

User Guide for the

ei3 Enodia Service Helper Program

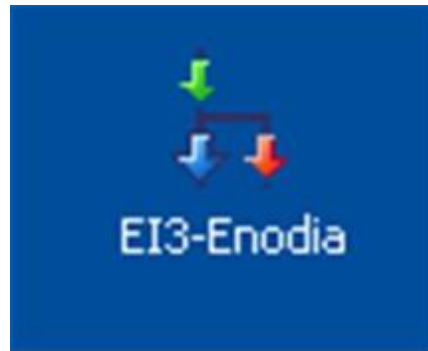


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Overview:

This document introduces the user to the ei3 Enodia Service Helper program and describes:

1. The prerequisites for its use.
2. What the Enodia program does, and
3. How to use it in a Remote Service Session.

The intended audience of this document is a technical expert who will use Enodia.

Purpose of Enodia:

Remote Service uses a network that allows devices on Machines to be manipulated by control programs like PC-Anywhere, VNC, Web Browsers, and other software. Some software that can be used in this environment is special purpose software like Siemens Step-7 that is designed for use with Siemens PLCs. The e-View Service platform was designed to that each machine device has its own unique address on the machine. Working within the ei3 Argo platform, each machine device has an address which is completely unique in the Argo network. In the Argo network, the local machine IP addresses are translated using the process of Network Address Translation, or NAT.

Most software has been designed to be completely NAT insensitive and works well when using the Argo Network Address. Other software is very sensitive to the effects of NAT. When the PLC has an Ethernet connection, Simatic Step-7 will try to use the local IP address of the PLC on the machine rather than the Argo IP address, and some Step-7 operations will then fail when using the program with an Argo connection.

Enodia solves this problem by allowing the user to always address the machine device by its local address on the Machine. So, when used in conjunction with an Argo Remote Service session, Enodia transparently transforms the local address of a device on the machine to the Argo address for communication, yet allows the any software that can communicate with a machine device to use the local or real device address for device control, programming, or management.

Because of the interest in using Step-7 over the Argo network, this document focuses on using Enodia with Step-7 and a Siemens Ethernet enabled PLC. However, Enodia can be used with any software that is used to communicate with machine devices. Enodia is a universal Remote Service Helper.

Prerequisite Software

Before Enodia can be used, the Microsoft Loopback adapter MUST be installed on the technician PC. This is standard Microsoft software distributed with all versions of Windows desktops. Installation of the MS Loopback adapter does not interfere in any way with the normal operation of the PC, but is required for use of Enodia.

Instructions about installing the MS Loopback adapter can be found here:

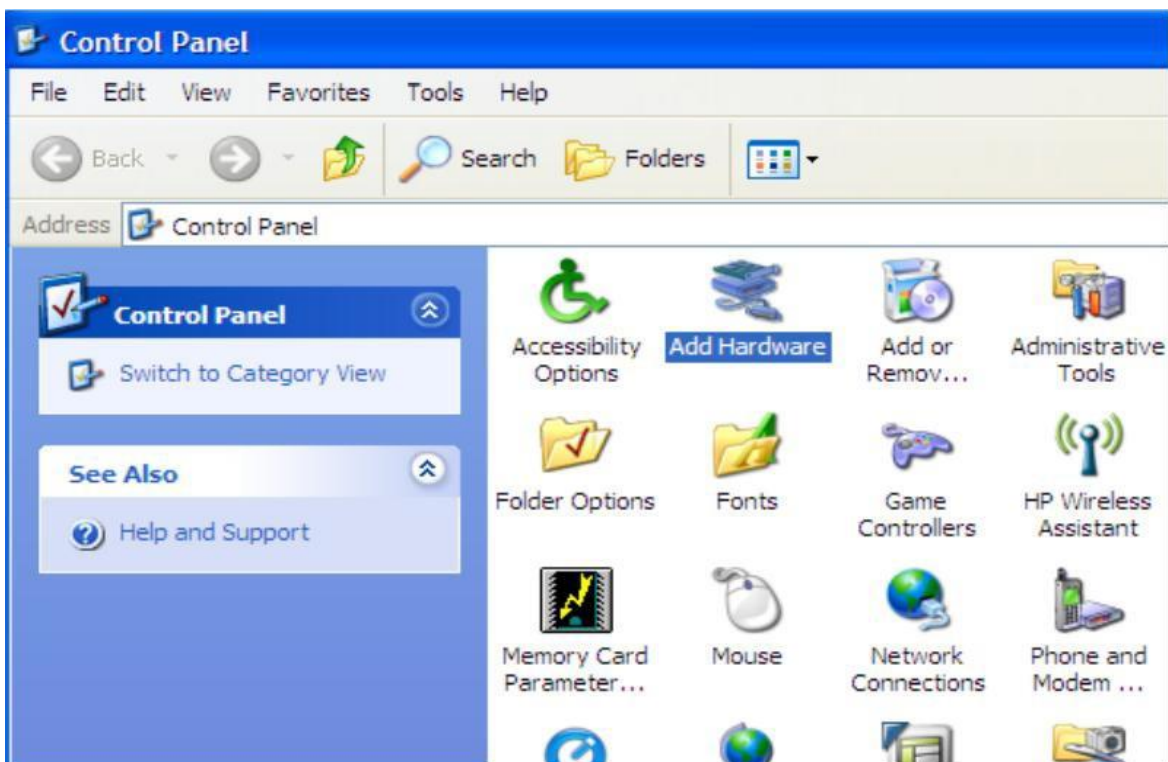
<http://www.windowsreference.com/windows-7/how-to-install-a-loopback-adapter-in-windows-7/>

The following steps may not be appropriate for Windows-7, so it is best to follow the instructions as shown in the above referenced web page.

Installing the MS Loopback Adapter

It is a simple process. Here are the steps:

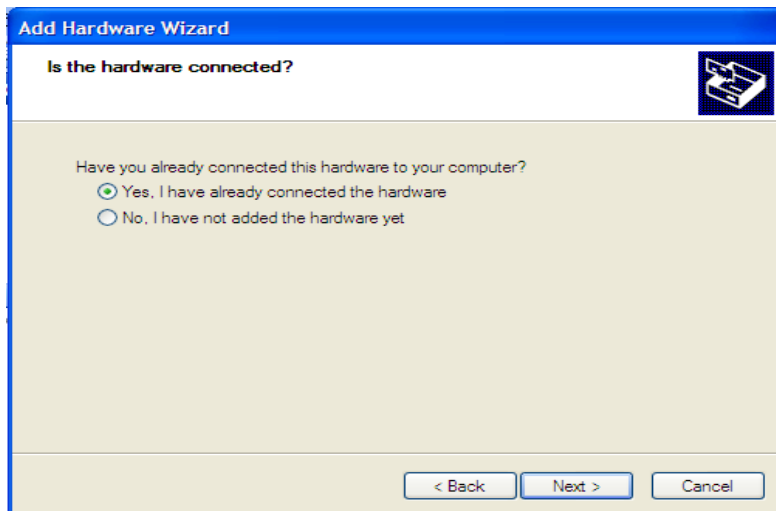
Click on Start/Setting/Control Panel so you see this:



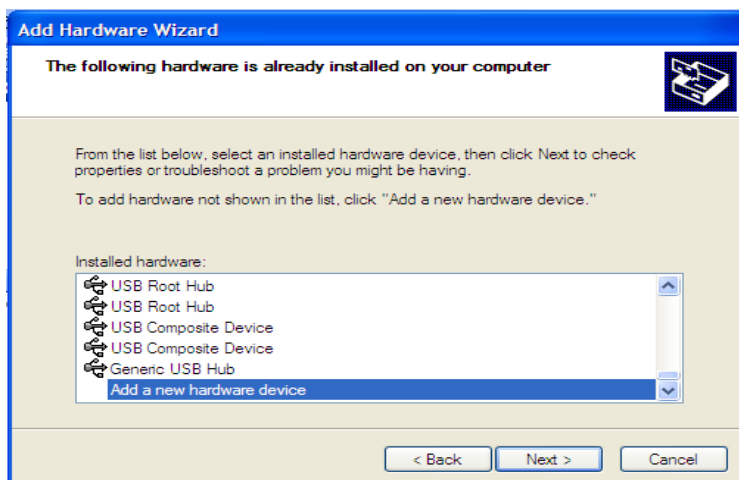
Then click on Add Hardware, and the following screen appears:



