

DL-11

User Manual



RS-485 Remote Temperature and Humidity

Ver. 1.0, Jul. 2024

WARRANTY

All products manufactured by ICP DAS are warranted against defective materials for a period of one year from the date of delivery to the original purchaser.

WARNING

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If you have any questions, please feel free to contact us via email:
service@icpdas.com



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1. Introduction

The DL-11 is a RS-485 remote Temperature/Humidity/Atmospheric pressure/Dew Point sensing module that gives you real time temperature and humidity information at the same time. It contains an RS-485 communication interface and a sensor for measuring temperature, humidity, atmospheric pressure, dew point sensing.

The DL-11 module supports Modbus RTU communication protocol for getting measured temperature and humidity values. DCON Utility Pro provides easy and convenient interfaces for users to configure the module. Based on an amazing tiny form-factor, the DL-11 achieves the maximum space savings that allows it to be easily installed anywhere.

1.1 Package List

The shipping package includes the following items:



DL-11



Quick Start

NOTE

If any of these items is missing or damaged, please contact your local distributor for more information. Keep the shipping materials and overall package in case you want to ship the module back in the future.

More Information

- Product Page:

<https://www.icpdas.com/en/product/DL-11>

Documentation:

<https://www.icpdas.com/en/download/index.php?model=DL-11>

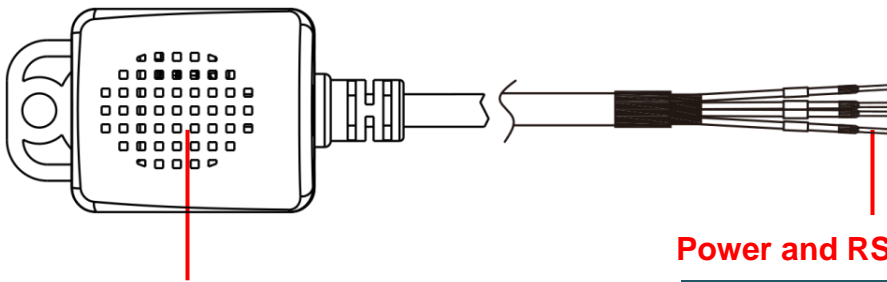
- Free Development Software – DCON Utility Pro:

https://www.icpdas.com/en/product/guide+Software+Utility_Driver+DCON_Utility_Pro

2. Hardware Information

2.1 Appearance & Pin Assignments

Front Panel

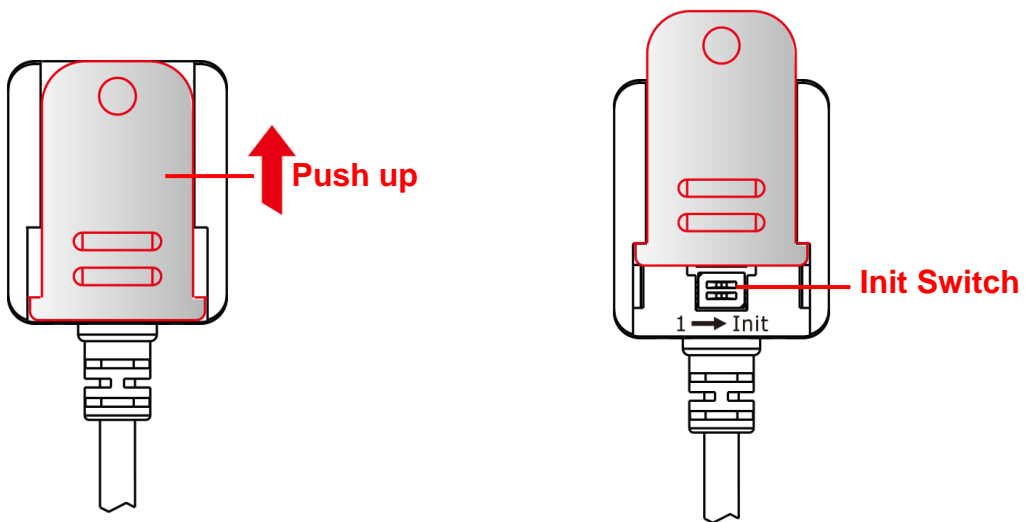


Temperature / Humidity and
Atmospheric pressure Sensor

Power and RS-485 Connector

CONN	Color	Pin Assignment
1	White	D-
2	Red	Vcc
3	Black	GND
4	Green	D+

Rear Panel



Push up

Init Switch

2.2 Specification

Temperature Sensor	
Measuring Range	-25 ~ +75 °C (-13 ~ +167 °F)
Resolution	0.1 °C
Accuracy	Typical: ± 0.4 °C @ 0 ~ 60 °C; refer to Figure 2
Precision	± 0.1 °C
Humidity Sensor	
Measuring Range	0 ~ 95% RH
Resolution	0.1% RH
Accuracy	Typical: ± 3% RH @ 20 ~ 80 % RH; refer to Figure 1
Precision	± 0.1% RH

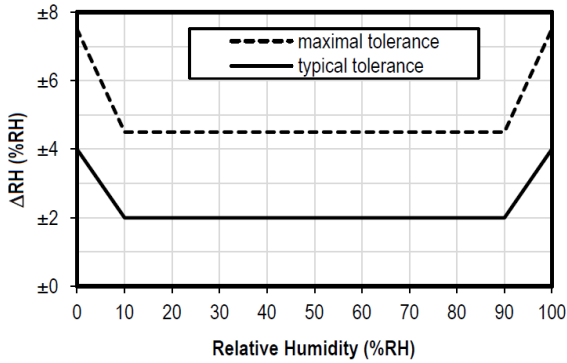


Figure 1 Tolerance of RH at 25°C for sensor.

