

Moxa EDS SNMP OPC Server (for Windows 2000) User Manual

Second Edition, June 2008



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1. Introduction

The Moxa EDS SNMP OPC Server is a driver of both the HMI software with OPC Client function and a real working data acquisition and control module OPC Server. This OPC server was implemented using advanced programming concepts of the most current version of the OPC specification for use in developing next generation industrial software applications.

Key features of the Moxa EDS SNMP OPC Server.

- Advanced OPC data Quality and data conversion to client's request
- Supports Multiple Moxa EDS Devices
- Utilizes the concept of Groups for easy configuration and manageability
- Support standard SNMP TAG data types, such as Counter, Gauge, String...etc.
- Internally Simulated for configuration and testing
- Automatically create EDS Device's Group and Tag
- OPC Sample Client for rapid testing of your OPC data connections
- GUI interface for viewing devices, tags, groups, and Real time data value
- Support OPC Data Access 2.0

2. System Configuration and Installation

System Requirements for Windows 2000

- IBM PC compatible with Pentium-4 or higher
- 128 MB RAM
- 10 GB disk space.
- Microsoft Win 2000
- Standard MS SNMP API Service

Hardware Support

This OPC Server driver supports Moxa industry hub Series devices data acquisition modules. The Ethernet cable and wires must be present to connect the user's computer to the devices. Supported devices are as follows:

ED6008, ED6008_M_SC, ED6008_S_SC, ED6008_MM_SC, ED6008_SS_SC

2.1 Install Moxa EDS SNMP OPC Server at Windows 2000

1. Insert the Moxa EDS SNMP OPC CD into the CD-ROM.
2. run SNMPOPC\Disk1\setup.exe
4. Follow the instructions of the setup program. The setup program will ask you for the folder where most of the files will be located.
5. The setup program will also ask you for the program folder.
6. At the end of installation, click OK to complete and launch the OPC client application.

Register OPC Server

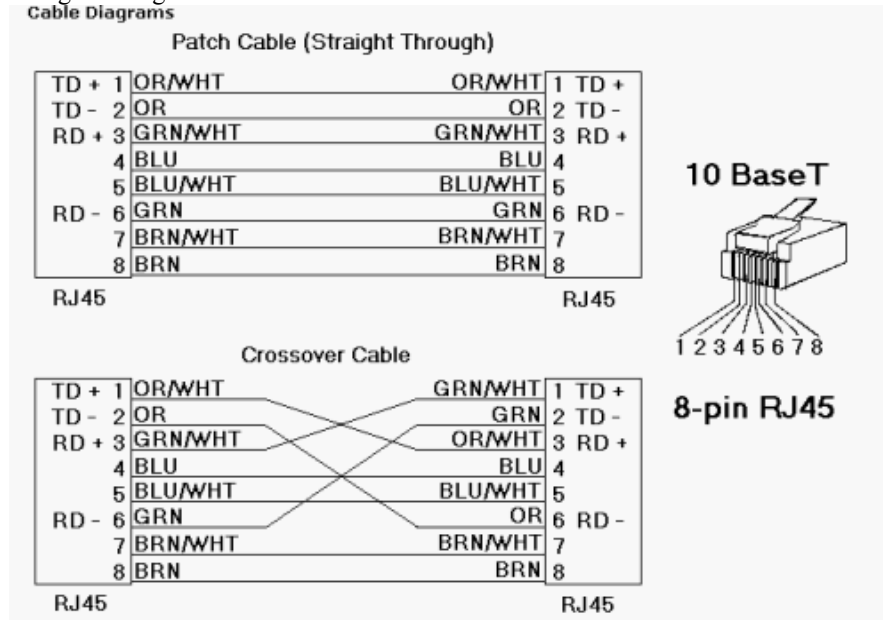
When you run SNMP OPC server first time, the OPC will register itself automatically. Otherwise you register OPC by manual as following step

1. Invoke DOS prompt window by executing DOS execution.
2. Change current directory to be “\Program Files\Moxa\ EDS SNMP OPC Server”
3. Type in “*SNMPOPC /RegServer*” command in DOS prompt mode and execute it.

Moxa EDS SNMP OPC Server would be registered into Windows system. If you want to unregistered Moxa EDS SNMP OPC Server, type in " *SNMPOPC /UnregServer*" command in DOS prompt window. (Please make sure current directory is “Program Files\Moxa\ EDS SNMP OPC Server”)

2.3 Hardware Wiring Setting

Straight through Ethernet cable with hub. Or the Crossover Ethernet cable.



1.4 Data Types Mapping

The following data types are supported by the Moxa EDS SNMP device driver:

SNMP TAG Data Type	OPC data type
INTEGER	32 bit unsigned integer
COUNTER	32 bit unsigned integer
GAUGE	32 bit unsigned integer
TimerTicks	32 bit unsigned integer
IPADDRESS	String
Object ID	String
STRING	String

Quick Start



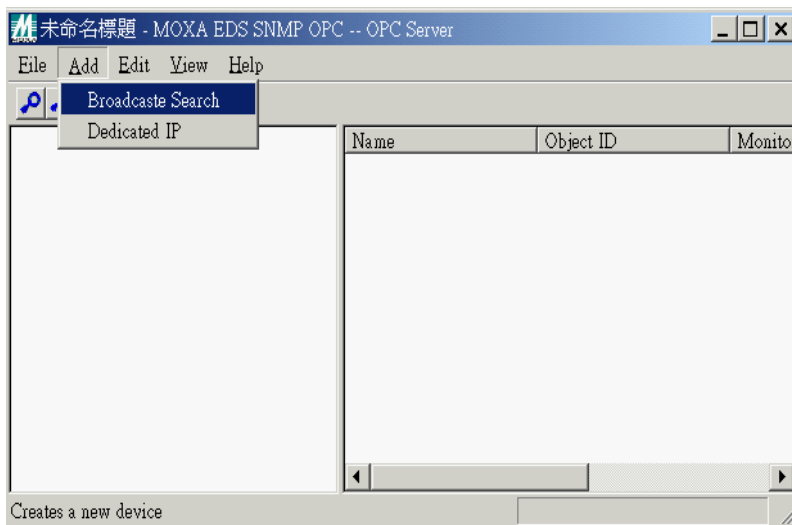
choose “program files” and click the Moxa EDS SNMP OPC Server item as the above picture
You can retrieve the data from any Moxa EDS SNMP devices listed above by the following configuration.