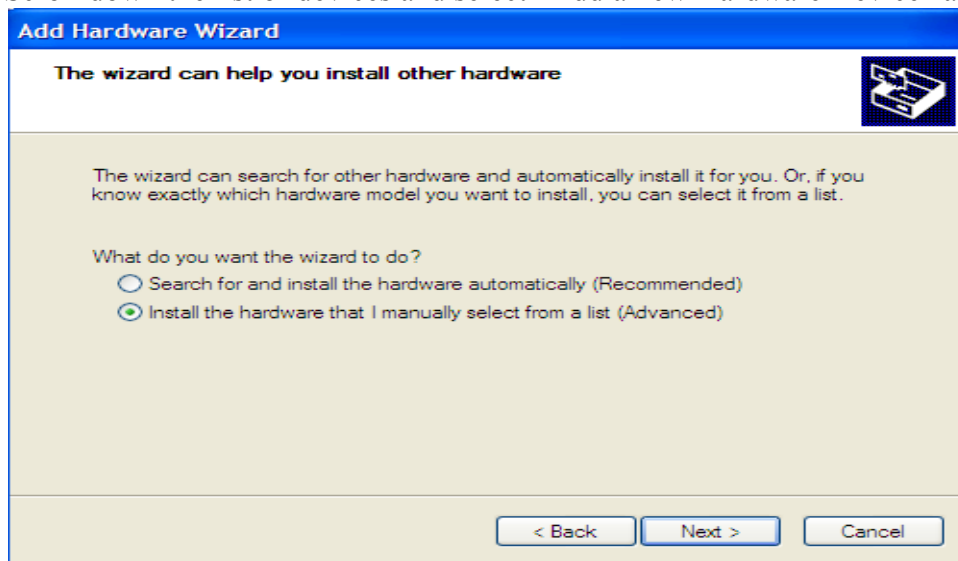
Click Next,



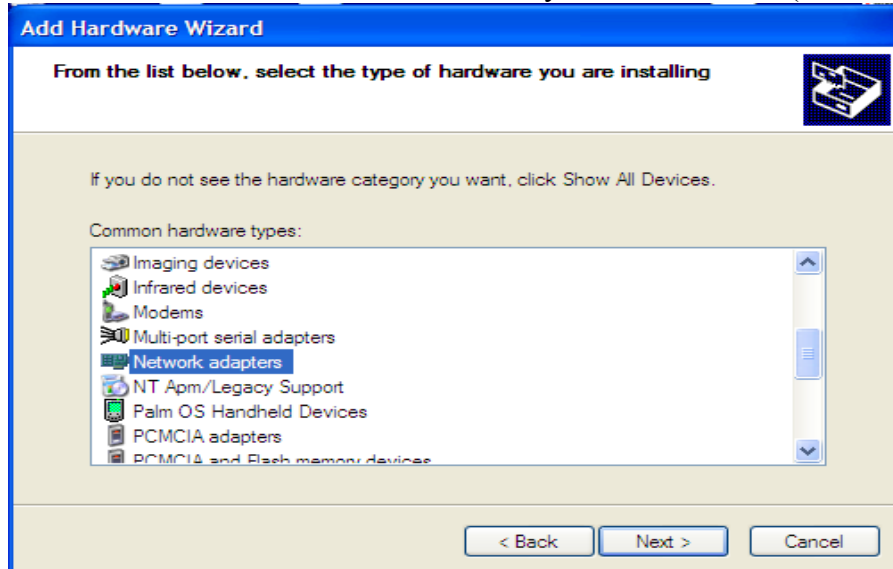
Chose Yes, I have already connected the hardware and then Next,



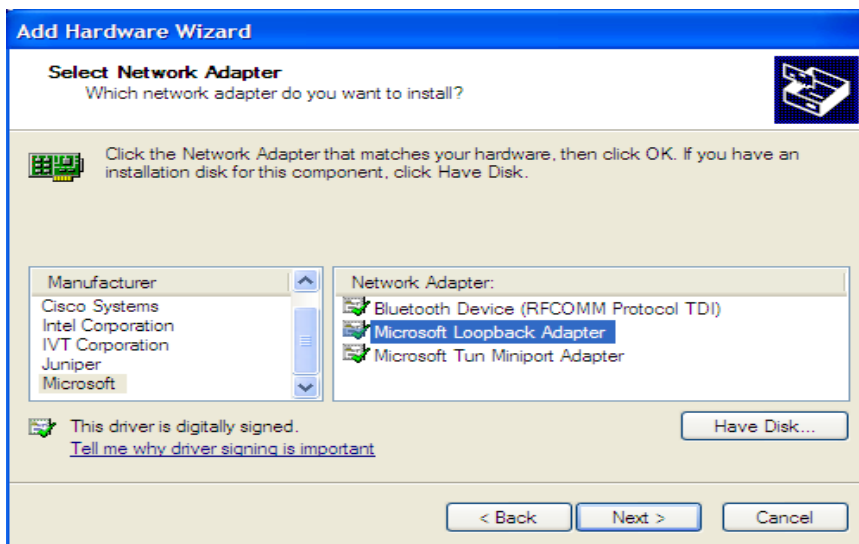
Scroll down the list of devices and select “Add a new Hardware Device” and then click on Next.



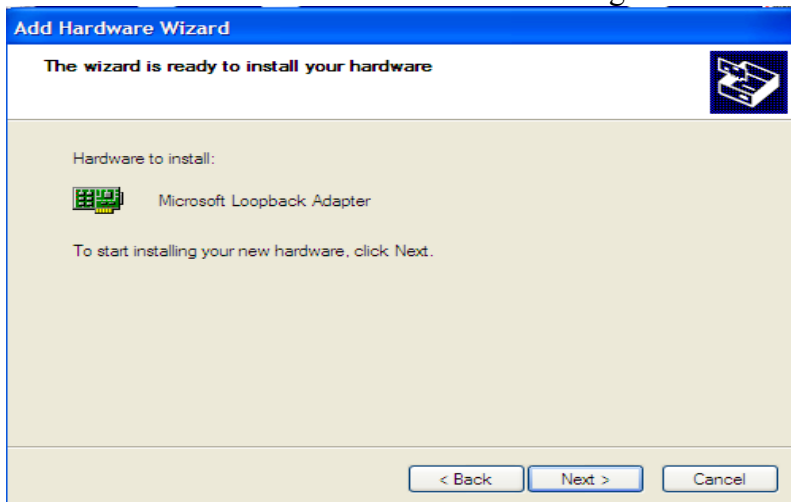
Select “Install the hardware that I manually select from a list (Advanced)” and click on Next.



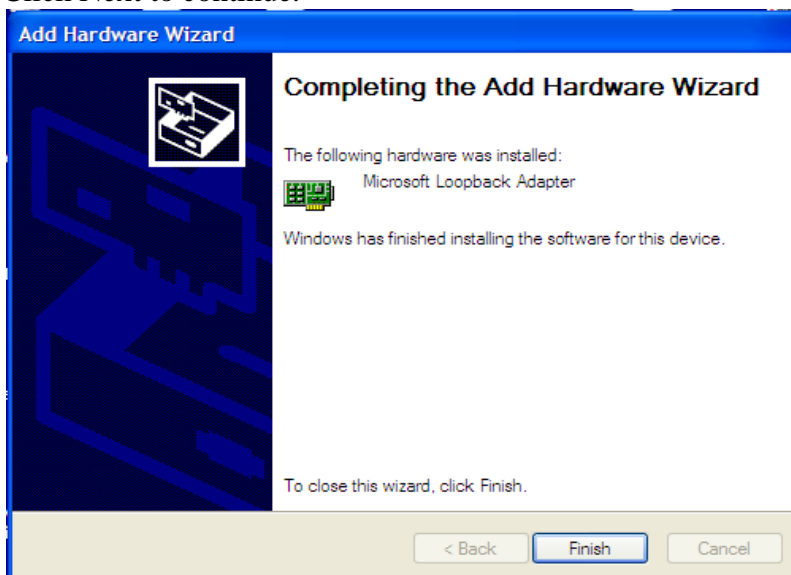
Highlight “Network adapters” and click on Next.



Select on the left side “Microsoft” and on the right “Microsoft Loopback Adapter” and click on Next.



Click Next to continue.



Click on Finish and the Loopback Adapter will be installed.

