TRP-C68H

Isolated 8 Channel Analog Input Ethernet Module
Support TRP-ASCII, Modbus TCP RTU/ASCII protocol

User's Manual

Printed Nov. 2018 Rev 1.0
Firmware version: 624

Trycom Technology Co., Ltd
No.35, Zhongxing Rd., Guishan Township, Taoyuan County 333, Taiwan.
Tel : 886-3-350-3351 Fax: 886-3-350-3352
Web: www.trycom.com.tw

1. Introduction

The TRP-C68H is an 8-ch analog Input differential isolation module that can read the voltage or current value from the web-based.

The user can read the Analog input value from the web-based that includes the smartphone.

Each channel allows the user to input the DC voltage or current.

The watchdog function ensures TRP-C68H can running very stable without the firmware crash.

the We built-in safety surge protection prevents the spark and damage analog chipsets at each channel.

There are 3 protocols auto-detect that include ASCII and Modbus TCP RTU / ASCII.

The watchdog function ensures running stable in the harsh environment.

It allows connecting 1~8 sets of host IP in the network security.

1-1.Features

- Wide input range DC power input.
- Automatically determine 3 TRP-ASCII and Modbus TCP RTU/ASCII communication protocol.
- 16 TCP Port can be open at the same time.
- Heart Beat function ensures a reliable communicating connection.
- Maximum 8 sets host IP that limits network access.
- Support Virtual-COM mode.
- The web-based can read analog value.
- It is easy to update the firmware by LAN interface.
- Back to factory configuration by external touch button.
- Auto reconnection when power or Ethernet fail.
- Digital input signal from +/- 0 to 30V DC.
- Built-in surge absorbers in each relay N.C and N.O.
- Built-In watchdog function prevents system boot fail.
- LED for each I/O channels working status.
- Support Auto-MDIX twisted pair crossover detection and Auto-Correction.
- Power/Link LED indicator.
- DIN-Rail and panel mount support.
- Dual power input selects from screw terminal or DC-Jack.

1-2.Specification

- Resolution: 16 bit/24bit.
- Sample rate: 24 BIT Normal mode: 10 sample / sec.

  16 BIT Fast Mode: 60 sample / sec.

- Bandwidth: Normal Mode: 15.72Hz.

  Fast Mode:/78.72Hz.

  Zero drift: 0.03uV/C .

  Span drift: 25 ppm/C.

- Accuracy: Normal 0.1 or better.

  Fast: 0.5 or better.

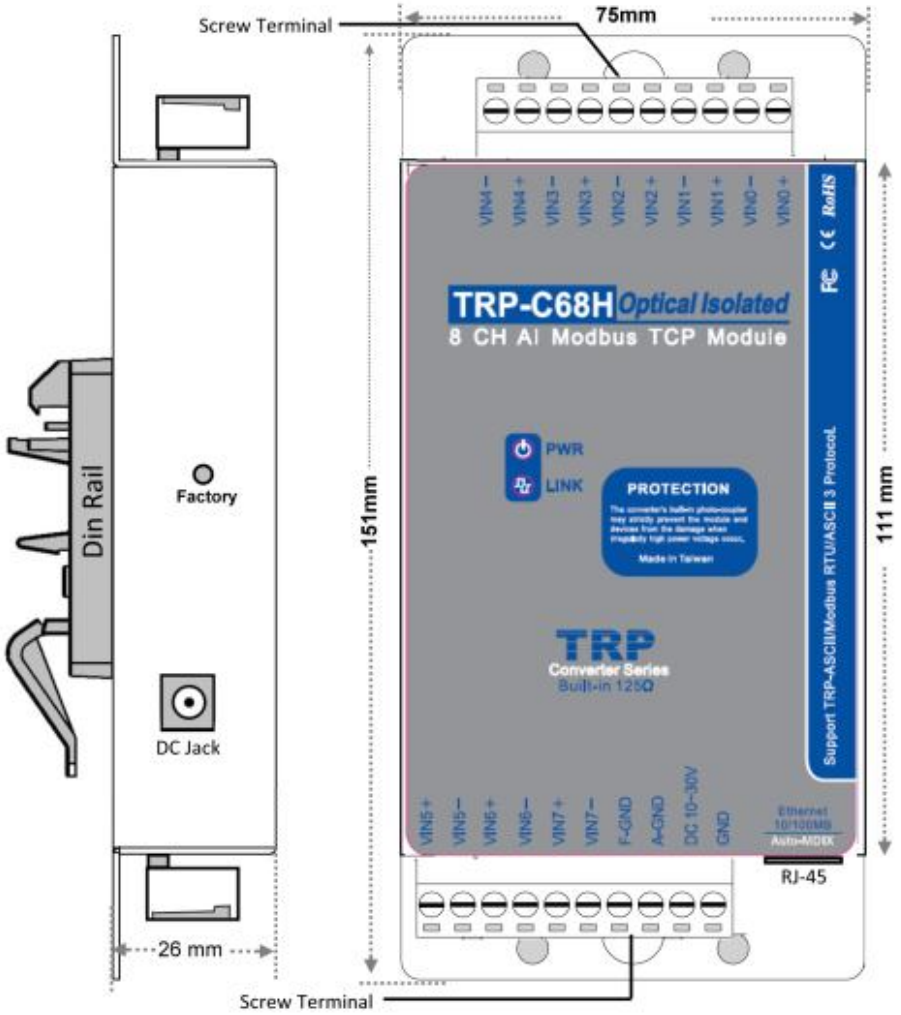
- Analog Input range: Voltage:±10V,±5V,±2.5V,±1.25V,±650mV..

  Current: +/-20mA. CMRR:92 db min/50/60Hz

- Analog input over voltage protection: +/- 48V.
- Power Input Voltage DC +10V to +30V.
- Protocol: TRP-ASCII and Modbus RTU/ASCII.
- Input channel:8-ch analog Input differential
- Input optical isolation: 3750 Vrms.
- Communication interface: Ethernet RJ45.
- Configuration mode: Device Manager, WEB settings.
- Heart Beat: TCP Port sent string every 5 seconds.
- TCP Maximum Connection:1~16.
- Module ID: 1~255.
- Connection type: Screw terminal for maximum AWG 12 wire.
- Power supply: Screw terminal, or external DC adapter.
- Power consumption 320mA/12V.
- Operating environment: 0 to 50℃.
- Storage temperature: -10 to 70℃.
- Humidity: 10~90% Non-condensing.
- Dimension: 151mm X 75mm X 26mm.
- Weight: 395g.

2. Hardware Description

2-1. Panel layout



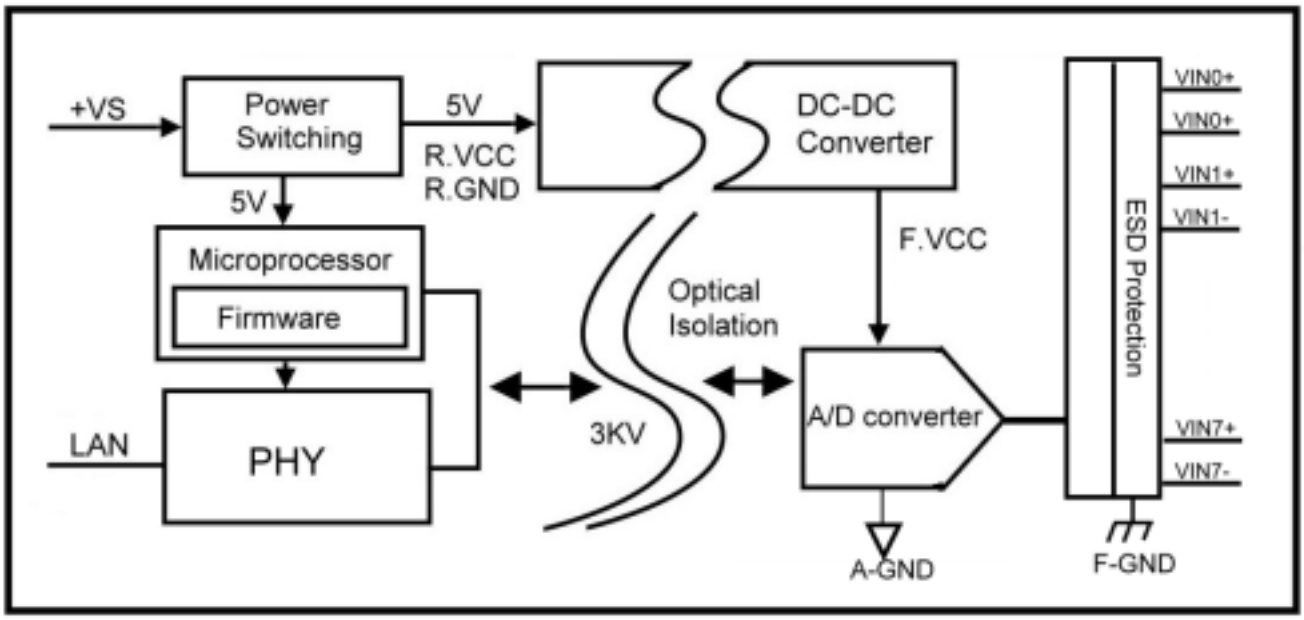
Notice: The Module provides two type power inputs, optional DC-JACK or Screw Terminal input, not to two used together!

PWR LED: Blinking is ready.

LINK LED: RJ-45 cable connection and data active.

DC Jack: Power Input DC +10V to +30V, Please use the 5.5*2.1mm DC JACK.

