WebAccess

Driver Configuration Manual

Omron NJ301-1100

ABPLCEIP.DLL

Driver date: 2018/7/13

English Version 1.0

Revision History

Date	Version	Author	Reviewer	Description
2018-08-13	1.0	Neal.Chen	Neal.Chen	Initial Release
2018-10-25	1.1	Neal.Chen	Joseph.Chiu	Update error code

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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.

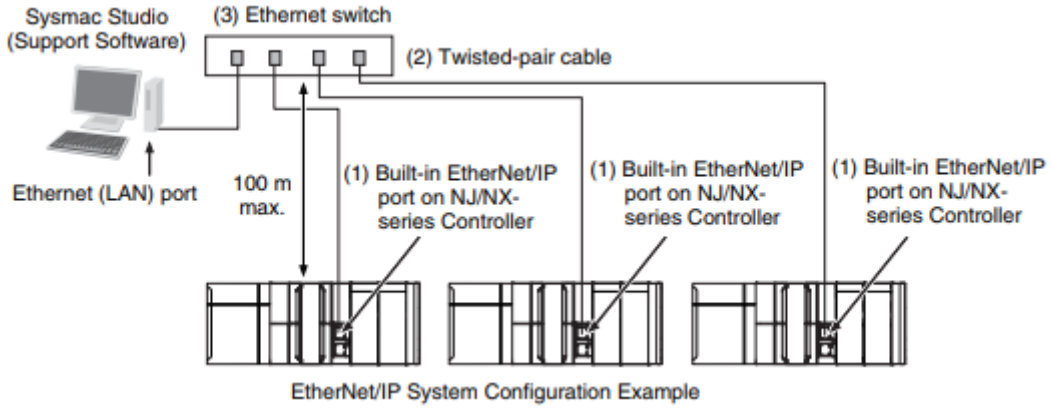


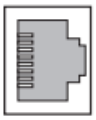
Figure 1.1 EtherNet/IP System Configuration

1.2 Ethernet Connectors

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

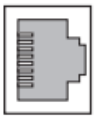
- Electrical specifications: Conforming to IEEE 802.3 standards.
- Connector structure: RJ45 8-pin Modular Connector (conforming to ISO 8877)
- For information on connecting shield wire to connector hoods, refer to 2-1-2 Ethernet Switch Types

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.