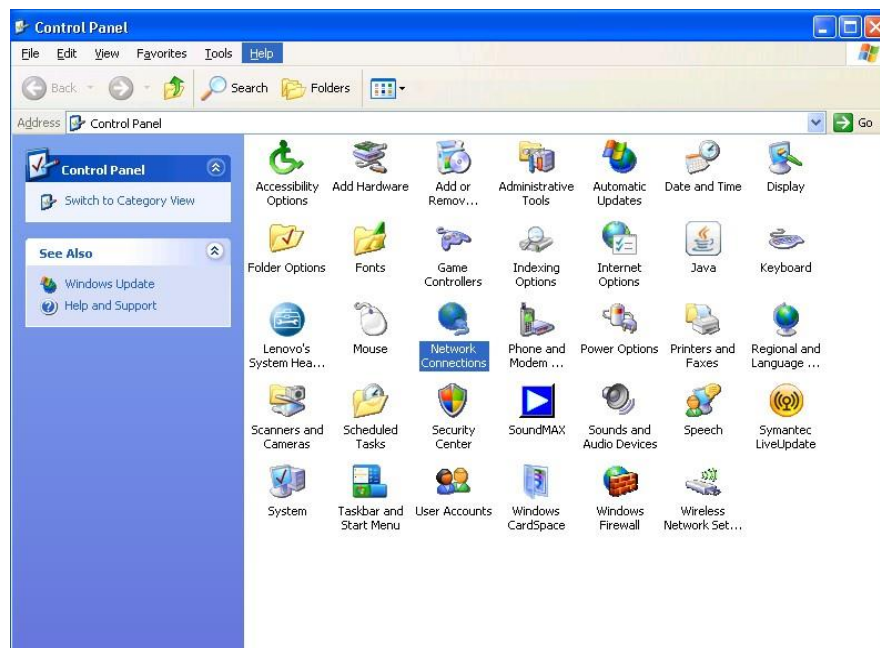
Configuring the MS Loopback Adapter

The MS Loopback Adapter should be configured for a Static IP address of 10.1.1.1 and a subnet mask of 255.255.255.0

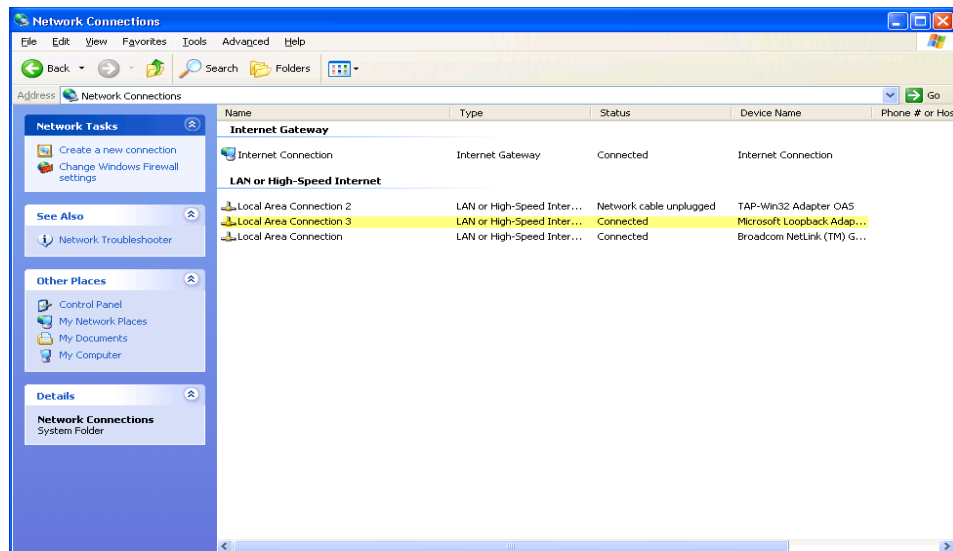
Configuring it to this address is a one-time operation which is done after the loopback adapter is installed and never has to be repeated. Also, the address will never have to be changed after using Enodia, so after initial configuration, no further user intervention is required.

To do so, please follow these steps:

Click on “Start”, then Control Panel,



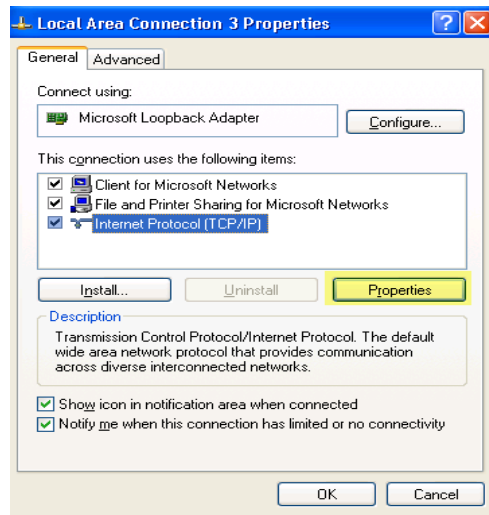
Double-Click on Network Connections, and view the following:



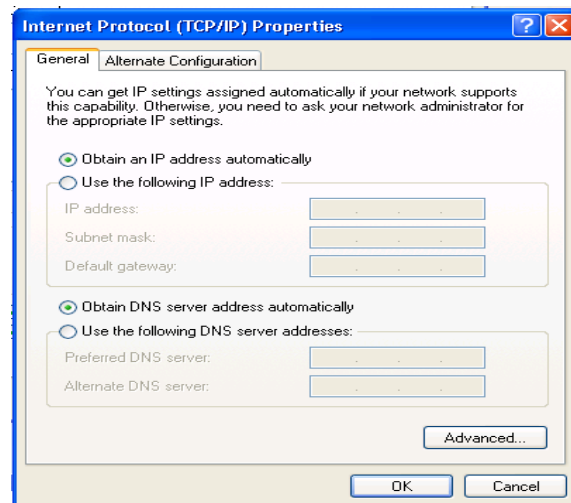
Your PC may have more than this number of Adapters, but there will be one as shown in the yellow highlight with the Device name of Microsoft Loopback Adapter.

Name	Type	Status	Device Name
Internet Gateway			
Internet Connection	Internet Gateway	Connected	Internet Connection
LAN or High-Speed Internet			
Local Area Connection 2	LAN or High-Speed Inter...	Network cable unplugged	TAP-Win32 Adapter OAS
Local Area Connection 3	LAN or High-Speed Inter...	Connected	Microsoft Loopback Adap...
Local Area Connection	LAN or High-Speed Inter...	Connected	Broadcom NetLink (TM) G...

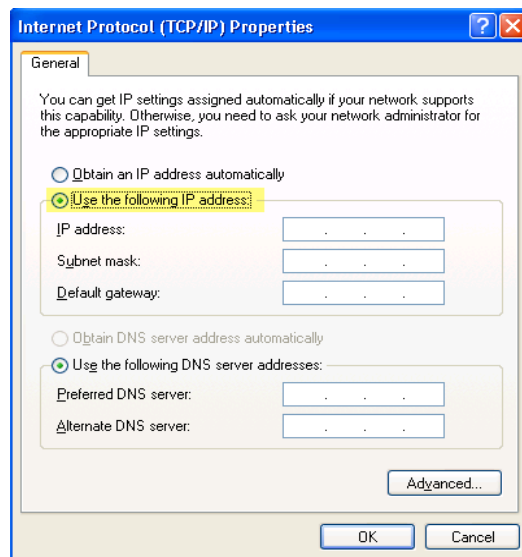
Select it, then right click and chose “Properties”. The following will appear:



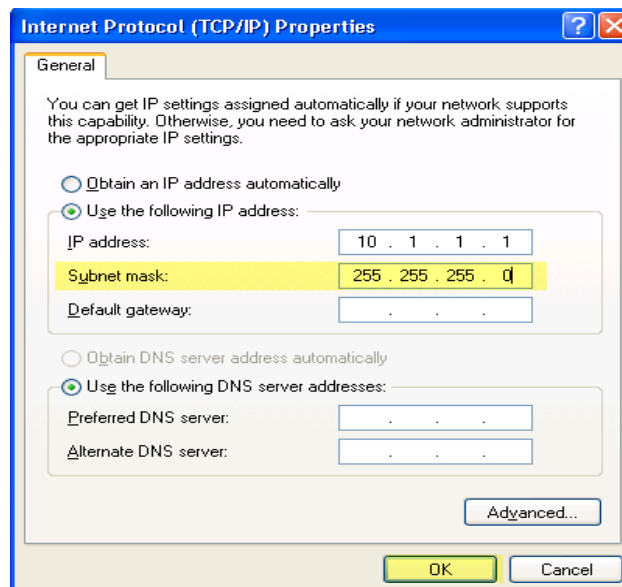
Select “Internet Protocol” and then click on Properties. This will display the following screen:



You will want to change these settings by doing the following:

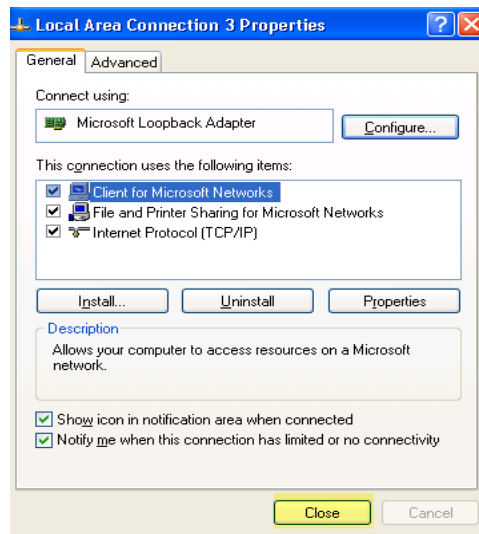


Select “Use the following IP address, and then fill in as follows:



Be sure to type the complete Subnet Mask as 255.255.255.0, then click OK.