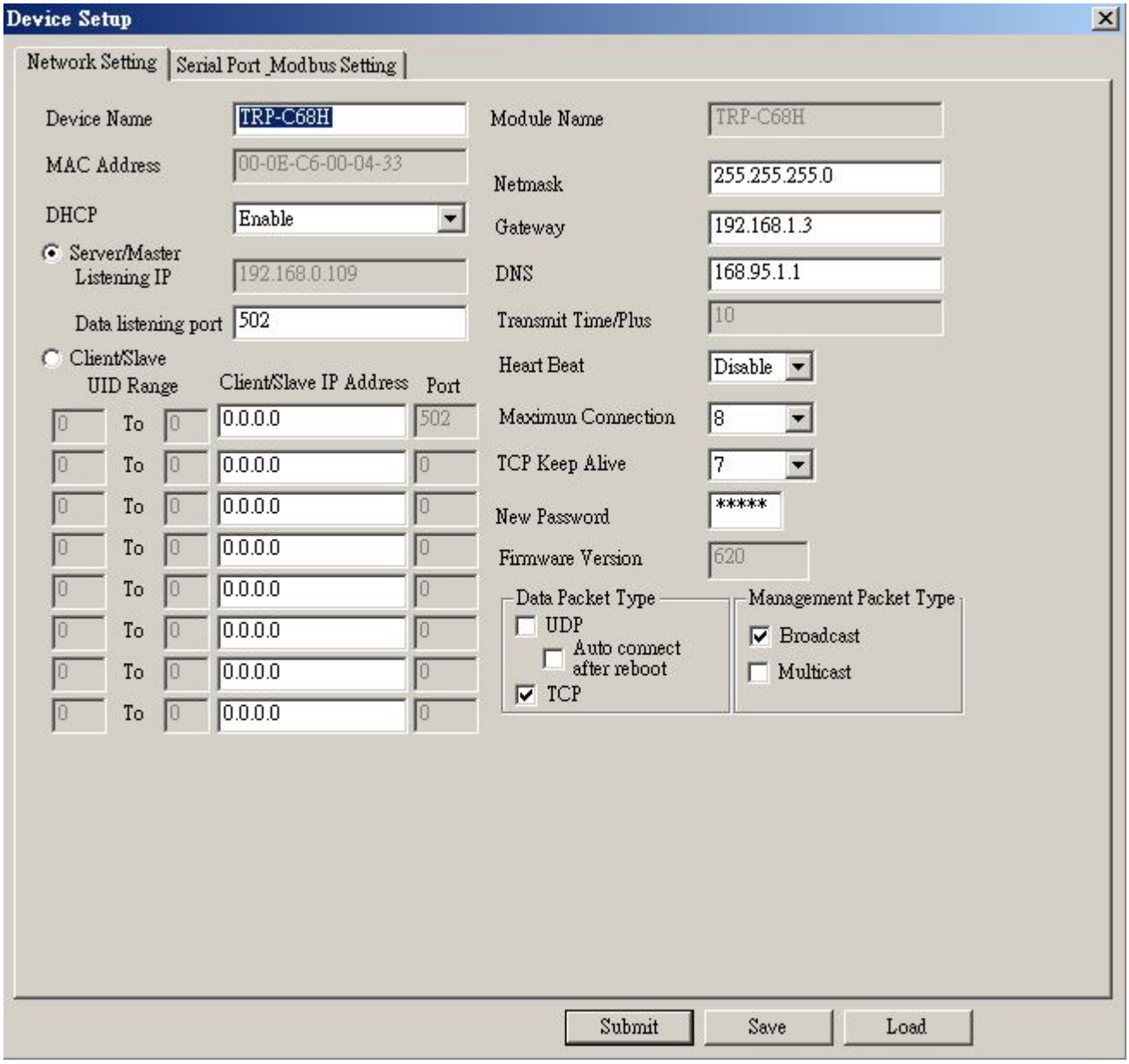
2-2. Block Diagram

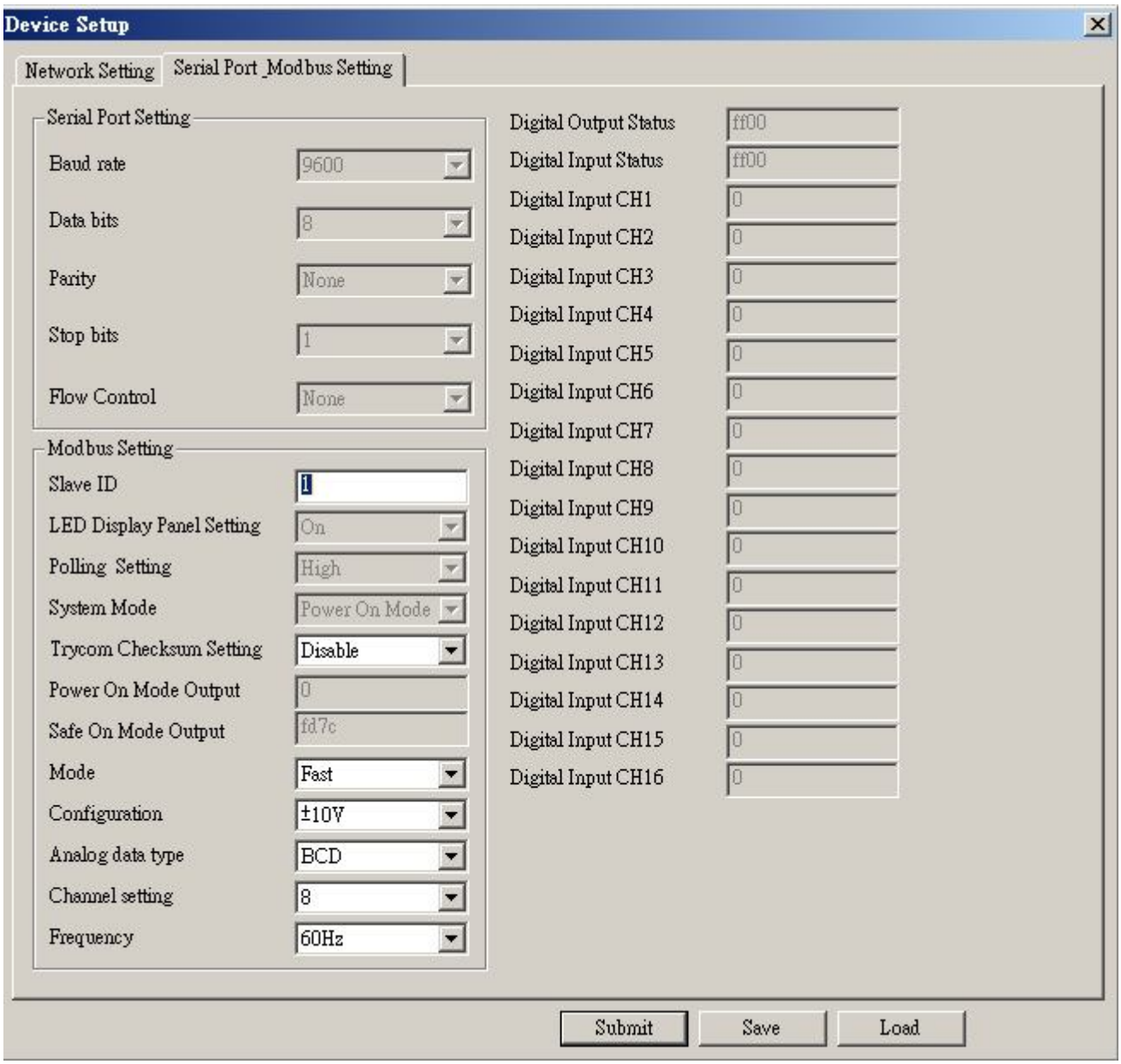


2-3. Factory Button

Hold down the button, and then power on, until the power light flashes, Release the button.

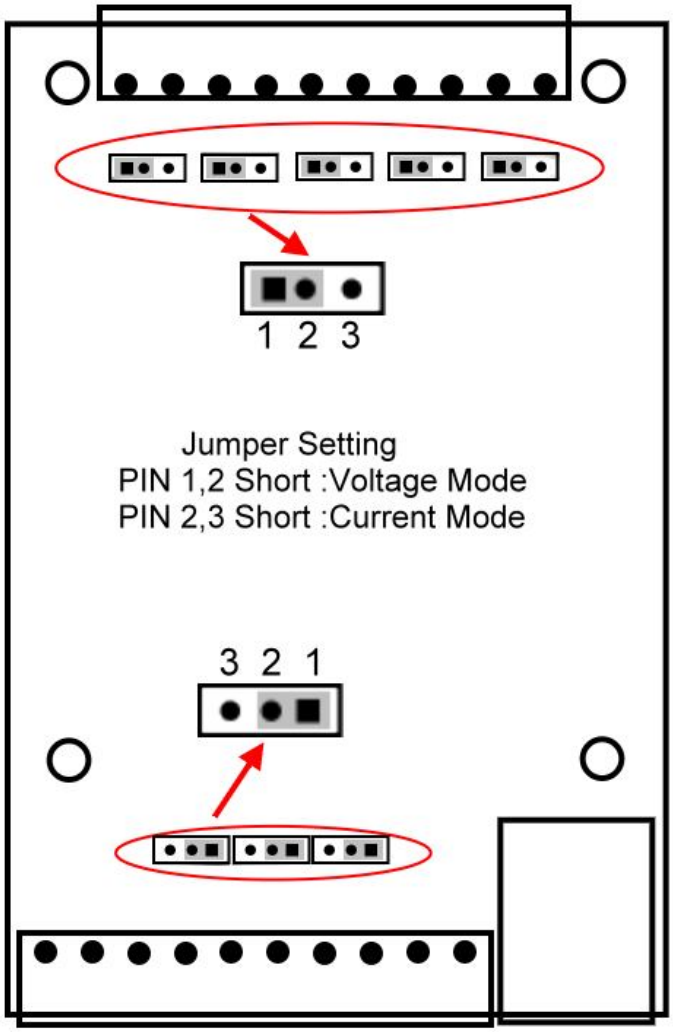
2-4. Factory parameter values


Device Setup
Network Setting
Serial Port _Modbus Setting
Device Name
TRP-C68H
MAC Address
00-0E-C6-00-04-33
DHCP
Enable
Server/Master Listening IP
192.168.0.109
Data listening port
502
Client/Slave
UID Range
Client/Slave IP Address
Port
To
0.0.0.0
Module Name
TRP-C68H
Netmask
255.255.255.0
Gateway
192.168.1.3
DNS
168.95.1.1
Transmit Time/Plus
10
Heart Beat
Disable
Maximun Connection
8
TCP Keep Alive
7
New Password
*****
Firmware Version
620
Data Packet Type
UDP
Auto connect after reboot
TCP
Management Packet Type
Broadcast
Multicast
Submit
Save
Load


Device Setup
Network Setting
Serial Port _Modbus Setting
Serial Port Setting
Baud rate
9600
Data bits
8
Parity
None
Stop bits
1
Flow Control
None
Modbus Setting
Slave ID
1
LED Display Panel Setting
On
Polling Setting
High
System Mode
Power On Mode
Trycom Checksum Setting
Disable
Power On Mode Output
0
Safe On Mode Output
fd7c
Mode
Fast
Configuration
±10V
Analog data type
BCD
Channel setting
8
Frequency
60Hz
Digital Output Status
ff00
Digital Input Status
ff00
Digital Input CH1
Digital Input CH2
Digital Input CH3
Digital Input CH4
Digital Input CH5
Digital Input CH6
Digital Input CH7
Digital Input CH8
Digital Input CH9
Digital Input CH10
Digital Input CH11
Digital Input CH12
Digital Input CH13
Digital Input CH14
Digital Input CH15
Digital Input CH16
Submit
Save
Load

