TRP-C26

16-channel Digital Input Isolated RS485 Module, Support ASCII and Modbus Protocol.

User's Manual

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1. Introduction

TRP-C26 provides 16 optical isolated digital input channels that allow you to input the logic signal from 0 to 30V DC. All channel features screw terminals for convenient connection of field signals as well as LED's to indicate channel status. All inputs are equipped with photo-couplers to protect the module against high voltage spikes, as well as ground potential differences. For easy user access, TRP-C26 can enter configuration mode and self-test mode with outer dip-switch. TRP-C26 support both ASCII and Modbus protocol, with a full set of command, dual watch-dog, and auto reset function the module can be remote controlled by PC in ASCII or Modbus RTU protocol.

1-1.Features

➢ Wide input range DC power supply.

➢ Support ASCII and Modbus RTU protocol.

➢ Supports baud rates from 1.2Kbps to 115.2 Kbps.

➢ All 16 channels digital input ca be used as counter.

➢ Digital output signal with 3750Vrms isolation protection.

➢ Dual watchdog: Module's firmware, host computer traffic.

➢ LED for each channels working status.

➢ DIN rail and panel mount support.

➢ Configured and self-test by external dip-switch.

➢ Support screw terminal and external DC power adaptor.

1-2.Specifications

➢ Power Input Voltage: DC +10V to +30V.

➢ Protocol: ASCII and Modbus RTU.

➢ Input channel: 16 digital input channels with counter.

➢ Input digital input counter: 0~65535.

➢ Input optical isolation: 3750 Vrms.

➢ Input logical level 0 ± 0~1V (max).

➢ Input logical level 1 ± 4.0V ~ +30V.

➢ Communication interface: RS485.differential 2 half-duplex wires.

➢ Communication speed: Baud rate from 1200bps to 115.2Kbps.

➢ Data format: Data bit: 8, Parity Check: None, Stop Bit: 1.

➢ Input impedance: 3KΩ.

➢ Inputs can be use as counter channel: 16.

➢ Counter frequency: 100 Hz.

➢ Dual watchdog Hardware reset circuit, module and host operating status.

➢ Signal LED: Power on, all input channels.

➢ Power supply: Screw terminal, or standard external DC adapter.

➢ Power consumption: 1.5W (max).

➢ Operating environment: 0 to 65C.

➢ Storage temperature: -20 to 65C.

➢ Humidity: 10-90% non-condensing.

➢ Dimension: 151mm X 75mm X 26mm.

➢ Weight: 395g.

1-3. Communication Wiring
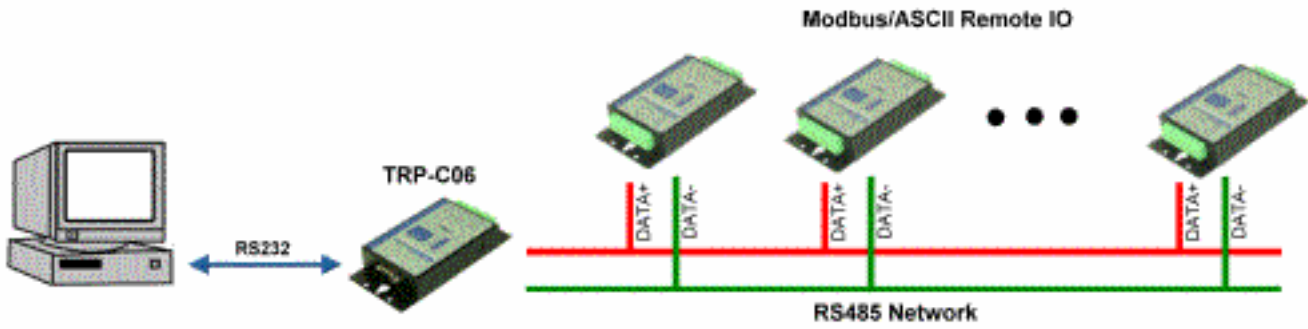
1-4. Panel Layout
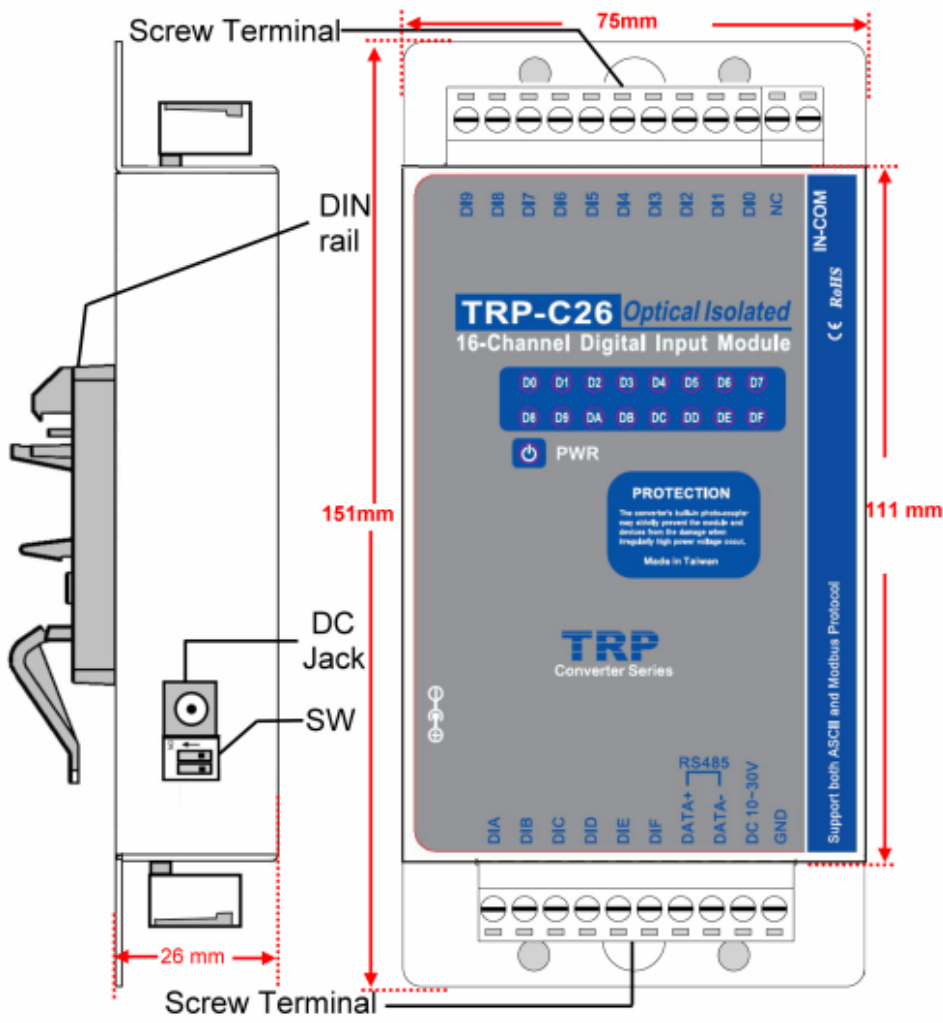
1-5. Block Diagram
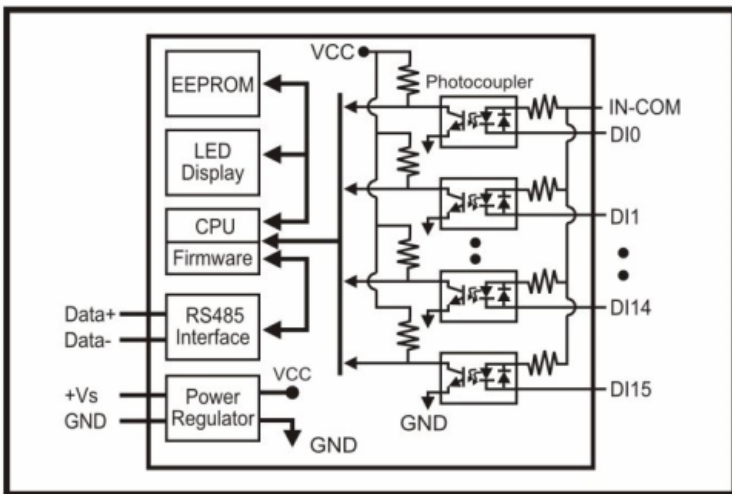
1-6. Pin Definition

