

## Product Application Note

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# **MPiec EtherNet/IP Communication via Cisco 1800 Router**

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Applicable Product: Yaskawa MPiec controller

Yaskawa America, Inc.  
Drives & Motion Division  
2121 Norman Drive South  
Waukegan, IL 60085  
(800) YASKAWA (927-5292)

Subject: Application Note	Product: MPiec	Doc#: AN.MP2000iec.04
Title: MPiec EtherNet/IP Communication via Cisco 1800 Router		

## Application Overview

This document describes the configuration required on a Yaskawa MPiec controller (if used as a scanner), configuration required on the scanner device (if the MPiec controller is used as an adapter) and the configuration of ports on an 1800 series Cisco router to enable EtherNet/IP communication between a Yaskawa MPiec controller and a third party device on a different sub network.

Router configuration is an advanced topic not fully covered by this application note.

## Application Highlights:

Industry: EtherNet/IP users

Major Features: EtherNet/IP communication when the adapter and scanner are on different sub networks.

## Products Used:

Component	Product and Model Number
Controller	Yaskawa MPiec
Software	Yaskawa MotionWorks IEC
Router	Cisco 1800 series
Third Party Devices	AB CompactLogix PLC

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## Implementation Method of Core Operation

Two different scenarios are discussed in this document. They are:

- 1) The MPiec controller is the adapter (slave) in the communication architecture.
- 2) The MPiec controller is the scanner in the communication architecture

In both architectures, the configuration of the Cisco router remains the same. The ports for both sub networks must be configured. The IP addresses for the hardware ports on the router serve as the default gateway for the automation devices connected to each network. The screen shown below is the router configuration:

```

!
interface FastEthernet0/0
 description Factory Floor
 ip address 192.168.1.254 255.255.255.0
 duplex auto
 speed auto
!
interface FastEthernet0/1
 description Device LAN
 ip address 192.168.2.254 255.255.255.0
 duplex auto
 speed auto
!

```

Figure 1: Port configuration for Cisco 1800 router

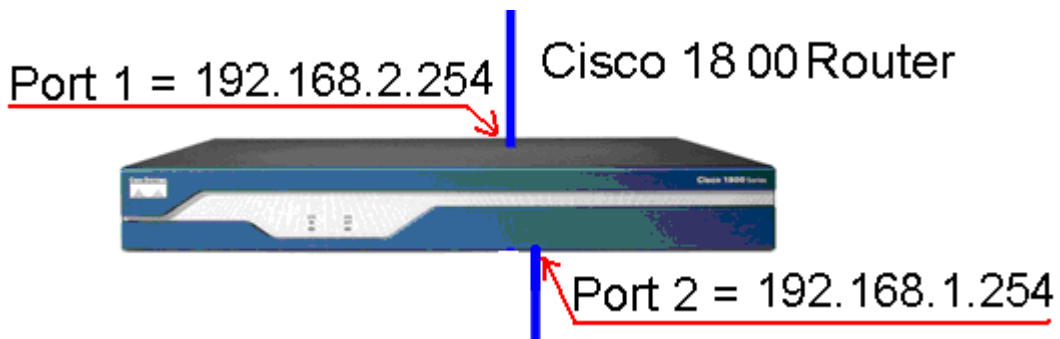


Figure 2: Port addressing on Cisco router

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**1) The MPiec controller is the adapter**

Ethernet/IP communication when there are two sub networks involved can be accomplished only if the EtherNet/IP scanner device is configured for point to point communication in the originator to target (O to T) message and requests point to point data in the target to originator (T to O) message. A screen shot of an AB CompactLogix PLC as the scanner and MPiec controller as the adapter is given below.

