

DCON Utility Pro User Manual

Version 2.0.1, February 2019



Written by Martin Hsu Edited by Anna Huang All products manufactured by ICP DAS are under warranty regarding defective materials for a period of one year, beginning from the date of delivery to the original purchaser.

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Email: service@icpdas.com

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1. Introduction

DCON Utility Pro is a toolkit that can help user easily to search, configure and test I/O modules.

For supported platforms, please refer to below table:

For Windows 98,NT,2000,XP,Vista,Win 7,Win 8 and Win 10 PC or Laptop

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

For ICPDAS CE5 platform PAC

http://ftp.icpdas.com.tw/pub/cd/winpac/napdos/wp-8x4x_ce50/micro_sd/dcon_utility_pro/

For ICPDAS CE6 platform PAC

http://ftp.icpdas.com.tw/pub/cd/xpac-atom-ce6/pc_tools/dcon_utility_pro/

For ICPDAS CE7 platform and ARM CPU PAC

http://ftp.icpdas.com.tw/pub/cd/winpac am335x/wp-5231/system disk/tools/dcon utility pro

For ICPDAS WES platform PAC

http://ftp.icpdas.com.tw/pub/cd/xpac-atom/tools/dcon_utility_pro/

Functions

DCON Utility Pro provides many useful functions for searching and configuring modules.

DCON U	tility Pro CE V 2.0.1.	0 ×
Ę		* 🔄 🖬 🖬 🖻 ?
Start A	ddress 1	End Address 8
ID	Addr Baud R	ate Checks Format Status Description
Ē	COM port Configuration	Sets COM port number and the communication configuration.
	Start Search	Starts to search the serial device(s) connected to the specified COM port.
II	Stop Search	Stops the search process.
*	Command Line	Sends a command to an addressed device and receives the response.
	Remote I/O Quick Configuration	Quick Configuration for one or multiple remote I/O devices.
	Backup/Restore Configuration for Local I-87K	Backups/Restores Configurations for I-87K I/O modules in the WinCE/WES based PAC
	Offline Configuration for 87PN	Edits configuration files for RU-87Pn/USB-87Pn/ET-87Pn in offline mode.
Ø	Data Logger	Logs data of continuously sending commands and receiving response for monitoring modules status.
?	About	Version information for related .dll files

2. Quick Start

Before searching the I/O, make sure the I/O modules are correctly wired, the basic wiring includes power supplier and communicate interface.

2.1. Power Supplier and wirings



Please refer to: http://www.icpdas.com/products/Accessories/power_supply/power_list.htm

- 1. The power supply must be DC power between +10V to +30V.
- 2. Wiring: +Vs connects to +Vs; GND connects to GND.
- 3. Carefully calculate the total watts or current consumption of the system.

If the total watts were not enough, the system will become unstable and abnormal.

Total watts = Σ (Supplied Voltage) * (Ampere consumed)

2.2. Setup the Communication Interface

DCON Utility Pro is very easy and convenient to configure and test the I/O modules via the serial port (RS-232/485) or virtual com port based-on Ethernet network.



2.3. Run DCON Utility Pro

Step 1: COM Port Search Option:

Include COM Port list, Baud Rate, Protocol, Checksum, Format and Timeout options.

i. Select searched COM Port and search options and define timeout value (default 300 ms)



The COM port for CE5/CE7 Controller is COM0



The COM port for CE6/XPE/WES Controller is COM1



ii. Baud Rate: default options are 115200 and 9600.



iii. Protocol: default options are DCON and Modbus RTU.

Baud Rate	Protocol	Check sum	Format		
☑ DCO	N	Modbus RTU	J	Modbus ASCII	

iv. Checksum: default option is "Disabled".

Baud Rate	Proto	ol Check	sum Forr	at					
Check	Checksum Disabled Checksum Enabled								

v. Format: default option is "N,8,1".

Baud Rate	Protocol Ch	ec.rsum	Format	
ℤ №,8,1	🗖 N,8	,2 🗉	E,8,1	0,8,1

Step 2: Start Search (🕨) if found searched modules than Stop Search (💷)

1	DCON Uti	ility Pro V 2.	0.1.0					<u> </u>
	Start Addi	ress (Address	10	?		
	ID	Address	Baud Rate	Checksum	Format	Status	Description	
	7021	0[0h]	9600	Disable	N,8,1	Remote I/O	[DCON]1*AO (mA,V)	
	COM:5 [I	DCON]	[N,8,2] A	ddress:1[0:	1h] Bai	ud Rate:115200 Ch	ecksum:Disable	.#

Step 3: Configure I/O settings and test the I/O value

For remote I/O modules, the main jobs are to change

i. Set communication parameters for RS-485 network (net address, baud rate, checksum, parity) and communication protocol used.

Set Module Configurations		Parity (INIT*) Checksum (INIT*) Analog Format Slew Rate Type Code	N,8,1-None Panity → Disable → Engineering Format → immediate → [22] 0 → +10 ∀ →				
---------------------------	--	---	---	--	--	--	--

- ii. Set type code range for analog modules
- iii. Set Power on value/Safe value for output modules

frmAO		J
Config	uration AO Host WDT About	
CH:0	 Set AO value with Engineering format AO Value ReadBack Range Output 00.000 0 ~ +10 V 0.000 We e Set to [Fower On Value] Set to [Safe Value] @ Read AO @ Read Safe Value 	
Ex	ât	
		-

iv. Check the I/O value for input and output modules

Tips & Warnings

1. If there are more than 2 modules with factory default settings, it needs to search and configure the I/O modules one by one.

In RS-485 network, you cannot connect two or more modules with the same communication parameters. It will cause some error due to conflictions of commands on RS-485 bus, like communication fault, or sometime running well and sometime not at all.

When all modules are configured with difference communication parameters, then user can use all of modules together.

If I/O module with unknown communication parameters, user can set it t Init Mode to fix communication parameter as below .Then user can find module out. When there are some modules to Init Mode, the communication settings are the same. By the same reason for chapter 2.3.1, they have to be searched and configured one by one.

It is better to Power on the I/O module with INIT* pin connects to the GND to get the I/O module's initial communication settings.

3. Quick configuration for Remote I/O modules

Support modules include all I-7K/M-7K and tM series I/O modules.



