GE Ethernet Global Data Driver Help

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GE Ethernet Global Data Driver Help

Help version 1.032

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Overview

The GE Ethernet Global Data (EGD) Driver provides an easy and reliable way to connect GE Ethernet Global Data (EGD) devices to OPC Client applications, including HMI, SCADA, Historian, MES, ERP and countless custom applications. It is intended for use with GE devices that support EGD transactions.

Device Setup

Supported Devices

GE devices equipped to handle EGD transactions. These devices require a CPU-364 or higher. This driver is also compatible with any device that supports EGD protocol.

Server Project Channel

When setting up a server project for this driver, it is recommended that the server project include only one channel. If more than one channel is used in a server project, each channel must be configured to bind to a unique network adapter.

Communication Protocol

Ethernet using Winsock V1.1 or higher.

Device ID

This an arbitrary field not used by the driver.

Connection Timeout

This parameter specifies the time that the driver will wait for a connection to be made with a device. Depending on network load the connect time may vary with each connection attempt. The default setting is 3 seconds. The valid range is 1 to 60 seconds.

Request Timeout

This parameter specifies the time that the driver will wait on a response from the device before giving up and going on to the next request. Longer timeouts only affect performance if a device is not responding. The default setting is 1000 milliseconds. The valid range is 100 to 30000 milliseconds.

Retry Attempts

This parameter specifies the number of times the driver will retry a message before giving up and going on to the next message. The default setting is 3 retries. The valid range is 1 to 10.

See Also: Name Resolution and **Exchange Configuration**.

Cable Diagrams

The following diagram illustrates the cable connections required to communicate with the GE EGD device.

Patch Cable (Straight Through)

TD +	1	OR/WHT	OR/WHT	1	TD +
TD -	2	OR	OR	2	TD -
RD +	3	GRN/WHT	GRN/WHT	3	RD +
	4	BLU	BLU	4	
	5	BLU/WHT	BLU/WHT	5	
RD -	6	GRN	GRN	6	RD -
	7	BRN/WHT	BRN/WHT	7	
	8	BRN	BRN	8	

RJ45   RJ45

10 BaseT
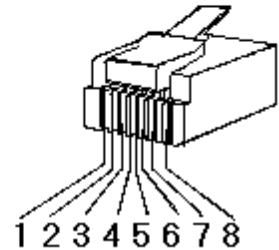
Crossover Cable

TD +	1	OR/WHT	GRN/WHT	1	TD +
TD -	2	OR	GRN	2	TD -
RD +	3	GRN/WHT	OR/WHT	3	RD +
	4	BLU	BLU	4	
	5	BLU/WHT	BLU/WHT	5	
RD -	6	GRN	OR	6	RD -
	7	BRN/WHT	BRN/WHT	7	
	8	BRN	BRN	8	

RJ45   RJ45

1 2 3 4 5 6 7 8

8-pin RJ45

Name Resolution

Logical names can be assigned to IP addresses for EGD Producer Exchanges by using the Name Resolution dialog. To do so, click **Device** | **Properties**.
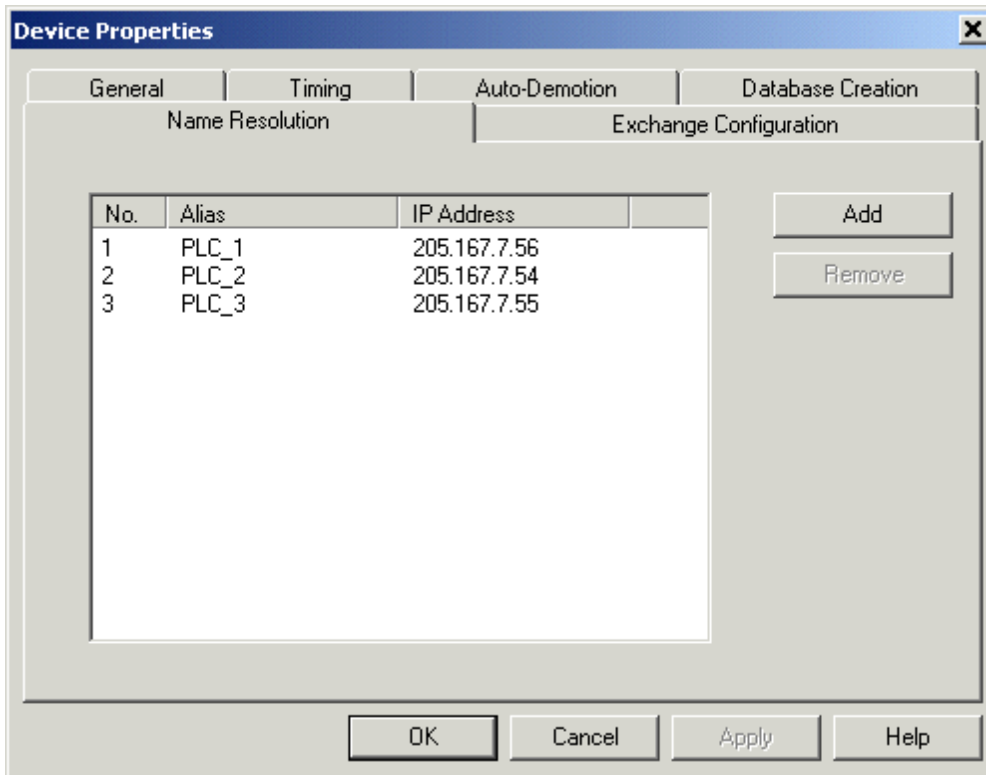
1. Click **Add** to add a new entry to the list.

2. Enter in an **Alias Name** to perform **IP address mapping**.
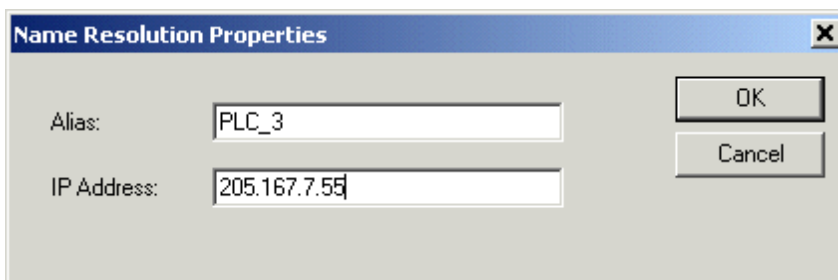
Note: To remove an entry from the list, simply select an entry and then click **Remove**.

See Also: Exchange Configuration

Exchange Configuration

Both consumer and producer exchanges can be configured within the GE EGD Device Driver. These exchanges must match the exchanges configured in the producing/consuming GE EGD Devices.

Consumer Exchanges

A consumer exchange defines an exchange that will be consumed by the GE EGD device driver. This exchange will be configured in a GE EGD device as a producer exchange with a consumed address equal to the IP address of the machine running the device driver. A consumer exchange can be configured using the following dialog, which is accessible through **Device** | **Properties** | **Exchange Configuration**.

Note: Please refer to the Server Help file for descriptions of the General, Timing, Auto-Demotion and Database Creation properties.
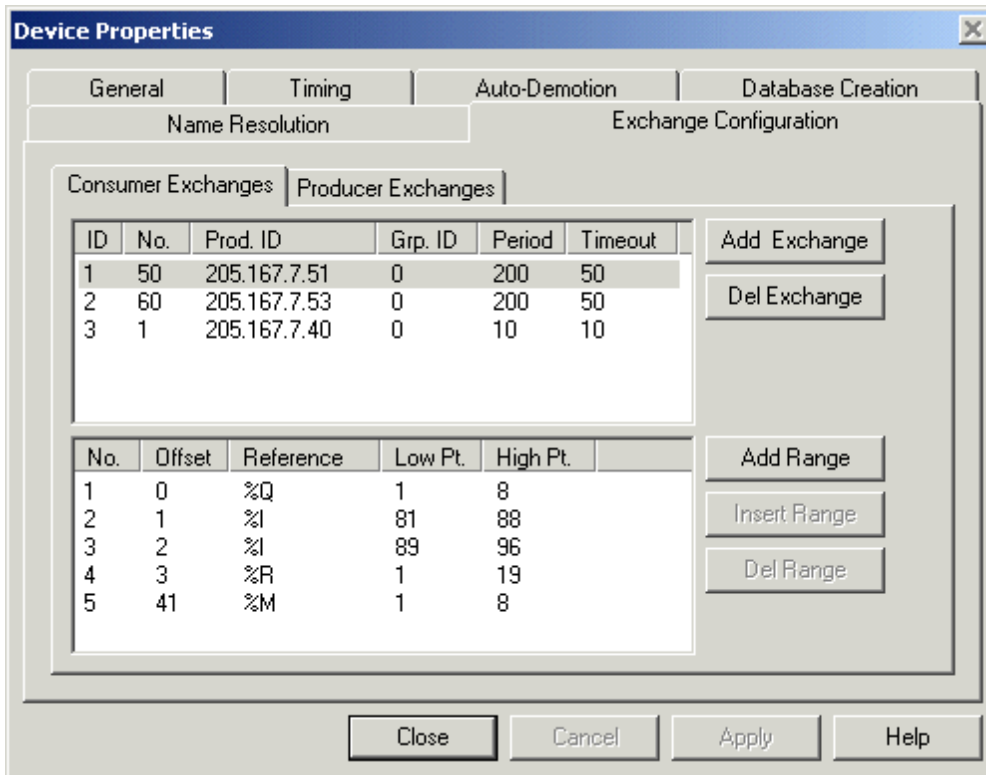
Consumer Exchange Properties

- **ID:** This is a user-defined Exchange ID number used when defining tags that will reference the exchange. This allows users to make changes to the exchange parameters without having to reconfigure pre-existing tags. For more information, refer to **Address Descriptions**.
- **No.:** Defines the exchange number and must match the exchange number of the producing node.
- **Producer ID:** Defines the IP address of the producing node.
- **Group ID:** Defines the multicast group ID if there is more than one consumer receiving the same exchange.
- **Period:** Defines the time interval, in milliseconds, that the consuming node should receive updates from the producing node.
- **Timeout:** Specifies the timeout, in milliseconds, that the consumer should declare an error if a consumed exchange is not received in the time allotted.

Defining a new Consumer Exchange

A new consumer exchange can be added by clicking **Add Exchange**. The exchange can be configured as shown below.

Defining Range Properties for a Consumer / Producer Exchange

Select a previously created exchange to display range properties for that exchange. A new range definition can be added by first highlighting an exchange and then clicking **Add Range**. The dialog should appear as shown below.

Consumer / Producer Exchange Range Properties

- **No.:** A range number defined by the driver. This number is used to address memory within an exchange definition. For more information, refer to **Address Descriptions**.
- **Offset:** Byte offset into the exchange data segment.
- **Reference:** Memory type mnemonic corresponding to the type of data being transferred.
- **Low Pt.:** Starting address offset.
- **High Pt.:** Ending address offset.

Note: The total amount of range data for an exchange cannot exceed 1400 bytes.