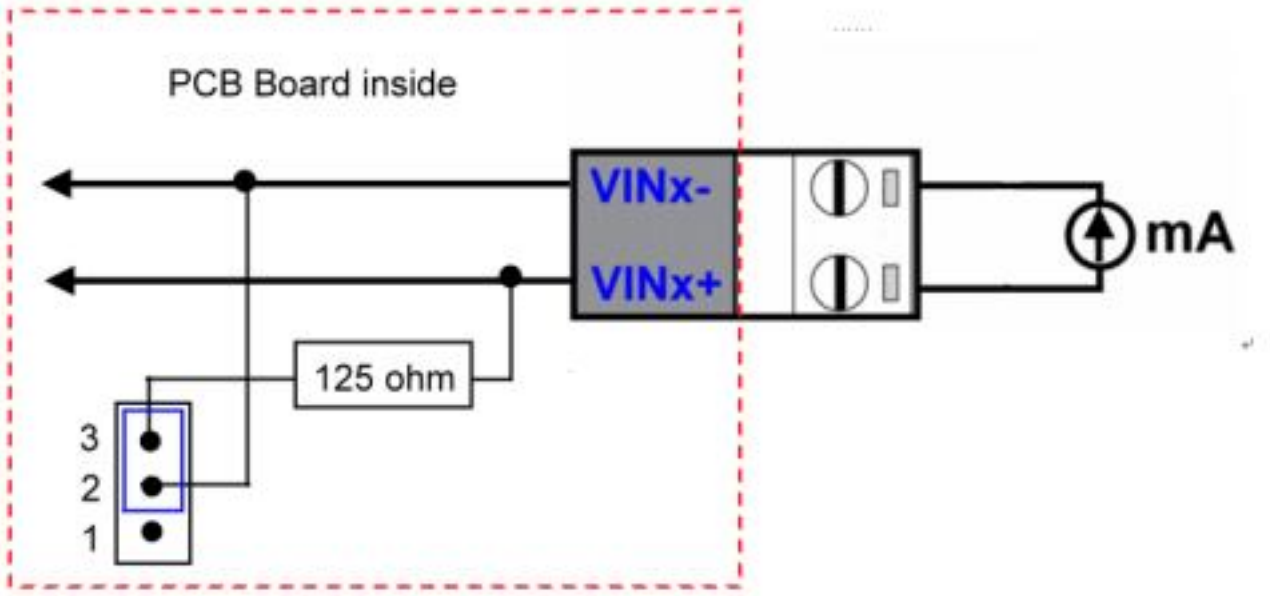
2-5. Voltage and current selectable.

The TRP-C68H which is built in 125ohm resistors inside. The default is for voltage mode, if user who needs using the current mode, please open the metal cover then adjust the jumper to pin2,3 position ,please refer the following setting.

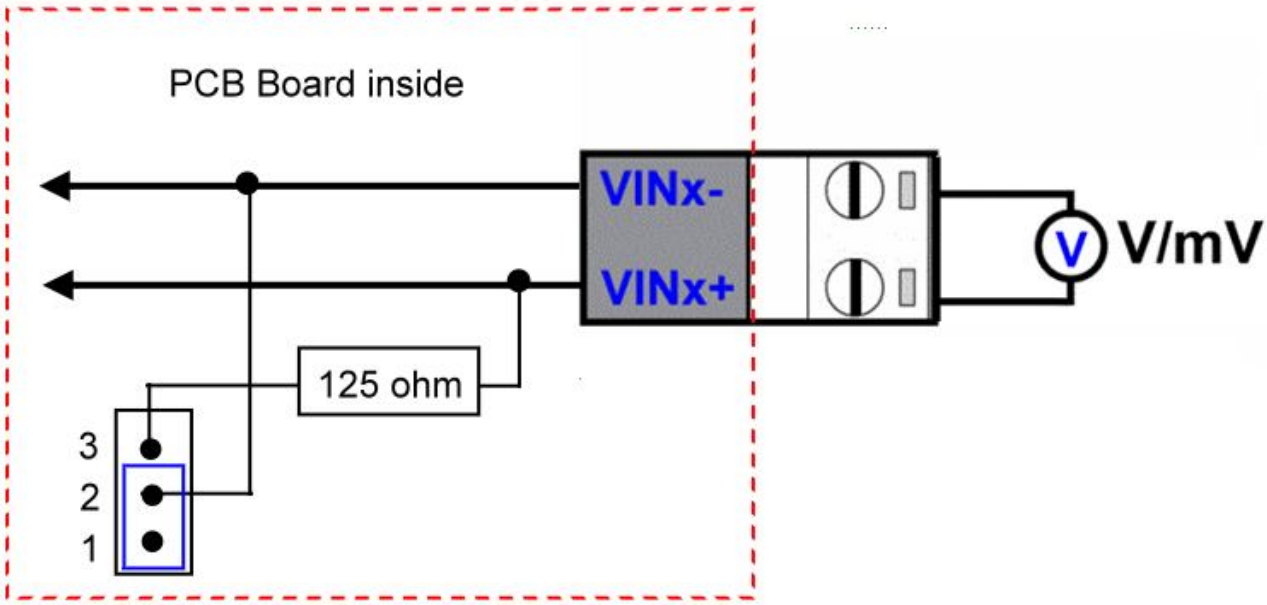


2-6. Wire Connection

Voltage mode



Current Mode



2-7. Pin Description

VIN5+	Analog CH5 input positive	VIN4-	Analog CH4 input negative
VIN5-	Analog CH5 input negative	VIN4+	Analog CH4 input positive
VIN6+	Analog CH6 input positive	VIN3-	Analog CH3 input negative
VIN6-	Analog CH6 input negative	VIN3+	Analog CH3 input positive
VIN7+	Analog CH7 input positive	VIN2-	Analog CH2 input negative
VIN7-	Analog CH7 input negative	VIN2+	Analog CH2 input positive
F-GND	To earth ground	VIN1-	Analog CH1 input negative
A-GND	To earth ground	VIN1+	Analog CH1 input positive
DC 10~30V	Input DC 10~30V	VIN0-	Analog CH0 input negative
GND	Power Ground	VIN0+	Analog CH0 input positive

3. Install TRP-C68H Hardware

STEP1: Connect power source with TRP-C68H, the PWR LED will blinking.

STEP2: Connect TRP-C68H with network by RJ45 cable.

If the cable is properly connected the “LINK” LED will light up.

*The TRP-C68H Support Auto-MDIX, A straight-through or crossover RJ45 cable can be used to make a connection directly to the HUB/Router/PC LAN port.

STEP3: Connect TRP-C68H screw terminal wiring, such as 2-5 picture description.

4. How to configure TRP-C68H

**Please make sure the both IP segment between the PC and TRP-C68H are same.*

For example:

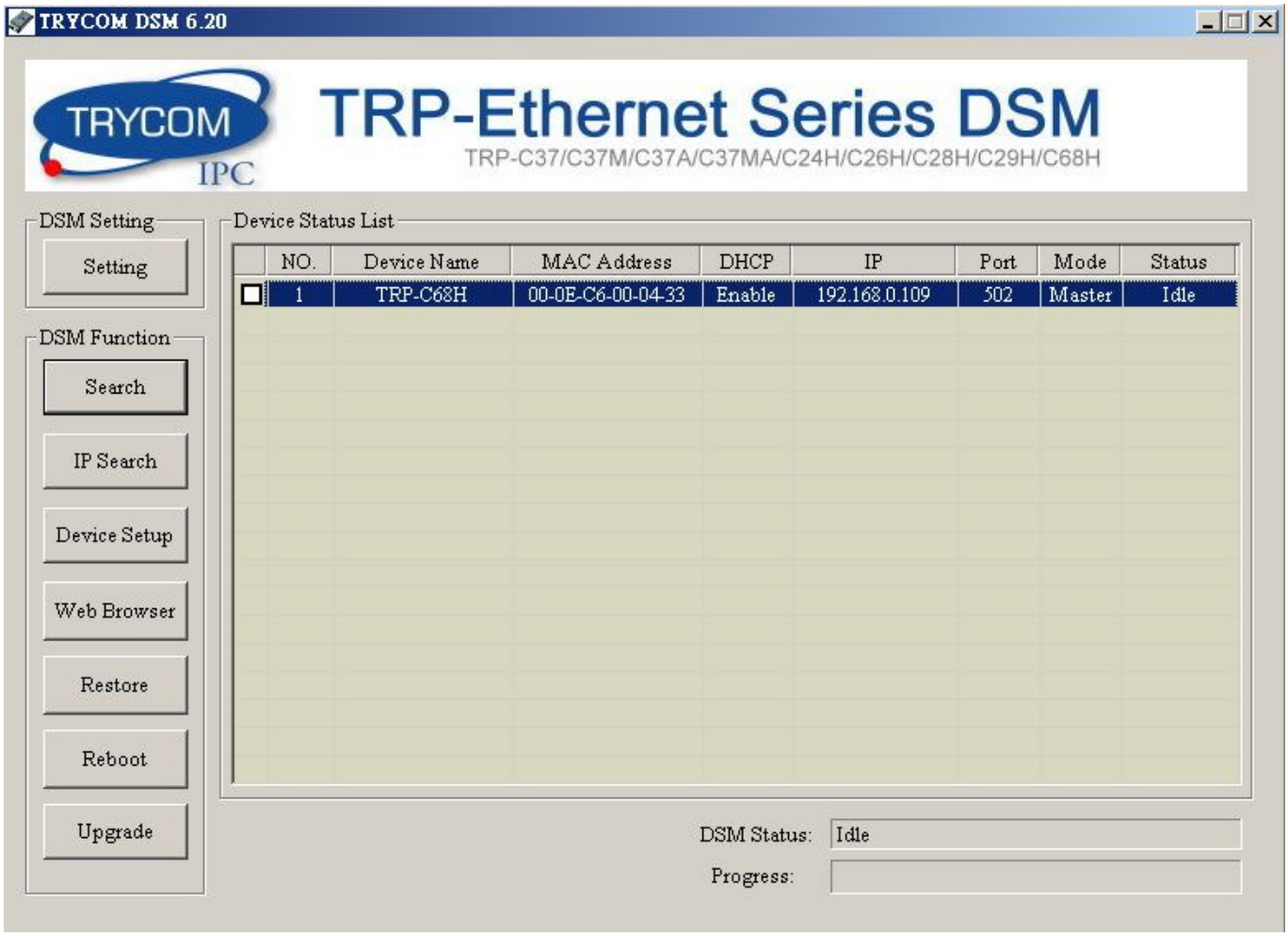
Computer IP is 192.168.1.xx

TRP-C68H 192.168.1.1

There are 2 ways can change the module parameter values.