Here we take the M-7026 as an example; user may have to set the type code for AO and AI channels, power on value, safe value or alarm mapping.

If there are multiple M-7026 devices that need to be configured with similar settings, it will waste much time to configuration modules again and again for every module. User can follow below steps to set the same configurations for larger amount modules.

7026 Firm	ware[B100]	AI DI	Host WDT	Event Log	About		- Phile Philippe 1	X
CH:0 0 CH:1 0	Type Code 03] +/ 10 V 03] +/ 10 V Set Chennel T	Slew Rate Slew Rate immediate ppe Code As CH	 ✓ Set ✓ Set 0 	Set AO AO Value 00.000 00.000 Set to Read A ⁱ Read Pc Read Se	Value with Enginee ReadBack 00.000 00.000 (Power On Value) O O O O Value de Value	ring format Range +/- 10 V +/- 10 V 	Output 0.000 Write 0.000 Write Safe Value]	
10:43 AM :	::GET_CH2_SIMP	LE_AI_HIGH_A	LARM_LIMIT	[@00RHC2]	; [!01+10.000]; [31 ms]=>OK		1

onfiguration	n AO	AI	DI	Host WDT	Event Log	About			• • •		• • •.
	AI Value			Type Code			Alarm Mode	High Ala	rm Lamat	Low Alar	m Lumit
V CH:00	-000.001			[08] +/- 10 V		•	Disable 👻	10		-10	
V CH:01	-000.001			[08] +/- 10 V		•	Disable 👻	0		0	
CH:02	-000.001			[08] +/- 10 V		-	Disable 👻	10		-10	
V CH:03	-000.001			[08] +/- 10 V		•	Set Alarm				
V CH:04	-000.001			[08] +/- 10 V		•	DO Bit Status	High Ala	rm Status	Low Alar	m Status
V CH:05	+000.000			[08] +/- 10 V		•	DO0	CH:00 CH:01	Clear	CH:00 CH:01	Clear
				Set all c	hannels as CH	10	DO2	CH:02	Clear	CH:02	Clear
							Set to [Pow	ver On Value]		Set to [S	afe Value]
							Read DO				
							💿 Read Power	On Value			
💿 Read Safe Value											
Exit											

3.1. Quick Configuration for large amount modules

User may need to save I/O for backup configuration or need to save the same configuration for many models in different place. User can follow below step to save it to files once and write its configuration to the others modules.





Step 2: Click "Remote I/O quick configuration" (
), then click the button "Configure as INIT*
Status"

DCON Utility Pro V 2.0.1.0		
?) (S	
Start Address 0 End /	Remote I/O Configu	
ID Address Baud Rate 7021 0[0h] 9600	Auto Configuration About	
	COM Port COM5 Place make sure the INI	T* is connected to GND
	Configure as INIT* Status	
	Configure IA) by File	
COM:5 [DCON] [N,8,2] A		
	Exit	
		h.

Step 3: Select I/O to find to load the configuration form, change the settings then click "Write Configurations to I/O Module" to make the change affected

Remote I/O Configuration		
Auto Configuration About		
COM Port COM5 - Please make sure the INIT	* is connected to GND	
Configure as INIT*Status Select 1/C Configure AS INIT*Status 7024 U 7024 U 7024 U 7028 7028 7028 7028 7028 7028 7024 7024 U 7024 7024 U 7024 7024 U 7028 7028 7028 7033 D 7031 7041 7042 7042 7043 7043 7044 7044 7045 7045	E Firmware [B100] [Offline Configuration]	
7046 7046D	Protocol (INIT*) DCON	Event Log About
	Address 1 (D1H)	Configure 7026 OK
	Data rate (M11*) N.8.1-None Parity Parity (M11*) N.8.1-None Parity Checksum (M11*) Disable Analog Format Engineering Format Fast Mode Normal Mode	Setting Remote I/O Configurations OK: Follow the instructions below: 1. Make sure the Dip Switch is set to Normal (or Run). 2. Re-power on the module to make new settings effective. 3. Search for the module again and confirm the settings.
	Response Delay 0 ms	
	Exit Write Configurations to I/O Module	e Save Configurations to the File
	Configure 7026 OK=>Total Configure Command Count 36	i.

if need to set next module with different net address or the same net address, just change as new one and click "Write Configurations to I/O Module" to make the change affected.

Let the module's INIT* to normal state and reset the power and it will startup with new settings.

3.2. Save configurations to file and configure I/O by file

Steps for saving configurations to file, then users can back up the module's configurations.

Configuration <u>AO</u> Protocol (INIT*) Address Baud Rate (INIT*) Parity (INIT*) Checksrum (INIT*) Analog Format Fast Mode Response Delay	AI DI Host WDT Event DCON • [D1H] 9600 • N,8,1-None Parity • Disable • Engineering Format • Normal Mode •	Comments of the Configured File Comments of the Configured File Module ID = 7026 Module Firmware = B1.0 Date Time = 2018/12/19 Description = Save As Cancel
Exit	Write Configurations to I/O Module	Save Configurations to the File

Save As							×
$\leftarrow \rightarrow \cdot \cdot \uparrow$	- « D0	CON_Utility_Pro	_PC > auto_config	ٽ ~	Search auto_	config	,c
Organize 🔻	New fold	er				□== ▼	?
💻 This PC	^	Name	^		Date modified	Туре	
3D Objects	s		No	items match yo	ur search.		
📃 Desktop				-			
🔮 Document	ts						
🕹 Download	s						
👌 Music							
Pictures							
📑 Videos							
🏪 OS (C:)							
DATA (D:)		(_	
		•					
File <u>n</u> am	ne: R0_70	26.ini					~
Save as <u>t</u> yp	pe: INI in	i files (*.ini)					~
∧ Hide Folders					<u>S</u> ave	Cance	el

3.3. Restore the configurations by loading saved file

Step 1: Make sure the INIT switch set to "Init Mode" side, then power on the module



Step 2: Click "Next" button to enter Offline configuration form of selected module

Remote I/O Configuration	×
Auto Configuration About	
COM Port COM5 V Please make sure the INIT* is connected to GND	
Configure as INIT*Status	
Configure I/O by File	
Check comments of the configuration	
UNIT=REMOTE 7026 FIRMWARE=B1.0 Module ID = 7026 Module Firmware = B1.0 Date Time = 2018/12/19 Description =	
Next Cancel	
Exit	

