

Quick Start Guide for tM-AD5

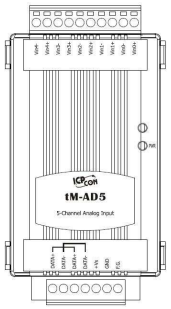
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Congratulations!

Congratulations on purchasing the tM-AD5 the most popular automation solution for remote monitoring and control applications. This Quick Start Guide will provide information needed to get started with the tM-AD5. Please also consult the User Manual for detailed information on the setup and use of the tM-AD5.

What's in the shipping box?

In addition to this guide, the shipping box includes the following items:



tM-AD5

Technical Support

- **ICP DAS Website**
  http://www.icpdas.com/

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1 Understanding the Hardware Specifications and Wiring Diagrams

Before installing the hardware, you should have a basic understanding of hardware specification and the wiring diagrams.

System Specifications：

Communication	
Interface	RS-485
Format	(N, 8, 1), (N, 8, 2), (O, 8, 1), (E, 8, 1)
Baud Rate	1200 ~ 115200 bps
Protocol	DCON, Modbus/RTU, Modbus/ASCII
Dual Watchdog	Yes, Module (2.3 seconds), Communication (Programmable)
LED Indicators	
Power	1 LED as Power Indicator
Isolation	
Intra-module Isolation, Field-to-Logic	2500 V_{DC}
EMS Protection	
ESD (IEC 61000-4-2)	±4 kV Contact for Each Terminal
	±8 kV Air for Random Point
EFT (IEC 61000-4-4)	±4 kV for Power
Surge (IEC 61000-4-5)	±3 kV for Power
Power Requirements	
Reverse Polarity Protection	Yes
Powered from Terminal Block	Yes, 10 ~ 30 V_{DC}
Consumption	1 W Max.
Mechanical	
Dimensions (W x L x H)	52 mm x 98 mm x 27 mm
Installation	DIN-Rail Mounting
Environment	
Operating Temperature	-25 ~ +75°C
Storage Temperature	-30 ~ +75°C
Humidity	10 ~ 95% RH, Non-condensing

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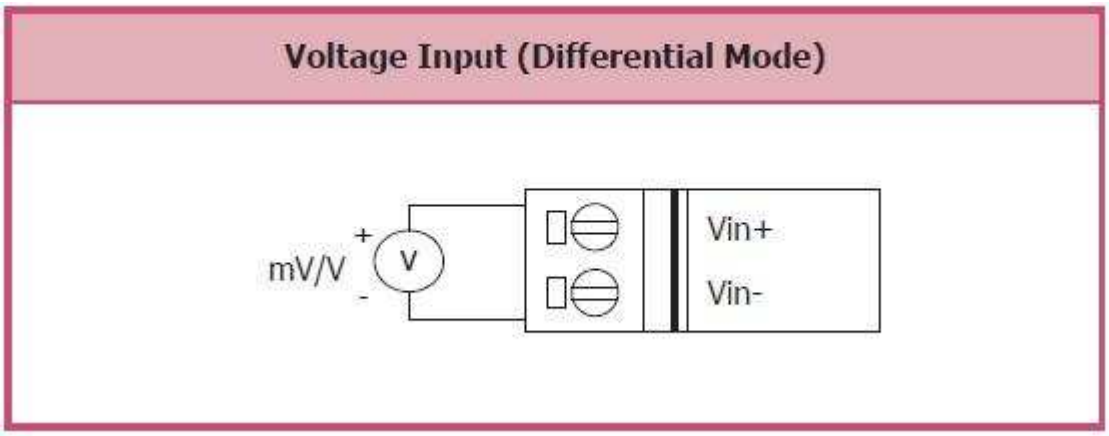
I/O Specifications：