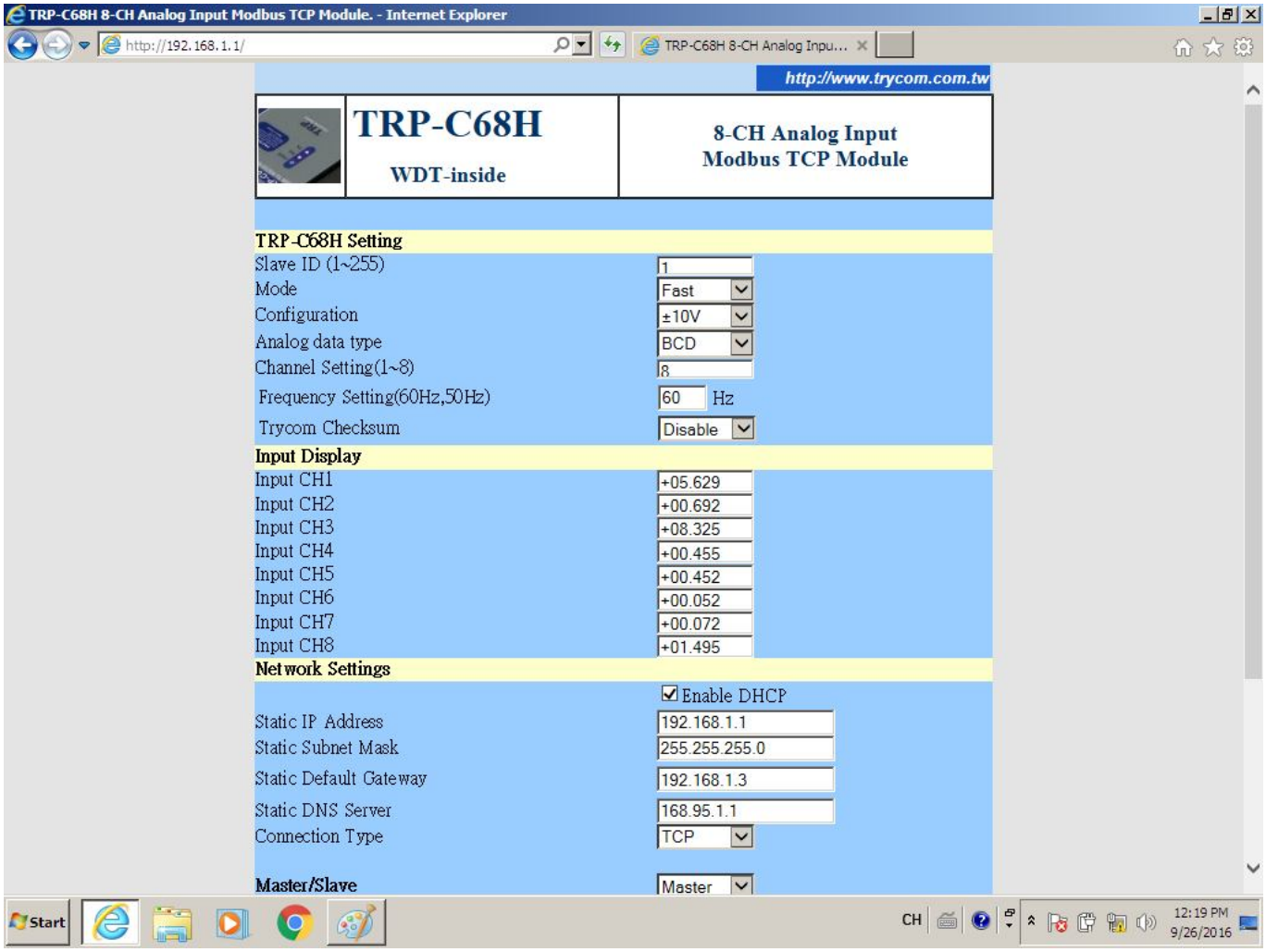
A. DSM utility

The DSM utility you can download from our website, it is an execution file which helps user easy to find the TRP-C68H over the network.



B. WEB Server

The TRP-C68H provides a simple way to modify the parameter or user can easy to read the analog value from the Web browser.



4-1. Using DSM Utility

The DSM utility software performs several functions:

A: Searching for TRP-C68H connected to the network.

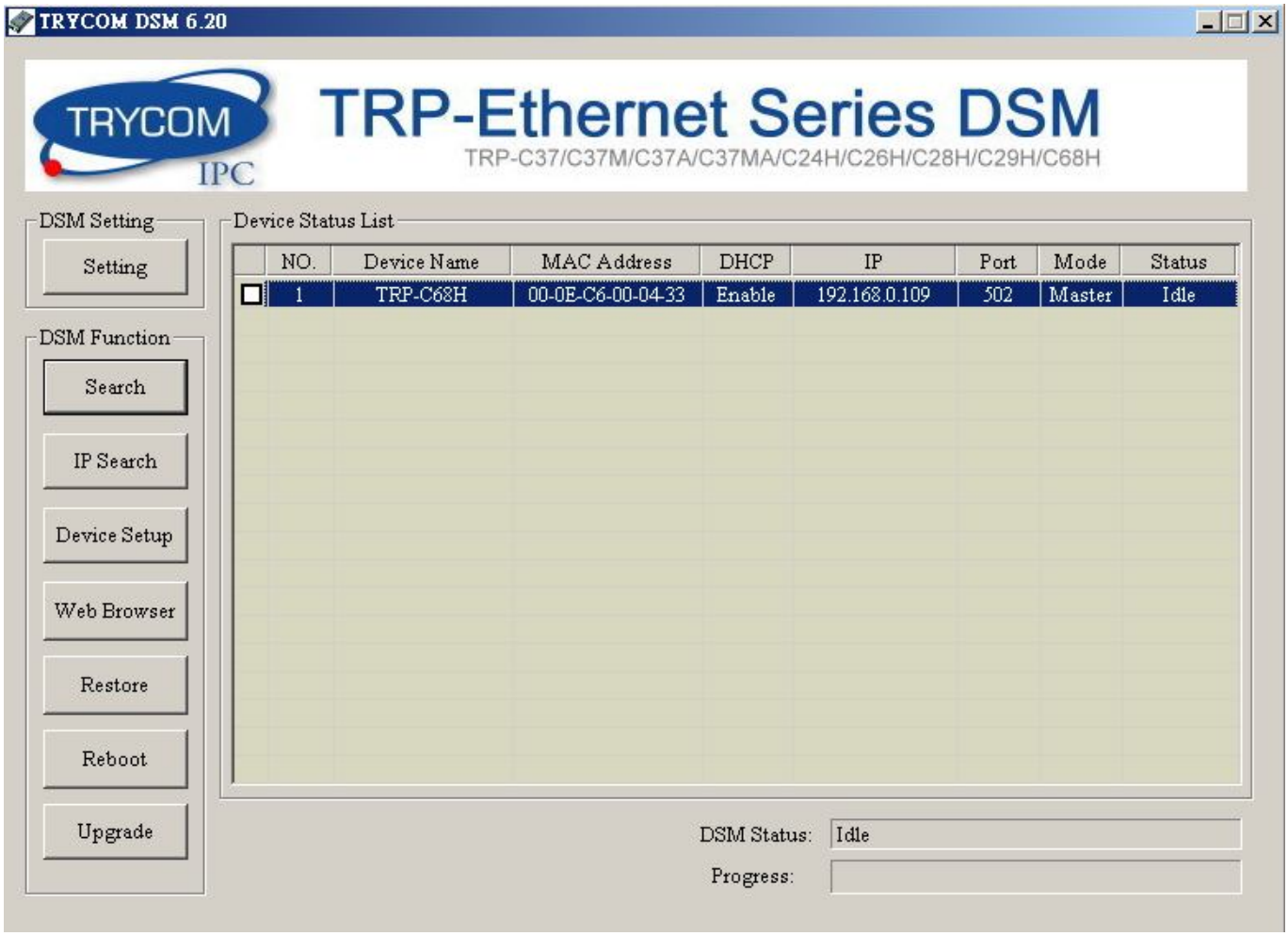
B: Displaying and changing the configuration.

C: Upgrading the TRP-C68H firmware, Refer the Firmware upgrade help file.

D: Saving and Loading Configuration from external log File or memory.