Producer Exchange

A producer exchange defines an exchange that will be produced by the GE EGD device driver. This will be configured in a GE EGD device as a consumer exchange with a producer address equal to the IP address of the machine running the device driver. A producer exchange can be configured using the following dialog, which is accessible through **Device** | **Properties** | **Exchange Configuration**.
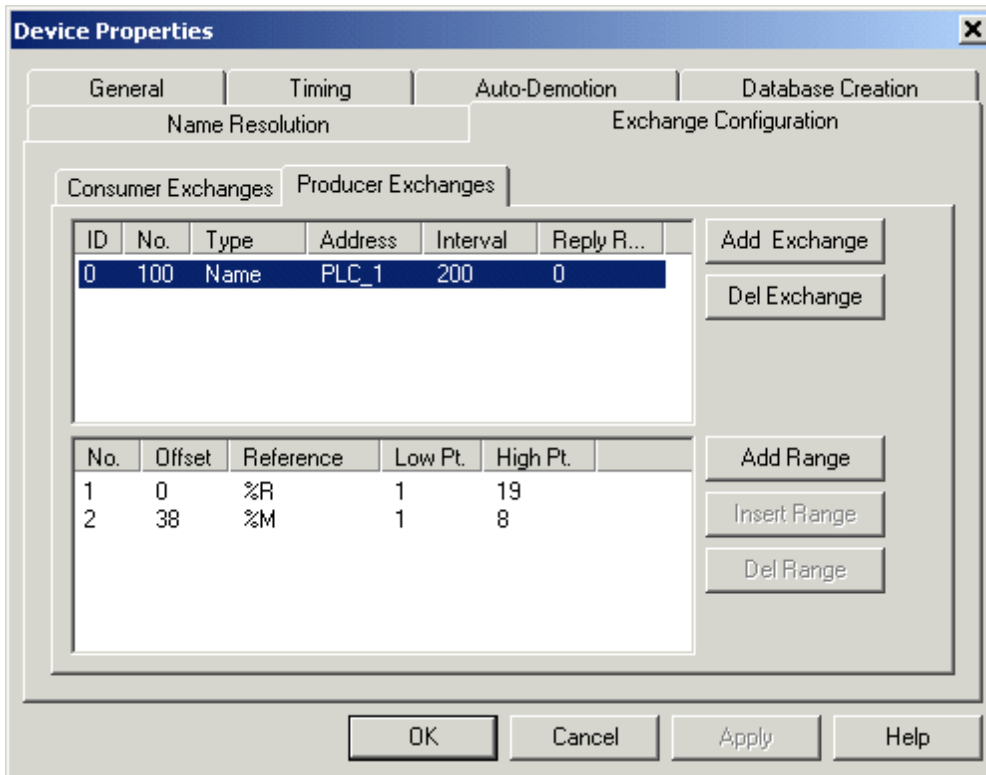
Producer Exchange Properties

- **ID:** This is a user-defined Exchange ID number used when defining tags that will reference the exchange. This allows users to make changes to the exchange parameters without having to re-configure pre-existing tags. For more information, refer to **Address Descriptions**.
- **No.:** Defines the exchange number and must match the exchange number of the consuming node.
- **Type:** Defines the type of consumer address defined in the following field. This type can be Name, IP or Group ID
- **Address:** Defines the consumer address. If the type is Name, the address is a name defined in the **Name Resolution** configuration. When the type is IP, the address is an IP address in dotted decimal form (XXX.XXX.XXX.XXX). If the type is set to Group ID, the address specifies the multicast Group ID.
- **Interval:** Defines the time interval, in milliseconds, that the GE EGD device driver should produce data and send it to the consuming nodes.
- **Reply Rate:** Currently not used.

Defining a new Producer Exchange

A new producer exchange can be added by clicking **Add Exchange**. The exchange can be configured as shown below.

Data Types Description

Data Type	Description
Boolean	Single bit
Byte	Unsigned 8 bit value bit 0 is the low bit bit 7 is the high bit
Char	Signed 8 bit value bit 0 is the low bit bit 6 is the high bit bit 7 is the sign bit
Word	Unsigned 16 bit value bit 0 is the low bit bit 15 is the high bit
Short	Signed 16 bit value bit 0 is the low bit bit 14 is the high bit bit 15 is the sign bit
DWord	Unsigned 32 bit value bit 0 is the low bit bit 31 is the high bit
Long	Signed 32 bit value bit 0 is the low bit bit 30 is the high bit bit 31 is the sign bit
BCD	Two byte packed BCD Value range is 0-9999. Behavior is undefined for values beyond this range.
LBCD	Four byte packed BCD Value range is 0-99999999. Behavior is undefined for values beyond this range.
Float	32 bit floating point value. The driver interprets two consecutive 16 bit registers as a floating point value by making the second register the high word and the first register the low word.
Double	64 bit floating point value

Address Descriptions

The GE Ethernet Global Data protocol supports the addresses discussed below.

Address Format Overview

Producer Exchange Format: Px:r:MMyyyyy
Consumer Exchange Format: Cx:r:MMyyyyy
P - Defines a producer exchange
C - Defines a consumer exchange
x - Exchange ID
r - Range Number
MM - Memory Type Mnemonic*
yyyyy - Memory Address*

*For more information, refer to Addressing below.

Note: For more information on producer/consumer exchanges, refer to **Exchange Configuration**.

Addressing

This driver supports the following memory type, mnemonics and address ranges. The default data types for dynamic tags are shown in **bold**. Consumer exchange references are Read Only, while Producer exchange references are Read/Write.

Description	Memory Type and Range	Data Type*
Discrete Inputs	I0001 to I32760 I0001 to I32753 (every 8th bit) I0001 to I32745 (every 8th bit) I0001 to I32729 (every 8th bit)	**Boolean** Byte Word, Short, BCD DWord, Long, Float, LBCD
Discrete Outputs	Q0001 to Q32760 Q0001 to Q32753 (every 8th bit) Q0001 to Q32745 (every 8th bit) Q0001 to Q32729 (every 8th bit)	**Boolean** Byte Word, Short, BCD DWord, Long, Float, LBCD
Discrete Globals	G0001 to G32760 G0001 to G32753 (every 8th bit) G0001 to G32745 (every 8th bit) G0001 to G32729 (every 8th bit)	**Boolean** Byte Word, Short, BCD DWord, Long, Float, LBCD
Internal Coils	M0001 to M32760 M0001 to M32753 (every 8th bit) M0001 to M32745 (every 8th bit) M0001 to M32729 (every 8th bit)	**Boolean** Byte Word, Short, BCD DWord, Long, Float, LBCD
Temporary Coils	T0001 to T32760 T0001 to T32753 (every 8th bit) T0001 to T32745 (every 8th bit) T0001 to T32729 (every 8th bit)	**Boolean** Byte Word, Short, BCD DWord, Long, Float, LBCD
Status References (Same for SB, SC)	SA0001 to SA32760 SA0001 to SA32753 (every 8th bit) SA0001 to SA32745 (every 8th bit) SA0001 to SA32729 (every 8th bit)	**Boolean** Byte Word, Short, BCD DWord, Long, Float, LBCD
Register References	R0000 to R32767 R0000 to R32766	**Word**, Short, BCD DWord, Long, LBCD, Float
Analog Inputs	AI0000 to AI32767 AI0000 to AI32766	**Word**, Short, BCD DWord, Long, LBCD Float
Analog Outputs	AQ0000 to AQ32767 AQ0000 to AQ32766	**Word**, Short, BCD DWord, Long, LBCD Float

*Default data type of Boolean becomes Byte when an array specification is given. The following data types support arrays: Byte, Word, Short, DWord, Long, Float. An array is a collection of contiguous elements of a given data type.

Examples

'P50:2:M1' references internal coil 1 which is defined in range 2 of producer exchange 50.	
'C100:3:R2' references register 2 which is defined in range 3 of consumer exchange 100.	
'C1:2:G1 [4]' includes the following **byte** addresses:	G1,G9,G17,G25 1 row implied = 4 bytes

Note: G25 indicates the fourth byte beginning at bit 25.	4 x 8 (byte) = 32 total bits
'P2:1:R16 [3][4] includes the following **Word** addresses:	R16,R17,R18,R19 R20,R21,R22,R23 R24,R25,R26,R27 3 rows x 4 columns = 12 words 12 x 16 (word) = 192 total bits

Note 1: The actual number of addresses of each type depends on the GE Ethernet Global Data Exchange Configuration.

Note 2: The total amount of range data for an exchange cannot exceed 1400 bytes.

Configuring EGD in VersaPro and the OPC Server

This topic discusses the setup and configuration of a project using the GE 90-30 PLC, VersaPro, an OPC Server and the GE Ethernet Global Data drivers. It also provides basic information on Ethernet Global Data (EGD).

Ethernet Global Data

Ethernet Global Data is a communications protocol developed by GE in 1998 that allows a device (the Producer) to transfer data to other devices (the Consumers) on the network. Applications requiring high-speed networking and coordination from PLC to PLC (or PLC to GE Variable Frequency Drives) can take advantage of EGD. Ethernet Global Data is up to 10 times more efficient on bandwidth utilization than the normal polling system.

Configuring EGD in VersaPro

This example was tested using VersaPro v2.01.

1. Launch VersaPro. Click **File** | **New Folder**.

2. **Name** the project and then click **Finish**.

   Note: If a project already exists, click **File** | **Open Folder**.

3. The hardware modules on the 90-30 PLC must be configured first in the **Hardware Configuration Utility** included with VersaPro. Double-click on **Hardware Configuration** in the **Folder Browser**.
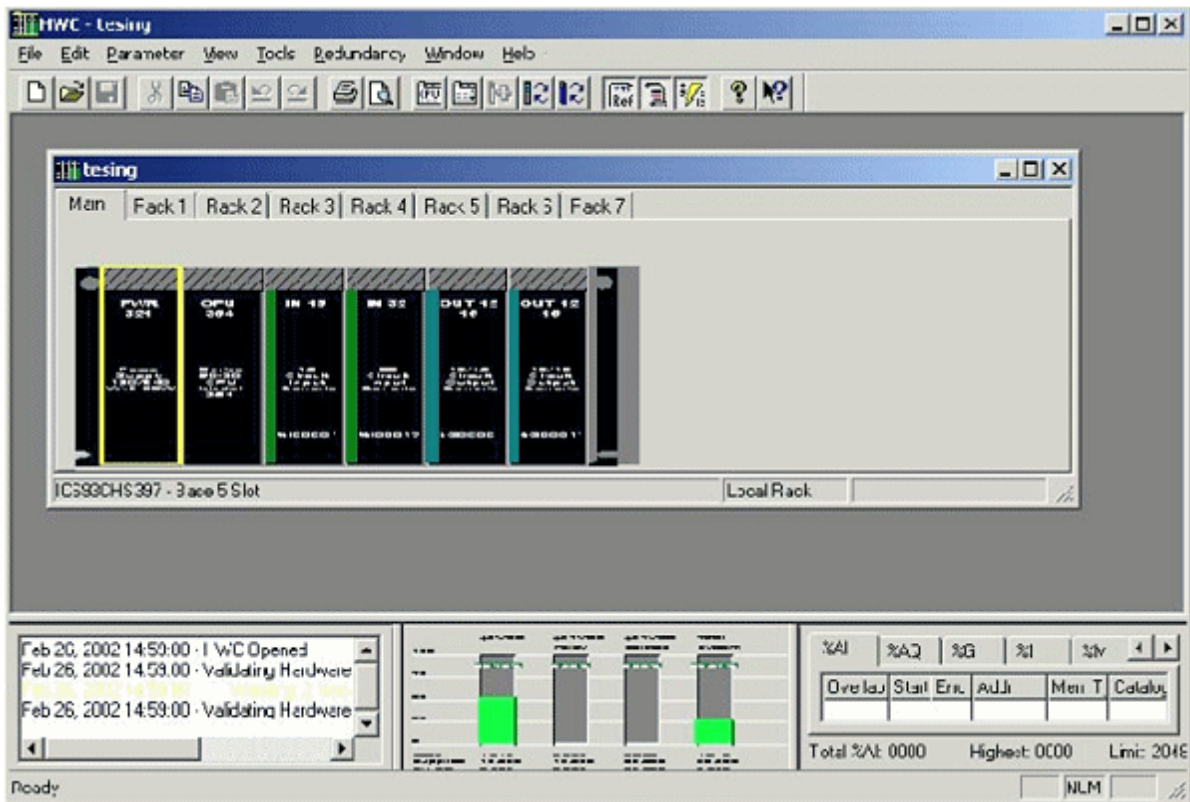
4. Double-click each module to configure. The most important configuration is the CPU. In the Ethernet tab of the CPU configuration window, the following parameters need to be configured:

   - Adapter Name

   - IP Address

   - Subnet Mask

   - Gateway IP Address

   - Status Address

   The Adapter Name is used to identify the PLC during EGD configuration in VersaPro and may be named as

desired. The Status Address is the start of an 80 bit global status area (80 consecutive single-bit locations or 5 consecutive 16 bit registers). It may be kept at the default.

