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Application Brief

EtherNet/IP Network Configuration

Omron FZ3 Vision System to Rockwell ControlLogix Controller Communication Example

EtherNet/IP™

CONTENTS

Cat No. QSG_FZM1_ROCKWELLPLC_EIP

Application Brief

EtherNet/IP Network Configuration

Omron FZ3 Vision System to Rockwell ControlLogix Controller Communication Example

Overview

This document will allow a user to setup an EtherNet/IP Tag Data Link between an Omron FZ3 Vision System and a Rockwell ControlLogix 5561 Controller. This tag Data Link will consist of 20 Bytes (Command Area) from the Rockwell Controller to Omron FZ3 and 48 Bytes (Response Area) from the Omron FZ3 to Rockwell Controller.

Note: The setup for a Rockwell CompactLogix would be identical.

1-1 Hardware and Network Configuration

1-1-1 Network Physical Setup

Application Brief

EtherNet/IP Network Configuration

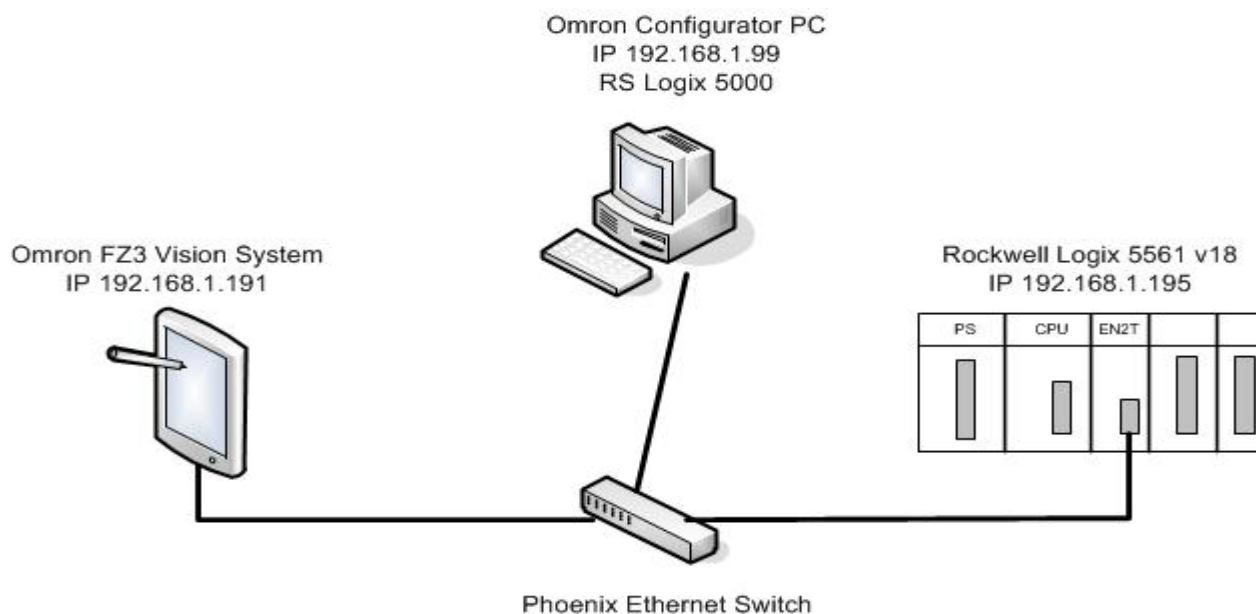Omron FZ3 Vision System to Rockwell ControlLogix Controller Communication Example

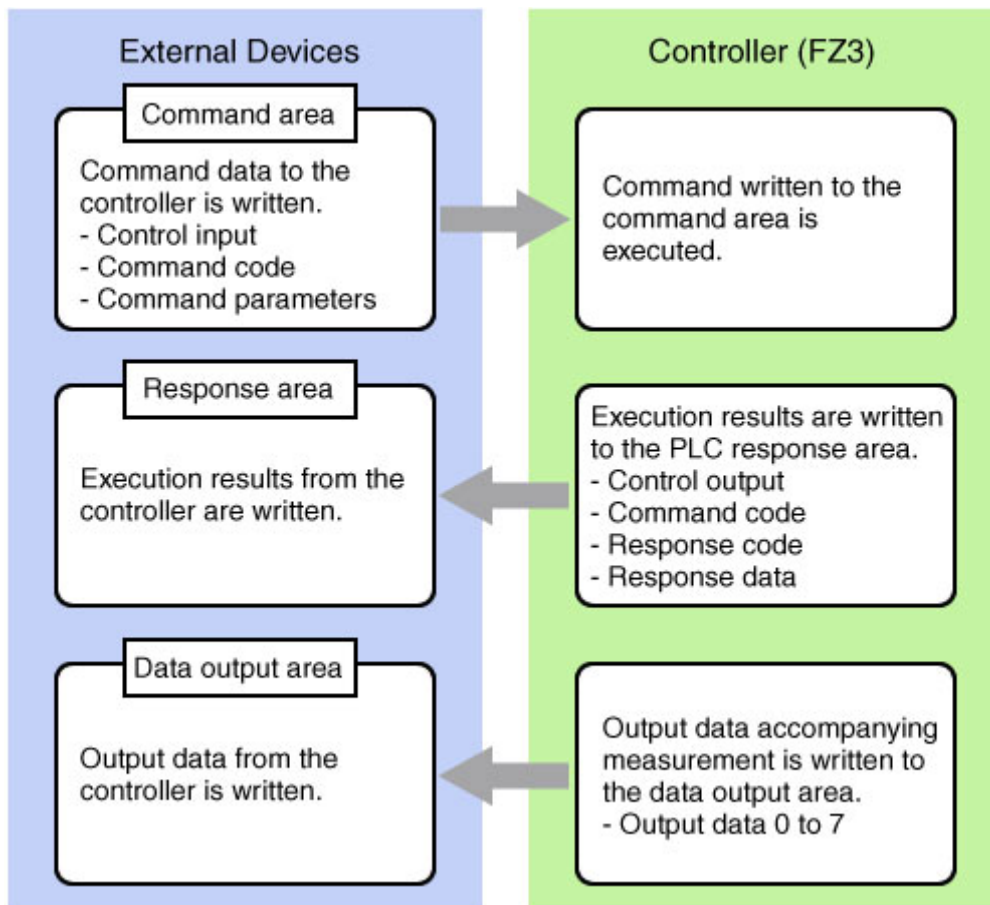## 1-1-2 Communication Processing Flow (EtherNet/IP)

Send area (Command area)
Communication direction Target -> Originator (FZ3) Data size 20 bytes

Receiving area (Response area/Data Output area)
Communication direction Originator (FZ3) -> Target Data size 48 bytes (Response area + Data Output area)

EtherNet/IP Network Configuration

Omron FZ3 Vision System to Rockwell ControlLogix Controller Communication Example