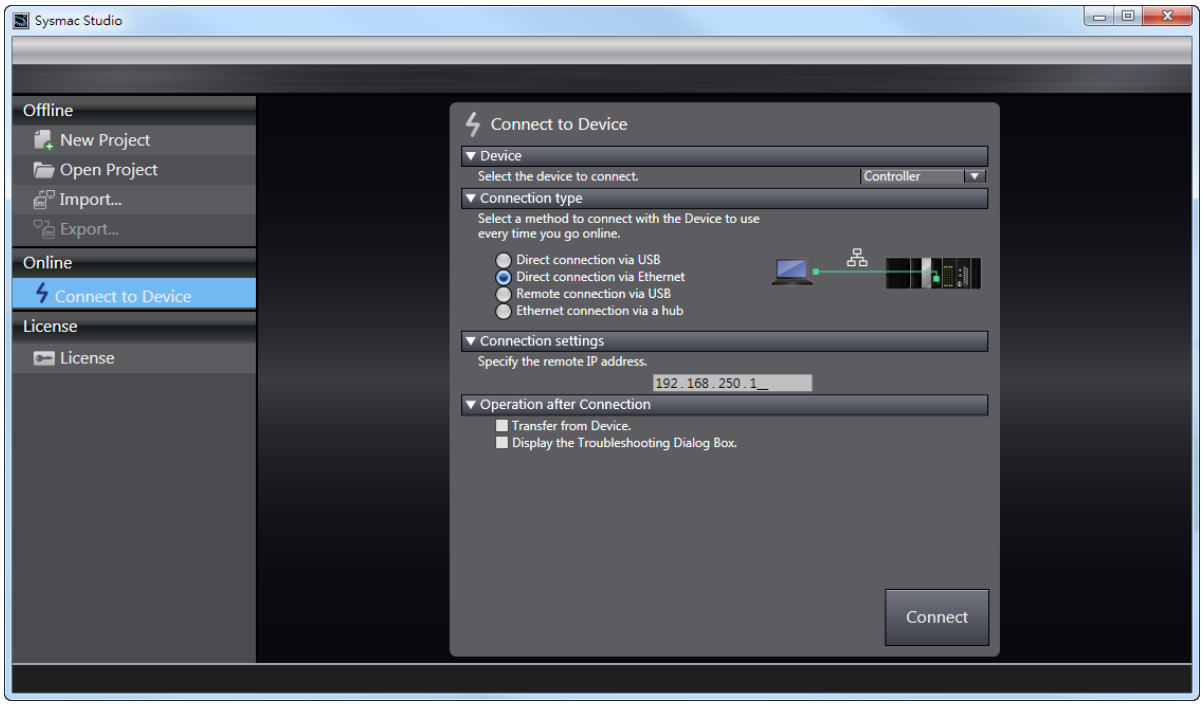


Figure 1.3 Connect to Device of the Omron sysmac studio

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

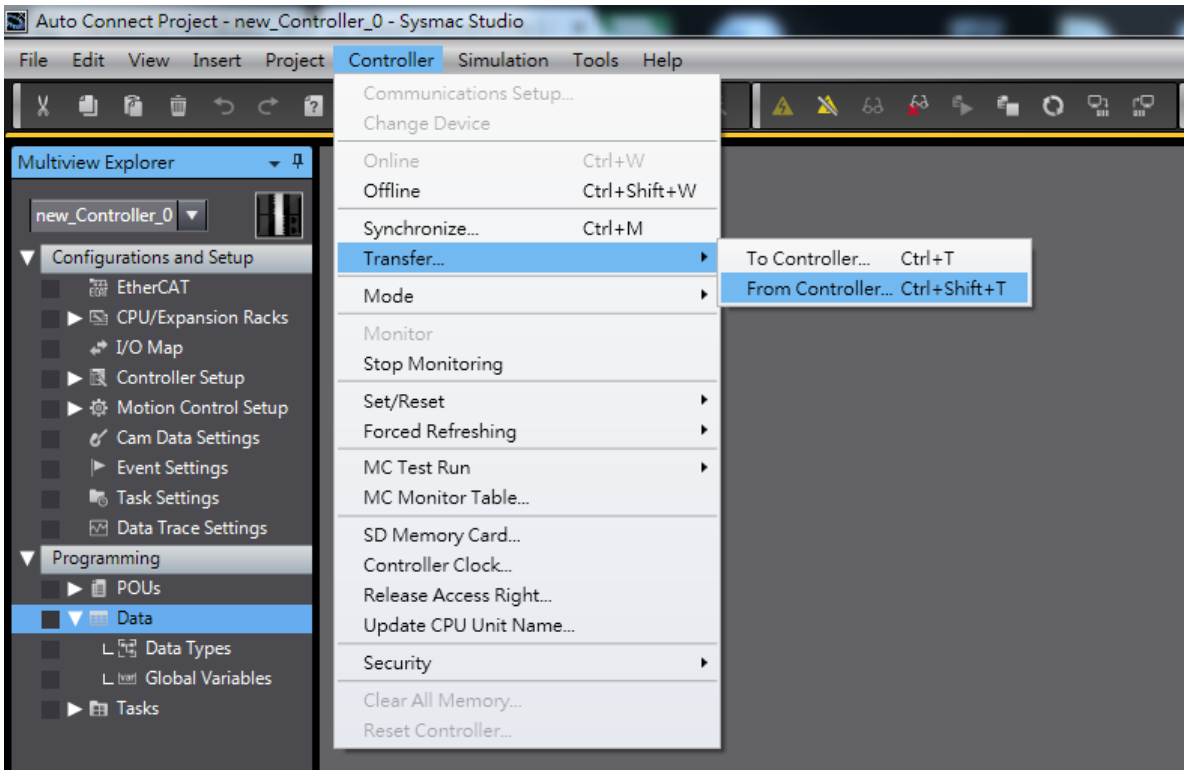


Figure 1.4 Transfer the project from the PLC controller