Note: Be aware of this status area so that there are no attempts to allocate something else in the same register space later.

5. Once the hardware configuration is complete, save it to disk.

6. Go back to VersaPro and choose **Tools | Communications Setup** to invoke the Communication Configuration Utility.

7. Make sure that the PLC is listed in this utility with the correct IP address. If not, add the PLC, using **Port ENET**. Then, click **OK** to save the changes and exit the communication configuration utility.

8. In VersaPro, click **PLC | Connect** to test connectivity with the PLC.

9. Once connectivity is established, click **Edit | Rack Operations | Ethernet Global Data**.
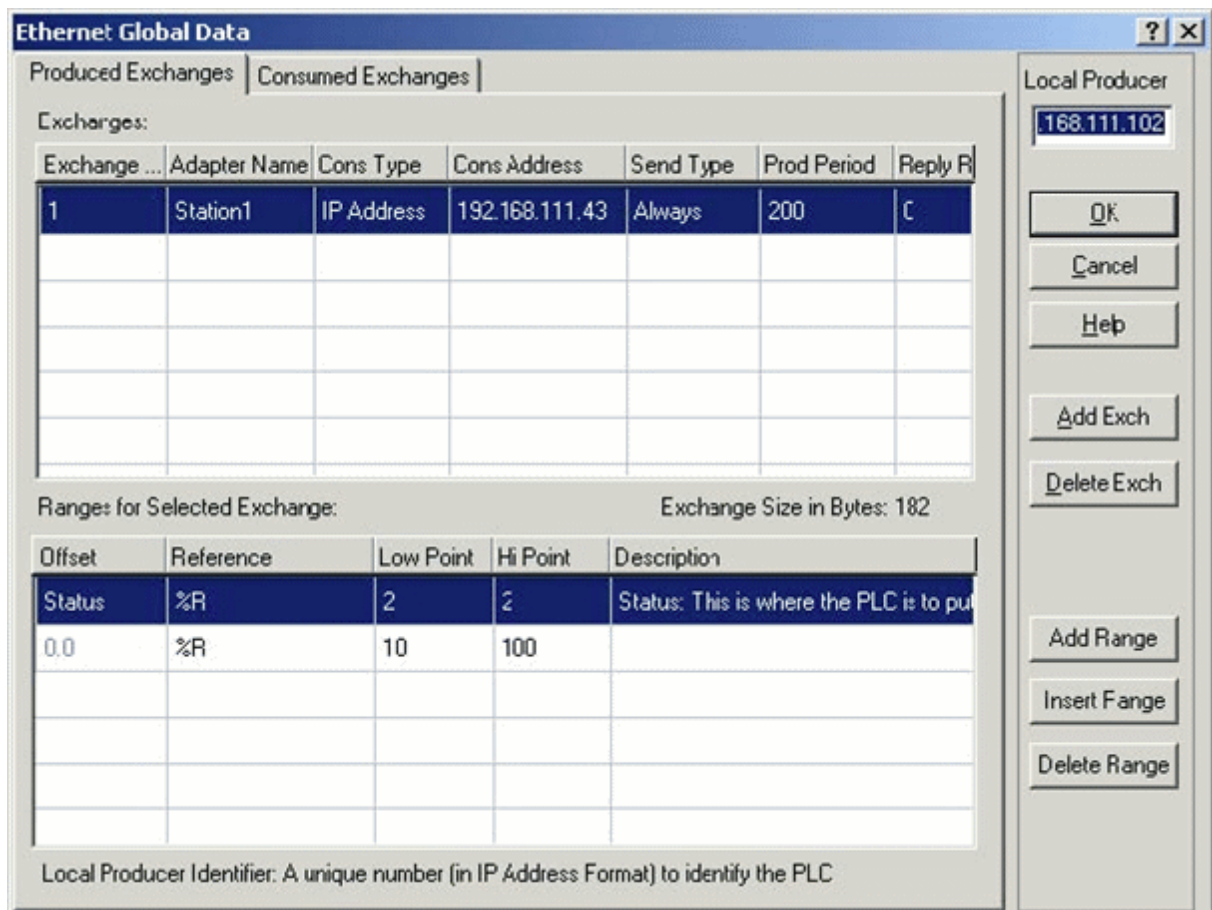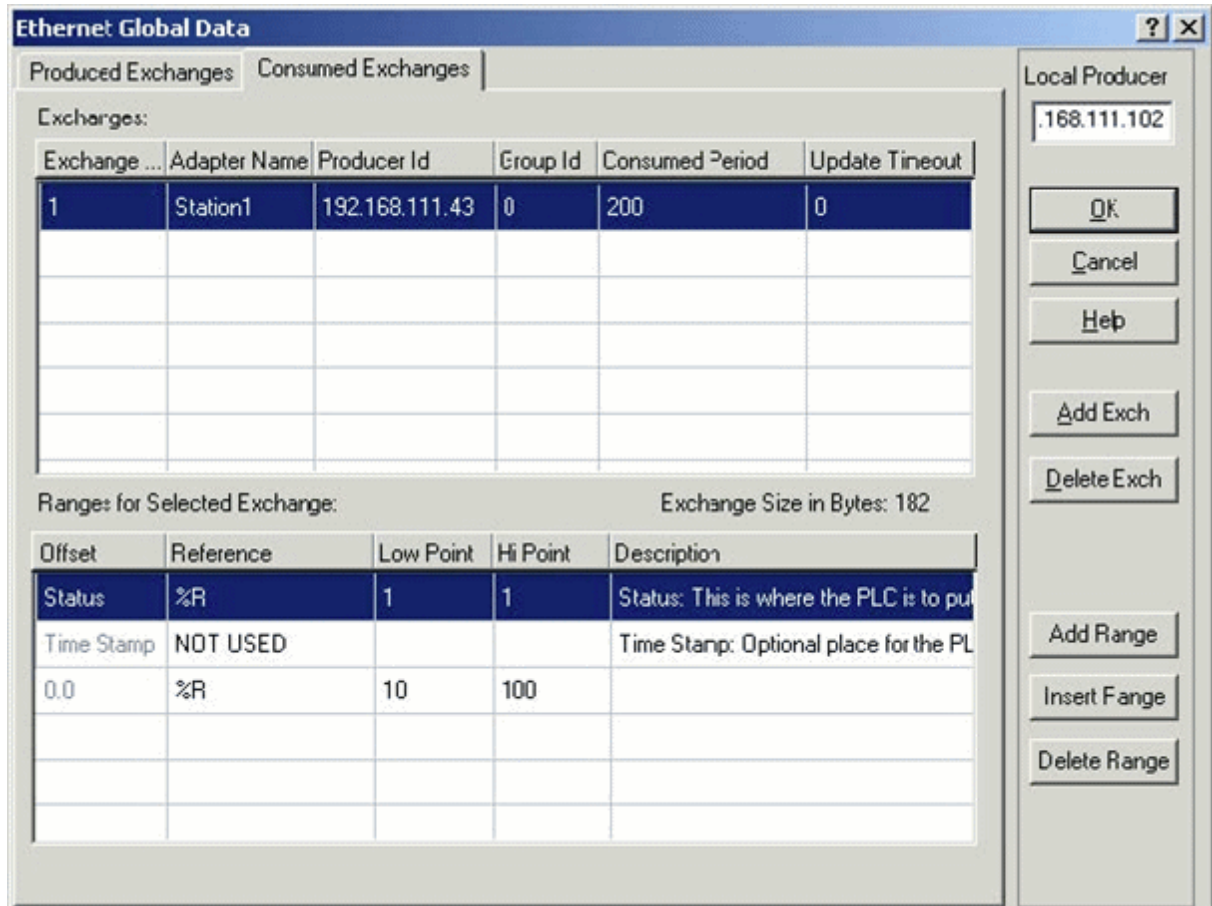

In the Produced Exchanges screen, complete the following.

- Enter the PLC's IP address in **Local Producer**.

- Click on **Add Exch** to make a new exchange.

- Enter an **Exchange ID** of 1.

- Enter the IP address of the PC running the OPC Server in **Cons Address**.

  Note: The Prod Period, in milliseconds, specifies how often the PLC will send the data to the consumer(s). The consumer(s) (OPC Server) must be set to receive data at this same period. Configuration of the OPC server will be covered later.

- For the ranges, a 16 bit exchange status area must first be defined. In this example, %R2 has been chosen. Make sure that this status area does not overlap the global status area defined in step 2. After the exchange status area is defined, add the ranges of data that the PLC will produce.

When all is finished, click the Consumed Exchanges tab.

In the Consumed Exchanges screen:

- Producer ID should match the IP address of the PC running the OPC Server.

- The Consumed Period, in milliseconds, specifies how often the PLC will expect the data from the producer.

    Note: The producer (OPC Server) must be set to send data at this same period.

- Define a 16 bit status area. In this example, %R1 has been chosen.

- In this example, the ranges of data are set to match those in the Produced Exchanges screen. That is, a bi-directional transfer of this register range is set up over EGD. This will cause the Hardware Configuration Utility to display non-fatal warnings that the ranges in the producer and consumer exchanges are overlapping. These warnings may be ignored. They would not appear if the register range was set to be only produced or only be consumed.

10. Once these parameters are set, click **OK**.

11. In VersaPro, click **PLC | Store** to download the configuration to the PLC. Then, turn on **Store Hardware Configuration and Motion to the PLC** and click **OK**.

12. Next, click **PLC | Run** (or press F5) to start the program running in the PLC. The PLC must be in "Enabled" mode (outputs enabled) in order to communicate using EGD.

### Configuring EGD in the OPC Server

1. Start a new OPC Server project. Add a new channel, choosing the GE Ethernet Global Data driver.

2. Add a new device, accepting the defaults until the Producer and Consumer Exchange tabs are reached.
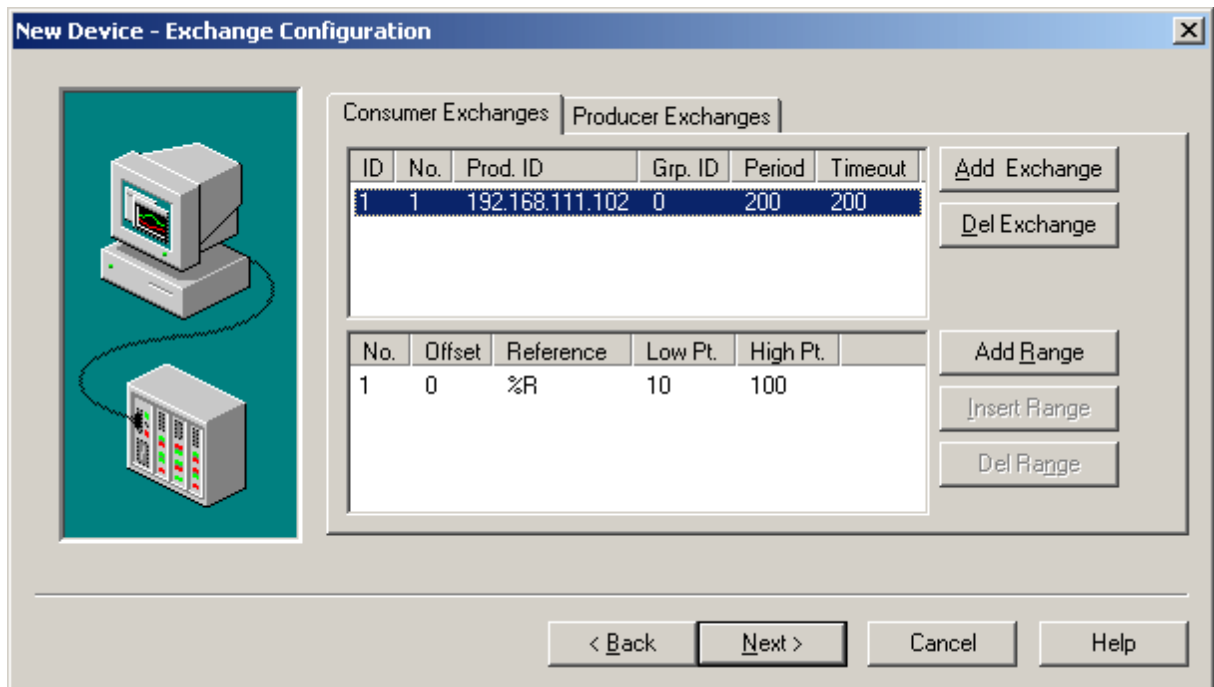
3. In the **Consumer Exchanges** tab, click **Add Exchange**. Give it an ID of 1 and an Exchange number of 1. For the Producer ID, enter the IP address of the PLC. A minimum update timeout of 100 ms is suggested. In this example, an update timeout of 200 ms is used.

