M-7000 DIO Module Quick Start Guide

This document describes the methods used to quickly set up and test the ICPDAS I/M-7000 series modules using the ICPDAS DCON Utility. After confirming that the module is operational, more applications or software support be found by referring to the following links:

For Win32:
ftp://ftp.icpdas.com/pub/cd/8000cd/napdos/driver/dcon_utility/

For Linux:
ftp://ftp.icpdas.com/pub/cd/8000cd/napdos/driver/dcon_linux/

SDK tool:
Active X: ftp://ftp.icpdas.com/pub/cd/8000cd/napdos/driver/dcon_activex/
DDE server: ftp://ftp.icpdas.com/pub/cd/8000cd/napdos/driver/dcon_dde/
DLL: ftp://ftp.icpdas.com/pub/cd/8000cd/napdos/driver/dcon_dll/
Indusoft: ftp://ftp.icpdas.com/pub/cd/8000cd/napdos/driver/dcon_indusoft/
Labview: ftp://ftp.icpdas.com/pub/cd/8000cd/napdos/driver/dcon_labview/

Loading the DCON Utility

1. The required installation file can be downloaded from:
   ftp://ftp.icpdas.com/pub/cd/8000cd/napdos/driver/dcon_utility/setup/
   More information related to about version numbers and the latest supported modules can be obtained from
   ftp://ftp.icpdas.com/pub/cd/8000cd/napdos/driver/dcon_utility/

Setting up and testing the module

1. After installing the DCON Utility, there will be a shortcut icon for the DCON Utility located on the Windows desktop. Double click this icon to launch the DCON Utility to set the module's configuration to fit with your application. After double clicking the icon, the following screen will be shown:

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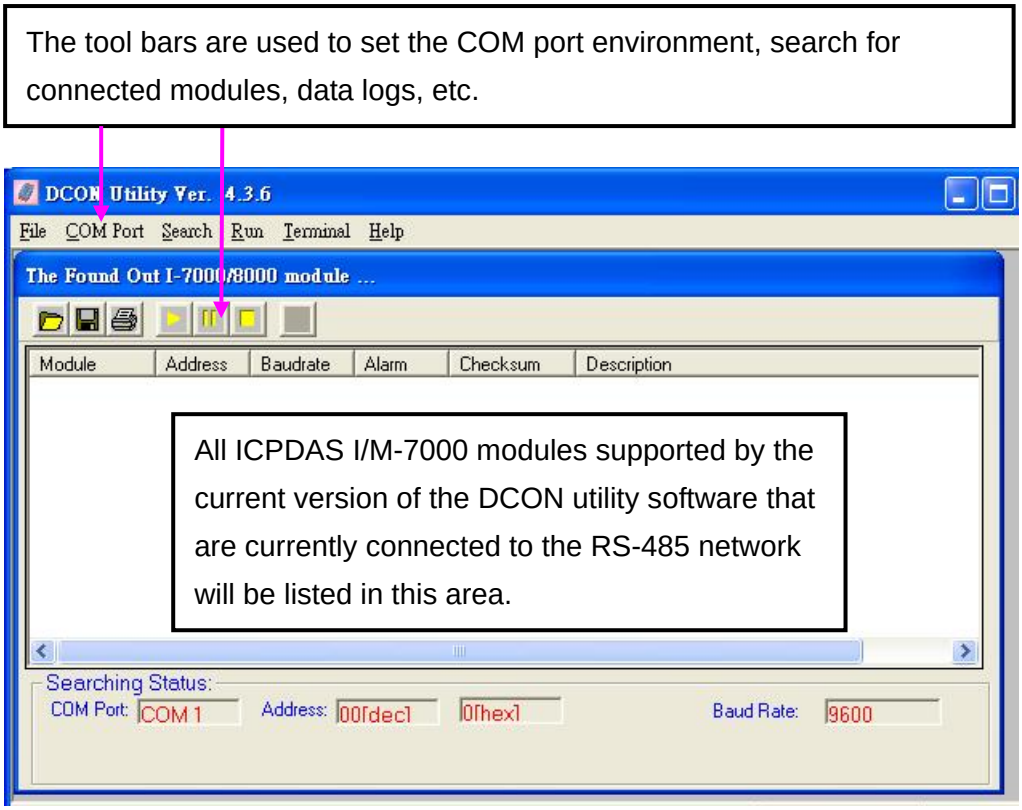