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

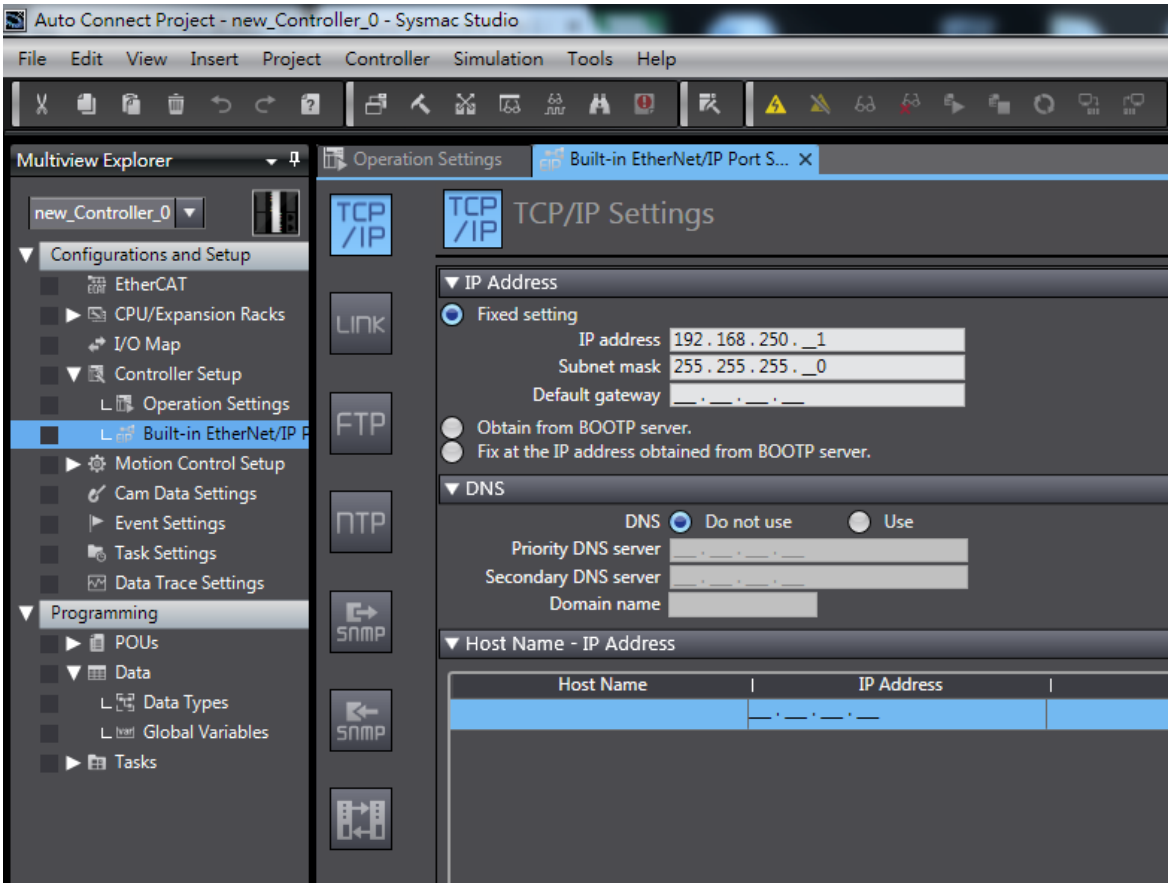


Figure 1.5 TCP/IP setting of the PLC controller

- Create global variables to test the connection