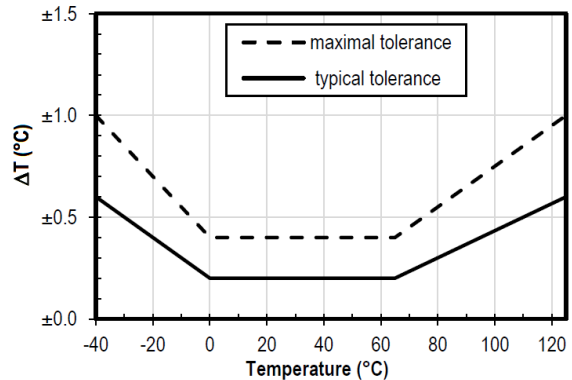


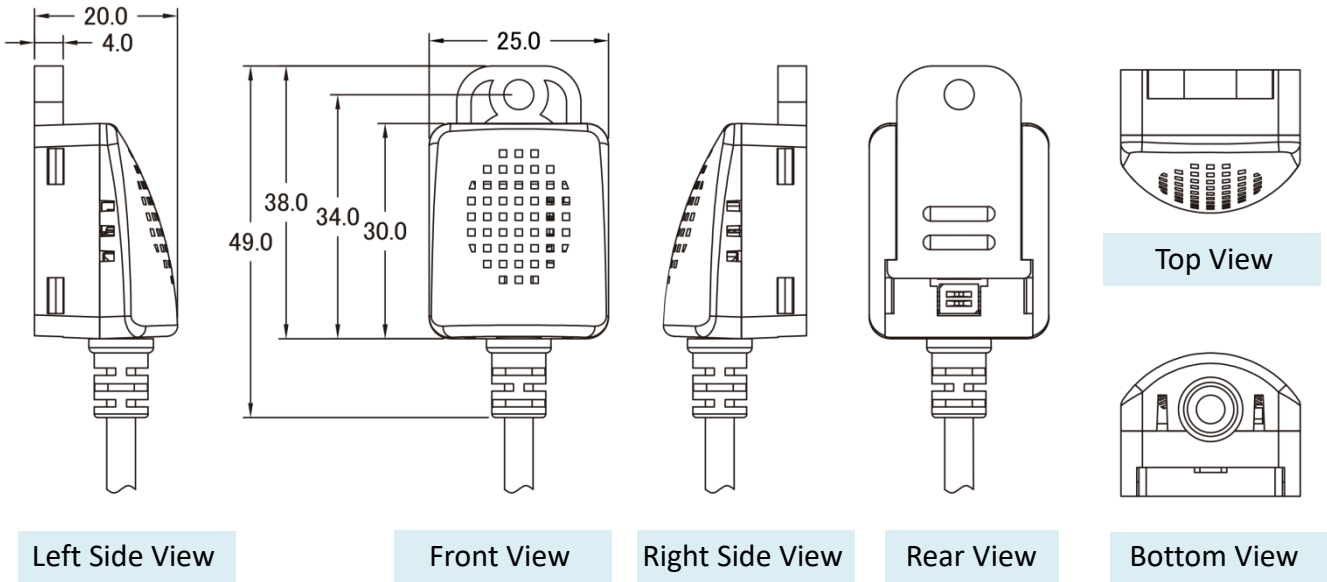
Figure 2 Temperature accuracy of the sensor.

Dew Point	
Range	Calculated using temperature and relative humidity
Resolution	0.1 °C
Atmospheric Pressure	
Range	300 ~ 1200 hPa
Accuracy	1 hPa
Resolution	0.1 hPa
Communication	
Interface	1 x RS-485; non-isolated
Baudrate	1200 ~ 115200 bps
Data Format	N, 8, 1
Protocol	Modbus RTU
Max. Modules on same bus	32

Power	
Input Range	+10 ~ +30 V _{DC}
Consumption	0.05 W
Mechanical	
Dimensions (W x L x H)	25 mm x 20.2 mm x 30 mm
Installation	Magnetic mount; Wall mount
Cable Length	3 m
Environment	
Operating Temperature	-25 ~ +75 °C
Storage Temperature	-30 ~ +80 °C
Ambient Relative Humidity	0 ~ 95% RH, Non-condensing

2.3 Dimensions

Unit: mm



2.4 Factory Default Settings

Item	Default	Item	Default
Device ID	1	Data Format	N, 8, 1
Baud Rate	115200 bps		Parity: None
Protocol	Modbus RTU		Data Size: 8
			Stop Bits: 1

3. Getting Started

This chapter provides a basic overview of how to configure and operate your DL-11 module.

