

Only for eWON types equipped with a MPI port

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## 1 Purpose

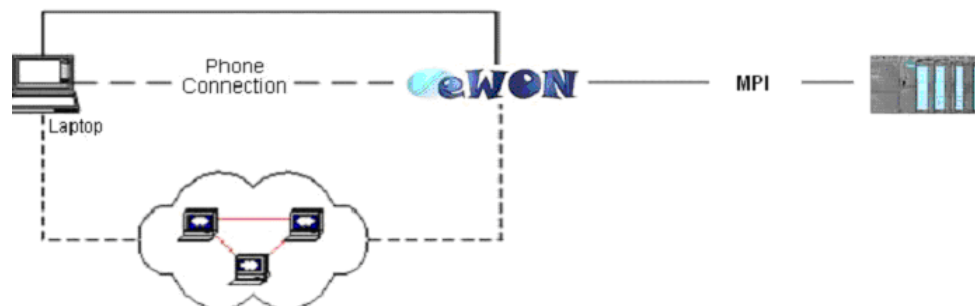
This technical note describes how to set up a remote collaboration. A remote collaboration consists in configuring, programming or monitoring a PLC from a remote location, without the need of connecting directly the PC to the PLC. A remote collaboration therefore involves a TCP/IP connection and eventually a router, depending on the protocol used by the PLC.

In this document, we will configure a complete remote collaboration system with a SIEMENS S7300 PLC, the SIMATIC STEP7 Programmer software and, of course, an eWON as a router. The S7300 uses the MPI protocol.

Three cases of remote collaboration will be treated:

- A direct connection to the eWON by Ethernet.
- A direct connection to the eWON using a phone line. With this topology, the eWON IP address is known since it is established with your own PC at the PPP connection time.
- A connection to the eWON using Internet and callback. This kind of connection can be used with callback: we call the eWON and let ring a certain amount of time and we hang up. After a specified amount of time, the eWON connects to an ISP using its phone line. In this case, the eWON IP address is not known so that the eWON must publish it's address, by mail for instance.

The following graph shows the three network topologies.



The direct Ethernet connection will be used to describe the global setup. After this configuration is working, the changes for the phone and Internet topologies will be described.

In order to follow this technical note, you need:

- An eWON equipped with a MPI port, a PSTN or ISDN modem and a firmware release that supports MPI and ISOTCP protocols for the S7300 and S7400 PLCs.
- A modem connected to your PC for direct phone connection with the eWON.
- An Internet connection account both for your PC and for the eWON.
- An S7300 (or S7400 PLC) equipped with a MPI port
- A RS485 cable to connect the PLC to the eWON.
- SIMATIC MANAGER STEP 7 -Programmer (in this example V5.3 is used)

In this document, we use Windows XP but any supported operating system can be used. We also assume the reader has some knowledge of the SIMATIC STEP 7 Programmer software.

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## 2 Configuration Steps Overview

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Starting with an eWON out of the box, this document will show how to set up a remote collaboration using several steps. The purpose of some of the steps is to test what has been set up so far. Those steps are therefore not absolutely necessary but can be really useful to localize a potential problem. The steps are:

- eWON S73&400 Configuration
- Set up a tag to test the S73&400 configuration
- Upload (from PLC to PC) a program using eWON as Gateway
- Display data online using eWON as Gateway
- Download (from PC to PLC) a program using eWON as Gateway
- Connecting to your PLC using a phone line
- Connecting to your PLC using an internet connection

## 3 eWON Configuration

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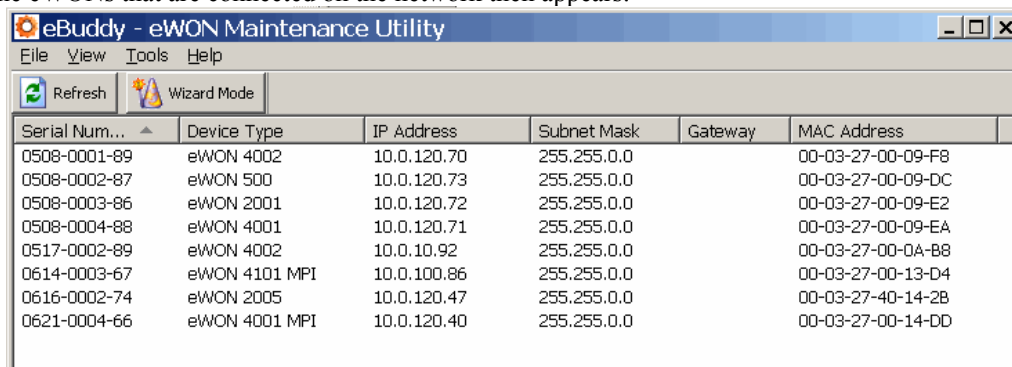
### 3.1 eWON IP address configuration

The eWON is configured through its web server<sup>1</sup>. Right out of the box, the eWON has “10.0.0.53” as IP address. You can find the eBuddy utility on the eWON web site (<http://www.ewon.biz> (Support/Download Software)). This utility allows to find an eWON on the network and to change its IP address to match your LAN IP addresses range.

#### ◆ Finding an eWON on the network with eBuddy

Launch eBuddy.exe and click CTRL+L to switch in list mode if not the case.

The list of the eWONs that are connected on the network then appears:



Serial Num...	Device Type	IP Address	Subnet Mask	Gateway	MAC Address
0508-0001-89	eWON 4002	10.0.120.70	255.255.0.0		00-03-27-00-09-F8
0508-0002-87	eWON 500	10.0.120.73	255.255.0.0		00-03-27-00-09-DC
0508-0003-86	eWON 2001	10.0.120.72	255.255.0.0		00-03-27-00-09-E2
0508-0004-88	eWON 4001	10.0.120.71	255.255.0.0		00-03-27-00-09-EA
0517-0002-89	eWON 4002	10.0.10.92	255.255.0.0		00-03-27-00-0A-B8
0614-0003-67	eWON 4101 MPI	10.0.100.86	255.255.0.0		00-03-27-00-13-D4
0616-0002-74	eWON 2005	10.0.120.47	255.255.0.0		00-03-27-40-14-2B
0621-0004-66	eWON 4001 MPI	10.0.120.40	255.255.0.0		00-03-27-00-14-DD

#### ◆ Setting the IP address from an eWON

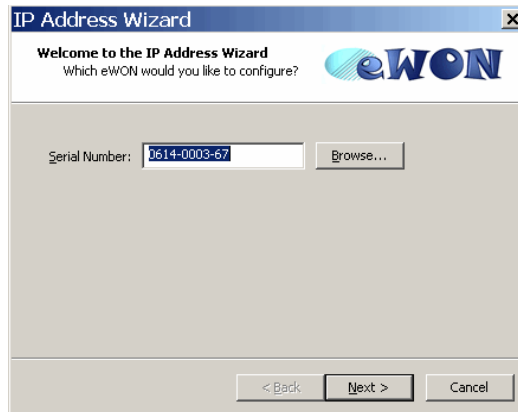
If the eWON you want to set the IP address is in the list, just right-click on it, and select Set IP Address in the contextual menu (if the eWON is not in the list, then right-click in the blank area under the list):

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<sup>1</sup> It is also possible to configure the eWON by dropping into it a file using a FTP client, but this is a more complex process that is explained in the eWON Reference Guide.

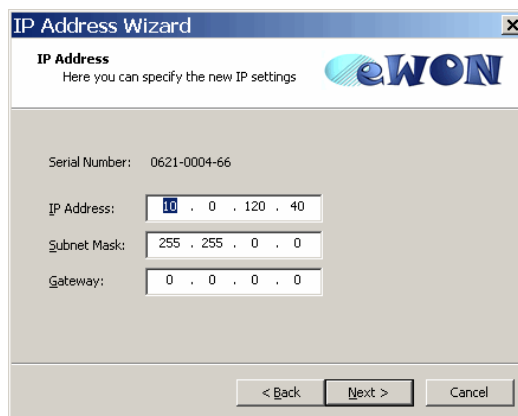
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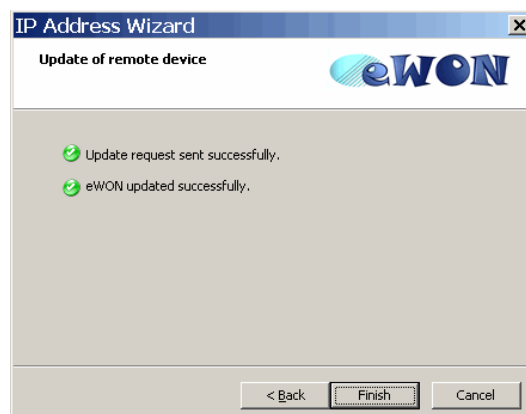
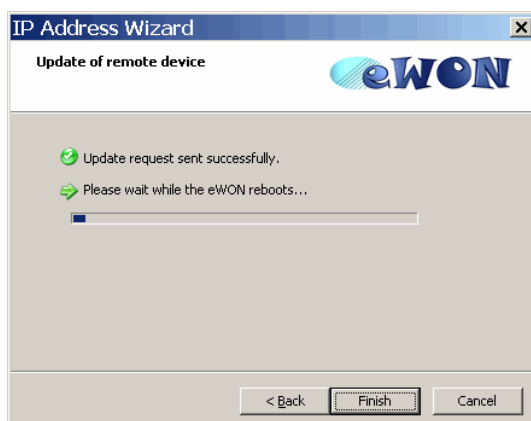


Enter the eWON serial number in the Serial Number field if not yet done, or click on the Browse button to search the eWON.

Once the serial number entered, click on Next and set the IP Address and Subnet Mask:



Then click on Next again to launch the update and wait for the eWON to reboot:



When done, click on Finish to exit from the IP Address Wizard.

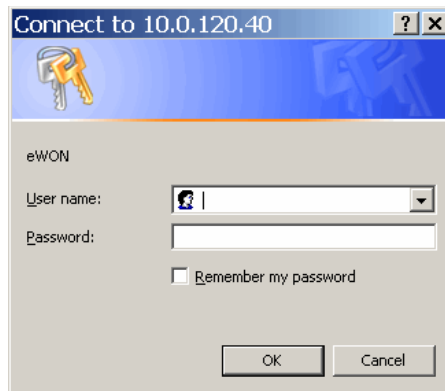
Now your eWON should appear in the eBuddy list with the new information you have entered.

