

Quick Start
For tM-AD4P2C2

August 2013, Version 1.00

Congratulations!

Congratulations on purchasing the tM-AD4P2C2 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-AD4P2C2. Please also consult the User Manual for detailed information on the setup and use of the tM-AD4P2C2.

What's in the shipping box?

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



tM-AD4P2C2

Technical Support

- **tM Series DIO User Manual**
  http://www.icpdas.com/root/product/solutions/datasheet/tm-series/tM-AD_Series_User_Manual.pdf

- **tM-SERIES Website**

  http://www.icpdas.com/root/product/solutions/remote_io/rs-485/tm-series/tm-ad4p2c2.html

- **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/Display	
System LED Indicator	Yes, 1 LED as Power/Communication Indicator
Isolation	
Intra-module Isolation, Field-to-Logic	2500 VDC
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 Line
Power	
Reverse Polarity Protection	Yes
InputVoltageRange	10 ~ 30 VDC
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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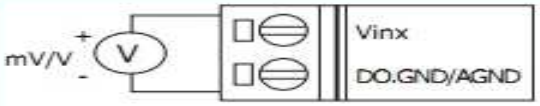
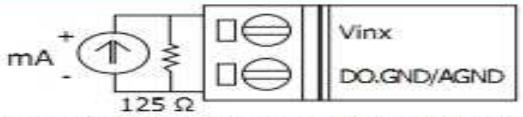
I/O Specifications :

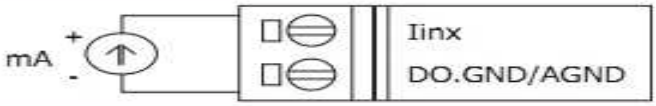
Analog Input		Voltage	Current
Channels		2 Single-ended	2 Single-ended
Type		±1 V, ±2.5 V, ±5 V, ±10 V	±20 mA, 0 ~ 20 mA, 4 ~ 20 mA
Resolution	Normal Mode	14-bit	
	Fast Mode	12-bit	
Sampling Rate	Normal Mode	10 Hz total	
	Fast Mode	200 Hz total	
Accuracy	Normal Mode	±0.1 %	
	Fast Mode	±0.5 %	
Zero Drift		±20 μV/°C	
Span Drift		±25 ppm/°C	
Input Impedance		10 MΩ	136 Ω
Overvoltage Protection		120 VDC	-
Overcurrent Protection		-	Yes, 50 mA @ 110 VDC
Digital Input			
Channels		2	
Type		Wet Contact (Source)	
On Voltage Level		+3.5 ~ 50 VDC	
Off Voltage Level		+1 VDC Max.	
Input Impedance		10 KΩ, 0.5 W	
Counters	Channels	2	
	Max. Count	65535 (16-bit)	
	Max. Input Frequency	50 Hz	
	Min. Plus Width	10 ms	
Overvoltage Protection		70 VDC	
Digital Output			
Channels		2	
Type		Isolated Open Collector (Sink)	
Max. Load Current		700 mA/Channel	
Load Voltage		+3.5 ~ 50 VDC	
Overvoltage Protection		60 VDC	
Overload Protection		1.4 A (with short circuit protection)	
Short Circuit Protection		Yes	
Power-on Value		Yes, Programmable	
Safe Value		Yes, Programmable	

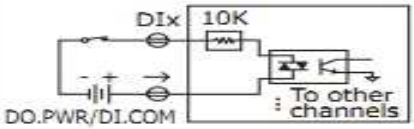
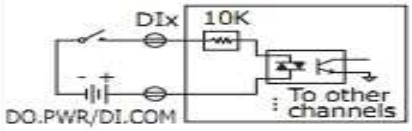
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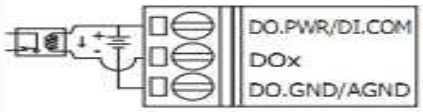
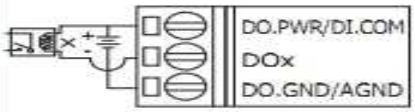
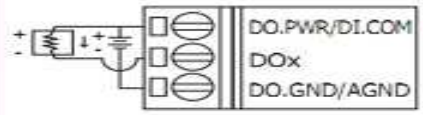
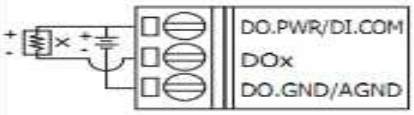
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Wire Connection :

