



WebAccess Driver Configuration Manual

Omron NJ301-1100

ABPLCEIP.DLL

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English Version 1.0



Revision History

Date	Version	Author	Reviewer	Description
2018-08-13	1.0	Neal.Chen	Neal.Chen	Initial Release
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1. Introduction to Omron EtherNet/IP

WebAccess SCADA Node provides an EtherNet/IP driver to connect the Omron PLC by using the EtherNet/IP protocol. The Omron CS- and CJ- series PLCs as CS1W-EIP21, CJ1W-EIP21, CJ2HCPU6□-EIP, CJ2M-CPU3□ are supported by EtherNet/IP units.

NX-series CPU units build-in EtherNet/IP port are listed as

- NX701-17□□
- NX701-16□□
- NX1P2-11□□□□
- NX1P2-11□□□□1
- NX1P2-10□□□□
- NX1P2-10□□□□1
- NX1P2-90□□□□
- NX1P2-90□□□□1

NJ-series CPU units build-in EtherNet/IP are listed as

- NJ501-□5□□
- NJ501-□4□□
- NJ501-□3□□
- NJ301-12□□
- **NJ301-11□□**
- NJ101-10□□
- NJ101-90□□

1.1 Omron EtherNet/IP

EtherNet/IP is an industrial multi-vendor network that uses Ethernet components. The EtherNet/IP specifications are open standards managed by the ODVA (Open DeviceNet Vendor Association), just like DeviceNet. EtherNet/IP is not just a network between controllers; it is also used as a field network. Since EtherNet/IP uses standard Ethernet technology, various general-purpose Ethernet devices can be used in the network. The EtherNet/IP Unit and built-in EtherNet/IP port have the following features as high speed, high capacity data exchange through tag data links.

The EtherNet/IP protocol supports implicit communications, which allows cyclic communications (called tag data links in this manual) with EtherNet/IP devices. Data can be exchanged at high speed between Controllers and devices, using high-volume tag sets (up to 640 words for the CJ2M-EIP21 and up to 184,832 words for other CPU Units) between PLCs. Using the NJ/NX-series CPU Unit, up to 184,832 words of data (total of 369,664 words with two ports) can be quickly exchanged between controllers and devices. Using the NJ-series CPU Unit, up to 9,600 words of data can be exchanged.

You can send CIP commands to devices on the EtherNet/IP network when required by execution of CIP communications instructions in a program. As a result, it is possible to send and receive data with devices on the EtherNet/IP network.

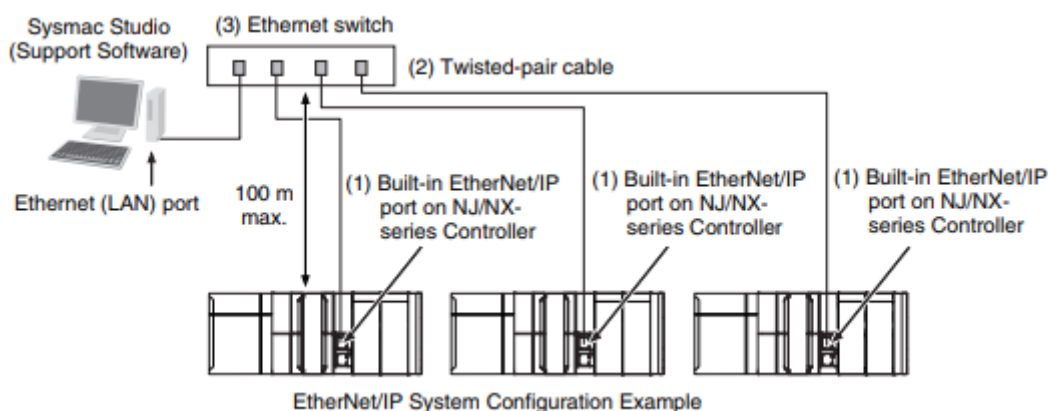


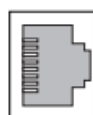
Figure 1.1 EtherNet/IP System Configuration

1.2 Ethernet Connectors

The following standards and specifications apply to the connectors for the Ethernet twisted-pair cable.