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### 3.2 eWON Web Site

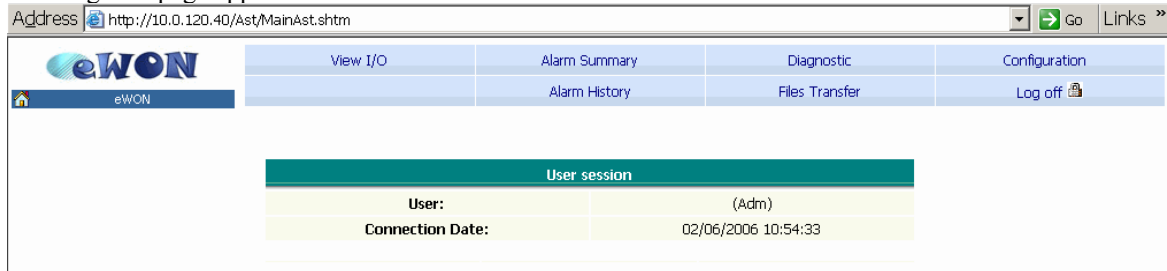
We have assigned an IP address to the eWON, so we can reach its HTTP server to configure it. Open a Web browser and type the address you assigned to the eWON in the address bar (10.0.120.40 here). The following login page appears:



A pre configured adm user exists to allow the first configuration<sup>2</sup>.

- User name: adm
  - Password: adm
- Then click OK

The following web page appears:



In the upper part of the web page you will find a menu bar allowing you to navigate through the different web pages of your eWON. For example to configure your eWON click on the Configuration menu button.

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<sup>2</sup> The default password of the adm login MUST be changed for obvious security reasons. Refer to the Reference Guide for explanation on how to change a user password.

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### 3.3 S73&400 IO Server configuration

Now that we have access to its web site, we will configure the eWON to connect to a S7300/400 PLC. The eWON embeds what is called IO Servers. Those servers are responsible of collecting the data on the PLCs and make them available for further usage (Gateway).

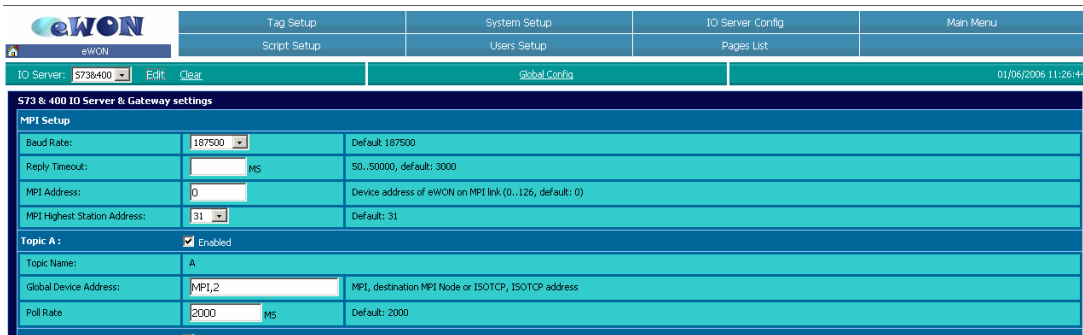
Connect the PLC MPI port to the eWON MPI port (serial port) using a RS-485 cable.

The eWON IO servers are configured by using a specific web page you can reach by following the link:

Configuration → IO Server Config



Select the **S73&400** in the IO Server drop down list. The following page appears:



Set the **Baud Rate** to the MPI transmission rate of your PLC (187500)  
Set the **MPI address** to the MPI address of your eWON (0)  
Set the **MPI Highest Station Address** to 31  
Check the **enable** box for **topic A**  
Set the **Global Device Address** to MPI,# ; where # represents the MPI address of your PLC (MPI,2)  
Set the **Poll Rate** to 2000

Click **Update Config**

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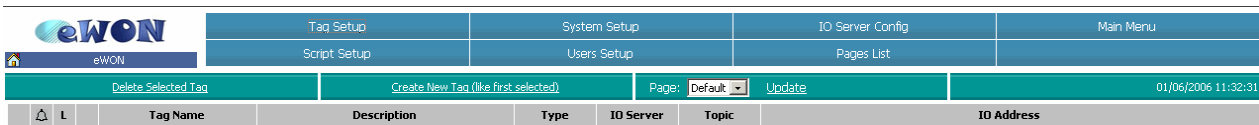
### 3.4 Checking the MPI connection

We will now create a tag to read a variable in the PLC.

The creation of a Tag is done in the Tag Setup page.

**Configuration → Tag Setup**

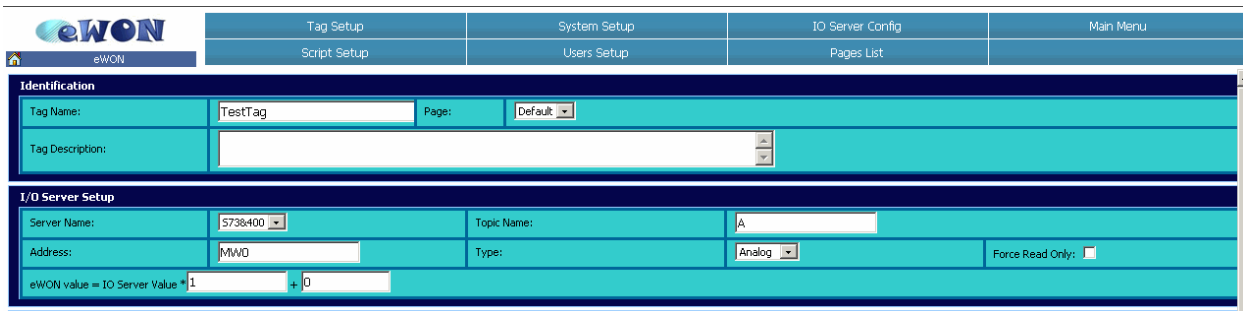
The following page appears:



Select **Create New Tag**

The **Tag Setup** page appears. The page is composed of four or six parts (depending on the eWON type) that allow you to configure the Tag configuration fields (such as the Tag name and Tag Description, the Tag I/O Server Setup, the Tag visibility,...).

In this tutorial, we will only care about the Tag name and IO server.



Set the **Tag Name** to TestTag  
Set the **Page** to Default  
Set the **Server Name** to **S73&400**  
Set the **Topic Name** to A  
Set the **Address** to an accessible item address in your PLC (MW0)  
Set the **Type** to Analog  
Let the **eWON value** to 1 and 0  
  
Click **Add/Update Only**

Now that we have created the tag, we will check it's value.

**Main Menu → View I/O**

The following page will be displayed:

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The screenshot shows the eWON web interface. At the top, there are navigation tabs: View I/O, Alarm Summary, Diagnostic, and Configuration. Below these, there are sub-tabs: Alarm History, Files Transfer, and Log off. A green bar contains 'Show Graph For Selection', 'Page: Default', and 'Update'. The main table has columns: Tag Name, Value, New Value, and Description. The 'TestTag' row shows a value of 50 and a 'New Value' input field containing '50'. An 'Update' button is located below the 'New Value' field.

Change the **New Value** of the TestTag and click **Update**.

To check if the new value has been correctly written to the PLC click on the **Page Update** button to read again the value in the PLC.

To verify the function of the MPI tag polling, you can also have a look at the Event log.  
The Event log can be reached under:

Diagnostic → EventLog

The screenshot shows the eWON web interface with the 'Event Log' tab selected. The 'Event Class' is set to 'All Events' and the 'Reporting Level' is set to 'Trace'. The 'Per Page' is set to 20. The log table has columns: Time, Event, Description, Originator, and Help. The log shows several 'mpi-Read failed' events and one 'stdios-Device ENTERS slow poll mode' event.

Time	Event	Description	Originator	Help
31/05/2006 13:23:19	1073768629	stdios-Device LEAVES slow poll mode (S738400 - Address 258 -)	s74srv	
31/05/2006 13:23:19	-31205	mpi-Read failed	s74srv	
31/05/2006 13:23:16	-31205	mpi-Read failed	s74srv	
31/05/2006 13:23:13	-31205	mpi-Read failed	s74srv	
31/05/2006 13:23:10	-31205	mpi-Read failed	s74srv	
31/05/2006 13:23:07	26804	stdios-Device ENTERS slow poll mode (S738400 - Address 258 -)	s74srv	

Set the **Event Class** to All Events and the **Reporting Level** to Trace and click **Update**.

If you don't succeed in reading a value in the PLC please check again the MPI address and the MPI Transmission rate you defined in the S73&400 IO-Server config.

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## 4 Using eWON Gateway functions:

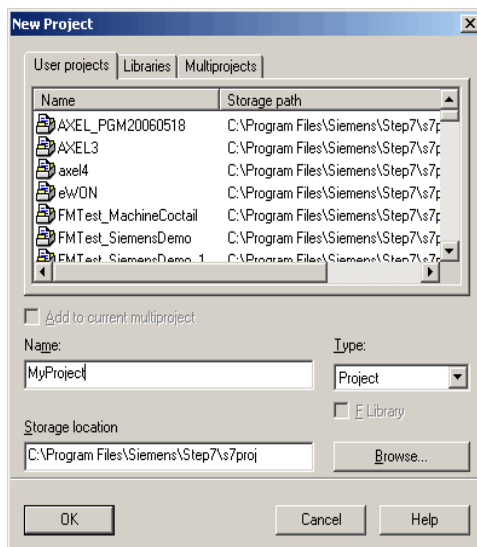
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### 4.1 Upload a program

We will now explain how to upload a program from the PLC to your PC.

- 1) Start the Step7 application.
- 2) Create a new project in your Step7 application.

File → New



Enter the Name of the new Project and click OK.