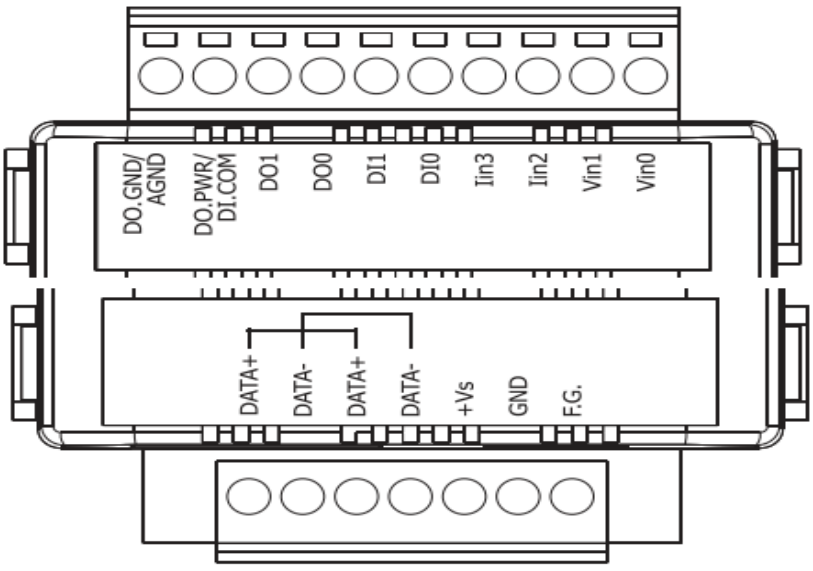
Voltage Input for Vin0 and Vin1	Current Input for Vin0 and Vin1
	 Requires Optional External 125 Ω Resistor

Current Input for Iin2 and Iin3


Digital Input/ Counter	ON State Readback as 1	OFF State Readback as 0
Source	+3.5 ~ +50 VDC	OPEN or <1 VDC
		

Output Type	ON State Readback as 1	OFF State Readback as 0
Drive Relay	Relay ON	Relay OFF
		
Resistance Load		

Pin Assignment :