You will be returned to this window:



Click on “Close”.

The MS Loopback Adapter is now ready to use with the ei3 Enodia software.

Obtaining and Installing Enodia software.

The ei3-Enodia software can be copied from this link:

<http://www.ei3.com/enodia-2-1-0-4/>

To Use Enodia, complete machine device definitions are needed on the Platform.

Enodia can only be used when the platform definition of a device includes an explicit definition of the IP port that the device listens on for connections. So, an HMI using PC-Anywhere for remote control listens on port 5631. A Cube web server listens on port 80. An Ethernet enabled Siemens PLC is listening for connections on port 102. So, the device definition on the platform must include the port number for Enodia to work in a Remote Service Session. This is shown in the next section showing the example of using Enodia to assist a Remote Service session using Step-7 to a machine Siemens PLC.

Configuring the Platform for a Machine device to be available for use with Enodia

Edit Device Information

Partner Group (Login): ei3 Corporation

Customer: Amcor Tobacco Packaging Switzerland GmbH

Machine: LEMANIC Riviera

Name: S7 Line

Location: LEMANIC Riviera

Manufacturer - Category: Siemens - PLC

Model:

Argo IP Address: 10.240.57.51

Local IP Address: 172.17.5.1

Bus #:

TCP Port: 102



Communication Type: [N/A]

Connection Software: Siemens Step 7

Programing Software: Siemens Step 7

Help URL:

Click & Launch:

For use with Step-7, the Platform definition of a PLC with a direct Ethernet connection must specify that TCP Port 102 is to be used as the communication port for the device. Enodia software examines the platform device definition and will only allow communication from Step-7 to devices so defined. On the [eView](#) web site, navigate to the device configuration page and make sure that the device definition looks like this:

After entering the TCP Port, Click on the Save Button. The machine device is now configured to be used with Enodia. NO CHANGES SHOULD BE MADE TO EITHER THE ARGO OR LOCAL IP ADDRESSES.

If port 102 is not added, Enodia will refuse to allow a Step-7 connection to the PLC.

To enable full use of Enodia, all devices on the machine should have their ports completed on the

eView platform!

Starting Enodia and a Remote Service Session.

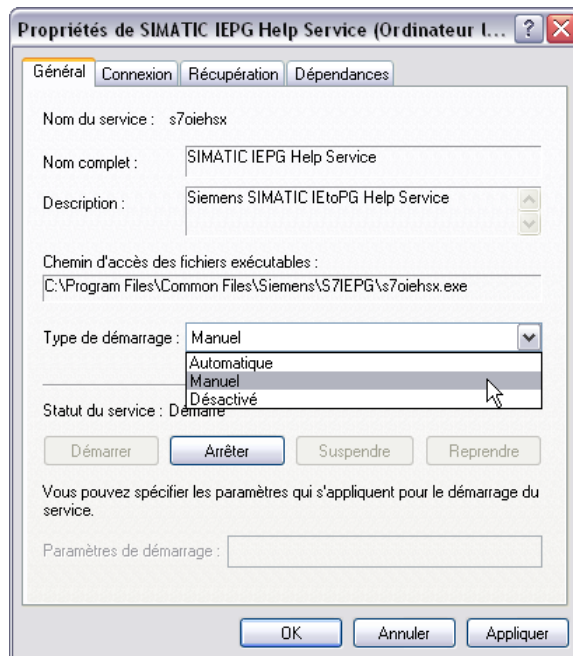
One starts a Remote Service session in the normal way on the eView platform.

Configuring Simatic Step-7 Software environment on your PC

The Simatic suite of software is quite complete and is very powerful. However, it includes a service named “Simatic IEPG Help Service” that will interfere with the proper functioning of the Enodia software. Therefore it is necessary to stop the IEPG Help Service before starting Enodia.

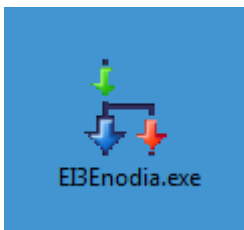
To do this follow these Steps:

1. Right-click on the icon "My Computer" and select "Manage."
2. Select "Services and Applications \ Services"
3. Select the SIMATIC IEPG line Help Service and double-click the item.
4. In the tab "General", select "Startup type: Manual".
5. Click Stop.
6. Close the window with "OK"
7. Leave the services window open , we will need later.

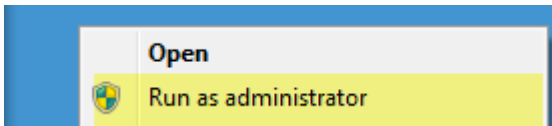


Using Enodia

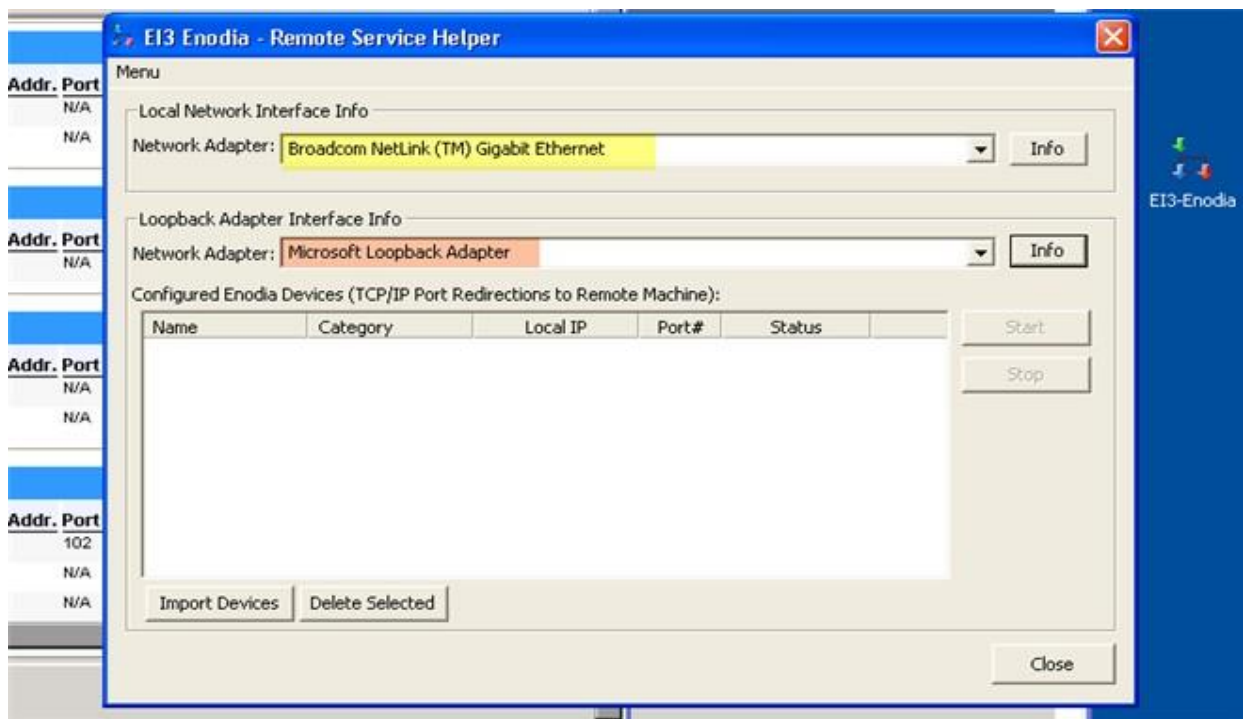
We launch enodia by clicking on it's icon on the desktop.



