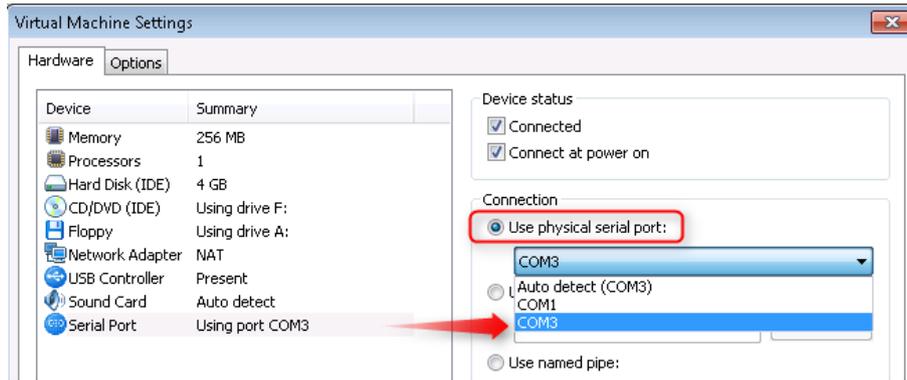
3. Add Serial Port to the Hardware list (if it does not already exist).



4. Select "Use physical port" (Even though LinkManager makes a virtual COM port, VMWare sees it as a physical port)



5. Set the port to the COM port used by the LinkManager (see section 0)



Note: If VMWare does not allow you to add a Serial port, it may be because the PC does not have a physical Serial port, but if LinkManager is started and connected, it would have created a virtual COM port that VMWare will see as a physical COM port.

6. Press **OK** twice, and select the **Select Finish** and **OK**, Start the VMWare Windows image, and start the Proficy software.
7. Follow the procedure described in section 2 on getting access to the PLC via LinkManager.

Note: VMWare will typically make the physical COM port of the host system (e.g. COM3) appear to the virtual OS as COM1. You should configure the Proficy to use the port of VMWare (COM1) and not the physical port of the host system (COM3) that is used by LinkManager.

4.1. Startup order of VMWare, LinkManager and Proficy

If you have already preset a COM port in LinkManager as well as in VMWare, the startup order would be irrelevant. You can stop and start the components individually.

If you encounter problems, or you have changed the COM port setting of LinkManager it is recommended to do the following:

1. Stop the VMWare engine.
2. Stop LinkManager completely.
3. Start LinkManager.
4. Connect to the Serial PLC and check the assigned COM port under Status (by right-clicking the LinkManager tray icon)
5. Check the COM port settings of the Virtual Machine Settings of the Windows image with the Proficy software.
6. Start the VMWare image.
7. Start Proficy software and connect to the PLC

Appendix A, Organizing COM ports in Windows

Clean up Windows Registry for redundant COM ports:

You may experience that older versions of the Proficy software require a lower COM port number. In case your PC assigns a COM port of e.g. 13, it may be due to previous installs of virtual COM ports from in relation to installation of other programs.

You can clean your PC for redundant COM ports in Windows registry:

1. Open regedit (Start → run → Regedit)
2. Navigate to:

**HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Control\COM
Name arbiter**

3. In the ComDB set all values to 00
4. Restart your PC

Enable LinkManager to use COM1:

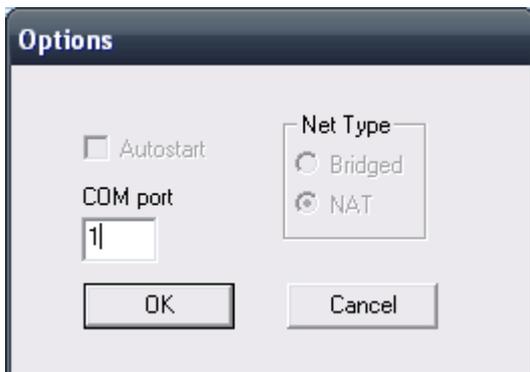
If you prefer the COM port to be COM1:

Even if no COM ports are installed on the PC, Windows will never assign a COM port lower than COM3 to the LinkManager. You therefore have to do the following to force LinkManager to use COM1:

1. Open Windows Control Panel → System → Hardware → Device Manager → Ports (COM & LPT).
2. If there already are physical COM ports listed, you must re-assign the port numbers to free up COM1.