Please check module in Init Mode as above step 1. If module is in INIT Mode, DCON Utility will enter modules' Offline configuration form as below step:

Configuration AO	AI	DI	Host WDT	About		
Protocol (INIT*)	DCON		~			
Address	1	•	01H			
Baud Rate (INIT*)	9600		~			
Parity (INIT*)	N,8,1-N	one Parity	/ ~			
Checksum (INIT*)	Disable		~		Configure 7026 OK	
Analog Format	Engineer	ring Form	at 🗸			
Fast Mode Response Delay	Normal N	Mode ms	~		Setting Remote I/O Configurations OK: Follow the instructions below: 1. Make sure the Dip Switch is set to Normal (or Run). 2. Re-power on the module to make new settings effective. 3. Search for the module again and confirm the settings.	
					ОК	
Exit	Write Cor	nfiguratio	ns to I/O Modi	le	Saug Confirmations to the Elle	

Tips & Warnings



There is only one module can be power on in "INIT Mode" settings when configuration modules. It needs to remove before finished module, then user can configure next module in "INIT Mode". When module in "INIT Mode", the communication settings will not effected right away. It needs to switch module to "Normal Mode" then reset power. The new settings will be effect. User can configure all modules finish and switch all to Normal Mode, then it can power on all modules in the RS-485 network.

Step 3: Search the I/O module and verify the configuration result



4. Configure and test I-8K and I-87K modules on I/O expansion slot for ICPDAS PAC



Search backplane I/O modules:

Start Address 1 End Address 8	
ID Addr. Baud Rate Checks. Format Status Description	
8014 Slot1 Slot [8KIO]8/16*AI (mA,mV,V) 8040 Slot2 Slot [8KIO]32*DI	-8K modules
87088 Slot3 115200 Disable N,8,1 Slot [DCON]8*PWM + 8*DI 87005 Slot4 115200 Disable N,8,1 Slot [DCON]8*AI +8*DO (Unive	
87019R Slot5 115200 Disable N,8,1 Slot [DCON]8*AI (Universal mA 87028U Slot6 115200 Disable N,8,1 Slot [DCON]8*AO (V) — I-	87K modules
87013 Slot7 115200 Disable N,8,1 Slot [DCON]4*AI (RTD)	

When search backplane I/O modules, they include serial bus I/O (I-87K/I-97K) and parallel bus I/O (I-8K/I-9K)

The parallel bus I/O (I-8K/I-9K), can check the calibration parameters

Basic Informat	ion AT Data C.	alibration		
Library Versio	on 3100	Firmware 1 1	Firmwar	re 2 1
Single-Ended	/ Differential	Differential		
Default Parar	neters Saved Da	ate None		Refresh Informations
User Parame	ters Saved Date	None	_	Save Informations to file
	Gain in use	Offset in use	Default Gain	Default Offset
+/- 10V	32854	-28	32854	-28
+/- 5V	32856	-27	32856	-27
+/- 2.5V	32864	-28	32864	-28
+/- 1.25V	32676	-38	32676	-38
+/- 20mA	32864	-28	32864	-28

Test the I/O values

8014										×
I-8014	IW slot Inc	lex 1		Gain +/- 1	V 0.0	-				
Basio	: Informati	on 🛛 AI Dat	a Calibrat	tion						
For	mat Flo	at 💌]							
R	ead Data	Min Data	Max Data	Delta	R	ead Data	Min Data	Max Data	Delta	
CO	00.0000	-00.0021	00.0012	00.0033] C8					
C1	00.0C01	00.0000	00.0119	00.0119	C9					
C2	00.0058	00.0000	00.0085	00.0085	C10					
C3	00.0034	00.0000	00.0055	00.0055	C11					
C4	-00.0043	-00.0061	00.000	00.0061	C12					
C5	00.0079	00.0000	00.0110	00.0110	C13					
C6	00.0009	-00.0003	00.0018	00.0021	C14					
C7	-00.0070	-00.0079	00.000	00.0079	C15					
	Enable Log	I	Log Interv	al 100		▶ ms				

It also provides UI to calibrate the I/O accuracy

8014	×
I-8014W slot Index 1 Gain +/- 10.0 V 💌	
Basic Information AI Data Calibration	
Steps for AI Calibraions	
Step 1: Send first stable Voltage to Channel 0 for Calibration	
Input first Voltage (float) 9.0 (Unit : Voltage)	
Set as Calibration Point 1 Y1 X1	
Step 2: Send second stable Voltage to Channel 0 for Calibration	
Input second Voltage (float) _9,0 (Unit : Voltage)	
Set as Calibration Point 2 Y2 X2	
Step 3: Save New Calibration parameter:	
Gain Offset Save new Calibration settings	

For serial bus I/O (I-87K/I-97K), there is no need to set communication parameters.

Step 1: Click module name to enter configuration form and write configuration, then save configuration to .ini file as below:

Configuration		211				
Protocol (
Address	uuu)					
Baud Rate	(INIT*)	115200				
Parity (INI	T*)	N,8,1-None	Parity			
Checksum	(INIT*)	Disable	-			
Analog Fo	ormat	2's Comple	ment I 💌			
60/50 Hz		60Hz	•			
					Set Module	e Configurations
Exit		Save Config	jurations to the File			
7019R Fin	nware[A	21]				
Configurat	ion AI	About				
	AI Value 1685 [+0	01.759]	Type Code		CJC Offset	Temperature Offse
	1694 [+0	01.750]	[08] +/- 10 V			
	1601 [±0	01.759]	[08] +/- 10 V			
CH:02	1601 [+0	01.750]][08] +/- 10 V			
✓ CH:03	1681 [+0	01.758]	[08] +/- 10 ∨	_	0.00 + -	
✓ CH:04	1681 [+0	01./58]	[08] +/- 10 V	_	0.00 + -	00.00 + -
CH:05	1682 [+0	01.758]	[08] +/- 10 ∨	_	0.00 + -	
CH:06	1689 [+0	01.761]	[08] +/- 10 ∨	-	0.00 + ·	
CH:07	1082 [+0	01.759]][08] +/- 10 V	•	0.00	
			Set all channe	ls as CHO		
🗹 Enable/	'Disable C.	JC Module (CJC Offset 05.10	+ - Temp	erature	
Exit	-	Sava Config	urations to the Eile	_		
EXIL		Save Coring	jurations to the File			
:36 AM ::G	ET_CH7_I	NPUT_RANGE	E[\$008C7]; [!00C7	R08]; [3 ms]	==>OK	
7019R Firr	nware[A:	21]				
Configurati	on AI	About				
Protocol ()	NI Comm	ents of the	Configured File			×
Address	ID	ulation O	70.100			
Baud Rate	(II) Desc	npuon=87	/019K			
Parity (INI	т*					
Checksum	(II)					
Analog Fo	orm					
60/50 Hz						
		Save As			Cancel	
					Set Modul	
					Sectionuli	s connigar a cions