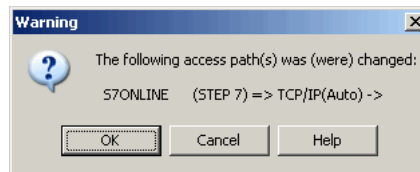
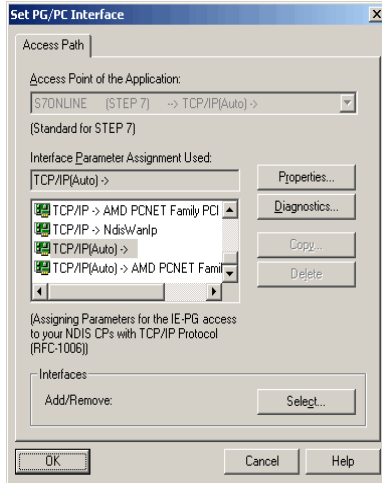
- 3) Set the PG/PC Interface

Options → Set PG/PC Interface

Select the TCP/IP interface you are using to connect to the eWON and click OK. (In our example TCP/IP(Auto))

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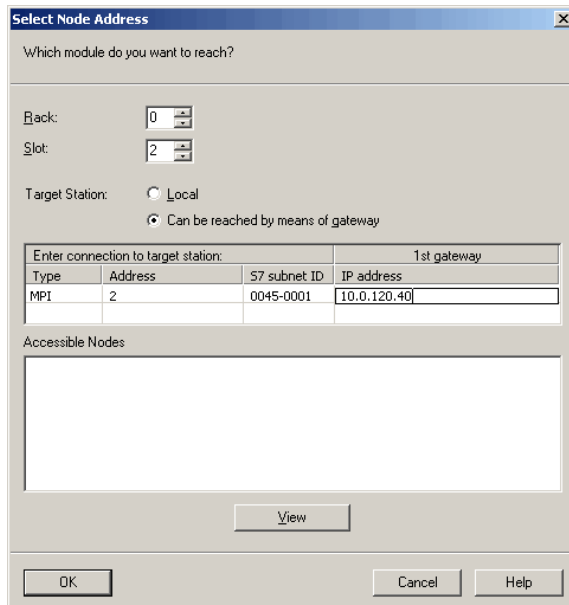
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Click **OK** to confirm the change.

#### 4) Upload the program

PLC → Upload Station to PG



Enter the following parameters:

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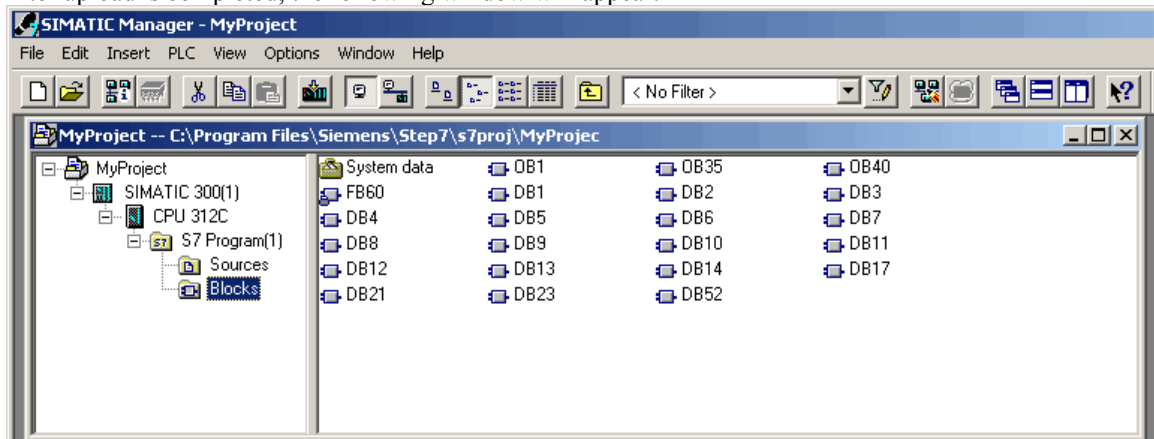
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Set the Rack and Slot number corresponding to the CPU of the PLC to reach (**Rack:0, Slot:2**)  
Check the Target Station «**Can be reached by means of gateway**» option.  
Fill the «Enter connection to target station» with following values:

- **Type:** MPI
  - **Address:** MPI address of your PLC (2)
  - **S7 subnet ID:** the MPI Subnet ID of your PLC (0045-0001)
- Fill the «**1<sup>st</sup> gateway**» with following value:
- **IP address:** your eWON IP address (10.0.120.40)

Click **OK** to start the upload

After upload is completed, the following window will appear:



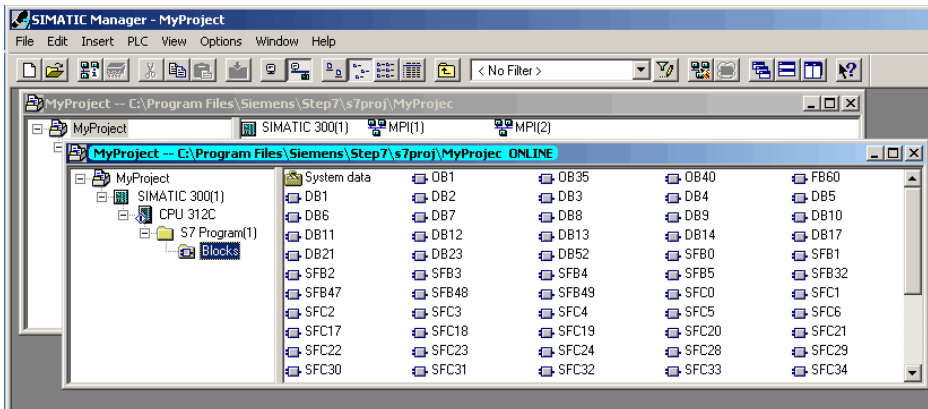
Only for eWON types equipped with a MPI port

## 4.2 Go Online

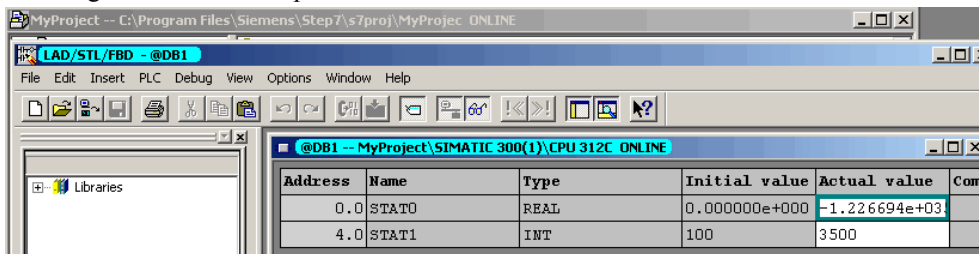
Once the program uploaded to your PC you can switch to online mode in your Step7 application.

View→ Online

The following window will be displayed:



To display the data of a datablock for example double click the datablock in the Online window.  
The following window will be opened:



Click on the glasses icon to display the data online.

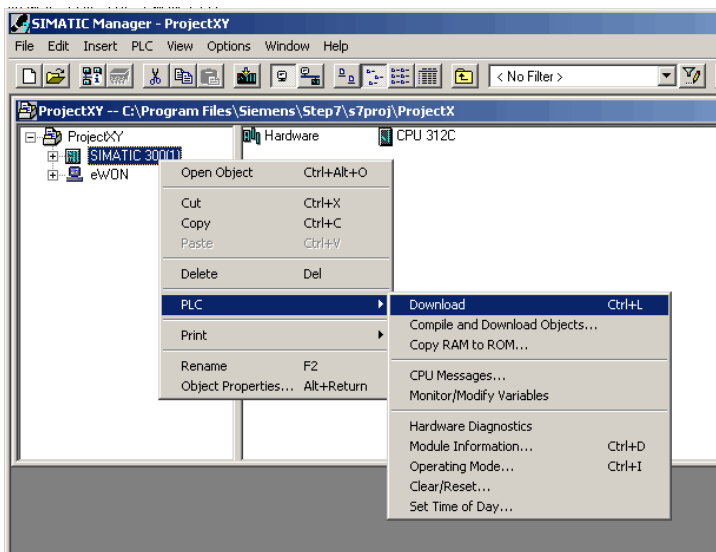
Note: You can also see the data online by creating a variable table (VAT\_1) in the offline display. For this you don't have to switch all the program to the online mode. Only open the variable table in the offline display and click on the glasses icon to monitor the variables.

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### 4.3 Download a Program

When you first made an upload of a program through your eWON, then the download of the program is very simple because Step7 stores the gateway (= eWON) used for the Upload. You only will have to select the PLC in the Step7 application and choose PLC → Download.



When Step7 doesn't know the right gateway, follow the steps below to download a program:

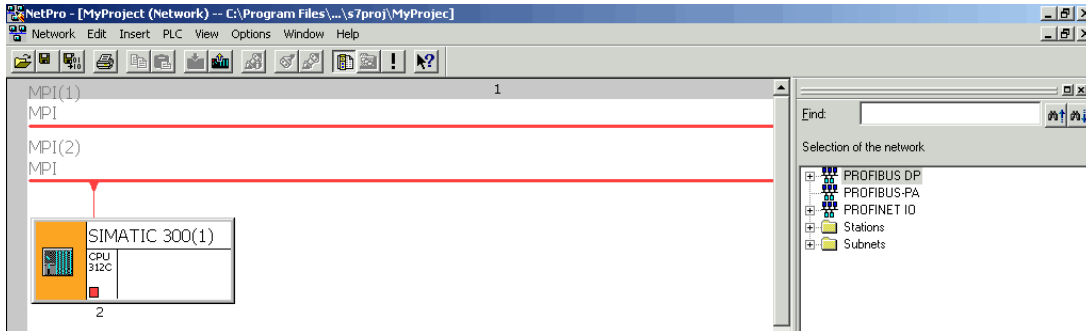
- 1) First download the «**eWON gateway station file for STEP7**» (**eWON.cfg**) from our web site. (<http://www.ewon.biz> (Support /Documentation /Technical notes – Miscellaneous)).

In appendix 1 we explain also how to create the «**eWON gateway station file for STEP7**» from scratch.