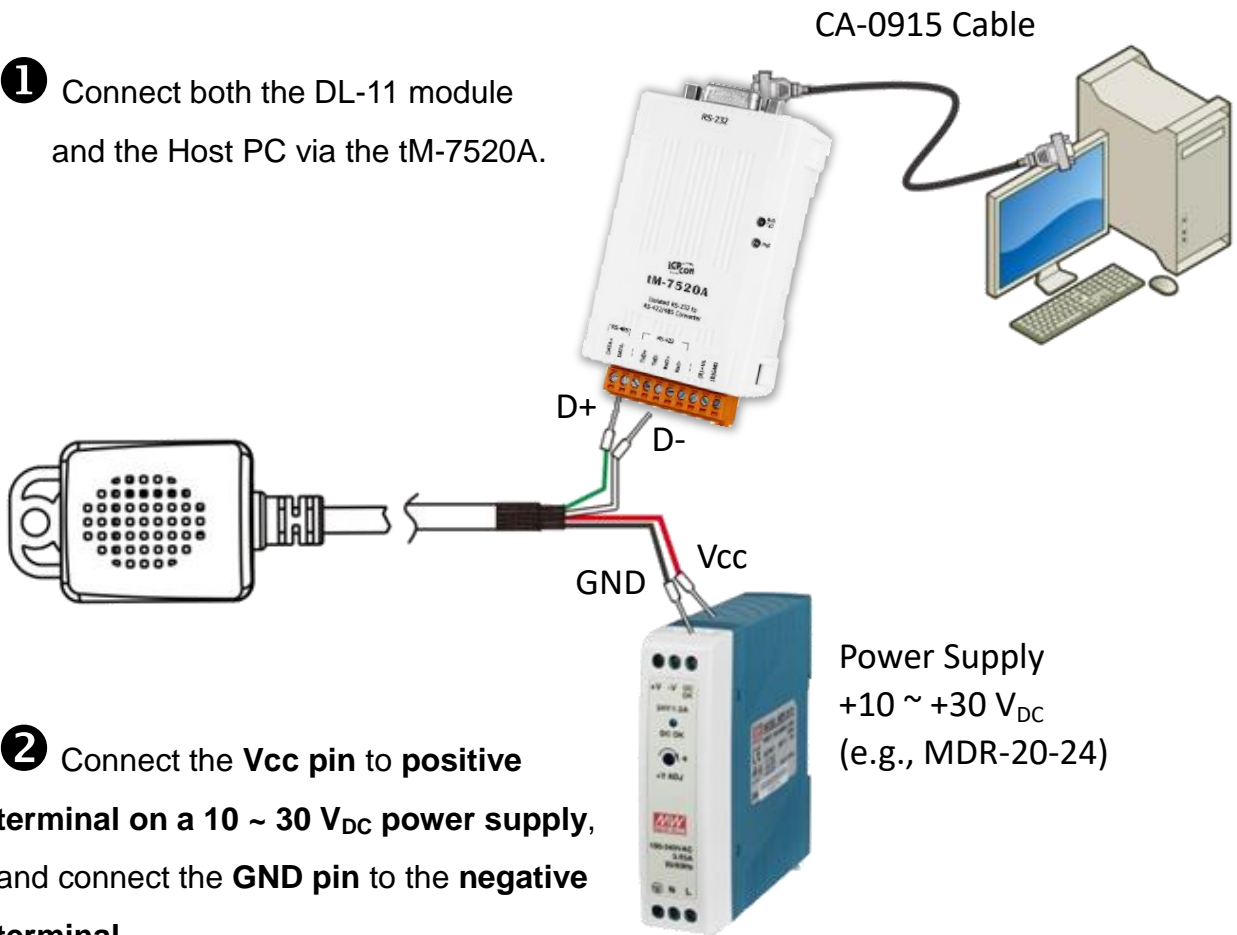
3.1 Connecting the Power and the Host PC

Prepare for device

- ☑ RS-232 to RS-485 Converter: tM-7520A (optional)
- ☑ Exterior power supply device: MDR-20-24 (optional)

Wiring


- 1 Connect both the DL-11 module and the Host PC via the tM-7520A.



- 2 Connect the **Vcc** pin to **positive** terminal on a 10 ~ 30 V_{DC} power supply, and connect the **GND** pin to the **negative** terminal.

