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How to use DCON_Utility Pro to configure modules on Linux PAC platform?

The main execution platform of DCON Utility Pro is Windows series platform, please refer to the following list <https://www.icpdas.com/tw/download/index.php?root=&model=&kw=DCON%20Utility>

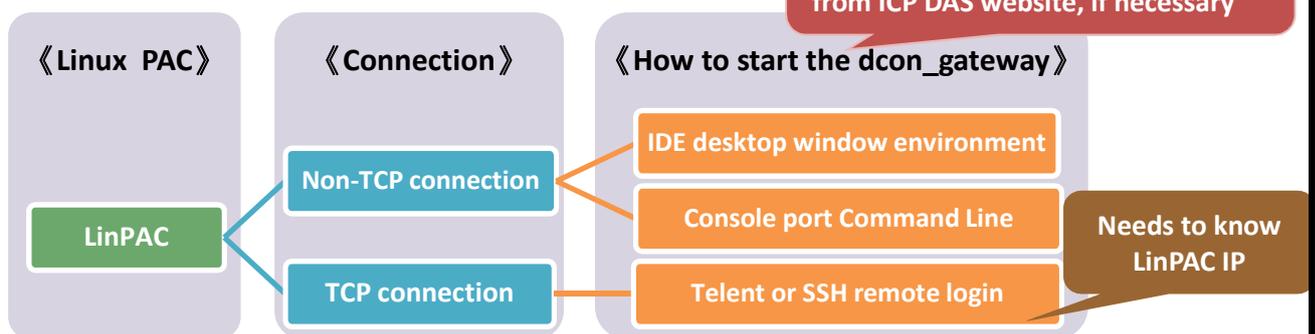
Filename	Description
DCON Utility Pro PC version	For Windows XP/7/8/10 PC and WES PAC
DCON Utility Pro WinCE5.0 version	For WinCE 5.0 PAC
DCON Utility Pro WinCE 7.0 version	For WinCE 7.0 PAC
DCON Utility Pro WinCE6.0 version	For WinCE 6.0 PAC

This section will consist of four parts, which are described below:

Linux PAC platform support method

From V4.0.0.2, DCON Utility Pro provides the DCON_Gateway program to be executed on the Linux platform, and then the PC can configure the module through the specified COM Port via the Ethernet connection. The operation method is as follows.

1. Start the DCON_Gateway program on the Linux PAC host first. This part can be executed by connecting to the console port of LinPAC through the RS-232 of the PC or connecting to the telnet port through the Ethernet.



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There are two ways to start the DCON_Gateway program. The following is an example of LP-5231:

A) Connect the Console port of LinPAC to the RS-232 of the PC, and execute the program directly on the LinPAC host

Method 1: After logging in through the terminal software (for example: HyperTerminal), then enter: **dcon_gateway_lp5k**

```

root@LP-5231:~# dcon_gateway_lp5k
10.1.0.50

```

Method 2: Connect the screen, keyboard and mouse, after logging in, through the text window on the desktop, enter: **dcon_gateway_lp5k**

```

root@LP-5231:~# dcon_gateway_lp5k
10.1.0.50

```

B) Connect to the Internet route, connect to LinPAC remotely, and execute the program

Step 1: Query LP-8421 IP

Method 1: Connect the console port of LinPAC to the PC (after logging in through the terminal program, enter: **ifconfig**)