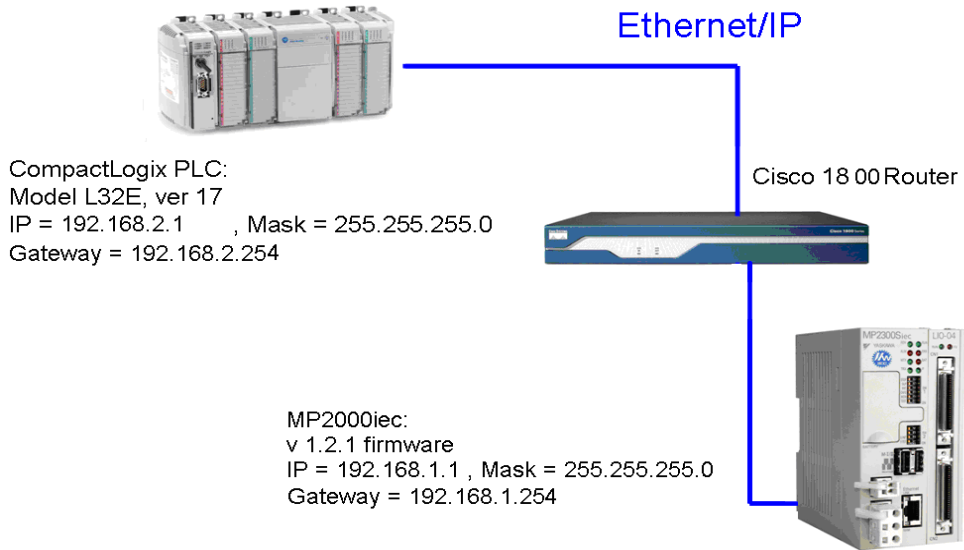



Figure 3: EtherNet/IP architecture with the MPiec controller as an adapter

The only configuration required in the MPiec is to simply enable the instances through which the communication is desired.

Input Assembly Instances (Originator to Target)			Output Assembly Instances (Target to Originator)		
Enabled	Instance	Size (bytes)	Enabled	Instance	Size (bytes)
<input checked="" type="checkbox"/>	111	128	<input checked="" type="checkbox"/>	101	128
<input type="checkbox"/>	112	256	<input type="checkbox"/>	102	256

Figure 4: MPiec controller as an EtherNet/IP adapter

		
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In the special case of an AB PLC (CompactLogix) as a scanner device (on a different sub network from the Yaskawa MPiec controller), the MSG function block must be used to enable CIP messaging. This is required because the normal configuration will not allow “Point to Point” as a setting. The read and write configurations for MSG function blocks are shown in the figures below.

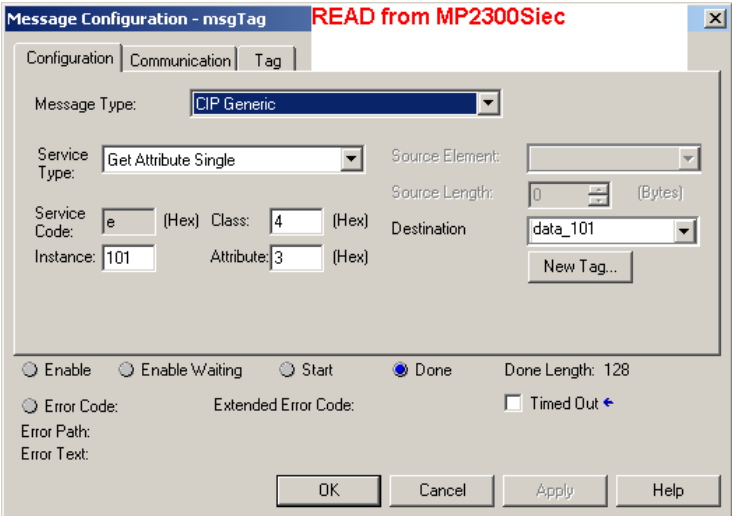


Figure 5: Configuration to read from the Yaskawa MP2000Siec (instance 101)