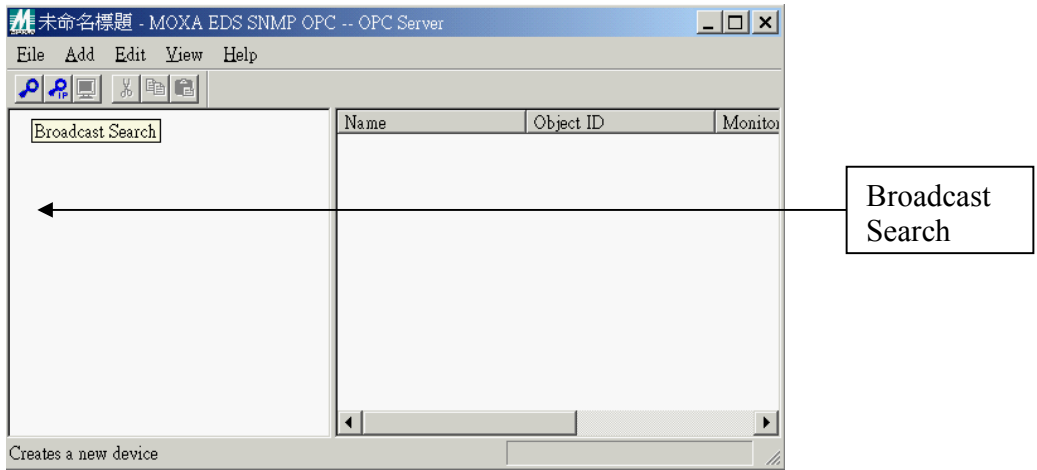
Step 1: Broadcast Search

Step 2: Dedicated IP

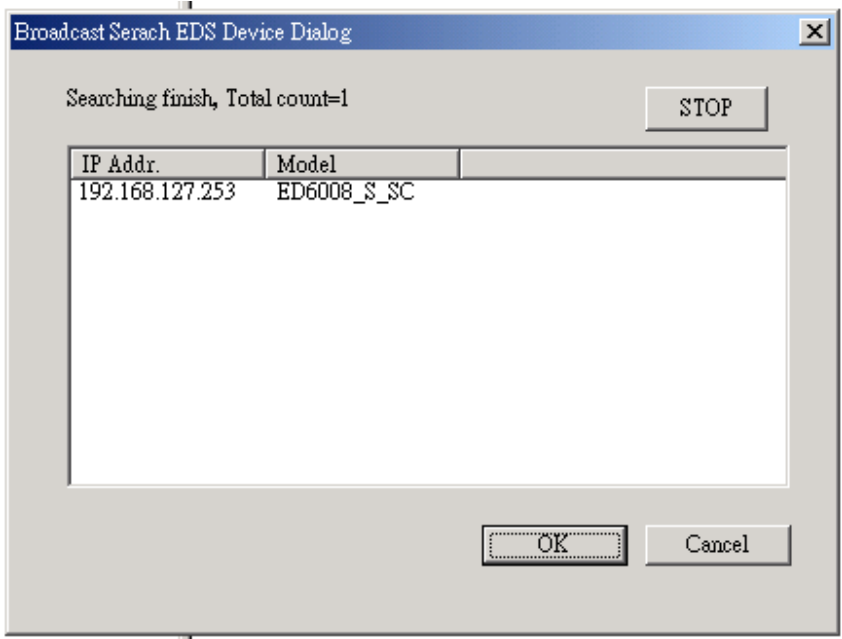
Step 1: Broadcast Search

Using this function to search the Moxa devices in the LAN

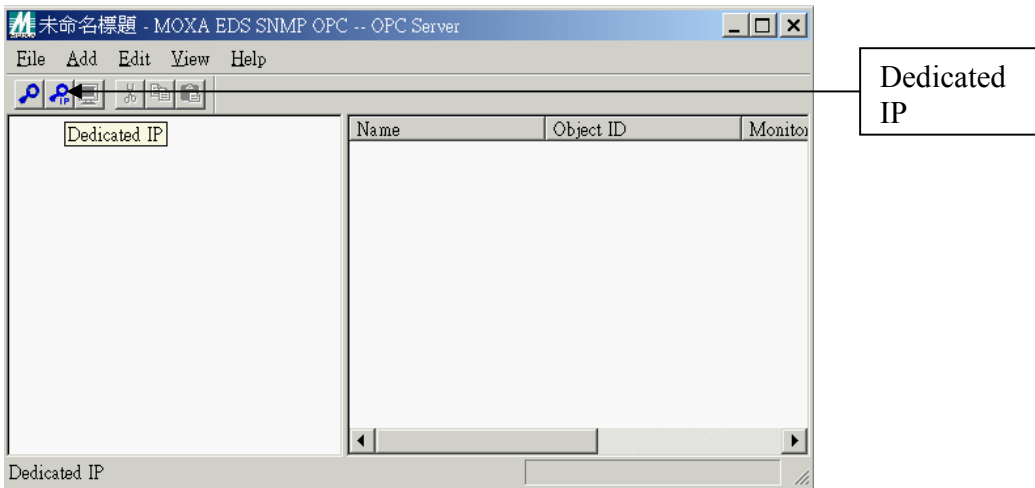
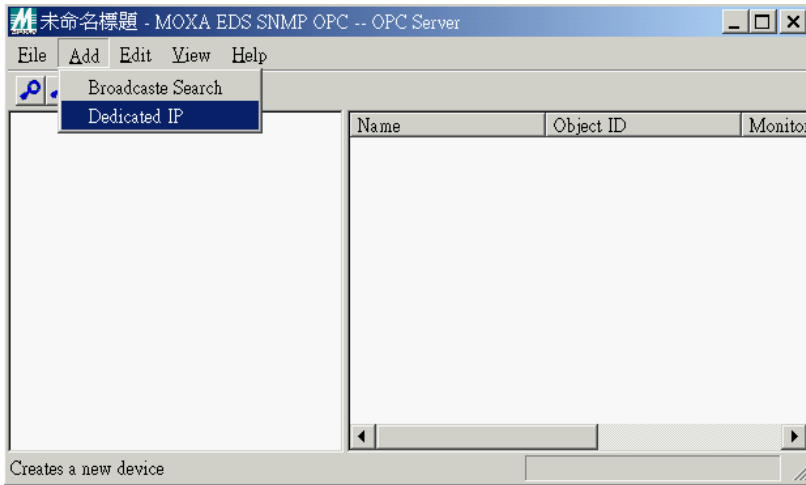