However, in a Windows-7 environment, be sure to right-click on it, and select the “Run as Administrator” option

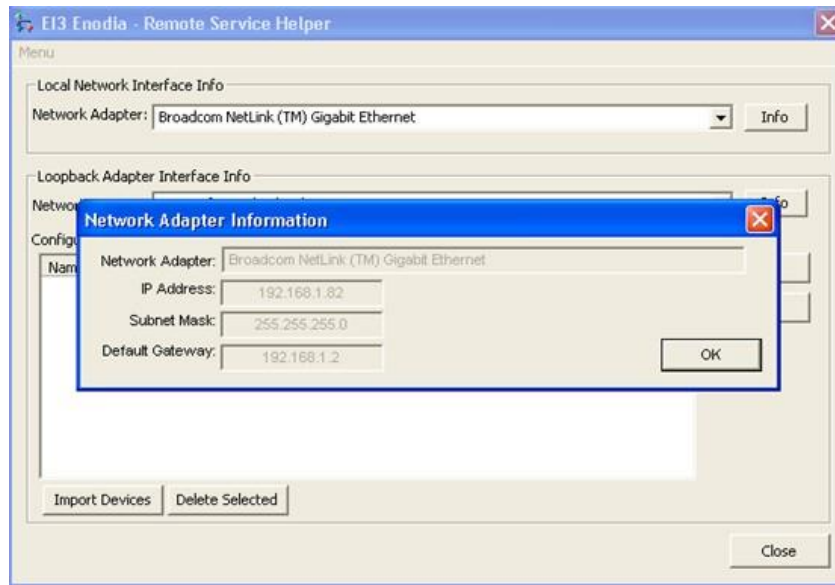


This is very important!!!

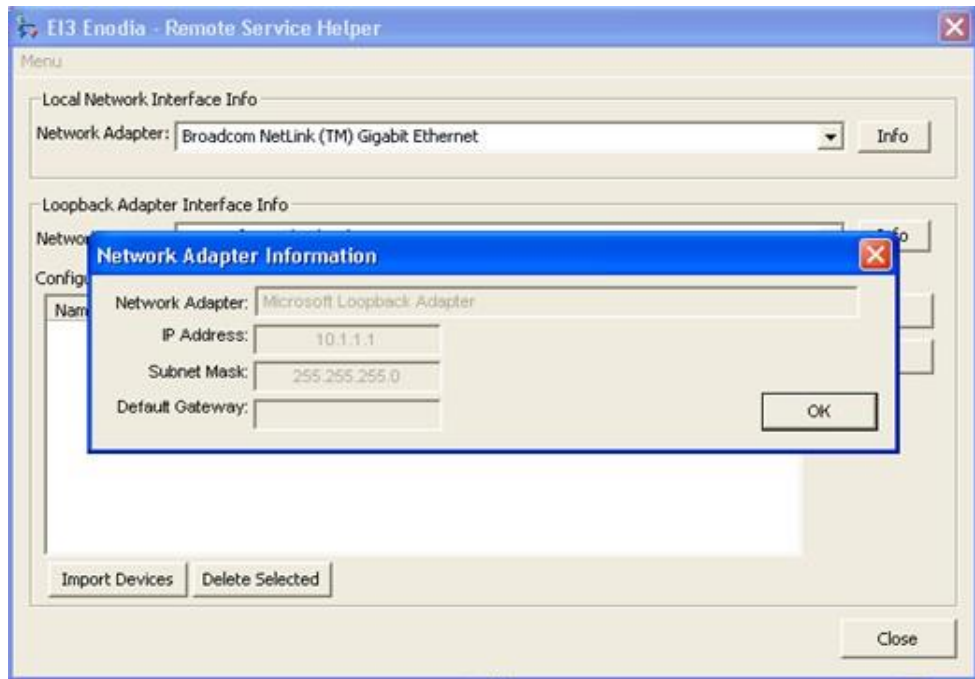


You will see that it shows two network adapters, the Broadcom Adapter is the network card in the test PC. The MS Loopback adapter is also shown as this is a valid network adapter since we installed it earlier.

You can click on the “Info” buttons next to each adapter to see the configuration of each:



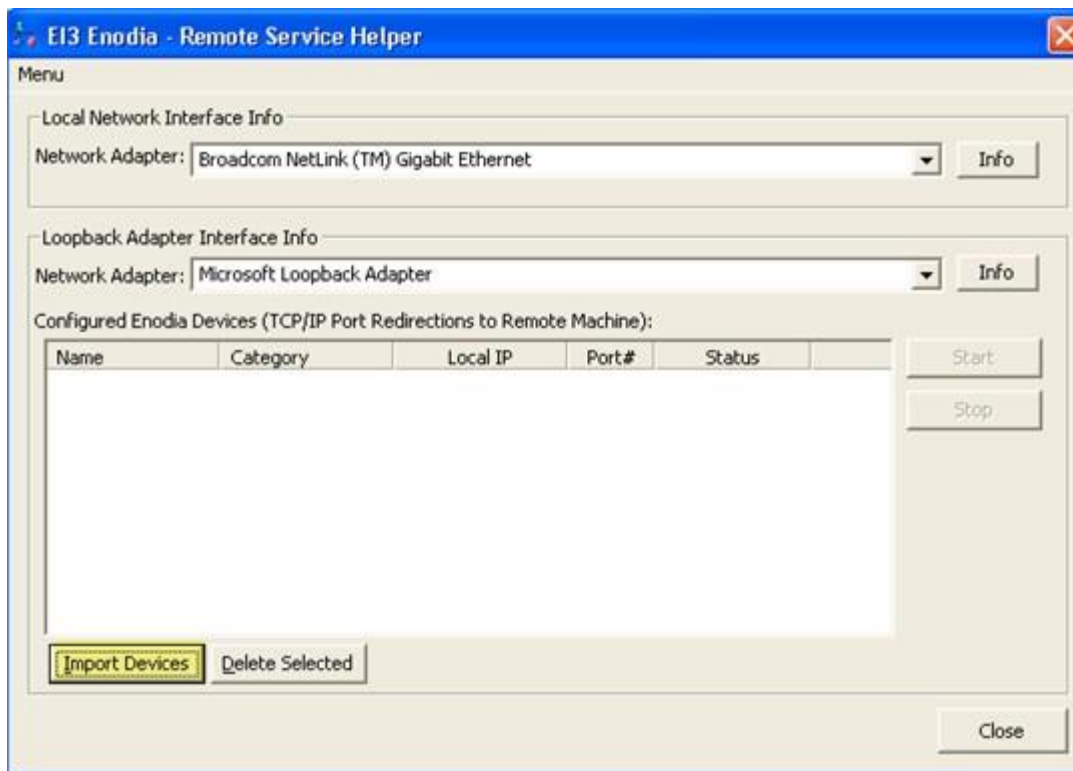
This shows the configuration of the Hardware adapter, and the next that of the Loopback adapter:



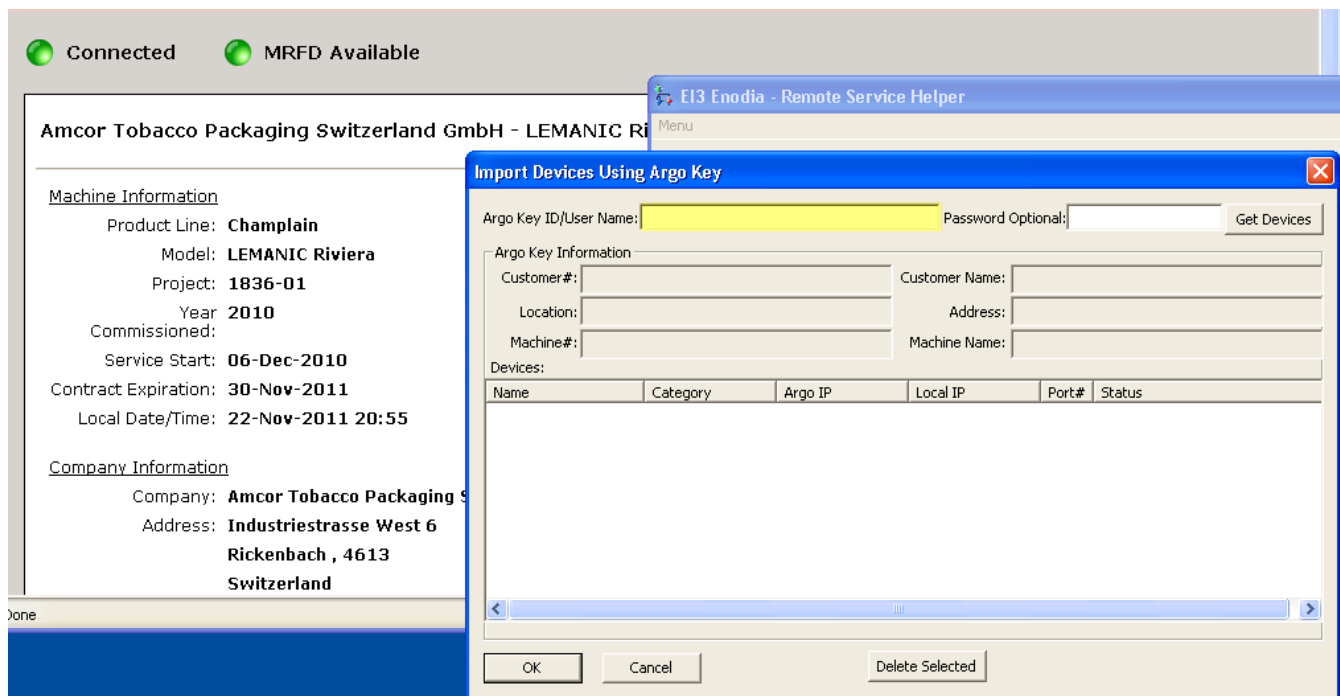
You may note that Loopback has the **static** IP address we configured into it earlier.

