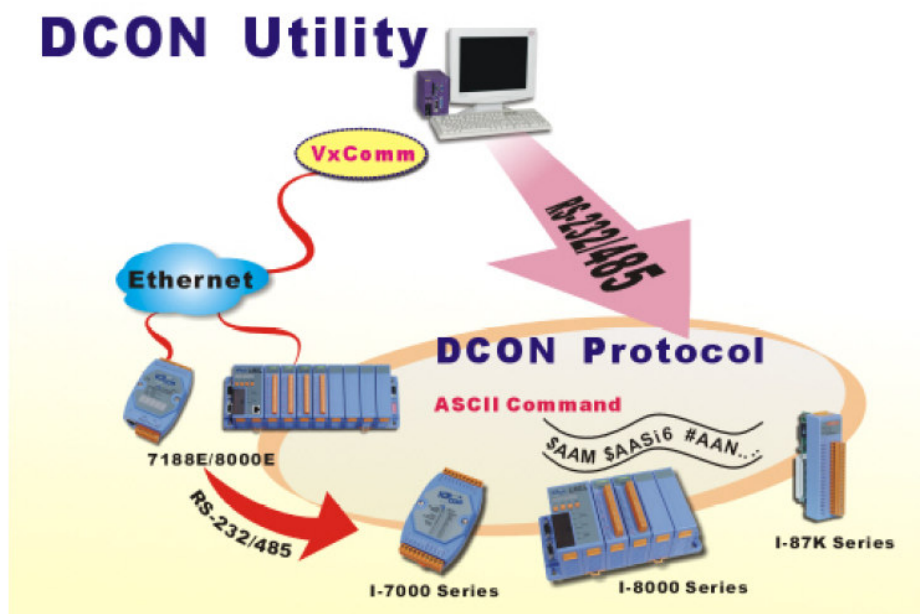


DCON Utility

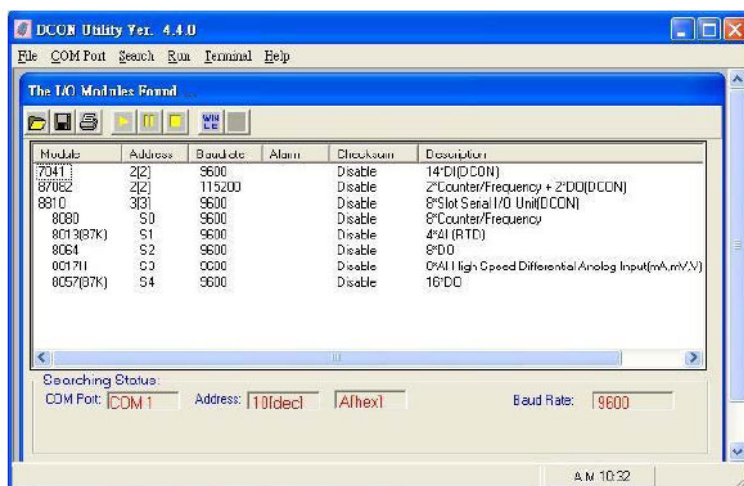
User's Manual

Version 1.1, April 2006



Chapter1. Introduction

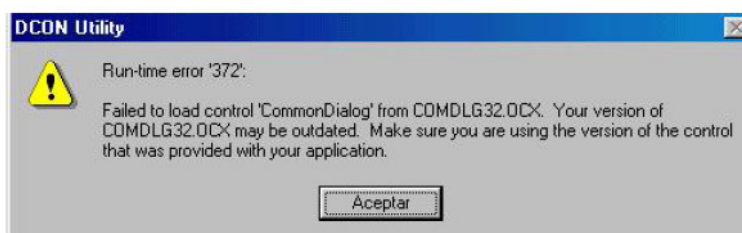
The DCON Utility is a toolkit that help user to search the network, easily to configure and test the I/O modules via the serial port (RS-232/485) or Ethernet port (using virtual com port). It also helps to configure the i-87K I/O modules on WinCon 8000 system. It supports not only the **DCON Protocol I/O modules** but also the **M Series I/O Modules (Modbus RTU M-7K,M-87K)** and will support Modbus ASCII M-87K in the future.



For DCON Utility version information and supported module list, please refer to ftp://ftp.icpdas.com/pub/cd/8000cd/napdos/driver/dcon_utility/
CD:\Napdos\Driver\DCON_Utility

To update the DCON Utility, please refer to ftp://ftp.icpdas.com/pub/cd/8000cd/napdos/driver/dcon_utility/setup/

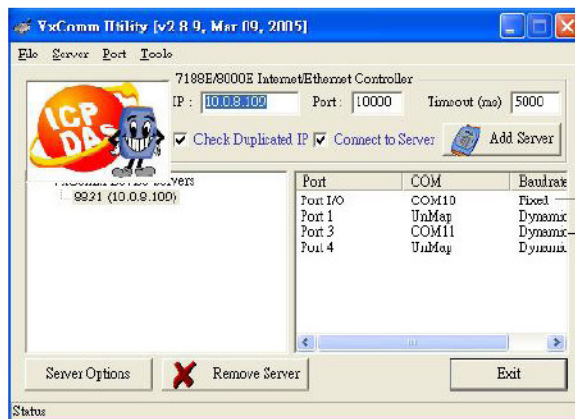
Note: Sometimes there will be a problem to cause a Run Time Error Message as below.



This error is caused by the different version of ocx, because there is another copy at the path of system32.

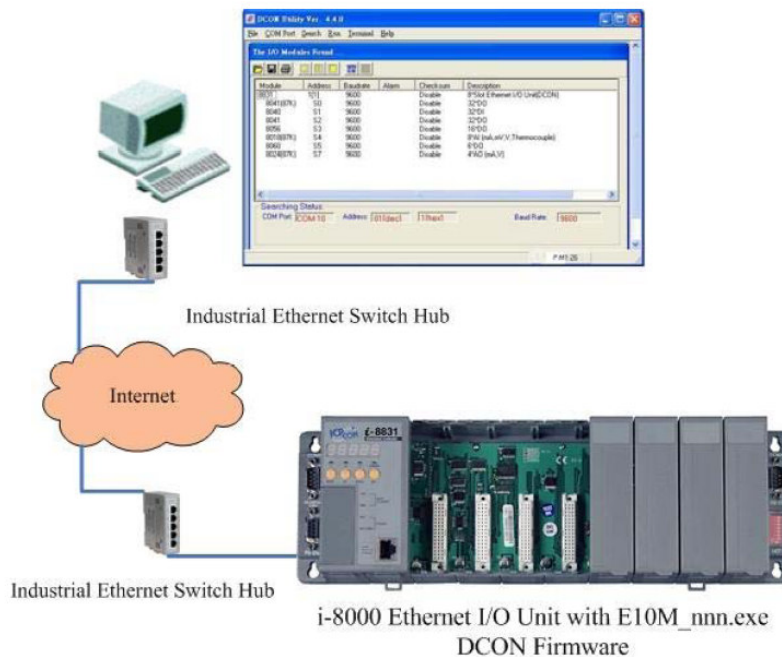
1. Please find the ocx file in system32 and backup the ocx to another folder.
2. Copy the ocx that in the DCON Utility installed path to system32.
3. Run the DCON Utility again.

DCON Utility is a program using the **COM port** as its communication interface. When DCON Utility wants to communicate with the remote the Ethernet I/O unit, the host PC has to install **VxComm** utility and assigned a COM port to map the port I/O(9999) of i-8000 Ethernet I/O unit. And the remote Ethernet I/O must support **XServer** to have the virtual **COM port's** function.



DCON Utility can search the i-8000 Ethernet I/O unit by using the VxComm technology

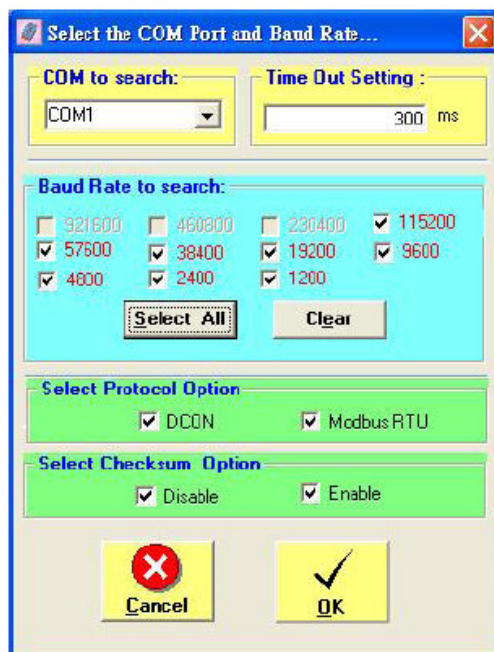
By using the VxComm technology, DCON Utility can also search the remote RS-485 network via Ethernet interface with i-8000 Ethernet I/O unit's COM3 port.



By using the VxComm technology, DCON Utility can search the DCON Protocol I/O modules via Ethernet Interface.