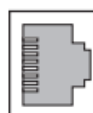
- Electrical specifications: Conforming to IEEE 802.3 standards.
- Connector structure: RJ45 8-pin Modular Connector (conforming to ISO 8877)
- For information on connecting shield wire to connector hoods, refer to 2-1-2 Ethernet Switch Types

10Base-T and 100Base-TX



Connector pin	Signal name	Abbr.	Signal direction
1	Transmission data +	TD+	Output
2	Transmission data –	TD–	Output
3	Reception data +	RD+	Input
4	Not used.	----	----
5	Not used.	----	----
6	Reception data –	RD–	Input
7	Not used.	----	----
8	Not used.	----	----

1000Base-T



Connector pin	Signal name	Abbr.	Signal direction
1	Communication data DA+	BI_DA+	Input/output
2	Communication data DA–	BI_DA–	Input/output
3	Communication data DB+	BI_DB+	Input/output
4	Communication data DC+	BI_DC+	Input/output
5	Communication data DC–	BI_DC–	Input/output
6	Communication data DB–	BI_DB–	Input/output
7	Communication data DD+	BI_DD+	Input/output
8	Communication data DD–	BI_DD–	Input/output

Figure 1.2 The connectors for the Ethernet twisted-pair cable

1.3 Omron Sysmac Studio

- Open the Omron sysmac studio and use the known PLC's IP address or the default IP address (192.168.250.1) to connect the Omron PLC.