DIA	Digital Input Channel 10	DI9	Digital Input Channel 9
DIB	Digital Input Channel 11	DI8	Digital Input Channel 8
DIC	Digital Input Channel 12	DI7	Digital Input Channel 7
DID	Digital Input Channel 13	DI6	Digital Input Channel 6
DIE	Digital Input Channel 14	DI5	Digital Input Channel 5
DIF	Digital Input Channel 15	DI4	Digital Input Channel 4
DATA+	RS485+	DI3	Digital Input Channel 3
DATA-	RS485-	DI2	Digital Input Channel 2
DC 10~30V	Input DC 10~30V	DI1	Digital Input Channel 1
GND	DC Ground	DI0	Digital Input Channel 0
		None	None
		IN.COM	External Voltage Input for isolation. Max:30V

2. Wire Connection For Digital Input
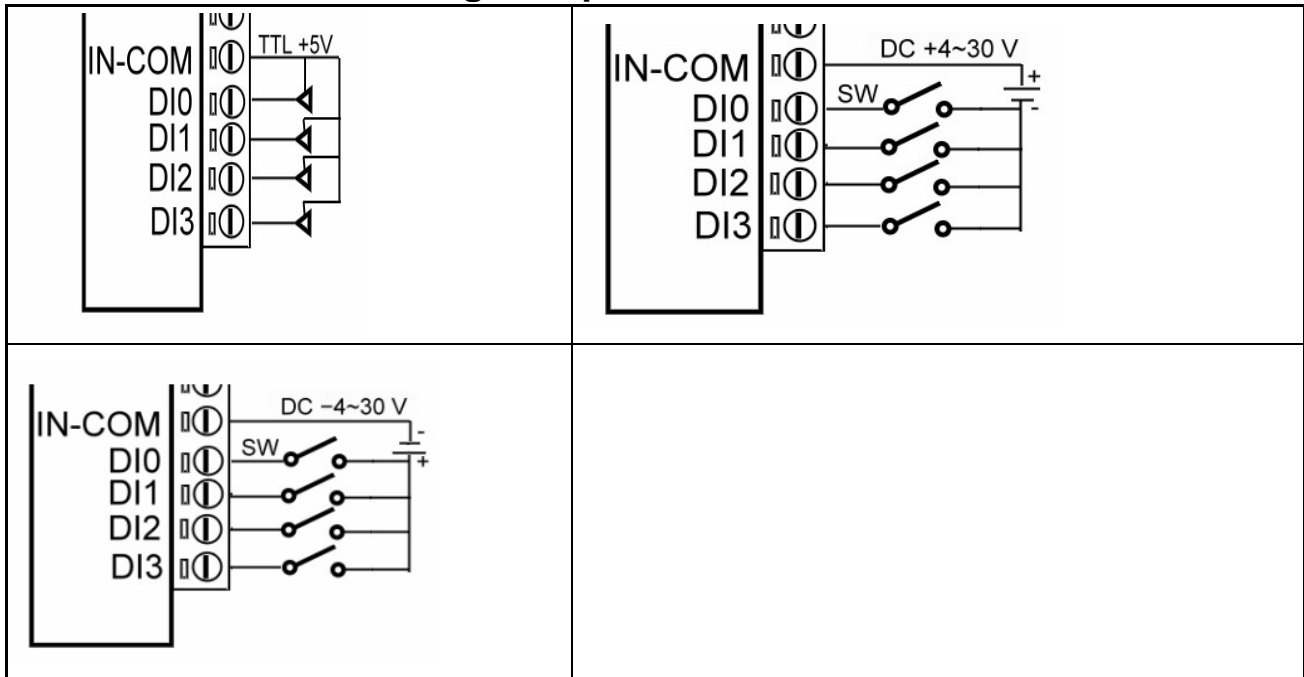
3. System Configuration Switch

The TRP-DIO and AIO support the Modbus RTU and ASCII communication protocol, It has a two pins external dip-switch that allow user to select protocol between Modbus RTU and ASCII. The dip-switch also provides "back to default" function when user forget the configuring information stored in EEPROM such as ID (RS-485 Module address), baud rate and data format.
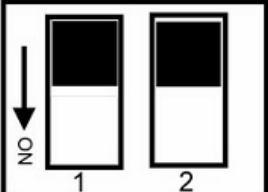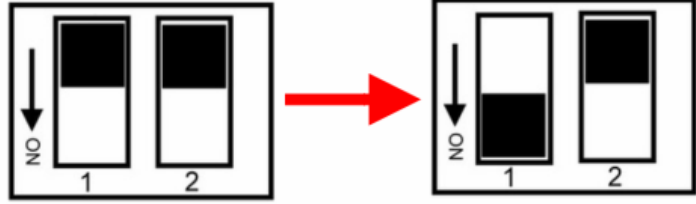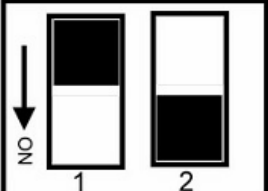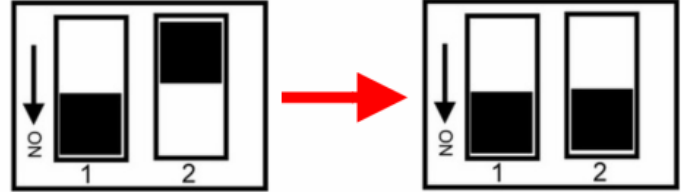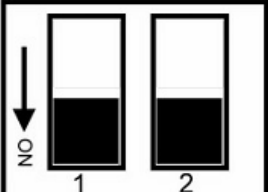
*Default setting:
ID Address: 01
Baud Rate: 9600
Checksum: Disable
Data Format: 00
RS485 Communication format: N, 8, 1.