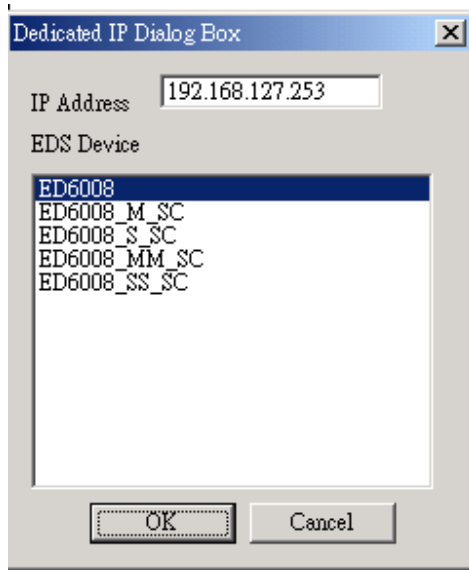
After searching the devices in the LAN. The current EDS device on the Ethernet will be display in the following dialog box.
to select a IP Addr. and check [OK] button, it will create a new EDS device



Step 2: Dedicated IP



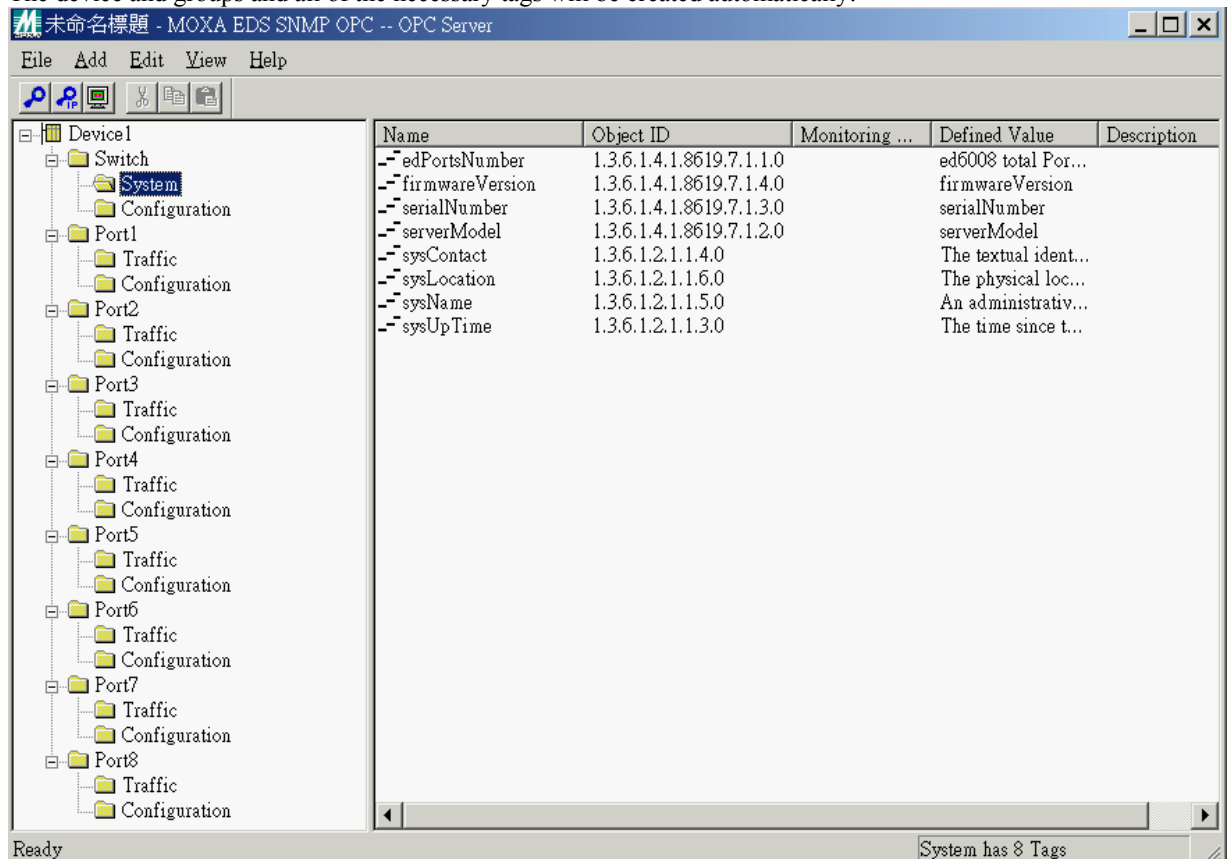
It will display available EDS devices in the dialog box, you can choose one of this and key in IP Address by manual, and check [OK] button, it will create new EDS device.



To choose the device

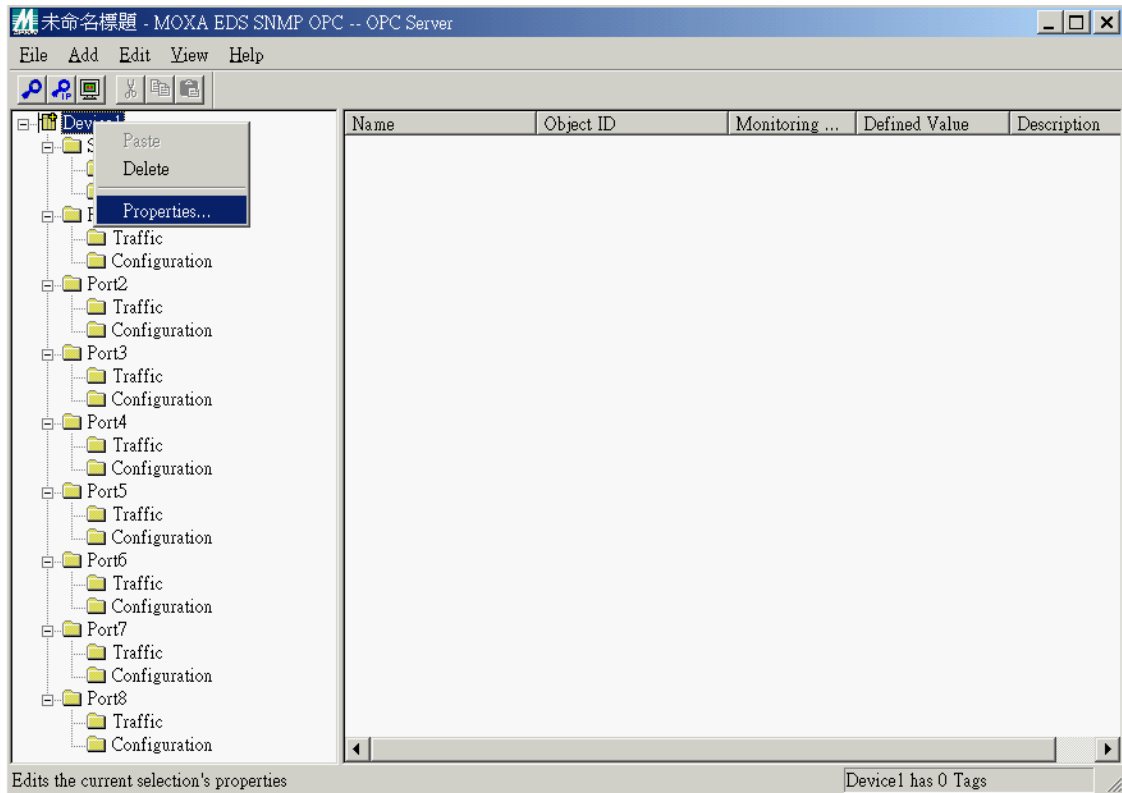
Select one of the device, the system will create all of the tags automatically. By OPC hierarchy, it shows Device->Group->Tag. The Moxa EDS SNMP OPC Server will create the device and all of the related groups and the related tags. Users do not have to create by manual. It will save a lot of time.