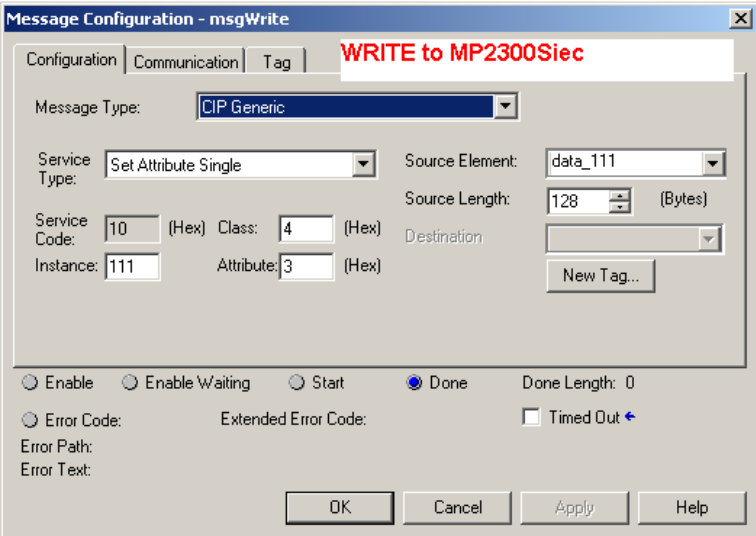


Figure 6: Configuration to write to the MP2300Siec (using instance 111)

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**2) The MPiec controller as the scanner**

The architecture where an MPiec controller is the scanner in EtherNet/IP communication across a Cisco 1800 router is shown below.

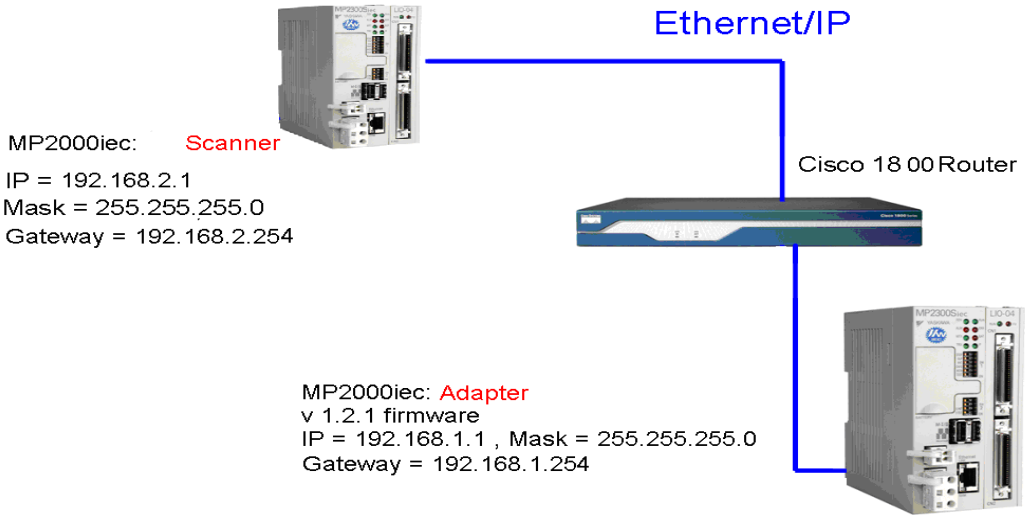


Figure 7: EtherNet/IP communication architecture across a Cisco router

Shown below is a screen shot of the configuration of the Yaskawa MPiec controller. The EtherNet/IP instances that are used to communicate with an adapter device are defined and the connection types are set to point to point in both directions.

The screenshot shows the configuration for the **EtherNet/IP Adapter**. On the left is a tree view with the following items:  
 - mechatronics-ii  
 - TCP/IP Settings  
 - EtherNet/IP  
 - EtherNet/IP Adapter  
 - Modbus/TCP [Slot\_1]

The main configuration area is titled "EtherNet/IP Adapter" and contains the following sections:

**I/O Assembly Instances**

Type	Instance #	Size (bytes)	Update Interval (ms)	Ownership	Priority	Connection	Use Run Idle
Input	101	128	10	Exclusive	Scheduled	Point to Point	False
Output	111	128	10	Exclusive	Scheduled	Point to Point	True

[Add Input/Output Assembly Instance](#)

**Configuration Assembly Instance**

Type	Instance #	Size (bytes)	Optional Data (hexadecimal)

[Add Configuration Assembly Instance](#)

Figure 8: MPiec scanner configuration