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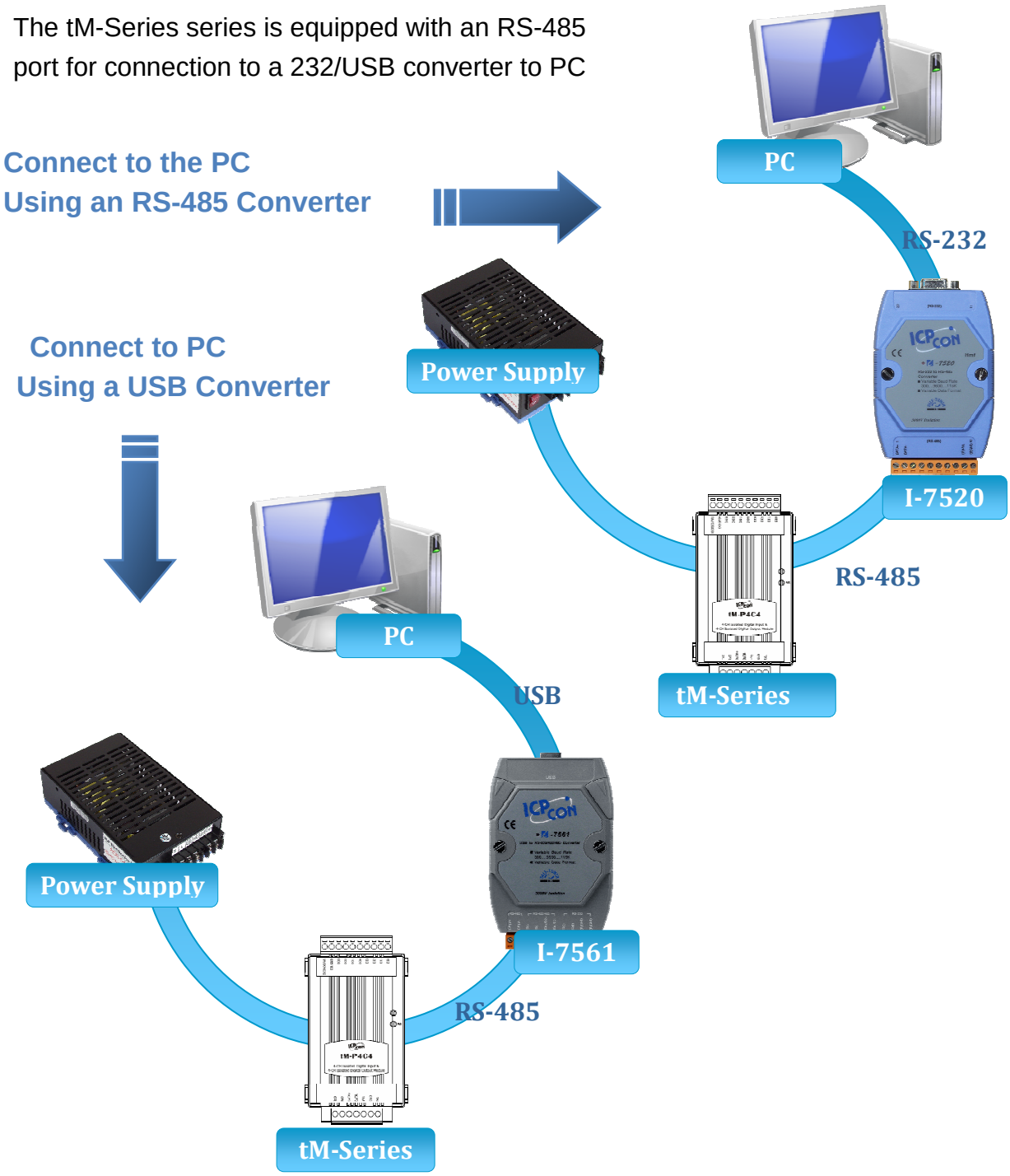


2 Booting the tM-AD4P2C2 in Init Mode

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

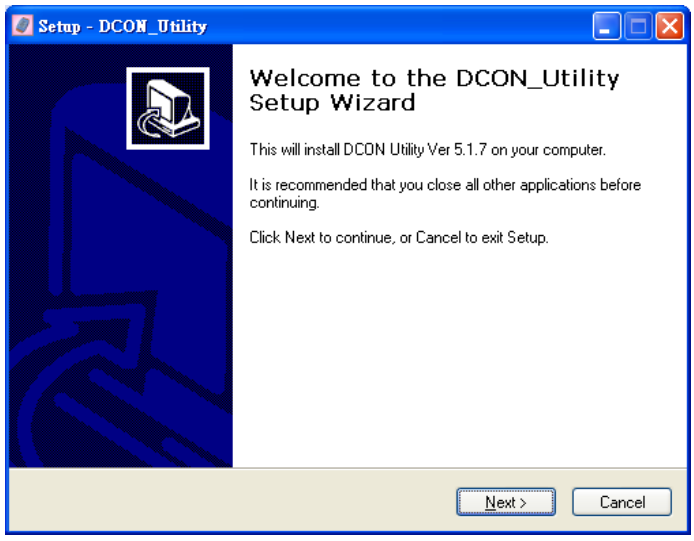


The DCON Utility can be obtained from the companion from the ICPDAS FTP site:
http://www.icpdas.com/download/7000/7000.htm

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.