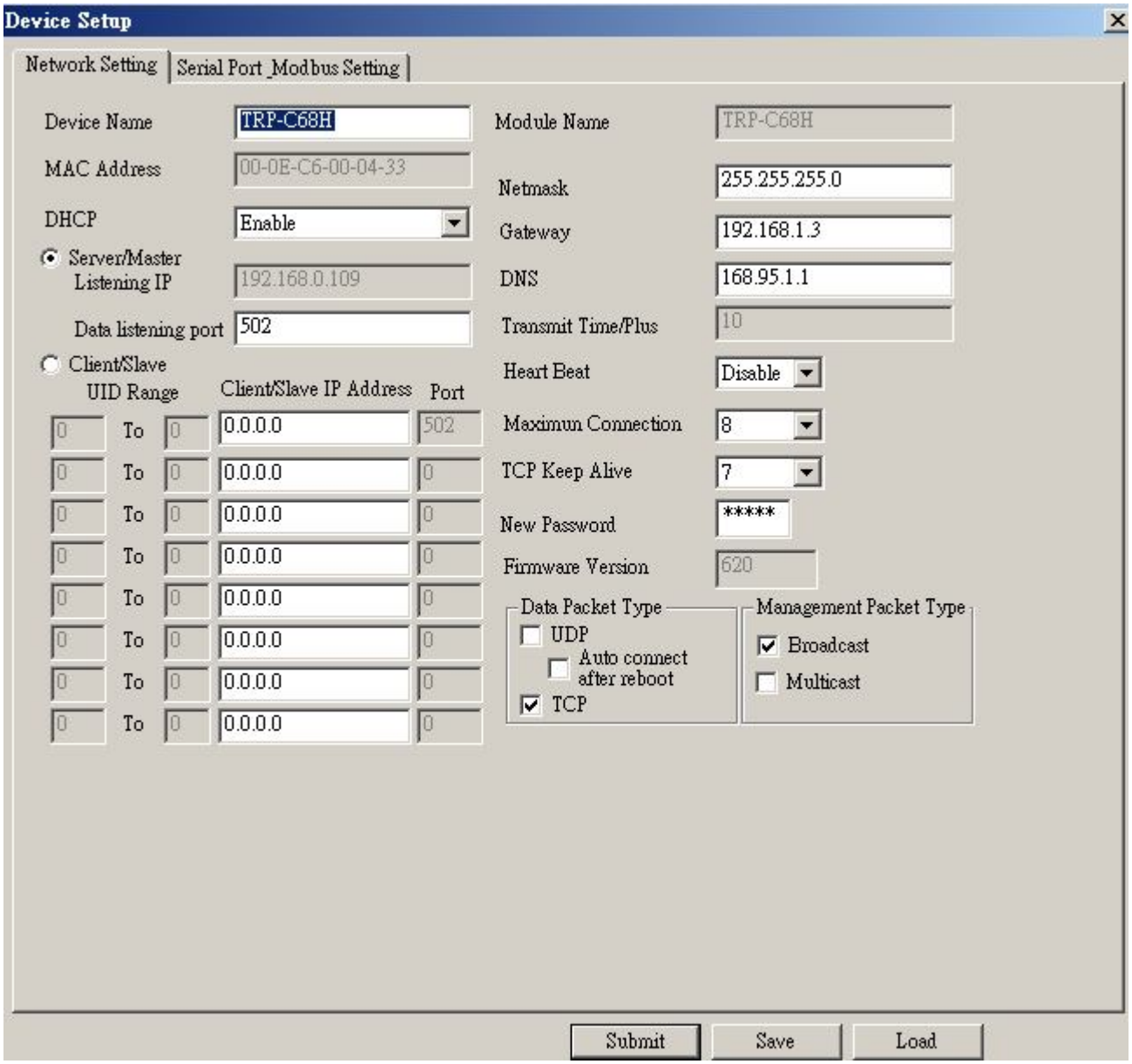
4-2. Searching TRP-C68H

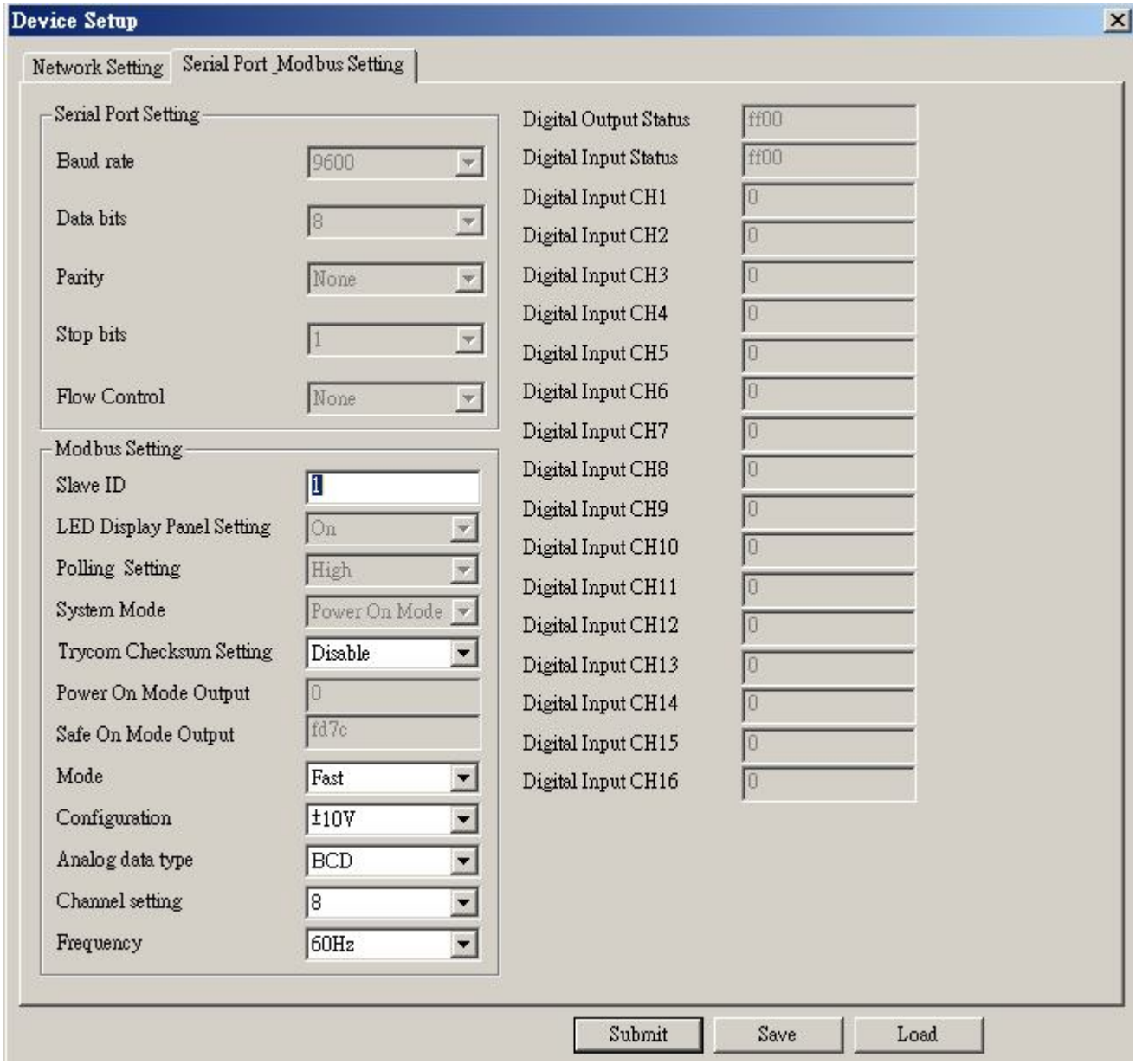
Once TRP-C68H is connected to the network the **DSM** software will search it and display it in a window by name, IP address, Mac….Information.



4-3.Configuring Server Properties

Select the “NO.” item and Double click to open the module configuration, after setting then click “Submit” will save the configuration to memory.


Device Setup
Network Setting
Serial Port _Modbus Setting
Device Name
TRP-C68H
MAC Address
00-0E-C6-00-04-33
DHCP
Enable
Server/Master
Listening IP
192.168.0.109
Data listening port
502
Client/Slave
UID Range
Client/Slave IP Address
Port
To
0.0.0.0
Module Name
TRP-C68H
Netmask
255.255.255.0
Gateway
192.168.1.3
DNS
168.95.1.1
Transmit Time/Plus
10
Heart Beat
Disable
Maximun Connection
8
TCP Keep Alive
7
New Password
*****
Firmware Version
620
Data Packet Type
UDP
Auto connect after reboot
TCP
Management Packet Type
Broadcast
Multicast
Submit
Save
Load



◆ Device Name:

Device server name, Maximum 10 chars.

◆ Model Name:

TRP-C68H.

◆ MAC Address

The TRP-C68H MAC address.

◆ DHCP

If DHCP is disabled, it allows user setting the IP address, Subnet mask, Gateway.

If DHCP is enabled, the IP address, Subnet mask, Gateway address will be dynamically configuration by DHCP server such router.

When DHCP is enabled, but the DHCP server is not available on the network, the TRP-C68H will timeout then back to factory setting IP=192.168.1.1.

◆ Server Listening IP

The TRP-C68H IP address.

◆ Server Data listening port

TRP-C68H port address.

◆ Client Destination IP

When user using the pair mode, the client setting need to input module IP and port which one need to connect.

◆ Client Destination port

Client port address.

Port**:** 16 bit number. (1 ~ 65535)

◆ Netmask

The default LAN Netmask is configured for a Class C address. This maybe reconfigured by the user.

◆ Gateway

Input the gateway IP address that can be allows users to access the serial server from internet.

◆ DNS

Short for Domain Name System, an Internet service that translates domain names into IP addresses. Because domain names are alphabetic, they're easier to remember. The Internet however, is really based on IP addresses. Every time you use a domain name, therefore, a DNS service must translate the name into the corresponding IP address.

◆ Transmit Timer: This feature is only available to Serial Server TRP-C37 and TRP-C37M.

◆ Maximum Connection: 1~16

The function allows the user to configure the TRP-C68H in Server mode, adjust 1~16 TCP client host connections.

◆ TCP Keep Alive: 1~7 /Minute

When TRP-C68H in Server or Client mode, the TRP-C68H without data over the 1~7 Min setting value,

The TRP-C68H will be disconnecting TCP port.

◆ New Password: 12345

It only accepts value from10000~65535 integer, if input the wrong password over 5 times, the WEB-Page will lock until the TRP-C68H re-boot.

◆ Firmware Version: ABC

◆ Slave ID:1~255.

ID performs MODBUS RTU / ASCII and TRP-ASCII will use to address.

◆ LED Display Panel Setting :ON/OFF

No used

◆ Polling Setting: High/Low.

No used

◆ System Mode

No used

◆ Trycom Checksum setting: Disable/Enable.

TRP-ASCII command used bit checksum.

◆ Power on Mode Output: 0000~FFFF.

No used.

◆ Save ON Mode Output: 0000~FFFF.

No used.

◆ Mode: Fast/Normal.

Fast Mode: 2 Bytes, The analog chipset reads the data speed is very fast.

This mode suitable the Modbus poll or Modscan utility.

Normal Mode:3 Byte,The analog chipset reads the data speed is normal.

This data output 3 bytes.

- **Configuration:+/-10V,+/-5V,+/-2.5V,+/-1.25V,+/-650mV,+/-20mA,+4~20mA.**

Selecting the mode for the analog Voltage or Current input.

Analog Data Type: BCD, PRECENT, HEX.

Selecting the display data way for the Decimal, Percentage or Hexadecimal.

- **Channel Setting:1~8.**

There are eight channels input Disable or Enable.

- **Frequency:50Hz/60Hz.**

Display last stored in the memory of the digital input counter value.

- **Submit**

Save the setting value to memory.

- **Save**

Save the setting value to external log file.

- **Load**

Load the setting value to external log file.

- **Upgrade**

Upgrade the TRP-C68H firmware.

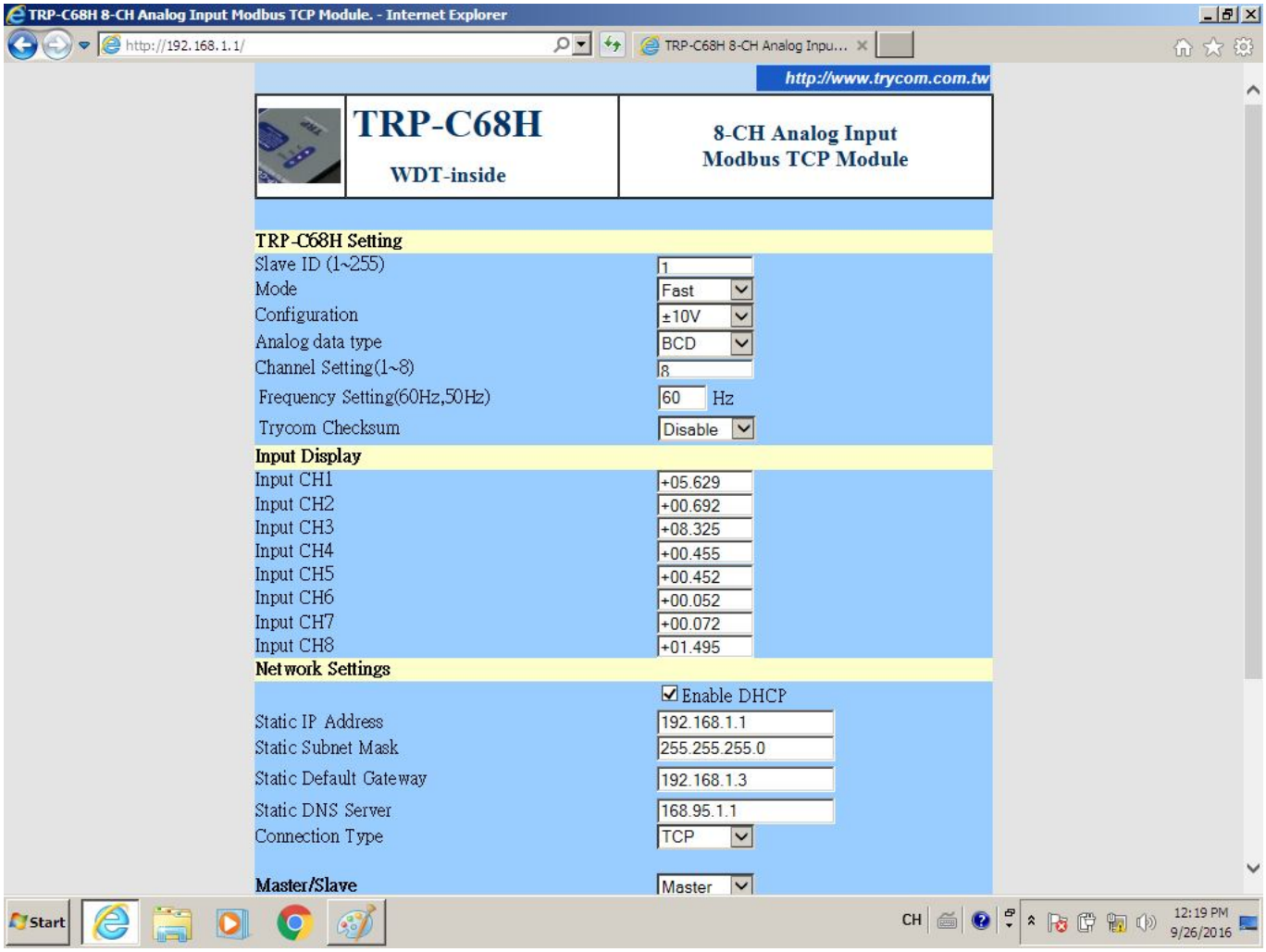
4-4.Using the WEB Server mode

The Web Server can be used to configure the TRP-C68H from any web browser software (such as I.E).