3.2 Installing Software on Your PC

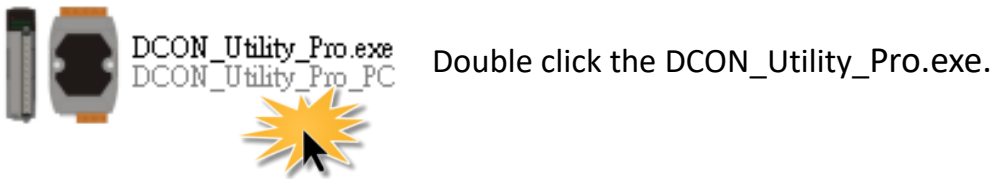
Download **DCON Utility Pro.zip** from the ICP DAS web site and decompress it

 <https://www.icpdas.com/en/download/show.php?num=1046>


3.3 Searching Module

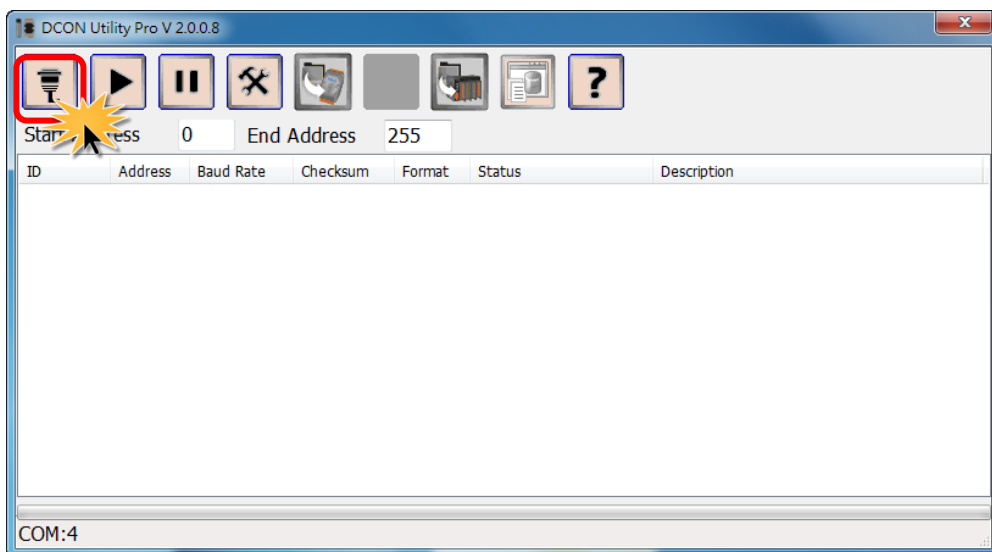
Step 1

Run the DCON Utility Pro software



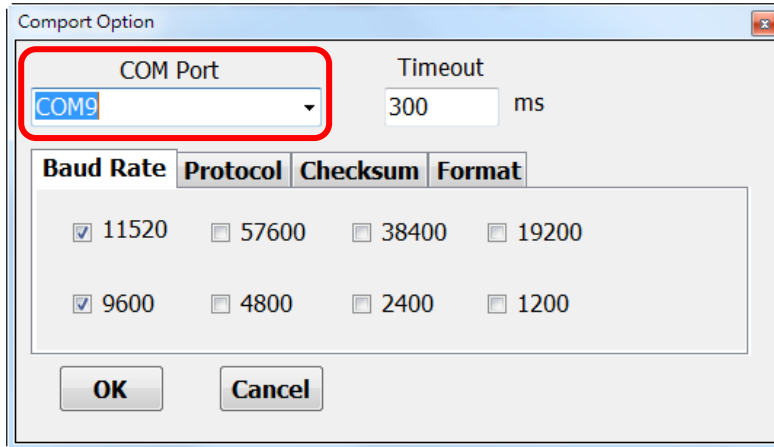
Step 2

Click the  button to open the “Comport Option” dialog box.



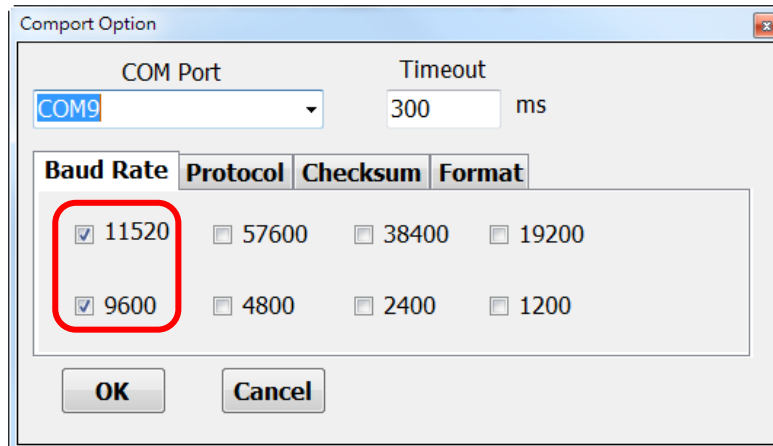
Step 3

Select COM Port (e.g., COM9) on the Host PC to which the DL-11 is connected.



