I-7243D

MODBUS TCP Server/DeviceNet Master Gateway

Quick Start User Guide

1. Introduction

This manual introduces the user to the methods used to implement the I-7243D module into their applications in a quick and easy way. This will only provide with the basic instructions. For more detailed information, please refer to the I-7243D user manual located on the ICPDAS CD-ROM or download it from the ICPDAS web site:

CAN_CD:\DeviceNet\Gateway\I-7243D\Manual or http://www.icpdas.com/products/Remote_IO/can_bus/i-7243d.htm

The goal of this manual is focused on helping users to quickly familiarize themselves with the I-7243D module and the CAN-Ethernet communication gateway. Here, we use one I-7243D and two DeviceNet devices as the example that will demonstrate how to use the I-7243D modules. The architecture of this example is depicted below.



After configuring and letting the I-7243D start to communicate with these two DeviceNet devices by Utility tool, users can get the data of these two devices via communicating with the I-7243D with Modbus/TCP protocol.

2. Hardware Installation

- **Step1:** Here, we use two DeviceNet devices, the attributes of them are shown below. They are CAN-8424 and CAN-8224 separately.
 - Device 1: MACID: 0x01, support Poll IO connection, Baud-rate: 125Kbps Produced connection size: 2 bytes Consumed connection size: 2 bytes
 - Device 2: MACID: 0x02, support Poll IO connection, Baud-rate: 125Kbps Produced connection size: 16 bytes Consumed connection size: 8 bytes
- **Step2:** Connect the (R)Vs+ and (B)GND pins of the I-7243D module to the DC power supply (10~30VDC).



- **Step3:** Connect the Ethernet ports of the I-7243D and the PC to the hub with standard network cable respectively.
- Step4: Connect the CAN ports of the I-7243D with these two DeviceNet devices

3. Configure the I-7243D with these two DeviceNet devices

Before starting the I-7243D gateway tests, users need to configure the parameters of it via the "Configuration Wizard" and "I-7243D Utility" tools. The details of this procedure are shown below. For more information about setting steps, please refer to section 5 of the I-7243D's user's manual.

📸 Configure Wizard V. 1.2.0	СОМ1	
COM status	Host PC	Operation
COM1 115200 Line control : N.8,1	Mask Host Mask	Connect COM1/COM2 of PC to COM1 of the 7188E/8000E.
Close	Gateway Host Gateway	Step 5: Press the [Open] button.
7188E Setting (Origin)	7188E Setting (Recomend)	Information of the
IP IP	IP Enter IP	7188E/8000E
Gateway Gateway	Gateway Enter Gateway	
		Exit

Step1: Configure the network parameters via "Configuration Wizard"

To Use the Configuration Wizard, you must first install PCDiag. (8000CD:\Napdos\7188e\TCP\PCDiag\Setup\Setup.exe)

- **Step2:** After configuring the network setting of the I-7243D, users can use the I-7243D Utility tool to configure it with these two DeviceNet devices.
- **Step3:** Click the "Connect" button to connect with the I-7243D. These steps are shown in the following figure.

1	Connect	Setting About	
	5	◆ Connect	3
		Port 502 Timeout 5000 ms Connect	3
			上午 11.35 2007/3/14

Step4: Click right of the mouse button to add these two devices into I-7243D's scan-list table.

	Si 1-72	243D Utility (Online Mode (Ethernet))		
	<u>.</u>	120		
		8 7	MASTER MACID: 0	Right click mouse
			DEVICE 1 MACID: 1	bullon
				Insert Device
2		S Insert Device		
Input the device's		Description DEVICE 2		
description and MAC	D	Device MAC ID 2		Cancel
then press OK button				
	Stat	us: Idle		上午 10.37 2007/4/10
	<mark>56 -72</mark> File O	243D Utility (Online Mode (Ethernet)) nine View Insert Setting About		
	<u>R</u>			
		🖲 🖌 🗸		
			DEVICE 1 MACID: 1	
			DEVICE 2 MACID: 2	
	Stat	us: Idie		上午 10:38 2007/4/10

Step5: Now users need to configure the connection parameters between the I-7243D and these two parameters by double click the left of mouse button on the device's picture.