The device and groups and all of the necessary tags will be created automatically:

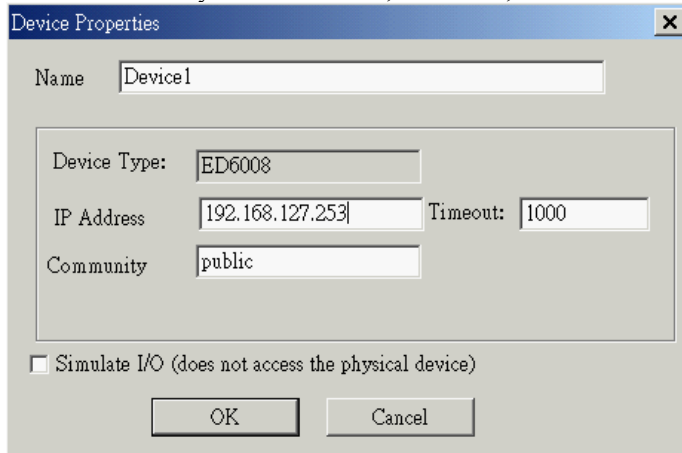


Modify the device

Move the cursor to the Device1. Click the right button of the mouse and choose “Property”



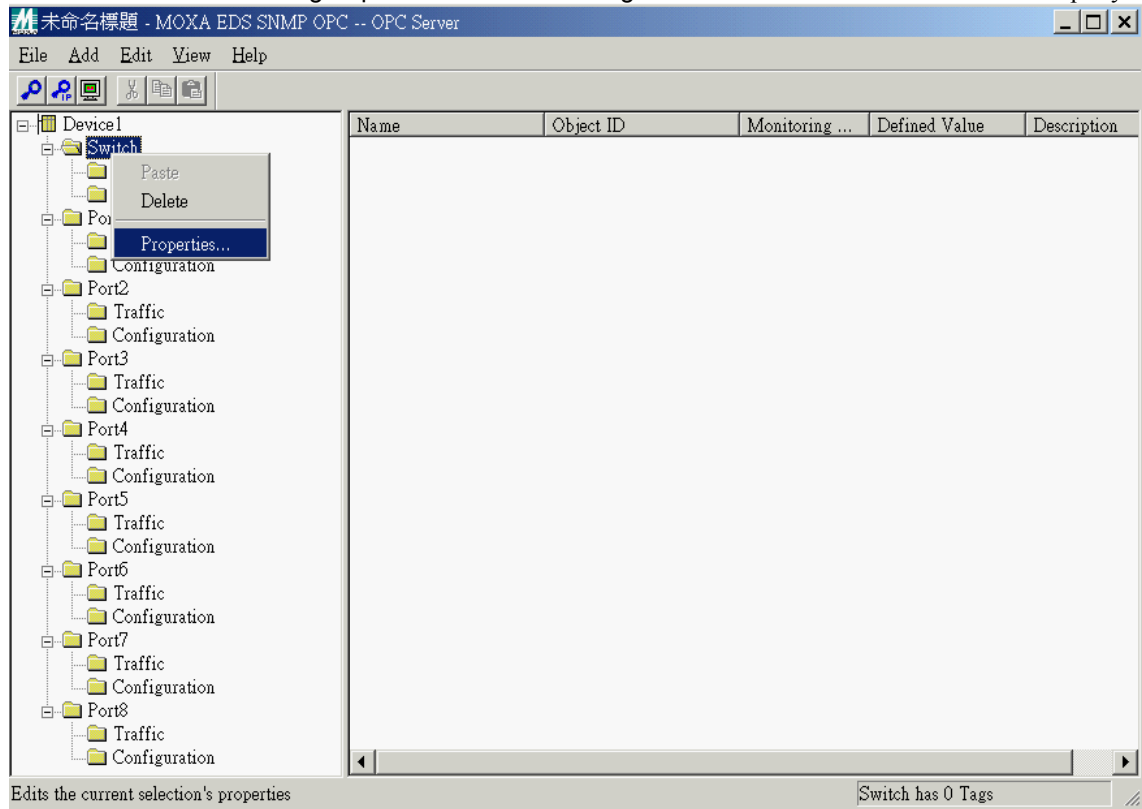
Users could modify the device name, IP address, Timeout value and the Community.



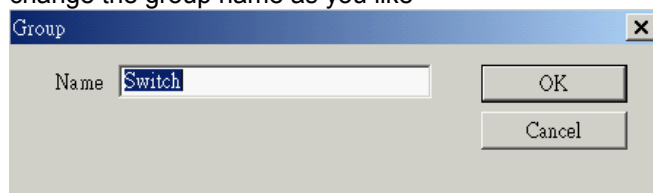
Name: OPC device name for OPC Client connecting
Device Type: Defined Moxa EDS device type
IP Address: EDS Device's IP Address
Timeout: Communication Timeout interval. Unit: msec.
Community: default value is “public”. User can change it
Simulate I/O: Internally Simulated for configuration and testing

Modify the group name

To move the cursor to the group name and click the right button of the mouse and choose “Property”



change the group name as you like



Modify the tag

By double click the tag name, users could modify the contents of the tags as follows.

The screenshot shows a 'Tag Properties' dialog box with the following fields and values:

Field	Value
Name	edPortsNumber
Defined Value	ed6008 total Ports number
Description	
ObjectID	1.3.6.1.4.1.8619.7.1.1.0
Data Type	Integer
Number of Bytes	2
TAG Item No.	1314

Name: OPC TAG name

Defined Value: 請貴公司填寫

Description: 請貴公司填寫

Object ID: SNMP TAG Object ID

Data Type: OPC Data Type converted from SNMP TAG Data type, as 1.4 Data type mapping

Number of Bytes: bytes of OPC TAG's value for OPC internal use

TAG Item No.: Moxa EDS SNMP TAG No. for OPC internal use

3. OPC Server Configuration

3.1 OPC Server Tool

The Moxa EDS SNMP OPC Server tool is your main configuration utility for setting up and maintaining the Moxa EDS devices driver. It provides fields for specifying the properties of devices, groups and tags.