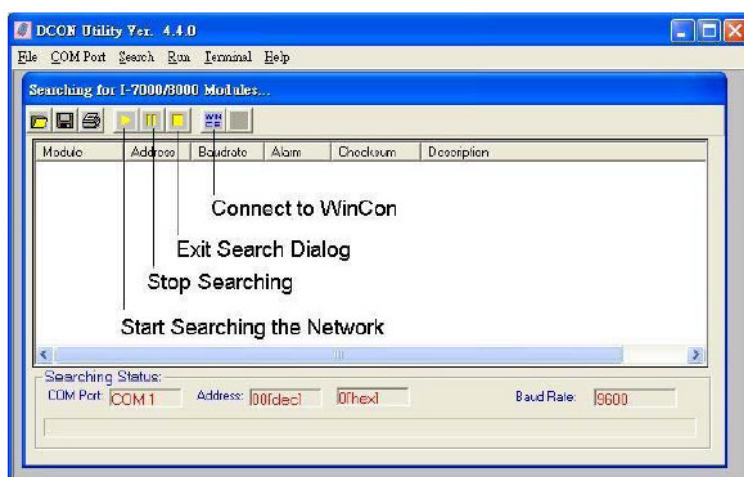
Search I/O modules:

DCON Utility is a program based on COM port interface, it can search DCON Protocol and Modbus RTU Protocol modules and support checksum disable and enable.



Search functions:

The buttons below show the description about the search function.



Search modules:

If it is the first time to search and to configure the new or unknown modules, there are rules which can help to search and configure the modules.

Step 1. Make sure the wirings are correctly connected.

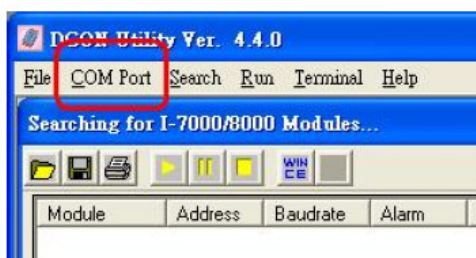
Please refer to the previous sections.

Step 2. Search and configure the modules one by one.

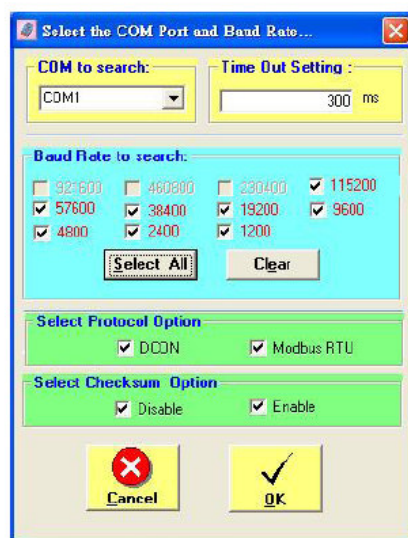
If the modules are new or unknown, they may have the same communication settings, and if there are two modules with the same communication settings, it will get an unexpected search result. So they must be searched and be configured one by one.

Step 3. Check the COM Port Setting.

- Choose the COM port of Host PC that will connect to the module and select the searching parameters.



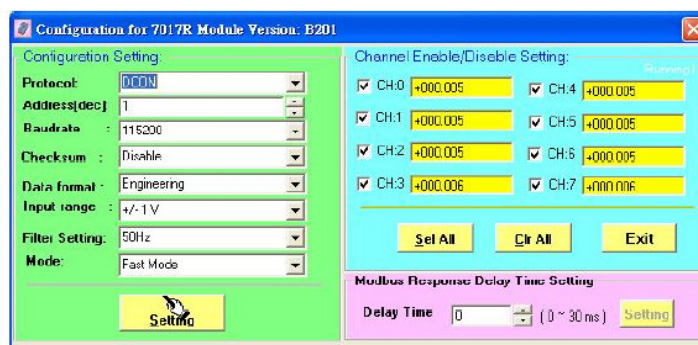
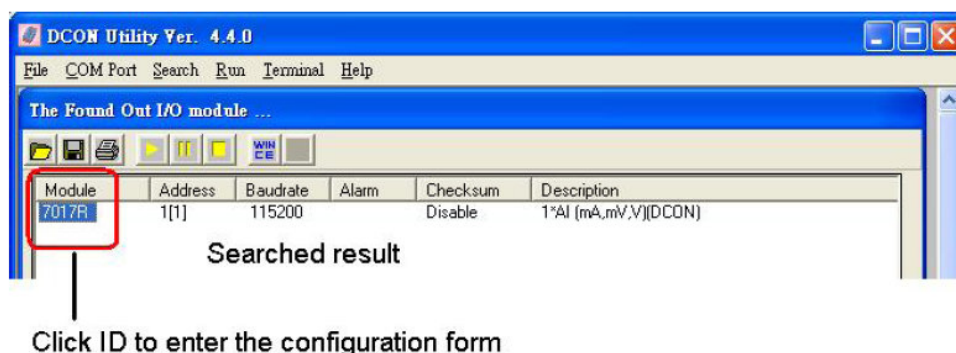
- If does not know the communication settings of modules, it can select multi-baud rate, protocol or checksum conditions, but it will spend more time to scan the network.



Step 4. Clicks  to start searching.



Step 5. Click Searched ID to enter the configuration form.



The Configuration form of 7017R

Search the unknown modules:

Sometimes, user tries to find the I/O modules and failed to do it.

Step 1. Make sure the wiring is correct.

Step 2. Search and configure the modules one by one.

Step 3. Connect the INIT* to GND and Power on the module.

If the modules are powered on with the INIT* connected to GND , it can get the initial communication settings, the initial communication settings of 7000 series and 87K series are list in the table below.

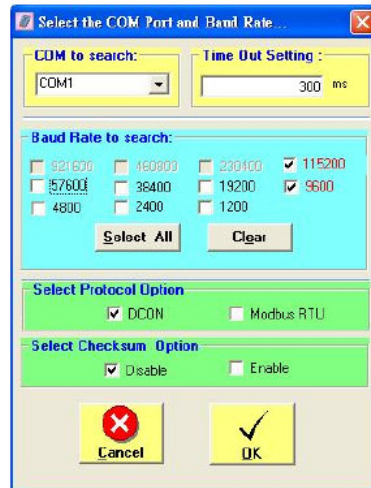
	7000 series (i-7000 and M-7000)	87K series
Address	0	0
Baud rate	9600	115200
Checksum	Disabled	Disabled
Protocol	DCON Protocol	DCON Protocol

Note 1: The default settings and initial settings are different.

Note 2: If the module is a new one, it will have the default communication settings, the default communication settings of i-7K, M-7K and 87K series are list in the table below.

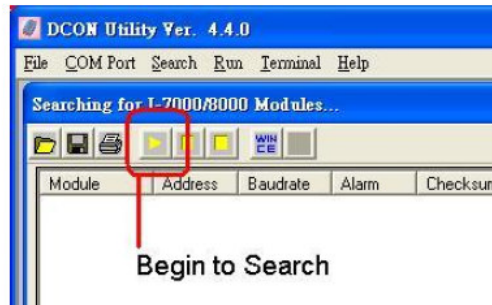
	i-7000	M-7000	87K series
Address	1	1	1
Baud rate	9600	9600	115200
Checksum	Disabled	Not defined	Disabled
Protocol	DCON Protocol	Modbus Protocol	DCON Protocol

Note 3: i-8000 system can not power on with INIT* connect to INIT*COM to get the default communication setting, because when INIT* connect to INIT*COM, the firmware can not be auto executed by the MiniOS7.

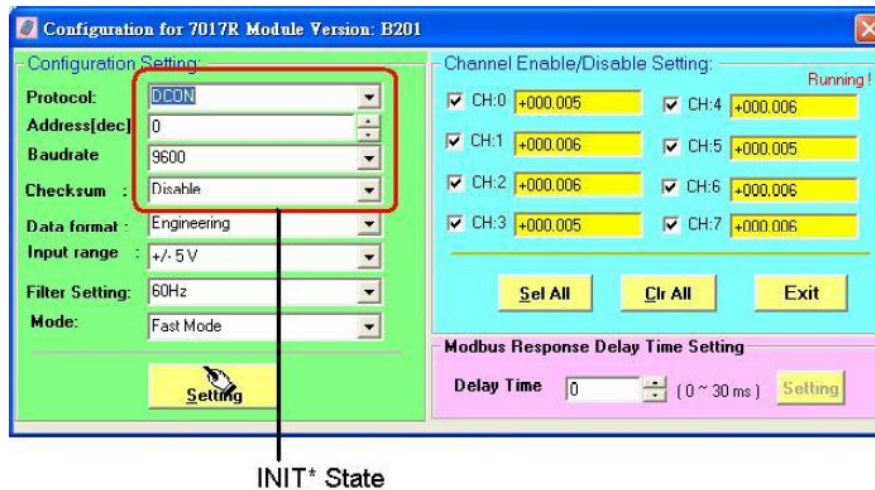
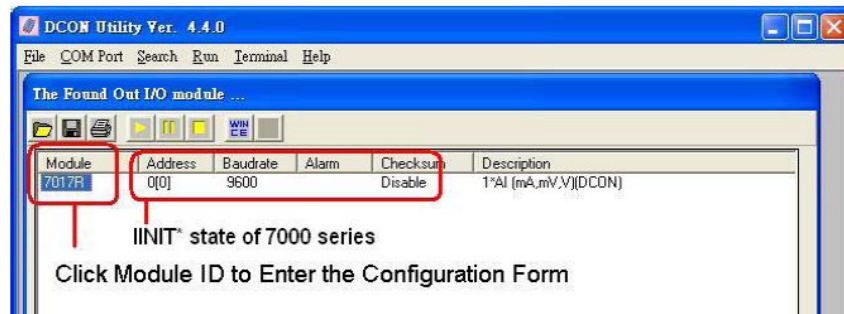
Check the COM Port Setting.