- 2) Configure the eWON S73&400 IOserver to set the eWON Baud Rate to the MPI transmission rate of your PLC. (refer to chapter 3.3 S73&400 IOserver configuration)
- 3) Start the Step7 application
- 4) Open the program you want to download to the PLC.
- 5) Open the NetPro window

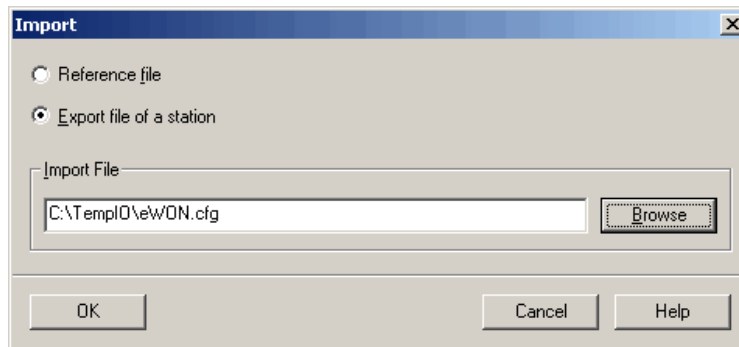
Options → Configure Network
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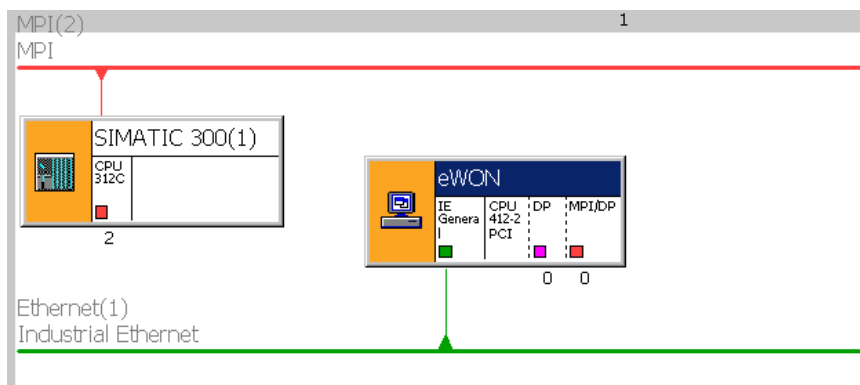


- 6) Insert the eWON gateway station file you downloaded just before.

Edit → Import



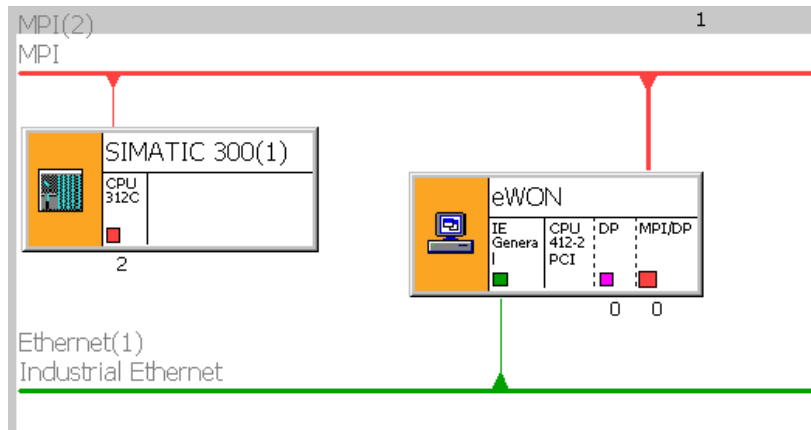
**Browse** to select the **eWON.cfg** file and click **OK**.  
The eWON gateway will now be displayed in the network layout:



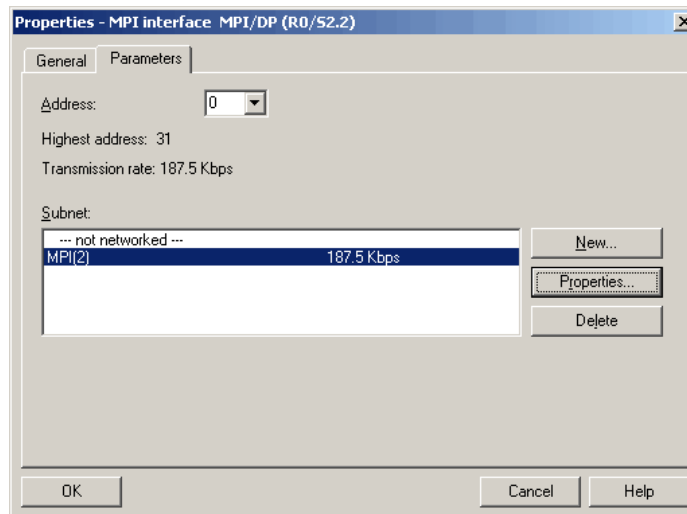
If you have problems with the importation of the eWON.cfg file refer to appendix 1 explaining how to create the «eWON gateway station file for STEP7» from scratch.

- 7) Link the MPI interface of the eWON to the MPI network of your PLC.  
To do this, click on the red square of the eWON and drag it to the MPI network.

Only for eWON types equipped with a MPI port



- 8) Open the MPI interface of the eWON by a double-click on the red square and check if the **MPI address**, the **transmission rate** and the **Subnet-ID** are correctly set. (Use the **Properties...** button for details)

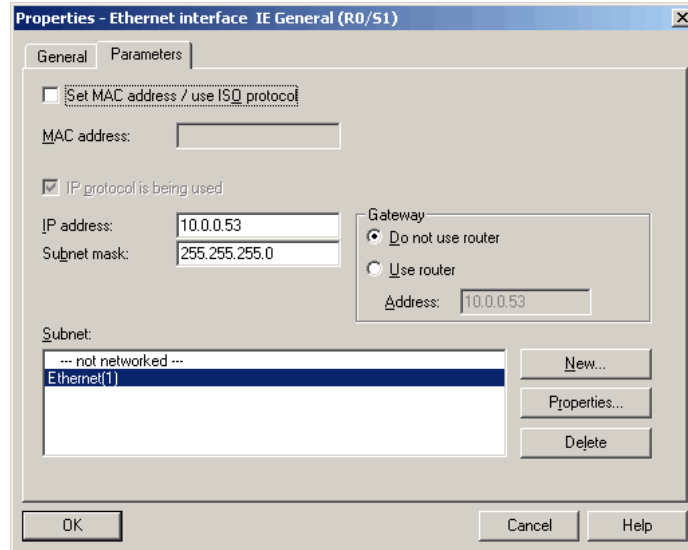


Click **OK** to close the Properties window.

- 9) Open the Ethernet interface of the eWON by a double-click on the green square.

Only for eWON types equipped with a MPI port

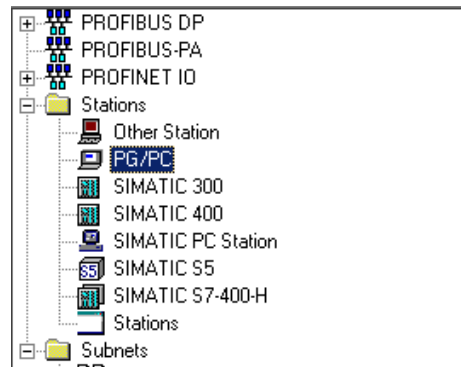
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Set the **IP address** and **Subnet mask** of your eWON.  
Click OK.

10) Add a PG/PC Station to the network layout.

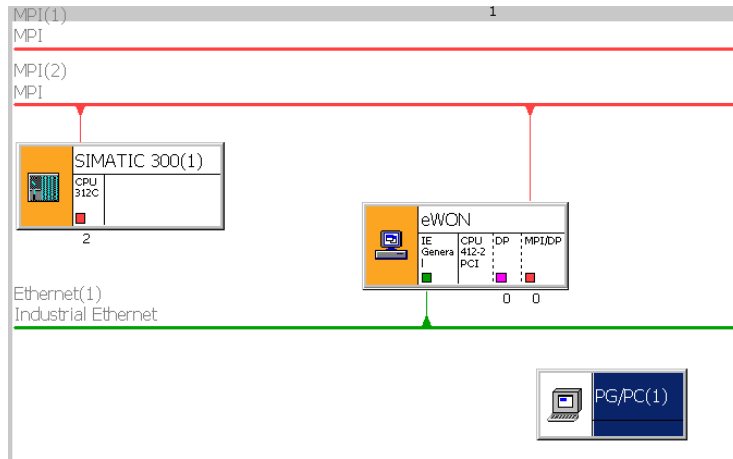
Insert → Network Objects



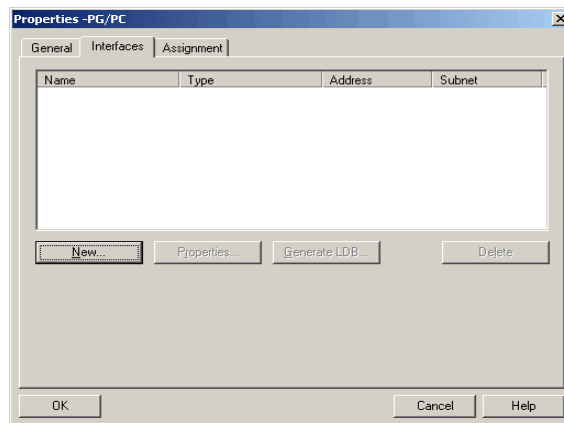
Double-click on the **PG/PC Station**.

The PG/PC will be added to the network:

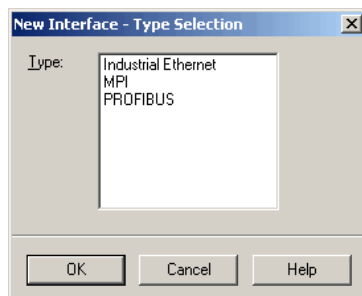
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**Right click the PG/PC and click on Option Properties...**  
Select the **Interfaces** tab :

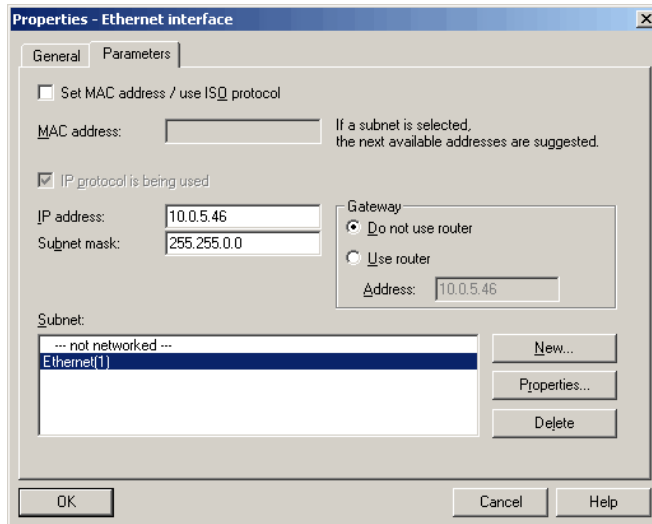


Click **New**



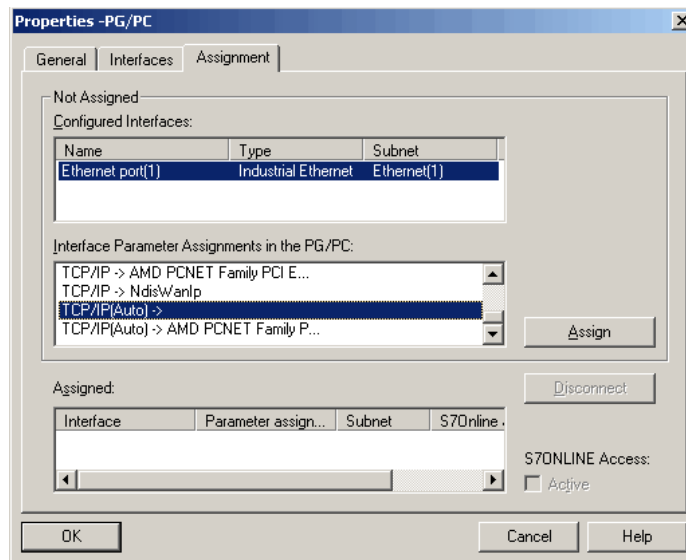
Select the **Industrial Ethernet**, and click **OK**.