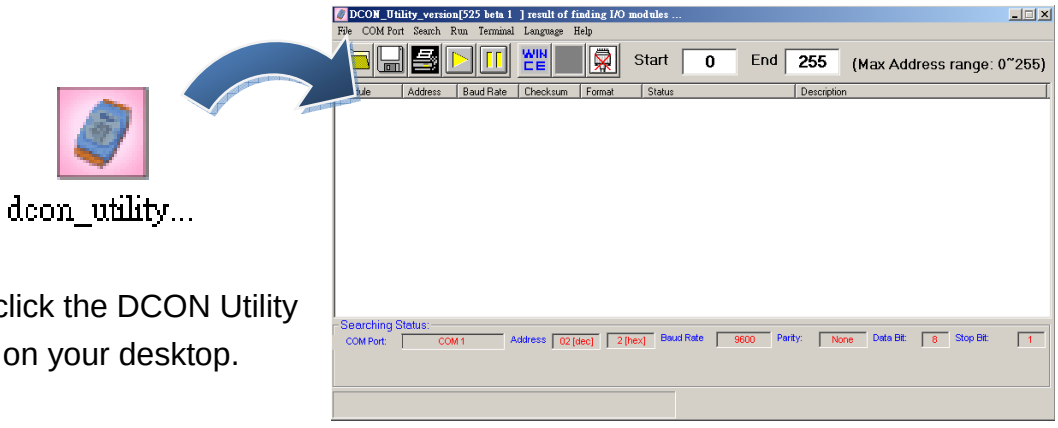
5 Using the DCON Utility to Initialize the tM-AD4P2C2 Module

The tM-AD4P2C2 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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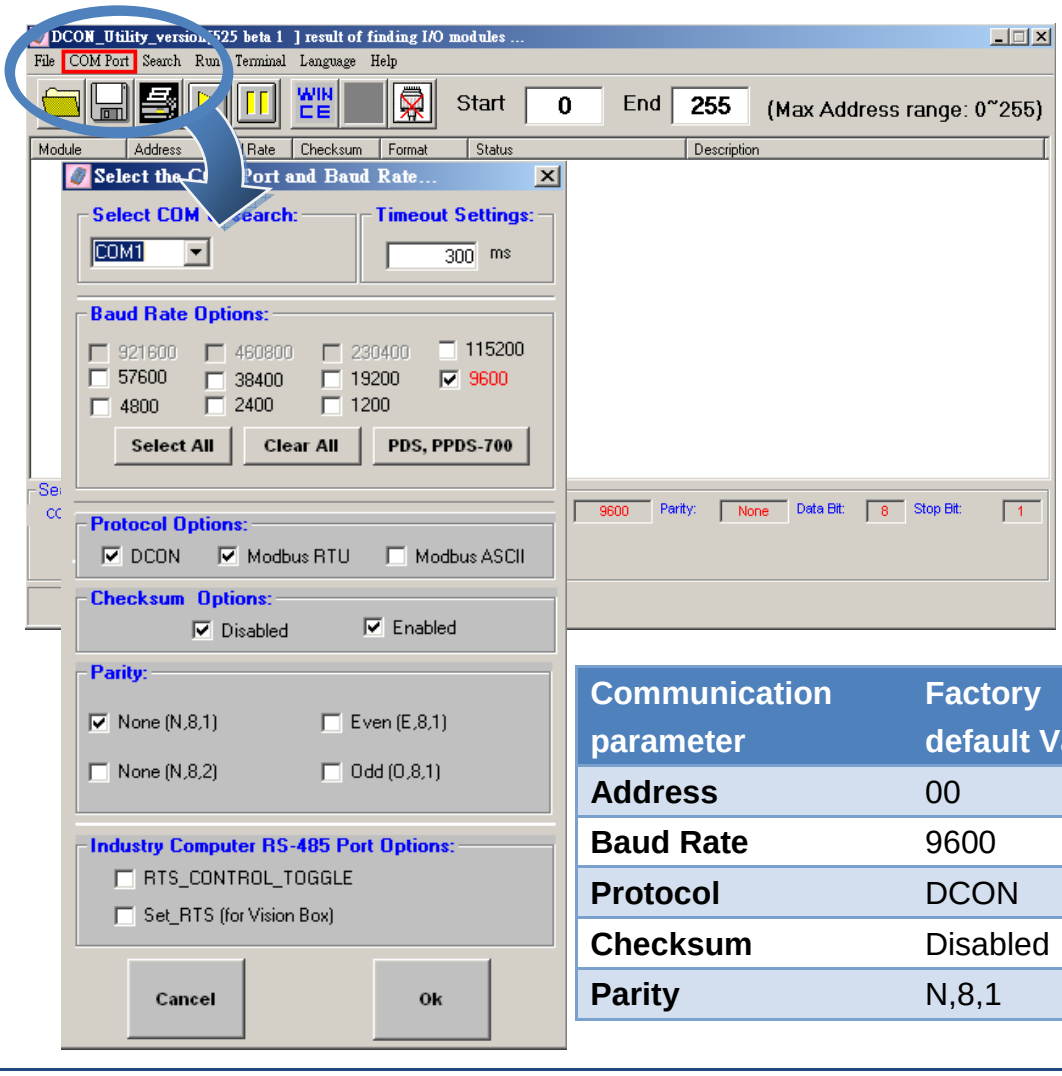
Step 1: Run the DCON Utility