Note: When module is powered on with INIT* connects to GND, it can just choose baud rate 115200, and 9600 as searching condition.

Step 5. Clicks  to start searching.

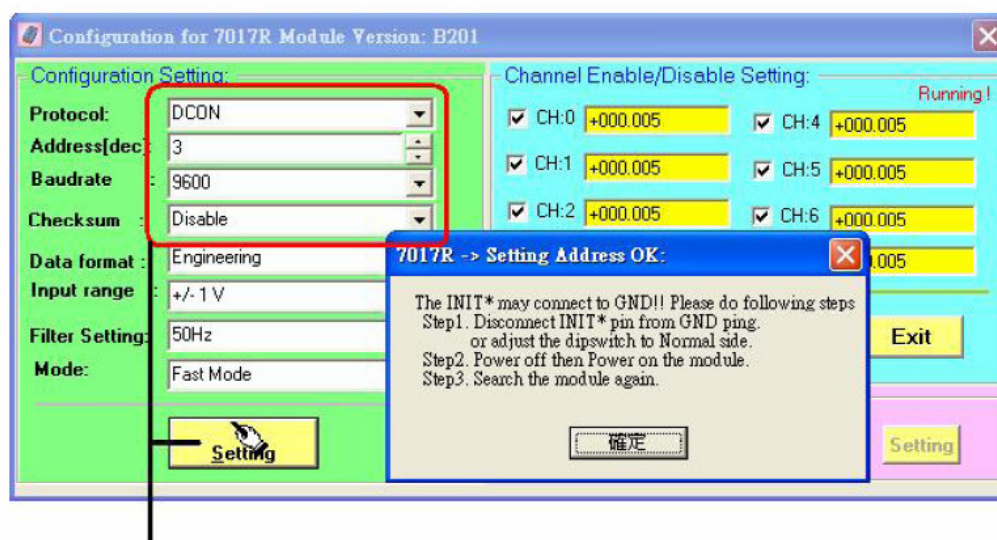


Click Module ID to Enter the Configuration form.



Change and Save the Communication Settings to EEPROM.

When module is powered on with INIT* connected to GND, the module will use initial settings as its communication parameters, but the real communication settings which save on EEPROM are not changed. The better way is to connect the INIT* to GND and click "Setting" to save the initial settings to EEPROM.



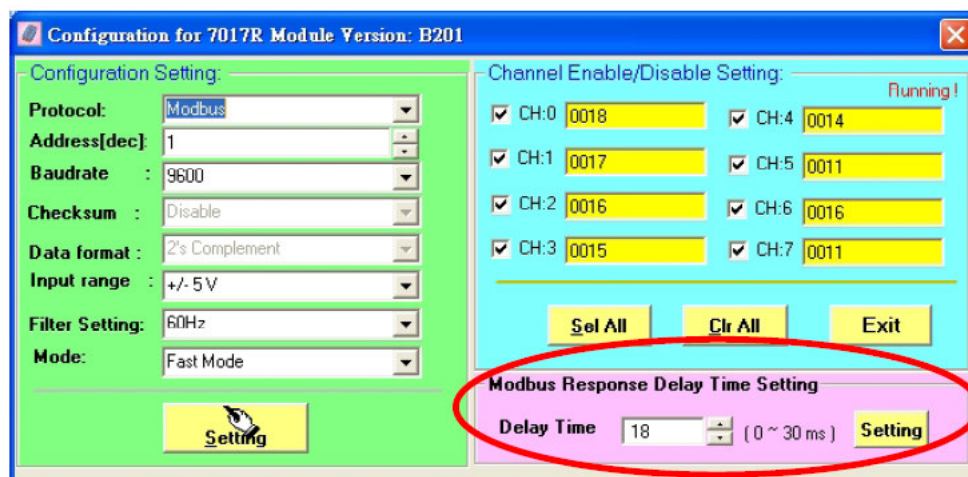
Change the communication settings and Click "Setting" to bring change into effect.

Step 8. Reset the Power and Release the INIT* to Normal state then Search again.

When successfully set the communication settings, it must release the INIT* to normal state and reset the power then search again, the module now use the new communication settings and the settings are the same as those which save at EEPROM.

Modbus Response Delay Time:

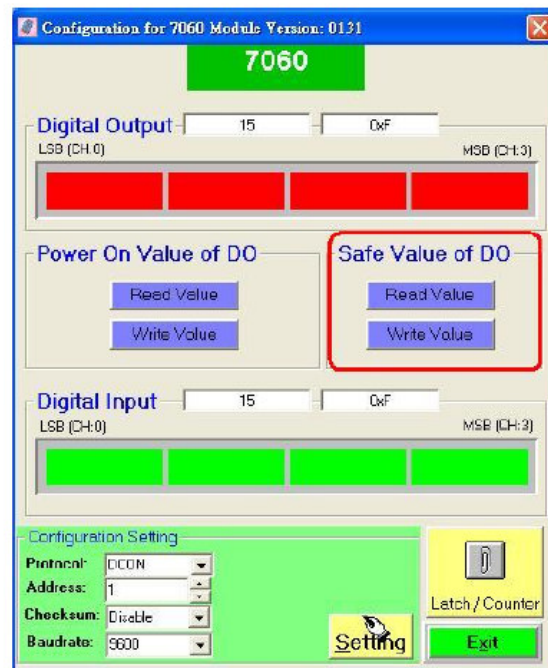
Sometimes the Modbus modules need to set the Modbus Response Delay time, For Modbus RTU mode, messages start with a silent interval of at least 3.5 character times, some PLC or SCADA software can not totally receive the response data from the Modbus modules for the quick response time.



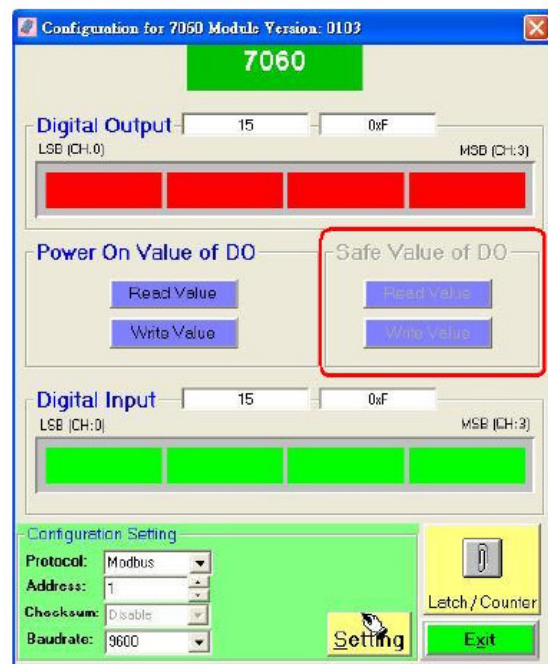
The Response Delay Time settings of Modbus Protocol I/O modules

Configure Digital I/O modules:

The Modbus DO modules don't support safe value function, but the DCON modules do.



7060 is set to DCON Protocol



7060 is set to Modbus Protocol

To Configure Analog Input modules:

The DCON modules support Engineering, Percent, Hex, Ohm data formats; the Modbus modules support only Hex data format.

The screenshot shows the 'Configuration for 7017R Module Version: B201' window. The 'Configuration Setting' panel on the left has the following values: Protocol: DCON, Address[dec]: 1, Baudrate: 9600, Checksum: Disable (circled in red), Data format: Engineering, Input range: 0-5V, Filter Setting: 60Hz, and Mode: Fast Mode. The 'Channel Enable/Disable Setting' panel on the right shows eight channels (CH:0 to CH:7) all enabled with checkboxes. Each channel has a value field: CH:0 (+000.004), CH:1 (+000.004), CH:2 (+000.004), CH:3 (+000.004), CH:4 (+000.003), CH:5 (+000.004), CH:6 (+000.003), and CH:7 (+000.003). Below these are buttons for 'Sel All', 'Clr All', and 'Exit'. At the bottom, the 'Modbus Response Delay Time Setting' panel shows a 'Delay Time' of 0 ms (0 ~ 30 ms) and a 'Setting' button.

