I-7540D-MTCP

Ethernet/Modbus TCP/Modbus RTU to CAN Converter

Quick Start User Guide

1. Introduction

This manual introduces the user to the methods used to implement the I-7540D-MTCP 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-7540D-MTCP user manual located on the ICPDAS CD-ROM or download it from the ICPDAS web site:

Fieldbus_CD:\CAN\Converter\I-7540D-MTCP\ or http://www.icpdas.com/products/Remote_IO/can_bus/<u>I-</u>7540-MTCP.htm

The goal of this manual is focused on helping users to quickly familiarize themselves with the I-7540D-MTCP module and the CAN-Modbus TCP /Modbus RTU communication converter. Here, we use two I-7540D-MTCP modules (called the I-7540D-MTCP_A and the I-7540D-MTCP_B) as the example will demonstrate how to use the I-7540D-MTCP modules. The architecture of this example is depicted below.



When the I-7540D-MTCP receives a valid Modbus TCP command, it can convert this command into a CAN message and transmits it into the CAN network. Another I-7540D-MTCP will receive the CAN message then store it into the buffer. Meanwhile, user can use Modbus RTU command to get the message back.

I-7540D-MTCP Ethernet/ Modbus to CAN Converter Quick Start User Guide Version 1.0 ----- 1

2. Hardware Installation

Users need to make a hardware connection between the CAN devices before the application. The details of this are illustrated below:

Step1: Set-up the 120Ω terminator resistor of module A and B. Before going to the next step, check if the JP3 is enabled or not. If not, it is necessary to open the cover for each I-7540D-MTCP and re-configure their JP3 jumpers to enable them again, as shown in below figure.



Step2: Power connection for the I-7540D-MTCP #A and I-7540D-MTCP #B. Connect the (R)Vs+ and (B)GND pins of the I-7540D-MTCP module to the DC power supply (10~30VDC).



Step3: Ethernet port connection:

By using Ethernet hub device to connect the Ethernet port with the I-7540D-MTCP #A, I-7540D-MTCP #B and the PC with standard network cable **respectively**.

Step4: RS-232 connection: Connect the RS-232 ports of the I-7530A-MR #B to the COM port of the PC by using the attached cable CA-0910. The wire connection is shown below.



Step5: CAN bus connection:

Connect the CAN ports of these two I-7540D-MTCP modules to the CAN network by using the following structure.



3. The I-7540D-MTCP Parameters Configuration

Before testing the I-7540D-MTCP converter, users need to configure the RS-232, Ethernet and CAN parameters via the I-7540D-MTCP Utility tool. The details of this procedure are shown below.

Step1: The default network setting of the I-7540D-MTCP is shown below.

IP: 192.168.255.1 Mask: 255.255.0.0 Gateway: 192.168.0.1 Before communicating with the I-7540D-MTCP, you must change the PC's network segment address which is the same with the I-7540D-MTCP. In this case, the PC's IP address needs to be 192.168.xx.xx.

- Step2: After changing the PC's IP address, you must change those two I-7540D-MTCPs to different IP address by using the I-7540D-MTCP Utility. The I-7540D-MTCP Utility tool is located in the Fieldbus_CD:\\can\converter\I-7540-MTCP\utility folder on the companion CD-ROM or can be downloaded from the web site: http://www.icpdas.com/products/Remote_IO/can_bus/I-7540d-MTCP. htm
- Step3: Click the "Connect" button to connect with the I-7540D-MTCP #A and the I-7540D-MTCP #B. These steps are shown in the following figure.

File Action Help		
Connect Disconnect	2 about	
Setting CAN Test Modbus Modbus Test		
Operatio dode	Network Status	
Op mode Set	Gateway: N/A Se	et
City and Conting		et
CAN redification		et
CAN Bus Bauonate	216322551	ot
BITO 00 (Hex) B Acceptance Code 00 00 Timeout	5000 ms Connect	
	wodify IP	
Acceptance Mask 00 00 00 00 (Hex)	,	
Acceptance Mask 00 00 00 (Hex) Error Resp.	CAN Bus Pair Connection Status	
Acceptance Mask 00 00 00 (Hex) Error Resp. TimeStamp Resp.	CAN Bus Pair Connection Status	
Acceptance Mask 00 00 00 (Hex) Error Resp. TimeStamp Resp.	CAN Bus Pair Connection Status	
Acceptance Mask 00 00 00 (Hex) Error Resp. TimeStamp Resp. Setting Default COM Status COM 1 N/A Set	CAN Bus Pair Connection Status CAN Bus Pair Set CAN Bus Pair Set TCP UDP Server Client	
Acceptance Mask 00 00 00 (Hex) Error Resp. TimeStamp Resp. Setting Default COM Status COM 1 N/A Set COM2 N/A Set	CAN Bus Pair Connection Status CAN Bus Pair Set CAN Bus Pair Set Connect to N/A Se	

Step4: Click the "Connect" button. If this process is successful, the I-7540D-MTCP Utility shows the I-7540D-MTCP #A communication information as below.