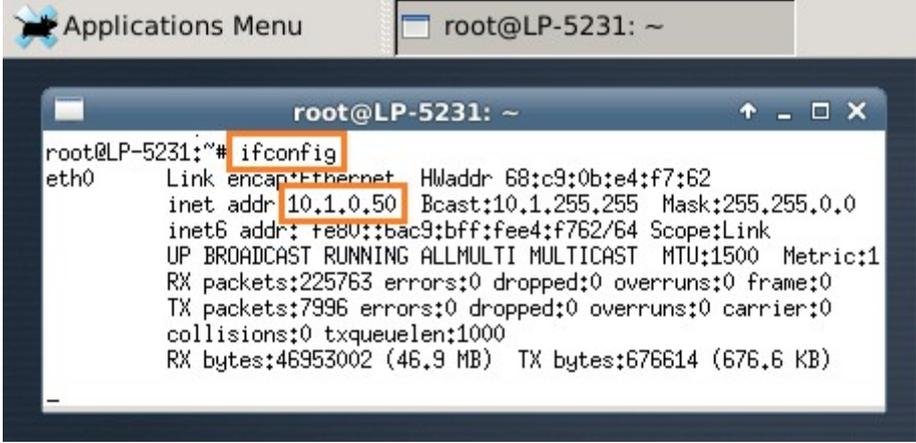
```

root@LP-5231:~# ifconfig
eth0  Link encap:Ethernet  HWaddr 68:c9:0b:e4:f7:62
      inet addr: 10.1.0.50  Bcast:10.1.255.255  Mask:255.255.0.0
      inet6 addr: fe80::6ac9:bff:fee4:f762/64  Scope:Link
      UP BROADCAST RUNNING ALLMULTI MULTICAST  MTU:1500  Metric:1
      RX packets:247425  errors:0  dropped:0  overruns:0  frame:0
      TX packets:8486  errors:0  dropped:0  overruns:0  carrier:0
      collisions:0  txqueuelen:1000
      RX bytes:49527407 (49.5 MB)  TX bytes:1117302 (1.1 MB)

```

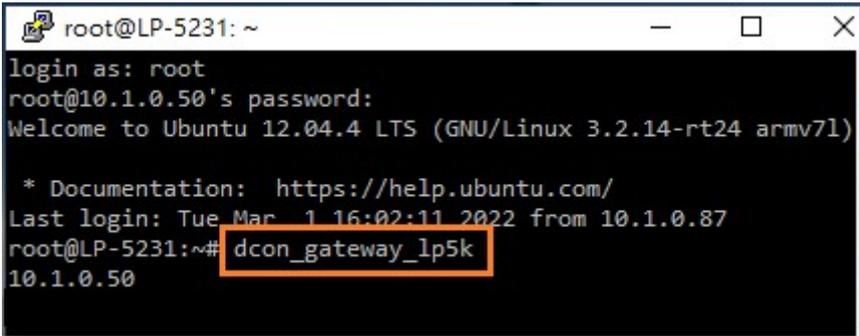
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Method 2: Run the program directly on the LinPAC host (Terminal Emulator, input: **ifconfig**)



```
root@LP-5231:~# ifconfig
eth0      Link encap:Ethernet  HWaddr 68:c9:0b:e4:f7:62
          inet addr: 10.1.0.50  Bcast:10.1.255.255  Mask:255.255.0.0
          inet6 addr: fe80::bac9:bff:fee4:f762/64  Scope:Link
          UP BROADCAST RUNNING ALLMULTI MULTICAST MTU:1500 Metric:1
          RX packets:225763 errors:0 dropped:0 overruns:0 frame:0
          TX packets:7996 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:46953002 (46.9 MB)  TX bytes:676614 (676.6 KB)
```

Step 2: Use Telnet or SSH tool to log in to LinPAC remotely, enter the command:
dcon_gateway_lp5k