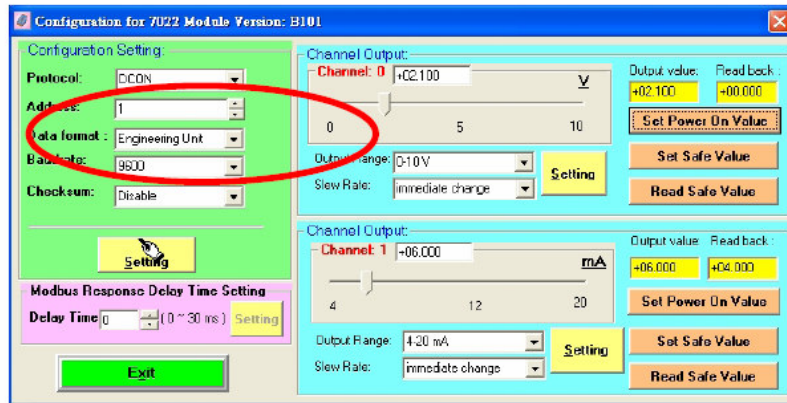
7017R is set to DCON Protocol

The screenshot shows the same 'Configuration for 7017R Module Version: B201' window, but with the 'Modbus' protocol selected. The 'Configuration Setting' panel now shows: Protocol: Modbus, Address[dec]: 1, Baudrate: 9600, Checksum: Disable (circled in red), Data format: 2's Complement, Input range: 0-5V, Filter Setting: 60Hz, and Mode: Fast Mode. The 'Channel Enable/Disable Setting' panel shows eight channels (CH:0 to CH:7) all enabled with checkboxes. Each channel has a value field: CH:0 (0018), CH:1 (0017), CH:2 (0016), CH:3 (0015), CH:4 (0014), CH:5 (0011), CH:6 (0016), and CH:7 (0011). Below these are buttons for 'Sel All', 'Clr All', and 'Exit'. At the bottom, the 'Modbus Response Delay Time Setting' panel shows a 'Delay Time' of 18 ms (0 ~ 30 ms) and a 'Setting' button.

7017R is set to Modbus Protocol

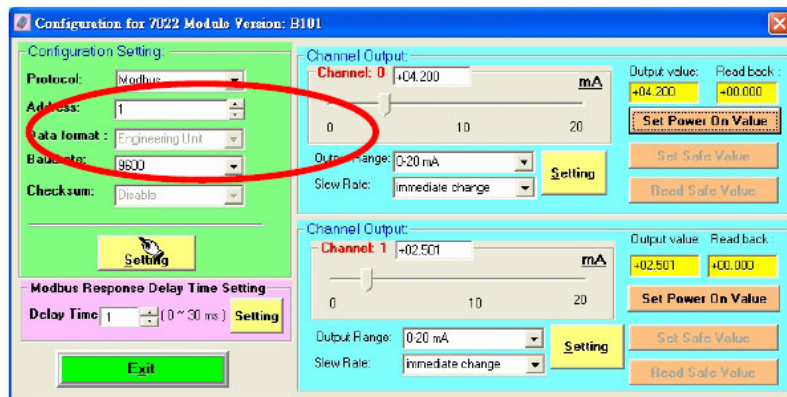
To Configure Analog Output modules:

The DCON AO modules support Engineering, Percent, Hex data formats; the Modbus modules support only Hex data format.



7022 is set to DCON Protocol

The modbus AO modules do not support the safe value function also.



7022 is set to Modbus Protocol

The differences between DCON modules and Modbus modules.

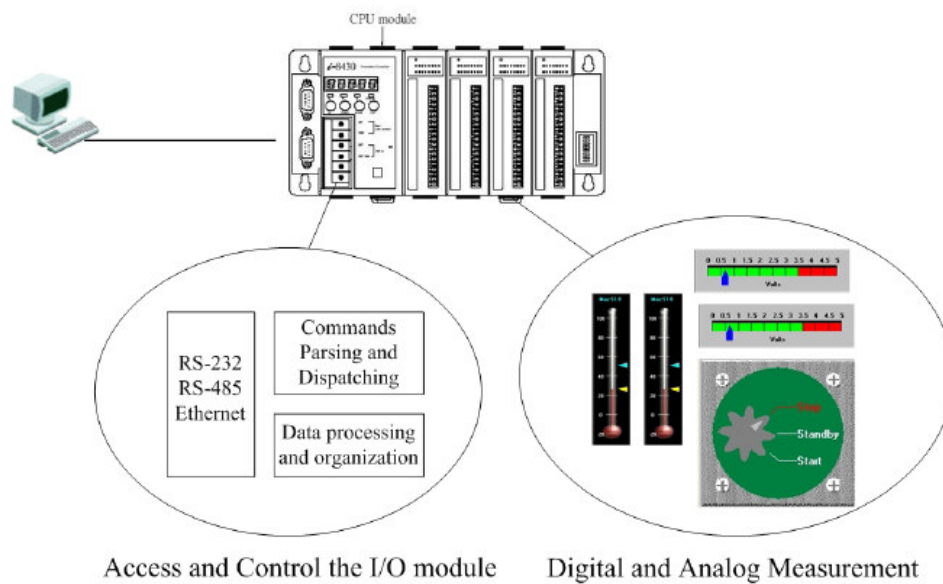
	DCON Protocol	Modbus
Checksum setting	Yes	No
Modbus response delay time	No	Yes
DO safe value	Yes	No
AO safe value	Yes	No
Data format(Engineering)	Yes (AI, AO)	No
Data format(Hex)	Yes (AI, AO)	Yes
Data format(Percent)	Yes (AI, AO)	No
Data format(Ohm)	Yes (RTD, Thermistor)	No

To Configure i-8410, i-8810, i-8411, i-8811, i-8430, i-8830, i-8431, i-8831, i-8KE4 and i-8KE8 I/O Units:

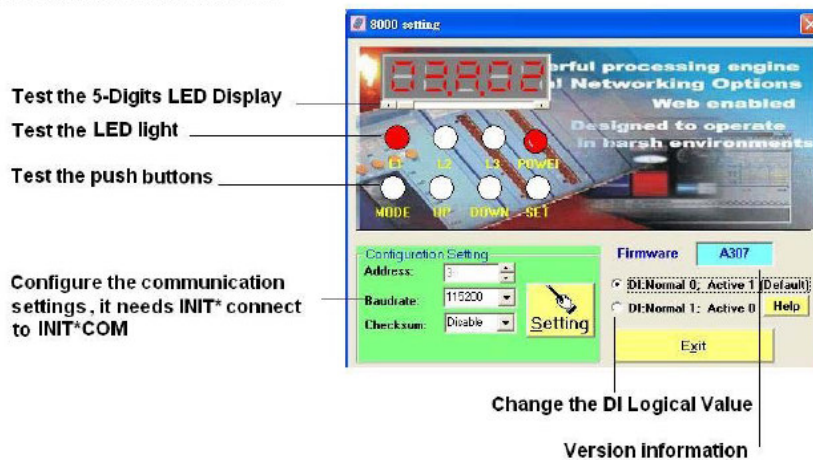
i-8000 system includes CPU module and the I/O modules on its slots.

3.2.1 Configure the CPU module:

1. The CPU module is the communication and control center of i-8000 system.
2. DCON Utility communicates with this CPU module.
3. CPU module can get data from I/O modules.
4. CPU module can save the configuration settings of I/O modules.
5. CPU module can control the LED Display and Push Button function.

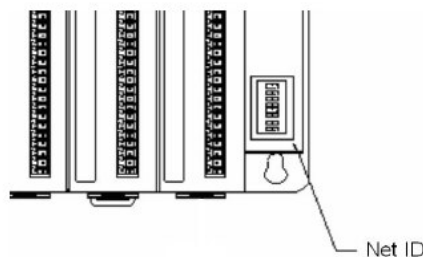


For CPU module, the most important is to configure the communication Settings and DI Active State Reverse function.

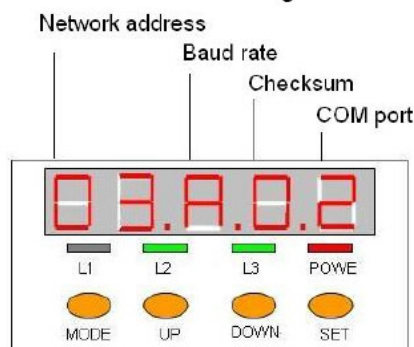


➤ The Net Address of i-8000 system:

The Net address of i-8410, i-8810, i-8411, i-8811, i-8430, i-8830, i-8431, i-8831 are determined by the dip switch at the right edge of plastic housing.

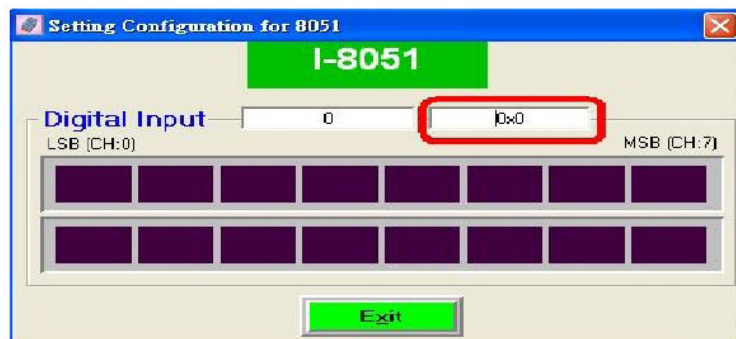


For Serial Interface, the communication settings will show on the 5-digital LED menu.