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**Deselect** the «Set MAC address / use ISO protocol»  
Set the **IP address** and the subnet mask of **your PC**.  
In the Subnet window on the bottom of the page select **Ethernet(1)**  
Click **OK**.

Go to the **Assignment** tab of the properties page:

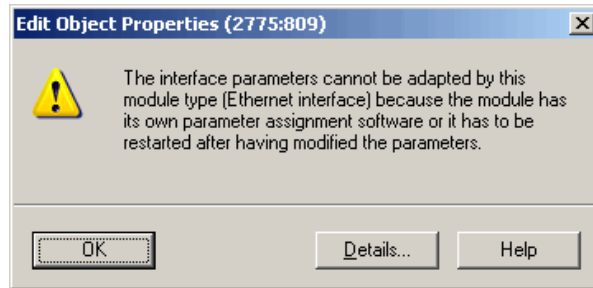


In the «Interface Parameter Assignments in the PG/PC» select the TCP/IP interface you are using to connect to the eWON. (In our example **TCP/IP(Auto)**)

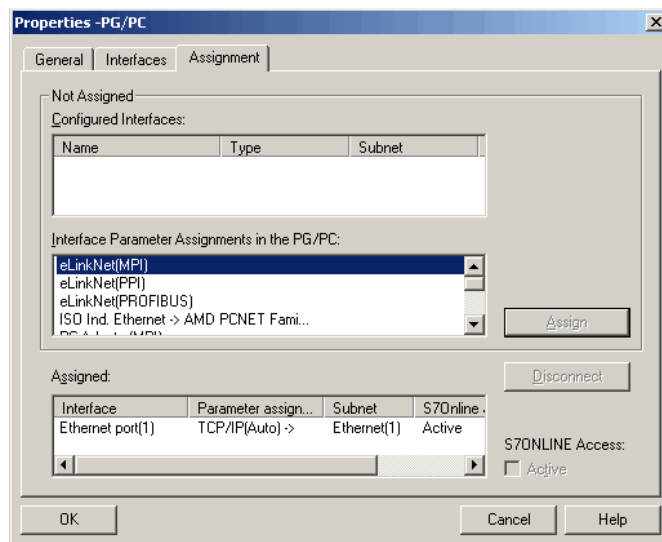
Click the **Assign** button.

The following message could be displayed:

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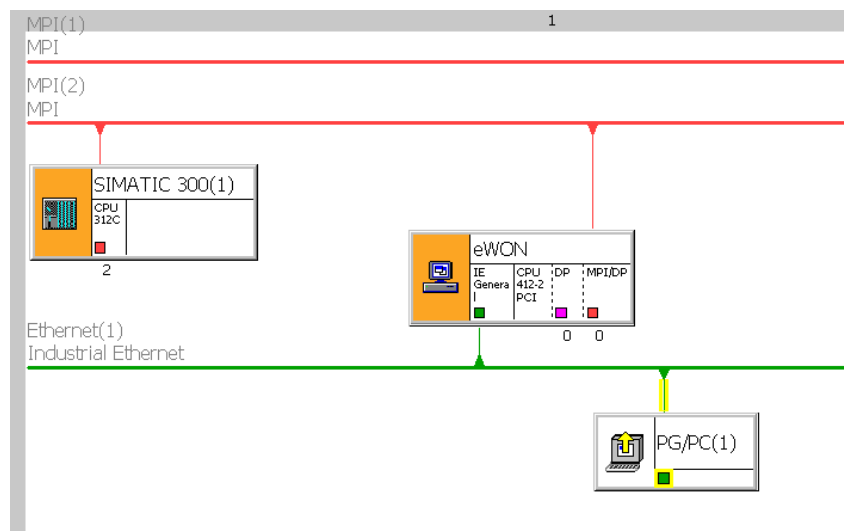


Ignore the message and click **OK**



Verify that the **Assigned** Interface is the Ethernet card and click **OK**.

Your network layout should now looks like this:

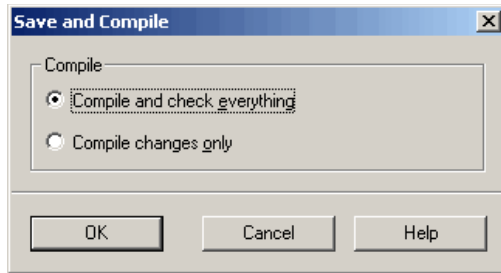


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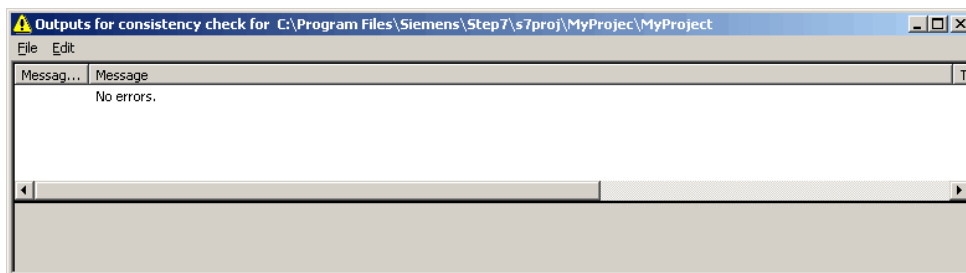
11) Compile and save the network layout

Network → Save and Compile...



Select the «**Compile and check everything**» option.  
Click **OK**.

If there was no error at compilation the following message will be displayed.

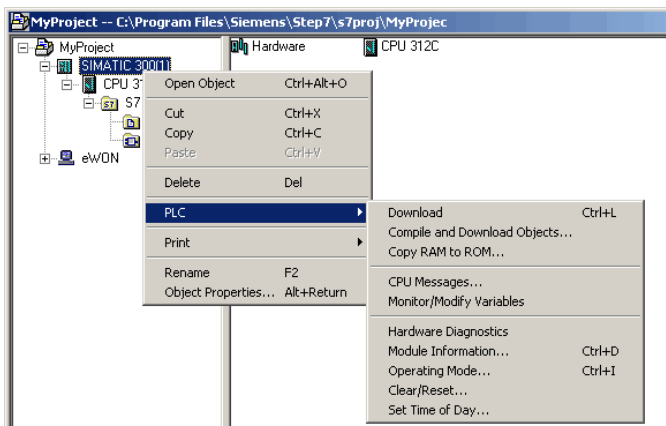


12) Close the NetPro window

Network → Exit

13) Download the program:

Select the PLC in the Step7 window





# MPI Gateway for SIEMENS S7300 & S7400 PLCs

**TN 29**  
ver 1\_0  
2006-06-06

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Right click the PLC or use the PLC menu to download the program.

PLC → Download or PLC → Compile and Download Objects
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Only for eWON types equipped with a MPI port

## 5 Remote Collaboration

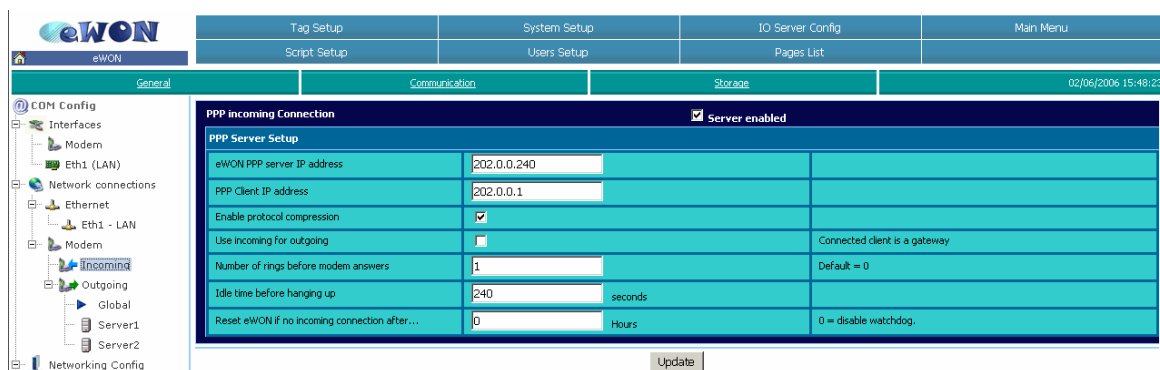
### 5.1 Remote Collaboration with Direct Phone Connection

In this section, we will set up a remote collaboration using a PPP link established between the PC and the eWON. Some changes are needed in the eWON to act as a PPP server and even also on the PC to set up the correct routing tables.

#### 5.1.1 eWON PPP Configuration

The eWON PPP configuration is reached on the web site (starting from the main page, see above) following the link:

**Configuration → System Setup → Communication → Network Connections → Modem → Incoming**



PPP Incoming Connection			
<input checked="" type="checkbox"/> Server enabled			
PPP Server Setup			
eWON PPP server IP address	202.0.0.240		
PPP Client IP address	202.0.0.1		
Enable protocol compression	<input checked="" type="checkbox"/>		
Use incoming for outgoing	<input type="checkbox"/>		Connected client is a gateway
Number of rings before modem answers	1		Default = 0
Idle time before hanging up	240	seconds	
Reset eWON if no incoming connection after...	0	Hours	0 = disable watchdog.

**Check the Server enabled** box for the PPP Incoming Connection.

Set the **eWON PPP server IP address** to 202.0.0.240.

Set the **PPP client IP address** to 202.0.0.1.

Enable the protocol compression.

Let the other items unchanged

Click **Update**

#### 5.1.2 Starting the Remote Collaboration

Create a Dialup-Connection on your PC.