In Internet Explorer type the IP Address of the TRP-C68H into the address field and press the Enter key. The following window will appear:

Example:

If TRP-C68H's IP is 192.168.1.1 ,Please Input the 192.168.1.1 then enters at web address, the web-page will appear.

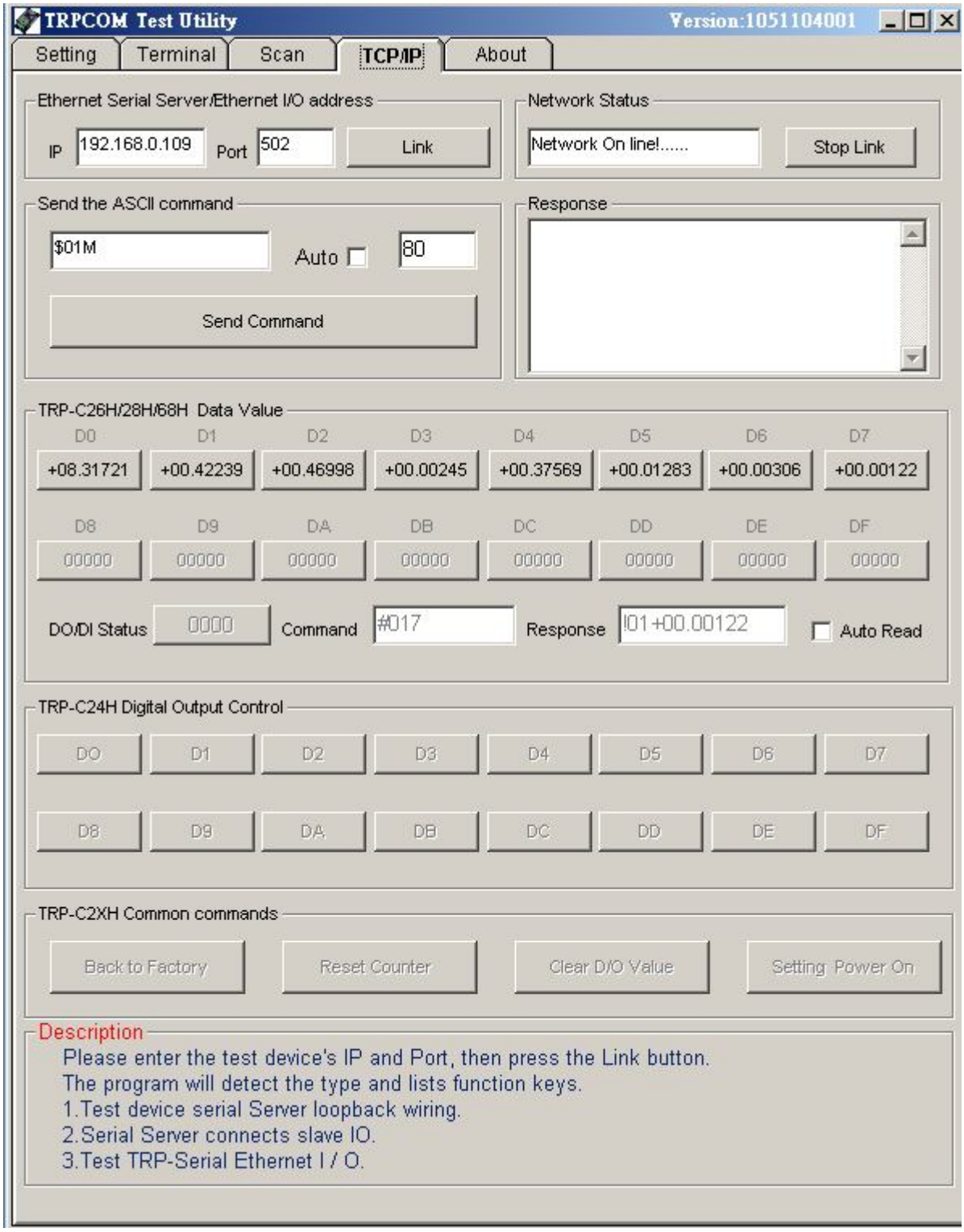

TRP-C68H 8-CH Analog Input Modbus TCP Module. - Internet Explorer
http://192.168.1.1/
TRP-C68H 8-CH Analog Inpu...
http://www.trycom.com.tw
TRP-C68H
WDT-inside
8-CH Analog Input
Modbus TCP Module
TRP-C68H Setting
Slave ID (1~255) 1
Mode Fast
Configuration ±10V
Analog data type BCD
Channel Setting(1~8) 8
Frequency Setting(60Hz,50Hz) 60 Hz
Trycom Checksum Disable
Input Display
Input CH1 +05.629
Input CH2 +00.692
Input CH3 +08.325
Input CH4 +00.455
Input CH5 +00.452
Input CH6 +00.052
Input CH7 +00.072
Input CH8 +01.495
Network Settings
Enable DHCP
Static IP Address 192.168.1.1
Static Subnet Mask 255.255.255.0
Static Default Gateway 192.168.1.3
Static DNS Server 168.95.1.1
Connection Type TCP
Master/Slave Master
Start
CH
12:19 PM
9/26/2016

4-5. TRPCOM Test Utility

The TRPCOM test utility may help to use the debugging program development phase, the user can find this software in our CD internal directory copied to the hard disk, and then directly execute TRPCOM.exe.

TRPCOM utility can automatically detect the model, it will list the corresponding function key,

It helps developers to understand and control the digital state.



4-6 How to setup the network security

In network security, the TRP-C68H is able to setup 1~ 8 sets host IP, only these host IP can access the TRP-C68H.

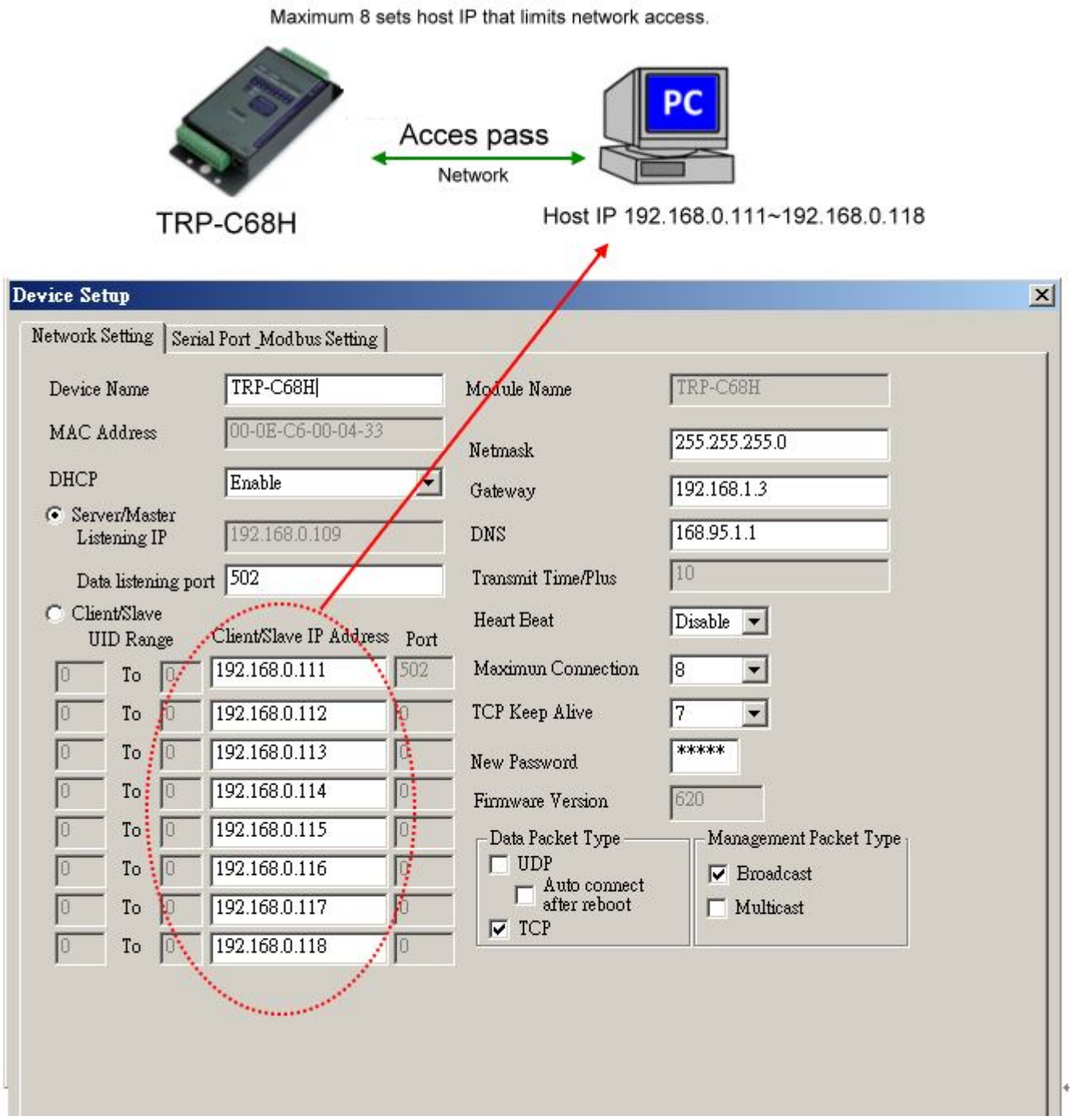
The TRP-C68H actually can make connections with any Host IP,

Once the user has filled in the Host IP, these IP are available, the TRP-C68H will be pass with them, other host IP will not pass.

Refer to the following example illustrates.

*Please make sure the firmware version is 624 above,

and the DSM utility version is 6.20 above.



5. TRP-ASCII Communication Protocol

TRP-C68H supports three modes of communication Protocol TRP-ASCII, Modbus RTU, Modbus ASCII.