Baudrate Table:

0x3	0x4	0x5	0x6	0x7	0x8	0x9	0xA
1200	2400	4800	9600	19200	38400	57600	115200



Choose "DI: Normal 1; Active 0" will reverse the Logical input value of DI modules.



In this case, when there is no DI input signal detected, the LED is off, but the logical value is 1; otherwise, the LED will be on and the logical value is 0.

DI Active 0, Normal 1		
Input Type	ON State LED ON Readback as 0	OFF State LED OFF Readback as 1
	Relay Contact	Relay Contact
Relay Contact		
TTL/CMOS Logic		
Open Collector		

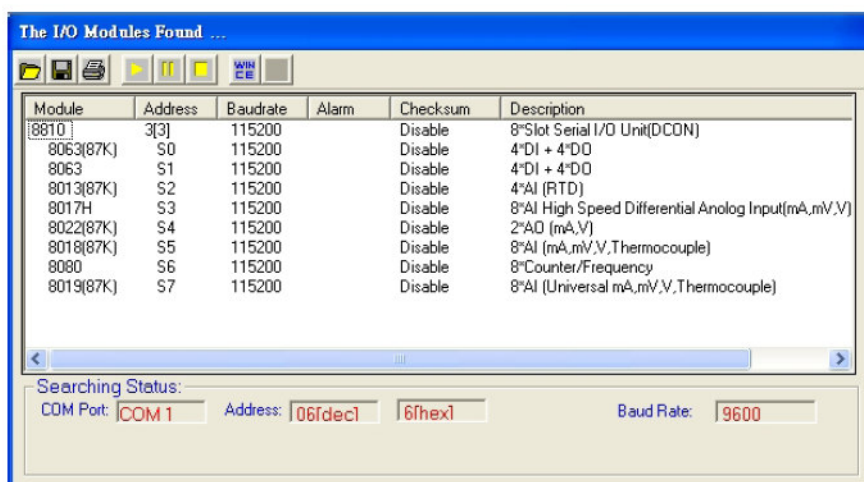


3.2.4 The differences between i-8K and i-87K I/O modules:

The DCON firmware (DCON_nnn.exe, E10M_nnn.exe) supports both 8K and 87K series I/O modules. The two series I/O modules can be plug in same I-8000 MCU. The modules for DI, DO, DIO, AI, AO and Counter/Frequency are supported. Other modules such as multi-serial port (8112, 8144, 8142, 8144), MMC(8073), motion (8090, 8091) are not supported. The file in the shipped CD lists details.

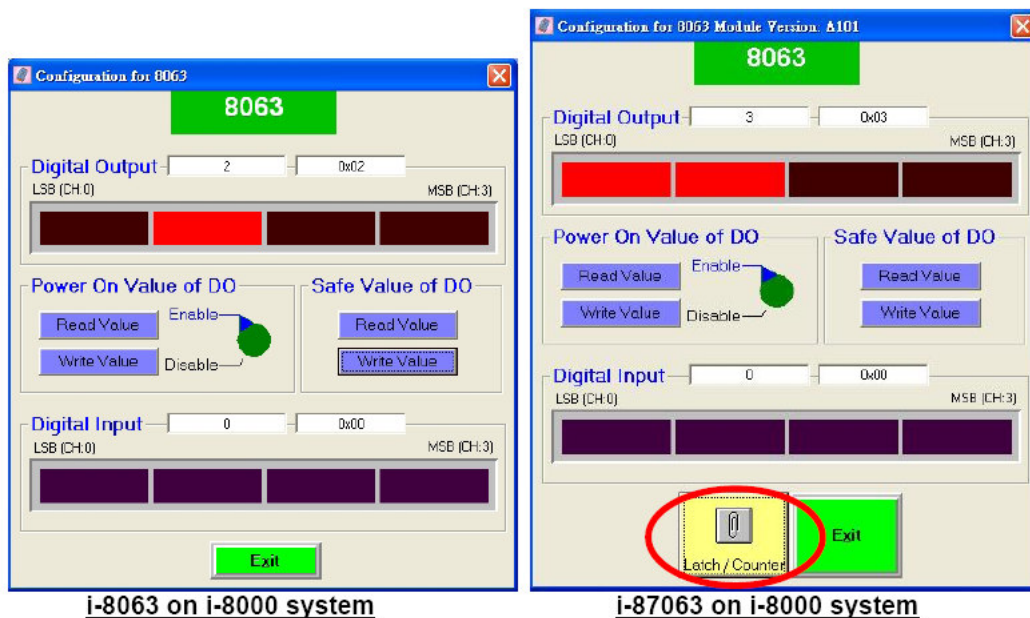
CD:\Napedos\Driver\DCON_Utility\DCON_Utility_Module_List.htm

The DCON firmware only accepts 4 digits numbers. Thus both 8K and 87K series are recognized as 4 digits numbers. When using the DCON Utility to search I/O modules, the screen shown as following:



To Configure Digital I/O modules on i-8000 system:

Both i-8K DO modules and i-87K DO modules have DO Power On value and Safe value and they are all controlled by the CPU module of i-8000 system.



But DI module of i-87K have DI counter and DI latch functions and i-8K DI modules do not.



The DI counter and latch functions of i-87063 on i-8000 system.

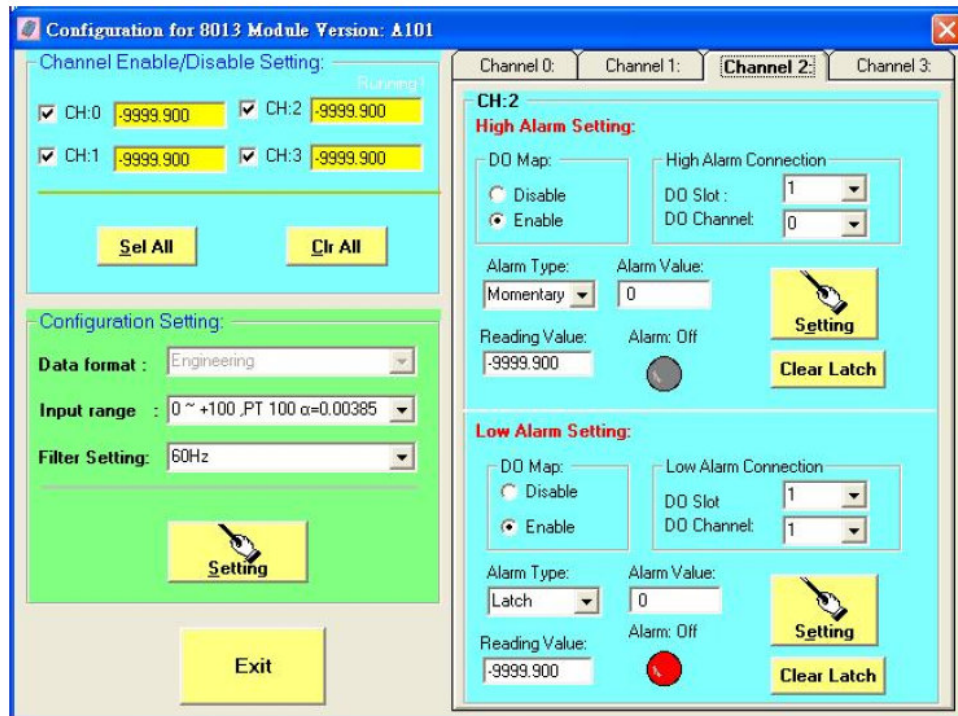
Note 1: There is a DI Counter value (0 ~ 65535) for each channel of 87K DI modules.

Note 2: When the Clear Latch function is applied, the Latch Low and Latch High values are reset to 0.

To Configure Analog Input modules on i-8000 system:

The analog input modules on i-8000 system have advantages on DO Alarm mapping, they can have their alarm output map to any slot of DO module (must less then or equal to 16 bits DO) for each channel of Analog input, the firmware will auto scan the Analog input modules and auto trigger the DO alarm output.

The data format of the Analog input modules on i-8000 system only support engineering format, i-8000 system does not support hex format and percent format.

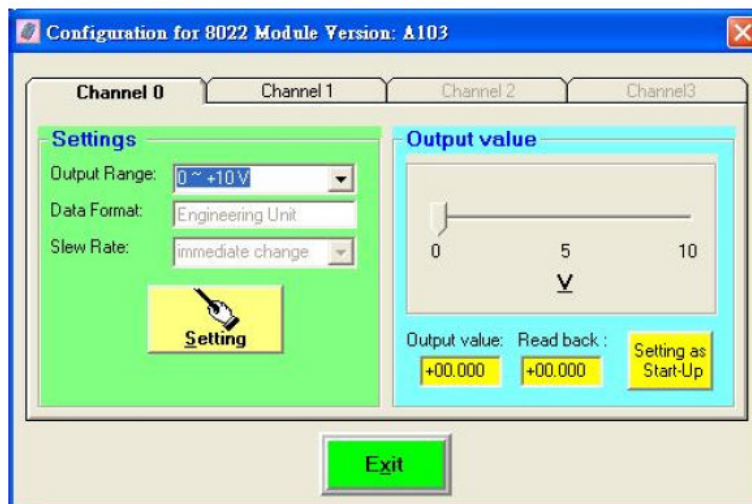


i-87013 RTD input on i-8000 system

To Configure Analog Output modules on i-8000 system:

The analog output modules on i-8000 system can change their type codes and setup their Power On value, but do not have Safe value.