Call the eWON with the username adm and the password adm and wait for the connection to be established. This step can take up to a minute.

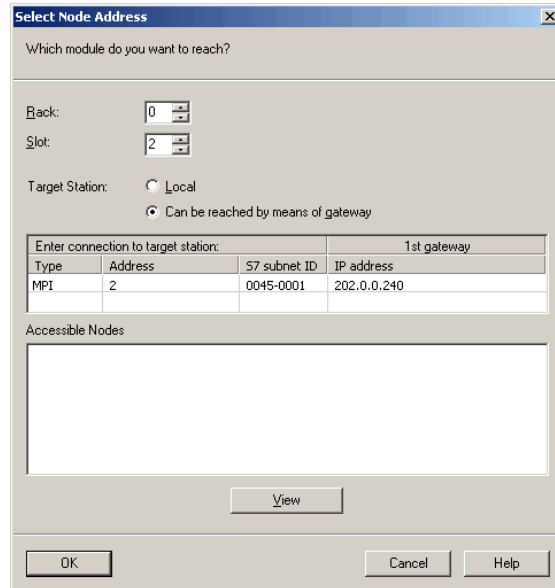
To test the connection, you can ping the eWON at its address 202.0.0.240.

Only for eWON types equipped with a MPI port

## 5.1.3 Step7 configuration

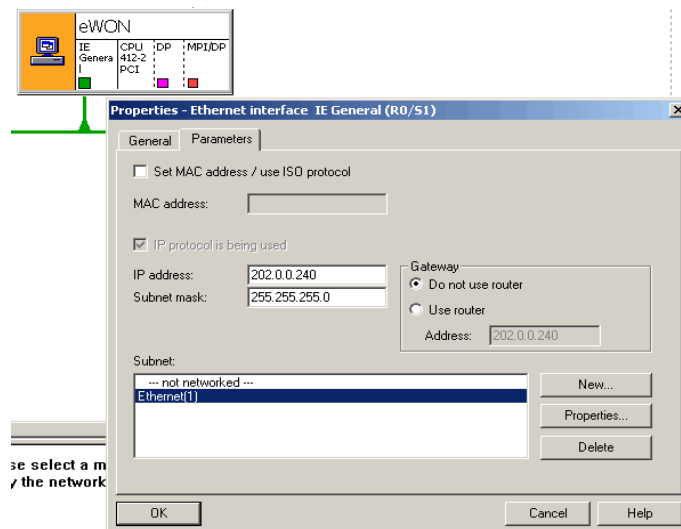
### 5.1.3.1 Upload a program

Follow the steps as for the upload of the program with a direct Ethernet connection and just change the **1st gateway address** to the eWON PPP server address **202.0.0.240**.



### 5.1.3.2 Download a program

Follow the steps as for the download of the program with a direct Ethernet connection and just change in the NetPro window the address of the Ethernet interface of the eWON gateway to the eWON PPP server address **202.0.0.240**. (Click on the green square to open the properties window)



Only for eWON types equipped with a MPI port

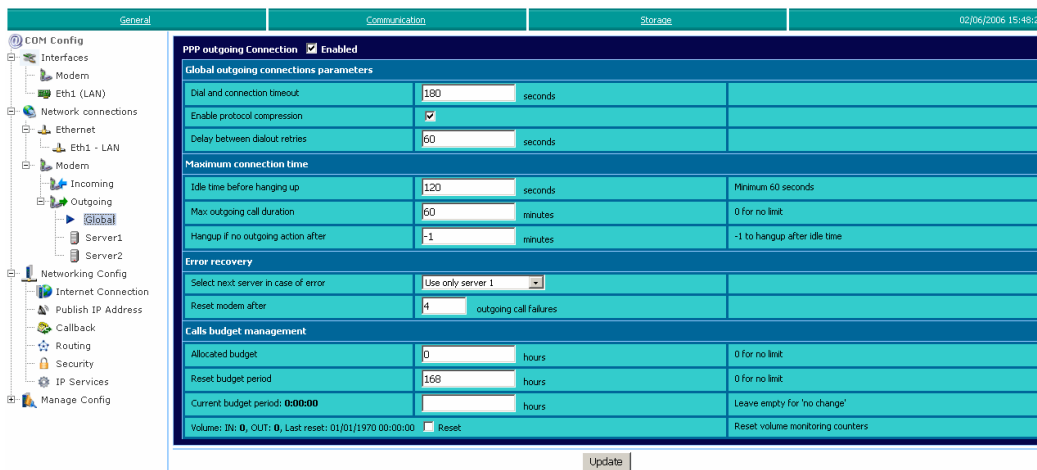
## 5.2 Remote Collaboration through Internet

In the previous section, the IP address of the eWON was known at connection time. If the eWON is used with callback to connect to Internet, the IP address allocated to the eWON is assigned by the ISP and is usually different at each connection. We must therefore ask the eWON to publish its IP address after it has been assigned by the ISP so that we can configure the Step7 program to use that address.

### 5.2.1 eWON ISP Configuration

First of all activate the PPP outgoing connection of the eWON.

**Configuration → System Setup → Communication → Network connections → Modem → Outgoing → Global**



**Enable the PPP outgoing Connection.**  
 Enable the protocol compression.  
 Set the «Select next server in case of error» to **Use only server 1.**

Let the other items unchanged

Click **Update**

Then configure the PPP outgoing connection for server 1.

**Configuration → System Setup → Communication → Network connections → Modem → Outgoing → Server1**

Only for eWON types equipped with a MPI port

Enter the **Server phone number**, **User name** and **Password** provided by your ISP in the Server access setup.

Depending on your ISP, other parameters like CHAP could be necessary.

Click **Update**

### 5.2.2 eWON Callback setup

We now will configure the eWON callback feature to use the PPP outgoing Connection-Server1 to connect to the internet.

**Configuration → System Setup → Communication → Networking Config → Callback**

**Check the callback enabled box.**

Select for the **Dialup account** the **Primary dialup server**.

**Enable the Publish IP address.**

Select the **On Ring** Callback mode.

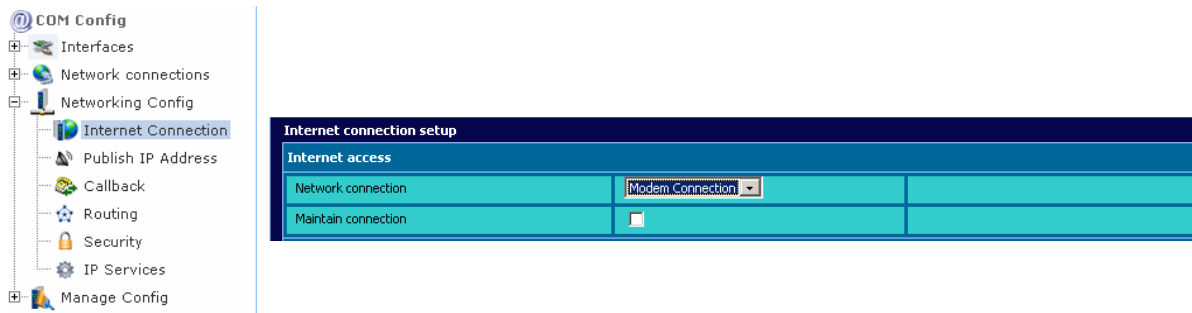
Click **Update**

Only for eWON types equipped with a MPI port

### 5.2.3 eWON Internet connection setup

To allow the callback feature to connect to the Internet we must configure the Internet connection setup.

**Configuration → System Setup → Communication → Networking Config → Internet Connection**



In the Network connection list box select **Modem Connection**.  
Let the Maintain connection box unchecked.

Click **Update**

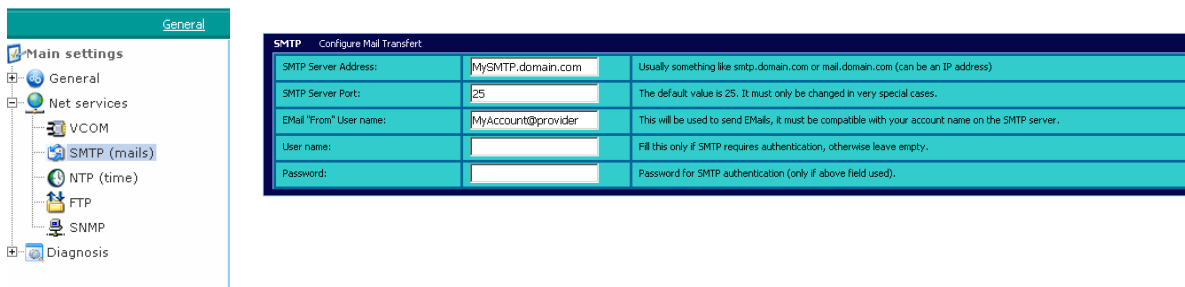
### 5.2.4 eWON IP address publishing

We will use the easiest way to publish an IP address: an Email. For this, we need to configure first a SMTP server and an address where to send the information.

The SMTP server configuration is found in the Main settings menu from the eWON.

**Configuration → System Setup → General → Net services → SMTP (mails)**

A long page appears with a section named **SMTP Configure Mail Transfert**, the following figure only shows the section of interest:



Enter the **SMTP Server Address** (an URL or an IP address).  
Enter the **SMTP Server Port**.  
Enter the **Email “From” User name**, compatible with your ISP (e.g.: [username@provider.com](mailto:username@provider.com)).  
Only if your SMTP server requires authentication fill in the User name and Password fields.

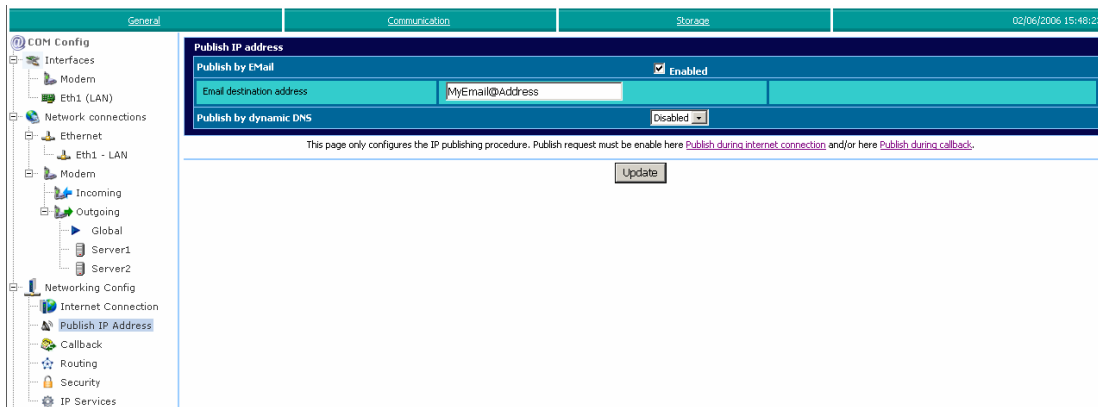
Click **Update**

Only for eWON types equipped with a MPI port

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The address publishing is a built-in facility of the eWON. The configuration of the Email address where to send the Email must be configured in the following page:

**Configuration → System Setup → Communication → Networking Config → Publish IP Address**



**Enable the Publish by EMail.**

Enter your Email address in the **Email destination address**.