Save As 🗈 🥐 🧱 🏢	ок 🗙
System_Disk\Tools\DCON_Utility_Pro_CE6\auto_Confi	g
Name: S5_87019R.ini Type: INI ini files	_

Step 2: Load configuration status OK. Then you can load files for every I-87KW slot and every PAC using the same configuration settings without do it again and again.

4.1. Load file step for Configuration and test modules on slot

Steps for configuration I-87K module once, copy and load file to the others PAC without configuration them again and again.

DCON Utility Pro CE	V 2.0.1.0		×
	II 🛠		
Auto Configuration	For Backplan	e I-87K	×
Auto Configuration	About		
Restore I/O	Slot	Configured Status	Scaned I/O
Load Config.	Slot: 1	-	Empty
Load Config.	Slot:2	-	Empty
Load Config.	Sio Open		OK ×
Load Config.	Slo	_87019R	
Load Config.	Slo		
Load Config.	Slo		
Load Config.	Slo <u>N</u> ame:	S5_87019R Iype: INI Files (*.ini)	_
Exit	Set Aut	o Configuration INI Path	
Do not have value			

DCON Utility Pro CE	V 2.0.1.0		×			
Auto Configuration	For Backpla	ne I-87K	×			
Auto Configuration	About					
Restore I/O	Slot	Configured Status	Scaned I/O			
Load Config.	Slot:1	-	Empty			
Load Config.	Slot:2	-	Empty			
Load Config.	Slot:3	-	87088			
Load Config.	Slot:4	-	87005			
Load Config.	Slot:5	ОК	87019R			
Load Config.	Slot:6	-	87028U			
Load Config.	Slot:7	-	87013			
Exit	Set Au	to Configuration INI Path				
1:43 AM :: [@00A20	:7TOO]; [!OC)]; [8 ms]==>OK				



User only can save and load configuration for I-87k module but I-8K module.

• Run Data Logger: Utility use customized parameter to monitor the I/O modules and will make a log file for I/O data.

DCON Utility Pro Version 2.0	.0.0 for PC Platform				×
	× 🔄 (
Start Address 0	End Address 255				
ID Address Baud Ra	ate Checksum Form	at Status	Description		
87057 0[0h] 115200) Disable N,8,1) Dicable N,8,1		[DCON]16*	"DO \O (mA)	
			[DCON]8 ×	(IIIA)	
	and Data Logger				
Edit Command D	ata Logger About			<u> </u>	
COM Port	COM Port	COM3 🔹	Load	Cmd0=>\$00M Cmd1=>\$00M	<u>^</u>
Court Court	Protocol	DCON 🔽		Cmd2=>\$03M Cmd3==>\$03M	
Start Search	Baud Rate	115200 -	Remove	[4]\$03F=>103	
AA[0],87057 AA[3],87028C	Data Format	N.8.1			
	Checksum	Disable	Add >>		
	Address	3[03h]	Modify		
	Timeout (ms)	200(ms) •			
	Delay for Next (ms)	200(ms) 💌			
COM:3[N,8	Command Reference	Get Firmware	•		
	Send Command	\$03F			
	Compared Response	103			
	Compare Mode	Partial Match	•		
				4	▼
Stop Data Logger COM	4 Port 3 Closed				1

🗧 Tool for Command Data Logger			×
Edit Command Data Logger About			
Start Stop 🗆 Pause 🛛	Log To File 🛛 🗖 Log Error Only	Logger5_27_13.csv 💌 Vie	ew
COM Command Response Data COM3 \$00M 10187057 COM3 @00AA55 > COM3 @00 >AA55 COM3 \$01M 10187028C COM3 #010+01 10187028C COM3 \$0180 10187028C	Compared Data Response Result 10187057 0 True > 0 True >AA55 0 True 10187028C 0 True 1 0 False 101 0 True	Sent Error Timeout 4 0 0 4 0 0 4 0 0 4 0 0 4 0 0 4 0 0 4 0 0 4 0 0 4 0 0	
Use Default Name Default(Logger mm dd hh.csv style)	Saved File Mode Interval to Change File Name	Overwrite	
Stop Data Logger COM Port 3 Closed		<u>, , , , , , , , , , , , , , , , , , , </u>	

• Terminal Line: for some situation users would want to use command to test module's function directly.

To use command to test a module, it should know all its communication parameters or it will get no response.

- 1. It can get the communication parameters by using search function.
- If doesn't have any idea about modules communication parameters, it can set module to INIT* state and reset the power and start searching, it will be found as Initial communication settings. (please refer to)
- 3. Click the "Command Line" (🛠) and select the parameters correctly then start to test the command.
- User can choice the module's "Address" and "Select ID", it gets a list of commonly used commands at the left bottom block of UI, it just needs to select the test command in the list and click the "Send" button to get the result data.