1-2 FZ3 EIP Network Settings Configuration

1-2-1 Command Area from AB to FZ3

| Command area

Master → Slave (FZ3)

Command area top channel	Bit																Name
	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	
+0																EXE	Control input (2CH)
+1																DSA	
+2	CMD-CODE																Command code (2CH)
+3																	
+4	CMD-PARAM																Command parameter (Maximum 6CH)
+5																	
+6																	
+7																	
+8																	
+9																	

Signal	Signal name	Function
CMD-EXE	Command execution bit	Executes commands Reference: ▶ Command Control (EtherNet/IP) (p.219)
DSA	Data output request bit	Requests the next data output Reference: ▶ Data Output (EtherNet/IP) (p.219)
CMD-CODE	Command code	Stores command codes
CMD-PARAM	Command parameter	Stores command parameters

1-2-2 Response Area from FZ3 to AB

| Response area

Master ← Slave (FZ3)

Response area top channel	Bit																Name
	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	
+0												RUN	OR		BUSY	FLG	Control output (2CH)
+1																GATE	
+2	CMD-CODE																Command code (2CH)
+3																	
+4	RES-CODE																Response code (2CH)
+5																	
+6	RES-DATA																Response data (2CH)
+7																	

| Signal	Signal name	Function
CMD-FLG	Command completion bit	Turns ON when command execution is complete.
GATE	Data output completion bit	Turns ON when data output is complete.
BUSY	Command execution in progress bit	Turns ON when command execution is in progress.
OR	Overall judgement	Turns ON when the overall judgement result is NG. (The OR signal is output when the checkbox for [Output] is selected in the ADJUST window.)
RUN	RUN window	Turns ON when the controller is set to the RUN window.
CMD-CODE	Command code	Returns the executed command code.
RES-CODE	Response code	Stores the response from the executed command.
RES-DATA	Response data	Stores the response data from the executed command.

EtherNet/IP Network Configuration

Omron FZ3 Vision System to Rockwell ControlLogix Controller Communication Example

1-2-3 Data Area FZ3 to AB

Data area

Master ← Slave (FZ3)

Output area top channel	Bit																Name
	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	
+0	DATA0																Output data 0
+1																	
+2	DATA1																Output data 1
+3																	
+4	DATA2																Output data 2
+5																	
+6	DATA3																Output data 3
+7																	
+8	DATA4																Output data 4
+9																	
+10	DATA5																Output data 5
+11																	
+12	DATA6																Output data 6
+13																	
+14	DATA7																Output data 7
+15																	

1-2-4 FZ3 Controller Startup Settings

Communications protocol for Ethernet/IP is configured in the Startup settings menu. Settings will be applied after the data has been saved and the controller rebooted.
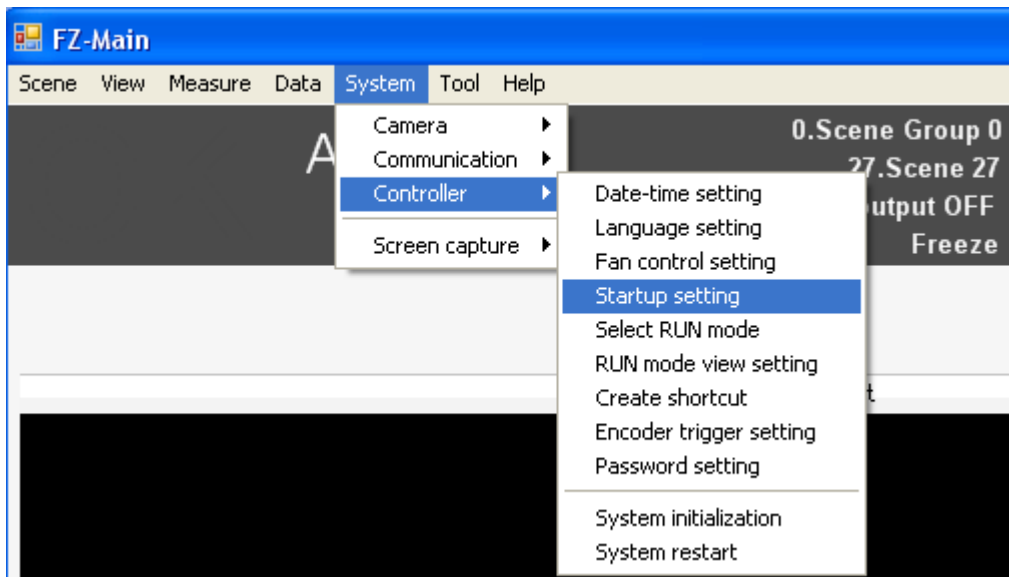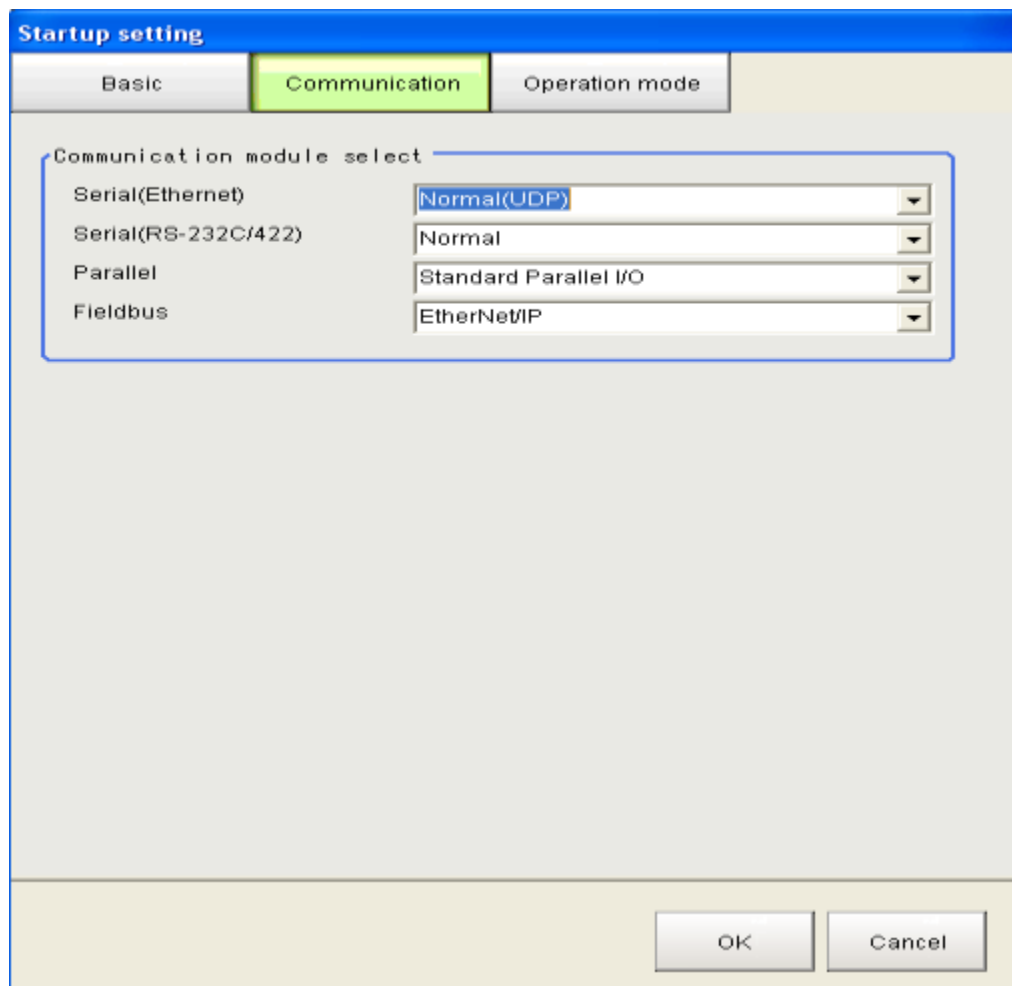
Application Brief

