

# Technical Note

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## Configuring an Omron PLC with Omron FINS Ethernet Driver

### 1. Introduction

This document describes how to configure an Omron PLC with a FINS-enabled Ethernet module and the Omron FINS Ethernet driver. These instructions assume the driver is in direct communication with a PLC on the local Ethernet network, though this driver may also be used to communicate with remote PLCs on interconnected FINS networks.

The main issue with FINS Ethernet communications is that PLCs need a way to map FINS node numbers to IP addresses. IP address information is not conveyed in FINS messages and must be inferred from the FINS network parameters contained in the messages. Configure the PLCs to accomplish this via one of three methods: automatic conversion, IP address table, or combination.

The automatic conversion method is usually easiest and is used in this example. The PLC calculates the IP address of the destination node from its own IP and the FINS node number of the destination. It is assumed that the host number of the IP, generally the last octet, is the same as the FINS node number.

**Note:** The FINS limits the range of node numbers from 1 to 127, limiting the range of IP addresses that can be used with this method.

The IP address table explicitly maps nodes to IP addresses in a delimited table format, allowing customization for most implementations.

The combination method uses both. When the PLC sends a message to a given FINS node, it checks the IP address table for that node. If the node is listed, the PLC sends the message to the IP address in that table entry. If an entry is not found, the PLC constructs an IP address with the automatic conversion method.

## 2. Settings

The relevant settings for an Omron CJ2 PLC and an Omron FINS Ethernet driver.

### PC (ThingWorx® Kepware® Server host):

IP: 10.10.112.118

Subnet Mask: 255.255.0.0

### PLC (EtherNet IP):

IP: 10.10.110.58

Unit: 0

Node Number: 58

**Note:** This is same as last octet of IP using auto conversion.

Set IP with rotary switches on the EtherNet IP module:

IP setting 10.10.110.58 (decimal) = 0A.0A.6E.3A (hex)

The switches are oriented as shown below. Check the Ethernet module documentation for correct information.

```
-----  
| 3 | A | 6 | E |           (socket) |  
-----  
| 0 | A | 0 | A |           |  
-----
```

Set Unit Number with rotary switch on top of ETN01 module:

Unit: | 0 |

Set Node Number with rotary switch on top of ETN01 module:

Unit: 58 (decimal) = 3A (hex)

Node: | 3 | x161 | A | x 160

### 3. Driver Setup

1. Set the UDP port number in the Channel Properties Communications Parameters group. FINS requires that all nodes on a FINS Ethernet network use the same port number. The default value is 9600.

Property Groups	<div style="border: 1px solid black; padding: 2px;"> <b>Communication Parameters</b> </div>	
General	Port	9600
Ethernet Communications		
Write Optimizations		
Advanced		
<b>Communication Parameters</b>		

2. Set the PLC model number and IP on the General tab.

**Tip:** In this example, this is the model and IP of a single PLC. To communicate with a remote device, the model would be that of the remote device and the IP would be that of the “go-between” PLC.

Property Groups	<div style="border: 1px solid black; padding: 2px;"> <b>Identification</b> </div>	
<b>General</b>	Name	Omron FINS Ethernet
Scan Mode	Description	
Timing	Driver	Omron FINS Ethernet
Auto-Demotion	Model	C200
FINS Network Configuration	Channel Assignment	Omron FINS Ethernet
Run Mode Settings	ID	255.255.25.255
Communication Parameters	<div style="border: 1px solid black; padding: 2px;"> <b>Operating Mode</b> </div>	
Redundancy	Data Collection	Enable
	Simulated	No

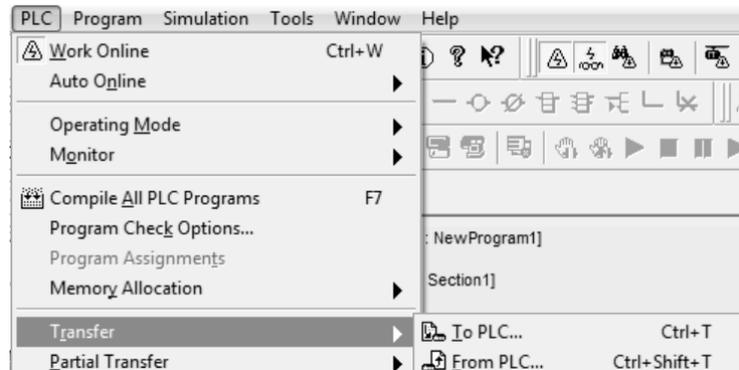
3. Set the FINS network parameters in the FINS Network Configuration group.