Features

Key features of the Moxa EDS SNMP OPC Server

- Moxa EDS SNMP OPC data Quality and data conversion to client request
- OPC server utilizes advanced free-threading capabilities.
- Supports Multiple Groups for easy configuration and manageability
- Create new EDS Device Group and Tag automatically
- GUI interface for viewing tags, groups, and real time value
- Support OPC Data Access 2.0

Access Methods

From the Windows Start menu:

- Select Programs from the Start menu.
- Select Moxa EDS SNMP OPC Server from the Programs group
- Select Moxa EDS SNMP OPC Server execution file from the Programs submenu.

4.1.1 Using the Tool's Browser

The Tree Browser displays a hierarchical list of the I/O driver and its devices, groups and tags. The I/O driver appears at the top of the tree.

Tool Tree Browser

Name	Object ID	Monitoring ...	Defined Value	Description
--bridgePriority	1.3.6.1.4.1.8619.7.1....		bridgePriority	
--defaultGateway	1.3.6.1.4.1.8619.7.1....		defaultGateway	
--dnsServerIpAddr	1.3.6.1.4.1.8619.7.1....		dnsServerIpAddr	
--enableDhcpClient	1.3.6.1.4.1.8619.7.1....		enableDhcpClient	
--enableTelnetConsole	1.3.6.1.4.1.8619.7.1.6.0		enableTelnetCon...	
--enableWebConfig	1.3.6.1.4.1.8619.7.1.5.0		enableWebConfig	
--forwardingDelay	1.3.6.1.4.1.8619.7.1....		forwardingDelay	
--helloTime	1.3.6.1.4.1.8619.7.1....		helloTime	
--lineSwapRecovery	1.3.6.1.4.1.8619.7.1.7.0		lineSwapRecovery	
--mailServerIpAddr	1.3.6.1.4.1.8619.7.1....		mailServerIpAddr	
--maxAge	1.3.6.1.4.1.8619.7.1....		maxAge	
--power1InputStatus	1.3.6.1.4.1.8619.7.1....		power 1 Input St...	
--power2InputStatus	1.3.6.1.4.1.8619.7.1....		power 2 Input St...	
--root	1.3.6.1.4.1.8619.7.1....		root	
--serverIpAddr	1.3.6.1.4.1.8619.7.1....		serverIpAddr	
--serverIpMask	1.3.6.1.4.1.8619.7.1....		serverIpMask	
--snmpCommunityNa...	1.3.6.1.4.1.8619.7.1....		snmpCommunit...	
--trapServerIpAddr	1.3.6.1.4.1.8619.7.1....		trapServer	

When you select an item in the Tree Browser, its properties display in the Properties Viewer. You can choose to view the item's configuration or statistics properties by clicking buttons on the Run-time toolbar.

Changing Items in the Tree Browser

When you delete devices, groups or tags in the OPC Server Tool, changes are made immediately to the I/O Server. Changes you make to the driver configuration while working with the OPC Server Tool automatically display in the Tree Browser.

Collapsing and Expanding the Tree Browser

You can collapse or expand the tree under an item by double-clicking it.

Navigating in the Tree Browser

Navigating through the Tree Browser can be done by selecting items with a mouse or by using the keyboard. Use the up or left arrow keys to move up in the Tree Browser. Similarly, use the down or right arrow keys to move down in the Tree Browser. You can also press a letter key to jump to the nearest item that begins with that letter.

Additional Tree Browser Features

Connection lines show the relationship between devices, groups and tags by displaying which devices are on a channel and which tags belong to a device. The plus and minus buttons indicate whether items are fully expanded or collapsed. The plus button shows the item is collapsed and the minus buttons indicates that the item is expanded. For example, a device with a plus sign next to it means that there are groups and possibly tags configured on that device.

The Menu Bar

The Tool menu bar includes a title bar, a Minimize button, a Maximize button, a Control-menu box, and the menus you can use to configure the driver.

The Power Tool has the following menus:

- File
- Add
- Edit
- View
- Help

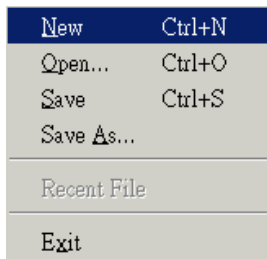
4.1.2 Using Shortcut Keys

The following is a list of shortcut keys for working with the I/O Driver Power Tool:

<Ctrl>-<N>	Opens a new EDS driver configuration file.
<Ctrl>-<O>	Allows you to open an existing file.
<Ctrl>-<S>	Saves the current file.
<Ctrl>-<D>	Broadcast Search
<Ctrl>-<G>	Dedicated IP

4.1.3 Using the File Menu

The following commands appear on the File menu.



New

Lets you make a new server configuration file.

Keyboard shortcut: <Ctrl>-<N>.

Open

Lets you open an existing server configuration file. You can select TDB file types.

Keyboard shortcut: <Ctrl>-<O>.

Save

Saves the current server configuration file to the default path for configuration files with the name you specify. The default path for configuration files is the same path where you installed the server. You can change the default path by entering a new location in the Default Path tab of the Tool's Setting Defaults for I/O Driver Configuration File Name and Path.

If you save a new server configuration file, the **Save As** dialog box prompts you to enter a name for your server configuration file.

Keyboard shortcut: <Ctrl>-<S>.

Save As

Lets you enter a new name and file type for the current server configuration.

Save As Dialog Box Options

Save In Field - Lets you select the directory that you want to store the file in.

File Name Field - Lets you save a file with a new name, or in a different location, by entering a new file name in the File Name field or by selecting a new directory in the Save In list. To save a file with an existing file name, select the name in the list or enter the current name.

Save as Type Field - Lets you specify the type of file you want to save the configuration as:

Exit

Exits the OPC Server Tool.

4.1.4 Using the Add Menu

The commands that appear in the Add menu are for creating and modifying server configuration files. These commands correspond with the buttons on the Tool's Configuration Toolbar.



Broadcast Search...

Lets you search for all of the Moxa devices in the LAN

Dedicated IP...

Let's you choose the correct type device and the system will create all of the device, groups and the tags automatically.

4.1.5 Using the Edit Menu

The commands that appear in the Edit menu are for cutting, copying, pasting, deleting and modifying configuration data.

E dit	V iew	H elp
Cut		Ctrl+X
Cop <u>y</u>		Ctrl+C
P <u>a</u> ste		Ctrl+V
D <u>e</u> lete		Del
P <u>ro</u> perties...		Ctrl+P

Cut

Let's you cut selected tag.

Copy

This function disabled in this system.

Paste

This function disabled in this system.

Delete

Let's you delete selected tag.

Properties...

Let's you define the configuration of selected devices, groups and tags.