Figure 2-1

2. Before searching for the module, the RS-232 environment should be set up using the “COM port” menu item. After clicking the “COM port” item, the following dialog will be show:

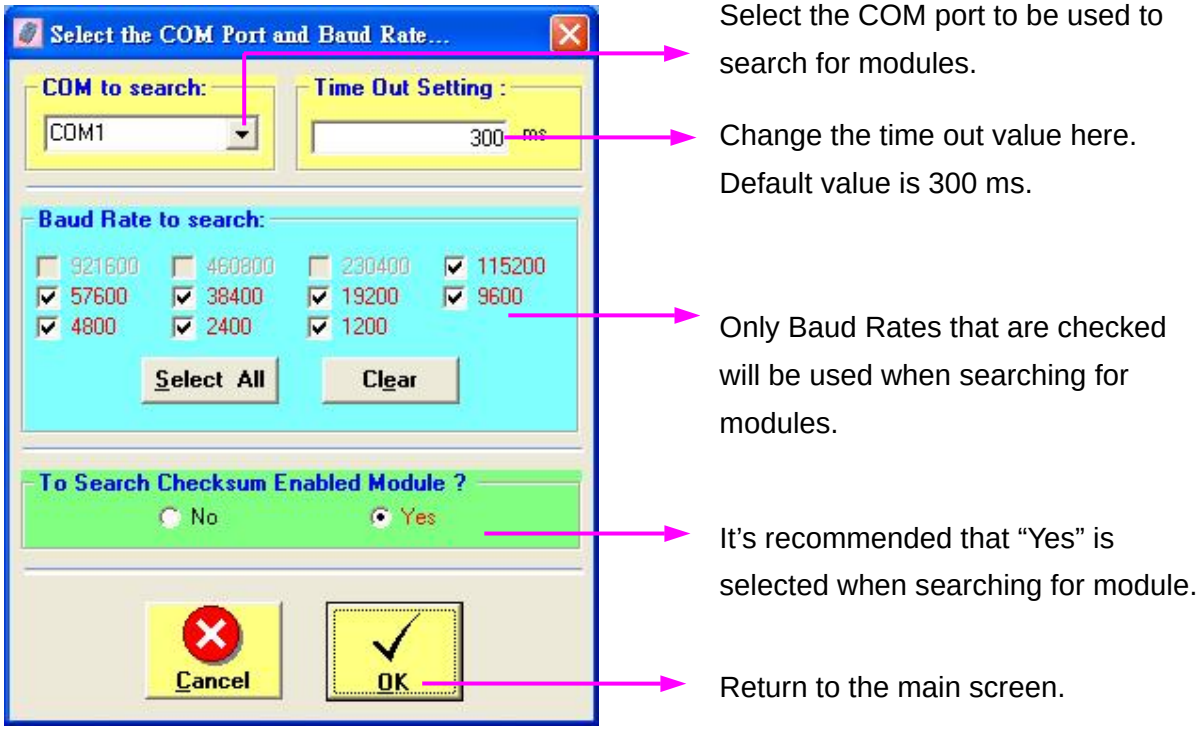


Figure 2-2

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3. Click the  button to search for all the ICPDAS I-M-7000 modules connected to the RS-485 network. Once a module is found the relevant information will be shown in the list area, shown in Figure 2-3:



Figure 2-3

Click the  button to stop searching, then double click the module name, shown as M-7060 in Figure 2-3. The dialog shown in Figure 2-4 will then open.