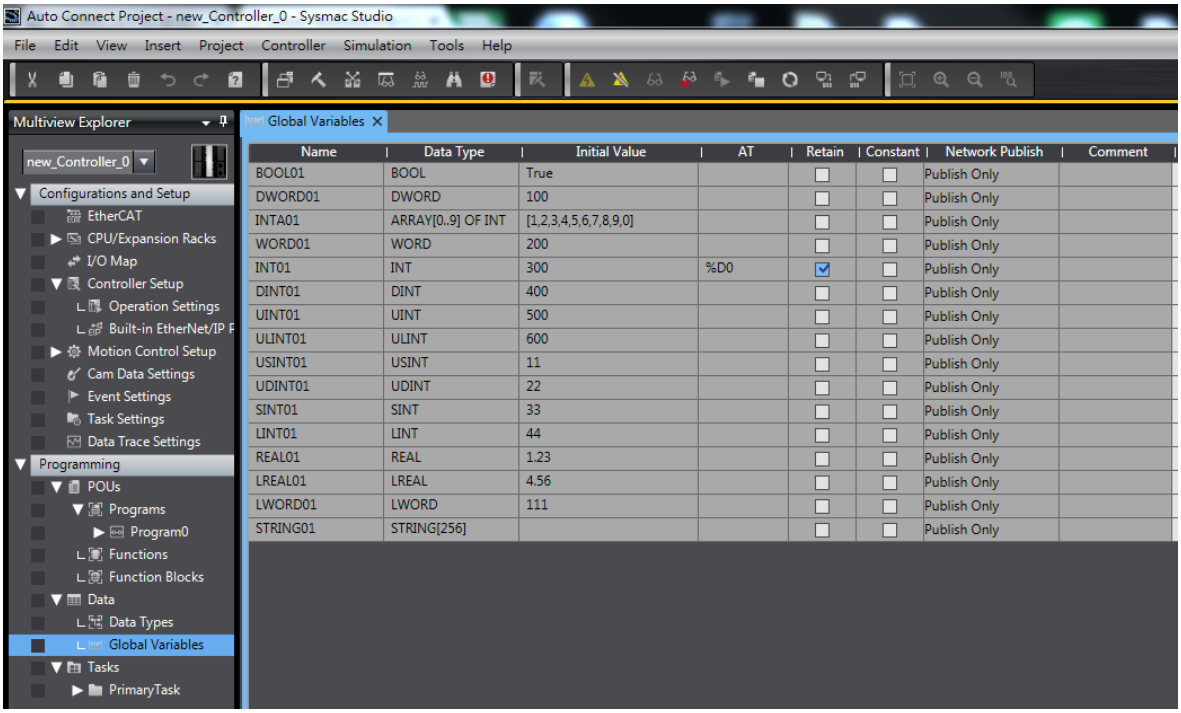


Figure 1.6 Global variables setting of the PLC controller

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

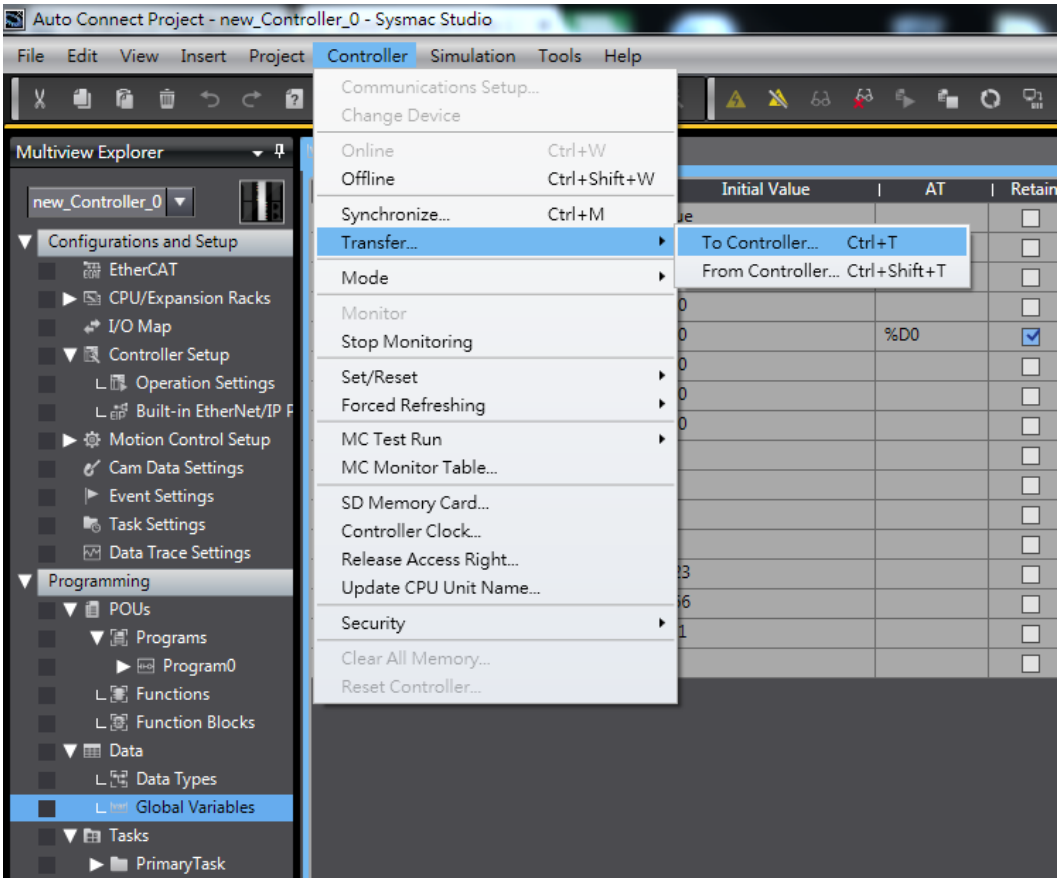


Figure 1.7 Transfer the project to the PLC controller