4.1.6 Using the View Menu

The command let the OPC server start to communicate with the devices.

V iew	H elp
M <u>o</u> nitor	
<input checked="" type="checkbox"/> S <u>t</u> atus Bar	

Monitor

Start to communicate with the devices. All of the value will show on the right screen. If the communication failed, it will show you "bad"

Status Bar

It will disable the status bar on the bottom of the screen or enable the status.

4.1.7 Using the Help Menu

H elp
A <u>b</u> out SNMPOPC...

About SNMPOPC...

Displays related information of the OPC server version and the copyright.

3.2 Configuring the I/O Driver with the Tool

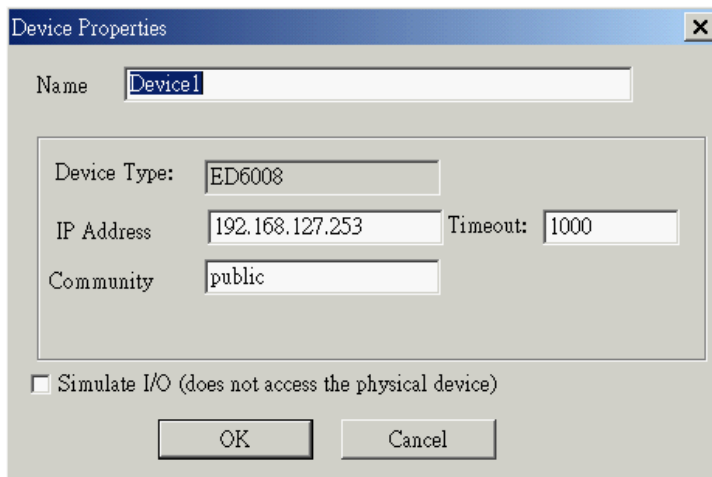
To modify the fields in the Properties Viewer

1. Select a device, group or tag from the Tree Browser and click the properties button in the Edit menu. The fields for the selected item appear in the Properties Viewer.
2. Edit the fields you want to change.

4.2.1 Modifying Devices

To modify an existing device

1. Select the device you want to modify from the Tree Browser.
2. Select specified device and click on *Properties* button in the *Edit* menu bar. *Device Properties* dialog will be pop up for device modification
3. Edit the device's fields as needed.



The screenshot shows a 'Device Properties' dialog box. The 'Name' field contains 'Device1'. The 'Device Type' field contains 'ED6008'. The 'IP Address' field contains '192.168.127.253' and the 'Timeout' field contains '1000'. The 'Community' field contains 'public'. There is a checkbox labeled 'Simulate I/O (does not access the physical device)' which is currently unchecked. At the bottom of the dialog are 'OK' and 'Cancel' buttons.

Device Name

Specifies the name of the modified device.

Valid Entries: *Up to 12 alphanumeric characters*

Device Type

It can not be modified by the users.

IP Address

Specifies which IP address to use for the selected device. You can specify the IP address as necessary for communication with your hardware.

Timeout

Specifies how long the I/O driver waits for a response from the selected device. The base of timeout field is mini-second. For example, if you specify 1000 in this field, server will wait for a response about 1000 mini-second (equal to 1 second).

Valid Entries:

1 ~ 65535

Community: default value is "public".

Simulation I/O

Specifies the device to be a virtual device. It does not connect to any physical devices. But it would provide a simulation signal to the server.

Valid Entries:

Enabled

Disabled

To delete an existing device

1. Select the device you want to delete from the Tree Browser.
2. Click on *Delete* button in the *Edit* menu bar.

4.2.2 Modifying Tag Groups

To modify an existing group

1. Select the group you want to modify from the Tree Browser.
2. Select Properties button from Edit menu bar. Group properties dialog will pop up for modification.

4.2.3 Modifying Tags

To modify an existing tag

1. Select the tag you want to modify from the Tree Browser.
2. Click on *Properties* button in the *Edit* menu bar. *Tag Properties* dialog will be pop up for tag modification
3. Edit the tag's fields as needed

Tag Name

Specifies the name of modified I/O tag.

Defined Value : 請貴公司填寫

Valid Entries

Up to 80 alphanumeric characters and symbols.

Data Type

OPC Data Type converted from SNMP TAG Data type (can not be modified)

See 1.4 Data type mapping

Description : 請貴公司填寫

Valid Entries

Up to 80 alphanumeric characters and symbols.

Object ID

SNMP TAG Object ID (can not be modified)

Number of Bytes

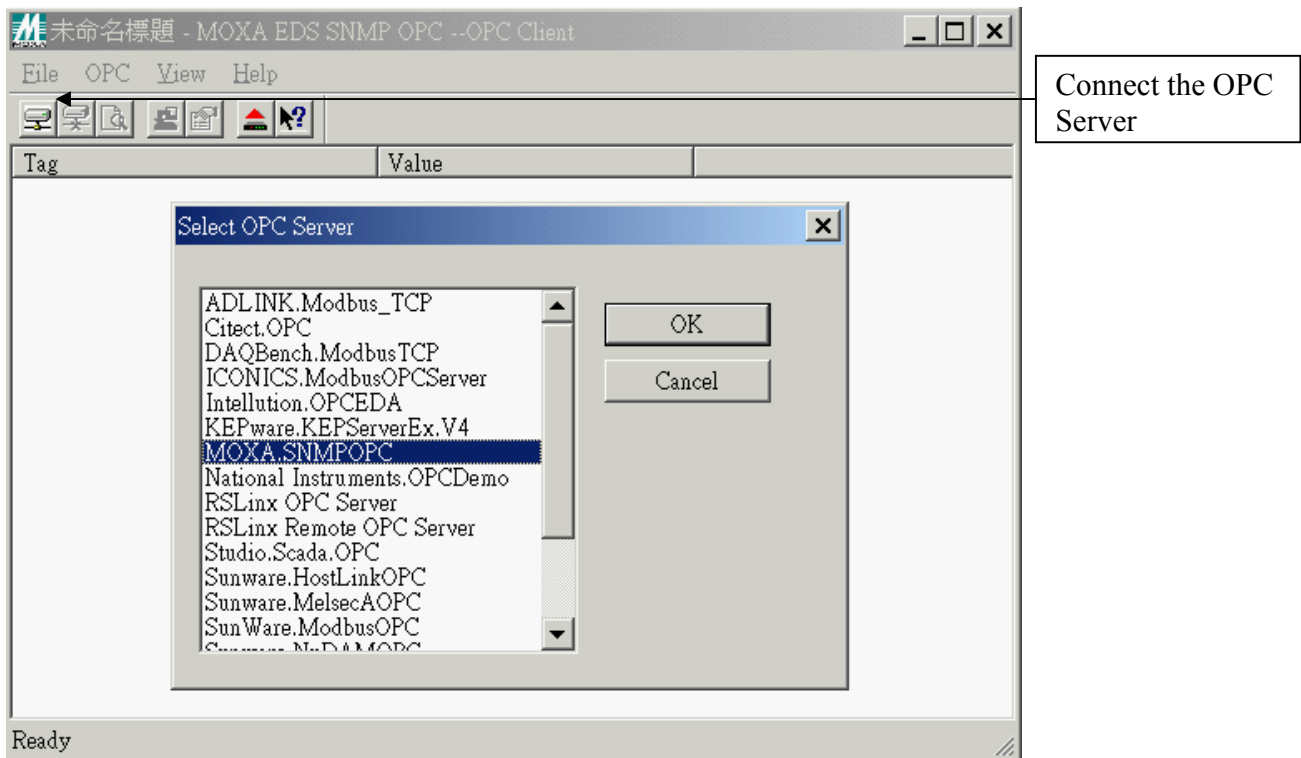
bytes of OPC TAG's value for OPC internal use