Clicking on OK in the “information” windows dismisses them.

To use Enodia, we next click on the “Import Devices” button on the Enodia main screen:



Doing so, then produces this screen:



Note that a new feature of Enodia working together with the new eView platform is to allow one to enter the user-name that one connects with to the platform.

So, I then enter my user name:

Import Devices Using Argo Key

Argo Key ID/User Name: Password Optional:

Argo Key Information

Customer#: Customer Name:

Location: Address:

Machine#: Machine Name:

Devices:

Name	Category	Argo IP	Local IP	Port#	Status
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OK Cancel Delete Selected

Then click on the “Get Devices” Tab.

The following screen appears:

Import Devices Using Argo Key

Argo Key ID/User Name: Password Optional:

Argo Key Information

Customer#: Customer Name:

Location: Address:

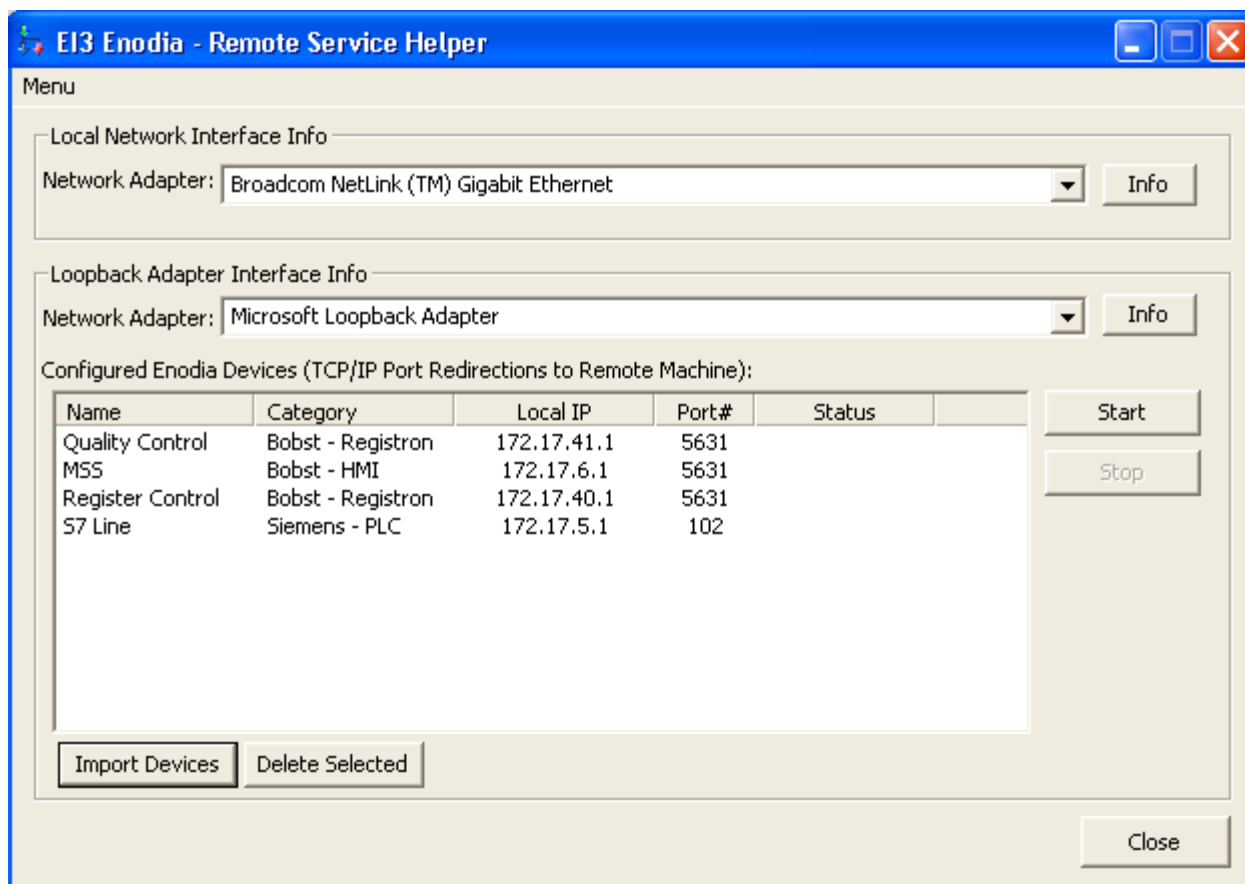
Machine#: Machine Name:

Devices:

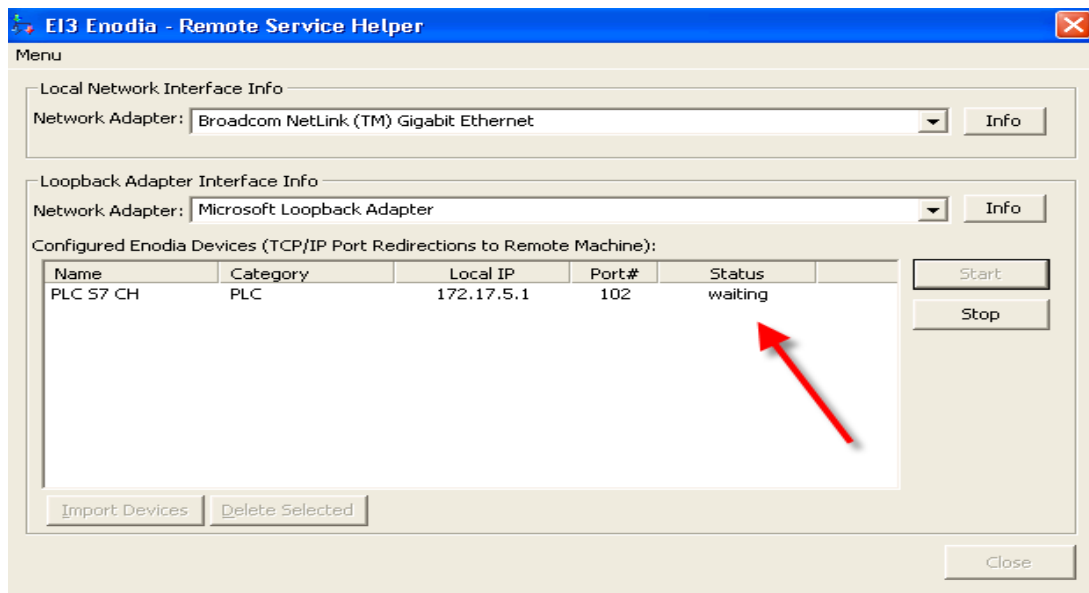
Name	Category	Argo IP	Local IP	Port#	Status
Embossing	Baumuller - Drives	10.240.57.42	172.17.9.22	---	Invalid Port#
Embossing	Baumuller - Drives	10.240.57.43	172.17.9.23	---	Invalid Port#
Embossing	Baumuller - Drives	10.240.57.44	172.17.9.24	---	Invalid Port#
Embossing	Baumuller - Drives	10.240.57.45	172.17.9.25	---	Invalid Port#
Embossing	Baumuller - Drives	10.240.57.46	172.17.9.26	---	Invalid Port#
Embossing	Baumuller - Drives	10.240.57.47	172.17.9.27	---	Invalid Port#
Flatbed Cutter	Baumuller - Drives	10.240.57.49	172.17.9.61	---	Invalid Port#
Register Control	Bobst - Registron	10.240.57.50	172.17.40.1	5631	No Errors
S7 Line	Siemens - PLC	10.240.57.51	172.17.5.1	102	No Errors
Flexo Cassette SIMO...	Siemens - PLC	10.240.57.52	172.16.1.254	---	Invalid Port#

As you can see, by using a valid username for the current Service session, Enodia has queried the database of machines and devices and has listed all the relevant information about this machine's devices. Further, Enodia has verified that the PLC can be reached using port 102 as desired. The "Invalid Port#" message indicates that these machine devices are not configured on the platform to use the ports for their specific programing tools. The Register Control PC uses PC-Anywhere. Since its port, 5631, was entered into the device definition for this devices it will be available through the Enodia Remote Service Helper. In fact, each device listed has a "Programing" or "Viewing" application. If the ports for these are entered into the device "port" definition field of the eView platform, then these are available through Enodia. **(Note that device definitions can only be changed or edited by your Company's Administrators.)**

So, we next click on the "OK" button, and we see this screen. Note, we only see the devices that have the port defined in the platform devices definition. This version of Enodia will support up to 32 active port redirections simultaneously. That is Enodia can support communications up to 32 devices simultaneously.