Click **Update**

### 5.2.5 Starting the Remote Collaboration

Call the eWON and let ring six times, then hang up.

The eWON calls back the ISP, connects itself to Internet and sends an Email with its online IP address.

You will receive an Email named “eWON callback” looking like the following one:

```
This Email has been generated automatically by  
eWON: eWON
```

```
*** eWON Description:
```

```
*** Online TCP/IP address
```

```
WWW: http://62.4.192.246
```

|

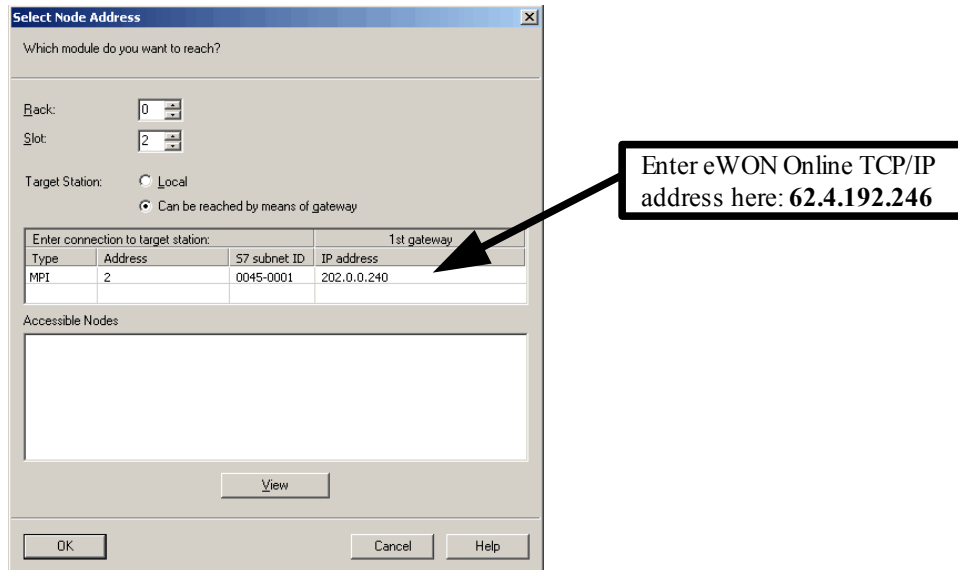
To connect to the eWON just click on the Online TCP/IP address link.

Only for eWON types equipped with a MPI port

## 5.2.6 Step7 configuration

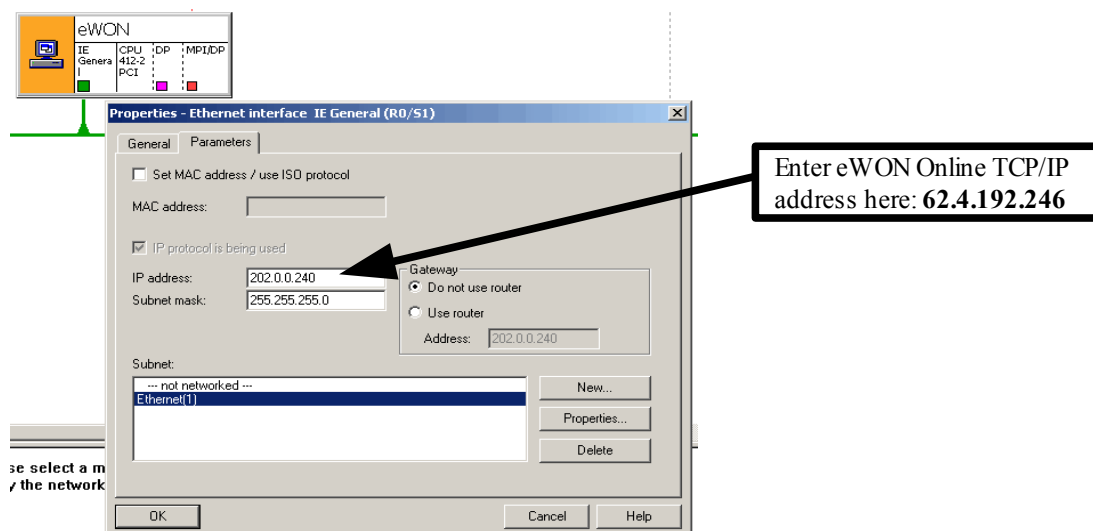
### 5.2.6.1 Upload a program

Follow the steps as for the upload of the program with a direct Ethernet connection and just change the **1st gateway address** to the eWON online TCP/IP address (**62.4.192.246** in our example)



### 5.2.6.2 Download a program

Follow the steps as for the download of the program with a direct Ethernet connection and just change in the NetPro window the address of the Ethernet interface of the eWON gateway to the eWON online TCP/IP address (**62.4.192.246** in our example)



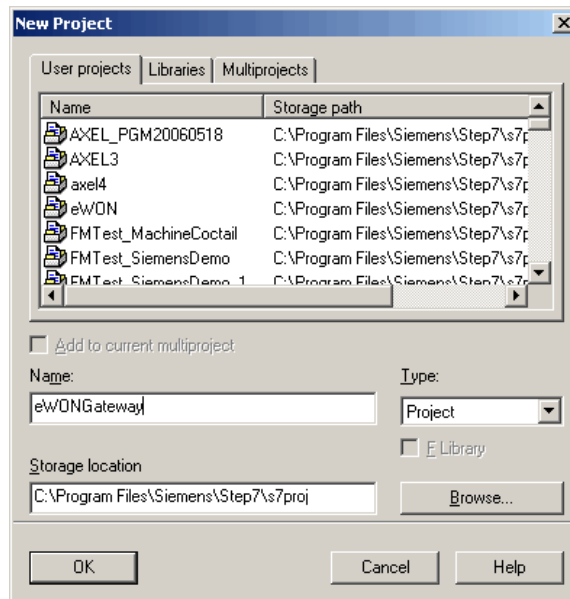
(Click on the green square to open the properties window)

Only for eWON types equipped with a MPI port

## 6 Appendix

### 6.1 Create «eWON gateway station file for STEP7» from scratch

- 1) Create a new project (called eWONGateway for example)

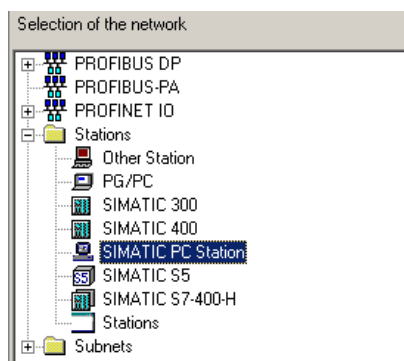


- 2) Open the Netpro application to edit the network

**Options → Configure Network**

- 3) Add a Simatic PC Station to the network.

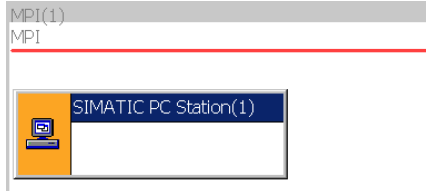
**Insert → Network Objects**



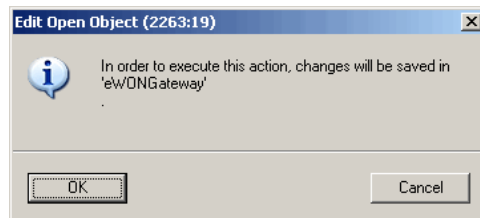
The network layout should now look like:

Only for eWON types equipped with a MPI port

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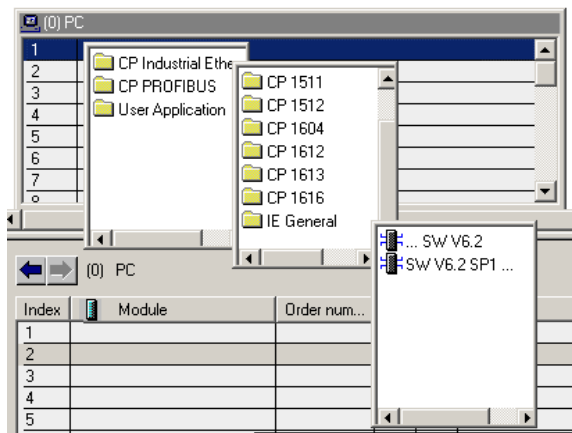


- 4) Add an Ethernet and a MPI interface to the Simatic PC Station:  
**Double-click** on the Simatic PC Station object to open the **HW Config window**.  
 The following message could appear:



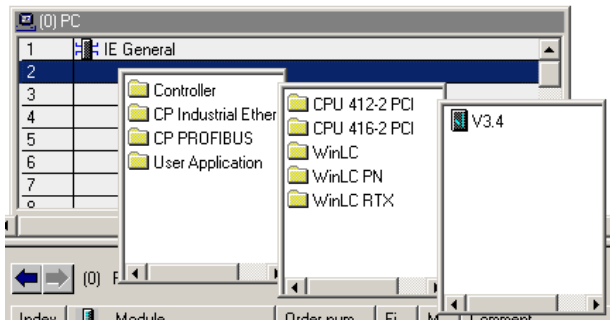
Click **OK** to confirm.

At first position insert a «CP Industrial Ethernet» «IE General» card (the Ethernet card).



(Leave IP config alone, it will be changed later)

At second position insert a «Controller» «CPU 412» .