TAG Item No.

Moxa EDS SNMP TAG No. for OPC internal use

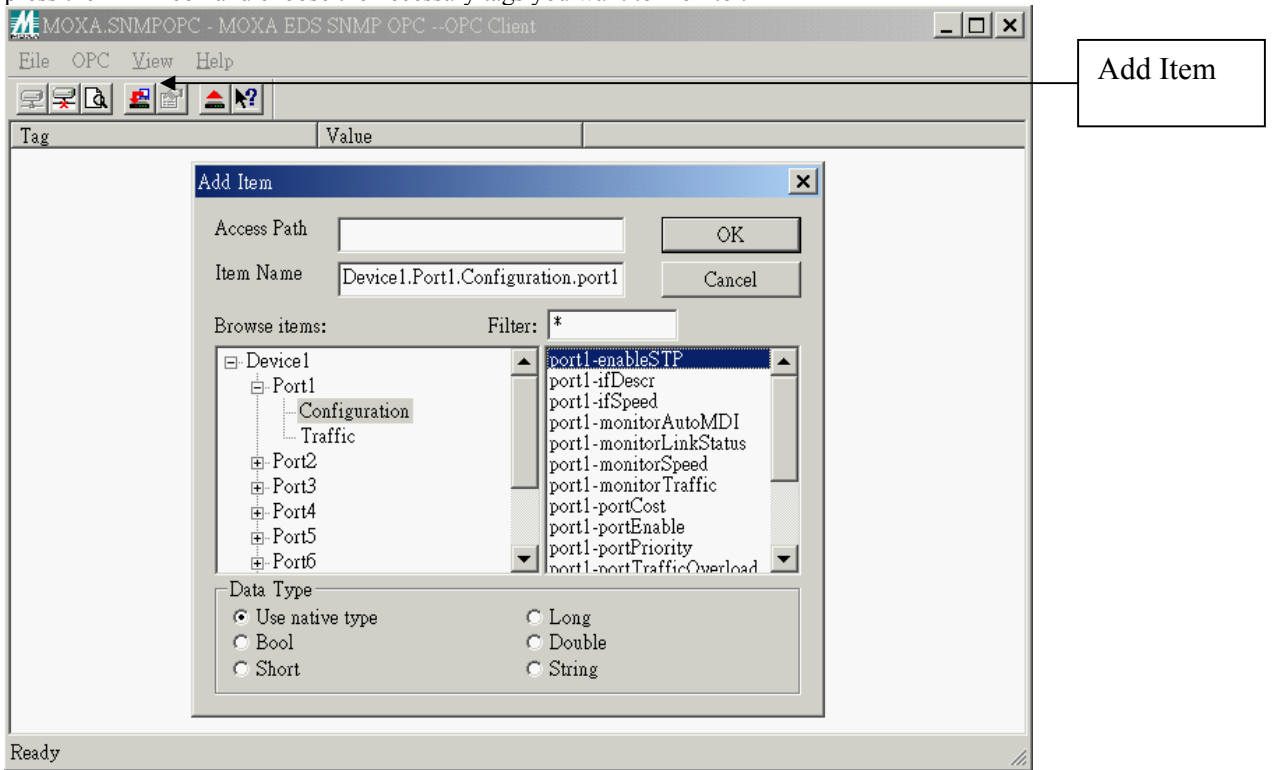
5. Using OPC Client

An OPC Client application, provided with the Moxa EDS SNMP OPC Server, has rapid methods for connecting your Servers. The OPC Client is able to browse the registry of a PC and display a complete list of all installed OPC Servers. It also provides real live data feedback and OPC Server browsing capabilities. The OPC Client is also helpful for connecting and testing other 3rd party OPC applications connected to same server.

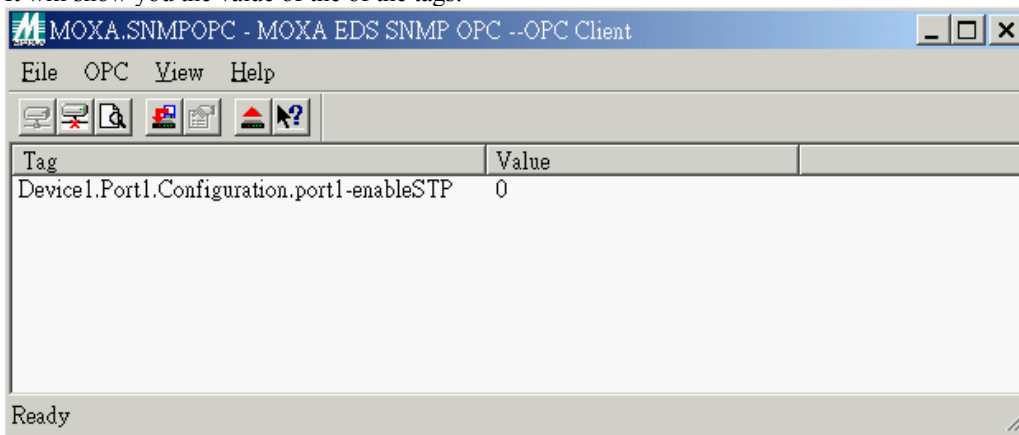


Add the tags to watch

press the ADD icon and choose the necessary tags you want to monitor.