DCON Utility Pro V 2.0.1.0	T PARADODA T T CLILL	3
Start Address 0 End A	Address 10	_
TD Address Daad Rote tAD4P2C2 0[0h] 9600	Ghocksom Format States Description Disable N,8,1 Remote I/O [DCON]2* I + 2*DO + 4*AI	
Tool for Termin	inal Command	
COM Port Baud Rate Checksum Timeout	t COM5 • Protocol DCON • 9600 • Format N,8,1-None Parity • Disable • Address 0 • tM Series • 100 • ms Select ID 1AD4P2C2 •	
COM:5 COM:5 COM:5	# #00 >0033005000000000 [3E 30 30 33 33 30 30 35 30 30 30 30 30 30 30 30 30] DULE_NAME 3:53 PM :: [#00]; [>003300500000000]; [31 ms]==>OK DULE_CONFIC DULE_PROTO DULE_PROTO	
SET_MOD GET_CHAN SET_CHAN READ_AL_ READ_CH0 READ_CH1 READ_CH2	NNEL_ENABL NNEL_ENABLI 0_AI 1_AI 2_AI	Ŧ

Test the Modbus RTU protocol

DCON Utility Pro V 2	10					
፪ ▶ ॥ 🛠 🐚 🖬 🗊 ?						
Start Address	End Address 10					
ID Address	Raud Rate Checksum Format Status Description					
tAD4P2C2 1[1h]	9600 Disable N,8,1 Remote I/O [Modbus RTU]2 DI + 2*DO + 4*AI					
	ool for Terminal Command					
	COM Port COM5 • Protocol Modbus RTU •					
	Baud Rate 9600 Format N,8,1-None Parity					
	Checksum Disable - Address 1 - tM Series - Send					
	Timeout 100 • ms Select ID tAD4P2C2 •					
	Command 01 04 00 00 00 04					
	Response 01 04 08 00 22 00 5A 00 00 00 00 7E 02					
COM:5	REAU_SIMPLE_AL_D 4:00 PM :: [01 04 00 00 00 04 F1 C9]; [01 04 08 00 22 00 5A 00 ^ READ_DI_LOW_LAT CLEAR_DI_LATCH READ_CH0_DI_COU CLEAR_CH_DI_COU CLEAR_CH1_DI_COU CLEAR_CH1_DI_COU READ_CH3_CHNAIL *					

Test the Modbus ASCII protocol

DCON Utility Pro V 2.	0.1.0						×	
	₹ ▶ ॥ 🛠 🐚 🖬 🗊 ?							
Start Address	Start Address 0 End Address 10							
ID Address	Baud Rate Ch	ecksum	Format St	atus	Description			
tAD4P2C2 1[1h]	9600 Di	sable	N,8,1 Re	mote I/O	[Modbus ASCII].*	'DI + 2*I	DO + 4*AI	
1	Tool for Terminal	Command						
	COM Port	COM5	•	Protocol	Modbus ASCII	-		
	Baud Rate	9600	•	Format	N,8,1-None Parity	•		
	Checksum	Disable	-	Address	1 - tM Series	-	Send	
	Timeout	100	▼ ms	Select ID	tAD4P2C2	-]		
	Command	:0104000	00004					
	Response	:0104080	035004C00	00000072				
COM:5]I [Modbus	READ_DI_HIG READ_DI_LO' CLEAR_DI_LA' READ_CH0_D CLEAR_CH0_D CLEAR_CH1_D GET_CHANNE SET_CHANNE SET_CHANNE READ_AT_ALL	GH_LAT W_LAT TCH I_COU DI_COU DI_COU DI_COU CI_COU CI_COU CI_COU CI_ENAI	4:09 PM ::	[:01040000	0004F7]; [:010408003	35004C	000000072]; ^	

4.2. Data Log function

This is a useful Data Logger tool. It can help customer to save data as *.csv file and it can compare some information on response data.

- 1. Search the COM Port to find the modules on RS-485 bus.
- 2. Click Data Logger button it will auto load all the searched modules (it can also click Start Search to search module in Data Logger Tool).
- 3. Select module ID, it will show communication parameters and the common commands for this module in correct protocol.
- 4. Select the test command from "Command Reference" list and edit the log conditions then click "" to add this command to scan list.



There are four comparison options as below.

Compare Mode	Full Match	-
	Full Match Data Length (Without CR) Partial Match None	

5. Change to "Data Logger" page and click "Start" to start the Data Logger.

Tool for Command Data Logger	×
Edit Command Data Logger About	
Start Stop Deuse Deg To File Log Error Only Logger12_20_17.csv	~ View
Command Response Data Command Data Response(ms) Result Sent Error	Timeout
COM5 :014600 :014600072240014F :01460007224001 COM5 :0104000 :010408002B004A 79 True 7 0	0
	
<	>
☑ Use Default Name Saved File Mode Overwrite ✓	
Default(Logger_mm_dd_hh.csv style) Interval to Change File Name 1 Hr 🗸	
Open COM Port 5 OK	

- 6. Click "Stop" to stop the Data Logger.
- 7. Click "View" can load the data list as below.

Tool for Co	ommand Data	Logger							×
Edit Com	mand Data L	ogger About							
Start	Stop	🗆 Pause 🛛	Log To File 🗌	Log Error Or	nly I	.ogger12_20	_17.csv	~ Vi	ew
COM	Command	Response Data	Compared Data	Response(ms)	Result	Sent	Error	Timeou	at 🔨
COM5	:014600	:014600072240014F	:01460007224001	62	True	1	0	0	
COM5	:0104000	:010408002200690		63	True	1	0	0	
COM5	:014600	:014600072240014F	:01460007224001	47	True	2	0	0	
COM5	:0104000	:010408002F005A0		63	True	2	0	0	
COM5	:014600	:014600072240014F	:01460007224001	47	True	3	0	0	
COM5	:0104000	:010408003C005A		63	True	3	0	0	
COM5	:014600	:014600072240014F	:01460007224001	47	True	4	0	0	
COM5	:0104000	:010408001A005A		63	True	4	0	0	
COM5	:014600	:014600072240014F	:01460007224001	47	True	5	0	0	
COM5	:0104000	:010408001A00690		63	True	5	0	0	
COM5	:014600	:014600072240014F	:01460007224001	47	True	6	0	0	
COM5	:0104000	:0104080038003E0		63	True	6	0	0	
COM5	:014600	:014600072240014F	:01460007224001	47	True	7	0	0	
COM5	:0104000	:0104080025003E0		63	True	7	0	0	~
<									>
🗹 Use I	Default Nam	e	Saved File Mo	de	C	verwrite	~		
Default(Logger_mm_dd_hh.csv style) Interval to Change File Name 1 Hr 🗸									
štop Data Lo	ogger COM Po:	rt 5 Closed							

Default file name and path will be as DCON_Utility_Pro\log_report\Logger_mm_dd_hh.csv. User can open it as Microsoft Execel to check data.