EtherNet/IP Network Configuration

Omron FZ3 Vision System to Rockwell ControlLogix Controller Communication Example

1-2-5 FZ3 Communication Startup Settings

Select the Communications Tab and choose the options shown below.
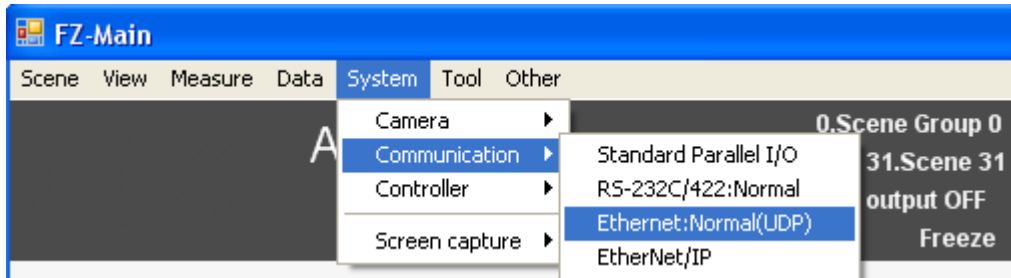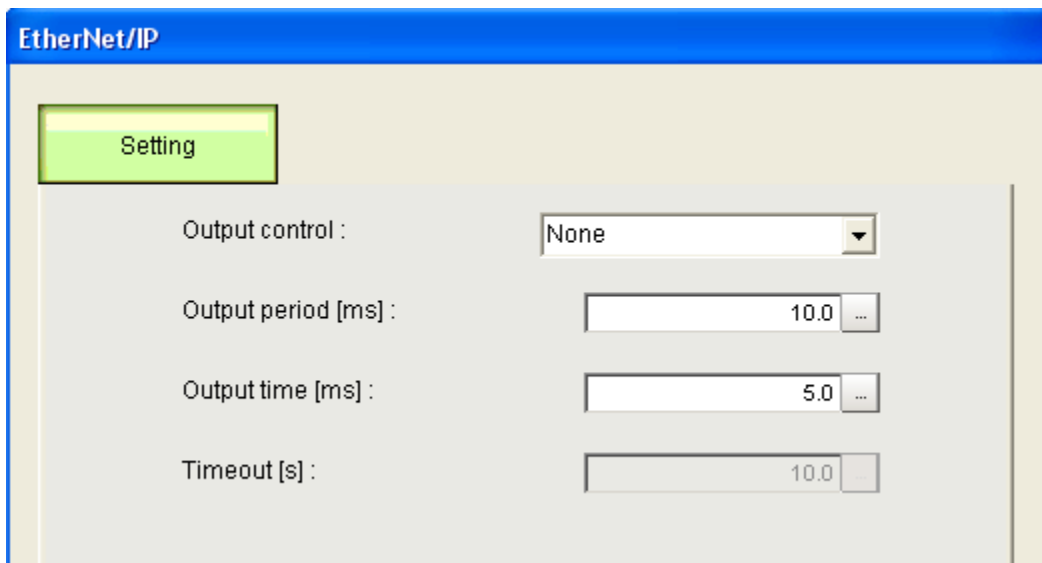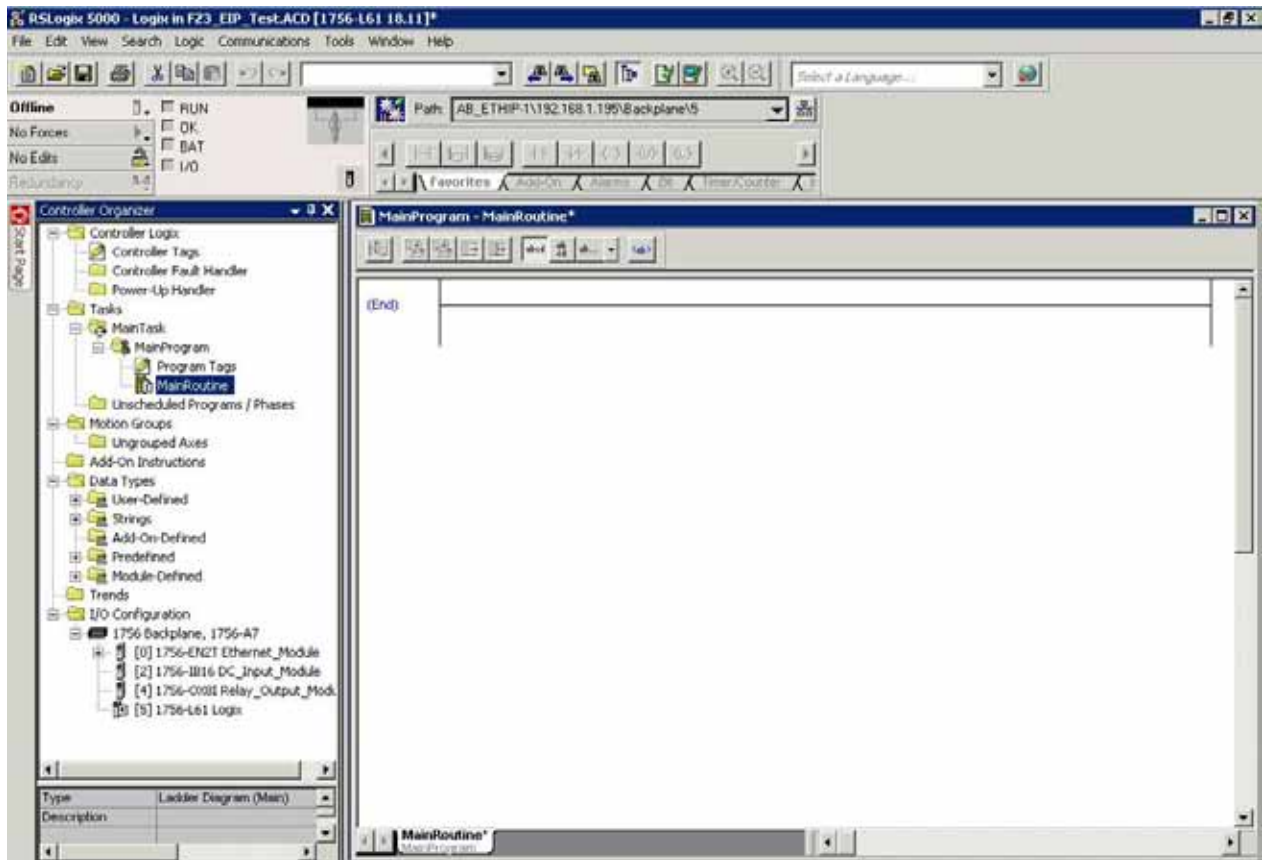

Click the **OK** button to accept.