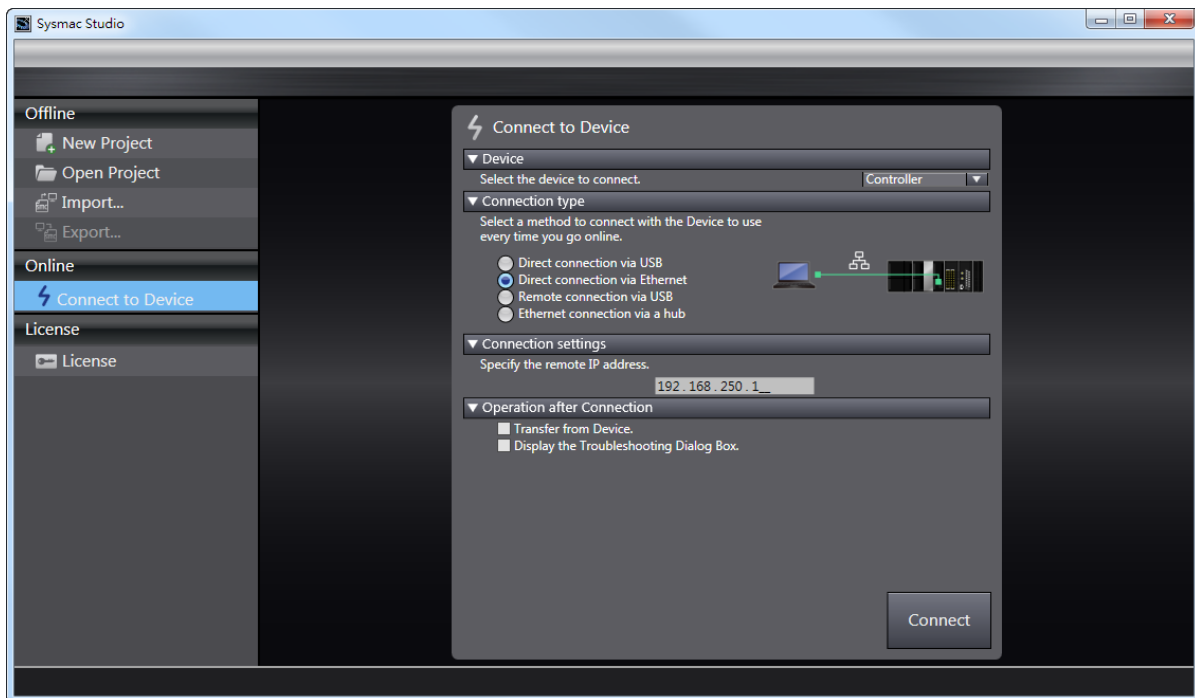


Figure 1.3 Connect to Device of the Omron sysmac studio

- Transfer the configuration from the PLC to back up the origin project

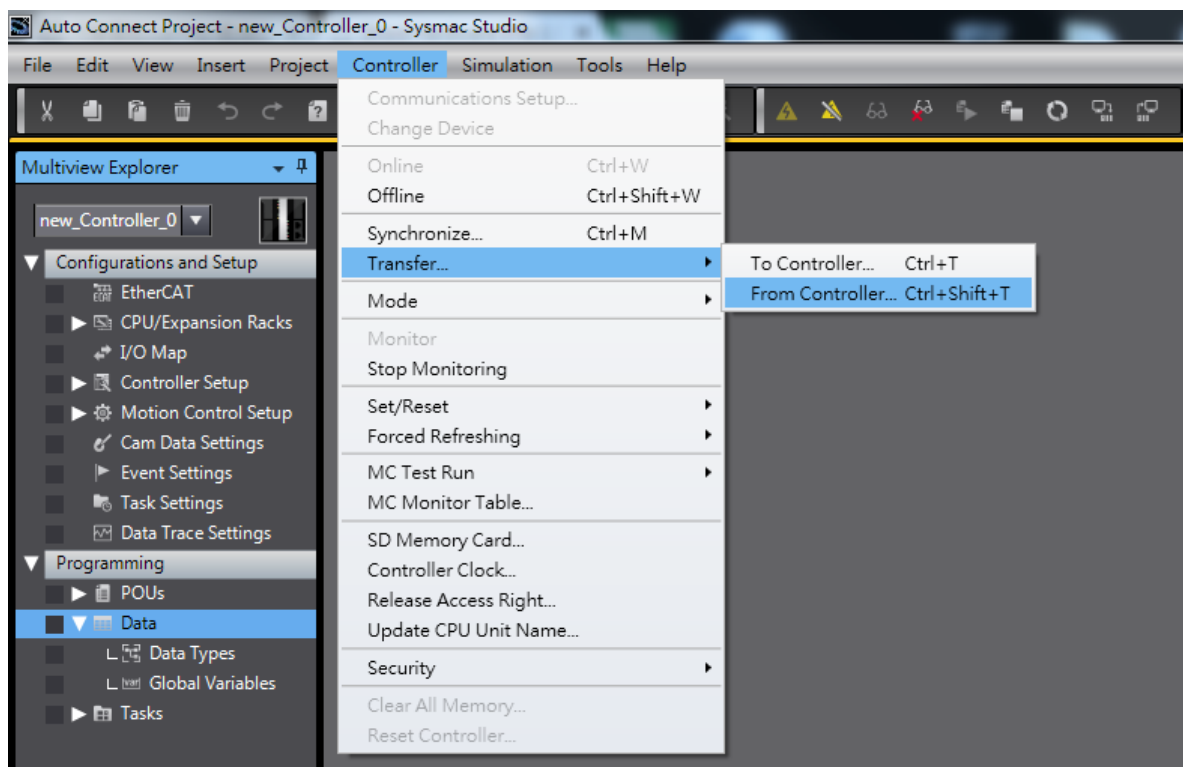


Figure 1.4 Transfer the project from the PLC controller