   Note: The value entered here for Consumed Period must match the value entered in VersaPro for "Prod. Period"

4. Next, click on the newly added exchange row in the upper half of the **Consumer Exchanges** tab, and click **Add Range**. Add the address range that was specified in VersaPro. The status area does not have to be defined.
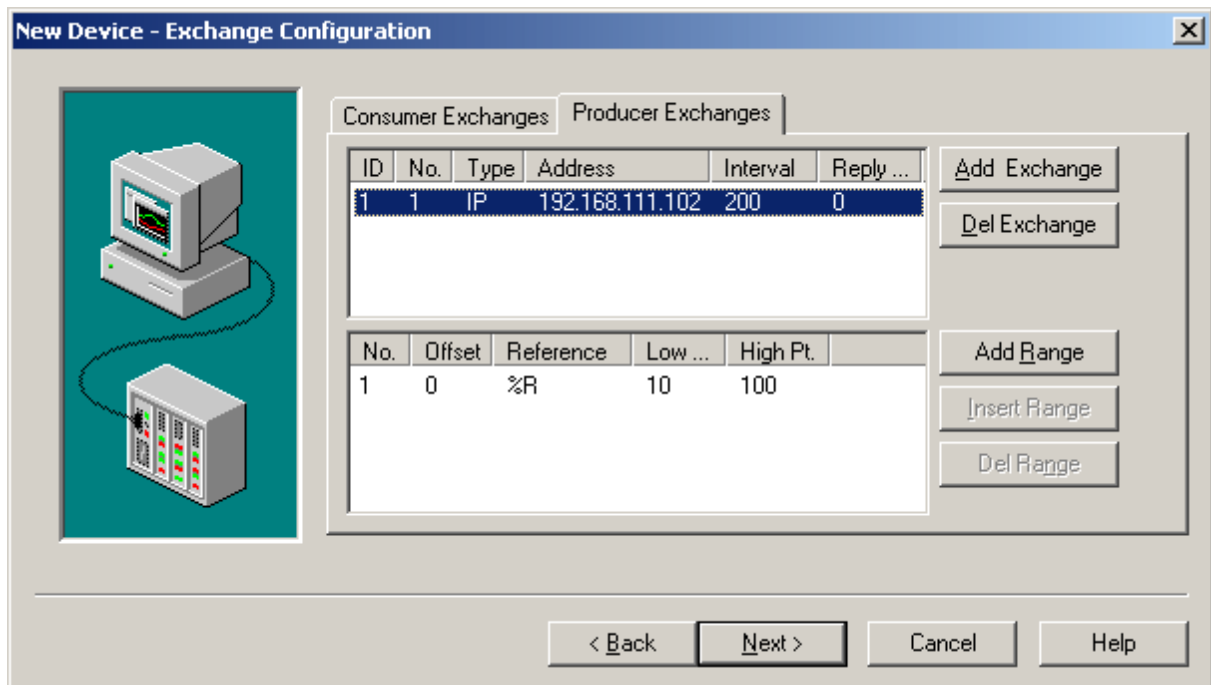
5. Next, click on the Producer Exchanges tab and add an exchange. Set the following values:

    - ID Number = 1

    - No. = 1

    - Type = IP

    - Address = IP address of the PLC.

    Note: The value entered here for Producer Interval must match the value entered in VersaPro for Consumed Period.

6. Next, click **Add Range**. Add the address range that was specified in VersaPro. The status area does not have to be defined.

7. Click **Next**, then **Finish**. Then save the project.

8. In the OPC Server, Channel1 and Device1 should now be visible. Double-click **Device1** to bring up the **Device Properties** box.

9. Go to the **Database Creation** tab and click **Auto Create**. Then, press **OK**.

10. A + sign will now be visible to the left of Device1. Click it to show the newly added tag groups for the consumer and producer exchanges.

11. The tag groups will contain tags corresponding to the ranges that was set in VersaPro. Launch the OPC Quick Client. Good values should be visible in both tag groups.

Configuring EGD in GE Proficy Machine Edition

The setup and configuration demonstration project below uses the GE 90-30 PLC, GE Proficy version 6.0, an OPC server and the GE Ethernet Global Data driver.

Ethernet Global Data

Ethernet Global Data (EGD) is a communications protocol developed by GE in 1998. It allows a device (the producer) to transfer data to other devices (the consumers) on the network. Applications that require high-speed networking and coordination from PLC to PLC (or PLC to GE Variable Frequency Drives) can take advantage of EGD: it is up to ten times more efficient on bandwidth utilization than the normal polling system.

Configuring EGD in GE Proficy Machine Edition (Version 6.0)

In the demonstration below, the PLC's IP address is 192.168.0.0 and the OPC server's IP address is 192.168.0.99.

1. To begin, start Proficy and then use the project templates to create a new, generic project for a **GE Series 90-30 PLC**.

2. Next, choose a CPU for the project. To do so, select the **Project** tab in the Navigator window in order to make the Project tree visible. Under **Hardware Configuration** | **Main Rack (IC693CHS391)**, click on **Slot1 (IC693CPU3xx)** to display the CPU's properties in the Inspector.

Note: When an item is clicked on in the Navigator's Project tree, its properties become visible in the Inspector window. Both the Navigator and Inspector windows 'float' in the main GE Proficy window.
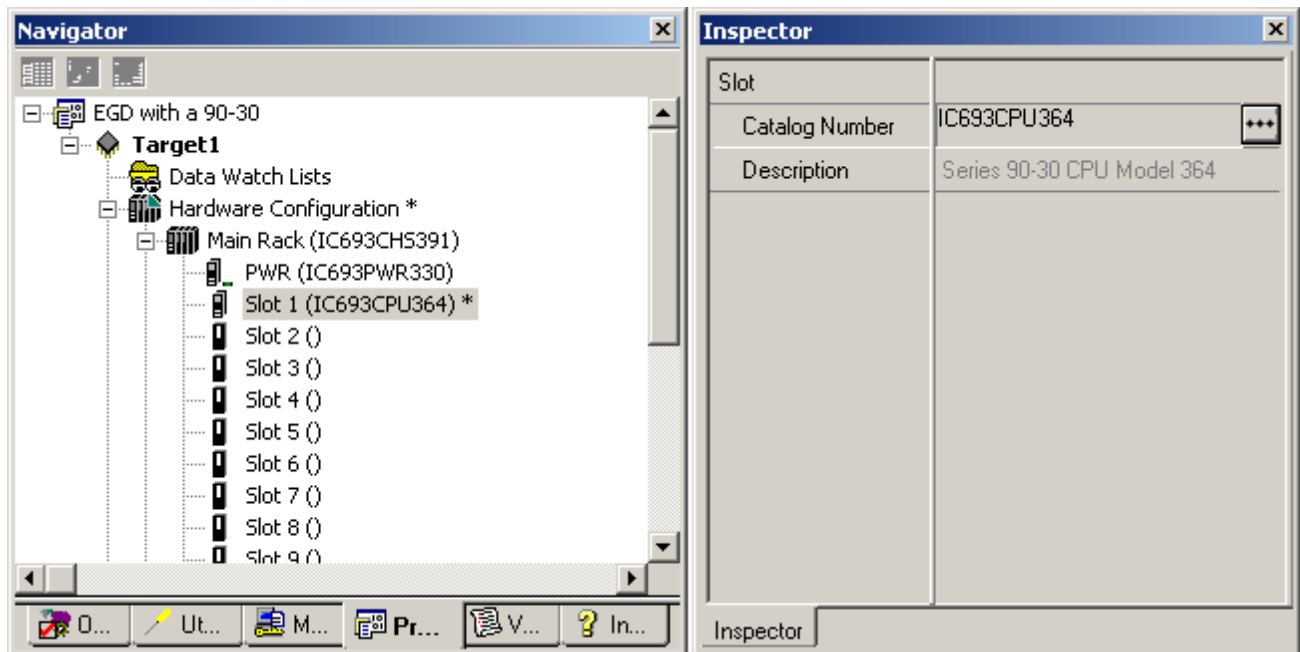

Note: A default catalog number will be displayed (such as "IC693CPU374"). For more options, click **Selection** and then choose the desired CPU. In this demonstration, IC693CPU364 is used.

3. Select a power supply for the project. To do so, locate **Main Rack (IC693CHS391)** in the Navigator and then click **PWR (IC693PWR3xx)** to display the power supply's properties in the Inspector window.

Note: A default catalog number will be displayed (such as "IC693PWR330"). For more options, click **Selection** and then choose the desired power supply. In this demonstration, IC693PWR321 is used.

4. Select modules as needed for the remaining slots under Main Rack.

5. Next, configure the CPU. In the project tree, under **Hardware Configuration** | **Main Rack (IC693CHS391)**, double-click **Slot1 (IC693CPU364)** to display the CPU's configuration window. Almost all of the entries in the Ethernet tab will be defaulted to zeros.
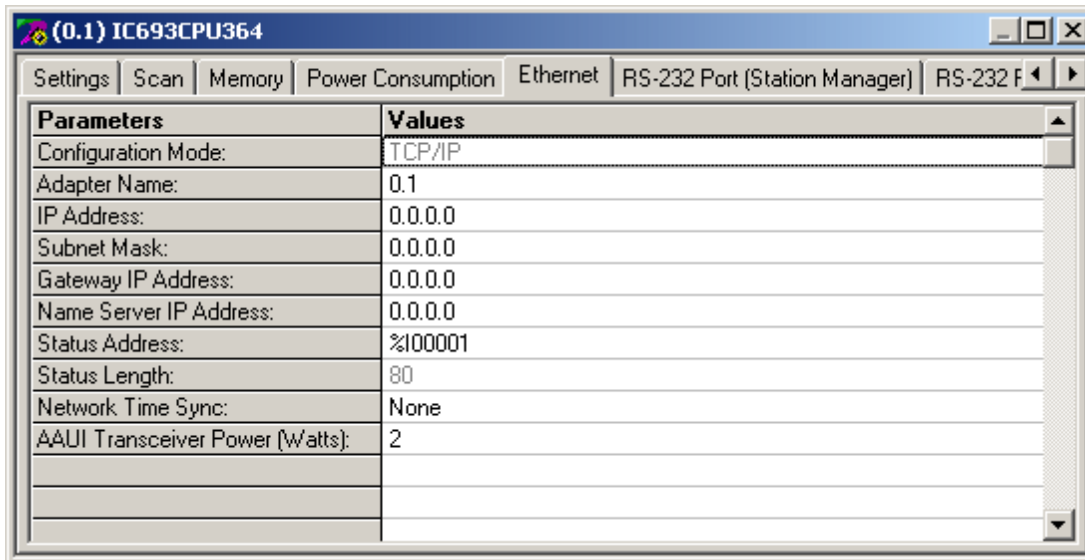
Important: It is strongly recommended that the PLC's pre-existing CPU configuration be uploaded into Proficy rather than entered manually. To do so, a serial connection is required between the PLC and the computer that is running Proficy. Use the PLC's SNP port and an SNP cable for the upload. For information on uploading the CPU configuration, refer to the instructions below.