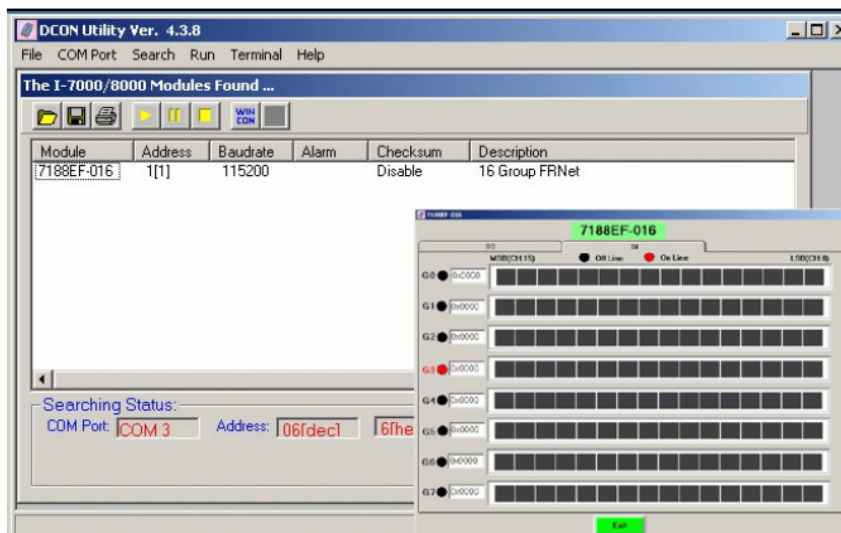
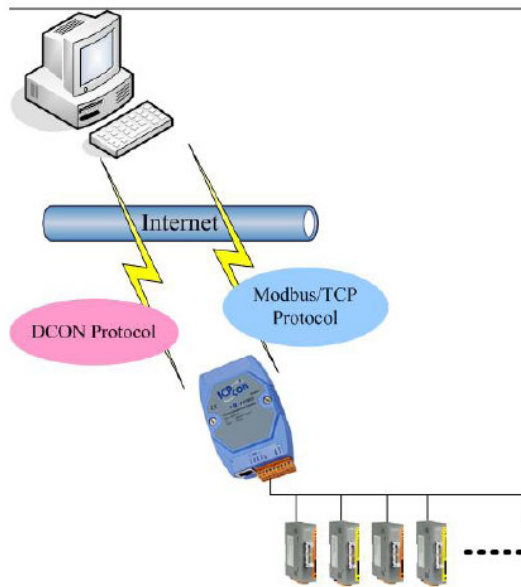
The data format of analog output modules on i-8000 system only support engineer format. The slew rate function also be disabled,



i-87022 on i-8000 system

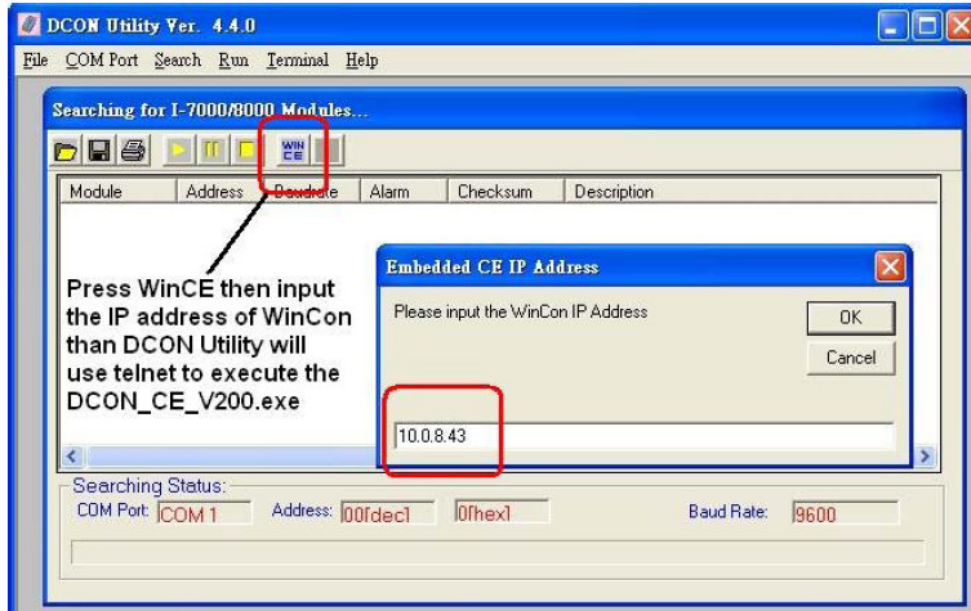
Configure i-7188EF-016:

i-7188EF-016 is an Ethernet I/O units running DCON Firmware **EF016nnn.exe**, it can support maximum 128 bits DI and 128 bits DO, the **Net Address is fixed to 1** and there is no need to configure the i-7188EF-016 Ethernet I/O unit.



Step 1: Check Compact Flash Card of the WinCon Controller and make sure the DCON_CE_V200.exe is located at the path **CompactFlash\ICPDAS\Tools** or **Compact Flash\ICPDAS\Tools**.

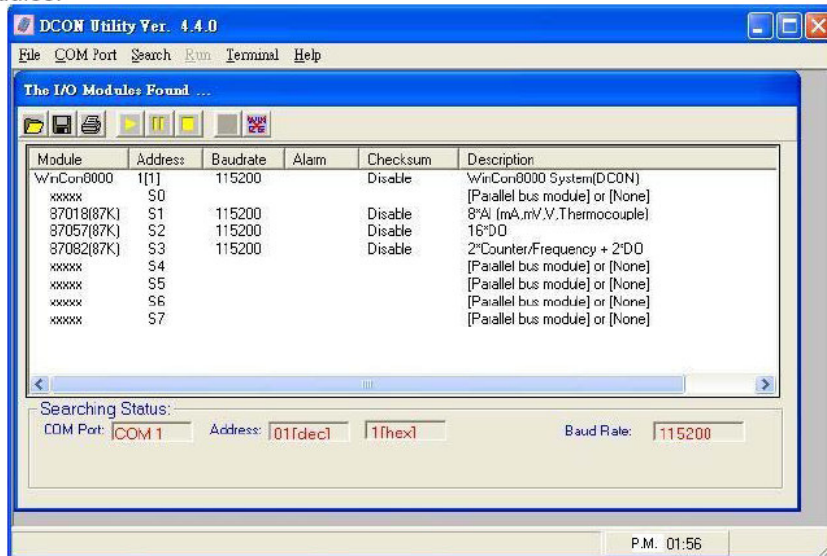
Step 2: Click  button and input the IP address of the WinCon.
It needs to use telnet protocol to execute the **DCON_CE_V200.exe** and to configure i-87K I/O module.





Step 3: Click button to Search the i-87K modules.

When DCON_CE_V200.exe has been executed, DCON Utility needs to use COM port cable to connect to the WinCon's COM2 (RS-232) in order to search and to configure i-87K I/O modules.



Note: DCON Utility only support i-87K I/O modules on WinCon, i-8K modules will not be shown by DCON_CE_V200.exe and DCON Utility.

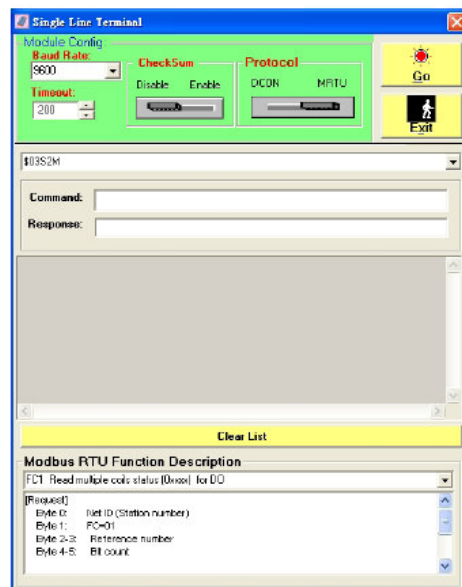
For using DCON_CE_V200.exe and wire connection of WinCon's COM2 with PC,

Terminal Single Line function:



This is a basic tool for user to test and debug the command.

It supports both DCON Protocol and Modbus RTU Protocol.



The first step user must know the communication settings of target module.

The second step is to look for the commands on user manual.

