

8-2-4 Route Path

The route path indicates the path from the local CPU Unit to the remote Controller on the network. Routing is performed for CIP communications instructions based on route paths.

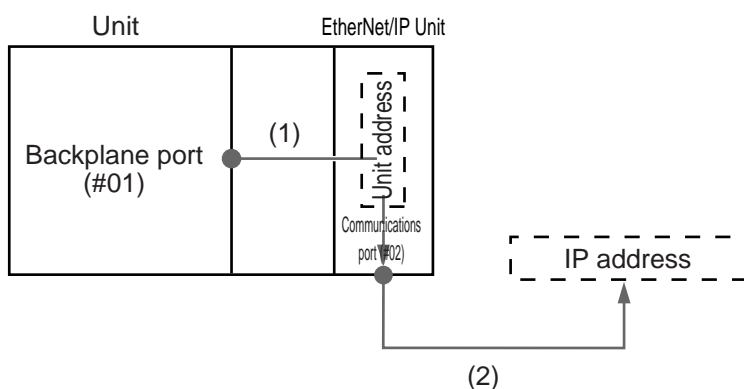
Route Path Notation

The EPATH data type is used to give route paths. The basic format is shown below.

Network_type_number \ Remote_address

The network type number and the remote address are determined as shown in the following table according to whether the route type is (1) a Unit on the CPU Rack or (2) a communications port on a Communications Unit.

Route	Network type number (hexadecimal)	Remote address (hexadecimal)
1. Output to Unit on CPU Rack	#01 (backplane port)	Remote Unit address (Refer to <i>Additional Information</i> below.)
2. Output from communications port on Communications Unit	#02 (EtherNet/IP Unit)	IP address



(1) When Routing the Output to a Unit on the CPU Rack

Output the command to the backplane port as a network with the CPU Rack. Specify the Unit address as the address of the remote Unit.

(2) When Routing the Output to a Communications Port on a Communications Unit

Output the command to an EtherNet/IP port. Specify the IP address as the address of the remote node.



Additional Information

Unit Addresses

A Unit address is used to discriminate between several devices connected to a single node on a network.

Set the unit address as shown below.

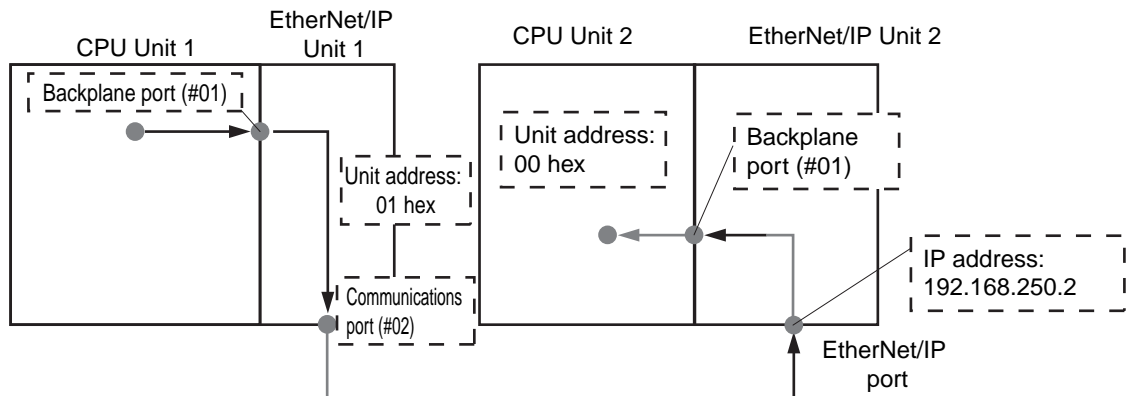
- CPU Unit: 00 hex
- CPU Bus Units (EtherNet/IP Units): Unit number + 10 hex
- Special I/O Unit: Unit number + 20 hex
- Inner Board: E1 hex
- Computer: 01 hex
- The Unit connected to network: FE hex

Route Path Notation Examples

The notation of the route path is different for communications on the built-in EtherNet/IP port and for communication on an EtherNet/IP Unit. This section provides examples of route paths.