	Modbus Protocol (Factory)
	Modbus Communication Protocol.
	Back to INIT for Modbus
	Step1. Adjust switch to "off off" position.
	Step2. Adjust switch to "on off" position
	Step3. Reboot
	ASCII Protocol
	ACSII communication protocol.
	Back to INIT for ASCII
	Direct adjust the switch to "on on" position In power on status, no need to reboot.
	Enter self-test mode
	Step1.Adjust switch to "on on" position.
	Step2. Reboot.

*INIT: ID=00, Baud-Rate: 9600, Data format: 00.

4. Command Description

Default setting:ID Address :01 Baud Rate:9600 DIO Mode Type :40　Checksum: Disable.
Command Format :"Leading Code"+"ID Address"+"Command"+"CHK"+(cr) .
Response Format :"Leading Code"+"ID Address"+"Data"+"CHK"+(cr) .

4-1. How to calculate the Checksum
1. Calculate the ASCII sum of all characters of the command string except the character return.
2. Mask the sum of string with OFFH.

Example:
Send the command is "$06M".
Sum of string is "$"+"0"+"6"+"M"="24H"+"30H"+" 4D"="A1H"……The checksum and [CHK]="A1".
Response string with checksum is :"A1".

5. Function description

Power on mode: When power fail, system reset or host watchdog timeout these will cause the module reboot and into power on mode. In power on mode TRP-C68 digital output value will return to "the last time" setting. And the module can accept the host's command to change the digital output value.

Dual Watchdog:
Module self watchdog: The module's watchdog is a hardware reset circuit while working in harsh or noisy environment, the module may be down. The circuit may enable the module to continue working and never halt.

Host watchdog: The host watchdog is a software function to monitor the module's output states. The purpose is to prevent the RS-485 network from communication problem or host halt due to unexpected situation. When the timeout interval expired, the module will turn all outputs to predefined safe value. This can prevent the controlled target from unexpected situation.

Safe mode: If the user enable watch-dog on the RS-485 line, The host will send the reset module's watchdog command one by one, when the host is not send the command (May be is RS485 off line or host halt), the module will watchdog timeout then into the safe mode, if the module into the safe mode, the digital out will not be changed until the watchdog disable.

6. ASCII Command Description
The TRP-Serial DIO and AIO support the ASCII communication protocol, The serial communication data format is Parity check: None , data bit :8, Stop bit:1 ,baud-rate can setting from 1200bps~115200bps.

6-1 ASCII Command List

Command List	Function Description	Page Index
%IDNNPPBBDD(CHK)(cr)	Set the module's configuration	See 6-2~6-4
#IDN(CHK)(cr)	Read digital input channel counter value	See 6-5
#IDCN(CHK)(cr)	Clear digital input N channel counter value	See 6-6
#IDCW(CHK)(cr)	Clear all digital input counters value	See 6-7
#IDCS(CHK)(cr)	Save all digital input counters value to EEPROM	See 6-8
$IDLS(CHK)(cr)	Read digital input latched	See 6-9
$IDC(CHK)(cr)	Clear digital input latched	See 6-10
$ID6(CHK)(cr)	Read digital input status	See 6-11
$ID2(CHK)(cr)	Read the module's configuration	See 6-12
$IDRS(CHK)(cr)	Reset the module's status	See 6-13
$IDM(CHK)(cr)	Read the module's name	See 6-14
$IDF(CHK)(cr)	Read the module's firmware version	See 615
$ID5(CHK)(cr)	Read reset status	See 6-16
~IDONN(CHK)(cr)	Change the module's name	See 6-17
~IDLEDA(CHK)(cr)	Set the module's LED operating mode	See 6-18
~IDWENN(CHK)(cr)	Enable watchdog and set the timeout value	See 6-19
~IDWD(CHK)(cr)	Disable watchdog	See 6-20
~IDWR(CHK)(cr)	Read watchdog timeout value	See 6-21
~**(CHK)(cr)	System stand by (Host OK!)	See 6-22
#**(CHK)(cr)	Save current digital input status	See 6-23
$ID4(CHK)(cr)	Read synchronized data	See 6-24

6-2. Set the module's configuration

Command	%IDNNPPBBDD(CHK)(cr)	
Syntax Description	%	First leading code
	ID	Address of setting module 00~FF(HEX)
	NN	New address of setting from 00~FF(HEX)
	PP	The Digital I/O module type define 40
	BB	New baud rate for setting (See The 6.2)
	DD	Data format (See The 6.3)
	CHK	Checksum
	(cr)	Carriage return
Response	!ID(CHK) (cr)	Command valid
	?ID (CHK)(cr)	Command Invalid

6-3.Baud rate setting (BB)

Code number	03	04	05	06	07	08	09	0A
Baud rate	1200	2400	4800	9600	19200	38400	57600	115200

6-4.Data format setting (DD)

Bit	7	6	5	4	3	2	1	0
Function	Input counter 0:Rising 1:Falling	Checksum 0:Disable 1:Enable	0	0	0	0	0	0

Example:
Send command:"%0001400600"…..If you turn on the system setting switch , the ID will become to "00".

New ID is "01",D I/O type is "40" ,Bard-Rate:9600 is "06",Checksum setting disable is "00", Response:"**!01**".

Example:
Send command:%0003400540….New ID="03",Bard-Rate="4800", Checksum= "Enable", Response:"**!03**".

6-5. Read digital input channel counter value

Command	#DN(CHK)(cr)	
Syntax description	#	First leading code
	ID	Address of setting module 00~FF(HEX)
	N	Digital input channel from channel 0-F
	CHK	Checksum
	(cr)	Carriage return
Response	!IDCCCCC(CHK)(cr)	Command valid CCCCC from 0 – 65535 (DEC)
	?ID(CHK) (cr)	Command Invalid

Example

Send command:"#012"　Read the TRP-C26 channel 2 counter value

Response: "!0100023"…..The digital input have been trigger 23 times.

*Unless you save value to EEPROM by using the command "#IDCS".　The counter's value will reset to 0 if power fail or send command "$IDRS".