Analog Input		
Input Channels		5 Differential
Type		+/- 1 V, +/- 2.5 V, +/- 5 V, +/- 10 V
Resolution	Normal Mode	14-bit
	Fast Mode	12-bit
Sampling Rate	Normal Mode	10 Hz total
	Fast Mode	200 Hz total
Accuracy	Normal Mode	+/-0.1%
	Fast Mode	+/-0.5%
Zero Drift		+/-20 uV/°C
Span Drift		+/-25 ppm/°C
Input Impedance		20 MΩ
Overvoltage Protection		120 Vdc

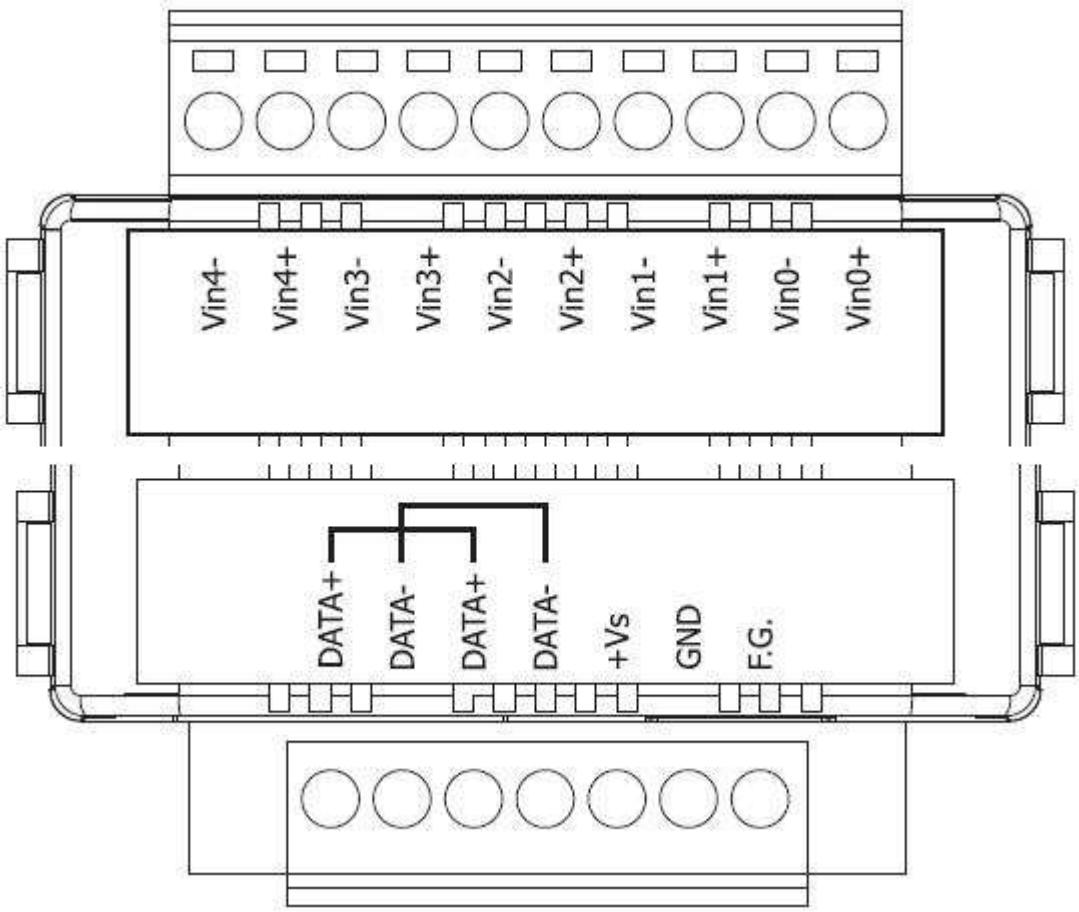
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Wire Connection :



Pin Assignment :