5 i-7540D-MTCP utility	
File Action Help	
Connect Disconnect Setting CAN Test Modbus Modbus Test Operature Operature Modbus Operature Operature Modbus Operature	Ion e
Operation mode Normal CAN Set	Gateway: 192.168.0.254 Set
CAN Parameters CAN Specification 2.0B CAN Bus Baudrate 1000K	MAC: 00:0d:e0:20:34:eb Web ID: 7540D Set Web Passwd: icpdas7540D Set
BITO 00 (Hex) BITI 00 (H CAN Acceptance Code 00 00 00 00 Parame Acceptance Mask FF FF FF FF FF (Hex)	Reset System eters Modify IP
Error Resp. No V TimeStamp Resp. No V	CAN Bus Pair Connection Status CAN Pair Connection
COM Status COM 1 115200,8,N,1 Set	TCP UDP Server Client
Connected Configuration Mode v2.0.0[08/31/20]	Consider to 192.100.0.05 Set 11] Copyright(c) 2011 ICP DAS Co., LTD.

Step5: After connecting with the I-7540D-MTCP #A, you can modify the operation mode to "Modbus TCP". In the same way, you can set the operation mode of I-7540D-MTCP #B to "Modbus RTU". The CAN parameters and network status of I-7540D-MTCP #A and I-7540D-MTCP #B are set as following table.

Conne	ect	Disconnec	t	Exit		? About
Setting	CAN Test	Modbus	Modbus T	Set est	opera Mode	tion
-Opera Ope	tion Mode — ration mode	Modbus	TCP	Image: A start of the start	Set	
CAN	Parameters					
CAN	Specification	1	2.0B		~	
CAN	Bus Bandrat	e	1000K		~	

	I-7540D-MTCP #A	I-7540D-MTCP #B	
CAN parameters	Specification: 2.0A	Specification: 2.0A	
	CAN baud rate: 1M bps	CAN baud rate: 1M bps	
	ACC: 00 00 00 00	ACC: 00 00 00 00	
	ACM: FF FF FF FF	ACM: FF FF FF FF	
	Err Response: No	Err Response: No	
	Time-stamp Response: No	Time-stamp Response: No	
Network status	IP: 192.168.255.1	IP: 192.168.255.2	
	Mask: 255.255.0.0	Mask: 255.255.0.0	
	Gateway: 192.168.0.1	Gateway: 192.168.0.1	

4. Testing the I-7540D-MTCP by using the I-7540D-MTCP Utility

- Step1: Run the I-7540D-MTCP Utility (I-7540D-MTCP.exe) two times. Then two I-7540D-MTCP Utility windows will be displayed on the screen. Assume that one is named as Utility #A and the other is called Utility #B.
- Step2: Click the "Connect" button to open the connection dialog. Key-in the IP of these I-7540D-MTCPs and press the "Connect" button to connect with them.
- Step3: After connecting with them, select the "Modbus Test" tab. Utility #A is shown in the below figure and Utility #B will be similar to Utility #A.

: Action Helb	Timer Mode (Date/Time)
	Start Time Time Start
meet Disconnect Exit	About Stop Time Time Stop
CAN Test Modbus Modbus Test	Fill Message
RTU	
Use Modbus TCP Command	Timer (ms) 1000 Send
120000140009	
TCP Prefix (Hex) Transaction identifier Protocol identifier Length	Field ID Function Code Start & down Burte Count
	6 01 4 v 0000 0009 12
CAN Message (Hex)	
MODE ID (Hex) RTR DLC DI	D2 D3 D4 D5 D6 D7 D8
P	
	Save Clear

Step4: Check the "Use Modbus TCP Command" checkbox and input the value to the "Modbus Command" frame and "CAN Message" frame on Utility #A. Click the "Send" button. Then, the utility will automatically transfer these CAN messages to the ASCII command string, and send it out through the PC's Ethernet port. (Suppose using Modbus function code 10_{hex} to send CAN message) After the I-7540D-MTCP #A receives this command, It will transfer the command to the CAN message. So, the I-7540D-MTCP #B will receive the CAN message transmitted from I-7540D-MTCP #A and store in the buffer. User can

use Modbus RTU command (function code 04_{hex}) to read the CAN

🖻 i-7540D-MTCP utility 📃 🔲 🔀
File Action Help
Image: Connect Image: Conne Image: Conne Image: Connect
Ul 10 00 00 00 00 00 00 00 00 23 01 02 03 04 05 06 07 08 TCP Prefix (Hex) Transaction identifier Protocol identifier Length Field ID Function Code StartAddress WordCount ByteCount 01 16 0000 0007 0E CAN Message (Hex) MODE D (Hex) RTR DLC D1 D2 D3 D4 D5 D6 D7 D8 I1-bit D I23 No 8 01 02 03 04 05 06 07 B
Receive Save Clear 01 10 00 00 00 07 Image: Clear Image: Cl
Connected Operation Made v2.0.0[08/21/2011] Conversity(a) 2011 ICD DAS Co. J. TD

message. Detailed steps are shown in the following figure.

Utility I-7540D-MTCP #A

🛿 i-7540D-MTCP utility
File Action Help
Image: Connect Image: Conne Image: Conne Image: Connect
Setting CAN Test Modbus Test 1
✓ Use Modbus RTU Command Timer (ms) 1000
01 04 00 00 00 07
Modbus Command (Hex) ID Function Code StartAddress WordCount ByteCount 01 4 0000 0007 0E
CAN Message (Hex) RTR DLC D1 D2 D3 D4 D5 Receive MODE D (Hex) RTR DLC D1 D2 D3 D4 D5 CAN message 11-bit D 000 No 8 00 00 00 00 00 CAN message
Receive 3 Receive Save Clear
01 04 0E 00 08 00 00 01 23 01 02 03 04 05 06 07 🖌
Connected Operation Mode v2.0.0[08/31/2011] Copyright(c) 2011 ICP DAS Co., LTD.

Utility I-7540D-MTCP #B