6-6. Clear digital input N channel counter value

Command	#DCN(CHK)(cr)	
Syntax description	#	First leading code
	ID	Address of setting module 00~FF(HEX)
	C	Clear N channel counter value to 0
	N	N=0-F *Channel DI0~DI15 digital input
	CHK	Checksum
	(cr)	Carriage return
Response	!ID(CHK)(cr)	Command valid
	?ID (CHK)(cr)	Command Invalid

Example

Send command: "#01C2"…..Clear DI2 counter value.

Response:"!01".

*If counter's value already been reset to 0 you must use command "#IDCS" to save the new value in EEPROM again, or the module will load old value if power fail or reset.

6-7. Clear all digital input counters value

Command	#DCW(CHK)(cr)	
	#	First leading code
	ID	Address of setting module 00~FF(HEX)
	CW	Clear all digital input counters value
Syntax description	CHK	Checksum
	(cr)	Carriage return
Response	!ID(CHK)(cr)	Command valid
	?ID (CHK)(cr)	Command Invalid

Example:
Send command:"#01CW"…..Clear DI0~DI15 counter value .
Response:"!01".

* After the command "#IDCW" you must save new value in EEPROM again, or the module will load old value if power fail or system reset.

6-8. save all digital input counters value to EEPROM

Command	#DCS(CHK)(cr)	
	#	First leading code
	ID	Address of setting module 00~FF(HEX)
	CS	Save all channels counter to EEPROM
Syntax description	CHK	Checksum
	(cr)	Carriage return
Response	!ID(CHK)(cr)	Command valid
	?ID (CHK)(cr)	Command Invalid

Example:
Send command:"#01CS"….Save DI0~DI15 counters value to EEPROM.
Response:"!01".

Then after power fail or reset
Send command:"#010"……..Read DI0 counter value.
Response: "!0100187"………..Last time save value is "187".

6-9. Read digital input latched

Command	$IDLS(CHK)(cr)		
Syntax description	$		First leading code
	ID		Address of setting module 00~FF(HEX)
	L		Read digital input latch
	S		S=0 Latch logic 0 S=1 No use
	CHK		Checksum
	(cr)		Carriage return
Response	!IDHHLL00(CHK)(cr)		HH(DI5-DI8) LL(DI7-DI0) latch status
	?ID (CHK)(cr)		Command Invalid

Example

Send command:"$01L0".......Read digital input logic 0.

Response:"!01101100   "......... DI12,DI4,DI0 have been latched.

*Digital input latch: User key in a digital signal to the module and want to read the response of key stoke. However the user will lost the stoke information because the key input is pulse digital input. If user read by the command "$ID6" in time A and time B , the response is that no key stoke. Use command $IDLS can solve this problem, user may read the key stoke in time position A and B.

6-10.Clear digital input latched

Command	$IDC(CHK)(cr)		
Syntax description	$		First leading code
	ID		Address of setting module 00~FF(HEX)
	C		Clear digital input DI0~DI15 latch
	CHK		Checksum
	(cr)		Carriage return
Response	!ID (CHK)(cr)		Command valid
	?ID (CHK)(cr)		Command Invalid

Example:

Send command:"$01C".......Clear digital input latch .

Response:"!01 "............... Latch have been clear.

6-11.Read digital input status

Command	$ID6(CHK)(cr)	
	$	First leading code
	ID	Address of setting module 00~FF(HEX)
	6	Read digital input/output status
Syntax description	CHK	Check sum
	(cr)	Carriage return
Response	!IDHHLL(CHK)(cr)	HH(DI5-DI8) LL(DI7-DI0) latch status
	?ID(CHK) (cr)	Command Invalid

Example:

Send command:$016…….Read digital I/O status .

Response:"!01EFEE"…..DI0,DI4,DI12 have been triggered.

6-12. Read the module's configuration

Command	$ID2(CHK)(cr)	
	$	First leading code
	ID	Address of setting module 00~FF(HEX)
	2	Read configuration
Syntax description	CHK	Check sum
	(cr)	Carriage return
Response	!IDPPBBDD(CHK)(cr)	Command valid PP: Digital I/O type=40 BB: Baud rate DD=Data format (See data format table) Module's Model:BIT0-2="000" TRP-C28 "001" TRP-C24 "010" TRP-C26
	?ID(CHK)(cr)	Command Invalid

Data format table

Bit	7	6	5	4	3	2	1	0
Function	Input counter 0:rising 1:falling	Checksum 0:Disable 1:Enable	0	0	0	0	0	0

Example:

Send command:$012…Read configuration .

Response:"!01400642"……. DIO type=40,Baud-Rate=9600 (See 6.2),Data format=42   Input counter :rising ,Checksum= Enable, Model=2….TRP-C26 (See Data format table).

6-13. Reset the module's status

Command	$IDRS(CHK)(cr)	
Syntax description	$	First leading code
	ID	Address of setting module 00~FF(HEX)
	RS	Reset the module
	CHK	Check sum
	(cr)	Carriage return
Response	!ID(CHK)(cr)	Command valid
	?ID(CHK) (cr)	Command Invalid

Example:

Send command:"$01RS".......Reset .

Response:"!01 "……… …………..Have been reset.

6-14. Read the module's name

Command	$IDM(CHK)(cr)	
Syntax description	$	First leading code
	ID	Address of setting module 00~FF(HEX)
	M	Reading module's name
	CHK	Check sum
	(cr)	Carriage return
Response	!IDNNNNNN(CHK)(cr)	NNNNNN :The chars from 1 –6 chars
	?ID(CHK)(cr)	Command Invalid

EX: Send command:$01M…Read the TRP-C26's name .

Response:"!01TRPC26"……. The module's name is TRPC26.

6-15. Read the module's firmware version

Command	$IDF(CHK)(cr)	
Syntax description	$	First leading code
	ID	Address of setting module 00~FF(HEX)
	F	Command for reading module's version
	CHK	Check sum
	(cr)	Carriage return
Response	!IDMODMMYY(CHK)(cr)	MOD :The module's type MM:Release Month YY : Release Year
	?ID(CHK)(cr)	Command Invalid

Example:

Send command:$01F…Read the TRP-C26's version.

Response:"!01C260605"……. The TRP-C26's version date is "06/2005".

6-16. Read reset status

Command	$ID5(CHK)(cr)	
Syntax description	$	First leading code
	ID	Address of setting module 00~FF(HEX)
	5	Command for reading reset status
	CHK	Check sum
	(cr)	Carriage return
Response	!IDS(CHK)(cr)	S =1 has been reset S=0 not been reset
	?ID(CHK)(cr)	Command Invalid

Example:

Send command:$015…Read the TRP-C26's reset status .

Response:"!011"……. The TRP-C26 has been reset.