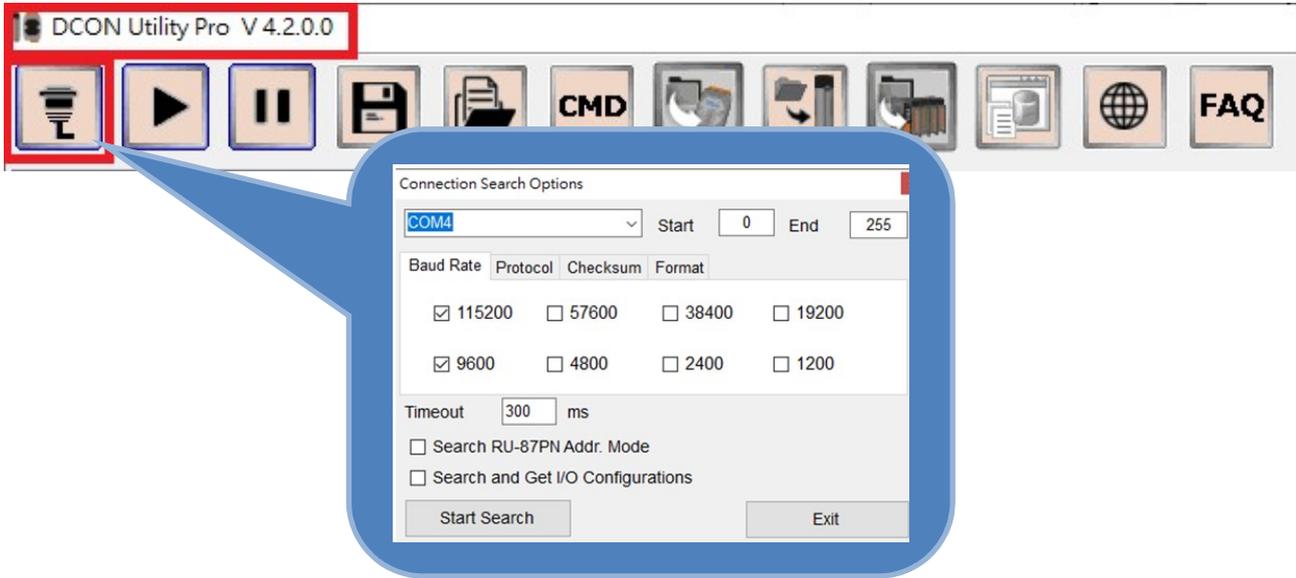


```
root@LP-5231:~#
login as: root
root@10.1.0.50's password:
Welcome to Ubuntu 12.04.4 LTS (GNU/Linux 3.2.14-rt24 armv7l)

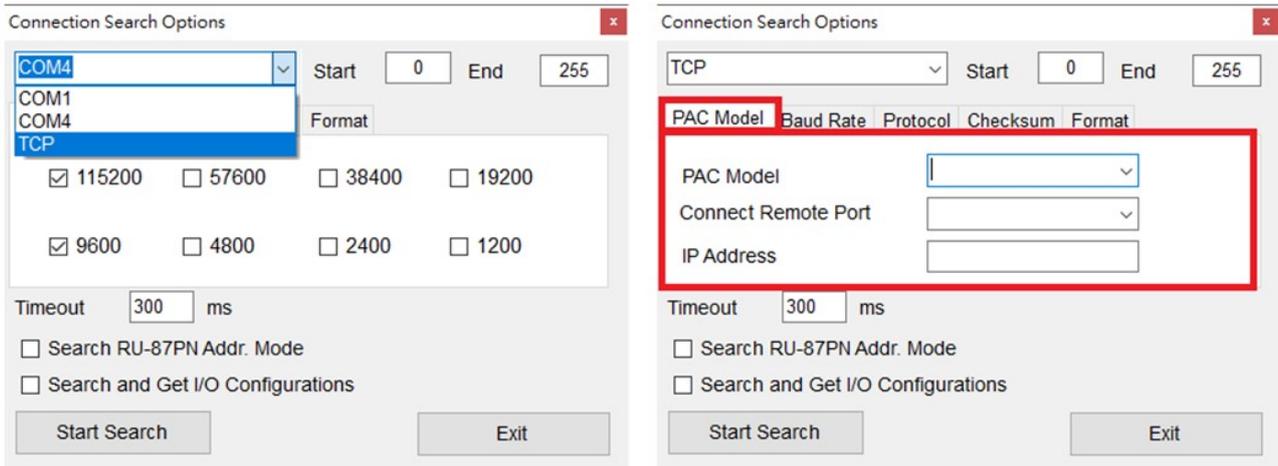
* Documentation:  https://help.ubuntu.com/
Last login: Tue Mar  1 16:02:11 2022 from 10.1.0.87
root@LP-5231:~# dcon_gateway_lp5k
10.1.0.50
```