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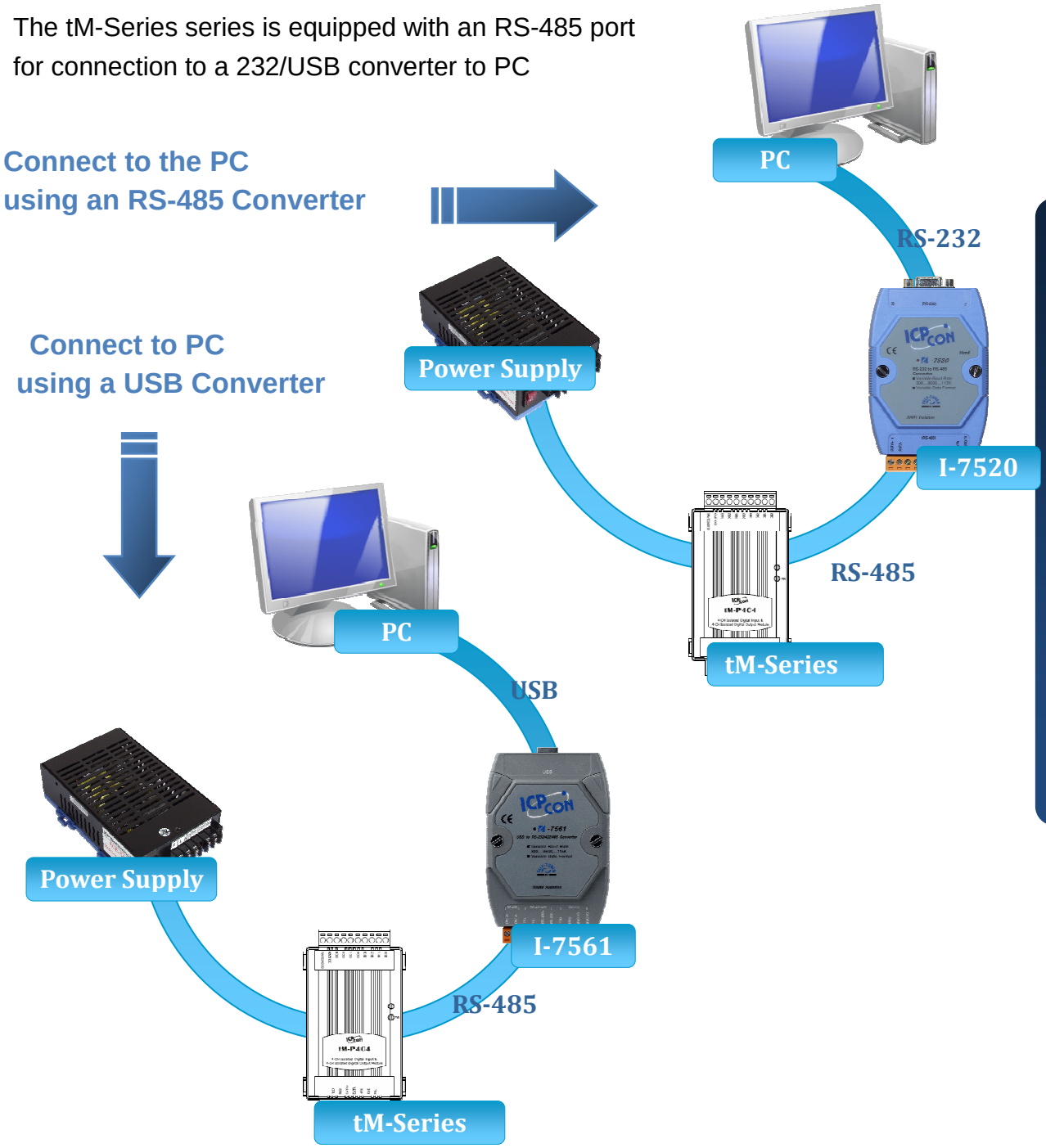


2 Booting the tM-Series in Init Mode

Make sure the switch placed in the "Init" position.