● Communicating with an EtherNet/IP Unit

Example: Communicating from the EtherNet/IP Unit mounted to CPU Unit 1 to CPU Unit 2 via the EtherNet/IP Unit mounted to CPU Unit 2



(1) CPU Unit 1 to EtherNet/IP Unit 1

- Network type number: "01" (Output the command via internal backplane port.)
- Remote address: "#01" (unit address of EtherNet/IP Unit)

(2) EtherNet/IP Unit 1 to EtherNet/IP Unit 2

- Network type number: "02" (Output the command via EtherNet/IP port.)
- Remote address: Specify the remote IP address.

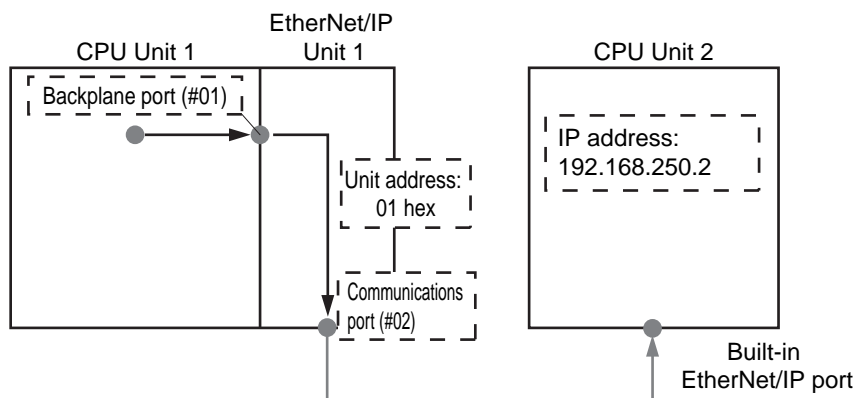
(3) EtherNet/IP Unit 2 to CPU Unit 2

- Network type number: "01" (Output the command via internal backplane port.)
- Remote address: "#00" (unit address of CPU Unit)

Route path: $\frac{\backslash 01 \backslash \# 01 \backslash 02 \backslash 192.168.250.2 \backslash 01 \backslash \# 00}{(1) \quad (2) \quad (3)}$

● Communicating with a Built-in EtherNet/IP Port

Example: Communicating from the EtherNet/IP Unit mounted to CPU Unit 1 to CPU Unit 2 via the Built-in EtherNet/IP port on CPU Unit 2



(1) CPU Unit 1 to EtherNet/IP Unit 1

- Network type number: "01" (Output the command via internal backplane port.)
- Remote address: "#01" (unit address of EtherNet/IP Unit)

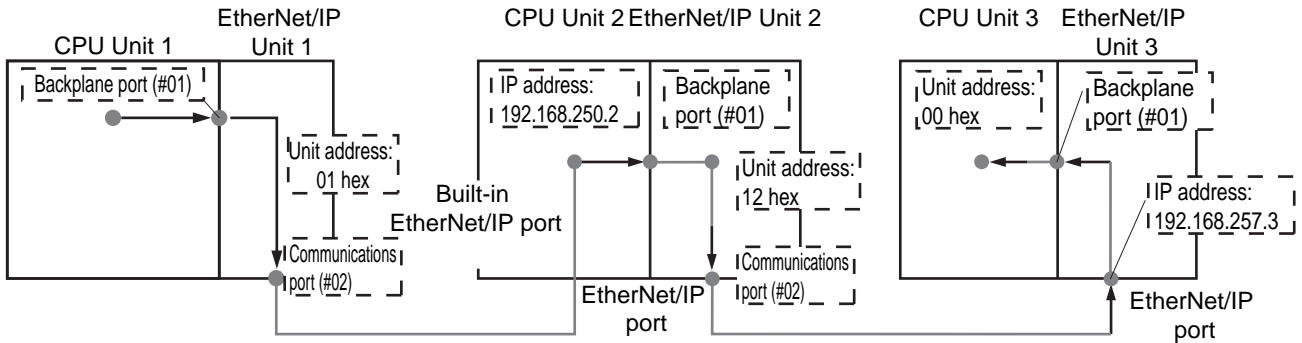
(2) EtherNet/IP Unit 1 to CPU Unit 2 (built-in EtherNet/IP port)

- Network type number: "02" (Output the command via EtherNet/IP port.)
- Remote address: Specify the remote IP address.