Double-click the DCON Utility shortcut on your desktop.

Step 2: Use the COM1 port to communicate with the tM-AD4P2C2

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.



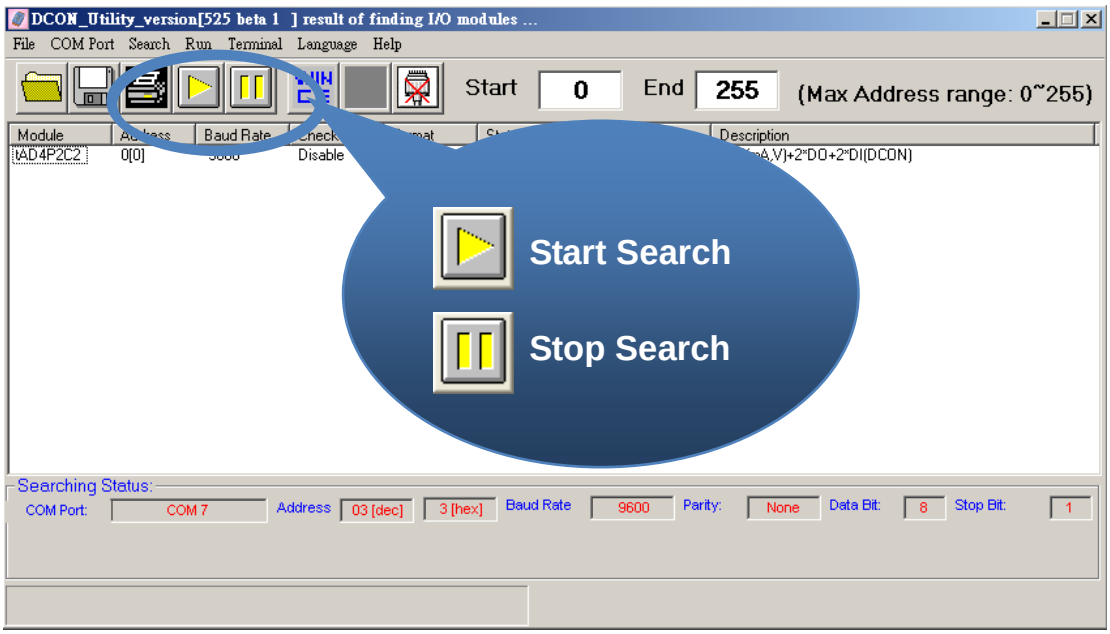
Communication parameter	Factory default Value
Address	00
Baud Rate	9600
Protocol	DCON
Checksum	Disabled
Parity	N,8,1