Time	Command Index COM	Command	Response Data	Compared Data	Response Time	Compare Mode	Result	Send Count	Compared Error Count	Timeout Count
12_20_17:15:49:499	0 COM	5 :014600	:014600072240014F	:014600072240014F	78	Full Match	TRUE	1	0	0
12_20_17:15:49:804	1 COM	5 :01040000004	:01040800280064000000067		62	No Compared	TRUE	1	0	0
12_20_17:15:50:134	0 COM	5 :014600	:014600072240014F	:014600072240014F	47	Full Match	TRUE	2	0	0
12_20_17:15:50:446	1 COM	5 :01040000004	:0104080037004C0000000070)	63	No Compared	TRUE	2	0	0
12_20_17:15:50:764	0 COM	5 :014600	:014600072240014F	:014600072240014F	47	Full Match	TRUE	3	0	0
12_20_17:15:51:70	1 COM	5 :01040000004	:010408003C004A00000006	D	63	No Compared	TRUE	3	0	0
12_20_17:15:51:389	0 COM	5 :014600	:014600072240014F	:014600072240014F	47	Full Match	TRUE	4	0	0
12_20_17:15:51:695	1 COM	5 :01040000004	:010408001B0064000000074		125	No Compared	TRUE	4	0	0
12_20_17:15:52:15	0 COM	5 :014600	:014600072240014F	:014600072240014F	47	Full Match	TRUE	5	0	0

4.3. Offline Configuration for 87Pn

It can edit the configuration files for RU-87Pn/USB-87Pn/ET-87Pn in offline mode Click "Offline Configuration for 87Pn" () and select the 87Pn model.

18 87PN Series	Off-Line Configure	x
Select 87PN	Model	
Model ID	RU-87P4	
Address	RU-87P1 RU-87P2 RU-87P4	
Checksum	RU-87P8 USB-87P1 USB-97P2	
Baud Rate	USB-87P4 USB-87P8	OK
	E1-8/F4	

Select the module ID then click "Configure" button to Load the configuration form of selected ID.

RU-87P4 [Offline]			ant and	×
PWR S.RDY	Auto Configuration Error	Code References About		
ė ė •	Configued I/O Addr.[He	x] Slot Configuration Status	Set As Scanned Write To 87PN	Scanned I/O
Address	87019R - 02	-	Configure	Empty
H ț	87019R 103	•	Configure	Empty
1000 M	87022 04 87024	· · · · ·	Configure	Empty
	87024D 05		Configure	Empty
Auto Config N/A Checksum Baud Rate N/A N/A SW1 1 2 2 3 Slot CPU Module	87024C 87024U 87026P 87028V 87028V 87028V 87041 87046 87046 87046 87046 87051 87052 87053A5 87054 87055 87057 87058 87058 87059	ions Load Configurations	Load configurations and write to	

Change the module configuration then exit the form.

87019R [Offline Configuration]				X
Configuration	n AI About				
	AI Value	Type Code		CJC Offset	Temperature Offset
V CH:00	+000.000	[08] +/- 10 V	•	0.00 + -	00.00 + -
V CH:01	+000.000	[08] +/- 10 V	•	0.00 + -	- + 00.00
V CH:02	+000.000	[08] +/- 10 V	•	0.00 + -	- + 00.00
V CH:03	+000.000	[08] +/- 10 V	•	0.00 + -	00.00 + -
V CH:04	+000.000	[08] +/- 10 V	•	0.00 + -	- + 00.00
V CH:05	+000.000	[08] +/- 10 V	•	0.00 + -	- + 00.00
V CH:06	+000.000	[08] +/- 10 V	•	0.00 + -	- + 00.00
V CH:07	+000.000	[08] +/- 10 V	•	0.00 + -	- + -
		Set all channels as CHO			
☑ Enable/D:	isable CJC Module CJC	Offset 00.00 + - Ten	npe	rature	
Exit]				

Click "Save Configurations" to save all configurations on 87Pn slot.

RU-87P4 [Offline]	The second second subjects in the second	×
PWR S.RDY	Auto Configuration Error Code References About	
	Configued I/O Addr.[Hex] Slot Configuration Status Set As Scanned Write To 87PN Sc	canned I/O
Address	87019R - 02 - Configure F	Empty
H N	87028U - Configure F	Empty
AL COM	87046 • 04 - Configure F	Empty
	87057 ▼ 05 - Configure F	Empty
Auto Config N/A Checkska N/A N/A SW1	Ext Save configurations Load Configurations Load configurations and write to	

User can send the configuration file by email or any communication tools to remote site, then the remote site can use their PC to run the DCON Utility Pro to load and write to their 87Pn. For more detail, please refer to RU-87Pn user manual section 3.3 Load & Write configure file at URL: <u>ftp://ftp.icpdas.com/pub/cd/8000cd/napdos/87pn_io_unit/ru-87pn/</u>

4.4. Setup RS-485 interface

DCON Utility Pro uses COM port to search remote serial I/O modules, if use PC or Laptop, it needs RS-232 to RS-485 converter or USB to RS-485 converter.



USB to RS-485 Converter (needs to install USB driver)

I-7561U/tM-7561



Download and Install USB driver

http://ftp.icpdas.com/pub/cd/Usb_tM/NAPDOS/UsbConverter/tM-7561_series/

Check the Device Manager to make sure the USB driver has been installed successfully.





If use PAC, it has RS-485 interface, it can configure the remote I/O modules

4.4.1. RS-485 interfaces

Module	Protocol	Comments
I-7000	DCON	RS-485
M-7000	Modbus RTU DCON	RS-485
tM series	DCON Modbus RTU Modbus ASCII	RS-485
M-2000	Modbus RTU DCON	RS-485
M-6000	Modbus RTU DCON	RS-485
I-87K	DCON	I-87Kn I/O Expansion Unit (RS-485) RU-87Pn I/O Expansion Unit (RS-485)
Sensor Series	Modbus RTU DCON	RS-485
SC Series	Modbus RTU DCON	RS-485
LC Series	Modbus RTU DCON	RS-485
DALI Gateway	Modbus RTU DCON	RS-485
I-8K/I-87K	DCON	IP-8411/IP-8811/I-8410/I-8411/I-8810/I-8811 (RS-485)

4.4.2. USB Interface

Module	Protocol	Comments
I-87K	DCON	USB-87Pn I/O Expansion Unit (USB Port)

http://ftp.icpdas.com/pub/cd/8000cd/napdos/87pn io unit/usb-87pn/



it necus to motan obb arrea

http://ftp.icpdas.com/pub/cd/8000cd/napdos/87pn io unit/usb-87pn/



4.4.3. Ethernet interface but using VxComm Port as communication port

The VxComm Driver creates virtual COM ports in Windows and maps them to the serial ports of the Slave I/O series device servers through the Internet/Ethernet network. The user's RS-232 client programs need only to change to the virtual COM port to access the serial devices connected to the device servers through the network.