Application Brief

EtherNet/IP Network Configuration

Omron FZ3 Vision System to Rockwell ControlLogix Controller Communication Example

1-2-6 FZ3 EtherNet Address Settings

After restarting, the communications menu will display the options for Ethernet settings.

The Ethernet menu will provide the address settings.
Enter the IP Address, Subnet Mask, Default Gateway, and DNS Server to match your network.
This example:
IP Address: 192.168.1.191
Subnet Mask: 255.255.255.0
Default Gateway & DNS Server: 192.168.1.1
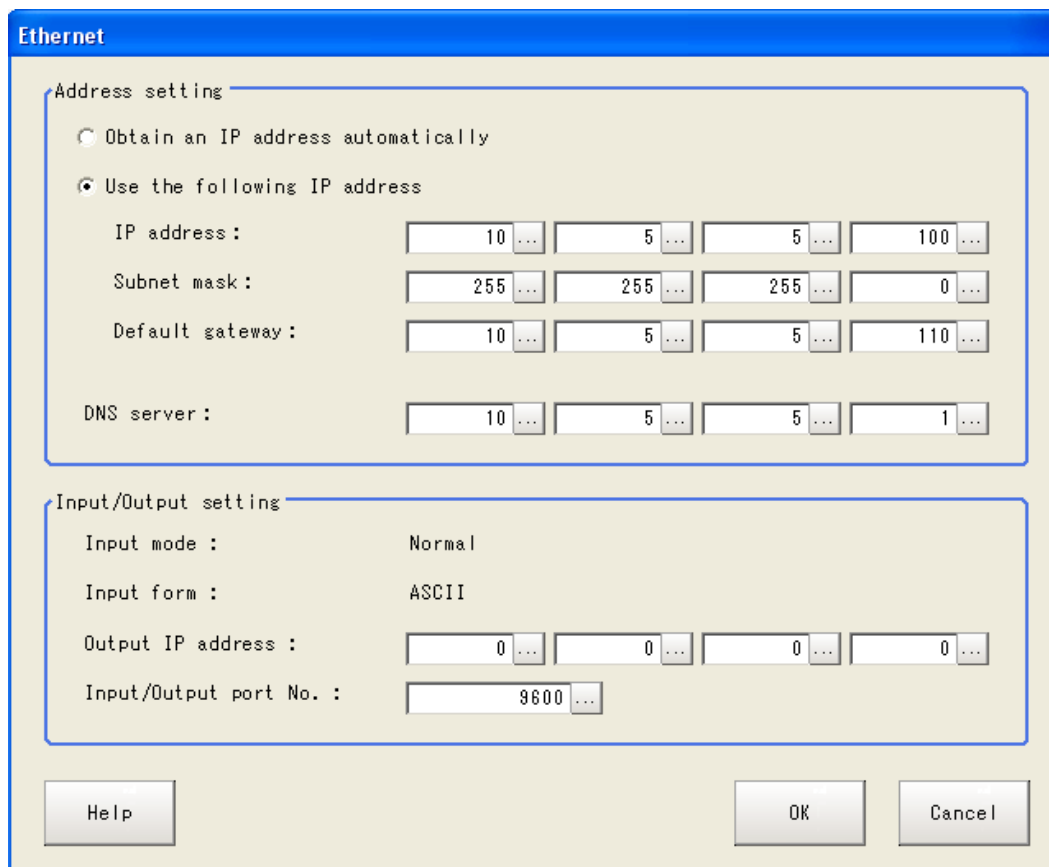
Click the **OK** button to accept.
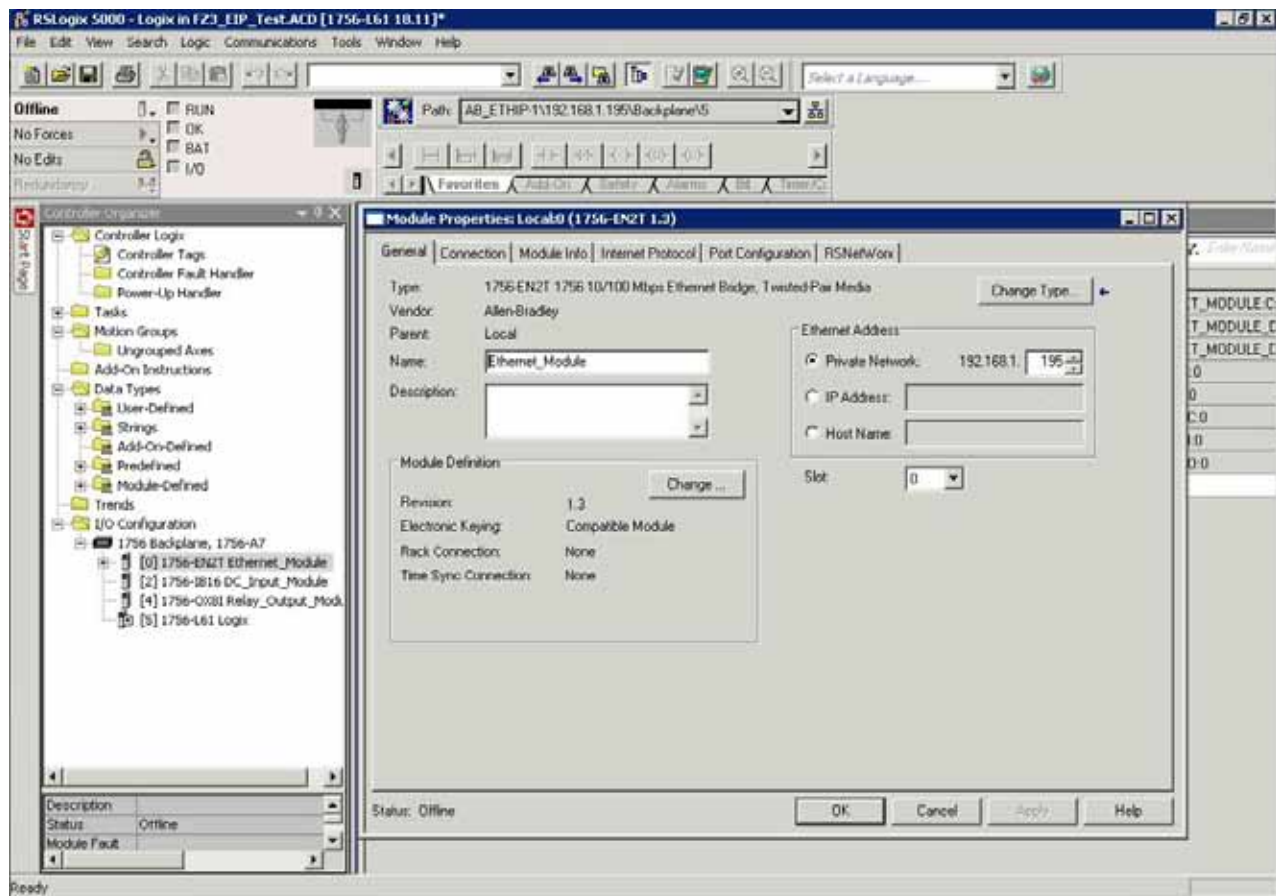