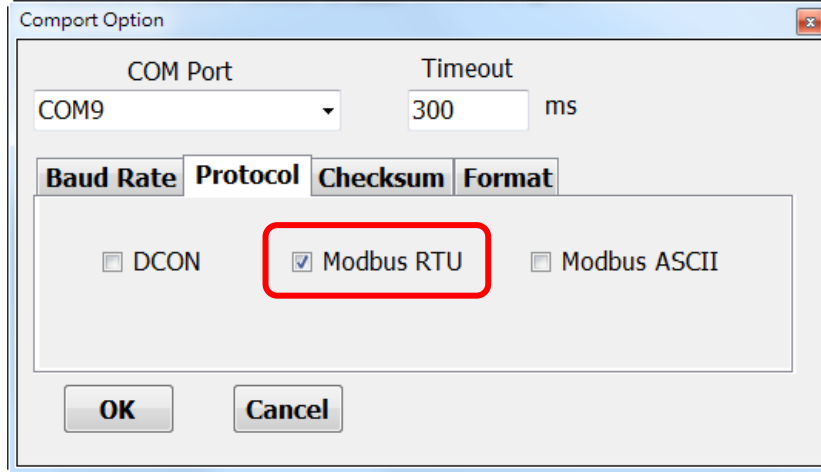
Step 4

Select the Baud Rate (e.g., 9600 and 115200) depends on DL-11 in the Baud Rate page.



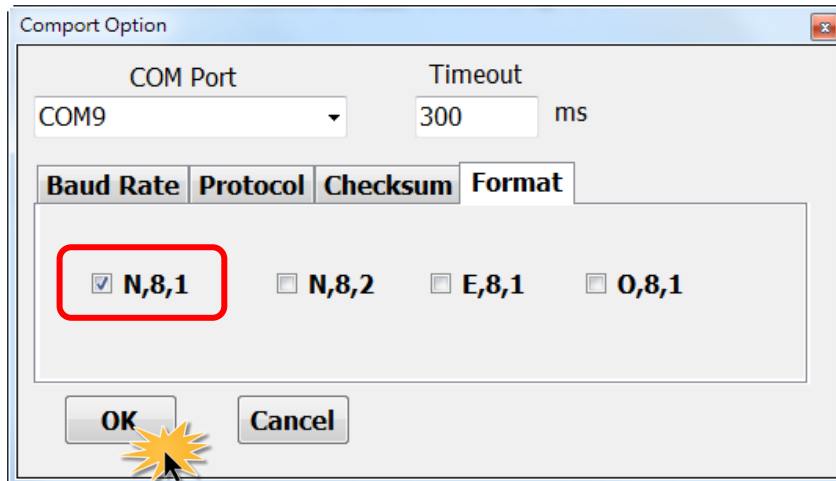
Step 5

Select the protocol that the DL-11 is using in the Protocol page.




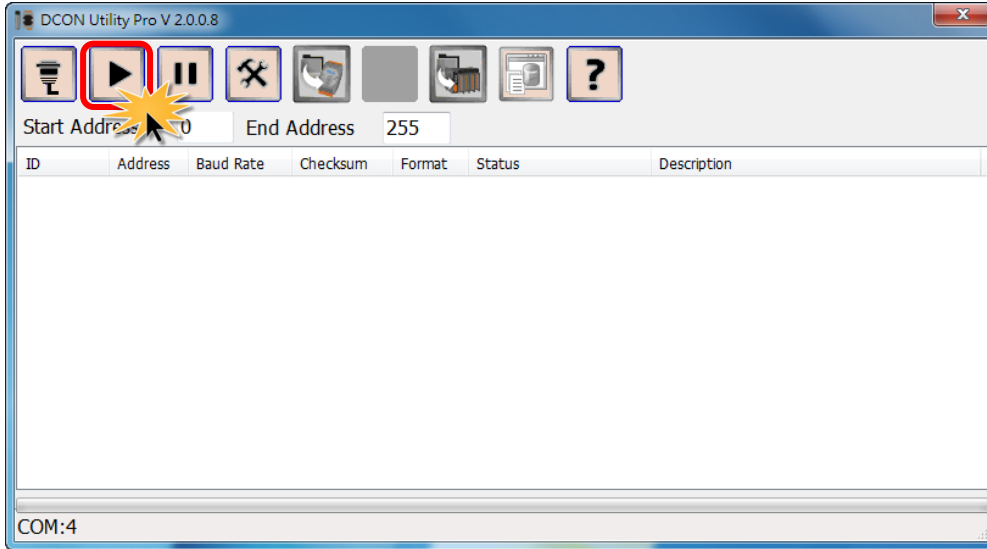
Step 6

Select the Data Format that the DL-11 is using in the Format page and click "OK".




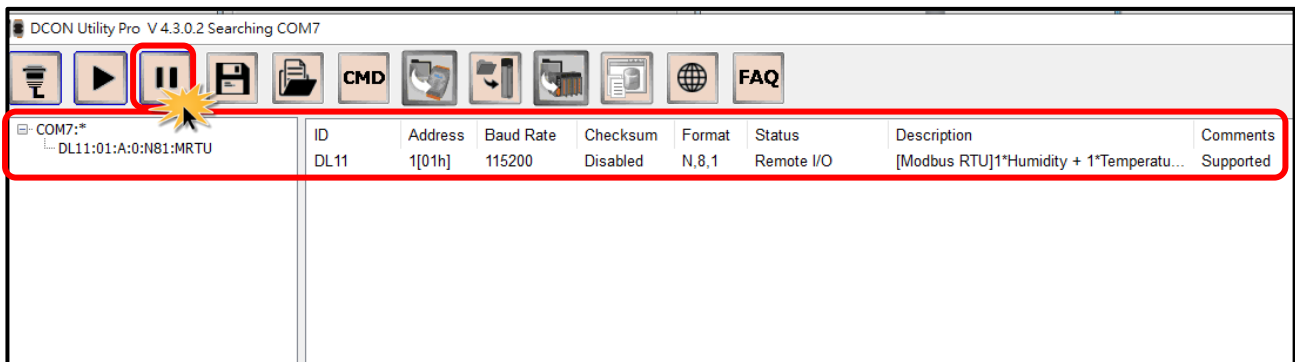
Step 7

Click the  button to search DL-11 module.