Right click a COM port and select Properties → Port Settings → advanced

3. Change the COM port number in the drop down list.
4. Restart your PC.
5. Right click the LinkManager system tray icon and select Options.
6. Enter 1 in the COM port field.



7. Stop and Start the LinkManager and start the Serial agent.

Appendix B, GE Fanuc Legacy Serial devices and software

You may come across other GE products, and you cannot be sure they will work according to the above procedure.

You may be able to pass data in a loopback test using a PC, but not via a modem or similar remote connection. Generally you may discover that Versamax products will not communicate at baud rates below 4800.

An example is the VersaMax products that beside the Proficy software, can be operated with the discontinued VersaPro software. Also you want to connect with other tools such as the Wizcon SCADA software.

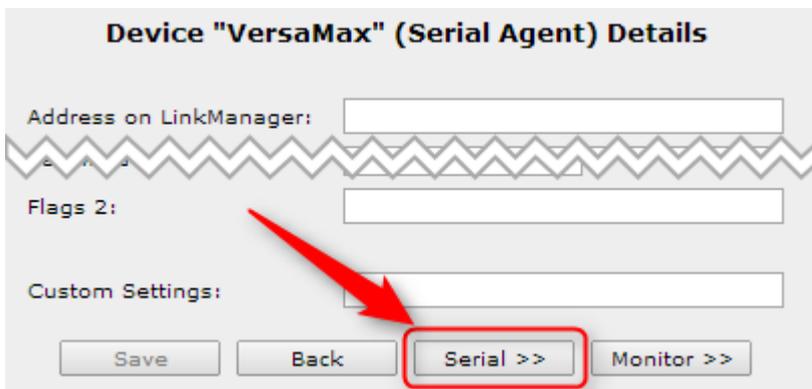
Typical challenges is the Serial communication that may work fine locally, but may run slow or unstable remotely.

The following is some hints on tuning the serial agent:

1. In the SiteManager select a Customer / Serial agent, and click the Parameter details icon



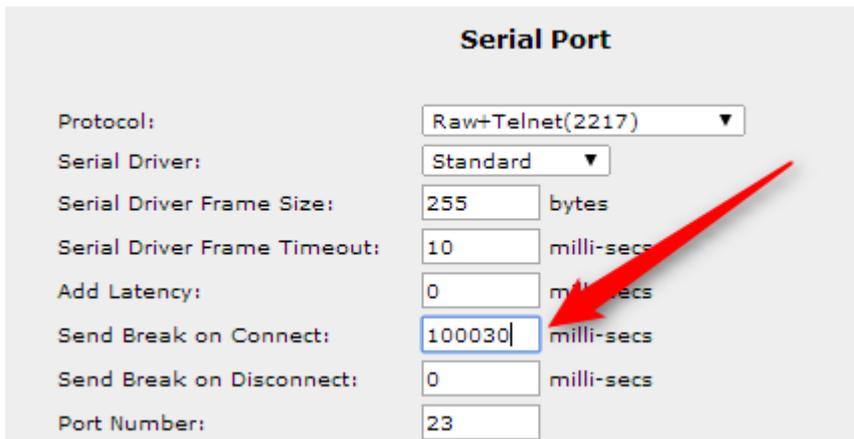
2. Click the Serial button:



3. Change the Protocol from Vendor Agent Controlled to Raw+Telnet (RFC2217)



4. Try adjust the Send Break on Connect parameter. It has been seen that lowering it to 100030 has a positive impact on older GE equipment.



Serial Port

Protocol:	Raw+Telnet(2217)
Serial Driver:	Standard
Serial Driver Frame Size:	255 bytes
Serial Driver Frame Timeout:	10 milli-secs
Add Latency:	0 milli-secs
Send Break on Connect:	100030 milli-secs
Send Break on Disconnect:	0 milli-secs
Port Number:	23

5. Save the changes, and try to connect with LinkManager.
6. If you have problems still, try increasing the SNP_T1 (Maximum Turn-around Time) of the program up to e.g. 200.

NOTE: For general trouble shooting on serial connections, refer to the guide “SiteManager Serial agent setup and trouble-shooting guide” found in the Secomea support section.

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