   a.   Get online with the PLC by clicking the lightning bolt icon in the menu bar. Alternatively, open **Target** at the top of the Proficy screen and then select **Go online with Target1**.
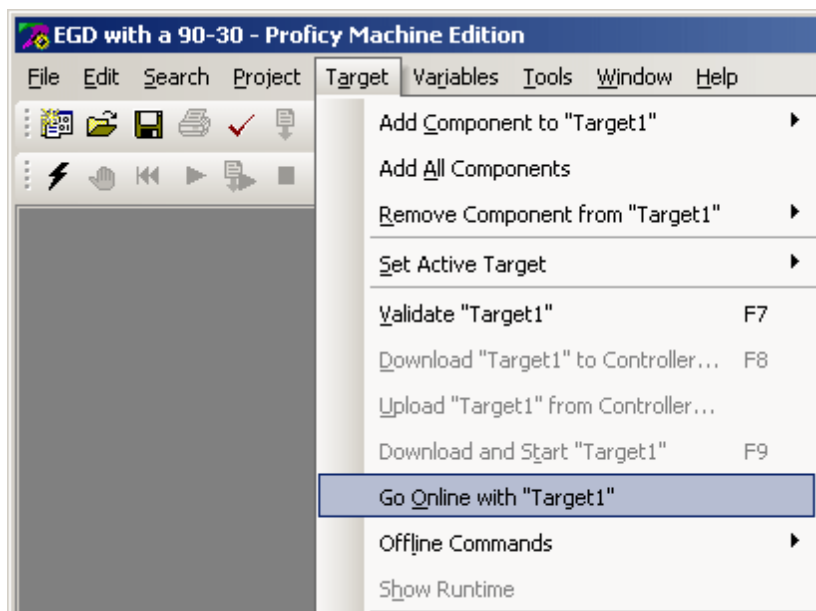
   Note: A connection will be established after several seconds. If the PLC's configuration does not match the Proficy project's configuration, a red cross will appear over Target1 in the project tree. This cross is informational and should not cause concern.

   b.   Next, select **Upload Target1 from controller...** from the **Target** drop-down menu. In the **Upload from Controller** box, check **Hardware Configuration and Motion** and then leave the remaining two options unchecked. Click **OK** to continue.
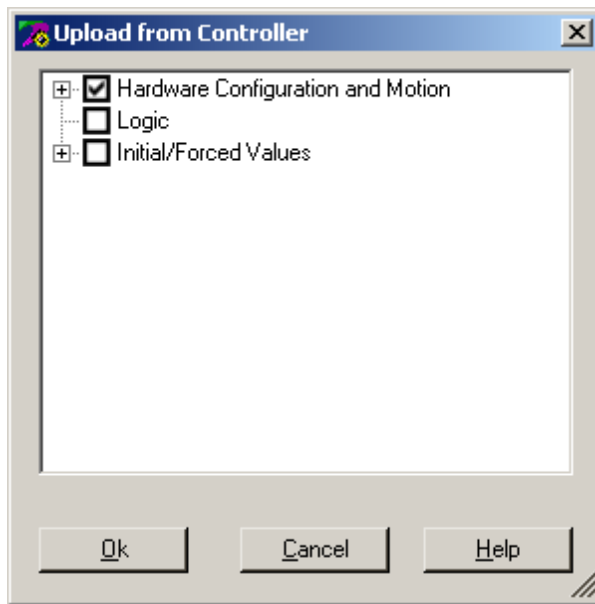
c. Once the upload has completed, re-open the CPU configuration and examine the Ethernet tab. An Ethernet configuration will have been uploaded from the PLC. All parameters except for the Adapter Name should now contain values. A valid Adapter Name will need to be entered eventually, but it is not possible to do so at this time. For now, note the IP Address (which will be needed shortly) and continue.

   Note: The red cross should still appear over the **Target1** icon. This is because a partial upload of the PLC was performed, not a complete upload.

d. Next, disconnect the serial connection between Proficy and the PLC by opening the **Target** drop-down menu and selecting **Go offline with Target1**. The red cross over **Target1** should go away.

   **Note:** The serial connection can also be used to download a new CPU configuration.

6. Then, click on Target1 at the top of the project tree. In the Inspector window, locate the **Physical Port** and change its setting from COM to ETHERNET. The **IP Address** parameter should then appear: enter the same IP address that appears in the CPU's Ethernet configuration.
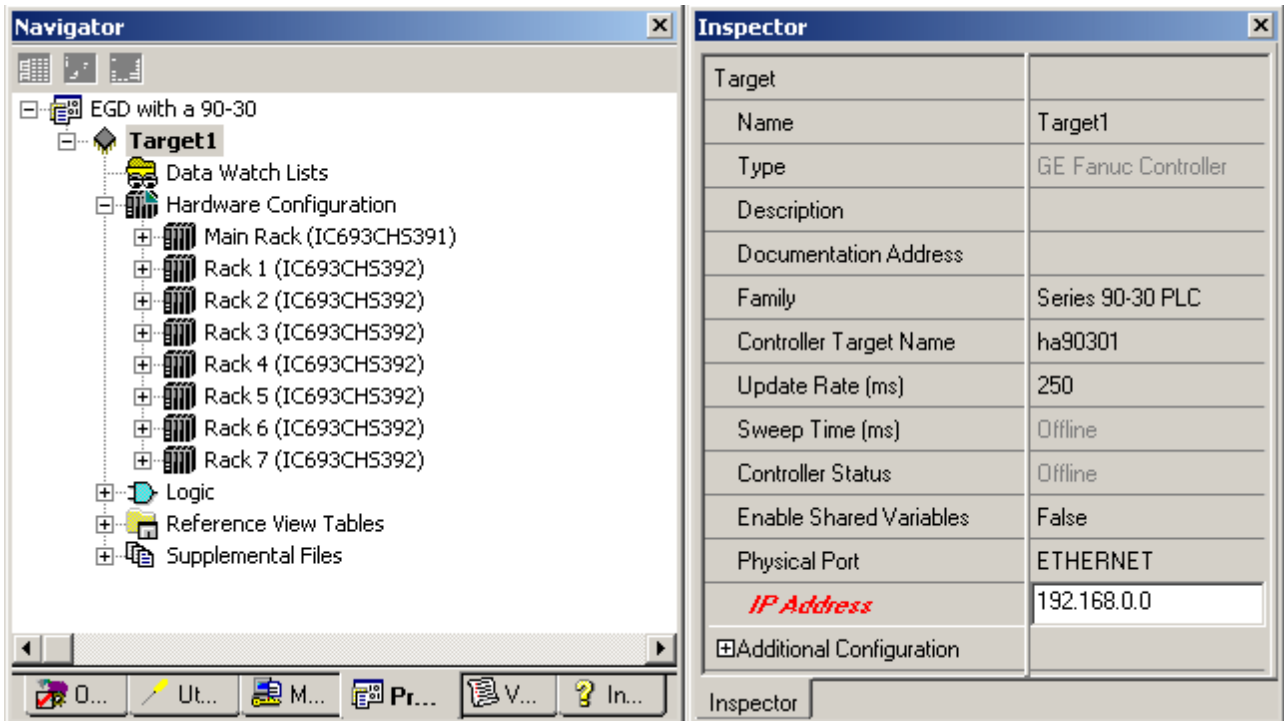
7. Users should now be able to enter an Adapter Name in the CPU's configuration. To do so, double-click on **Slot1 (IC693CPU364)** and then select the **Ethernet** tab. Then, double-click in the value field of **Adapter Name** and type "0.1."

Note: A serial connection is not necessary from this point on.

8. Next, add EGD components to the project by right-clicking on **Target1** and then selecting **Add Component | Ethernet Global Data**.
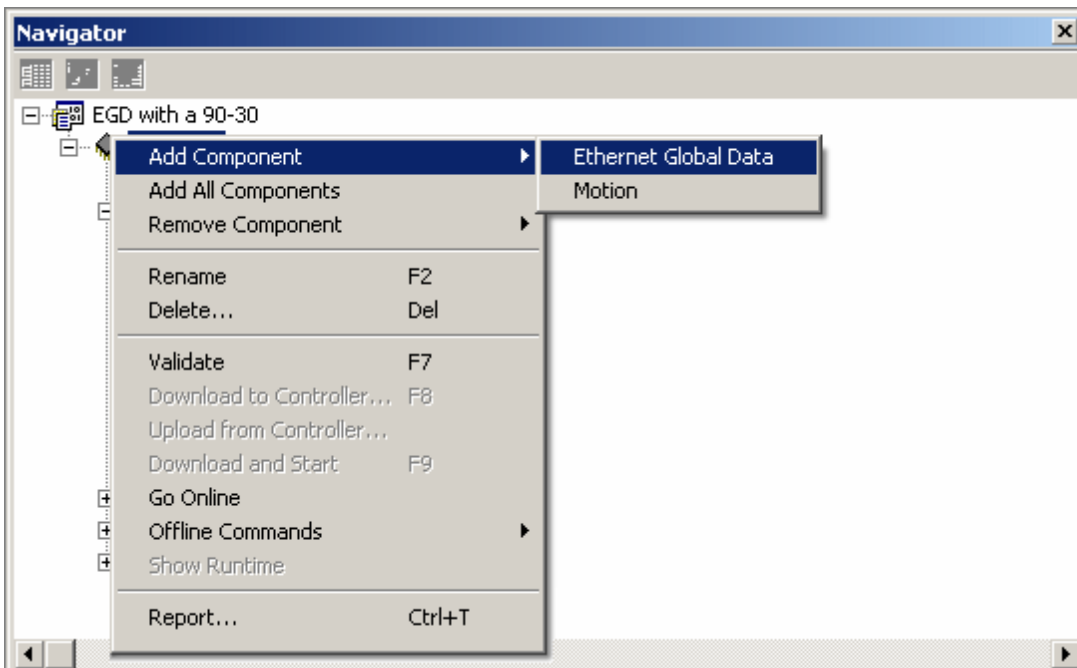