*If the module is system halt or detect abnormal voltage, the module will restart and reset the flag to "1".

6-17. Change the module's name

Command	~IDONN(CHK)(cr)	
Syntax description	~	First leading code
	ID	Address of setting module 00~FF(HEX)
	O	Command for rename module
	NN	NN:TRP-C24's name, Max.6 characters
	CHK	Checksum
	(cr)	Carriage return
Response	!ID(CHK)(cr)	Command valid
	?ID(CHK)(cr)	Command Invalid

Example:

Send command:"~01OTRYCOM"….. Change the module name become to "TRYCOM".
Response:"!01"……. . Command valid.

Then send the command "$01M"…read the module name.
Response:"!01TRYCOM"……. .The TRP-C26's name is "TRYCOM".

6-18. Set the module's LED operating mode

Command	~IDLEDA(CHK)(cr)	
Syntax description	~	First leading code
	ID	Address of setting module 00-FF(HEX)
	LED	Set the module's LED operating mode
	A	A=0 Turn on all LEDS, when digital input ON A=1 Turn off all LEDS, when digital input OFF
	CHK	Checksum
	(cr)	Carriage return
Response	!ID(CHK)(cr)	Command valid
	?ID(CHK)(cr)	Command Invalid

Example:

Send command:"~01LED0"….. Turn on all LED.
Response:"!01"……. . Command valid.

6-19. Enable watchdog and set the timeout value

Command	~IDWENN(CHK)(cr)	
Syntax description	~	First leading code
	ID	Address of setting module 00~FF(HEX)
	WE	Watchdog Enable
	NN	Set the watchdog time(NN:00~FF) One Unit=0.1 Sec FF: MAX. 25.5 Sec
	(cr)	Carriage return
Response	!ID(CHK)(cr)	Command valid
	?ID(CHK)(cr)	Command Invalid

Example:

Send Command:"~01WEFF"….. Set   the watchdog time for 25.5 Sec.

Response:"!01"……. . Command valid, When module count to 25.5 Sec the watchdog will into safe mode, then PWR LED will flash,   before timeout if host send "~**", the watchdog will recount.

*When the module is in safe mode ,   any digital output command are invalid , you will get   the response "!IDWE"   , which means the system is in safe mode, you can't change output status.
*Reset and power fail will not affect watchdog mode.

6-20.Disable watchdog

Command	~IDWD(CHK)(cr)	
Syntax description	~	First leading code
	ID	Address of setting module 00~FF(HEX)
	WD	Disable watchdog
	(cr)	Carriage return
Response	!ID(CHK)(cr)	Command valid
	?ID(CHK)(cr)	Command Invalid

Example:

Send Command:"~01WD"….. Watchdog disable.

Response:"!01"……. . Command valid, System LED will stop flashing.

6-21.Read watchdog timeout value

Command	~IDWR(CHK)(cr)	
Syntax description	~	First leading code
	ID	Address of setting module 00~FF(HEX)
	WR	Read watchdog timeout value
	CHK	Check sum
	(cr)	Carriage return

Response	!IDWANN (CHK)(cr)
	!ID (CHK)(cr)
		W: watchdog
		  A=E: watchdog enable
		    D: watchdog disable or safe mode
		  NN: watchdog timeout value

	?ID(CHK)(cr)	Command Invalid

Example:

Send Command:"~01WR"…. Read watchdog timeout value.

Response:" !01WD0F"……. . Command valid, set the watchdog timeout is "0F"..1.6 Sec.

6-22. System stand by (Host OK!)

Command	~**(CHK)(cr)	
Syntax description	~	First leading code
	**	Host ok!
	CHK	Check sum
	(cr)	Carriage return
Response		No Response

Before watchdog timeout,Send the Host ok !   NN:Watchdog timeout value

*If watchdog is in enable , send the "Host Ok!" before watchdog timeout (B) the watchdog will re-count, PWR LED will flashing after watchdog timeout.

6-23. Save current digital input status

Command	#**(CHK)(cr)	
	#	First leading code
	**	Save current digital IO status(All modules on line).
	CHK	Check sum
Syntax description	(cr)	Carriage return
Response		No Response

Example:

Send Command:"#**"………. Save current digital IO status of all on-line modules.

6-24. Read synchronized data

Command	$ID4(CHK)(cr)	
	$	First leading code
	ID	Address of setting module 00~FF(HEX)
	4	Read synchronized data
Syntax description	CHK	Check sum
	(cr)	Carriage return
Response	!AHHLL00(CHK)(cr)	Command valid A=1:Have been send"#**" A=0:Have been read HH: DI15-DI8 input status LL: DI7-DI0 input status
	?ID	Before send this command do not send the command "#**"

Example:

Send Command:"#**"……….Save current digital IO status(All modules on line).

Then send command:"$014"…. Read   synchronized   data.

Response:"!1010E00"…."1":Have been send the "#**,the DIO status valid is "010E" *After Read
    *synchronized   data ,A value is"1", Read again become to "0".

7. Modbus Protocol Description

*Command Format :**ID**(HEX)+**FC**(HEX)+**SU**(HEX)+**DA**(HEX) or **RC**(HEX)+**CRC16**(HEX)*

*Response Format : **ID**(HEX)+**FC**(HEX)+**SU**(HEX)+**DA**(HEX) or **RC**(HEX)+**CRC16**(HEX)*

*Error Format: **ID**(HEX)+ **FC**(HEX)+ **CRC16**(HEX).*

ID: RS485 Device Address(HEX)…..00~FF 1Byte.

FC: Function Code (HEX)…1 Byte.

SU: Sub Function (HEX)…..1 Byte.

DA: Data Format….No Limit.

RC: Reserved code…No Limit.

CRC: Checksum 2 Byte.