Application Brief

EtherNet/IP Network Configuration

Omron FZ3 Vision System to Rockwell ControlLogix Controller Communication Example

1-2-7 FZ3 EtherNet/IP Address Settings

The EtherNet/IP menu will provide communications conditions.

Choose the appropriate Timing settings for your network and application.
For this example program the default settings are OK.

Please refer to the Timing Chart (EtherNet/IP) from Section 7 of the FZ3 User's Manual Z290 for
for a detailed outline of I/O timing.

Application Brief

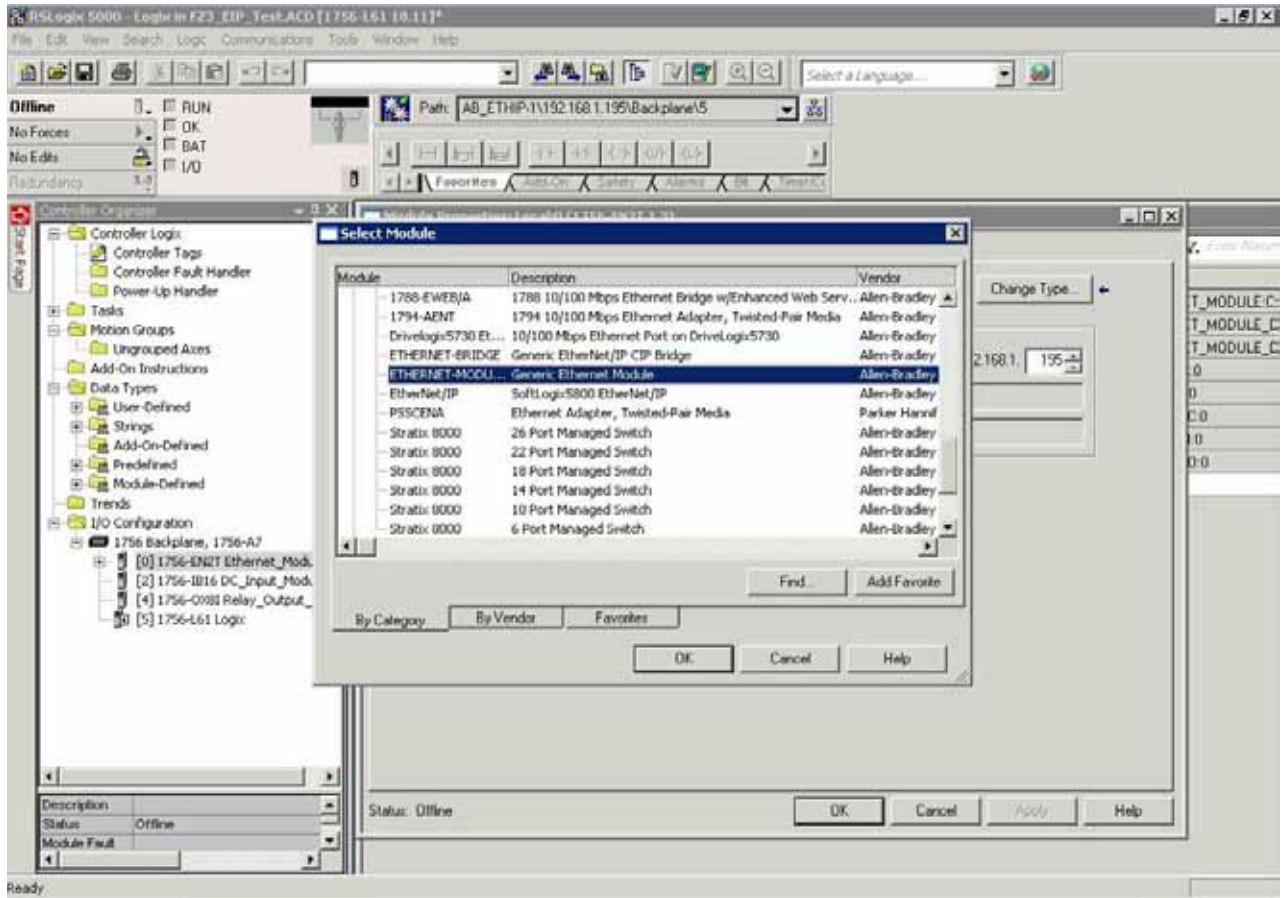# EtherNet/IP Network Configuration

Omron FZ3 Vision System to Rockwell ControlLogix Controller Communication Example

1-3 Rockwell ControlLogix Processor Configuration.

1-3-1 Open Existing or Create a new Project

Open the RSLogix Programming Software using the current project that is in the PLC.

Application Brief

EtherNet/IP Network Configuration

Omron FZ3 Vision System to Rockwell ControlLogix Controller Communication Example

1-3-2 Ethernet Module Settings

Right Click the 1756-EN2T Ethernet Module in the I/O Configuration section of the Project Workspace and Select Properties. Name the module "Ethernet Module". Enter the IP Address (192.168.1.195) and Set the correct Slot Number for the Ethernet Module.

Right Click on the 1756-ENBT/A Module and select "New Module".

Click the **OK** Button to accept

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Application Brief

EtherNet/IP Network Configuration

Omron FZ3 Vision System to Rockwell ControlLogix Controller Communication Example

1-3-3 Create New Generic Ethernet Module

Right Click the 1756-EN2T Ethernet Module in the I/O Configuration section of the Project Workspace and Select New Module.