Property Groups	<div style="border: 1px solid black; padding: 2px;"> <b>FINS Network Configuration</b> </div>	
General	Source Network Address	0
Scan Mode	Source Node	115
Timing	Destination Network Address	0
Auto-Demotion	Destination Node	0
<b>FINS Network Configuration</b>	Destination Unit	0
Run Mode Settings		
Communication Parameters		
Redundancy		

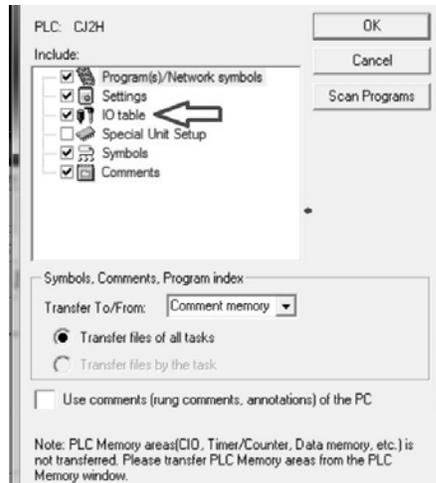
**Note:** The source node number is the same as the last Octet of PC’s IP address because the PLC is configured to use using automatic conversion. The network number is zero since because the ultimate destination is on a local Ethernet network. To communicate with a remote PLC, the destination network number would be non-zero and be configured in the “go-between” PLC’s routing table.

## 4. PLC Setup

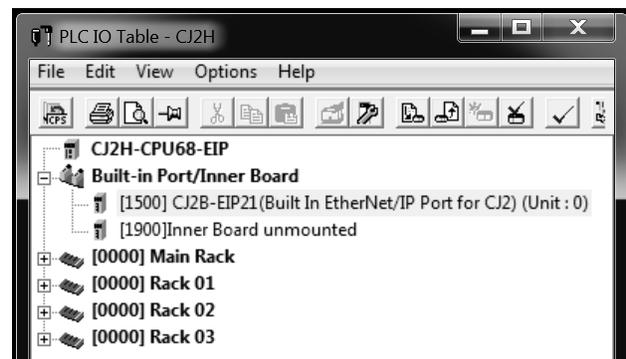
1. Verify the PLC is correctly configured to use the Ethernet and FINS network parameters specified in the driver configuration.
2. Run CX-Programmer.
3. Create a PLC object to communicate with the PLC or load a project that has been previously created for the PLC.
4. Select **Work Online**.
5. Select **PLC | Transfer | From PLC...** to get current PLC configuration.



6. Verify that "IO table" is checked in the Upload Options dialog.
7. Click **OK**.



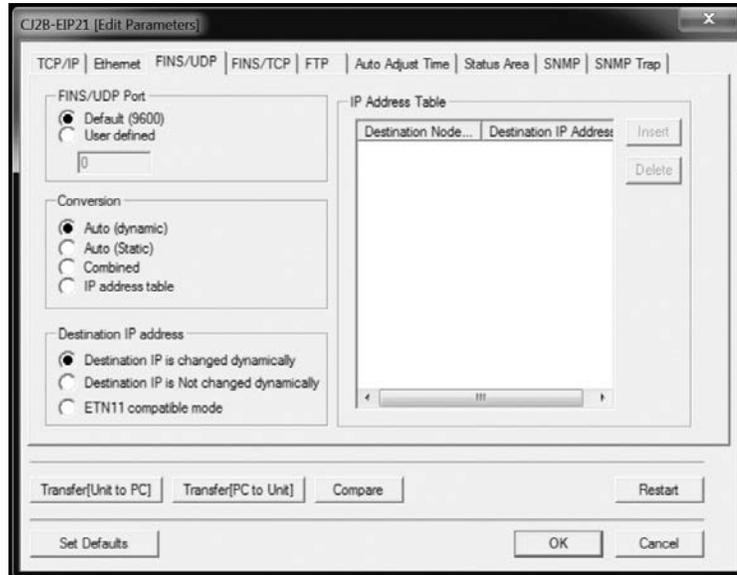
8. Double-click on IO table.
9. Expand the "Built-in Port/Inner Board" node.
10. Right-click on "[1500] CJ2B-EIP21(Built In EtherNet/IP Port for CJ2)" and select "Unit Setup".



11. Select "Auto" in the Ethernet tab.

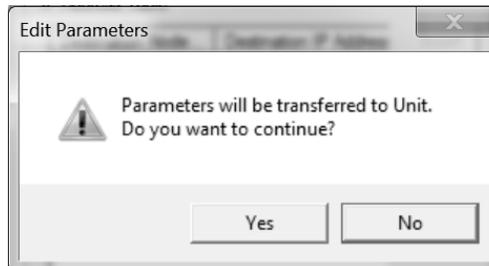


12. Select "Default" in the FINS UDP tab.



13. Select **Transfer [PC to Unit]**.

14. Click **OK**.



15. Select **Yes**

## 5. Summary

Verify the PLC, the Omron FINS Ethernet driver, and the server are all correctly configured by launching OPC QuickClient and confirming the tags show "Good" quality. Congratulations!