For I-8000 series modules the files are located at:

CD:\Napdos\DCON\IO Module\hw dcon on 8KUnit\8k modules.htm

For I-87K series modules the files are located at:

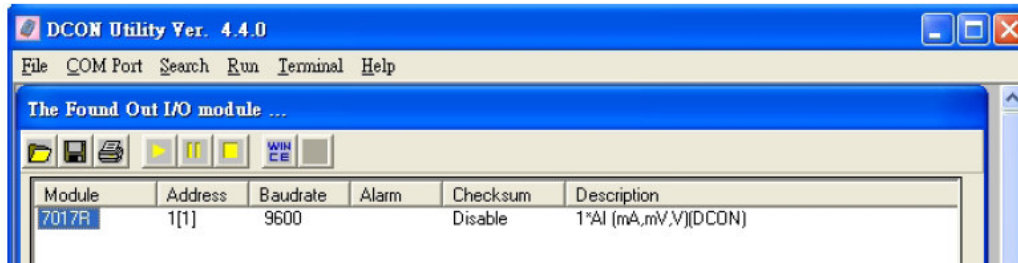
CD:\Napdos\DCON\IO_Module\87k_modules.htm

For i-7K and M-7K series modules, please refer to

CD:\Napdos\7000\Manual\

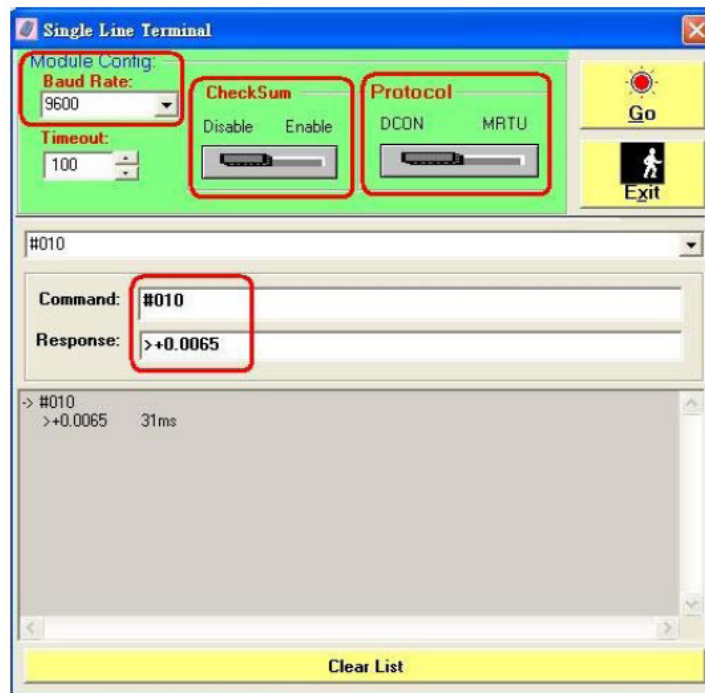
Example 1:

If there is a 7017R with the net address 01, baud rate 9600, checksum disable and DCON protocol.



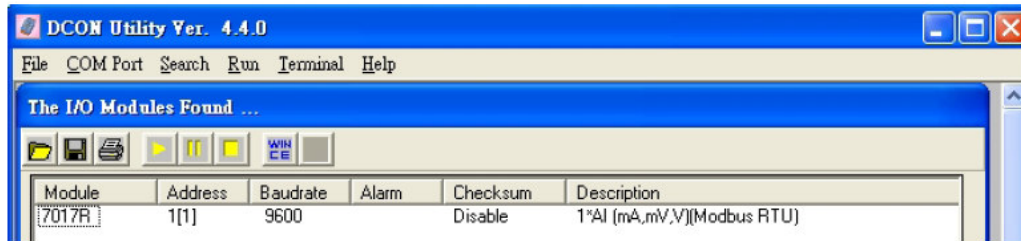
It can use #010 to read the AI values of channel 0.

The response of i-7017R is ">+0.0065"



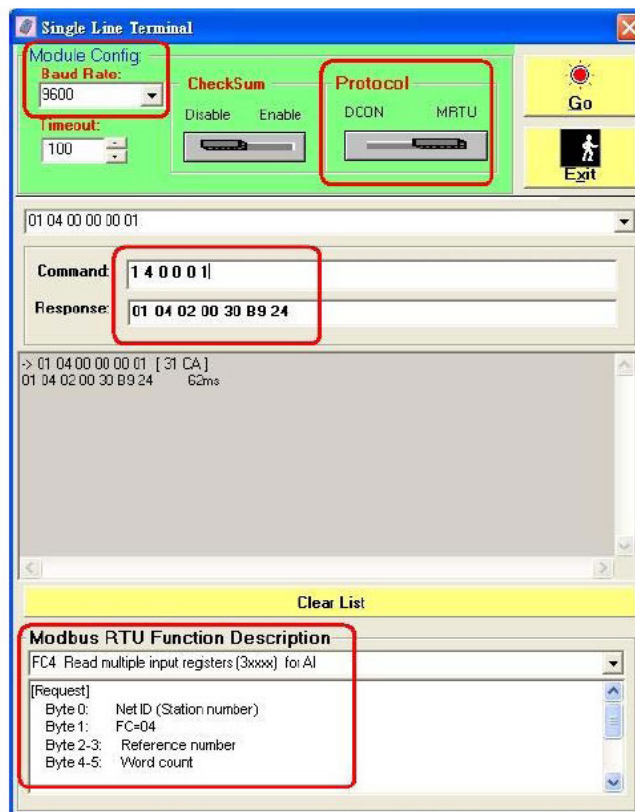
Example 2:

If there is a 7017R with the net address 01, baud rate 9600 and Modbus protocol.



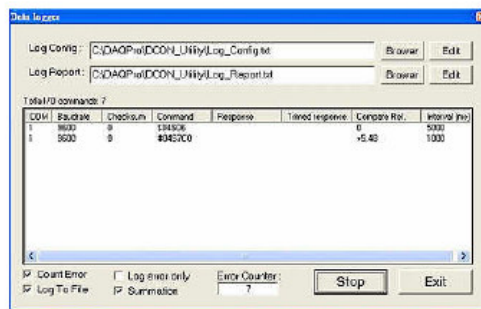
If wants to read AI value of channel 0, then it can look up to the description of Modbus command.

Then it can use 1 4 0 0 0 1 to read the AI value of channel 0 and get the value 01 04 02 00 30 B9 24



Data Log function:

This function is a simple tool to have data log report.



4.2.1 Edit the Log_Config.txt

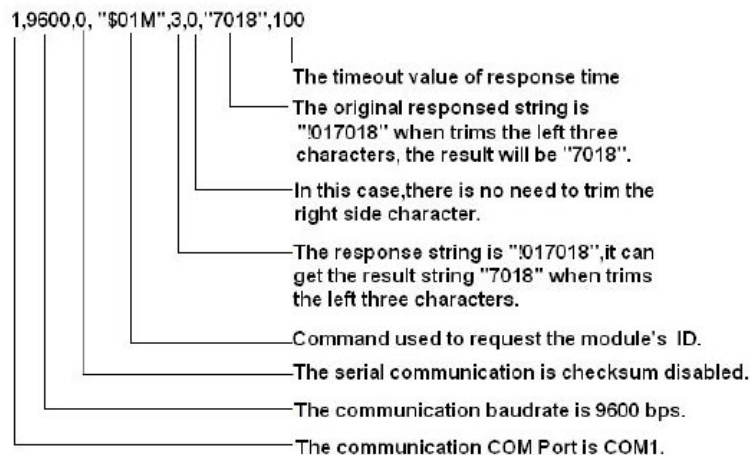
```
/*
The document is a configure file to let the Utility send specific
command string to the modules and log the communication packages
to the report file.
The parameters are:
[COM],[Baudrate],[Checksum],[Command],[Left trim],[Right trim],[Compare Ref.],[Time interval]

[COM]:          1 ~ 255
[Baudrate]:     1200,2400,4800,9600,19200,38400,57600,115200
[Checksum]:     0 ==> disable
                1 ==> enable
[Command]:      command string that will be sent to the I/O modules.
[Left trim]:    trims how many bytes of the left of the received string.
[Right trim]:   trims how many bytes of the right of the received string.
[Compare Ref.]: reference string used to compare the trimmed response string.
[Time interval]: time interval to run the command.
                unit: ms

Please change it to suit your hardware configuration.
[Oct,9,2003] by Kevin

Note 1: The config file is used from DCON Utility 4.2.7.
Note 2: The document is terminated by one '*' and one '/'.
*/
1,9600,0, "$01M",0,0,"017018",100
```

It needs to put right parameters to get right response records from modules,



[No.]: count of pooling	[Line]: indicator of command sequence	[Date]: system Date of Host PC	[Time]: system time of host PC	[Ms]: minisecond	[Command]: see reference of manual	[Response]: characters received from module	[Trimmed response]: characters after trim left and trim right	[Compare Ref.] characters or value want to compare with trimmed response	[Compare result]: if trimmed response of DI/O is equal to compare Ref. the compare result is 0 else is -1
000001.	001.	11/7/2003.	17:27:00.	000.	#08S4C0.	>+05.045.	+05.045.	+05.040.	-1
000002.	002.	11/7/2003.	17:27:00.	000.	\$08S56.	!0800000000	00000000.	00000000.	0
000003.	001.	11/7/2003.	17:27:01.	000.	#08S4C0.	>+05.043.	+05.043.	+05.040.	-1
000004.	002.	11/7/2003.	17:27:01.	000.	\$08S56.	!0800000000	00000000.	00000000.	-1
000005.	001.	11/7/2003.	17:27:02.	000.	#08S4C0.	>+05.043.	+05.043.	+05.040.	-1

Example 1.