	Device Configuration	
Select I/O Connection type	MACID: 1 Deschedion: DEVICE 1	OK Cancel
	Actual chosen 10 connection Polling C Bit-Strobe C CDS C Cyclic	
	Connection Object Instance Attributes Explicit Packet Rate 200 Produced connection size 2 Consumed connection size 3	2 Used for configuring
Select I/O data type	Available predefined connection data types	other devices
	Data Type Descriptions Data Leng	th
	BYTE ARRAY Output 1	
		Add to configured I/O data
	Configured I/D connection data and its offset address Data Type Descaption Type Len Addr. D Type D L EVITE ARRAY Input IB 2 0 0B 2	en 0 Adds • 0 • Delete configured I/O data
Input device I/O d	nta	Add or delete
length		selected I/O data

Step6: After configuring these two devices, the I-7243D will start to communicate with two devices. And the Utility will start to monitor the status of the I-7243D.



Step7: Finally, users need to map these two devices' IO connection data path into I-7243D's Input/Output Data Area. So that users can get/set IO data from/into IO Data Area via Modbus/TCP function 16 command, force multiple registers, to get/set these two DeviceNet devices' IO data.



I-7243D MODBUS TCP/DeviceNet Gateway Quick Start User Guide (Version 1.0, April/2007) 5

Step 8: After clicking "Save setting", the I-7243D Utility generates one record file (default file is called MBTCPDNM.ini). You can run the I-7243D Utility to load the record file to review all settings of specific I-7243D. If you forget to store these settings, you can still obtain the information for the I-7243D via Ethernet.

👺 I-7243D Utility (Online Mode (Ethernet))			
File Online View Insert Setting About			
Save Setting Save Setting As Exit	MASTER MACID: 0		
	DEVICE 1 MACID: 1		
	DEVICE 2 MACID: 2		
Status: Idle		上午 10:41	2007/4/10

4. Get/Set the IO data of these two DeviceNet devices.

Then users can get/set the IO data of these two devices by the Utility tool. Or users can get/set the IO data of these devices via using Modbus/TCP function code 4 and 16 commands to set/get data to/from I-7243D's IO Data Area, The details of this procedure are shown below.

4.1 Get/Set Data By using the I-7243D Utility tool

퉬 I-7243D Utility (Online Mode (Ethernet)) File Online View Insert Setting About 🌉 🔡 😫 MASTER Bus Parameters... MACID: 0 Master Settings... Start All Devices Stop All Devices DEVICE 1 MACID: Set Mor Set / Get 10 M Input Memory Get Data 00 01 02 03 04 05 06 07 08 09 10 11 12 12 1 Auto Display Mode · Hex ⊖ Dec Output ut Memory 00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 ▲ Set Data 00 01 02 03 04 05 06 07 08 09 10 11 12 0 Clear All Setting 09:20 2007/4/10 Status: Idle 0 Display Mode Hex 0-0 C Dec

Step1: Open the "Set/Get IO Memory Data" window.

Step2: Users can get the Device1, 2 bytes polling input data, and Device2, 16 bytes polling data, on the Input Memory Table, 0000~0001 and 0100~0115 after click the "Get Data" button or "Auto button".

Inpu	t Me	mo	y—																
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	-	Get Data
00	FF	FF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		Gerbuid
01	F5	FF	F1	FF	E8	FF	E4	FF	0	0	0	0	0	0	0	0	0	_	
02	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
03	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	(Auto
04	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		\leq
05	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		Ston
06	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
07	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
08	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
09	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		- Display Mode-
10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		Hex
12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	C Dec
4	1																+	_	
_	-																-		

Step3: By pressing the "Set Data" button, users also can set the data on the Output Memory Table into I-7243D's output data area.