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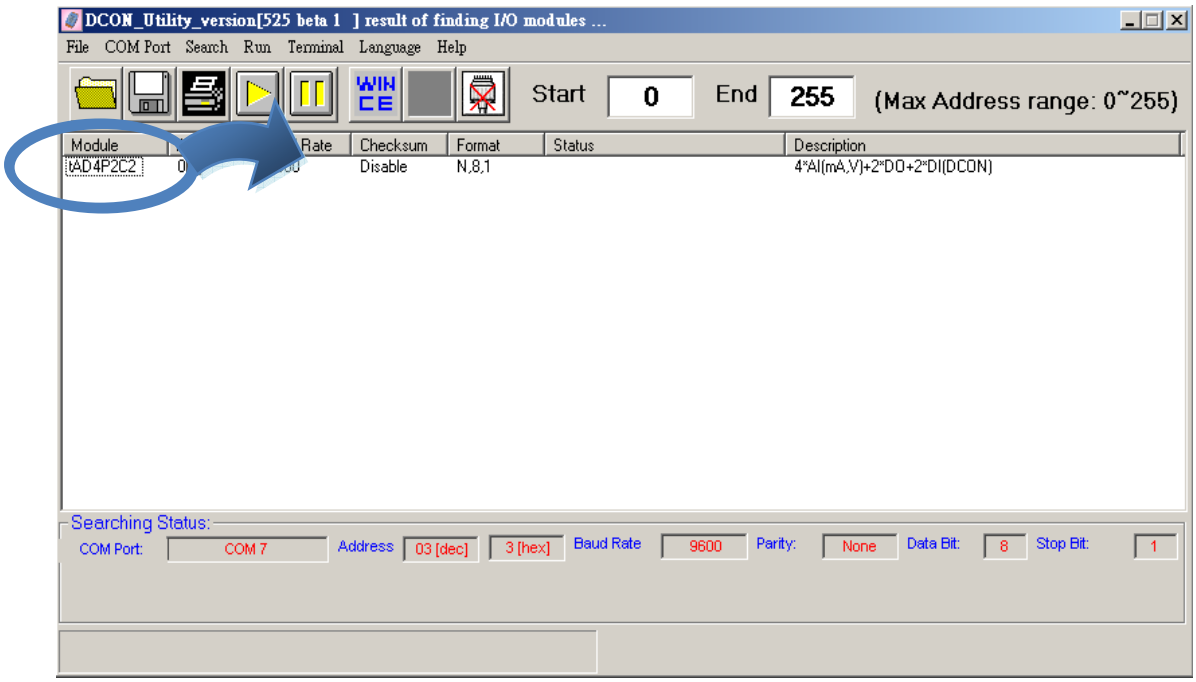
Step 3: Search for the tM-AD4P2C2 module

Click “Start Search” button from the toolbox to search for the tM-AD4P2C2 module. After the tM-AD4P2C2 module is displayed in the list, click “Stop Search” button.



Step 4: Connect to the tM-AD4P2C2

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

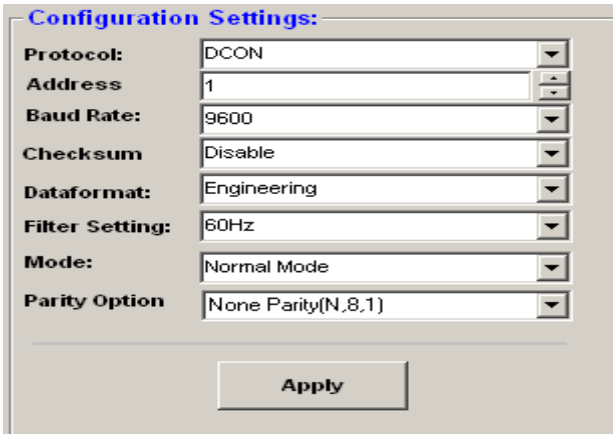


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Step 5: Initialize the tM-AD4P2C2 module