- Turn “Offline” and you can change the built-in EtherNet/IP IP address

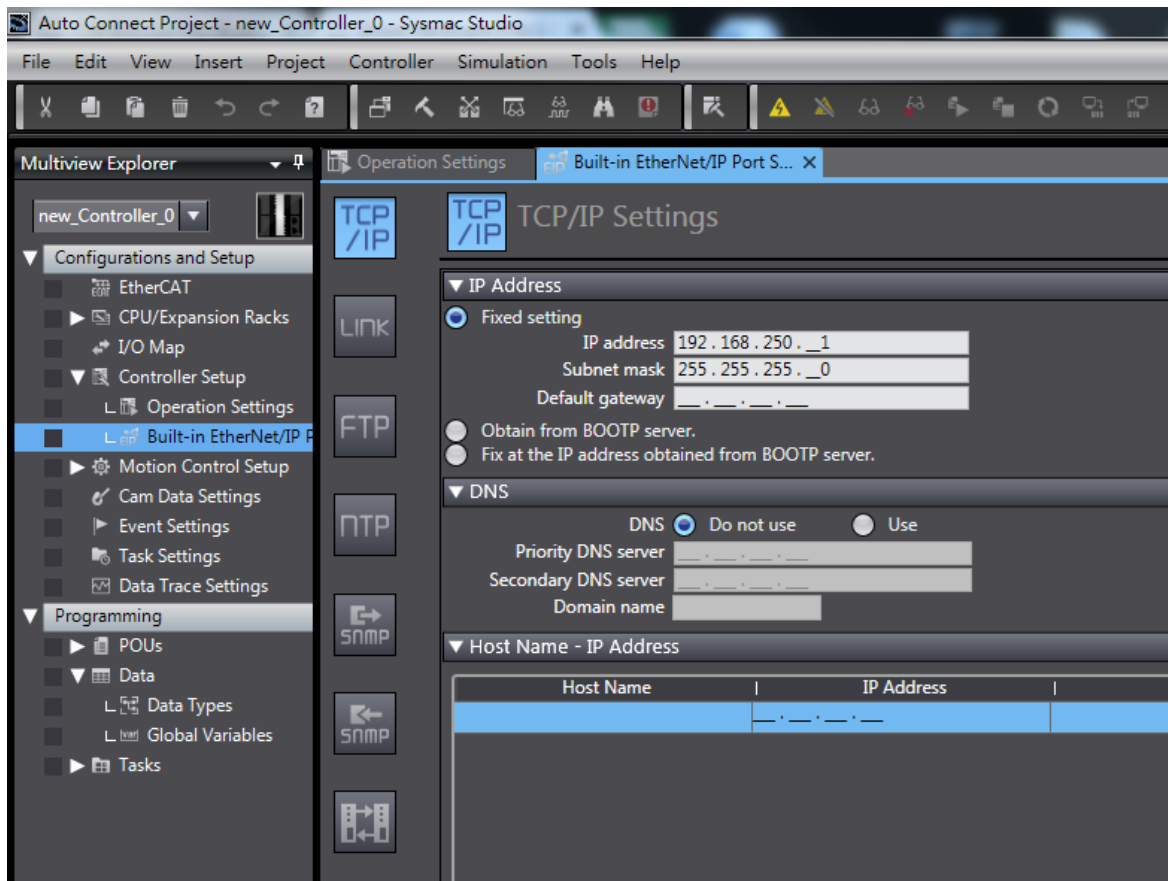


Figure 1.5 TCP/IP setting of the PLC controller

- Create global variables to test the connection

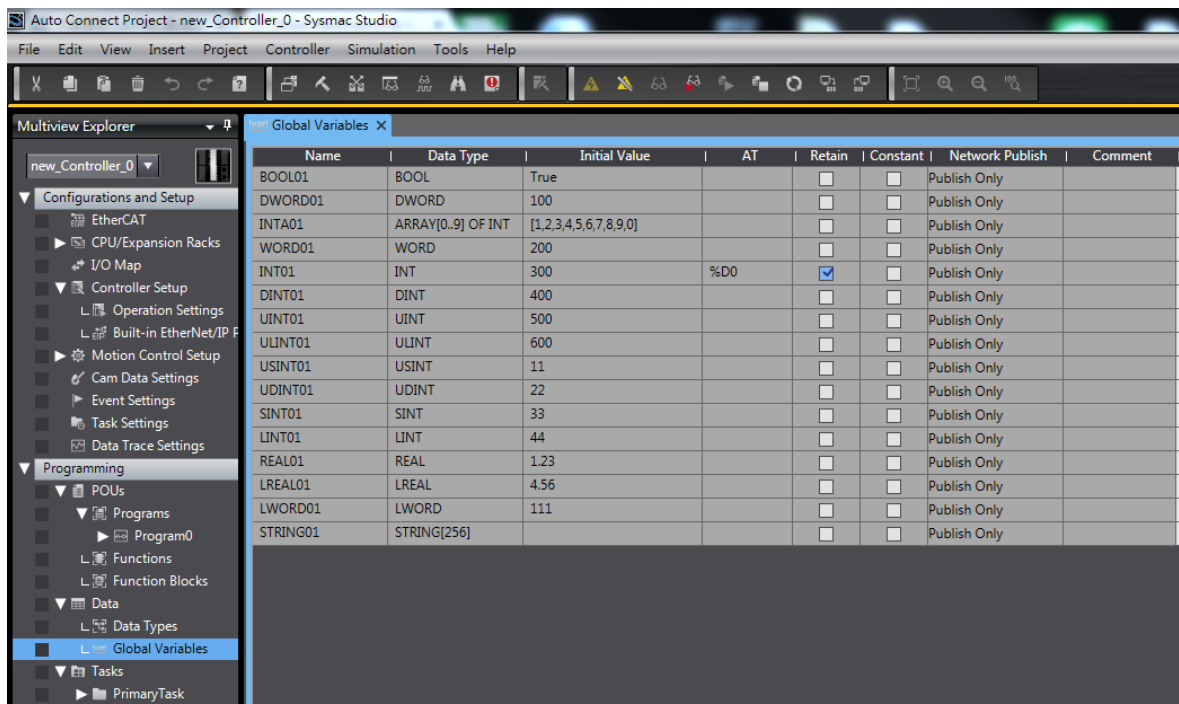


Figure 1.6 Global variables setting of the PLC controller