3 Connecting to the PC and the Power Supply

The tM-Series series is equipped with an RS-485 port for connection to a 232/USB converter to PC



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4 Installing the DCON Utility

The DCON Utility is an easy-to-use tool designed to enable simple configuration of I/O modules that use the DCON protocol.

Step 1: Locate the DCON Utility

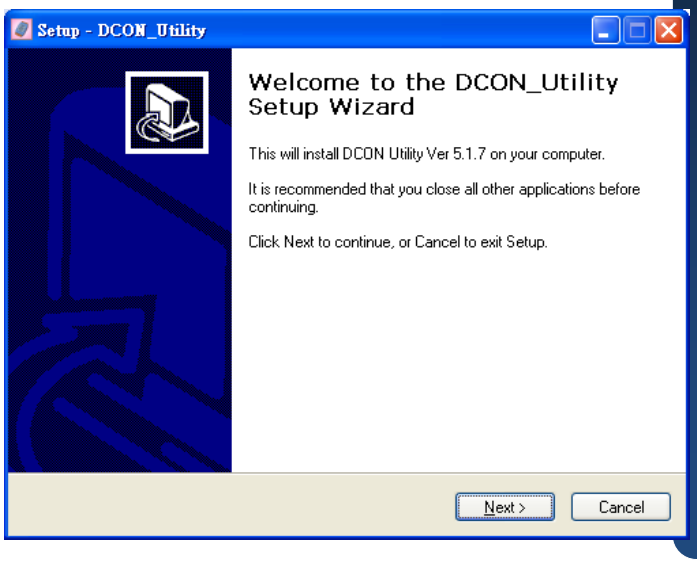


The DCON Utility can be obtained from the companion CD or from the ICPDAS FTP site:
CD:\Napdos\8000\NAPDOS\Driver\DCON_Utility\setup\
http://ftp.icpdas.com/pub/cd/8000cd/napdos/driver/dcon_utility/

Step 2: Follow the prompts to complete the installation



After the installation has been completed, there will be a new shortcut to the DCON Utility on the desktop.



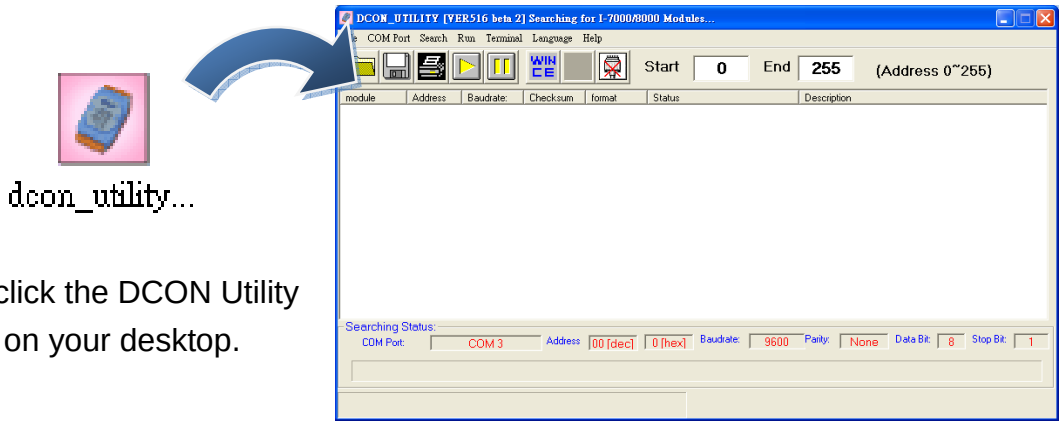
5 Using the DCON Utility to Initialize the tM-Series Module

The tM-Series is an I/O module based on the DCON protocol, meaning that you can use the DCON Utility to easily initialize it.