8. Modbus RTU Command List

Command List	Function Description	Index
ID 46 00 00 (CRC)	Read the module's name	8-1
ID 46 04 IP 00 00 00 (CRC)	Set up the module's address	8-2
ID 46 05 00 (CRC)	Read the module's configuration	8-3
ID 46 06 00 BD 00 00 00 00 00 00 (CRC)	Set up the module's configuration	8-4
ID 46 07 00 (CRC)	Read the module's Firmware	8-5
ID 46 08 00(CRC)	Read module reset status	8-6
ID 46 09 00(CRC)	Set up the module reset	8-7
ID 46 0B WS 00 (CRC)	Set up watchdog timeout value or disable	8-8
ID 46 0C 00 (CRC)	Read watchdog status	8-9
ID 46 0D 0S 00 (CRC)	Set up panel LED status	8-10
ID 01 00 SS 00 10 (CRC)	Read digital input (Latch) status	8-11
ID 02 00 SS 00 10 (CRC)	Read digital input (Latch) status	8-12
ID 03 00 SS 00 NN (CRC)	Read digital input counter value	8-13
ID 04 00 SS 00 NN (CRC)	Read digital input counter value	8-14
ID 05 SS NN 00 00 (CRC)	Clear digital input N channel Counter value	8-15
ID 0F SS NN 00 CN BC 00 (CRC)	Clear digital input N channel Counter value	8-16

8-1.Read the module's name

Command	ID 46 00 00 (CRC)	
Syntax Description	ID	Address of setting module 1~247
	46	Function code
	00	Read module's name
	00	Reserved code
Response	ID 46 00 00 0C 28 00 (CRC)	ID 46 00 00 ….Module command Line 0C 28 :Module's Name is C28
	ID C6 00(CRC)	ID C6 (CRC) C6:Function Code 00: Reserved code

EX: Send Command: 01 46 00 00   .Read the TRP-C24's name

Response: 01 46 00 00 0C 28 00 "……Module's name is C24

Error Response: "01 C6 00"……Error code

8-2.Set up the module's address

Command	ID 46 04 IP 00 00 00 (CRC)	
Syntax Description	ID	Address of setting module 1~247
	46	Function Code
	04	Set up module's ID
	IP	New module's ID
	00 00 00	Reserved code
Response	ID 46 04 00 00 00 00 (CRC)	ID 46 04 00 00 00 00 ….Change module ID OK!
	ID C6 00(CRC)	ID C6 (CRC) C6:Function Code 00: Reserved code

EX: Send Command: 02 46 04 03 00 00 00   .Set up the new ID is "03".

Response: 01 46 04 00 00 00 00 "……New ID is 03.

Error Response: "01 C6 00"……Error code.

8-3.Read the module's configuration

Command	ID 46 05 00 (CRC)	
Syntax Description	ID	Address of setting module 1~247
	46	Function Code
	05	Read module's configuration
	00	Reserved code
Response	ID 46 05 00 **BD** 00 00 00 00 00 00 (CRC)	ID 46 05 00 ……Module command Line **BD**:Baud Rate *See 8-2* 00 00 00 00 00 00 : Reserved code
	ID C6 00(CRC)	ID C6 (CRC) C6:Function Code 00: Reserved code

Example:

Send Command: 01 46 05 00   .Read TRP-C24's configuration.

Response:"01 46 05 00 **06** 00 00 00 00 00 00 "……06:BD=9600…See 8-2 baud rate table.

Error Response: "01 C6 00"……Error code.

8-4.Set up the module's configuration

Command	ID 46 06 00 BD 00 00 00 00 00 00 (CRC)	
Syntax Description	ID	Address of setting module 1~247
	46	Function Code
	06	Set up module's configuration
	00 **BD** 00 00 00 00 00 00	**BD**: Baud-Rate….See 8-2
Response	ID 46 06 00 00 00 00 00 00 00 00 (CRC)	ID 46 06 00 ……Module command Line 00 00 00 00 00 00 00 00 : Reserved code
	ID C6 00 (CRC)	ID C6 (CRC) C6:Function Code 00: Reserved code

Example:

Send Command: 01 46 06 00 **0A** 00 00 00 00 00 00   .Set up TRP-C28's configuration.

Response:"01 46 06 00 00 00 00 00 00 00 00 "…Command valid.

Error Response: "01 C6 00"……Error code.   *Baud-Rate set to 115200 .

8-5.Read the module's Firmware

Command	ID 46 07 00 (CRC)	
Syntax Description	ID	Address of setting module 1~247
	46	Function Code
	07	Read module's Firmware
	00	Reserved code
Response	ID 46 07 **YY MM DD** 00(CRC)	ID 46 07 ……Module command Line **YY**:Year **MM** :Month **DD:**Date 00 : Reserved code
	ID C6 00 (CRC)	ID C6 (CRC) C6:Function Code 00: Reserved code

Example:

Send Command: 01 46 07 00   .Set up TRP-C28's configuration.

Response:"01 46 07 07 04 06 00"…APR. 04.2007 TRP-C28 Firmware Version.

Error Response: "01 C6 00"……Error code.

8-6.Read module reset status

Command	ID 46 08 00(CRC)	
Syntax Description	ID	Address of setting module 1~247
	46	Function Code
	08	Read Module Reset status
	00	Reserved code
Response	ID 46 08 0D 00 (CRC)	D=0 Have been read, D=1 Have been reset
	ID C6 00 (CRC)	ID C6 (CRC) C6:Function Code 00: Reserved code

Example:

Send Command: 01 46 08 00   …Read the module's digital input status.

Response:"01 46 08 1 00 ..have been reset.

8-7.Set up the module reset

Command	ID 46 09 00	
Syntax Description	ID	Address of setting module 1~247
	46	Function Code
	09	Module Reset
	00	Reserved code
Response	ID 46 09 00 (CRC)	Reset module
	ID C6 00 (CRC)	ID C6 (CRC) C6:Function Code 00: Reserved code

Example:

Send Command:　01 46 09 00　…Read the module's digital input status.

Response:"01 46 09 00 ..Command valid.

Error Response: "01 C6 00"…Error code.

8-8.Set up watchdog timeout value or disable

Command	ID 46 0B WS 00 (CRC)	
Syntax Description	ID	Address of setting module 1~247
	46	Function Code
	2B	Set up power on mode
	WS	WS=00 Watchdog Disable Watchdog timer from 01~FF (100ms~25.5 Sec)
	00	Reserved code
Response	ID 46 0B 00(CRC)	00 ID 46 0B 00 ……Setting OK!
	ID C6 00 (CRC)	ID C6 (CRC) C6:Function Code 00: Reserved code

Example:

Send Command:　01 46 0B 05 00　　　　.Set up TRP-C28's watchdog timer=500ms.

Response:"01 46 0B 00"…Command valid.

Error Response: "01 C6 00"……Error code.

8-9.Read watchdog status

Command	ID 46 0C 00 (CRC)	
Syntax Description	ID	Address of setting module 1~247
	46	Function Code
	0C	Read watchdog value
	00	Reserved code
Response	ID 46 0C WT (CRC)	ID 46 0C ......Module command line WT: Watch dog vale
	ID C6 00 (CRC)	ID C6 (CRC) C6:Function Code 00: Reserved code

Example:

Send Command: 01 46 0C 00   …Read TRP-C28's watchdog value.

Response:"01 46 0C 01 0F.

Error Response: "01 C6 00"…Error code.