Route path:\01\#01\02\192.168.250.2

● **Access via a Relay Node**

Example: Communicating from CPU Unit 1 to CPU Unit 3 via CPU Unit 2



(1) CPU Unit 1 to EtherNet/IP Unit 1

- Network type number: "01" (Output the command via internal backplane port.)
- Remote address: "#01" (unit address of EtherNet/IP Unit)

(2) EtherNet/IP Unit 1 to CPU Unit 2 (built-in EtherNet/IP port)

- Network type number: "02" (Output the command via EtherNet/IP port.)
- Remote address: Specify the remote IP address.

(3) CPU Unit 2 to EtherNet/IP Unit 2

- Network type number: "01" (Output the command via internal backplane port.)
- Remote address: "#12" (Unit address of EtherNet/IP Unit (Unit number: 2+10 hex = 12 hex))

(4) EtherNet/IP Unit 2 to EtherNet/IP Unit 3

- Network type number: "02" (Output the command via EtherNet/IP port.)
- Remote address: Specify the remote IP address.

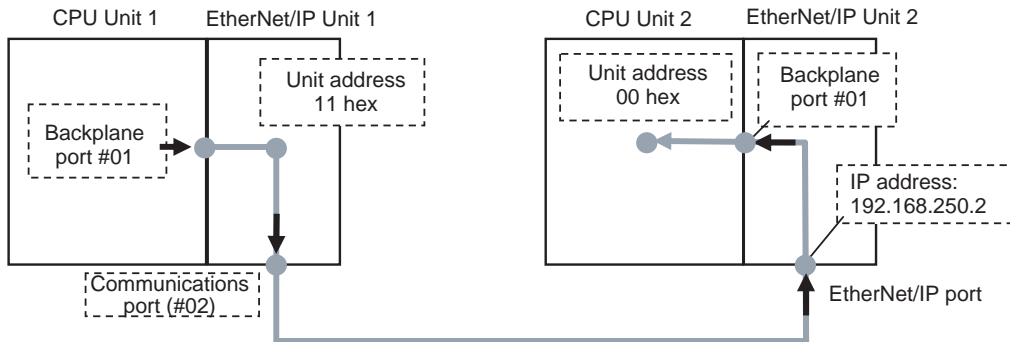
(5) EtherNet/IP Unit 3 to CPU Unit 3

- Network type number: "01" (Output the command via internal backplane port.)
- Remote address: "#00" (unit address of CPU Unit)

Route path: \01\#01\02\192.168.250.2\01\#12\02\192.168.257.3\01\#00
 (1) (2) (3) (4) (5)

● Communicating between EtherNet/IP Units

Example: Communicating via EtherNet/IP Units Mounted to CPU Unit 1 and CPU Unit 2



(1) CPU Unit 1 to EtherNet/IP Unit 1

- Network type number: "#01" (Output the command via internal backplane port.)
- Remote address: "#11" (Unit address of EtherNet/IP Unit (Unit number: 1+10 hex))

(2) EtherNet/IP Unit 1 to EtherNet/IP Unit 2

- Network type number: "#02" (Output the command via EtherNet/IP port.)
- Remote address: Specify the remote IP address.