Scroll down and Select "ETHERNET MODULE Generic Ethernet Module".
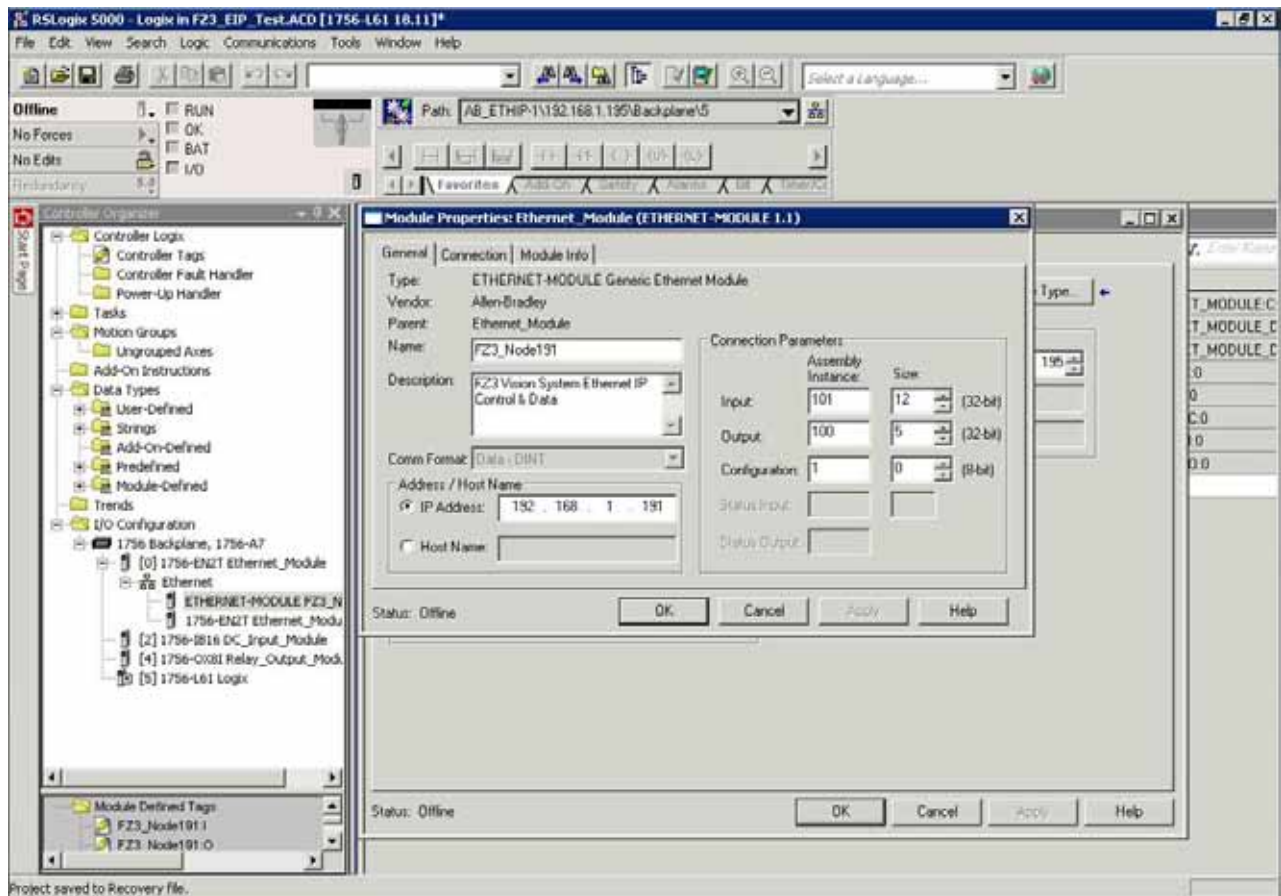

Choose OK to accept.

EtherNet/IP Network Configuration

Omron FZ3 Vision System to Rockwell ControlLogix Controller Communication Example

1-3-4 Configure Generic Ethernet Module

Double Left Click on the 1756-EN2T Ethernet Module in the I/O Configuration section of the Project Workspace.
This screen is for the configuration of the remote connection to the Omron FZ3.

Enter "FZ3_Node 191" for the Name.
Select Data-DINT for the Comm Format.
Enter "192.168.1.191" for the IP Address.
Enter "101" for the Input Instance. Note: This is the Produced Instance # of the FZ3.
Enter the Size as 12 DINT (= 48 Bytes).
Enter "100" for the Output Instance. Note: This is the Consumed Instance # of the FZ3.
Enter the size as 5 DINT (= 20 Bytes).
Enter "1" for the Configuration Instance with a size of "0".

Click the **OK** button to accept.

Application Brief

EtherNet/IP Network Configuration

Omron FZ3 Vision System to Rockwell ControlLogix Controller Communication Example