Now we click on the “Start” button to get Enodia to connect to the PLC in the machine:

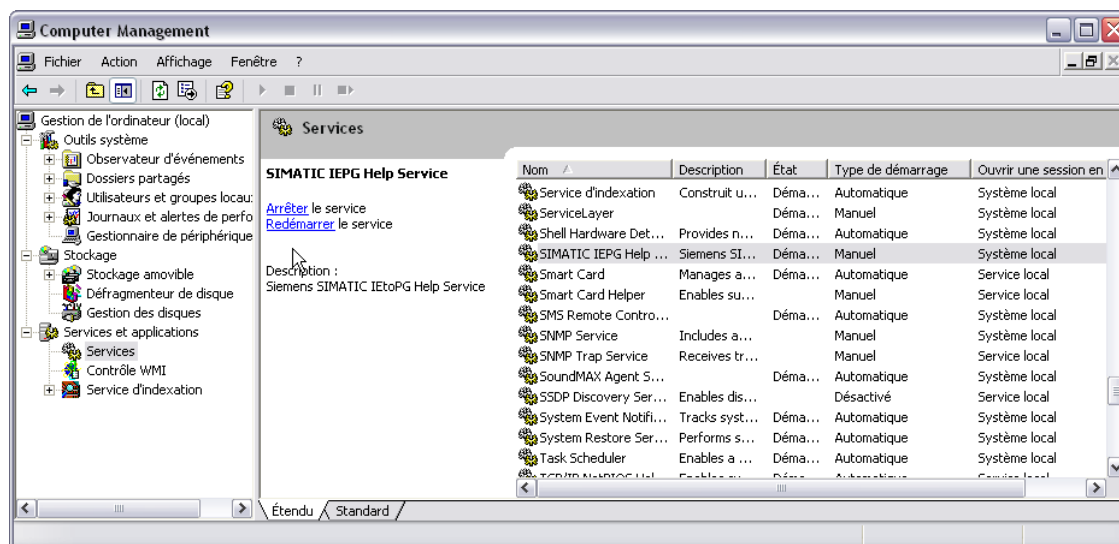


Note that the status of Enodia has changed to “waiting”. This means that it is ready to mediate communication between Step-7 software on the technician laptop and the remote PLC in the machine.

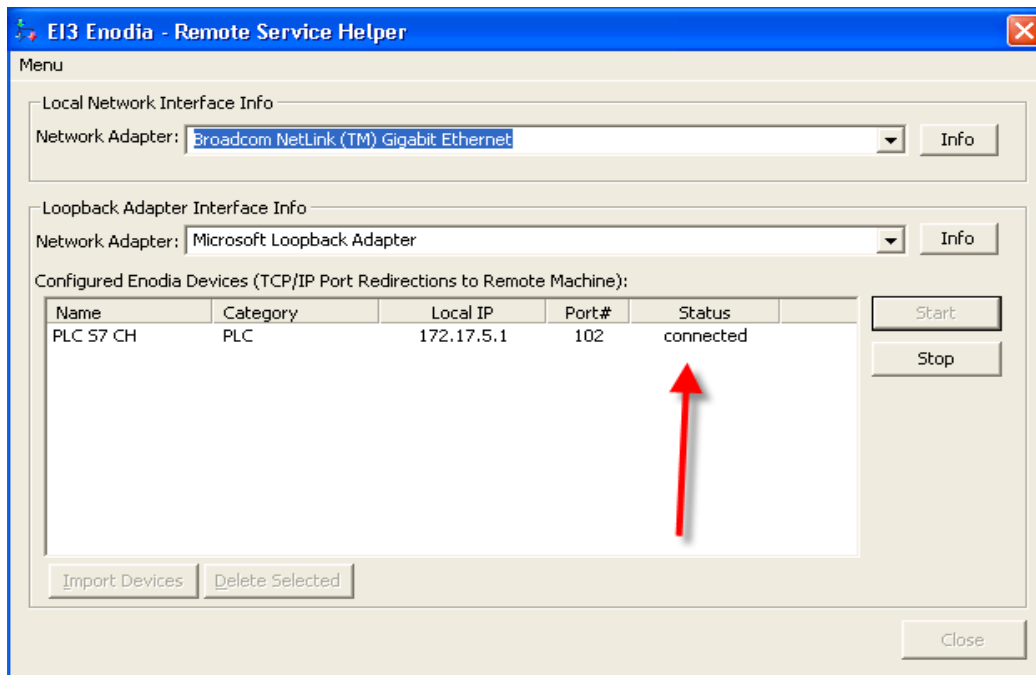
VERY IMPORTANT!!!

Earlier, in the section titled: “**Configuring Simatic Step-7 Software environment on your PC**”, you were asked to Stop the **Simatic IEPG Help Service** if it was running. At this point where Enodia is connected and waiting, you **MUST** start the **Simatic IEPG Help Service** in order for Siemens Step 7 software to work properly.

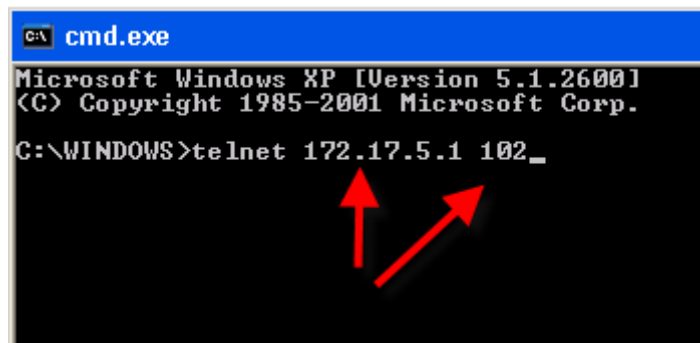
You can start the Service here:



When a program on the PC is connected to the PLC, the status that Enodia shows changes to “connected”



This can be emulated on a PC without Step-7 by the following command:

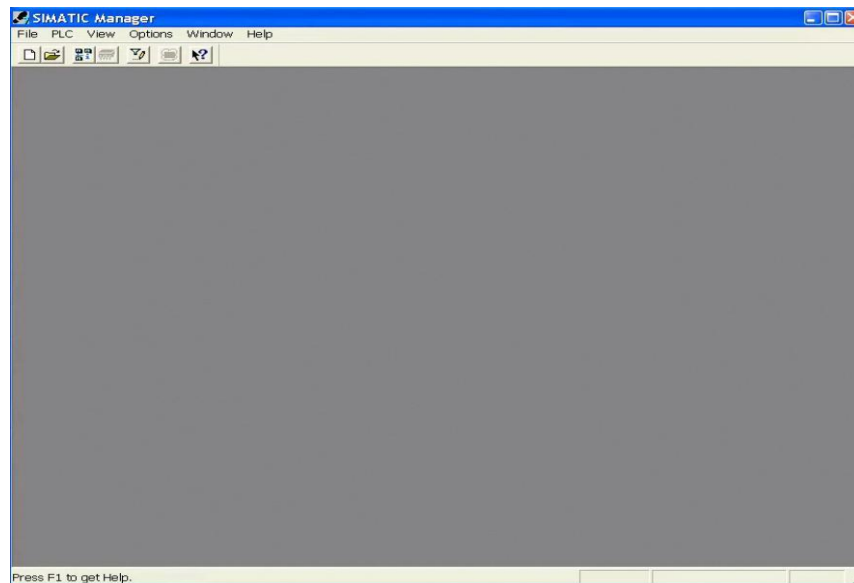


Note that we are using the address of the PLC as it actually is on the machine and the port used by Step-7 to communicate with the PLC. When the connection is made, the status shown in Enodia will change from waiting to connected. When the connection ends, the status will revert to waiting.

Configuring Simatic Step-7 to work with Enodia

Step-7 is a powerful and complex program with many options. The most important option to set in Step-7 for working with an Enodia enabled Remote Service Session is the proper configuration of the PG/PC interface parameter. The following demonstrates how to do this.