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2. Run the version after DCON_Utility_Pro V4.2.0.0 on the PC side, select the “Connection Options” option, the new connection option has a TCP interface in addition to the COM Port interface of the PC system itself.



After selecting the TCP connection, the original connection parameter option will have an additional PAC Model tab



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Search backplane I-87K module

Select the connected Linux host model and the corresponding COM Port, and enter the IP address of the host. Now we demonstrate the connection to search for the I-87K modules on LP-8421 backplane.

The screenshot shows the 'Connection Search Options' dialog box. The 'TCP' protocol is selected. The 'Start' field is set to 1 and the 'End' field is set to 4. The 'PAC Model' dropdown is set to 'LP-8421', 'Connect Remote Port' is 'COM1[Backplane]', and 'IP Address' is '10.0.8.45'. The 'Timeout' is set to 300 ms. There are two unchecked checkboxes: 'Search RU-87PN Addr. Mode' and 'Search and Get I/O Configurations'. The 'Start Search' button is highlighted with a red box.

Remarks 1. The backplane COM1 Port only supports the setting of I-87K/I-97K series DCON modules. Other I-8K/I-9K modules are directly controlled by API (SDK), not set by communication commands.

The screenshot shows the 'Connection Search Options' dialog box with the 'Protocol' tab selected. The 'DCON' checkbox is checked and highlighted with a red box. The 'Modbus RTU' and 'Modbus ASCII' checkboxes are unchecked. The 'Start Search' button is visible at the bottom left.

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Remark 2. Based on the protocol operation of DCON_Gateway, the communication station number (Address) of the I-87K module on the backplane represents the slot position where the module is located. In fact, the communication parameters of the I-87K module on the backplane are operated by the program on the Linux host.

The address number is 0, Baud rate 115200, Checksum disable, N,8,1 format, Open_Slot(slot) function must be used when controlling I-87K module; ChangeToSlot(slot); then the next control command and finally Close_Slot(slot);

The search results and related setting screens are as follows.

The screenshot displays the DCON Utility Pro V 4.2.0.0 interface. At the top, there is a toolbar with icons for Home, Play, Stop, Save, Print, CMD, and a list of device icons, followed by a 'FAQ' button. Below the toolbar is a table of COM ports:

COM*	ID	Address	Baud Rate	Checksum	Format	Status	Description	Comments
IP:10.0.8.45:COM1:Backplane								
87013:01:A:0:N81:DCON	87013	1[01h]	115200	Disabled	N,8,1	Remote Slot I/O	[DCON]4*AI (RTD)	Supported
87063:03:A:0:N81:DCON	87063	3[03h]	115200	Disabled	N,8,1	Remote Slot I/O	[DCON]4*DI + 4*DO	Supported
87017Z:04:A:0:N81:DCON	87017Z	4[04h]	115200	Disabled	N,8,1	Remote Slot I/O	[DCON]10/20 *AI(mA,mV,V)Differential/S...	Supported

Below the table, three configuration windows are open for different modules:

- 87013 Firmware[B106]:** Configuration window with settings: Protocol (INIT*) DCON, Address 1 [01H], Baud Rate (INIT*) 115200, Data Format (INIT*) N,8,1, Checksum (INIT*) Disabled, Type Code [20] +/- 100 ,PT 1, Analog Format Engineering Form, 60/50 Hz 60Hz. Includes an 'Exit' button.
- 87063 Firmware[A108]:** Configuration window with settings: Protocol (INIT*) DCON, Address 3 [03H], Baud Rate (INIT*) 115200, Data Format (INIT*) N,8,1, Checksum (INIT*) Disabled. Includes an 'Exit' button.
- 87017Z Firmware[B306]:** Configuration window with settings: Protocol (INIT*) DCON, Address 4 [04H], Baud Rate (INIT*) 115200, Data Format (INIT*) N,8,1, Checksum (INIT*) Disabled, Analog Format Engineering Form, Sample Mode Normal Mode, 60/50 Hz 60Hz, Response Delay 0 [Max.30ms]. Includes an 'Exit' button.

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Search Remote COM Port I/O modules

Then demonstrate searching for LP-8421 Remote COM2:ttyS0(RS-485 Port) which can support DCON/Modbus RTU/Modbus ASCII and other communication protocols.

Remark 3. Some definitions of COM Port on the Linux PAC host platform use names such as ttyS. For details, please refer to Appendix A.

The search results are as follows.

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Remark 4. Other COM2, COM3, COM4, COM5, COM36 can be connected to the remote I/O module of RS-485 interface and the I/O sensor module of RS-485 interface.

- Remote I/O module: <https://www.icpdas.com/en/product/p02.php?root=537>

RS-485 I/O Modules



- I/O Sensor modules: <https://www.icpdas.com/en/product/p02.php?root=298&kind=367>

IO/Sensor



If the specified COM Port itself is an RS-485 Port, it can directly connect to the RS-485 series modules. If it is RS-232 Port, you can connect RS-485 series modules through I-7520 RS-232 to RS-485 (you need to pay attention to the corresponding diagram of the Pin pin of RS-232 Port to check whether jumper processing is required)

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Search XV Board

Finally demonstrate the search and setting of LP-5231 with XV Board

The screenshot shows the 'Connection Search Options' dialog box. The 'TCP' protocol is selected. The search range is set from Start 1 to End 1. The 'PAC Model' is set to 'LP-5231' and the 'Connect Remote Port' is set to 'COM1[XVBoard]'. The 'IP Address' is '10.0.8.61'. The 'Timeout' is 300 ms. There are two unchecked checkboxes: 'Search RU-87PN Addr. Mode' and 'Search and Get I/O Configurations'. 'Start Search' and 'Exit' buttons are at the bottom.

XV Board only supports Modbus RTU protocol

The screenshot shows the 'Connection Search Options' dialog box with the 'Protocol' tab selected. The 'Modbus RTU' checkbox is checked and highlighted with a red box. The 'DCON' and 'Modbus ASCII' checkboxes are unchecked. The 'Timeout' is 300 ms. There are two unchecked checkboxes: 'Search RU-87PN Addr. Mode' and 'Search and Get I/O Configurations'. 'Start Search' and 'Exit' buttons are at the bottom.

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The search results are as follows.

The screenshot shows the DCON Utility Pro V 4.2.0.0 interface. At the top, there is a toolbar with icons for Home, Play, Stop, Save, Print, CMD, and FAQ. Below the toolbar is a table of search results:

ID	Address	Baud Rate	Checksum	Format	Status	Description	Comments
XV484	1[01h]	115200	Disabled	N,8,1	Remote I/O	[Modbus RTU]8*Counter/Frequency + 4*...	Supported

A red box highlights the search result: IP:10.0.8.61:COM1:XVBoard -> XV484:01:A:0:N81:MRTU. A configuration window titled "XV484 Firmware[A109]" is open, showing the following settings:

- Protocol: Modbus RTU
- Address: 1 (Hex: 01H)
- Baud Rate: 115200
- Data Format: N,8,1
- Checksum: Disabled
- Frequency Format: Hex Format
- Response Delay: 0 [Max. 30ms]

Buttons for "Exit", "Set Module Configurations", and "Clear" are visible. A status bar at the bottom reads "Wait for loading XV484"