Module	Protocol	Comments	
I-87K	DCON	ET-87Pn Ethernet I/O Expansion Unit (VxComm Port)	
FRnet Products	DCON	I-7188EF-016/I-7188EFD-016 (VxComm Port)	
		(using VxComm Port via Ethernet Port 9999)	
I-8K/I-87K		DCON	

For PC or Laptop to configure Ethernet remote I/O modules

Download VxComm Utility

http://ftp.icpdas.com/pub/cd/8000cd/napdos/driver/vxcomm_driver/

Install VxComm Port (Port I/O)

VxComm Utility [v2.13.12 File Server Port Tools	2, Mar.06, 2018]					1				
Add Server(s) Web Web Memore Server Web Memore Servers Configuration (UDP) Exit	- VxComm Serve	server		Configure	e Server	↓	IP Range Server Server IP Rang IP Rang Include 0 (N Virtual COM P(Fixe Map	Server Options Port Option Information Name : ET-87PN:1-00 Je Start : 10.1.1.123 Je End : 10.1.1.123 Is the following special IP : et I 254 (Gateway) I COM and 1/0 Port Mappings ort : COM30 I d baudrate, use current setti s virtual COM ports to "Port	rs Get name auto Skip duplicated 255 (Broadcast) Select the COM ngs of servers. 40" on servers.	natically IIP A Port number Cancel
	1. Cho Name ET-87PN:1-00	ose IP addres Alias N/A	S IP Address 10.1.1.123	Sub-net Mask 255.255.0.0	Gateway 10.1.0.254				3.	

VxComm Utility [v2.13.12, Mar.06, 2018] File Server Port Tools



DCON Utility Pro V 2.0.0.8	×	B DCON Utility Pro V 2.0.08	×
Comport Option Select Com port			
COM Port Timeout		Start Address 0 Elia Address 255	
1. tddress COM30 V 300 ms		ID Address Baud Rate Checksum Format Status Description	Ethornot/
		Trans Iting Tiszoo bable Nysz Naco comig. Enableto (bicongo siec naco comiguiadan	construct
Baud Rate Protocol Checksum Format			
☑ 11520 □ 57600 □ 38400 □ 19200	4		
☑ 9600 □ 4800 □ 2400 □ 1200			
OK Cancel			
COM:1		COM:30	

4.4.4. Zigbee interface



http://www.icpdas.com/root/product/solutions/industrial wireless communication/wireless solutions/ wireless selection.html#e

Module	Protocol	Comments
ZigBee Products	Modbus RTU DCON	RS-485 + ZB Converter

Setup the ZT-2000 Converter

http://ftp.icpdas.com.tw/pub/cd/usbcd/napdos/ZigBee/zt_series/utility/

- 1. Connecting to the ZT-2000 Converter Connect the ZT-2000 Series converter to the Host system using the either USB, an RS-232 or an RS-485 cable.
- Execute the ZT-2000 Topology Tool and click the COM Port menu item. Select the relevant COM Port number from the drop-down menu, and then select the data format and Baud Rate for the serial port. Click the OK button to initialize communication with the device.

	Device Inform	mation	
ZT-2009 Series Topology Utility	(1) COM Port No.	COM3	•
COM Port	(2) Parity Check	N,8,1	•
COM3 N, 8, 1 115200	(3) Baud Rate	115200	•
	ОК	Cano	el



Run DCON Utility Pro and select the appropriate COM Port settings to connect to the ZigBee Coordinator (ZT-2550/ZT-2570).

5. Configure Backplane Local Slot I/O modules



Below table show PAC model type and OS relation:

PAC OS	WP-8000 WP-5000	XPAC-8000	ViewPAC	The others	Backplane COM port
CE5	WP-8xxx WP-51xx		VP-41xx, VP-25Wx VP-23Wx		СОМО
CE6		XP-8xxx-CE6 XP-8xxx-Atom-CE6			COM1
CE7 (ARM CPU)	WP-5231 WP-5231-3GWA		VP-4231-CE7	IWS-2231-CE7 IWS-3231-CE7 IWS-4231-CE7	СОМО
WES		XP-8xxx XP-8xxx-Atom		iPPC-6631-WES7	COM1

Module	Protocol	Comments
I-87K	DCON	Backplane COM Port, Serial bus
I-8K	I/O API	Backplane Data Bus, Parallel bus

Default communication settings of I/O modules are list at the below table.

	І-7К	I-87K	M-7K, tM and other modules which support Modbus RTU protocol
Protocol	DCON Protocol	DCON Protocol	Modbus Protocol
Address	1	1	1
Baud rate	9600	115200	9600
Checksum	Disabled	Disabled	Not defined

Initial communication settings of I/O modules are list at the table below.

	I-7K, M-7K, tM and other modules	I-87K
Address	0	0
Baud rate	9600	115200
Checksum	Disabled	Disabled
Protocol	DCON Protocol	DCON Protocol

Note: The default settings and initial settings are different.

Note: The Ethernet I/O unit can't power on with INIT* status to get the default communication setting, because when INIT* connect to INIT*COM, the firmware cannot be auto executed by the MiniOS7.

Module	Protocol	Comments
I-87K	DCON	ET-87Pn Ethernet I/O Expansion Unit (VxComm Port)
FRnet Products	DCON	I-7188EF-016/I-7188EFD-016 (VxComm Port)
		(using VxComm Port via Ethernet Port 9999)
I-8K/I-87K	DCON	IP-8441/IP-8841/I-8430/I-8431/I-8830/I-8831/I-8KE4/I-8KE8
		(VxComm Port)

Appendix A. Trouble Shoot

DCON Utility needs to install Microsoft .NET Framework 3.5 or later version. User can download it from WEB: <u>http://www.microsoft.com/en-us/download/details.aspx?id=21</u>

Install the .NET Framework 3.5 on Windows 10, Windows 8.1, and Windows 8

You may need the .NET Framework 3.5 to run an app on Windows 10, Windows 8.1, and Windows 8. You can also use these instructions for earlier Windows versions.