Step 8

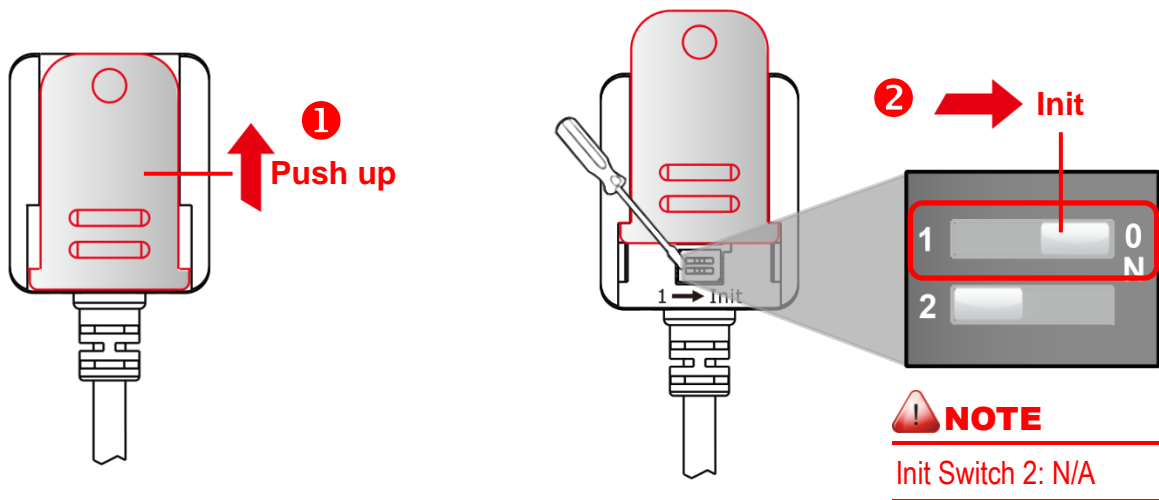
After the DL-11 module name is displayed in search list, click the  button.



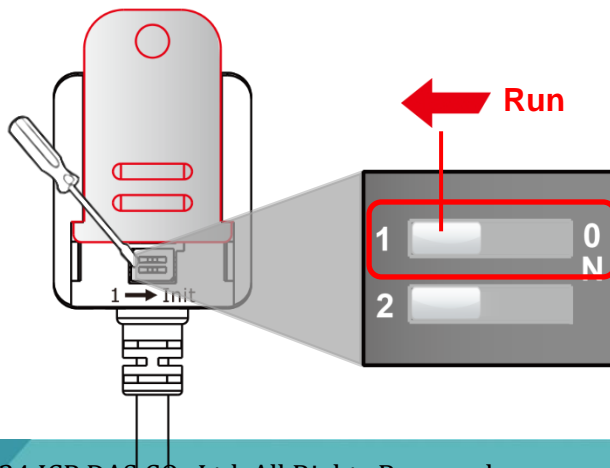
What to do when DCON Utility Pro cannot find the DL-11 module?

Ensure that the power supply and the RS-485 wiring for the DL-11 are configured correctly, refer to the [Section 3.1 Connecting the Power and the Host PC](#). If the DCON Utility Pro still cannot find the DL-11 when normal wiring and power up, please follow the procedures described below to solve the situation:

1. Use the blade of a flat-head screwdriver to set the “**Init Switch 1**” on the DL-11 to the “**ON**” (**Init Mode**) position, and **reboot** the module.