- Turn “Online” and you can download the global variables to verify the connections

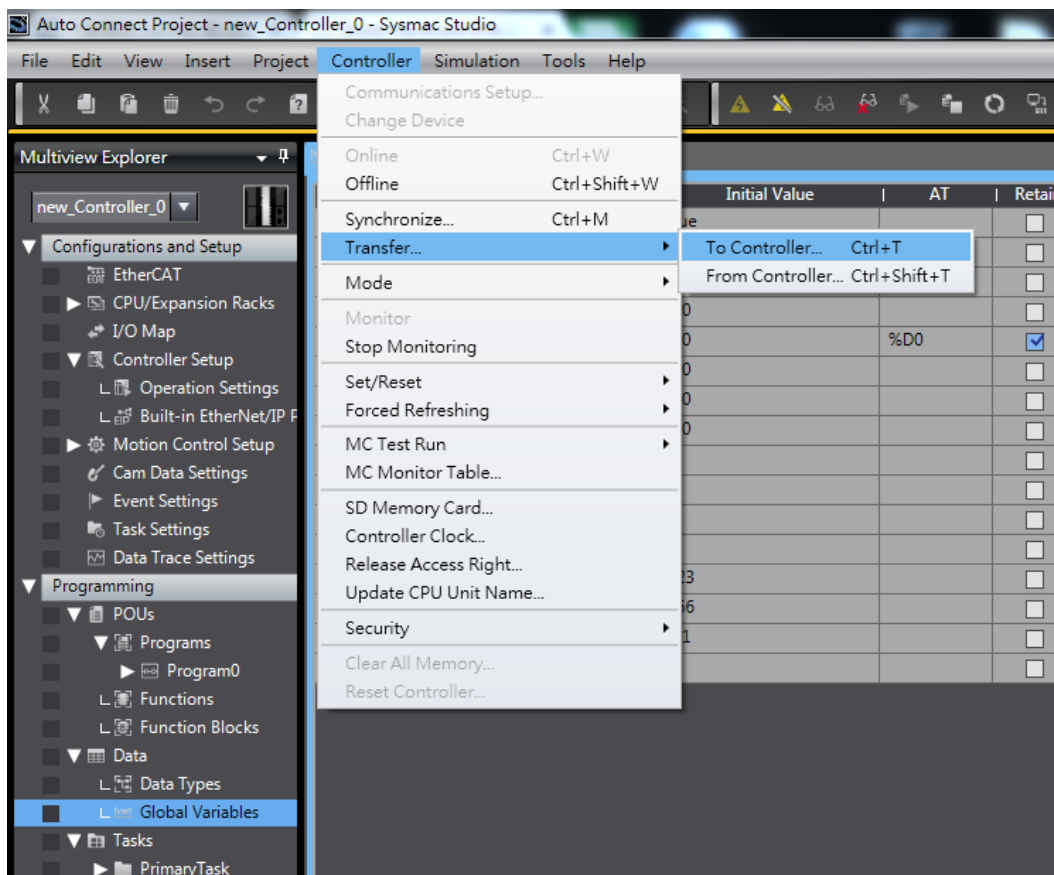


Figure 1.7 Transfer the project to the PLC controller

- Use “Watch” to check and change the values of the global variables to verify the connection