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

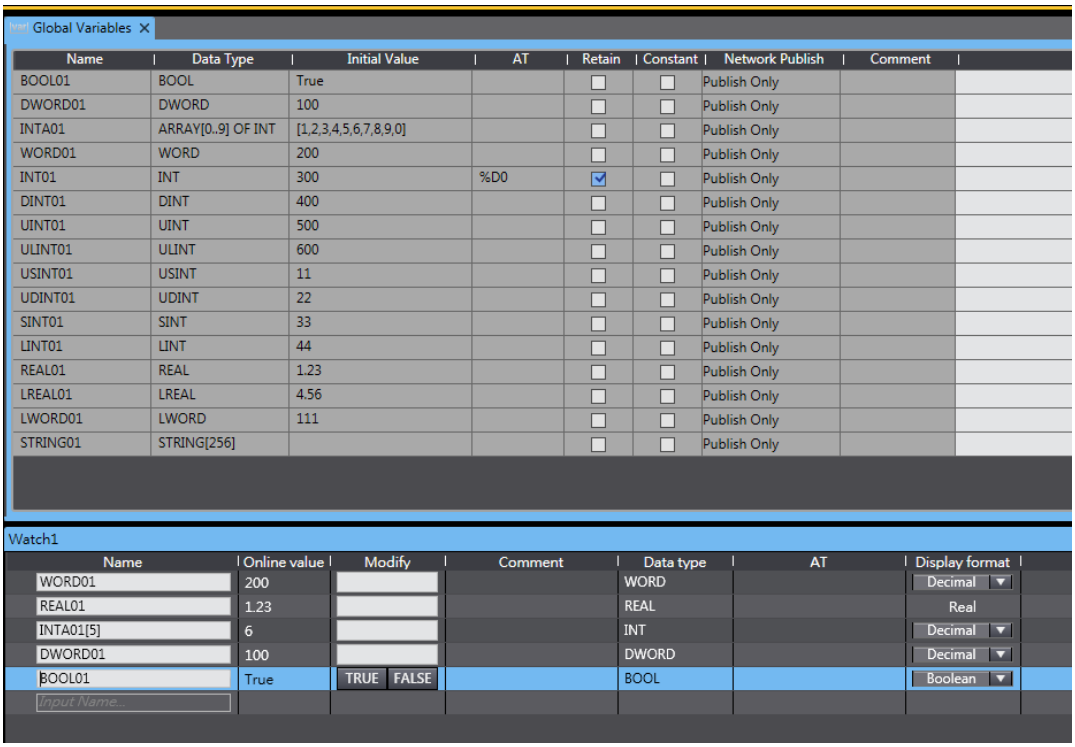


Figure 1.8 Watch window of the online PLC controller

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.