(3) EtherNet/IP Unit 2 to CPU Unit 2

- Network type number: "#01" (Output the command via internal backplane port.)
- Remote address: "#00" (unit address of CPU Unit)

Route path : \01\#11\02\192.168.250.2\01\#00
 (1) (2) (3)

- (1) Unit address of Local EtherNet/IP Unit (Unit number: 1+10 hex)
 (2) IP address of remote EtherNet/IP Unit
 (3) Unit address of remote CPU Unit

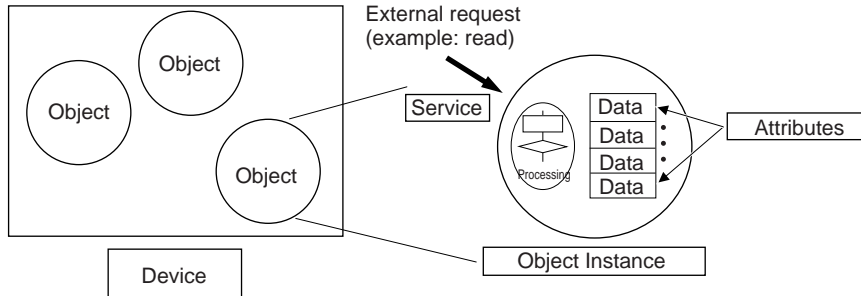


Version Information

You can use the CJ1W-EIP21 EtherNet/IP Unit mounted to an NJ-series Controller with a CPU Unit with unit version 1.01 or later and Sysmac Studio version 1.02 or higher.

Request Path (IOI)

In the CIP world, each device is modeled as a collection of objects. An Object abstractly represents the specific configuration elements of a device.

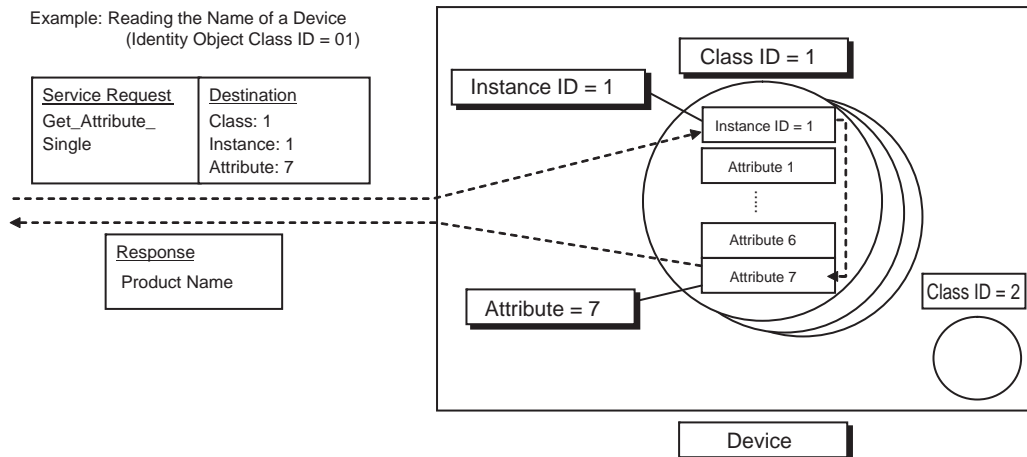


In the CIP Common Specification, “Object,” “Class,” “Instance,” “Attribute,” and “Service” are defined as follows: (Source: CIP Common Specification)

Term	Definition
Object	An abstract representation of a particular component within a device.
Class	A set of objects that all represent the same kind of system component.
Instance	A specific and real (physical) occurrence of an object.
Attribute	A description of an externally visible characteristic or feature of an object.
Service	A request from an external object (e.g., to read data).

You use the Class ID, Instance ID, and Attribute ID to access an object.

You specify these three IDs to designate an object in a device. When you make a request from an external device for a service, you must specify the Class ID, Instance ID, and Attribute ID. (The Instance ID and Attribute ID are not required for some services.)



These are called Internal Object Identifiers (IOI) because they identify the Class ID, Instance ID, and Attribute ID within the device. Refer to *8-3 CIP Objects Sent to the EtherNet/IP Unit* for the class ID, instance ID, attribute ID, and service code for each object.