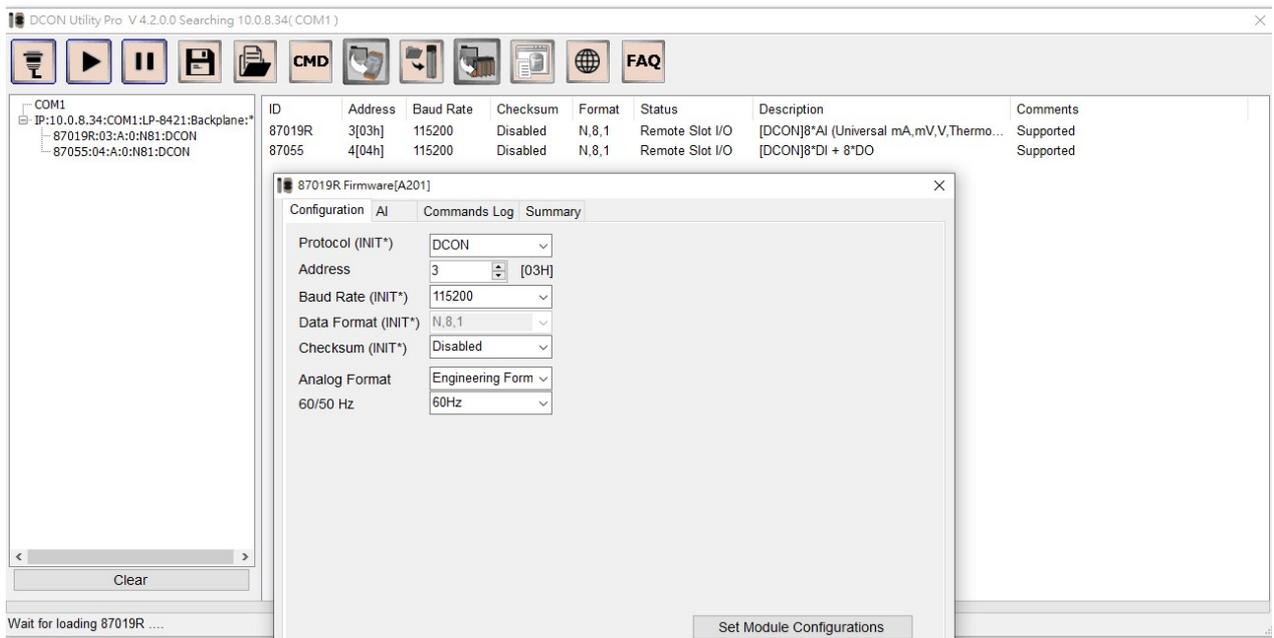
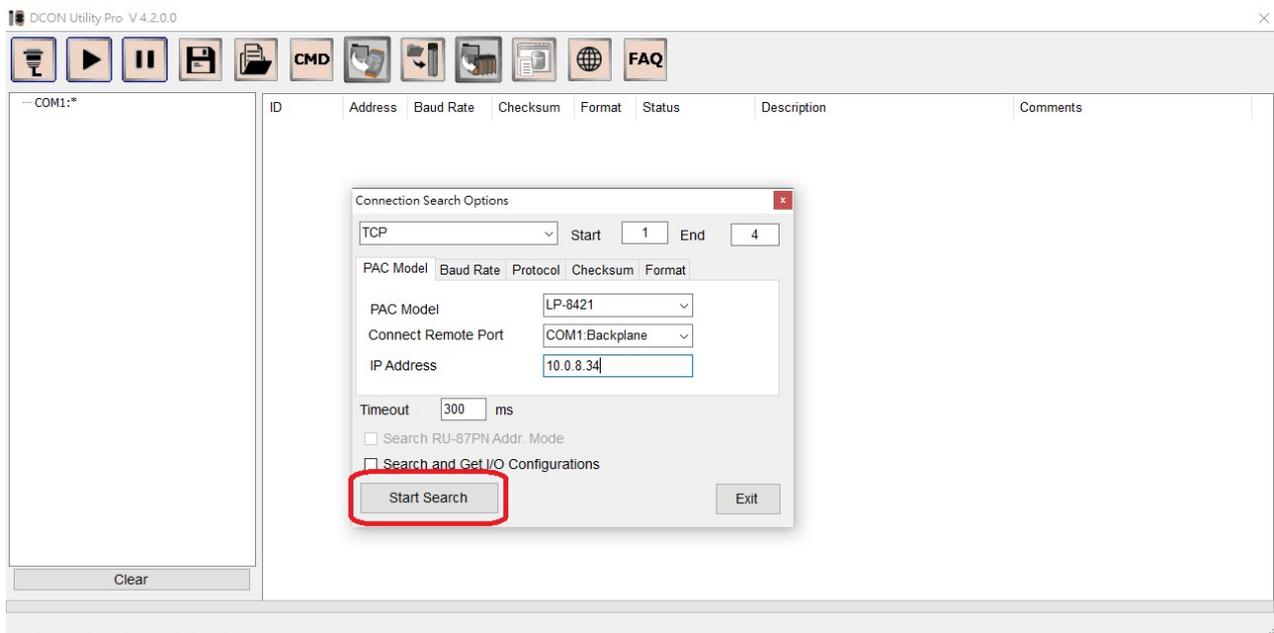
Remark 5. The LP-5231 COM1 Port only supports XV Board Modbus RTU I/O modules. Please refer to the link below for the module list.