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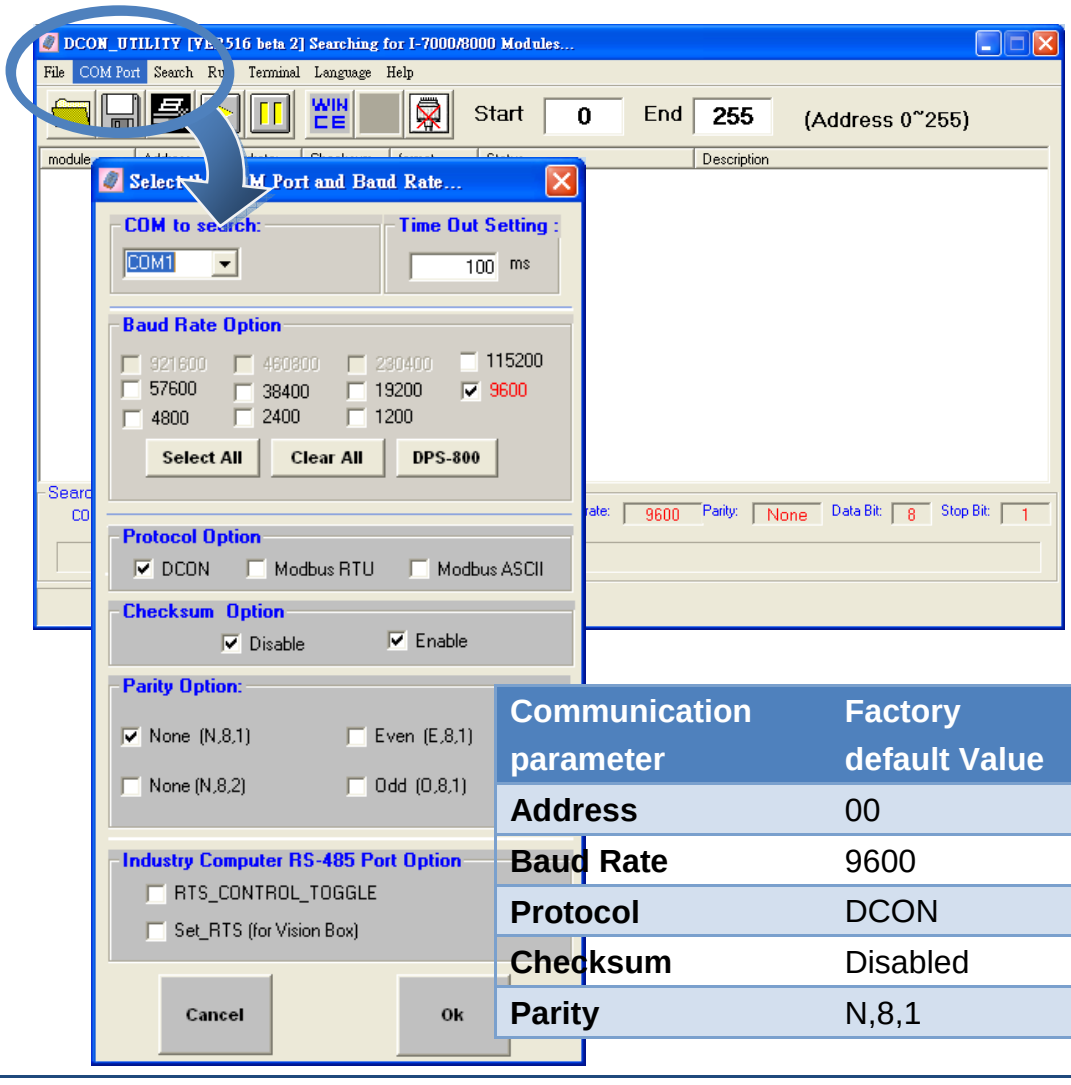
Step 1: Run the DCON Utility



Double-click the DCON Utility shortcut on your desktop.

Step 2: Use the COM1 port to communicate with the tM-Series

Click the “COM Port” option from the menu and a dialog box will be displayed that will allow you to set the communication parameters as described in the table below.