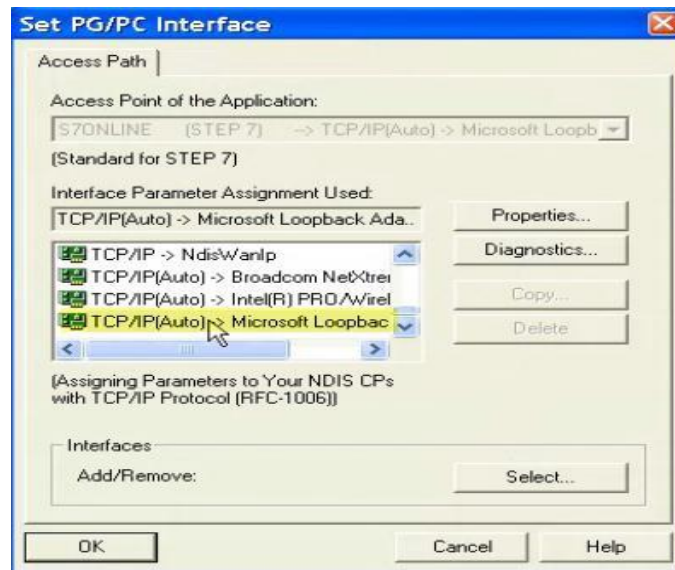
1. Open Simatic Manager:



2. Choose Options/Set PG/PC Interface:

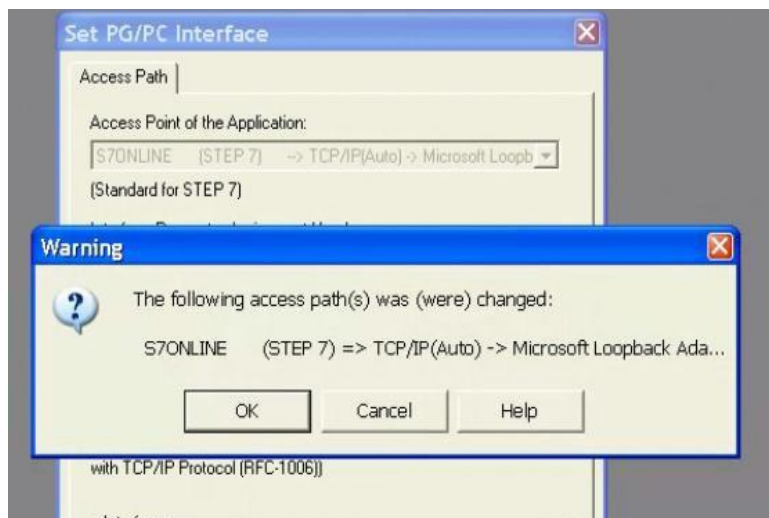


3. Scroll down the list of available Interface Parameters to the Microsoft Loopback Adapter:



and click on OK.

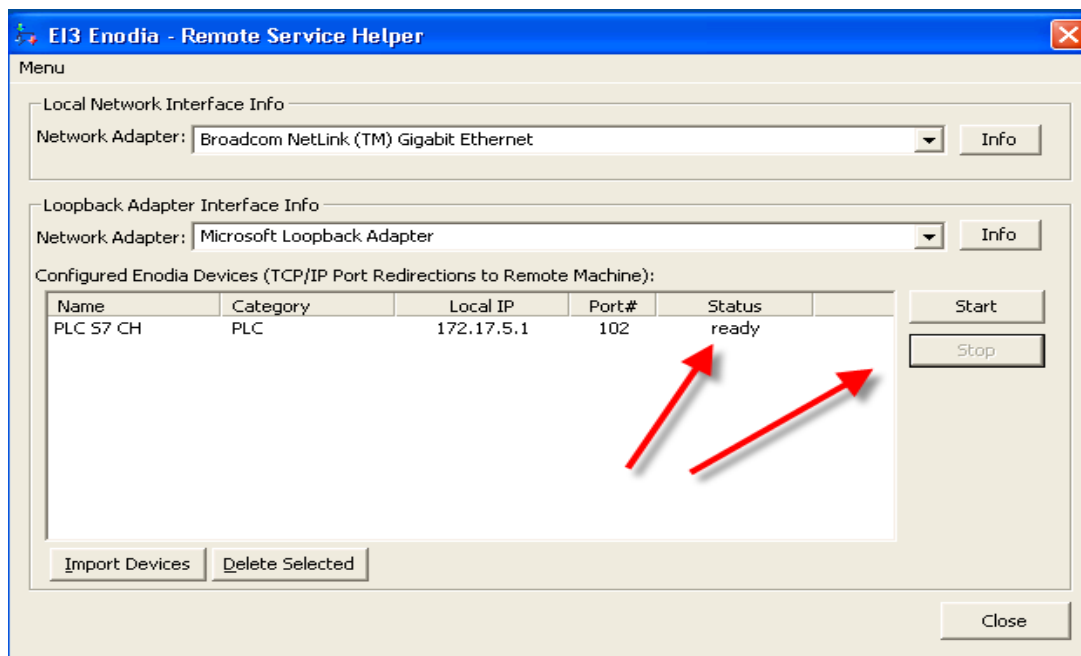
4. The following appears:



Click on OK and then,

5. Open the Project, Access Remotely, and Go Online.

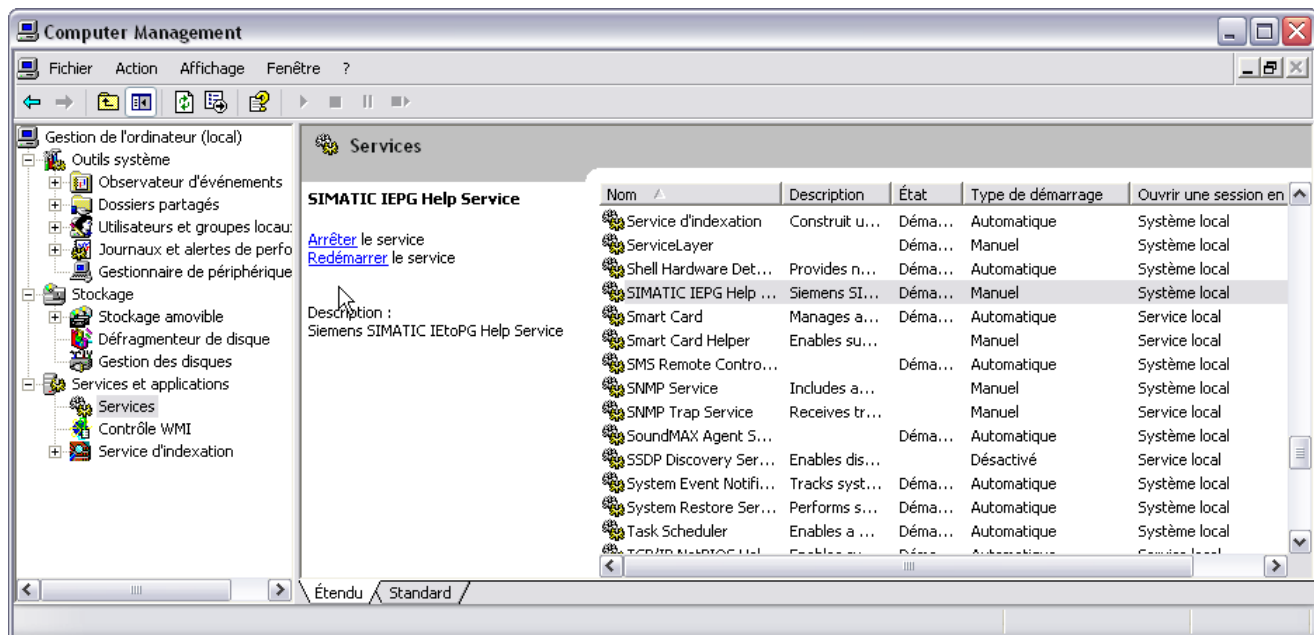
Finally, when the user has completed the remote intervention, the Enodia connection should be stopped by clicking on the Enodia “Stop” button. This will change the status from “waiting” to “ready” as shown below:



Note the status is “ready” and “Stop” is unavailable as Enodia is ready to be either restarted or closed. Since we are done with remote intervention, we choose “Close”. The Enodia program closes and the Remote Service session can be ended.

Closing the Simatic IEPG Service Window

As the final step, you should close the service management window for the IEPG Help Service that you opened earlier.



Do this by clicking changing the mode back to Automatic and then start the service.

Conclusion

We have demonstrated how Enodia can be used to enable software on the technician PC to communicate over the Argo e-Service network in a way that makes the Network Address Translation completely transparent to both the software and the target device.

We have given this demonstration in the context of a connection from Simatic Step-7 on the technician's PC to a PLC in a Remote Machine. The same techniques can be used with Argo and Enodia to enable the use of machine local IP addresses for any device with any "Programing Tool" on the machine that uses TCP as the communications transport.