

Product Application Note

MPiec: Configuring DigiOne IAP for Serial – Ethernet MODBUS communication

Applicable Product: MPiec

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Title: MPiec: Configuring DigiOne IAP for Ethernet – Serial MODBUS communication		

Application Overview

This document details the steps to configure a DigiOne IAP serial to Ethernet converter for use in MPiec applications when the MP controller has to interface with a serial device using MODBUS protocol.

Application Highlights:

Industry:AutomationMajor Features:MPiec applications with serial devices

Application Challenges:

 The MPiec controller does not have a serial port for communicating with other devices. For applications that require the MPiec controller to communicate with devices that have only a serial port a user will have to use a serial to Ethernet converter. This document describes the configuration for DigiOne IAP to be used as a serial to Ethernet converter.

Products Used:

Component	Product and Model Number
Controller	MPiec
Software	MotionWorks IEC
HMI	RedLion G3-10
Converter	DigiOne IAP serial to Ethernet converter



Serial Communication (DB9)

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Implementation Method of Core Operation

Set the IP address of the device using the MAC address from the DigiOne unit. The 'arp' command is made use of as shown below

ex C:\WINDOWS\system32\cmd.exe	<u>- 0 ×</u>
Microsoft Windows XP [Version 5.1.2600] (C) Copyright 1985-2001 Microsoft Corp.	-
C:\Documents and Settings\motionisland>arp -s 192.168.207.54 00-40-9D-3C-56-	95

Figure 1: Setting the IP address of the DigiOne device

Log on to the web page of the DigiOne device. Set the network settings under Configuration>Network

Digit	Digi One IAP Configuration and Management
Connectware™	
Home	Network Configuration
Configuration	▼ IP Settings
Network	O Obtain an IP address automatically using DHCP *
Serial Ports Users	 Obtain an P address addination of the P Use the following IP address:
Security	
System	* IP Address: 192.168.207.54
Applications	* Subnet Mask: 255.255.255.0
PPP	Default Gateway: 192.168.207.253
Industrial Automation	
Management	* Changes to DHCP, IP address and Subnet Mask require a reboot to take effect.
Serial Ports	
Connections	Apply
Administration	
Backup/Restore	► DNS Settings
Update Firmware	Advanced Network Settings
Factory Default Settings	P Advanced Network Settings
Device Information Reboot	
	Copyright © 1996-2008 Digi International Inc. All rights reserved.
Logout	

Figure 2: Configuring network settings

Make sure that the unit is clear of any previous configurations. To make sure of it click on 'factory default settings' under administration. Reboot.

Click Industrial automation under Applications as shown in Figure 3. Start the industrial automation wizard. If prompted for a user name and password, use: root and dbps.

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Subject: Application Note	Product: MPiec Doc#: AN.MCD.09.093 AP for Ethernet – Serial MODBUS communication
	Digi One IAP Configuration and Management
Connectware™ Home Configuration	Industrial Automation The Industrial Automation application is used to control and monitor any number
Network Serial Ports Users Security System	following links will help to configure this application. For more information, see How to Configure Industrial Automation For a guided installation, launch the Industrial Automation Wizard
Applications PPP Industrial Automation	Display Industrial Automation Configuration Summary
Management Serial Ports Connections	 Serial Slaves Serial Masters Network Masters
Administration Backup/Restore	Destination Tables (Packet Routing)

Figure 3: Industrial automation wizard

Create a new table for the configuration

실 http://192.1	168.207.54 - Digi One	IAP Configuration and N	1anagement - I	Microsoft Interne	t Ex 💶 🗆 🗙
	Automation ole to configure the Ir	ndustrial Automation set	tings.		
	configuration using my_table	; the following table			
Help			Cancel	<< Back	Next >>
ど Done				📄 🔡 Internet	

Figure 4: New table creation

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Subject: Application Note	Product: MPiec	Doc#: AN.MCD.09.093
Title: MPiec: Configuring DigiOne IAP for Ethernet – Serial MODBUS communication		

Select MODBUS family as shown in Figure 5

🍯 http	🎒 http://192.168.207.54 - Digi One IAP Configuration and Management - Microsoft Internet Ex 💶 💌		
Industrial Automation Protocol Family Specify the protocol family or families that the automation devices or PLCs use to communicate with one another.			
0	Modbus Family (Modbus/RTU, Modbus/ASCII, Modbus/TCP)		
0	Rockwell/PCCC Family (DF1 Full-Duplex, DF1 Radio Modem, DF1 Half-Duplex, Allen- Bradley Ethernet, EtherNet/IP)		
0	Protocol Mapping (Allow multiple automation devices to communicate with each other using different protocols and families)		