TRP-ASCII Command Protocol Description

Command Format :"Leading Code"+"ID Address"+"Command"+"CHK"+(cr) .

at :"Leading Code"+"ID Address"+"Data"+"CHK"+(cr) .

How to calculate the checksum

1. Calculate all characters of the command string to get the ASCII sum, except the character return.

2. Mask the sum of string with 0FFH.

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".

TRP-ASCII: ease of use TRP-ASCII integration to develop their own software, such as VB, VC .

Command List	Function Description	Paragraph index
%IDNNTTDD(CHK)(cr)	Set the module configuration	See 5-1
#IDN (CHK)(cr)	Read analog input from N channel value	See 5-2
#ID(CHK)(cr)	Read all channel analog value	See 5-3
$ID2 (CHK)(cr)	Read module's configuration	See 5-4
$IDF (CHK)(cr)	Read the module's firmware version	See 5-5
$IDM (CHK)(cr)	Read the module's name	See 5-6
$01RS(CHK)(cr)	Reset Module	See 5-7
~IDONN (CHK)(cr)	Change the module's name	See 5-8
~IDEV	Set up the calibration enable/disable	See 5-9
$018	Perform zero calibration	See 5-10
$ID9	Perform full calibration	See 5-11
~**(CHK)(cr)	Read Module ID and mode name	See 5-12
#**(CHK)(cr)	Back to factory setting	See 5-13

5-1. Set the module configuration

Command	%IDNNTTDD(CHK)(cr)	
Syntax Description	%	First leading code
	ID	Address of setting module 00~FF(HEX)
	NN	New address of setting from 00~FF(HEX)
	TT	Analog input type setting…Please refer to TT table below.
	DD	Data format setting…Please refer to DD table below.
	CHK	Checksum
	(cr)	Carriage return
Response	!ID(CHK) (cr)	Command valid
	?ID (CHK)(cr)	Command Invalid

5-1-1.TT: Analog input type

Type Code		08	09	0A	0B	0C	0D
Voltage:		±10V	±5V	±2.5V	±1.25V	±650mV	±20mA
% of FSR		±100 %	±100 %	±100 %	±100 %	±100 %	±100 %
2'S complement	Fast Mode	0000~8000~FFFF	0000~8000~FFFF	0000~8000~FFFF	0000~8000~FFFF	0000~8000~FFFF	0000~8000~FFFF
	Normal Mode	000000~800000~FFFFFF	000000~800000~FFFFF	000000~800000~FFFFF	000000~800000~FFFFF	000000~800000~FFFFF	000000~800000~FFFFF

5-1-2.DD: Data format setting ***Default**

Bit	7	6	5	4	3	2	1	0
Function	Rejection ***0=60Hz** 1=50Hz	Checksum ***0:Disable** 1:Enable	Mode ***0=Normal** 1=Fast	0	0	Perform Voltage 0:Disable 1:Enable:	Engineer Unit Format ***00**=Voltage 01=Percent 10=2's Complement HEX Format	

Ex: Send command:"%01020800".....ID from 01 to 02,type-+/-10V,DD=Normal mode, Voltage mode.
Response:!01....Command valid.
Send command:"#027"…Read channel 7 value.
Response:" !02+08.90165"……Voltage ="+8.90165V".

Ex: Send command:"%02010822".....ID from 02 to 01,type-+/-10V,DD=Fast mode, Hex mode.
Response:"!02"….Command valid.
Send command:"#011"…Read channel 1 value.
Response:" !01>EDAE"……Hex data="EDAE".

Ex: Send command:"%01010821".....ID from 01 to 01,type-+/-10V,DD=Fast mode, Percent mode.
Response:"!01"….Command valid.
Send command:"#010"…Read channel 0 value.
Response:" !01>+084.59%"……+84.59 Percent.

5-2. Read analog input from N channel value

Command	#IDN(CHK)(cr)	
Syntax description	#	First leading code
	ID	Address of setting module 00~FF(HEX)
	N	Digital Input channel 0~7
	CHK	Checksum
	(cr)	Carriage return
Response	!ID**Data**(CHK) (cr)	**Data**: Channel N data
	?ID (CHK)(cr)	Command Invalid

Ex: Send command:"#010" Read the TRP-C68H channel 1 value.
Response:"!01+08.336".....Channel 1 value =+8.336V, DD type=Voltage mode.

5-3. Read all channel analog value

Command	#ID(CHK)(cr)	
Syntax description	#	First leading code
	ID	Address of setting module 00~FF(HEX)
	CHK	Checksum
	(cr)	Carriage return
Response	!IDData0~Data7(CHK) (cr)	Chanel0~Chanel7 value
	?ID (CHK)(cr)	Command Invalid

Ex: Send command:"#01"…Read all channel value.

Response:" !01+00.23836**+08.25372**+00.13980**+00.00213**+00.09615**+00.00641**+00.00367**-00.00061**"…...Channel 0~7 Value..

5-4. Read Module's Configuration

Command	$ID2(CHK)(cr)	
Syntax Description	$	First leading code
	ID	Address of setting module from 00~FF(HEX)
	2	Read module's configuration
	CHK	Checksum
	(cr)	Carriage return
Response	!ID**TTDD**(CHK)(cr)	**TT**: Analog input type DD: Data Format
	?ID(CHK)(cr)	Command Invalid

Example:

Send command:"$012" …..Read module's configuration.

Response:"!010820"….TT=08=+/-10V….See 5-1-1.

DD=20....5-1-2.

5-5. 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	Checksum
	(cr)	Carriage return
Response	!IDVer(CHK)(cr)	Ver:Firmware Version
	?ID(CHK)(cr)	Command Invalid

EX: Send command:$01F…Read the TRP-C68H's version.

Response: "!01621"….Vesion 621.

5-6. 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	Checksum
	(cr)	Carriage return
Response	!IDNNNNNNNNN(CHK)(cr)	NNNNNN :The chars from 1~9 chars
	?ID(CHK)(cr)	Command Invalid

EX: Send command:$01M…Read the TRP-C68H's name.

Response:"!01TRPC68H"……. The module's name is "TRPC68H".

5-7. Reset Module

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

EX: Send Command:"$01RS"

Response:" !01"……. . Command valid!

5-8. Change the Module 's name

Command	~IDONN(CHK)(cr)	
Syntax description	~	First leading code
	ID	Address of setting module 00~FF(HEX)
	O	Change Module Name
	NN	NN : 1~9 characters char
	(cr)	Carriage return
Response	!ID (CHK)(cr)	Command valid
	?ID(CHK)(cr)	Command Invalid

EX: Send Command:"~01ODEVICE1"…Change Name.

Response:" !01"……. . Command valid!

Send command:$01M…Read the TRP-C68H's name.

Response:"!01DEVICE1"……. The module's name is "DEVICE1".

How to manually more positive voltage calibration

Send command "~IDE0"….calibration enable.
Send command "~IDE1"….set up the calibration enable.
Send command "$ID8".....perform the Zero calibration.
Send command "~IDE1".....set up calibration enable again.
Send command "$ID9"... ….perform the full calibration.
Send command "~IDE0".....calibration disable.

5-9. Set up the calibration Enable/Disable

Command	~IDEV(CHK)(cr)	
Syntax Description	$	First leading code
	ID	Address of setting module from 00~FF(HEX)
	E**V**	**V**=0 Disable **V**=1 Enable
	CHK	Checksum
	(cr)	Carriage return
Response	!ID(CHK)(cr)	Command valid
	?ID(CHK)(cr)	Return not enable calibration before calibration command

Example:
Send command:"~01E1",
Response: "!01"…… Enable calibration.

5-10. Perform Zero Calibration

Command	$ID8(CHK)(cr)	
Syntax Description	$	First leading code
	ID	Address of setting module from 00~FF(HEX)
	8	Perform zero calibration
	CHK	Checksum
	(cr)	Carriage return
Response	!ID(CHK)(cr)	Command valid
	?ID(CHK)(cr)	Return not enable calibration before calibration command

Example:

Send command:"$018",

Response: "!01"**.**

5-11. Perform Full Calibration

Command	$ID9(CHK)(cr)	
Syntax Description	$	First leading code
	ID	Address of setting module from 00~FF(HEX)
	9	Perform full calibration
	CHK	Checksum
	(cr)	Carriage return
Response	!ID(CHK)(cr)	Command valid
	?ID(CHK)(cr)	Return not enable calibration before calibration command

Example:

Send command:"$019",

Response: "!01".

Refer to paragraph 4 Function description before calibration.

5-12. Read Module ID and Model Name

Command	~**(CHK)(cr)	
Syntax description	~	First leading code
	**	When TCP connected, get online module ID and Model Name.
	(cr)	Carriage return
Response	!IDName (CHK)(cr)	ID: Decimal Name: Model Name.
	?ID(CHK)(cr)	Command Invalid

EX: Send Command:"~**"… When TCP connected, get online module ID and module name.

Response:"!01TRP-C24H".

5-13. Back to Factory setting

Command	#**(CHK)(cr)	
Syntax description	#	First leading code
	**	Back to factory setting.
	(cr)	Carriage return
Response	!ID (CHK)(cr)	Command valid
	?ID(CHK)(cr)	Command Invalid

EX: Send Command:"~**"… Back to factory.

Response:"!01".

6. Modbus RTU/ASCII Communication Protocol

** For more modbus RTU / ASCII protocol specification, please download from http://www.modbus.org website.*

Obtain more modbus TCP instruction test, we recommend user can be downloaded from the following Web site

Modbus Poll Test utility http://www.modbustools.com/

Modbusscan Test utility http://www.win-tech.com/html/modbus1.htm.

User can use the virtual-com program with TRPCOM.exe for Modbus RTU test; these programs can be found in our directory of the CD!

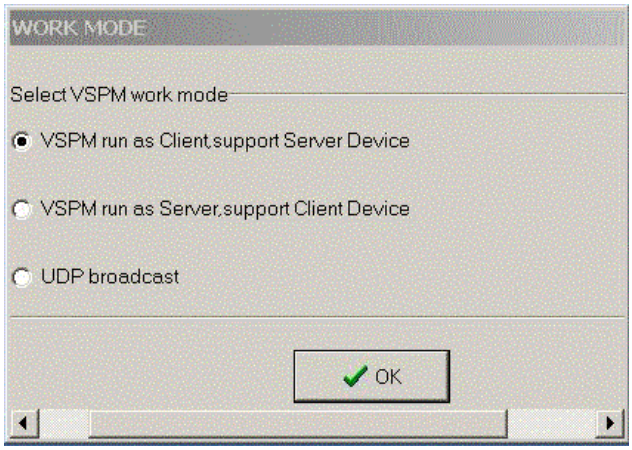
Install the Virtual-COM

Step 1. Insert the TRP-Serial CD and find the TRP-C68H folder.

