

# **Technical Note**

## **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. For simplicity, 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 (KEPServerEX 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 on the Channel Properties dialog box, Communications Parameters tab. FINS requires that all nodes on a FINS Ethernet network use the same port number. The default value is 9600.

5		
Network Inte	erface	Write Optimizations
Advanced Commu		nications Parameters
	Network Intr	Network Interface

- 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.

Device Prope	erties			X		
	Co	mmunication	s Parameters			
Run	Mode Settings		FINS Network Configuration			
General	Scan Mode	Timing	Auto-Demotion	Redundancy		
Channe	el Assignment					
Nam	ne: OMR	ON_CJ2				
Driv	Driver: Omron FINS Ethernet					
Device						
Nam	ne: FINS	Ethernet				
Mod	lel: CJ2			•		
ID:	10.10	0.110.58				
V Enab	le data collect	ion	Simula	ate Device		
	ок	Cancel	Apply	Help		

3. Set the FINS network parameters on the FINS Network Configuration tab.

Device Prope	erties					X
Communications Parameters						
General	Scan Mode	Timing	Timing Auto-Demotion			dancy
Run N	Mode Settings		FINS Net	work Cor	nfiguratio	n
Source Network Address Number:			Number:	0		
Source Node Number:			118			
Destination Network Address Number:			0			
Destination Node Number:			58			
Destination Unit Number:			0			
	ОК	Cancel	App	oly	H	elp

**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.

CJ2B-EIP21 [Edit Parameters]		×
TCP/IP   Ethemet FINS/UDP   FINS/TCP   FTP FINS/UDP Pot © Default (9600) User defined 0 Conversion © Auto (dynamic) Auto (Static) © Combined 0 IP address table	Auto Adjust Time   Status Area   SNMP   SNM	Insert Delete
Destination IP address Destination IP is changed dynamically Destination IP is Not changed dynamically ETN11 compatible mode	Compare	Restart
		nesidii
Set Defaults	ОК	Cancel

- 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 Quick Client and confirming the tags show "Good" quality. Congratulations!