Figure 5: Modbus family

Click next

Enter

Select the message source and the port. In this example, the source is the RedLion HMI. It was connected to serial post 2 on the DigiOne device

http://192.168.207.5	4 - Digi One IAP Configuration and Management - Microsoft Internet Ex 💻 🗖
Message Source I Specify the location ar	<i>Location</i> nd how the serial- or network-device communicates with the Digi device.
O Receive message	es from network devices connecting using the network
Protocol:	Modbus/TCP
Transport:	
Network port:	502
Receive message	es from serial device connected to a serial port
Protocol: Modbus/RTU 💌	
Serial port:	
Help	Cancel << Back Next >>
	Figure 6: Selecting source port
settings on the serial	source device

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Title: MPiec: Configuring DigiOne IAP for	Ethernet – Serial MODBUS comr	nunication

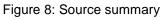
🚰 http://192.168.207.54 - Digi One IAP Configuration and Management - Microsoft Internet Ex 📘			
	Message Source Serial Settings		
Specify the seri	Specify the serial parameters of the attached serial device.		
Description:			
Baud Rate:	9600 💌		
Data Size:	8 -		
Parity:	None 💌		
Stop Bits:	1 💌		
Flow Control:	None		

Figure 7: Serial settings

Click 'Next' twice

Figure 8 illustrates the window that displays the sources that have been configured. If the user needs more sources they can be added.

🚰 http://192.168.207.54 - Digi One IAP Configuration and Management - Microsoft Internet Ex 💻 🔲 🗙							
Messages Sources (Masters) Specify where messages originate from, otherwise known as maters. Masters typically send messages to one or more slave devices.							
The fo	ollowing source			lefined:			
	Protocol	Source	Action				
	Modbus/RTU	Serial port 2	Remove				
	Continue creati	ng more mess	age sourc	es			



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Configure the slave/message destination as shown in Figure9

🚰 http://192.168.207.54 - Digi One IAP Configuration and Management - Microsoft Internet Ex]					
Message Destination Addresses Specify the address or range of addresses of the destination devices. Messages sent to these addresses will be sent to these destinations.					
Send all messages to this destination					
 Send only messages matching specific protocol address Address: 					
C Send only messages in a range of protocol addresses Addresses: 0 to 255					

Figure 9: Destination specification

Enter details of the network device (IEC controller)

🚰 http://192.168.207.54	4 - Digi One IAP Configuration and Management - Microsoft Internet Ex	<u>- 🗆 ×</u>
Message Destinat Specify the location of	tion Location where messages sent by masters are sent to,	
 Send messages Protocol: Serial port: 	to serial device connected to serial port Modbus/RTU 💌 1 🔽	
Send messages Hostname:	to network device 192.168.207.51	
Protocol:	Modbus/TCP	
Transport:	TCP -	
Network port:	502	
		-
Help	Cancel << Back Next	>>

Figure 10: Network configuration of receiving device (MPiec)

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The unit ID of the IEC controller is 1

🚰 http://192.168.207.54 - Digi One IAP Configuration and Management - Microsoft Internet Ex 💶 🔲 >	<
Message Destination Protocol Settings Specify the settings of the protocol for the message destination.]
Override the Modbus unit address on incoming requests with specified unit address Unit address:	
O Ignore incoming broadcast requests using unit address 0	
 Send incoming broadcast requests to this serial device 	
Change the Modbus unit address to 1 before sending	
Figure 11: Unit ID of the MPiec	

Specify timeouts

🚰 http://192.168.207.54 - Digi One IAP Configuration and Management - Microsoft Internet Ex 💶 💌
Message Destination Settings Specify the timeouts and other settings that the destination device uses to communicate efficiently.
Slave timeout: 1000 ms
Delay before sending next request after receiving response from slave Line Turn delay: 0 ms
C Connect to the remote device only when needed (on-demand) Idle timeout: 300 s
 Always maintain connection to remote destination device
Reconnect to remote device when failing to connect
Reconnect delay: 5 s
Help Cancel << Back Next >>

Figure 12: Communication parameters

Figure 13 is a screen shot of the window that lists all the destination /slave devices that have been configured

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Message Destinations (Slaves) Specify where messages are sent to, otherwise known as slaves. Slaves receive messages from one or more masters depending on the protocol address.								
The following destinations have currently been defined:								
	Address	Protocol	Destination	Action				
	All	Modbus/TCP	192.168.207.51 on TCP port 502	Move Up	Move Down	Remove		
Continue creating more message destinations								

Figure 13: Destinations

Review the final configuration and press Finish

🚈 http	://192.168.:	207.54 - Digi On	e IAP Configuration	and Management -	Microsoft Inl	ternet Ex	_ 🗆 🗙
	mary y that the so	ettings below co	rrectly match the in-	dustrial automation	environment.		A
Mess	age Source	es:					
	Protocol	s	ource	Settings			
	Modbus/F	RTU S	erial port 2	9600 8N1 None	е		
Mess	age Destin	ations:					
	Address	Protocol	Destination		Settings		
	All	Modbus/TCP	192.168.207.51	on TCP port 502	N/A		
Help	2			Cancel	< Bac	sk Fi	nish
			Figure 14: Fina	l configuration			

Reboot the DigiOne. User is ready to use the serial HMI and the MPiec.