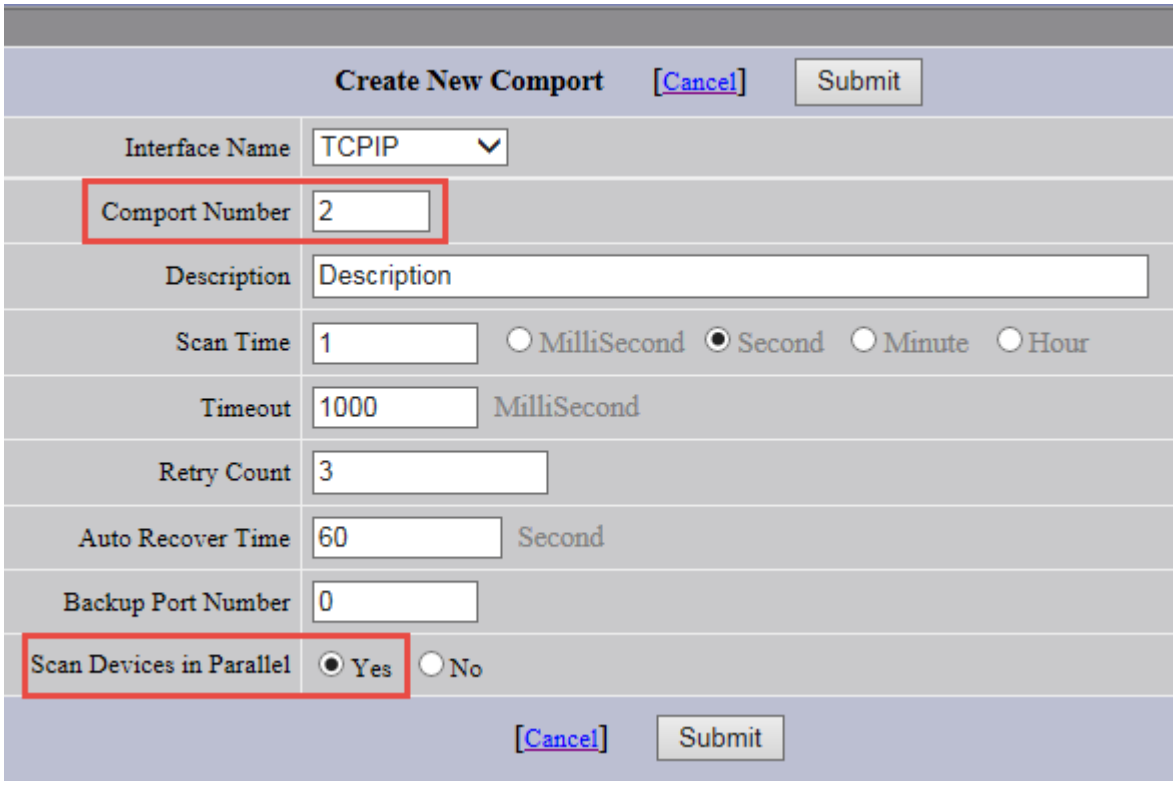


Figure 2.1 TCPIP Comport properties

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**".