Note: The icon **Ethernet Global Data** should now appear in the project tree. View its properties in the Inspector window. Then, locate the **Local Producer ID** parameter and enter the EGD Producer's IP address. In this demonstration, the PLC's IP address is used.
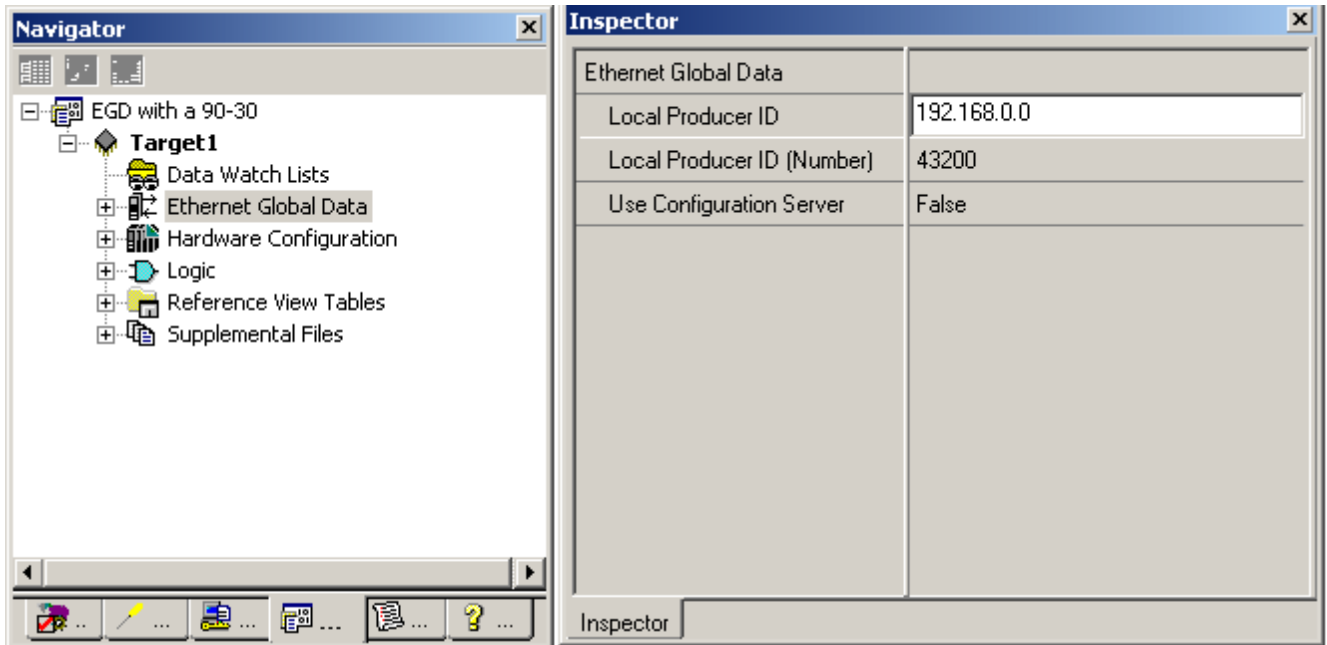
9. Expand the Ethernet Global Data icon to reveal the **Consumed Exchanges** and **Produced Exchanges** icons. Then, do the following:

   a. Right-click on Consumed Exchanges and select **New**. The icon **ConsExch1** will appear. Display its properties in the Inspector window and then locate the **Producer ID** parameter. Enter the IP address of the computer on which the OPC server will be running.
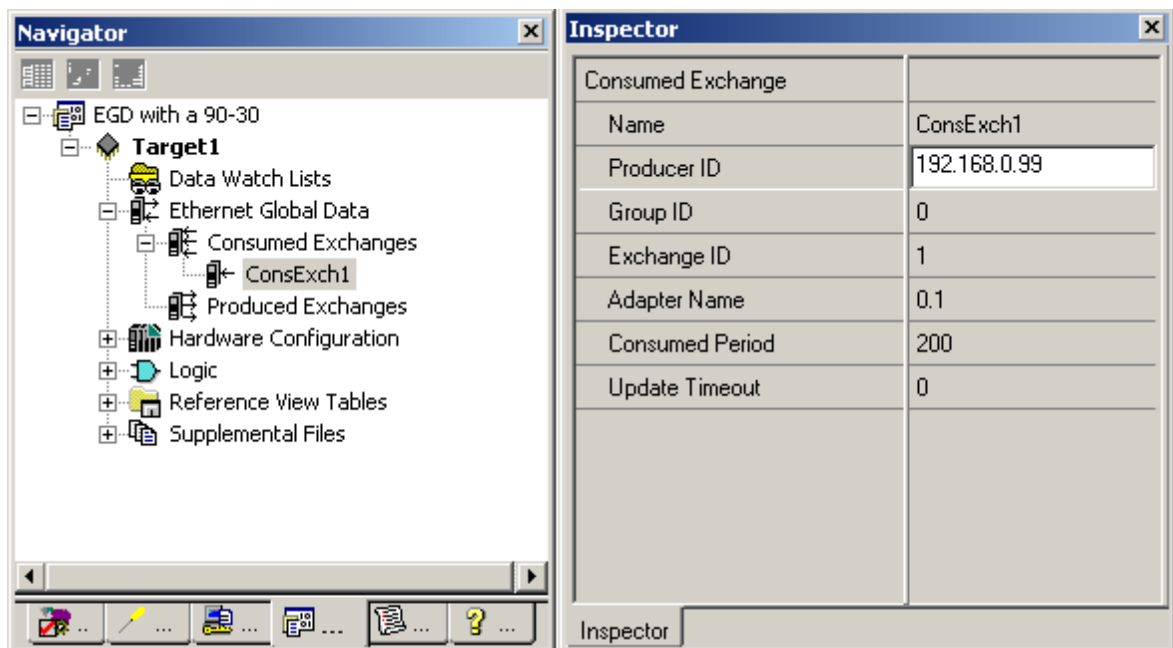
   b. Right-click on Produced Exchanges and select **New**. The icon **ProdExch1** will appear. Display its properties in the Inspector window and then locate the **Destination Type** and **Destination** parameters. In Destination Type, set the parameter to "IP Address." In Destination, enter the IP address of the computer on which the OPC server will be running.
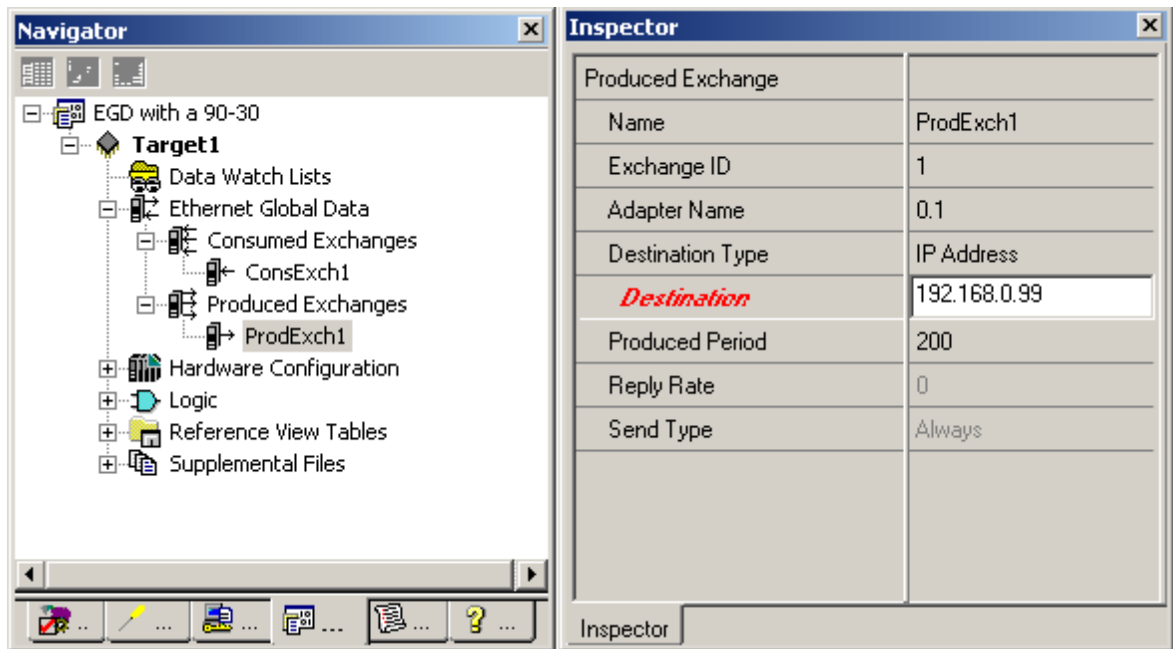
10. Next, double-click on **ConsExch1** to invoke the "ConsExch1" window, which is used to add register addresses to the Consumer Exchange. Click **Add** to insert a new row. In this demonstration, the new row's **Ref Address** is set to "%AI1030." The **Length** is set to 14.

11. Then, double-click on **ProdExch1** to invoke the "ProdExch1" window, which is used to add register addresses to the Producer Exchange. Click **Add** to insert a new row. In this demonstration, the new row's **Ref Address** is set to "%R00101." The **Length** is set to 14.


12. Create ladder logic for the project by expanding the **Logic** icon in the Project tree and then double-clicking on "_Main." This will invoke a window for creating and editing ladder logic.

Important: In order to place the PLC into the Run state, a ladder must be present in the PLC's memory. Therefore, ladder logic must be included in an EGD configuration for the 90-30 PLC even if the logic is not directly relevant.

Downloading the Project to the PLC

1. Save the Proficy project before continuing. Then, get online with the PLC by clicking the lightning bolt icon in the menu bar. Alternatively, open the **Target** menu at the top of the Proficy screen and then select **Go online with Target1**.

2. The project must be validated before a download can be attempted. To do so, open the **Target** menu and select **Validate "Target1"**. To check for validation errors, click the **Feedback Zone** window. Continue on if there are no errors.

3. Next, toggle Proficy into **Programmer Mode** by clicking the green hand icon in the Proficy toolbar (next to the lightning bolt icon).

4. Then, open the **Target** menu and click **Download | Target1**. The **Download to Controller** window will appear: make sure that all three items in the window are checked.
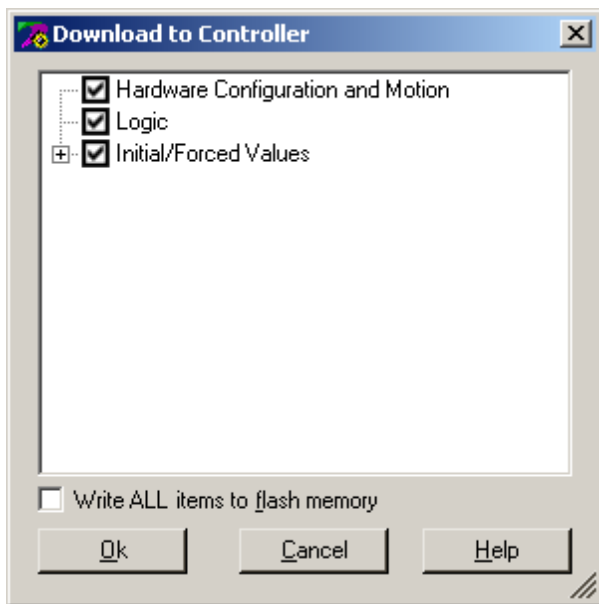

Note: If the download was successful, the Feedback Zone window should report no errors. When complete, the red cross over Target1 will be gone because the PLC's configuration matches the Proficy project's configuration.

Configuring an OPC Server Project

1. Next, create an OPC server EGD project. To do so, start the OPC server and create a new project. Under **Channel Properties**, set the device driver to **GE Ethernet Global Data**. Under **Device Properties**, proceed to **Exchange Configuration**. The preceding Device Properties dialogs' parameters can be left at the default settings.

2. Select the **Consumer Exchanges** tab and add an exchange. Set the parameters to the following:

    a. **ID:** 1.

    b. **Exchange Number:** 1.

    c. **Producer ID:** The 90-30 PLC's IP address.

    d. **Group ID:** 0.

    e. **Consumed Period:** 200.

    f. **Update Timeout:** 200.