Select Connection Tab to continue the Module Setup.
Enter **"10.0 ms"** for the RPI (Requested Packet Interval)
Check the **"Use Unicast Connection over EthernetIP"** Checkbox.
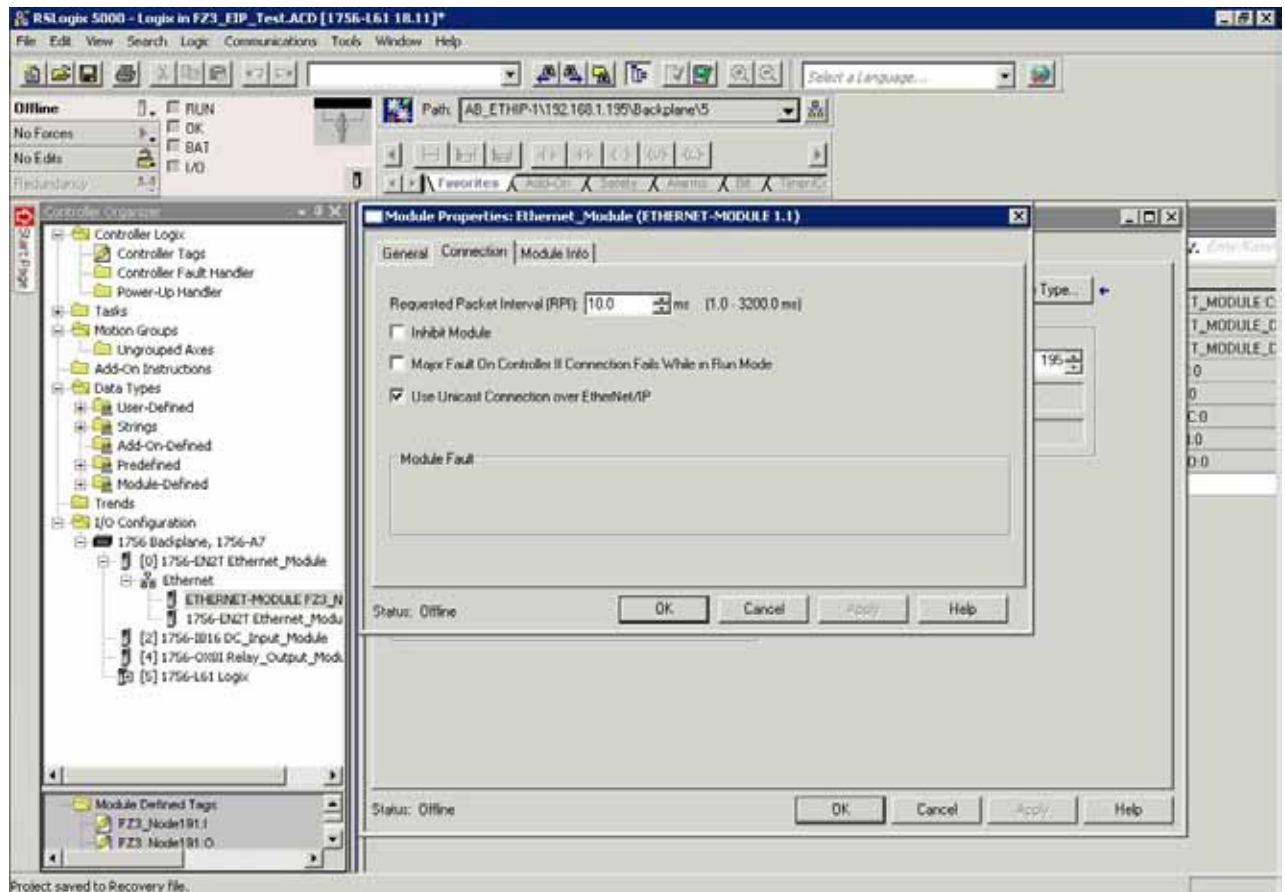
Click the **OK** button to accept.
Click the **OK** button to complete the Module Setup.
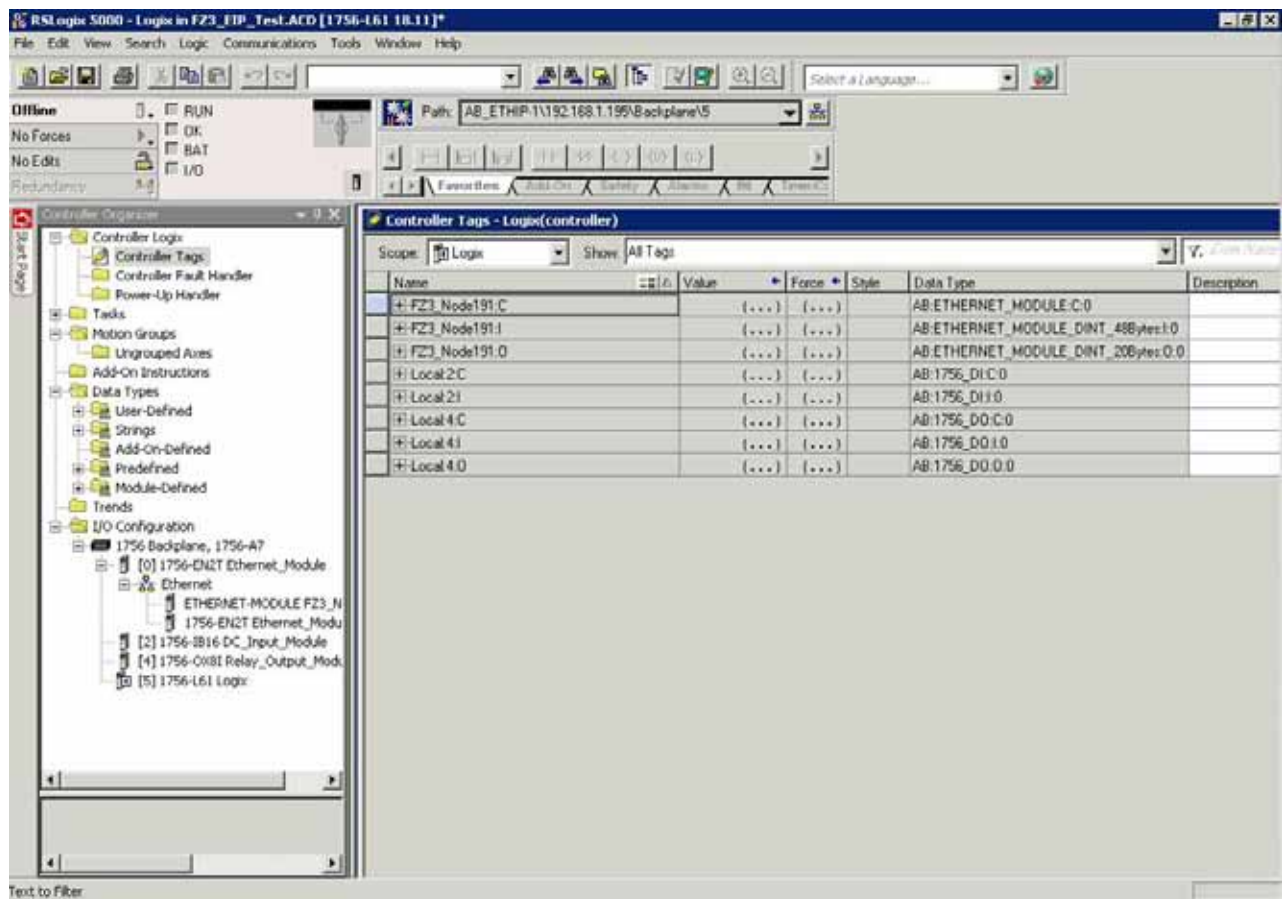
EtherNet/IP Network Configuration

Omron FZ3 Vision System to Rockwell ControlLogix Controller Communication Example

1-3-5 Communication Controller Tags Generated

The ControlLogix EtherNet/IP configuration is complete.
Note: The Software has automatically generated Input, Output, and Configuration Tags.