Dutp	ut M	lem	ory															_	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	-11	
00	33	44	FF	1F	FF	2F	FF	3F	FF	4F	0	0	0	0	0	0	0		Set Data
01	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	_	
02	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
03	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		Clear All
04	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		Setting
05	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
06	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
07	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
08	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
09	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		Display Mode
10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		Hex
12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	C Dec
•	1																F	_	

4.2 Get/Set Data By using the MBTCP tool

The address of the Input/Output Data Area is form 0x00 to 0xFF, 256 words. Users can get /set these two devices data by using Modbus/TCP function code 4 and 16 commands to set/get data to/from I-7243D's IO Data Area. The following tables are the setting of the address mapping on the section 3, step7.

Device	Connection Type	Data Type	Data Length	Mapping Address of IO Data Area
Dovice 1	Doll	Input	2 Bytes	Input Area: 0x00~0x01
Device_1	FOII	Output	Input2 BytesInpOutput2BytesOu	Output Area: 0x00~0x01
Dovice 2	Doll	Input	16 Bytes	Input Area: 0x20~0x2F
Device_2	FUII	Output	8 Bytes	Output Area: 0x02~0x09

Note: Here the setting of the I-7243D's Net ID is 0x01.

Step1: Using Modbus/TCP function code 4, read input registers, to read devices' input data from I-7243D's Input Data Area.

MBTCP Ver. 1.1.4	
ModbusTCP IP: 192.168.255.1 Port: 502 Connect Disconnect T Data Log	Protocol Description FC4 Read multiple input registers (3xxxx) for AI [Request] Byte 0: Net ID (Station number) Byte 1: FC=04 Byte 2-3: Reference number Byte 4-5: Word count
Polling Mode (no wait) Start Stop Timer mode (fixed period) Interval 100 ms Set Start Stop Stop Stop	Statistic Packet Clear Statistic Command Quantity Response Total Packet bytes 12 Difference Packet Quantity sent 1 0 Polling or Timer mode (Date/Time) Polling Mode Timing (mather Input Data of Start time Start Time Max 0 Stop time Stop Time Min 1000
[Byte0] [Byte1] [Byte2] [Byte3] [Byte4] [Byte 1 2 0 0 0 6 1 4 0 0 0 FF [Byte0] [Byte1] [Byte2] [Byte3] [Byte4] [Byte 01 02 00 00 00 06 01 04 00 00 00 FF	5] Send Command 5] [Byte0] [Byte1] [Byte2] [Byte3] 01 02 00 00 00 01> 01 04 FE FF FF 00
Clear L	Function code 4, Read

Step2: Using Modbus/TCP function code 16, force multiple registers, to write output data into I-7243D's Output Data Area.

MBTCP Ver. 1.1.4		
ModbusTCP IP: 192.168.255.1 Port: 502 Connect Disconnect Data Log	Protocol Description FC16 Write multiple registers (4xxxx) for AD Byte 0: Net ID (Station number) Byte 1: FC=10 (hex) Byte 2-3: Reference number Byte 4-5: Word count Byte 6: Byte count (B=2 x word count) Byte 7-(B+6): Register values	
Polling Mode (no wait) Start Stop	Statistic Clear Statistic Command Quantity Total Packet bytes 23 Packet Quantity sent 1 1 0	Output Data
Interval 100 ms Set	Polling or Timer mode (Date/Time) Polling Mode Timing (ms) Start time Start Time Max 0 Average Stop time Stop Time Min 1000 000	of Device_1
Oyte0] [Byte1] [Byte2] [Dyte3] [Oyte4] [Byte1] 1 2 0 0 0 11 1 1 0 00 00 00 05 0A FF FF FF FF [Byte0] [Byte1] [Byte2] [Byte3] [Byte4] [Byte4]	5] 1 FF 02 FF 03 FF 04 5] [Byte6] [Byte7] [Byte0] [Byte1] [Byte2] [Byte3] [Byte4] [Byte5] FF FF 01 FF 02 F 01 02 00 00 00 06> 01 10 00 00 00 05	and
Clear L	ists EXIT Program	Response: Setting OK
	Function code 16, force multiple registers	Data ice_2