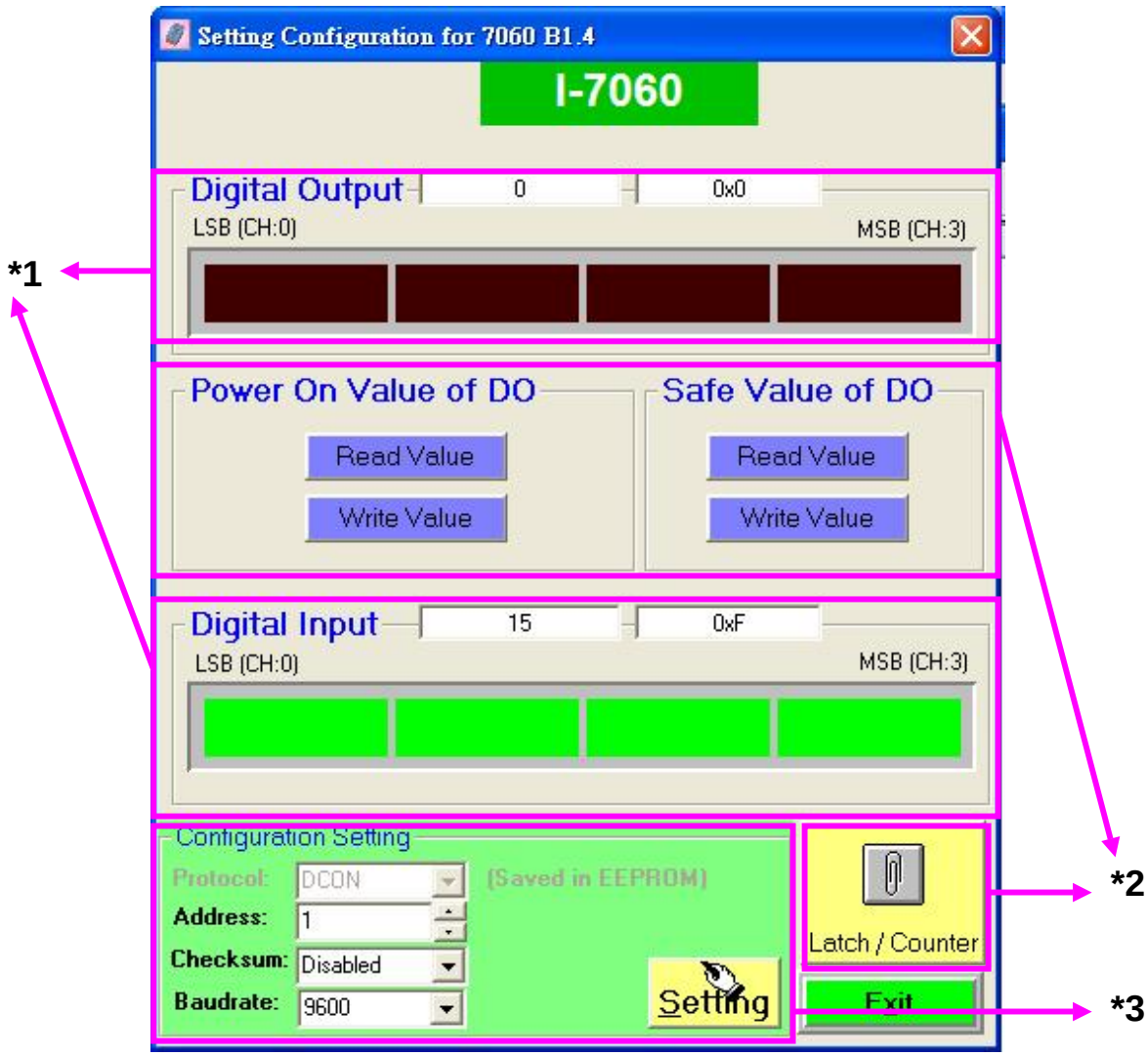


Figure 2-4

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***1** Function test: The LED buttons can be used to monitor the current DI status. Clicking the LED buttons will change the current DO status. Figure 2-4 shows that the current DI status of all 4 channels on the M-7060 is set to ON.