If we have an i-8810 MCU at Address 08 and an i-8041 DI module at Slot 05 on MCU

We use \$08S56 to read I/O Status and get response !0800000000

All we want from the response is the I / O Status 00000000

so we have to trim left 3(!08) from !0800000000 to get 00000000

Example 2.

If I/O status has been changed we can use Compared Ref. 00000000

If I/O status has been changed to 000000F0 then Compared result is -1

If no change then Compared result is 0

Example 3.

If we have an i-8810 MCU at Address 08 and an i-8017H AI module at Slot 04 on MCU

We use #08S4C0 to read Analog input at channel 0 and the response format is >+05.048

if we want to trim off the ">" character

then we set Left trim 1 and Right trim 0 to get +5.048 format

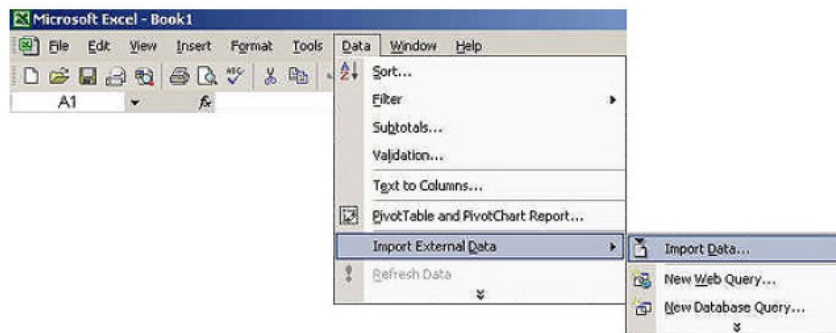
Use EXCEL to Import the data of Log_Report.txt

In some situation user would want to transfer Log_Report to excel file

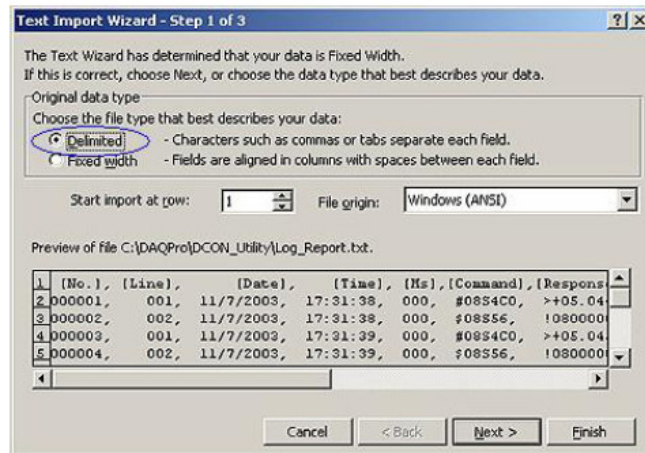
The procedure below will show how to do it

Step 1. Execute Excel.exe

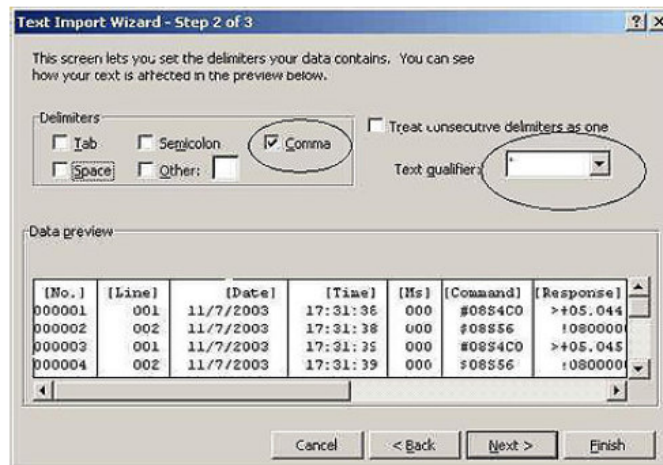
Step 2. Data ->Import External Data ->Import Data



Step 3. Select "Delimit"



Step 4. Select "Comma" as delimiter



Step 5. Click "Finish" and get the result

Microsoft Excel - Book1

File Edit View Insert Format Tools Data Window Help

Type a question for help

Standard toolbar: Undo, Redo, Cut, Copy, Paste, Find, etc.

	A	B	C	D	E	F	G	H	I	J
	[No.]	[Line]	[Date]	[Time]	[Ms]	[Command]	[Response]	[Trined response]	[Compare Ref.]	[Compare result]
1	1	1	11/7/2003	17:31:38	0	#08S4C0	>+05.044	5.044	5.04	-1
2	2	2	11/7/2003	17:31:38	0	#08S56	!0800000000	0	0	0
3	3	1	11/7/2003	17:31:39	0	#08S4C0	>+05.045	5.045	5.04	-1
4	4	2	11/7/2003	17:31:39	0	#08S56	!0800000000	0	0	0
5	5	1	11/7/2003	17:31:40	0	#08S4C0	>+05.044	5.044	5.04	-1
6	6	2	11/7/2003	17:31:40	0	#08S56	!0800000000	0	0	0

Sheet1 Sheet2 Sheet3

Ready NUM

Monitoring function:

When finish searching and configuring the module, the monitor function can pooling every module one by one and show the results.

The screenshot shows a software window titled 'Form3' with a table of monitoring data. The table has columns for 'Module Type', 'Address', 'Data', and 'Scanback'. It displays data for two modules: 7010 (A:0x1 9600) and 7017R (A:0x2 9600). Each module has 8 data points (0-7) representing analog input values. The scanback column shows the module's description: '8*AI (mA, uV, Thermocouple)' for 7010 and '1*AI (mA, uV)' for 7017R. At the bottom, there is a 'Running Cycles' counter showing '00000045' and four buttons: 'Stop', 'Reset', 'Continue', and 'Exit'.

Module Type	Address	Data	Scanback
7010	A:0x1 9600	[0] +0022.700 [1] +0022.700 [2] +0023.800 [3] +0022.200 [4] +0022.600 [5] +0022.500 [6] +0022.700 [7] +0022.600	8*AI (mA, uV, Thermocouple) Analog Input Value Analog Input Value Analog Input Value Analog Input Value Analog Input Value Analog Input Value Analog Input Value
7017R	A:0x2 9600	[0] 0025 [1] 0025 [2] 0027 [3] 0025 [4] 0020 [5] 0027 [6] 0025 [7] 0026	1*AI (mA, uV) Analog Input Value Analog Input Value Analog Input Value Analog Input Value Analog Input Value Analog Input Value Analog Input Value

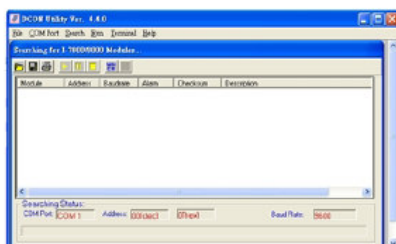
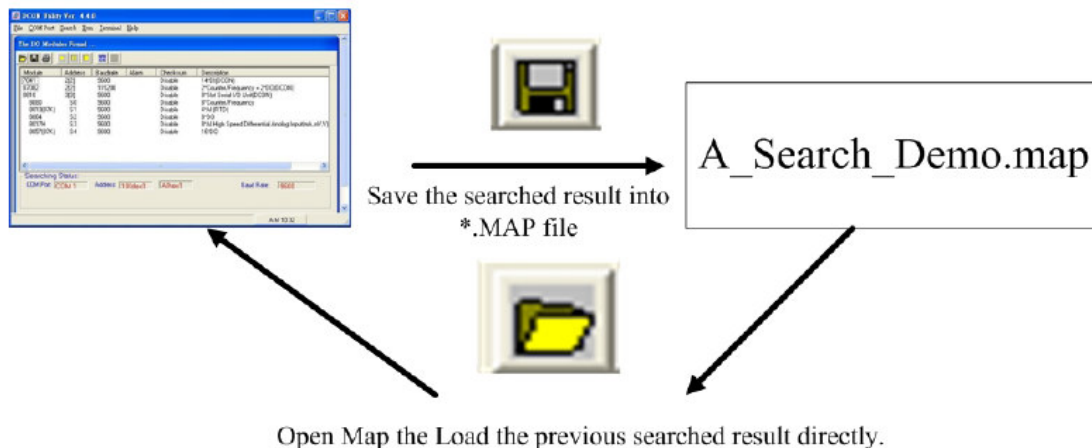
Running Cycles: 00000045

Stop Reset
Continue Exit

Save Map, Open Map and Print Map function:



When the network contains many modules and need long time to search, it can save the search result into a map file, it will be very convenient to open map directly to load the previous result to searched form without searching time.



It also can print the searched result by using Print Map function.