3. Click **Add Range** to add a range to the Consumer Exchange. Set the parameters to the following:

    a. **Reference:** %R.

    b. **Low Point:** 101.

    c. **High Point:** 114.
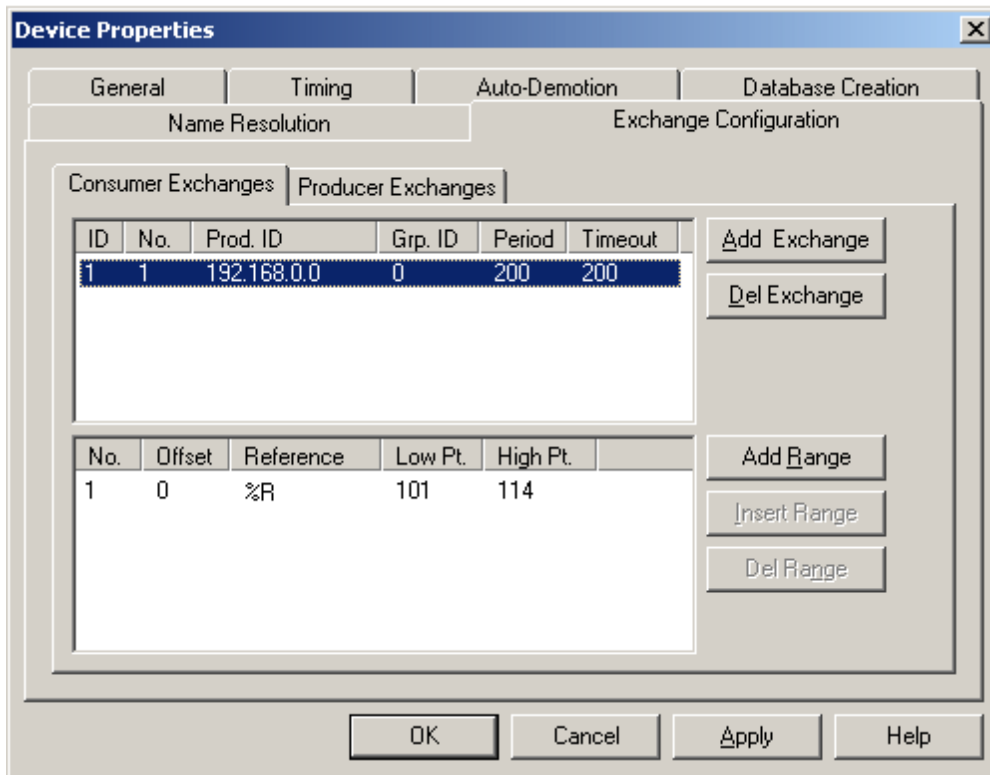

4. Select the **Producer Exchanges** tab and add an exchange. Set the parameters to the following:

    a. **ID:** 1.

    b. **Exchange Number:** 1.

    c. **Consumed Type:** IP.

    d. **Consumed Address:** The 90-30 PLC's IP address.

    e. **Producer Interval:** 200.

5. Click **Add Range** to add a range to the Producer Exchange. Set the parameters to the following:

    a. **Reference:** %AI.

    b. **Low Point:** 1030.

   c. **High Point:** 1043.
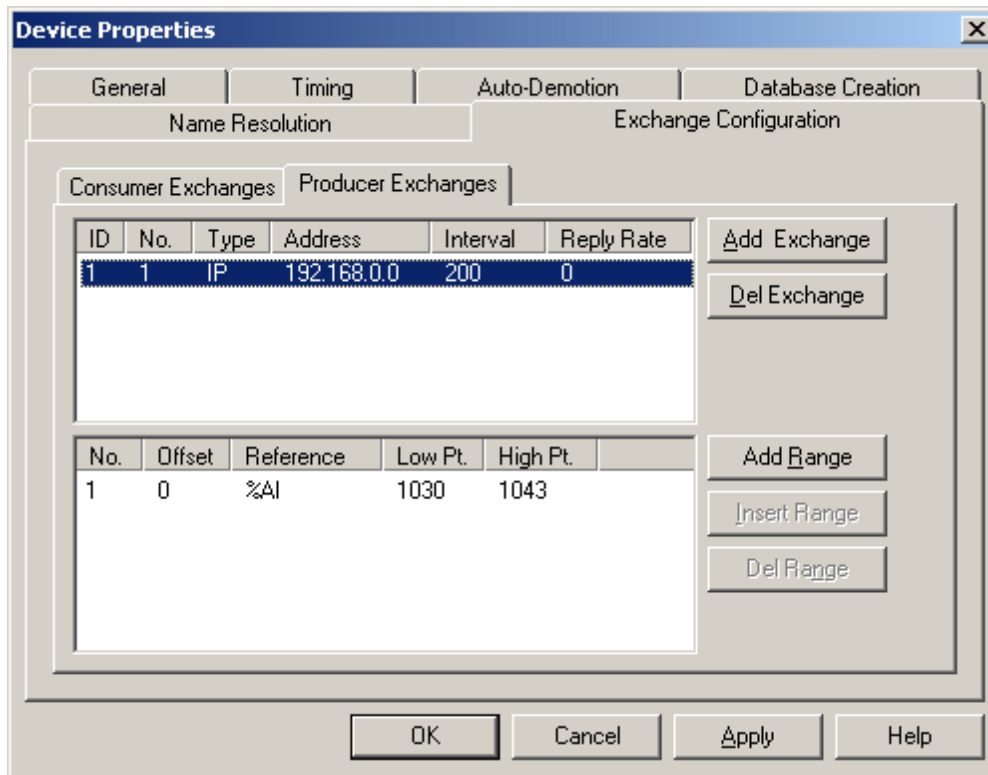
6. Accept the Device Properties that have been entered.

7. Next, create tags. To do so, first create a new folder and then name it **ConsEx**. Open the folder and create new tags at the addresses **C1:1:R101** through **C1:1:R114**.
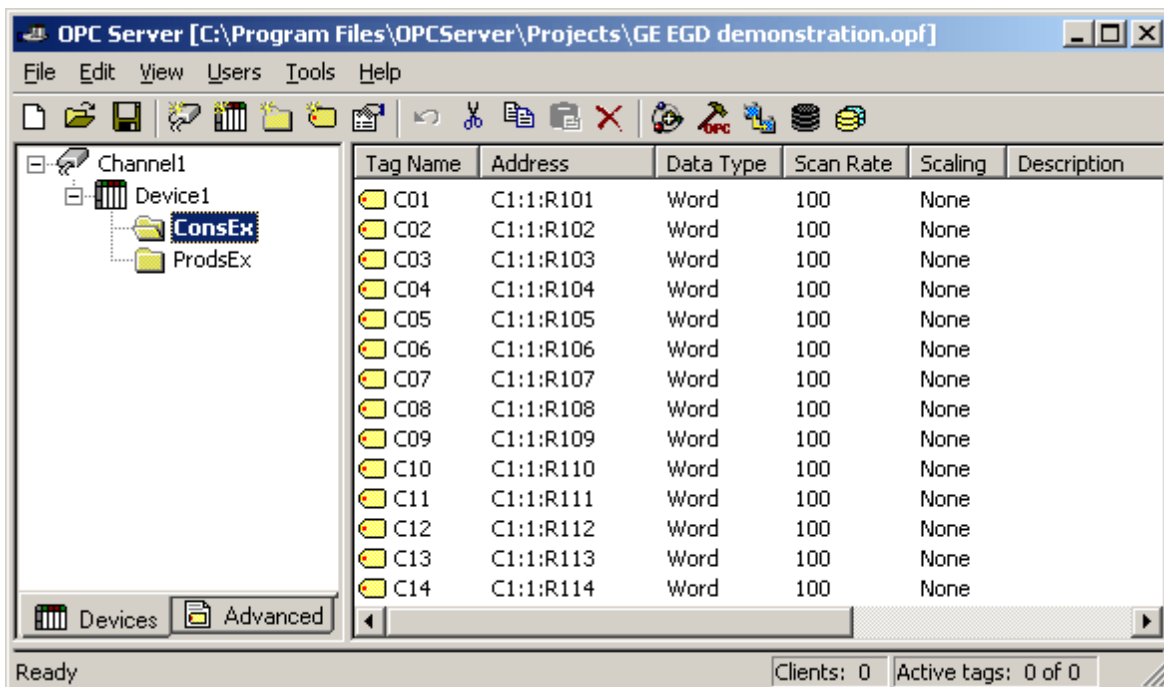
8. Create another new folder and then name it **ProdsEx**. Open the folder and create new tags at the addresses **P1:1:AI1030** through **P1:1:AI1043**.
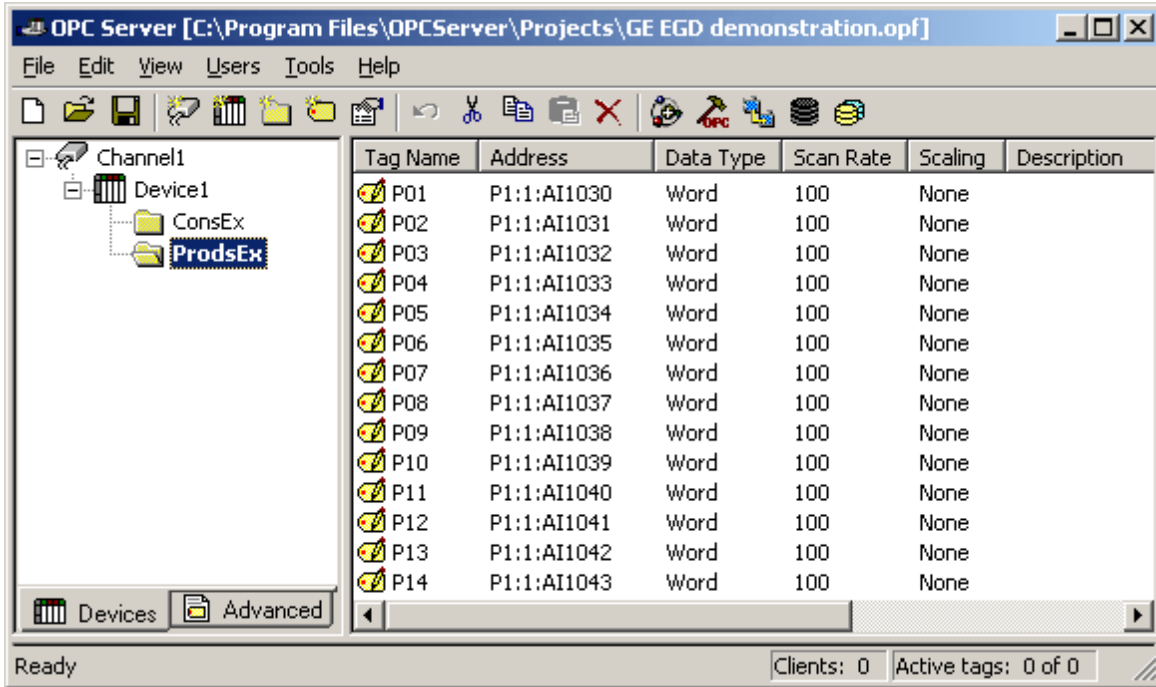
9. Next, start Quick Client. If the PLC is online and the Proficy project created earlier has been downloaded to the PLC, the tags should show "Good" quality. Users should also be able to write to the Producer tags (Consumer tags are Read Only).

Note: By going online with Proficy, users can check the values held by PLC registers at the addresses %AI1030 to %AI1043 and %R101 to %R114. To find the registers, return to the project tree and then click **Reference View Tables** | **Default Tables**.

Error Descriptions

The following error/warning messages may be generated. Click on the link for a description of the message.

Address Validation

Address '<address>' is out of range for the specified device or register
Array size is out of range for address '<address>'
Array support is not available for the specified address: '<address>'
Data Type '<type>' is not valid for device address '<address>'
Device address '<address>' contains a syntax error
Device address '<address>' is not supported by model '<model name>'
Device address '<address>' is Read Only
Missing address

GE Ethernet Global Data Device Specific Messages

Consumer exchange (<Exchange ID>) on channel '<channel>' contains an invalid signature from producer (<producer IP>)
Consumer exchange (<Exchange ID>) on channel '<channel>' is not receiving production data from producer (<producer IP>)
Consumer exchange (<Exchange ID>) on channel '<channel>' is not receiving updates within the configured period (elapsed time <time>ms)
Consumer exchange (<Exchange ID>) on channel '<channel>' is receiving an unsynchronized timestamp from producer (<producer IP>)
Consumer exchange (<Exchange ID>) on channel '<channel>' is receiving out of date data from producer (<producer IP>)
No exchanges have been configured. Tags not generated
Non-production exchange (<Exchange ID>) received from producer (<producer IP>)
Received exchange (<Exchange ID>) with an unsupported protocol version (<protocol version received>) from producer (<producer IP>)
The driver has not been properly configured to receive exchange (<Exchange ID>) from producer (<producer IP>)
The xml file contains an alias name which has illegal characters. Only alphanumeric and underscore characters are valid
Unable to bind consumer socket on '<device>'. (Error Code = <error code>)
Unable to bind producer socket required for multicasting on '<device>'. (Error Code = <error code>)
Unable to bind to adapter: '<adapter>'. Connect failed
Unable to create a producer socket on '<device>'. (Error Code = <error code>)
Unable to create a consumer socket on '<device>'. (Error Code = <error code>)
Unable to determine host name for producing node. (Error Code = <error code>)
Unable to get host address for producing node. (Error Code = <error code>)
Unable to join multicast group on '<IP address>'. (Error Code = <error code>)
Unable to read producer exchange (<Exchange ID>) configuration data on channel '<channel>'. Terminating producer exchange
Unable to reuse consumer socket on '<device>'. (Error Code = <error code>)
Unable to set time to live for multicasted socket on '<device>'. (Error Code = <error code>)
Winsock initialization failed (OS Error = n)
Winsock V1.1 or higher must be installed to use the GE Ethernet device driver

Address Validation

The following error/warning messages may be generated. Click on the link for a description of the message.