Global Variables									
Name	Data Type	Initial Value	AT	Retain	Constant	Network Publish	Comment		
BOOL01	BOOL	True		<input type="checkbox"/>	<input type="checkbox"/>	Publish Only			
DWORD01	DWORD	100		<input type="checkbox"/>	<input type="checkbox"/>	Publish Only			
INTA01	ARRAY[0..9] OF INT	[1,2,3,4,5,6,7,8,9,0]		<input type="checkbox"/>	<input type="checkbox"/>	Publish Only			
WORD01	WORD	200		<input type="checkbox"/>	<input type="checkbox"/>	Publish Only			
INT01	INT	300	%D0	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Publish Only			
DINT01	DINT	400		<input type="checkbox"/>	<input type="checkbox"/>	Publish Only			
UINT01	UINT	500		<input type="checkbox"/>	<input type="checkbox"/>	Publish Only			
ULINT01	ULINT	600		<input type="checkbox"/>	<input type="checkbox"/>	Publish Only			
USINT01	USINT	11		<input type="checkbox"/>	<input type="checkbox"/>	Publish Only			
UDINT01	UDINT	22		<input type="checkbox"/>	<input type="checkbox"/>	Publish Only			
SINT01	SINT	33		<input type="checkbox"/>	<input type="checkbox"/>	Publish Only			
LINT01	LINT	44		<input type="checkbox"/>	<input type="checkbox"/>	Publish Only			
REAL01	REAL	1.23		<input type="checkbox"/>	<input type="checkbox"/>	Publish Only			
LREAL01	LREAL	4.56		<input type="checkbox"/>	<input type="checkbox"/>	Publish Only			
LWORD01	LWORD	111		<input type="checkbox"/>	<input type="checkbox"/>	Publish Only			
STRING01	STRING[256]			<input type="checkbox"/>	<input type="checkbox"/>	Publish Only			

Watch1							
Name	Online value	Modify	Comment	Data type	AT	Display format	
WORD01	200			WORD		Decimal	
REAL01	1.23			REAL		Real	
INTA01[5]	6			INT		Decimal	
DWORD01	100			DWORD		Decimal	
BOOL01	True	TRUE FALSE		BOOL		Boolean	
Input Name...							

Figure 1.8 Watch window of the online PLC controller

2. Configure Omron PLC connection by using EtherNet/IP

The steps, in summary, are:

1. Start Internet Explorer **Web Browser**.
2. Enter IP address of the **Project Node**.
3. Use **WebAccess Configuration**.
4. Open or Create a **Project**.
5. Configure a **SCADA node** (the PC that will connect to the automation hardware).
6. Configure a **Comport** for the SCADA Node that is a **TCPIP type Comport**.

Note - It is recommended to select a Comport number greater than 2 so that it does not conflict with a Serial comport that you may want to use later.

2.1 TCPIP Comport Properties

The TCPIP Comport is usually associated with an Ethernet Network Interface Card on the SCADA Node PC. Any TCPIP compatible medium is supported as long as it complies with Microsoft TCPIP protocol stack. The user should give the setting of comport number, scan time, timeout, retry count, auto recover time & scan devices in parallel by the actual connection requirements.

Create New Comport		[Cancel]	<input type="button" value="Submit"/>
Interface Name	TCPIP <input type="button" value="v"/>		
Comport Number	<input type="text" value="2"/>		
Description	<input type="text" value="Description"/>		
Scan Time	<input type="text" value="1"/> <input type="radio"/> MilliSecond <input checked="" type="radio"/> Second <input type="radio"/> Minute <input type="radio"/> Hour		
Timeout	<input type="text" value="1000"/> MilliSecond		
Retry Count	<input type="text" value="3"/>		
Auto Recover Time	<input type="text" value="60"/> Second		
Backup Port Number	<input type="text" value="0"/>		
Scan Devices in Parallel	<input checked="" type="radio"/> Yes <input type="radio"/> No		
		[Cancel]	<input type="button" value="Submit"/>

Figure 2.1 TCPIP Comport properties

2.2 Device Setting

The user needs to set the device name, unit number, device type and the IP address and port number by the Omron PLC setting. The default port number of the EtherNet/IP protocol is “44818”.

Create New Device		[Cancel]	Submit
Device Name	NJ301_1100		
Description			
Unit Number	0		
Device Type	OmronEIP ▼		
Primary	IP Address	192.168.250.1	
	Port Number	44818	
	Device Address		
Secondary	IP Address		
	Port Number		
	Device Address		

Figure 2.2 OmronEIP device properties

2.3 Tag property

In the WebAccess SCADA, there are three data types for the discrete, analog and text tags. The below screenshots are the samples for the tag property setting for the Omron PLC.