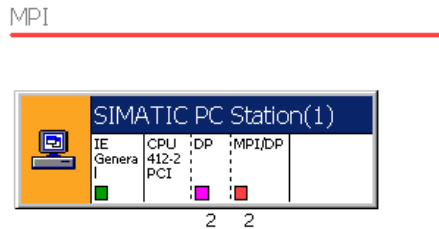


(Leave parameter (DP address) alone, not needed)

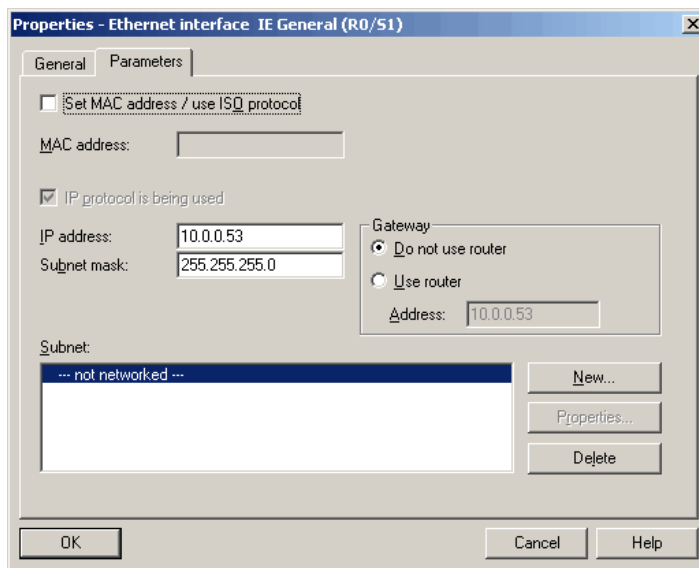
Only for eWON types equipped with a MPI port

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- 5) **Exit the HW Config window and confirm the «Save changes to Simatic PC Station».**  
Your network layout should now look like:

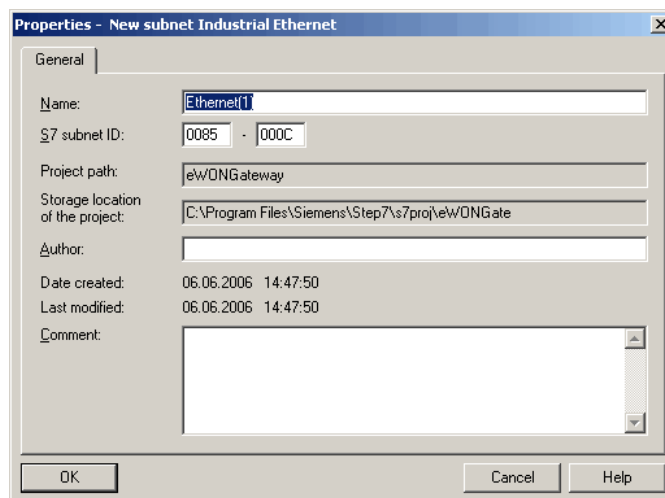


- 6) **Double-click on the green square to configure the Ethernet interface.**



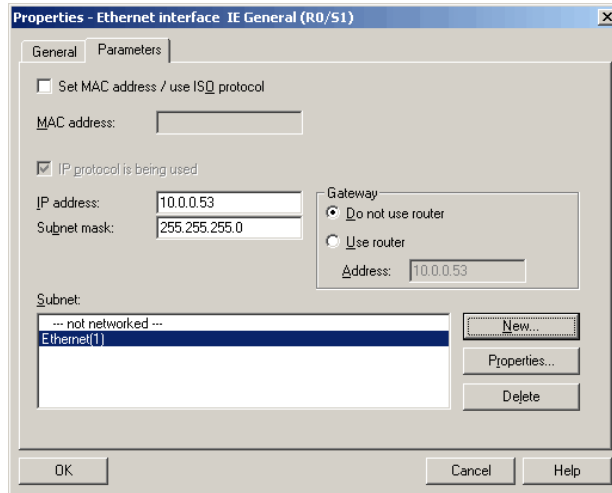
- Uncheck the Set MAC address
- Set the eWON IP address and subnet

Click the «New...» button to add a Subnet:

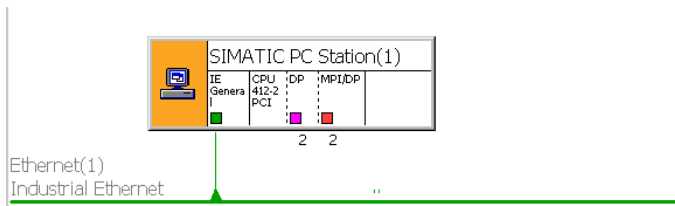


Only for eWON types equipped with a MPI port

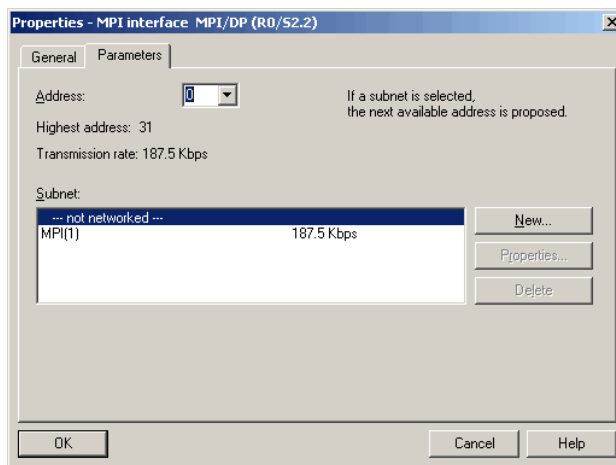
Let the default values and click **OK**.



Verify that the Subnet Ethernet(1) is selected and click **OK**.  
Your network layout should now look like:



7) **Double-click** on the red square to configure the **MPI interface**.



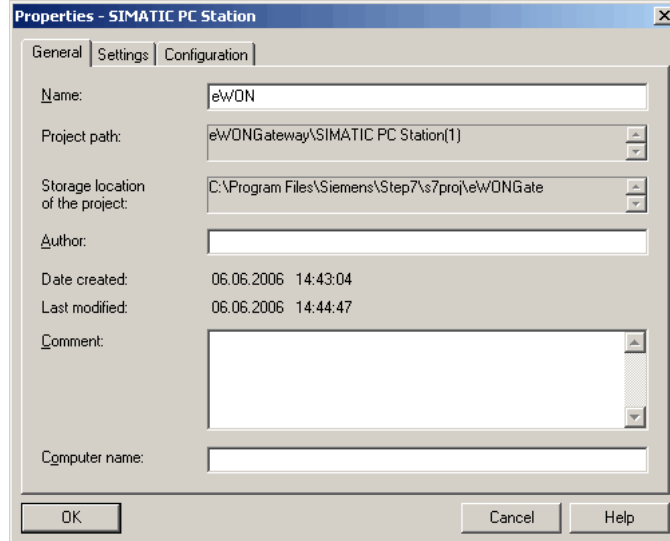
- Set the **MPI Address** of the eWON (0)
- Set the Subnet to «**Not networked**»

Click **OK** and ignore the warning message.

Only for eWON types equipped with a MPI port

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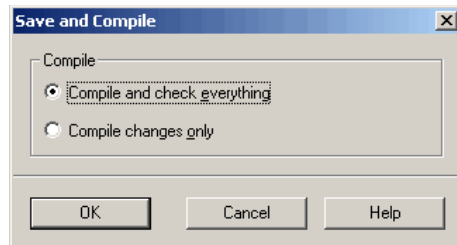
- 8) Change the name of the object:  
Right-click the Simatic PC Station and open the Object Properties window:



Set the name of the object (eWON) and click **OK**.

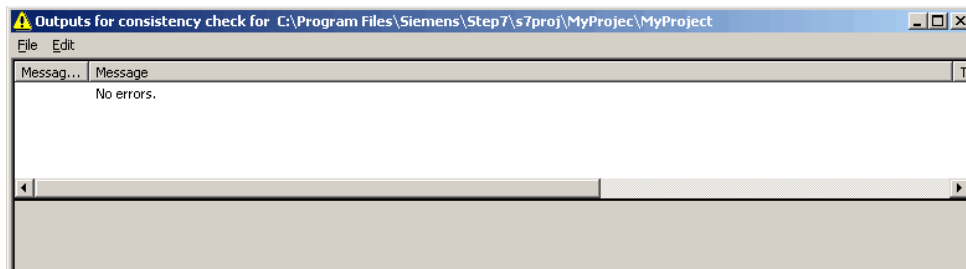
- 9) Compile and save the network layout

**Network → Save and Compile...**



Select the «**Compile and check everything**» option.  
Click **OK**.

If there was no error at compilation the following message will be displayed.

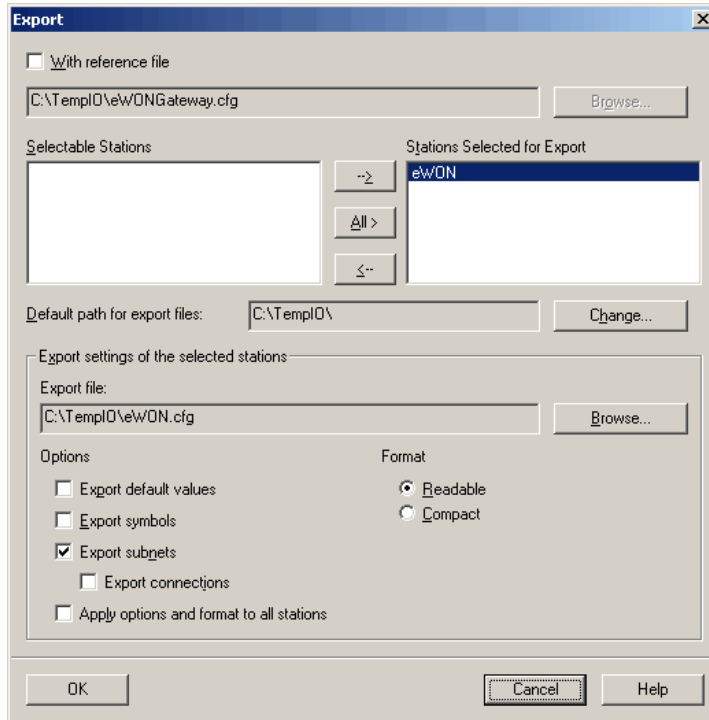


- 10) Export the eWON gateway station file

Only for eWON types equipped with a MPI port

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**Edit → Export...**



- Enter a name for the Export file: eWON.cfg (Browse button)
- In the Options section only check the «Export subnets»

Click **OK**.

11) Close the NetPro window

**Network → Exit**

The «eWON gateway station file for STEP7» is now ready for use.