Address Validation

Address '<address>' is out of range for the specified device or register
Array size is out of range for address '<address>'
Array support is not available for the specified address: '<address>'
Data Type '<type>' is not valid for device address '<address>'
Device address '<address>' contains a syntax error
Device address '<address>' is not supported by model '<model name>'
Device address '<address>' is Read Only
Missing address

Address '<address>' is out of range for the specified device or register

Error Type:
Warning

Possible Cause:
A tag address that has been specified statically references a location that is beyond the range of supported locations for the device.

Solution:
Verify the address is correct; if it is not, re-enter it in the client application.

Array size is out of range for address '<address>'

Error Type:
Warning

Possible Cause:
A tag address that has been specified statically is requesting an array size that is too large for the address type or block size of the driver.

Solution:
Re-enter the address in the client application to specify a smaller value for the array or a different starting point.

Array support is not available for the specified address: '<address>'

Error Type:
Warning

Possible Cause:
A tag address that has been specified statically contains an array reference for an address type that doesn't support arrays.

Solution:
Re-enter the address in the client application to remove the array reference or correct the address type.

Data Type '<type>' is not valid for device address '<address>'

Error Type:
Warning

Possible Cause:
A tag address that has been specified statically has been assigned an invalid data type.

Solution:
Modify the requested data type in the client application.

Device address '<address>' contains a syntax error

Error Type:
Warning

Possible Cause:
A tag address that has been specified statically contains one or more invalid characters.

Solution:
Re-enter the address in the client application.

Device address '<address>' is not supported by model '<model name>'

Error Type:
Warning

Possible Cause:

A tag address that has been specified statically references a location that is valid for the communications protocol but not supported by the target device.

Solution:
Verify that the address is correct; if it is not, re-enter it in the client application. Also verify that the selected model name for the device is correct.

Device address '<address>' is Read Only

Error Type:
Warning

Possible Cause:
A tag address that has been specified statically has a requested access mode that is not compatible with what the device supports for that address.

Solution:
Change the access mode in the client application.

Missing address

Error Type:
Warning

Possible Cause:
A tag address that has been specified statically has no length.

Solution:
Re-enter the address in the client application.

GE Ethernet Global Data Device Specific Messages

The following error/warning messages may be generated. Click on the link for a description of the message.

GE Ethernet Global Data Device Specific Messages
[Consumer exchange (<Exchange ID>) on channel '<channel>' contains an invalid signature from producer (<producer IP>)](#)
[Consumer exchange (<Exchange ID>) on channel '<channel>' is not receiving production data from producer (<producer IP>)](#)
[Consumer exchange (<Exchange ID>) on channel '<channel>' is not receiving updates within the configured period (elapsed time <time>ms)](#)
[Consumer exchange (<Exchange ID>) on channel '<channel>' is receiving an unsynchronized timestamp from producer (<producer IP>)](#)
[Consumer exchange (<Exchange ID>) on channel '<channel>' is receiving out of date data from producer (<producer IP>)](#)
[No exchanges have been configured. Tags not generated](#)
[Non-production exchange (<Exchange ID>) received from producer (<producer IP>)](#)
[Received exchange (<Exchange ID>) with an unsupported protocol version (<protocol version received>) from producer (<producer IP>)](#)
[The driver has not been properly configured to receive exchange (<Exchange ID>) from producer (<producer IP>)](#)
[The xml file contains an alias name which has illegal characters. Only alphanumeric and underscore characters are valid](#)
[Unable to bind consumer socket on '<device>'. (Error Code = <error code>)](#)
[Unable to bind producer socket required for multicasting on '<device>'. (Error Code = <error code>)](#)
[Unable to bind to adapter: '<adapter>'. Connect failed](#)
[Unable to create a producer socket on '<device>'. (Error Code = <error code>)](#)
[Unable to create a consumer socket on '<device>'. (Error Code = <error code>)](#)
[Unable to determine host name for producing node. (Error Code = <error code>)](#)
[Unable to get host address for producing node. (Error Code = <error code>)](#)
[Unable to join multicast group on '<IP address>'. (Error Code = <error code>)](#)
[Unable to read producer exchange (<Exchange ID>) configuration data on channel '<channel>'. Terminating producer exchange](#)

Unable to reuse consumer socket on '<device>'. (Error Code = <error code>)
Unable to set time to live for multicasted socket on '<device>'. (Error Code = <error code>)"
Winsock initialization failed (OS Error = n)
Winsock V1.1 or higher must be installed to use the GE Ethernet device driver

Consumer exchange (<Exchange ID>) on channel '<channel>' contains an invalid signature from producer (<producer IP>)

Error Type:
Fatal

Possible Cause:
The producing node has sent an exchange which does not conform to the standards expected by the GE EGD Device Driver.

Solution:
Contact Technical Support.

Consumer exchange (<Exchange ID>) on channel '<channel>' is not receiving production data from producer (<producer IP>)

Error Type:
Serious

Possible Cause:
The producing node's producer exchange is configured with no range data.

Solution:
Make sure the producer exchange is configured properly.

Consumer exchange (<Exchange ID>) on channel '<channel>' is not receiving updates within the configured period (elapsed time <time>ms)

Error Type:
Warning

Possible Cause:
Depending on network configuration, it could be taking too long to receive an update from the producer, or a bad network cable could be slowing communications down.

Solution:
Increase the configured time period. Check the network connections to make sure they are functioning at the highest speed possible.

Consumer exchange (<Exchange ID>) on channel '<channel>' is receiving an unsynchronized timestamp from producer (<producer IP>)

Error Type:
Serious

Possible Cause:
The producing node has flagged the produced timestamp to be unsynchronized with the data.

Solution:
Consult the GE EGD PLC documentation.

Consumer exchange (<Exchange ID>) on channel '<channel>' is receiving out of date data from producer (<producer IP>)

Error Type:
Serious

Possible Cause:
The producing node has flagged the produced data as either old or invalid.

Solution:
Consult the GE EGD PLC documentation.

No exchanges have been configured. Tags not generated

Error Type:
Warning

Possible Cause:
No exchanges have been configured.

Solution:
Add one or more exchanges to the device.

Non-production exchange (<Exchange ID>) received from producer (<producer IP>)

Error Type:
Serious

Possible Cause:
The producing node is producing exchanges which are not valid.

Solution:
Call Technical Support.

Received exchange (<Exchange ID>) with an unsupported protocol version (<protocol version received>) from producer (<producer IP>)

Error Type:
Fatal

Possible Cause:
The GE EGD Device Driver does not support the protocol version number received from the producing node.

Solution:
Call Technical Support.

The driver has not been properly configured to receive exchange (<Exchange ID>) from producer (<producer IP>)

Error Type:
Serious

Possible Cause:
The consumer exchange configuration does not match the exchange received from the producing node, or the exchange is not configured.

Solution:
Make sure that the consumer exchange is properly configured.

The xml file contains an alias name which has illegal characters. Only alpha-numeric and underscore characters are valid

Error Type:
Fatal

Possible Cause:
The project file has become corrupted.

Solution:
Try saving the project in .opf format, and then resave in .xml format.

Unable to bind consumer socket on '<device>'. (Error Code = <error code>)

Error Type:
Warning

Possible Cause:
The driver was unable to bind to the network adapter or IP Address specified.

Solution:
Try specifying a different network adapter and/or IP address.

Unable to bind producer socket required for multicasting on '<device>'. (Error Code = <error code>)

Error Type:
Warning

Possible Cause:
The driver was unable to bind to the network adapter specified.

Solution:
Try specifying a different network adapter and/or IP address.

Unable to bind to adapter: '<adapter>'. Connect failed

Error Type:
Fatal

Possible Cause:
The operating system could not find an unused port to use for communication with this device.

1. Network system failure, such as Winsock or network adapter failure.
2. Other applications have claimed all available ports (possible but unlikely).

Solution:
1. Reboot the computer and check the network adapter.
2. Check for applications that could be causing conflicts and then shut them down.

Unable to create a producer socket on '<device>'. (Error Code = <error code>)

Error Type:
Warning

Possible Cause:
The operating system could not find an unused port to use for communication with this device.

1. Network system failure, such as Winsock or network adapter failure.
2. Other applications have claimed all available ports (possible but unlikely).

Solution:
1. Reboot the computer and check the network adapter.
2. Check for applications that could be causing conflicts and then shut them down.

Unable to create a consumer socket on '<device>'. (Error Code = <error code>)

Error Type:
Warning

Possible Cause:
The operating system could not find an unused port to use for communication with this device.

1. Network system failure, such as Winsock or network adapter failure.
2. Other applications have claimed all available ports (possible but unlikely).

Solution:
1. Reboot the computer and check the network adapter.
2. Check for applications that could be causing conflicts and then shut them down.

Unable to determine host name for producing node. (Error Code = <error code>)

Error Type:
Warning

Possible Cause:
Network system failure or network adapter failure.

Solution:
Check to make sure that the network connection is working and active.

Unable to get host address for producing node. (Error Code = <error code>)

Error Type:
Warning

Possible Cause:
Network system failure or network adapter failure.

Solution:
Check to make sure that the network connection is working and active.

Unable to join multicast group on '<IP address>'. (Error Code = <error code>)

Error Type:
Warning

Possible Cause:
The operating system could not find an unused port to use for communication with this device.

1. Network system failure, such as Winsock or network adapter failure.
2. Other applications have claimed all available ports (possible but unlikely).

Solution:
1. Reboot the computer and check the network adapter.
2. Check for applications that could be causing conflicts and then shut them down.

Unable to read producer exchange (<Exchange ID>) configuration data on channel '<channel>'. Terminating producer exchange

Error Type:
Fatal

Possible Cause:
The system may be running low on memory.

Solution:
Make sure the system contains the amount memory required by the server.

Unable to reuse consumer socket on '<device>'. (Error Code = <error code>)

Error Type:
Warning

Possible Cause:
The operating system could not find an unused port to use for communication with this device.

1. Network system failure, such as Winsock or network adapter failure.
2. Other applications have claimed all available ports (possible but unlikely).

Solution:
1. Reboot the computer and check the network adapter.
2. Check for applications that could be causing conflicts and then shut them down.

Unable to set time to live for multicasted socket on '<device>'. (Error Code = <error code>)

Error Type:
Warning

Possible Cause:
Network system failure or network adapter failure.

Solution:
Check to make sure that the network connection is working and active.

Winsock initialization failed (OS Error = n)

Error Type:
Fatal

OS Error:	Indication	Possible Solution
10091	Indicates that the underlying network subsystem is not ready for network communication.	Wait a few seconds and restart the driver.
10067	Limit on the number of tasks supported by the Windows Sockets implementation has been reached.	Close one or more applications that may be using Winsock and restart the driver.

Winsock V1.1 or higher must be installed to use the GE Ethernet device driver

Error Type:
Fatal

Possible Cause:
The version number of the Winsock DLL found on the system is less than 1.1.

Solution:
Upgrade Winsock to version 1.1 or higher.

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