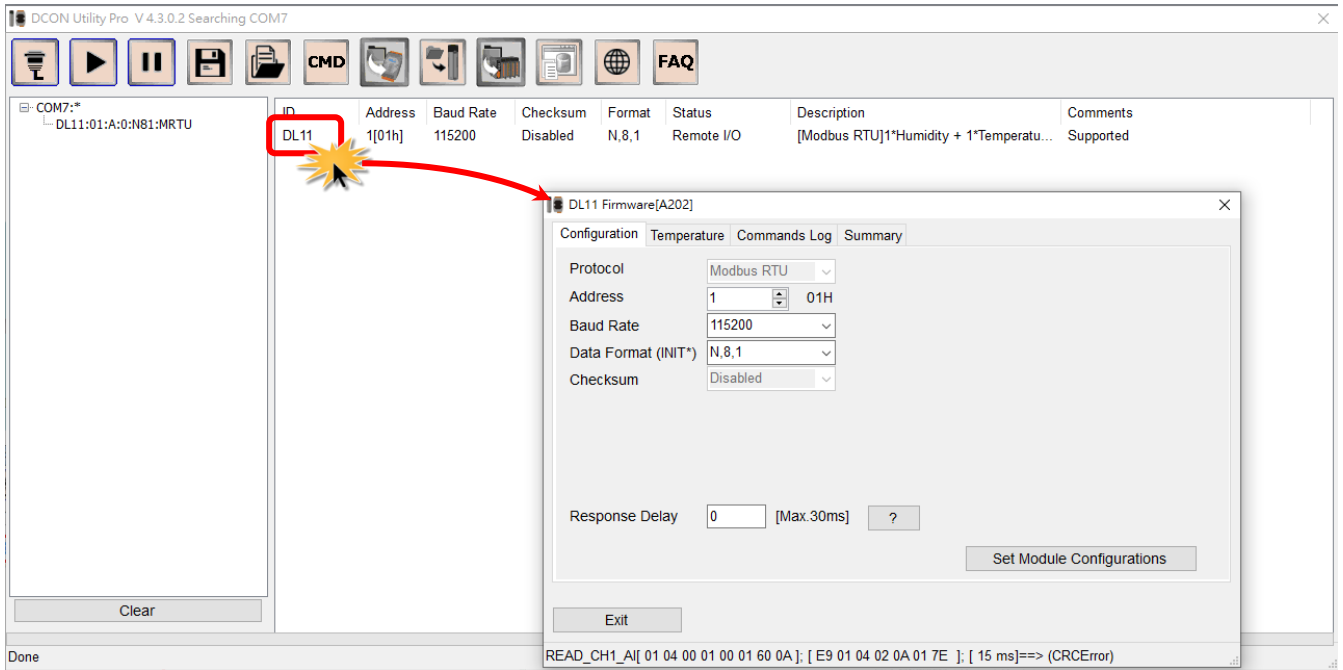


2. In the **Init mode**, refer to **Steps 2 to 8** in “[Section 3.3 Search Module](#)” to execute the search again.
3. Confirm that the DCON Utility Pro has found the DL-11, use the blade of a flat-head screwdriver to set the “**Init Switch 1**” on the DL-11 to the “**1**” (**Run Mode**) position, and **reboot** the DL-11 module.



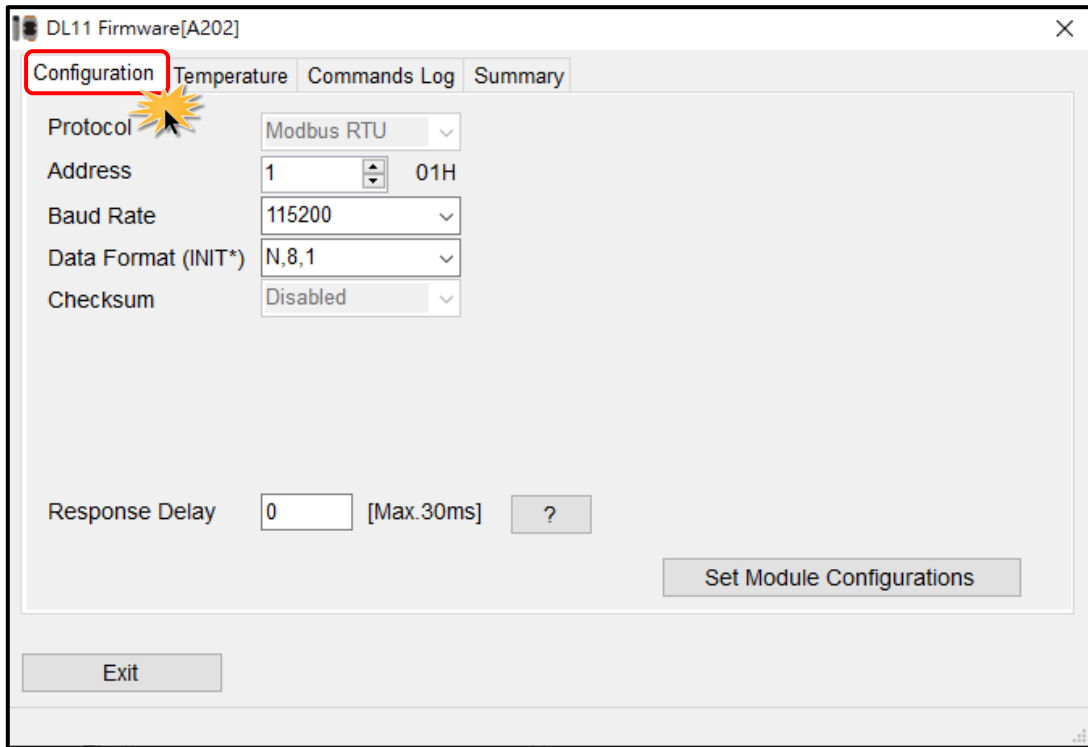
3.4 Configuring Module

In the DCON Utility Pro software, click the module name to open the configuration window, allowing you to configure the settings for DL-11 and verify the readings on the module, each of which will be described in more detail below.



Configuration

You can view and configure the settings on the DL-11 module, including the Address, Baud Rate and Data Format on the “**Configuration**” page.