Discrete tag property

Create New Tag		[Cancel]	Submit
Parameter	BOOL ▼	Point (discrete)	
Alarm	No Alarm ▼		
Tag Name	BOOL01 x		
Description	1 bit value		
Scan Type	Constant Scan ▼		
Address	BOOL01 /DT=BOOL		
Conversion Code	AUTO ▼		
Start Bit	0		
Length	1		
Signal Reverse	<input type="radio"/> Yes <input checked="" type="radio"/> No		
Log Data	<input type="radio"/> Yes <input checked="" type="radio"/> No		
Data Log Dead Band	3 %		
Write Action Log	<input checked="" type="radio"/> Yes <input type="radio"/> No		
Read Only	<input type="radio"/> Yes <input checked="" type="radio"/> No		
Keep Previous Value	<input type="radio"/> Yes <input checked="" type="radio"/> No		

Figure 2.3 The discrete tag property for the BOOL variable

Analog array tag property

Create New Tag		[Cancel]	Submit
Parameter	INT_A	Point (analog)	
Alarm	No Alarm		
Tag Name	INTA01_5	x	
Description	At most 3 dimensions array		
Scan Type	Constant Scan		
Address	INTA01 /DT=INT /IDX=5		
Conversion Code	AUTO		
Start Bit	0		
Length	16		
Signal Reverse	<input type="radio"/> Yes <input checked="" type="radio"/> No		
Scaling Type	No Scale		
Scaling factor 1	0		
Scaling factor 2	0		
Log Data	<input type="radio"/> Yes <input checked="" type="radio"/> No		
Data Log Dead Band	3	%	
Write Action Log	<input checked="" type="radio"/> Yes <input type="radio"/> No		
Read Only	<input type="radio"/> Yes <input checked="" type="radio"/> No		
Keep Previous Value	<input type="radio"/> Yes <input checked="" type="radio"/> No		

Figure 2.4 The analog tag property for the INT array

Text tag property

Create New Tag		[Cancel]	Submit
Parameter	STRING	Point (text)	
Tag Name	STRING01	x	
Description	String		
Scan Type	Constant Scan		
Address	STRING01 /DT=STRING		
Conversion Code	AUTO		
Text Length	72		
Write Action Log	<input checked="" type="radio"/> Yes <input type="radio"/> No		
Read Only	<input type="radio"/> Yes <input checked="" type="radio"/> No		
Keep Previous Value	<input type="radio"/> Yes <input checked="" type="radio"/> No		
Initial Value			
Security area	0		
Security level	0		
Log To ODBC	<input type="radio"/> Yes <input checked="" type="radio"/> No		
ODBC Log Data Source	Default		
Array Size	0		
		[Cancel]	Submit

Figure 2.5 The text tag property for the STRING variable

2.4 Parameter List

Parameter	Date Type	Description	Address format
DINT	Analog	32 bit signed integer	Logix_Tag_Name /DT=DINT
DINT_A	Analog	One dimension array	Logix_Tag_Name /DT=DINT /IDX=0
INT	Analog	16 bit signed integer	Logix_Tag_Name /DT=INT
INT_A	Analog	One dimension array	Logix_Tag_Name /DT=INT /IDX=0
LINT	Analog	64 bit signed integer	Logix_Tag_Name /DT=LINT
LINT_A	Analog	One dimension array	Logix_Tag_Name /DT=LINT /IDX=0
REAL	Analog	32 bit signed float	Logix_Tag_Name /DT=REAL
REAL_A	Analog	One dimension array	Logix_Tag_Name /DT=REAL /IDX=0
SINT	Analog	8 bit signed integer	Logix_Tag_Name /DT=SINT
SINT_A	Analog	One dimension array	Logix_Tag_Name /DT=SINT /IDX=0
BOOL	Discrete	1 bit value	Logix_Tag_Name /DT=BOOL
BOOL_A	Discrete	One dimension array	Logix_Tag_Name /DT=BOOL /IDX=0
STRING	Text	String	Logix_Tag_Name /DT=STRING

3. Error Code

8001 : port or unit error

8002 : Receive error

8003 : Address error

8xxx : Server returned error code