***2** Special functions or extra configuration: The appearance of this icon depends on the type of module that is used. DI modules include both a DI count and a latch value, so clicking the "Latch / Count" button will allow the current value to be monitored. DO modules include both a power-on value and a safe value function that are used for configuration purposes. Please refer to http://www.icpdas.com/download/7000/manual.htm for more information.

***3** Basic configuration: The protocol, module address and Baud Rate can be changed here. Please note that if only the module address is changed, there is no need to set the module to *init mode. Refer to the appendix for more information about *init mode.

4. The default configuration for all new ICPDAS M-7000 modules is as follows:

Protocol	Modbus RTU
Address	01
Baud Rate	9600 bps

If you have more than one M-7000 module then want to set their configuration for your application on the same RS-485 network, use the DCON utility to individually change the configuration of each module. Ensure that all modules are set at the same time, as the initial configuration of each module, especially the address, is the same, and will cause an RS-485 network conflict.

How do I set the configuration of the modules in my program or application?

ICPDAS M-7000 modules are command based. A series of commands are provided to allow the configuration and DI/O functions to be set. The basic DI/O and configuration commands are listed below. Refer to the ftp://ftp.icpdas.com/pub/cd/8000cd/napdos/7000/manual/modbusdio.pdf for more information.

1. The Configuration command structure of the Modbus RTU is as follows:

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Field ❶	Field ❷	Field ❸	Field ❹ ~ Field *n	Field (❹+*n)
Module Address	Function code	Sub function	Configuration field	CRC16

*n: This value depends on the Sub-function code. Please refer to the “Modbus DIO User’s Manual” for more details.

Ex: To modify the address of the module from 01 to 02, the following command should be sent:

01 46 04 02 *63 0C*

❶ ❷ ❸ ❹ ❺CRC16

Ex: To modify the baud rate of the module to 115200bps, the following command should be sent:

01 46 06 00 *0A 00 00 00 01 00 00 *63 0C*

❶ ❷ ❸ ❹ ❺CRC16

*Baud Rate code: Please refer to the following table for details:

Value	03	04	05	06	07	08	09	0A
Baud Rate	1200	2400	4800	9600	19200	38400	57600	115200

Note: The new Baud Rate will become effective after the module is restarted.
The data bits are fixed at one start bit, eight data bits, no parity and one stop bit for both the I-7000 and M-7000 series.

The supported DI/O commands are as follows:

Function code	Description
0x01	Read coils
0x02	Read discrete inputs
0x03	Read multiple registers
0x04	Read multiple input registers
0x05	Write single coils
0x0F	Write multiple coils

Ex: To read the current DI value of channels 0 to 7, the following command should be sent:

01 02 00 00 00 07 *39 C8*

Ex: To write the DO value 0xFF from channels 0 to 8, the following command

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should be sent:

01 0F 00 00 00 07 01 FF *39 C8*

Ex: To only set the DO value of channel 2 to 1, the following command should be sent:

01 05 00 02 FF 00 *2D FA*

M-7000/87K module DI/O mapping table

32 addresses are reserved for reading the DI values and writing the DO values. The mapping table is as follows:

Address 0xxxx	Channel	Item	Attribute
00001~00032	DO 0 ~ DO 31	Current DO value	R
00033~00064	DI 0 ~ DI 31	Current DI value	R
00065~00096	0~31	DIO Latch high value	R
00097~00128	0~31	DIO Latch low value	R

The effective bit values depend on the module, and the extra bit values will be filled with 0.
For example: M-7060 is a 4-channel relay output and 4-channel digital input module. The mapping table is as follows:

Address	Channel	Item	Attribute
00001	DO 0	Current DO value	R/W
00002	DO 1	Current DO value	R/W
00003	DO 2	Current DO value	R/W
00004	DO 3	Current DO value	R/W
00005~00032	Reserved		
00033	DI 0	Current DI value	R
00034	DI 1	Current DI value	R
00035	DI 2	Current DI value	R
00036	DI 3	Current DI value	R
00037~00064	Reserved		

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