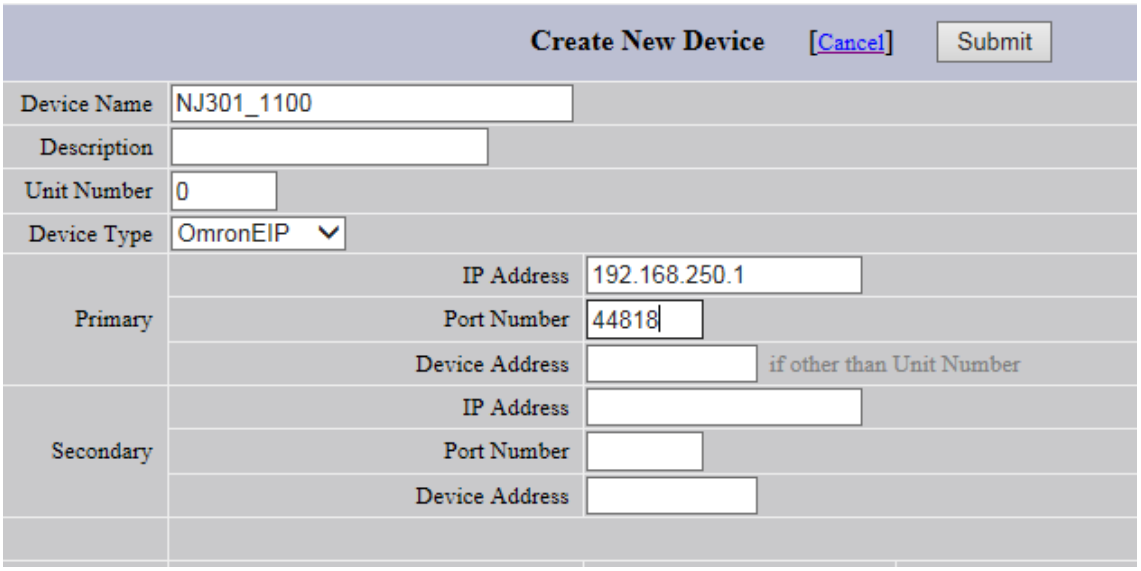


Figure 2.2 OmronEIP device properties

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

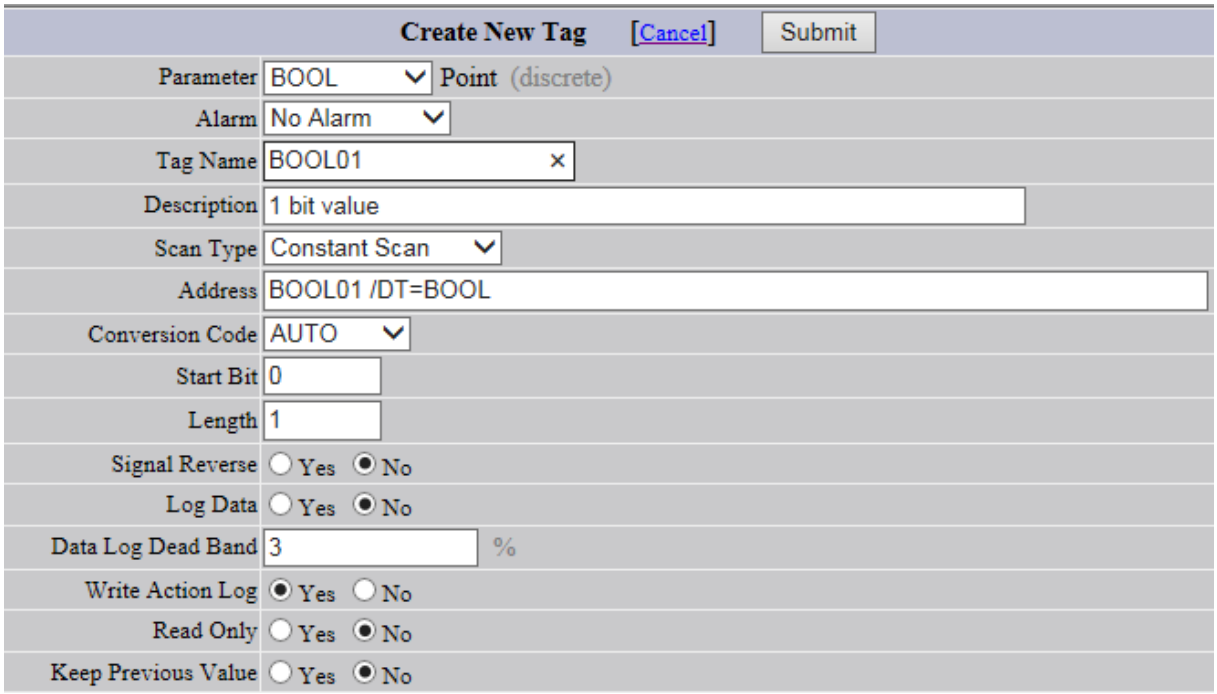


Figure 2.3 The discrete tag property for the BOOL variable

Analog array tag property