8-10.Set up LED panel status

Command	ID 46 0D 0S 00 (CRC)	
Syntax Description	ID	Address of setting module 1~247
	46	Function Code
	0D	Set Up LED Status Value
	0S	S = 0 Turn on all LED when DIO enable off S = 1 Turn off all LED when DIO enable on
	00	Reserved code
Response	ID 46 0D 00 (CRC)	ID 46 0D 00 ......Command valid
	ID C6 00 (CRC)	ID C6 (CRC) C6:Function Code 00: Reserved code

Example:

Send Command: 01 46 0D 01 00.

Response:"01 46 0D 00.

Error Response: "01 C6 00"…Error code.

8-11. Read digital input (Latch) status

Command	ID 01 00 SS 00 10 (CRC)	
Syntax Description	ID	Address of setting module 1~247
	01	Function Code
	00 SS	Start channel number SS=00 DI Value, SS=40 Latch High, SS=60 Latch low
	00 10	Digital Input channel number=16(BIN)=10(HEX)
Response	ID 01 BC HH LL(CRC)	ID 01..Module command Line BC: Byte Counter HH LL: Digital input status
	ID 81 ER (CRC)	ID 81 :Error Code ER=00 Syntax error ER=01 Data Format error ER=02 Start channel error ER=03 I/O out of range

Example:

Send command :   01 01 00 00 00 0F ".

Response:" 01 01 02 FF FF".

8-12. Read digital input (Latch) status

Command	ID 02 00 SS 00 10 (CRC)	
Syntax Description	ID	Address of setting module 1~247
	02	Function Code
	00 SS	Start channel number SS=00 DI Value, SS=40 Latch High, SS=60 Latch low
	00 10	Digital Input channel number=16(BIN)=10(HEX)
Response	ID 02 BC HH LL(CRC)	ID 02..Module command Line BC: Byte Counter HH LL: Digital input status
	ID 82 ER (CRC)	ID 82 :Error Code ER=00 Syntax error ER=01 Data Format error ER=02 Start channel error ER=03 I/O out of range

Example:

Send command :   01 02 00 00 00 0F "…..Read digital input status.

  Response:" 01 02 02 00 3F".

8-13. Read digital input counter value

Command	ID 03 00 SS 00 NN (CRC)	
Syntax Description	ID	Address of setting module 1~247
	03	Function Code
	00 SS	Start channel number SS=00
	00 NN	Channel number NN=1~10(HEX)
Response	ID 03 BC DATA (CRC)	ID 03 ……Module command Line BC: Byte Counter ,Each channel 2byte DATA :Channel counter value
	ID 83 ER (CRC)	ID 83 :Error Code ER=00 Syntax error ER=01 Data Format error ER=02 Start channel error ER=03 I/O out of range

Example:

Send command :   01 03 00 00 00 07"…..Read channel 0~6..counter value.

Response: 01 03 0E **00 65** 00 04 **00 85** 00 0A **00 0D** 00 08 **00 04**   Command valid.

Send command :   01 03 00 00 00 10"…..Read channel 0~F…….counter value.

Response:" 01 03 20 **00 21** 00 22 **00 20** 00 1E **00 1D** 00 1C **00 1C** 00 1A **00 1E** 00 20 **00 1F** 00 1F **00 1E** 00 1C **00 1C** 00 1D" Command valid.

8-14. Read digital input counter value

Command	ID 04 00 SS 00 NN (CRC)	
Syntax Description	ID	Address of setting module 1~247
	04	Function Code
	00 SS	Start channel number SS=00
	00 NN	Channel number NN=1~10(HEX)
Response	ID 04 BC DATA (CRC)	ID 04 ……Module command Line BC: Byte Counter ,Each channel 2byte DATA :Channel counter value
	ID 84 ER (CRC)	ID 84 :Error Code ER=00 Syntax error ER=01 Data Format error ER=02 Start channel error ER=03 I/O out of range

Example:

Send command : 01 04 00 00 00 07"…..Read channel 0~6 counter value.

Response: 01 04 0E **00 65** 00 04 **00 85** 00 0A **00 0D** 00 08 **00 04** …. Command valid.

Send command : 01 04 00 00 00 10"…..Read all DI counter value.

Response: 01 04 20 **00 00** 00 0C **00 32** 00 0C **00 4F** 00 22 **00 27** 00 0D **00 17** 00 11 **01 23** 00 2E **00 37** 00 47 **01 20** 00 21   …. Command valid.

8-15.Clear digital input N channel Counter value

Command	ID 05 SS NN 00 00 (CRC)	
Syntax Description	ID	Address of setting module 1~247
	05	Function Code
	SS	SS=01 Clear DI Latch , SS=02 Clear counter value
	NN	Select clear channel NN=00~0F
	00 00	Clear to 00
Response	ID 05 SS 00 00 (CRC)	Command valid
	ID 85 ER (CRC)	ID 85 :Function Code ER=00 Syntax error ER=01 Data Format error ER=02 Start channel error ER=03 I/O out of range

Example:

Send command :   01 05 02 00 00 00 ".....Clear Channel 0.

Response:" 01 05 02 00 00 00 "….. Command valid.

8-16.Clear or save digital input channel counter value

Command	ID 0F SS NN 00 CN BC 00 (CRC)	
Syntax Description	ID	Address of setting module 1~247
	0F	Function Code
	SS	SS=02 Clear Counter value SS=03 Save Counter value
	NN	Start channel number NN=00~0F
	00 CN	Channel number 01~10(HEX)
	BC	Byte Counter=01
	00	Reserved code
Response	ID 0F SS NN 00 CN (CRC)	Command Valid
	ID 8F ER (CRC)	ID 8F :Function Code ER=00 Syntax error ER=01 Data Format error ER=02 Start channel error ER=03 I/O out of range

Example:

Send command :   01 0F 02 00 00 10 01 00 "…..Clear channel 0~F counter value.

Response: 01 0F 02 00 00 10   Command valid.

Send command :   01 0F 03 00 00 10 01 00 "…..Save channel 0~F counter value.

Response: 01 0F 03 00 00 10   Command valid.