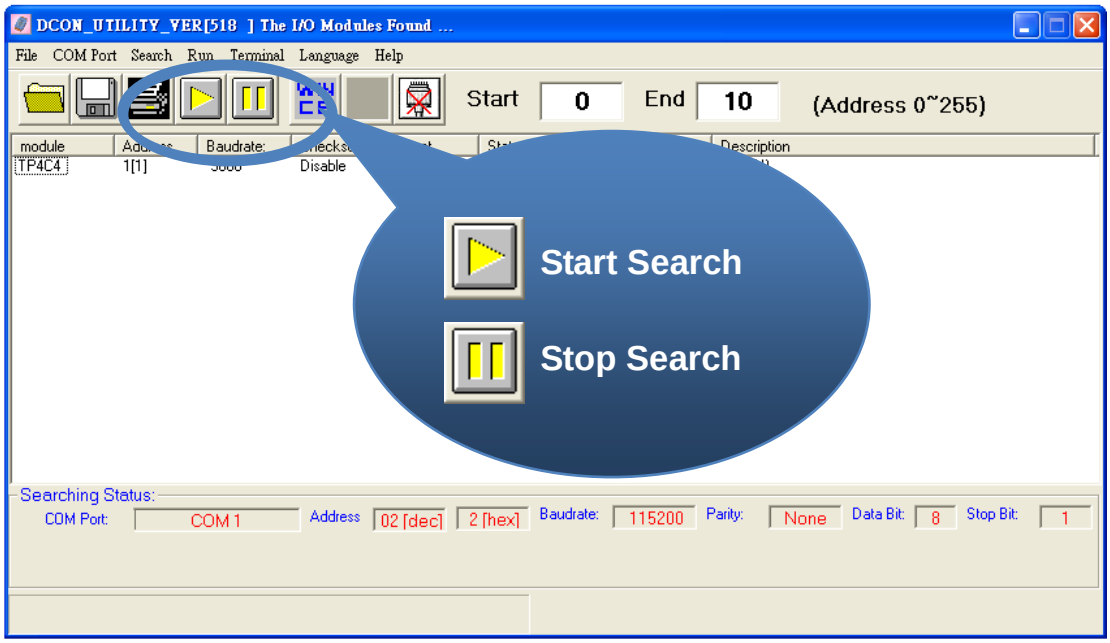
Communication parameter	Factory default Value
Address	00
Baud Rate	9600
Protocol	DCON
Checksum	Disabled
Parity	N,8,1