https://www.icpdas.com/en/product/guide+Remote_I_O_Module_and_Unit+PAC_I_O_Modules+XV-board

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End the DCON_Gateway program

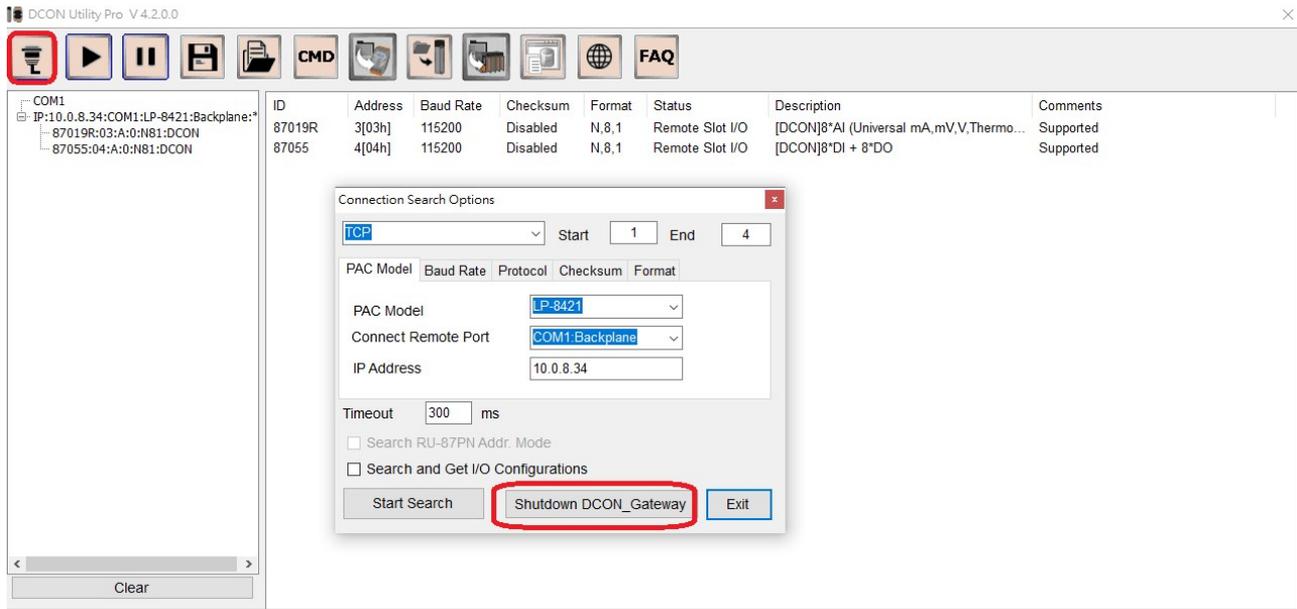
1. After the Linux PAC host executes DCON_Gateway, the program itself starts to count down. If there is no communication within 60 seconds after execution, the program will end automatically.
2. When the Linux PAC host executes DCON_Gateway, the PC side uses DCON Utility Pro to connect , search and module setting and other related procedures.