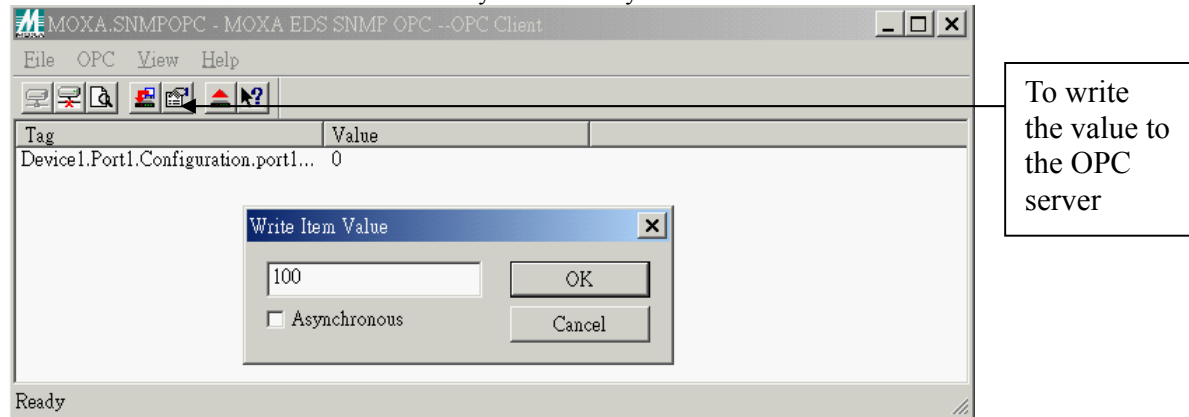


It will show you the value of the of the tags.



Write the value to the OPC Server

You can click the “Write Item” button and key in the value you want.



Features

- Setup dialog box for defining the default name and default setting for configuration files.
- Tree Browser for an overall view of your system setup.
- Moveable Tree Browser and toolbars.

5.1 Connecting OPC server

When OPC servers are installed on the system, they are registered so that clients can find them and users can view them in a list. To make a client/server connection, the user must first choose a server. The server name selected (for example, Moxa.SNMPOPC) is used to get a class ID which, in turn, is used to create a COM object. If the user selects a server that is not currently running, the system starts the server and then creates the object in that server on behalf of the client.

Once the COM object is created, the client application has an IOPCServer interface, as defined in the OPC specification. This is the main interface to the OPC server and this document refers to this as a Server interface. (The other interface is Group.) This OPC client always creates a group and registers an device interface with it to get asynchronous data notification.

When an item is added, the dialog displays either a hierarchy or a flat list of names, depending on the server. The names are queried from the Server object using the filter string and requested data type. When the user either types or selects a name, an item by that name is added to the Group object. This item is also read immediately to get an initial value.

Items in a group are scanned by the server; when their values change, the advise interface in the client is notified. A data structure containing the data for each item whose value or quality has changed (and only those items) is passed to the client device interface. The client unpacks and uses the data.

Server status and Group parameters

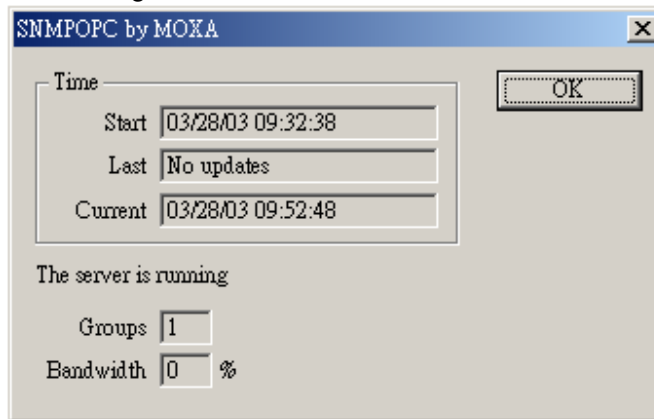
The Server status dialog periodically queries the Server object for status and displays the results. The Group Parameters dialog queries the group state and displays the results. The OK or Apply buttons in the Group Parameters dialog box write the parameters from the dialog to the Group object and read the parameters back. This primarily controls the scanning and updating of data. When a group is inactive, it does not send data notifications to the client and, typically there is no reason to scan the items when the group is inactive. The Update Rate in the Group Parameters dialog box specifies the rate at which data notifications should be sent

back to the client, assuming that data has changed. This is also the rate at which items are scanned on behalf of this client.

To write a value to an item, select the item in the OPC Client windows and choose Writer Value to Item from the OPC menu, The client writes the value typed in the Write Item Value dialog box to the correct item in the Group object. The method of writing data is determined by the synchronous checkbox. When data is written synchronously, the call to the server blocks until the operation has completed, which may take a long time. When data is written asynchronously, the call to the server returns quickly and the operation is carried out on another thread. When the write has finished, the client device interface is notified with the results.

The user can disconnect from the selected server by choosing Disconnect from the OPC menu, The Disconnect command un-registry the device interface, releases the Group object, and then releases the Server object. Releasing an object means that the client is no longer interested in the object, so the system can delete the object in the server.

Server State Dialog Box



Start Time: the time the server started running

Last Time: the last update time from the server

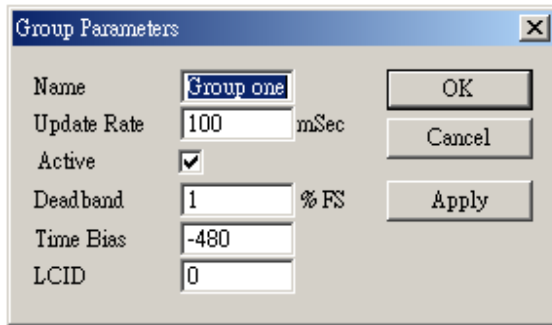
Current Time: the current time from the server.

Groups: number of connected group

Bandwidth: The behavior of this field is server specific. A suggested use is that it return the approximate Percent of Bandwidth currently in use by server. If multiple links are in use it could return the 'worst case' link. Note that any value over 100% indicates that the aggregate combination of items and UpdateRate is too high. The server may also return 0xFFFFFFFF if this value is unknown.

Group Parameter Dialog Box

[Remark: It can define only one group in Sample OPC Client utility]



Name	Group one	OK
Update Rate	100 mSec	Cancel
Active	<input checked="" type="checkbox"/>	Apply
Deadband	1 % FS	
Time Bias	-480	
LCID	0	

Name: group's name

Update Rate: the update rate (in milliseconds) for OPCGroups

Active: active state for OPCGroups

Deadband: The range of the Deadband is from 0.0 to 100.0 Percent. Deadband will only apply to items in the group that have a dwEUType of Analog available. If the dwEUType is Analog, then the EU Low and EU High values for the item can be used to calculate the range for the item. This range will be multiplied with the Deadband to generate an exception limit. An exception is determined as follows:

Exception if (absolute value of (last cached value - current value) > (pPercentDeadband/100/0) * (EU High - EU Low))

Time Bias: The purpose of the TimeBias is to indicate the timezone in which the data was collected

LCID: Group Local ID