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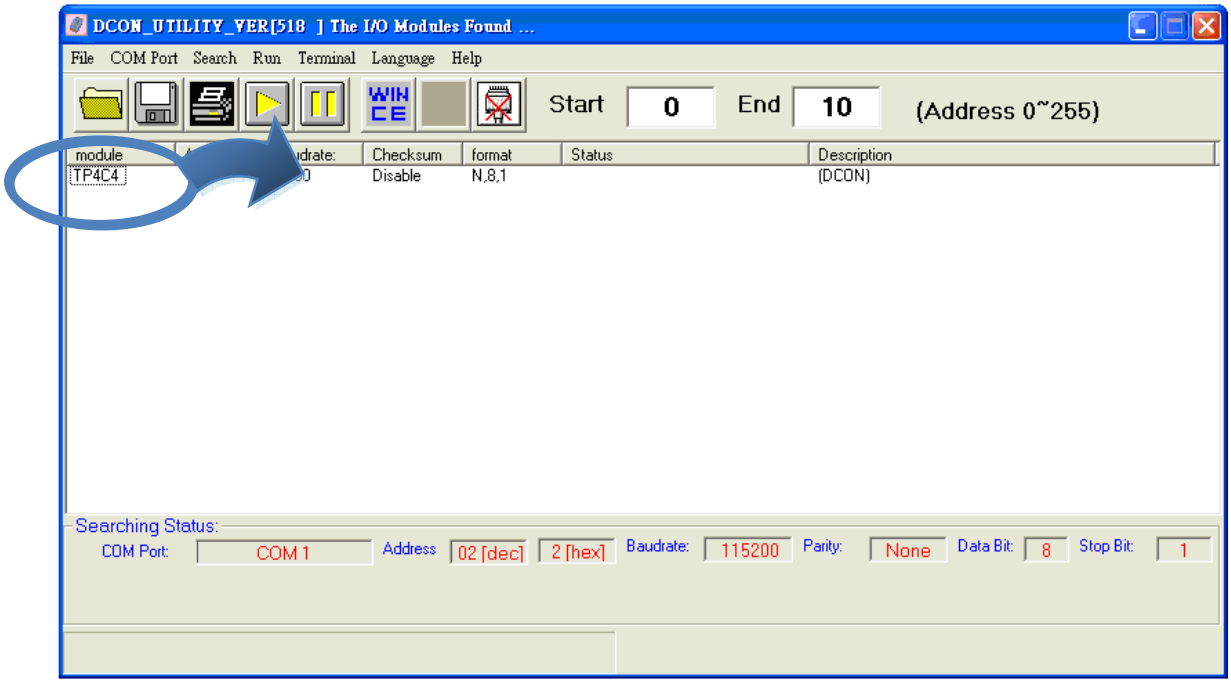
Step 3: Search for the tM-Series module

Click “Start Search” button from the toolbox to search for the tM-Series module. After the tM-Series module is displayed in the list, click “Stop Search” button.



Step 4: Connect to the tM-Series

After clicking on the name of the module in the list, a dialog box will be displayed.

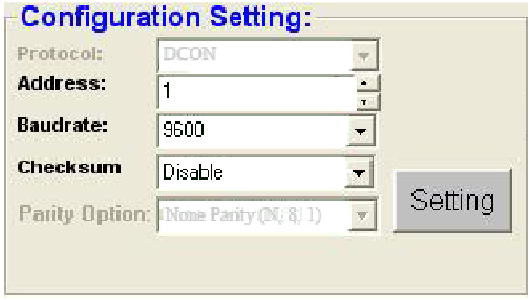


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Step 5: Initialize the tM-Series module

Set the “Address” field in the dialog box to 1 and then click “Setting” button to save the settings.