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3. After DCON Utility Pro completes the module setting, you can execute "Shutdown DCON_Gateway" through the connection setting option screen to end the DCON_Gateway program activated on the Linux PAC.

4. If the "Shutdown DCON_Gateway" program is not executed, the DCON_Gateway program which activated on the Linux PAC will end automatically after 120 seconds.



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**Appendix A: Linux host models supported by DCON Utility Pro and the default connection COM
Port name of each model**

Linux PAC model	DCON_Gateway File name	COM Port Supported	Comments
LP-8121	dcon_gateway_lp8k	COM1, COM2 (ttyS0), COM3 (ttyS1)	COM1 backplane Port
LP-8421		COM1,ttyS0(COM2),ttyS1(COM3), COM36(ttyS34)	COM1 backplane Port
LP-8821		COM1,ttyS0(COM2),ttyS1(COM3), COM36(ttyS34)	COM1 backplane Port
LP-9221		COM1,ttyS0(COM2),ttyS1(COM3), COM36(ttyS34)	COM1 backplane Port
LP-9421		COM1,ttyS0(COM2),ttyS1(COM3), COM36(ttyS34)	COM1 backplane Port
LP-9821		COM1,ttyS0(COM2),ttyS1(COM3), COM36(ttyS34)	COM1 backplane Port
LX-8031	dcon_gateway_lx8k	COM1(ttySA0),COM2(ttyS0),COM3(ttyS1),COM36(ttyS34)	ttySA0 backplane Port
LX-8131		COM1(ttySA0),COM2(ttyS0),COM3(ttyS1),COM36(ttyS34)	ttySA0 backplane Port
LX-8331		COM1(ttySA0),COM2(ttyS0),COM3(ttyS1),COM36(ttyS34)	ttySA0 backplane Port
LX-8731		COM1(ttySA0),COM2(ttyS0),COM3(ttyS1),COM36(ttyS34)	ttySA0 backplane Port
LX-9171	dcon_gateway_lx9k	COM1(ttySA0),COM2(ttyS0),COM3(ttyS1),COM36(ttyS34)	ttySA0 backplane Port
LX-9371		COM1(ttySA0),COM2(ttyS0),COM3(ttyS1),COM36(ttyS34)	ttySA0 backplane Port
LX-9771		COM1(ttySA0),COM2(ttyS0),COM3(ttyS1),COM36(ttyS34)	ttySA0 backplane Port
LX-9181		COM1(ttySA0),COM2(ttyS0),COM3(ttyS1),COM36(ttyS34)	ttySA0 backplane Port
LX-9381		COM1(ttySA0),COM2(ttyS0),COM3(ttyS1),COM36(ttyS34)	ttySA0 backplane Port
LX-9781		COM1(ttySA0),COM2(ttyS0),COM3(ttyS1),COM36(ttyS34)	ttySA0 backplane Port
LP-5231	dcon_gateway_lp5k	COM1, COM2(ttyO2), COM4(ttyO4), COM5(ttyO5)	COM1connect to XV Board