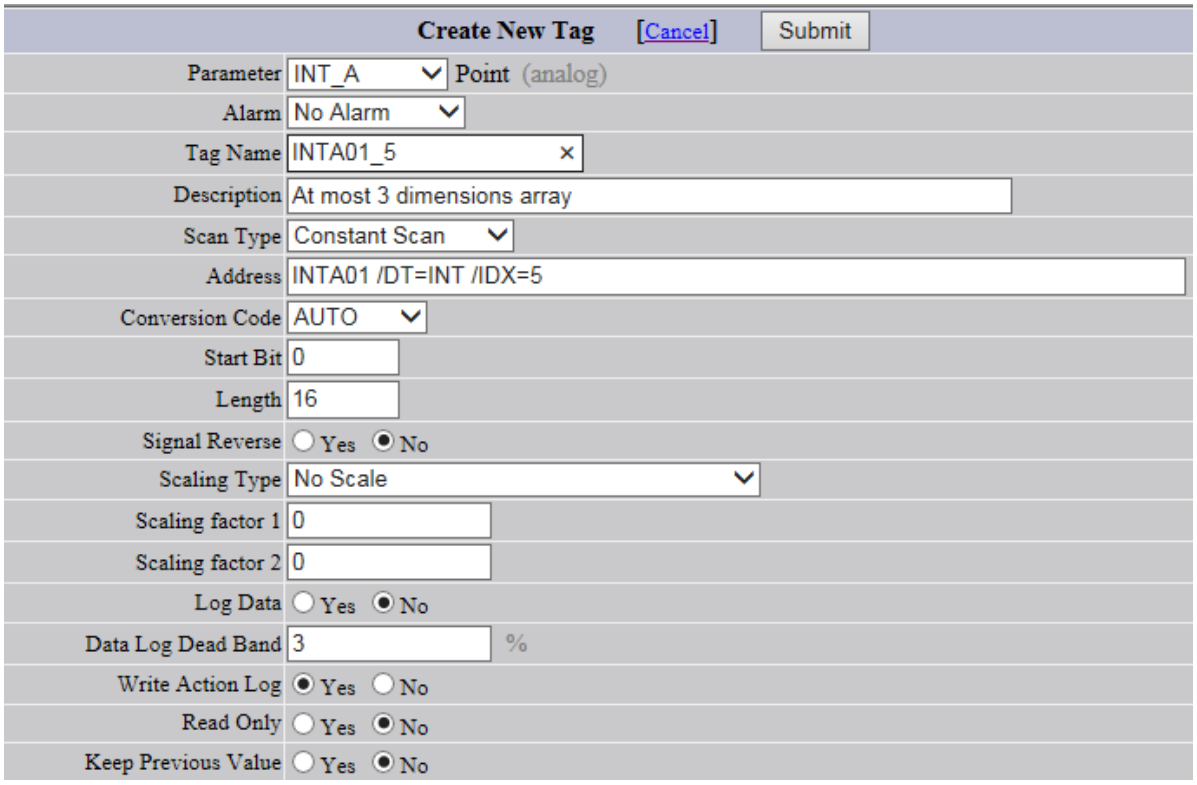


Figure 2.4 The analog tag property for the INT array

Text tag property

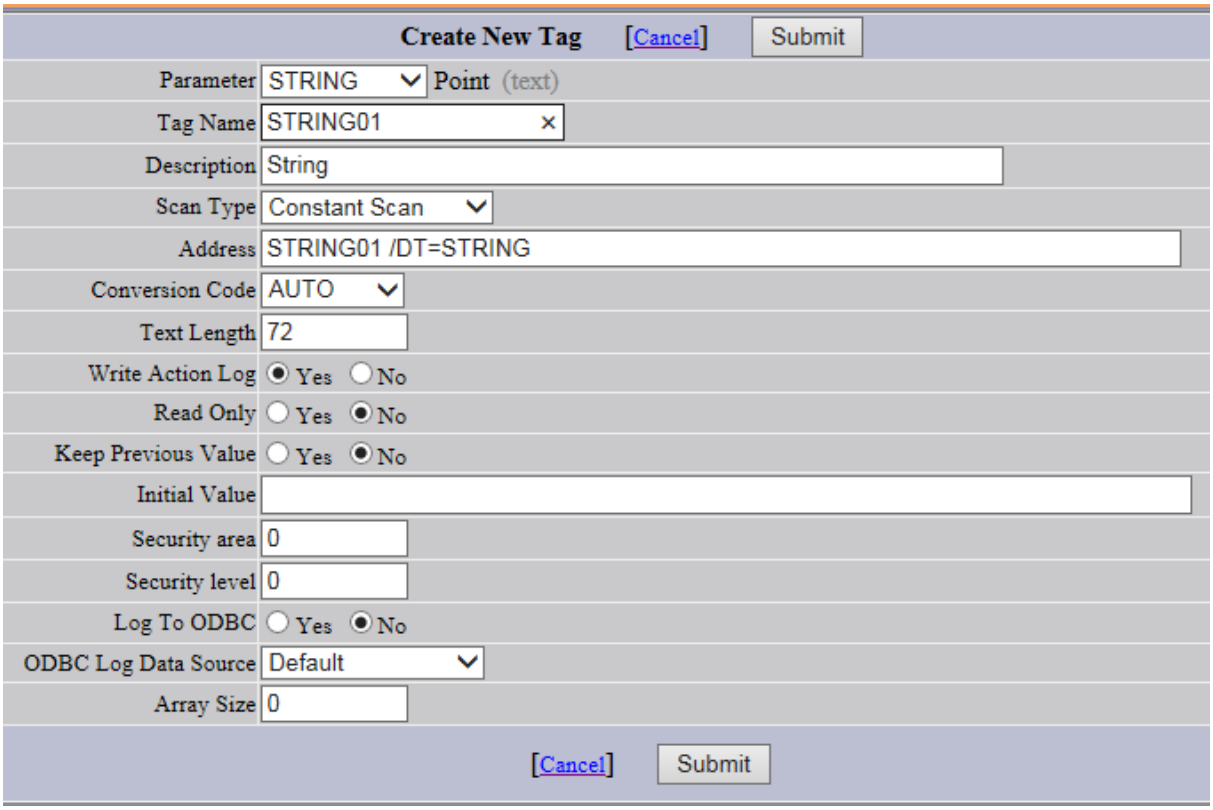


Figure 2.5 The text tag property for the STRING variable

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