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



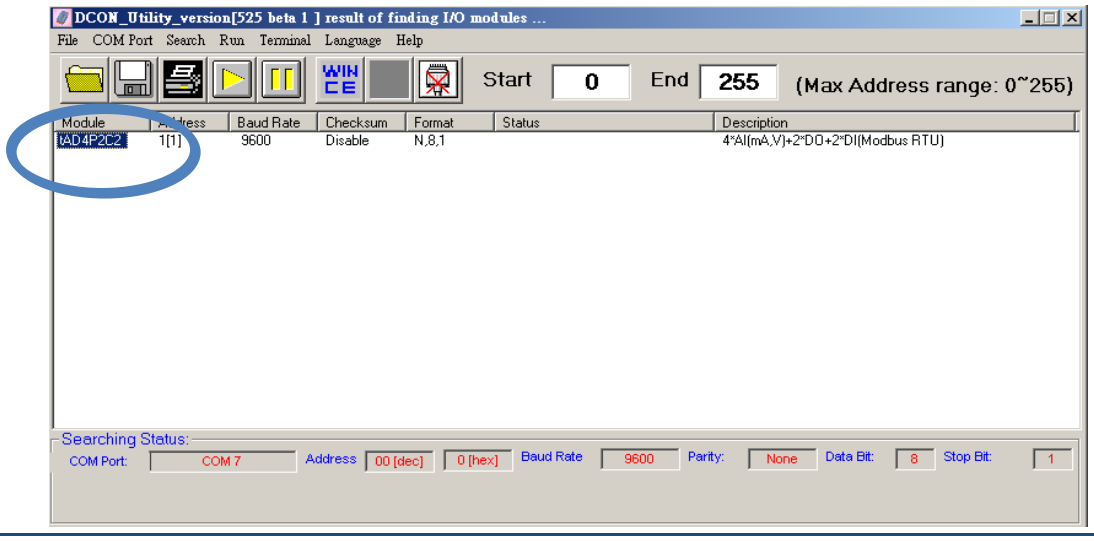


6 Rebooting the tM-AD4P2C2 Module in Normal Mode

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

7 Starting the Module Operation

After rebooting the tM-AD4P2C2 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 ~ 30004
40001 ~ 40004</td><td>Analog input value of channel 0 to 3</td><td>R</td></tr>
<tr><td>30129 ~ 30130
40129 ~ 40130</td><td>Counter value of digital input channel 0 to 1</td><td>R</td></tr>
<tr><td>40257 ~ 40260</td><td>Analog input type code of channel 0 to 3</td><td>R/W</td></tr>
<tr><td>40225 ~ 40226</td><td>High alarm limit of channel 0 to 1</td><td>R/W</td></tr>
<tr><td>40233 ~ 40234</td><td>Low alarm limit of channel 0 to 1</td><td>R/W</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), 0x4001</td><td>R</td></tr>
<tr><td>40484</td><td>Module name (high word), 0x0722</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>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 ~ 0Fh</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>00033 ~ 00034
10033 ~ 10034</td><td>Digital input value of channel 0 to 1</td><td>R</td></tr>
<tr><td>00065 ~ 00066
10065 ~ 10066</td><td>High latched value of DI</td><td>R</td></tr>
</table>

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Address	Description	Attribute
00073 ~ 00074 10073 ~ 10074	High latched value of DO	R
00097 ~ 00098 10097 ~ 10098	Low latched value of DI	R
00105 ~ 00106 10105 ~ 10106	Low latched value of DO	R
00225 ~ 00228 10225 ~ 10228	Over/under range status of analog input channel 0 to 3 for 4 ~ 20mA or 0 ~ 20mA ranges	R
00001 ~ 00002	Digital output value of channel 0 to 1	R/W
00129 ~ 00130	Safe value of digital output channel 0 to 1	R/W
00161 ~ 00162	Power on value of digital output channel 0 to 1	R/W
00193 ~ 00194	Counter update trigger edge of digital input channel 0 to 1	R/W
00257	Protocol, 0: DCON, 1: Modbus RTU	R/W
00258	Protocol, 0: determined by 00257, 1: Modbus ASCII	R/W
00260	Modbus host watchdog mode 0: same as I-7000 1: can use AO and DO command to clear host watchdog timeout status	R/W
00261	1: enable, 0: disable host watchdog	R/W
00264	Write 1 to clear latched DIO states	W
00265	DI active state	R/W
00266	DO active state	R/W
00269	Modbus data format, 0: hex, 1: engineering	R/W
00270	Host watch dog timeout status, write 1 to clear host watch dog timeout status	R/W
00271	1: enable, 0: disable fast mode	R/W
00273	Reset status, 1: first read after powered on, 0: not the first read after powered on	R
00289 ~ 00290	Low alarm status of channel 0 to 1. Write 1 to clear low latched alarm of channel 0 to 1	R/W
00305 ~ 00306	High alarm status of channel 0 to 1. Write 1 to clear high latched alarm of channel 0 to 1	R/W
00321 ~ 00322	Enable/disable alarm of channel 0 to 1	R/W
00337 ~ 00338	Alarm type, momentary or latched, of channel 0 to 1	R/W
00513 ~ 00514	Write 1 to clear counter value of digital input channel 0 to 1	W

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