10. How to use the utility for windows

The TRPCOM utility can help you to test the module's data transmit and receive, digital input and output communication status. User may download TRPCOM software from TRYCOM web www.trycom.com.tw
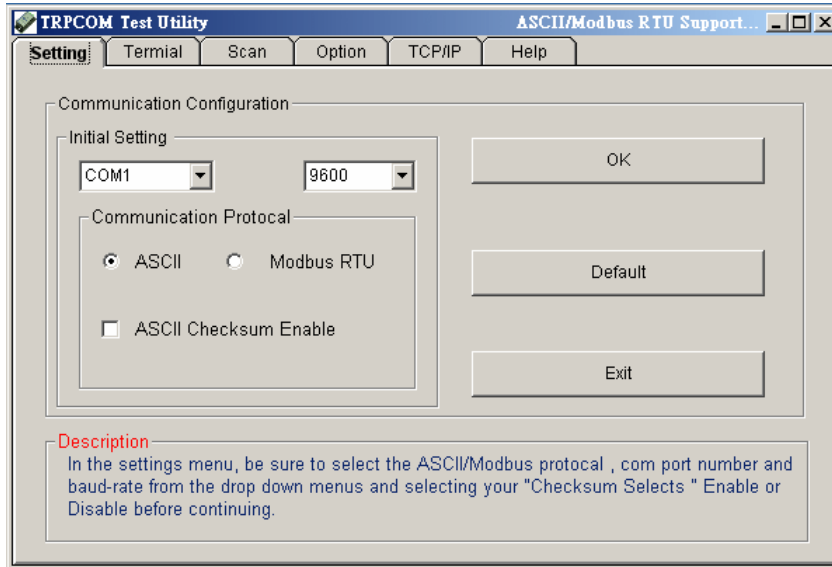

Figure 1

1.The "Setting function is for user to initiate the software to set the Com Port from 1 to 8 and setting the Baud-Rate from 1200 to 19200,Checksum Enable or Disable.   See Figure 1
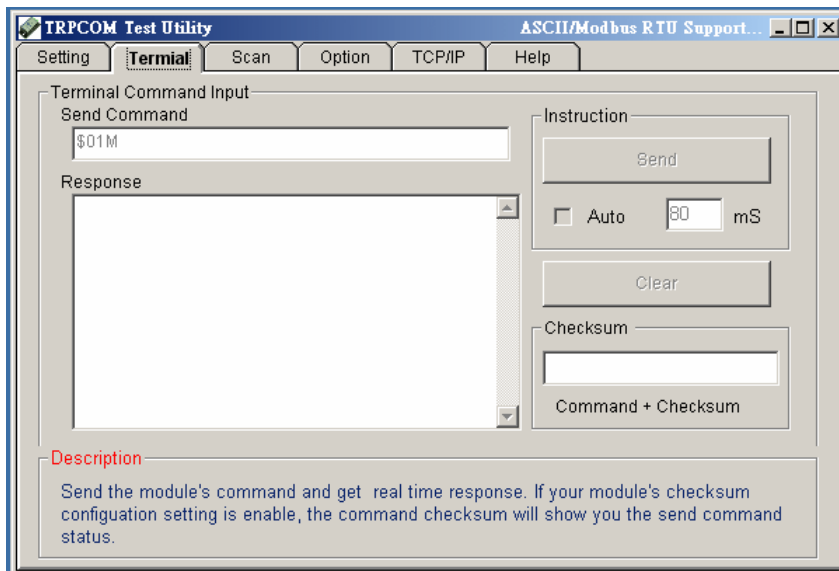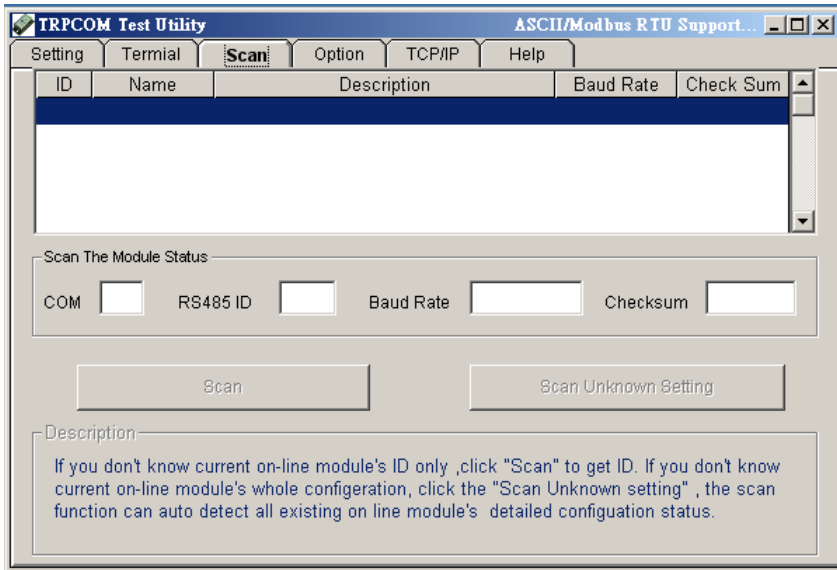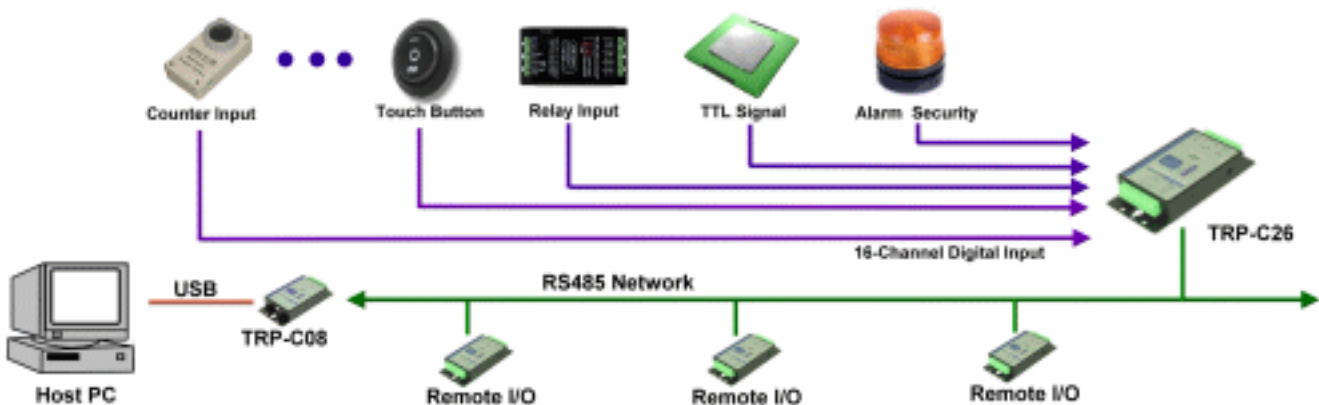*The Module Factory Setting is "9600" and "ID" is 01, Checksum is Disable.

Figure 2

2.The "Terminal" function is for user to input command, user can control all of module's digital input/output status or wait to get module response status   See Figure 2

Figure 3

If you don't know the baud-rate, ID or, Checksum you may select "Scan" to find the module's setting.

9. Application

10. Using the Modbus poll for test the TRP-DIO and AIO

The **Modbus poll** is the very popular utility that supports the Modbus RTU/ASCII and Modbus TCP/IP, you can download that for test the any TRP-DIO and AIO basic Modbus function.

The download website is http://www.modbustools.com/modbus_poll.asp

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