Install the .NET Framework 3.5 on Demand

You may see the following configuration dialog if you try to run an app that requires the .NET Framework 3.5. Choose Install this feature to enable the .NET Framework 3.5. This option requires an Internet connection.



Why am I getting this pop-up?

The .NET Framework is created by Microsoft and provides an environment for running applications. There are different versions available. Many companies develop their apps to run using the .NET Framework, and these apps target a specific version. If you see this pop-up, you're trying to run an application that requires the .NET Framework version 3.5, but that version is not installed on your system.

Enable the .NET Framework 3.5 in Control Panel

You can enable the .NET Framework 3.5 through the Windows Control Panel. This option requires an Internet connection.

- Press the Windows key Windows
 on your keyboard, type "Windows Features", and press Enter.

 The Turn Windows features on or off dialog box appears.
- 2. Select the .NET Framework 3.5 (includes .NET 2.0 and 3.0) check box, select OK, and reboot your computer if prompted.



You don't need to select the child items for Windows Communication Foundation (WCF) HTTP Activation and Windows Communication Foundation (WCF) Non-HTTP Activation unless you're a developer or server administrator who requires this functionality.

Troubleshoot the installation of the .NET Framework 3.5

During installation, you may encounter error 0x800f0906, 0x800f0907, 0x800f081f, or 0x800F0922, in which case refer to .NET Framework 3.5 installation error: 0x800f0906, 0x800f0907, or 0x800f081f to see how to resolve these issues.

If you still can't resolve your installation issue or you don't have an Internet connection, you can try installing it using your Windows installation media. For more information, see Deploy .NET Framework 3.5 by using Deployment Image Servicing and Management (DISM). If you don't have the installation media, see Create installation media for Windows.

How to Solve "can't find module" problem

If can't find I/O modules. There are some conditions to be caused this result. We will list some case and methods to solve problem.

- 1. If use the third party USB to RS-485 converter, please refer to next section.
- 2. Check the power supply and total watts or current consumption of the system.
- 3. Remove all other modules and just keep RS-485 converter and one "module" on RS-485 bus as below



- 4. Let the "module" at INIT* to GND state then power on the "module", at this moment the "module" should be at initial state.
- 5. Run DCON Utility Pro and open "Command Line" tool to check the following commands.

Tool for Terminal (Command	1	0+8	9000s	×
COM Port	COM5	•	Protocol	DCON -	
Baud Rate	9600	•	Format	N,8,1-None Parity -	0 ,
Checksum	Disable	•	Address	1 - 7K Series -	Send
Timeout	100	• ms	Select ID	-	
Command	\$002				
Response	100000600	[21 30 3	0 30 30 30 36	30 30]	
	44444	:38 PM :38 PM :38 PM :38 PM	[\$00M];[! [\$00F];[! [\$00P];[! [\$002];[!	00tAD4P2C2]; [31 ms]==: 00A1.4]; [15 ms]==>OK 0031]; [31 ms]==>OK 00000600]; [31 ms]==>O	>OK K
			Clear	Save to \logger_	_report\

\$00M: make sure the module ID is correct.

\$00F: read the firmware version of module.

\$00P: to check the module used protocol (response !AASC).

- AA module address (Hex format · 00 ~ FF)0: only support DCON protocol
- S 1: support DCON and Modbus RTU protocol
 3: support DCON, Modbus RTU and Modbus ASCII protocol
 0: current use DCON protocol
- C 1: current use Modbus RTU protocol3: current use Modbus ASCII protocol

Note: For I-87K and I-7K modules, they don't support \$AAP command.

- \$002 to check the communication parameters (response !AATTCCFF)
- AA check module address
- TT type code
- CC check baud rate and parity

Baud Rate Setting (CC)

7	6	5	4	3	2	1	0
Da	ata	a Baud					
Key	Desc	ription	ription				
Baud	Baud	Baud Rate					
	03: 1	03: 1200					
	04: 2	04: 2400					
	05: 4	05: 4800					
	06: 9	06: 9600					
	07: 1	07: 19200					
	08: 3	08: 38400					
	09: 5	09: 57600					
	0A: 1	15200					
Data	Data	Format					
	0: N8	31					
	1: N8	1: N82					
	2: E8	2: E81					
	3: O8	3: O81					

FF check checksum

Data Format Setting (FF)



0: Disabled 1: Enabled	CS	Checksum setting
1. Enabled		0: Disabled
1. Endoled		1: Enabled

If we know the module protocol, address, baud rate, checksum and parity settings then we can

let the INIT* to normal state and use the exact communication parameters to search it.

If it still can't find this module, please mail to service@icpdas.com for service support.

The communication issues for Third party USB to RS-485 Converter

ICPDAS I/O modules need pull high and pull low resistors on RS-485 network for stable signal. If not, the signal on RS-485 may become unstable and may be caused communication problems as below list. Problem phenomenon:

- 1. Can't communicate with I/O modules.
- 2. Modules work normal last time, and work abnormal this time.
- 3. Some/Sometimes modules work normal, some/sometimes modules work abnormal.

The RS-485 master is required to provide the bias resistors for I/O modules. There are some solutions can fix this problem:

1. Use ICPDAS converter or PAC: ICPDAS converter and PAC with a pull high and pull low resistors. It can improve communication signal on RS-485 network. About more detail information for all series converter, please refer

http://www.icpdas.com/root/product/solutions/industrial communication/industrial communicati on products.html#Converter



2. Add the Bias Resistor on RS-485 Network for stable signal:



3. Add tM-SG4 or SG-785: tM-SG4 and SG-785 with pull high and pull low resistors. It also can improve communication signal on RS-485 network. About more detail information for all series converter, please refer below :

tM-SG4

http://www.icpdas.com/root/product/solutions/signal_conditioning_modules/sg-700/tm-sg4.html

SG-785:

http://www.icpdas.com/products/DAQ/signal/sg-785.htm



Appendix B. Revision History

This chapter provides revision history information to this document.

The table below shows the revision history.

Revision	Date	Description
1.0.1	January 2019	Initial issue
2.0.1	January 2019	Various bug fixes and performance improvements.