FX3_Node191:C   Not Used
FX3_Node191:I   12 DINT Variables (48 Byte Input)
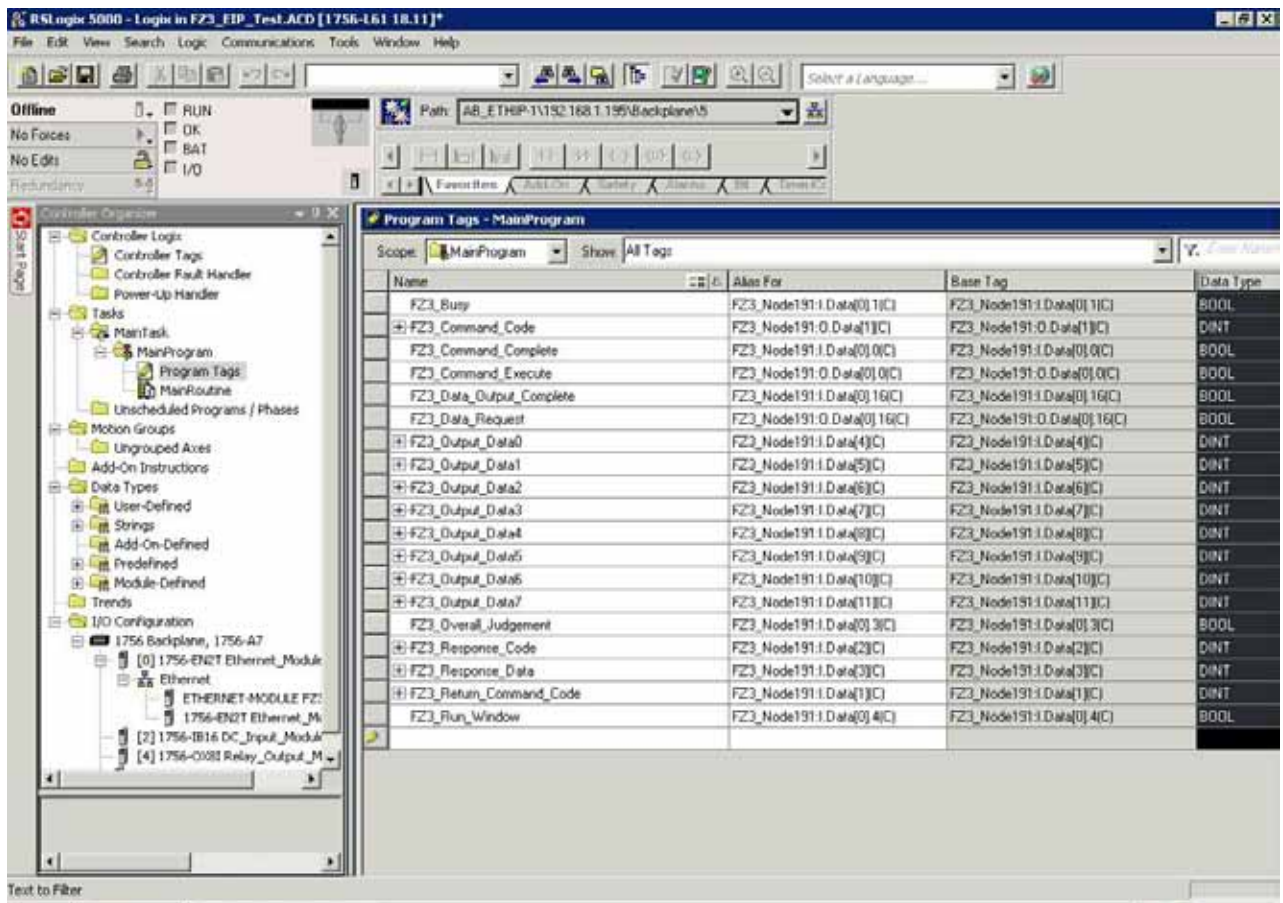FX3_Node191:O   5 DINT Variables (48 Byte Output)

Application Brief

EtherNet/IP Network Configuration

Omron FZ3 Vision System to Rockwell ControlLogix Controller Communication Example

1-3-6 Create Program Tags (Optional)

The ControlLogix Controller allows definition of tags with Alias to give the Controller tags user friendly tag names for programming.
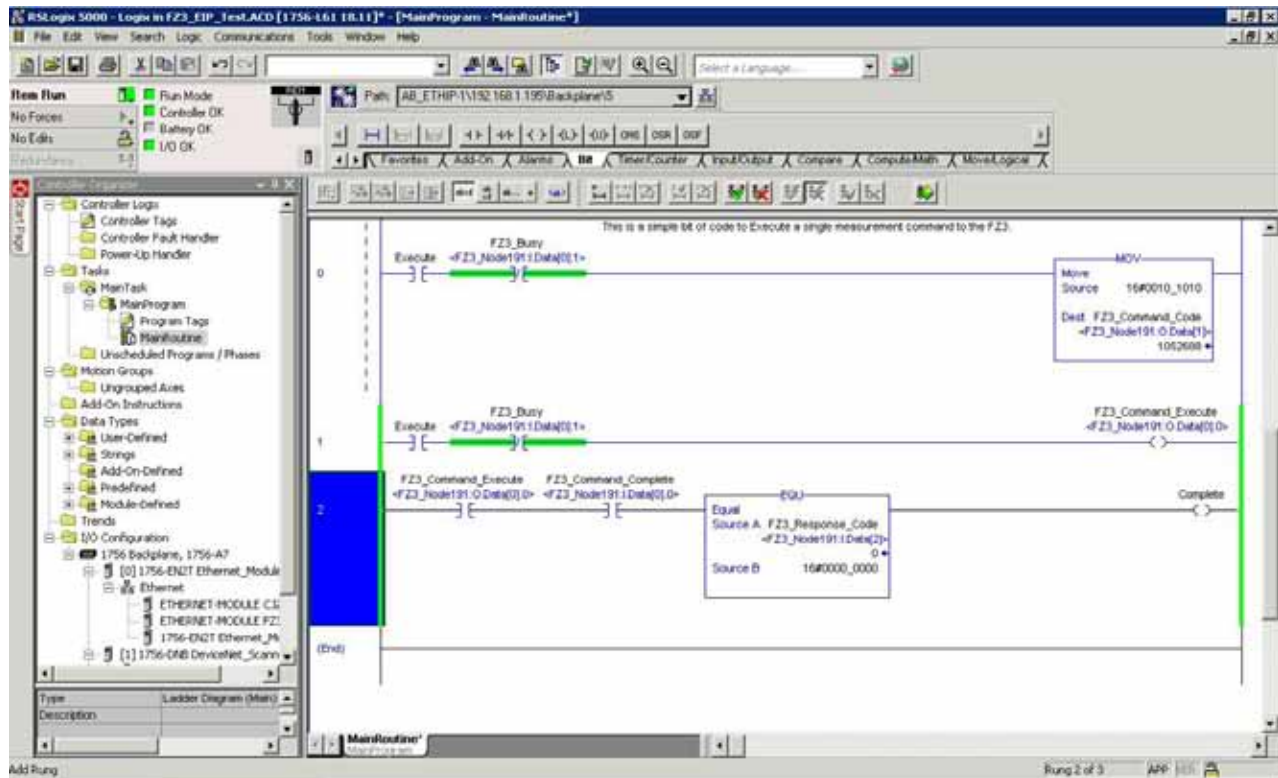
Select TASKS, MAIN TASK, PROGRAM Tags, Edit Tags
Enter a tag name and assign to the appropriate Controller Tag.

Application Brief

EtherNet/IP Network Configuration

Omron FZ3 Vision System to Rockwell ControlLogix Controller Communication Example

1-3-7 Simple Single Measurement Program

1-3-8 Configuration and Programming Complete

Select "Communications" and "Download" to send this configuration to the PLC.

The configuration is complete. The Tag Data Link should now be operational.