The following is an overview of the parameters:

Item	Description
Address	Sets the device ID for the DL-11.
Baud Rate	Sets the Baud Rate for the module.
Data Format	Reads the Data Format on the module.
Set Module Configurations	Click this button to save the new settings to the module.

Temperature

On the “**Temperature**” page, you can view the measured values and set the offset for each item.

DL11 Firmware[A202]

Configuration **Temperature** Commands Log Summary

Degree of
 1 0.1

Humidity (%)		055.60		
Temperature	°C	028.46	+ -	-002.00
Temperature	°F	083.22	+ -	-000.50
Dew Point	°C	018.71		
Dew Point	°F	065.67		
Atmospheric Pressure (hPa)		9972	+ -	000.00
Altitude (m)		0134.0	+ -	000.00

Sea Level Pressure(800~1260 hPa)

READ_CH1_AI[01 04 00 01 00 01 60 0A]; [90 01 04 02 0B 1E 3E]; [15 ms]==> (CRCError)

The following is an overview of the parameters:

Item	Description
Humidity(%)	Displays humidity value
Temperature	Displays temperature value
Dew Point	Displays dew point temperature value
Atmospheric Pressure	Displays pressure value
Altitude	Displays altitude value calculated from atmospheric pressure
Sea Level Pressure	Enter the sea level pressure value and click the “ Save Sea Level Pressure To EEPROM ” to save it if needed.
Degree of offset	Sets the scale of offset to 1 or 0.1 unit of measurement item
Set	Click this button to save new offset settings.

4. Modbus Register Table (Base 0)

Discrete Inputs (1xxxx)

Register		Points	Description	Data Format	Attribute
DEC	HEX				
00283	011B		Write 1 to save sea level pressure to non-volatile memory	1	W
10272	0110	1	Read the reset status of a module. 0: The module has not been reset since the last read. 1: The module has been reset, and this is the first time to read the value.	0: Not Reset 1: Resetted	R

Input Register (3xxxx)

Register		Points	Description	Data Format	Attribute
DEC	HEX				
30000	000	1	Read the humidity value (unit: 0.0.1 %)	0 ~ 10000	R
30001	001	1	Read the temperature value in degrees Celsius (unit: 0.01°C)	-32768 ~ 32767	R
30002	002	1	Read the temperature value in degrees Fahrenheit (unit: 0.01°F)	-32768 ~ 32767	R
30003	003	1	Read the dew point temperature value in degrees Celsius (unit: 0.01°C)	-32768 ~ 32767	R
30004	004	1	Read the dew point temperature value in degrees Fahrenheit (unit: 0.01°F)	-32768 ~ 32767	R
30005	005	1	Read the air pressure in 0.1 hPa	2600 ~ 12600	R
30006	006	1	Read the low word of altitude in 0.1 m	-32768 ~ 32767	R
30007	007	1	Read the high word of altitude in 0.1 m	-32768 ~ 32767	R

30480	1E0	1	Read the firmware version (Minor number) Hexadecimal Representation	0x0000	R
30481	1E1	1	Read the firmware version (Major number) Hexadecimal Representation	0xA202	R
30482	1E2	1	Read the module name High byte = 0x00 Low byte = 0x11	0x0011	R
30483	1E3	1	Read the module name High byte = 0x44(ASCII: D) Low byte = 0x4C(ASCII: L)	0x444c	R

Holding Register (4xxxx)

Register		Points	Description	Data Format	Attribute	Factory Value
DEC	HEX					
40448	1C0	1	Read/Write the temperature offset value (unit: 0.01 °C)	-32768 ~ 32767	R/W	0
40449	1C1	1	Read/Write the humidity offset value (unit: 0.01%)	-32768 ~ 32767	R/W	0
40450	1C2	1	Read/Write the pressure offset value (unit:0.1 hPa)	-32768 ~ 32767	R/W	0
40451	1C3	1	Read/Write the altitude offset value (unit:0.1 m)	-32768 ~ 32767	R/W	0
40484	1E4	1	Read/Write the Device ID	1 ~ 247	R/W	01
40485	1E5	1	Read/Write the Baud Rate (bps) and Data Format Bit-5:Bit-0 (Baud Rate) 03: 1200 04: 2400 05: 4800 06: 9600 07: 19200 08: 38400 09: 57600 0A: 115200 Bit-7:Bit-6 (Data Format)	0x03 ~ 0xCA	R/W	0x0A

			00: no parity, 1 Stop bit 01: no parity, 2 Stop bits 10: even parity, 1 Stop bit 11: odd parity, 1 stop bit			
40487	1E7	1	Read/Write the response delay time in ms	0 ~ 30	R/W	0
40498	1F2	1	Read/Write the low word of sea level pressure in 0.01 hPa Default:1013.25 hPa	0x0 ~ 0xFFFF	R/W	0x8BCD
40499	1F3	1	Read/Write the high word of sea level pressure in 0.01 hPa	0x0 ~ 0xFFFF	R/W	0x1

Appendix: Revision History

This chapter provides revision history information to this document.

The table below shows the revision history.

Revision	Date	Description
1.0	Jul. 2024	Initial issue