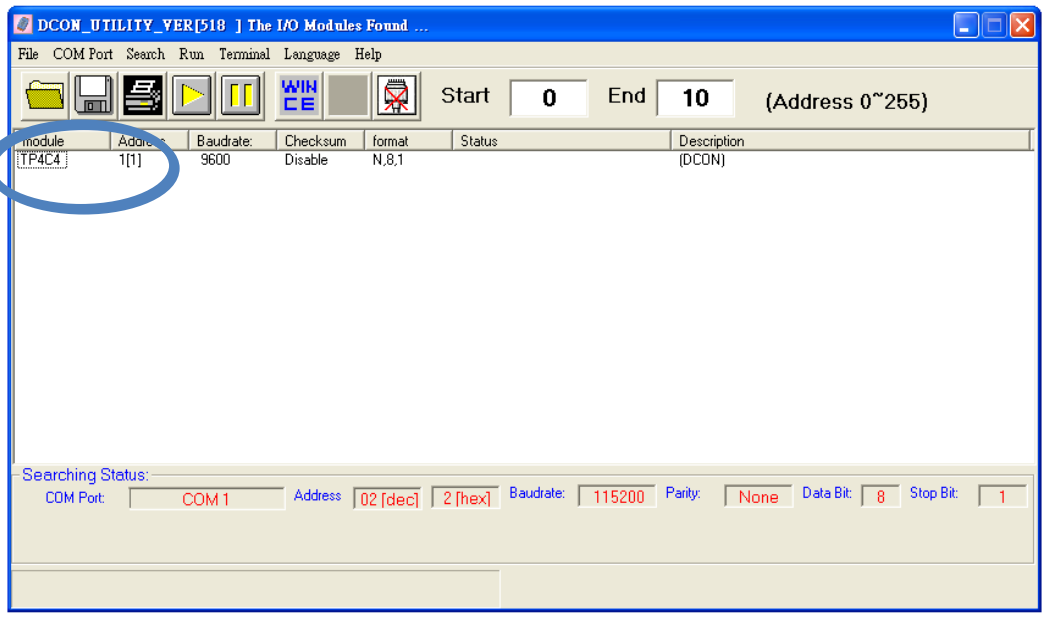


6 Rebooting the tM-Series Module in Normal Mode

Make sure the INIT switch is placed in the “Normal” position.

7 Starting the Module Operation

After rebooting the tM-Series module, search for the module to make sure the settings have been changed. You can double click on the name of the module in the list to open the configuration dialog box.



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8 Modbus Address Mapping

<table>
<tr><th>Address</th><th>Description</th><th>Attribute</th></tr>
<tr><td>30001 ~ 30005
40001 ~ 40005</td><td>Analog input value of channel 0 to 4</td><td>R</td></tr>
<tr><td>40481</td><td>Firmware version (low word)</td><td>R</td></tr>
<tr><td>40482</td><td>Firmware version (high word)</td><td>R</td></tr>
<tr><td>40483</td><td>Module name (low word) , 0x5001</td><td>R</td></tr>
<tr><td>40484</td><td>Module name (high word) , 0x0700</td><td>R</td></tr>
<tr><td>40485</td><td>Module address, valid range: 1 ~ 247</td><td>R/W</td></tr>
<tr><td>40486</td><td>Bits 5:0
Baud rate, 0x03 ~ 0x0A
<table>
<tr><td>Code</td><td>0x03</td><td>0x04</td><td>0x05</td><td>0x06</td></tr>
<tr><td>Baud</td><td>1200</td><td>2400</td><td>4800</td><td>9600</td></tr>
<tr><td>Code</td><td>0x07</td><td>0x08</td><td>0x09</td><td>0x0A</td></tr>
<tr><td>Baud</td><td>19200</td><td>38400</td><td>57600</td><td>115200</td></tr>
</table>
Bits 7:6
00: no parity, 1 stop bit
01: no parity, 2 stop bits
10: even parity, 1 stop bit
11: odd parity, 1 stop bit</td><td>R/W</td></tr>
<tr><td>40487</td><td>Type code</td><td>R/W</td></tr>
<tr><td>40488</td><td>Modbus response delay time in ms, valid range: 0 ~ 30</td><td>R/W</td></tr>
<tr><td>40489</td><td>Host watchdog timeout value, 0 ~ 255, in 0.1s</td><td>R/W</td></tr>
<tr><td>40490</td><td>Channel enable/disable, 00h ~ 1Fh</td><td>R/W</td></tr>
<tr><td>40492</td><td>Host watchdog timeout count, write 0 to clear</td><td>R/W</td></tr>
<tr><td>00257</td><td>Protocol, 0: DCON, 1: Modbus RTU</td><td>R/W</td></tr>
<tr><td>00258</td><td>Protocol, 0: determined by 00257, 1: Modbus ASCII</td><td>R/W</td></tr>
<tr><td>00261</td><td>1: enable, 0: disable host watchdog</td><td>R/W</td></tr>
<tr><td>00269</td><td>Modbus data format, 0: hex, 1: engineering</td><td>R/W</td></tr>
<tr><td>00270</td><td>Host watch dog timeout status, write 1 to clear host watch dog timeout status</td><td>R/W</td></tr>
<tr><td>00271</td><td>1: enable, 0: disable fast mode</td><td>R/W</td></tr>
</table>

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Address	Description	Attribute
00273	Reset status, 1: first read after powered on, 0: not the first read after powered on	R

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