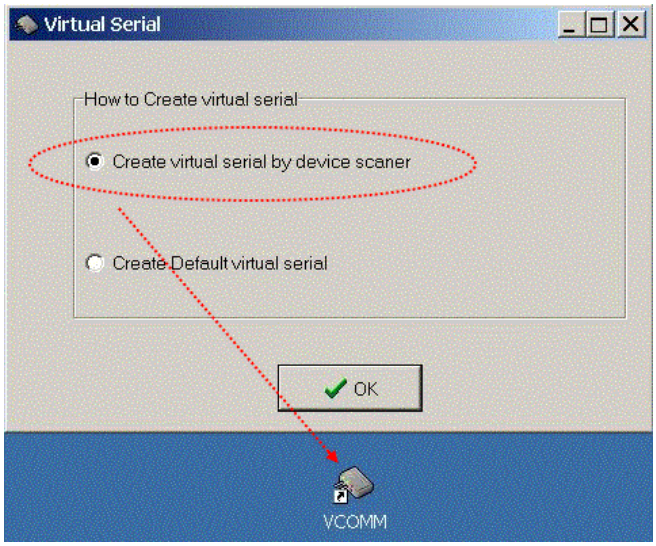
Step 2.Click “Vcomm.exe” icon then install Virtual-COM utility.

*The Virtual COM utility support multi-language, please select which language do you need.

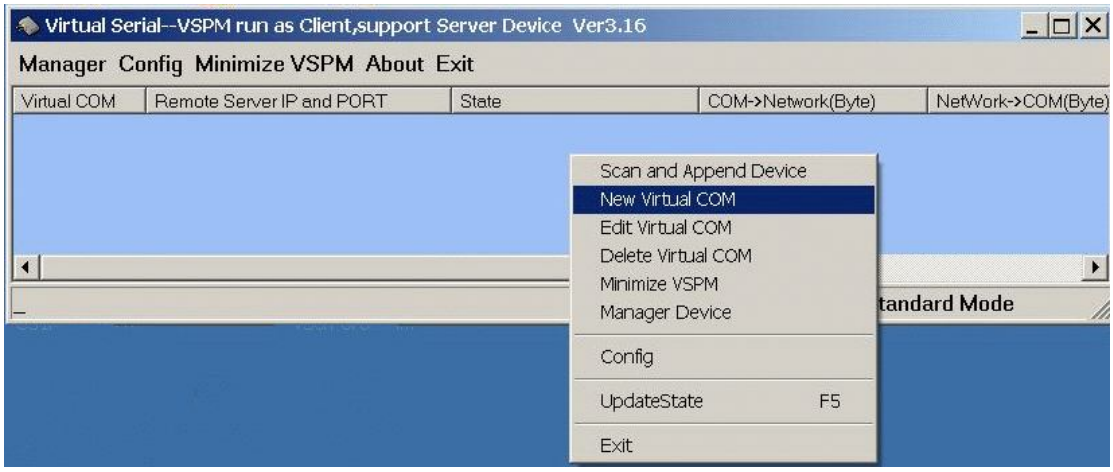
Step3. Click “OK” button and select “VSP run as Client support Server Device”.



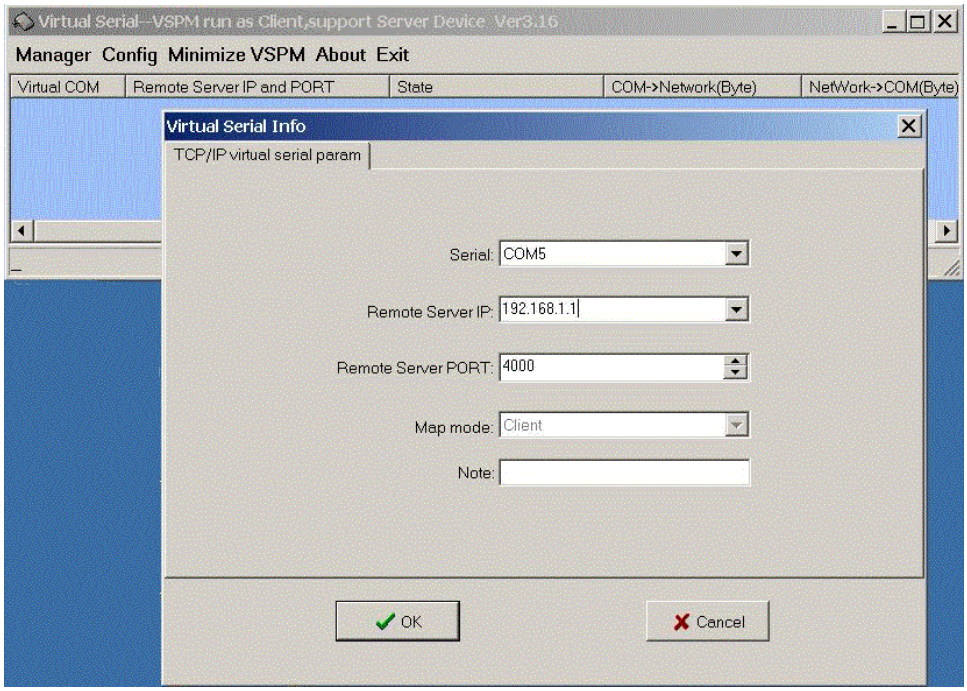
Step4. Select “Create virtual serial by device scanner”, then press “OK”



Step5. Run VCOMM.exe then click right button select “New Virtual COM”



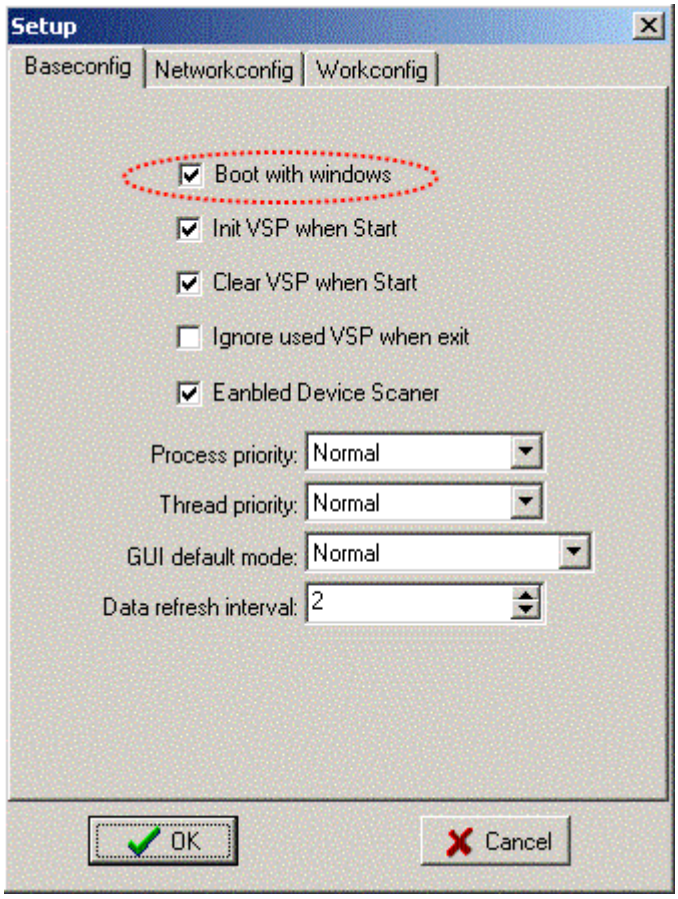
Step6. Select “Select Serial Port” and input TRP-C68H IP and port then press “OK”.



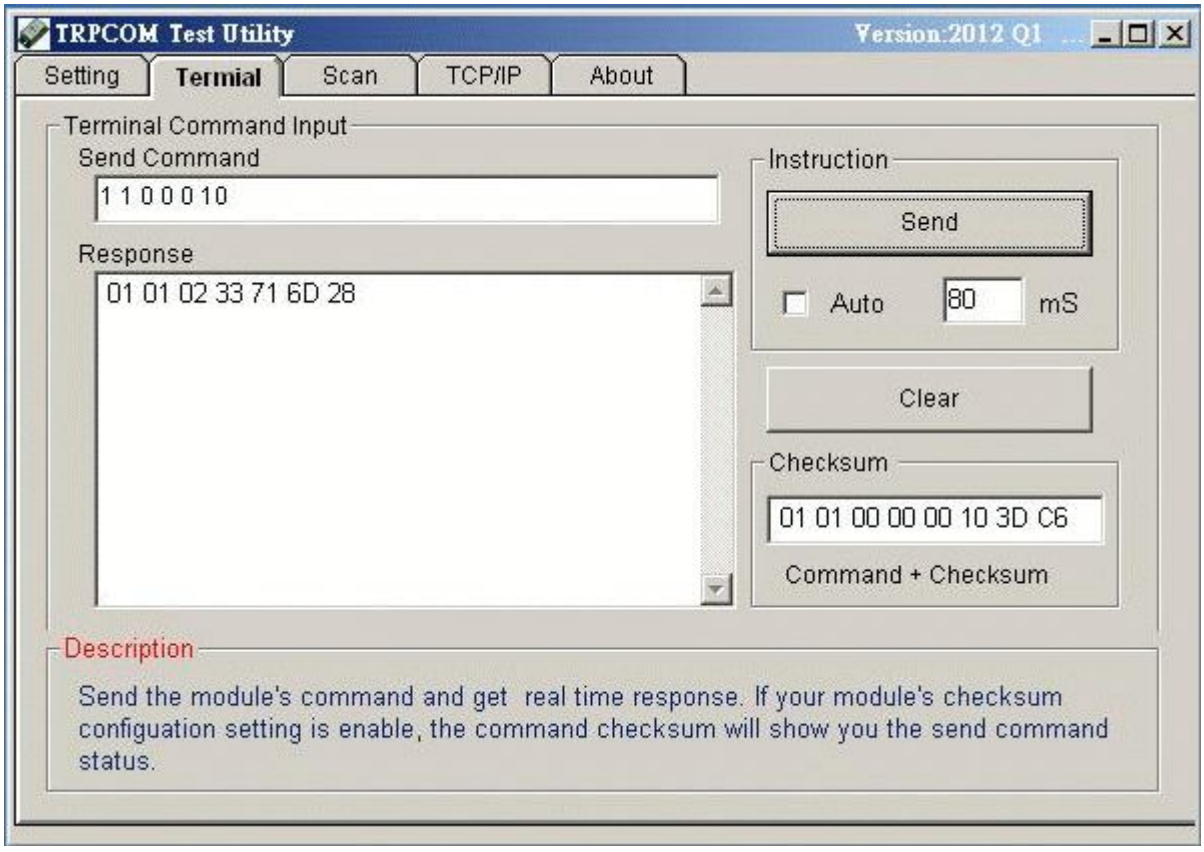
Step7. If Virtual-Com setting success, the display will appear bellow.

Step8. Run TRPCOM utility then select virtual-com port make a TRP-C68H command.

*If in VCOMM‘s configuration select “Boot with windows”, the virtual-com will Auto-connection when windows start.



** TRP-C68H in use the Virtual com mode, the default data format is 9600, N, 8,1, this mode is not allowed to change.*



Modbus TCP Command List

Command List	Function Description	C58H Description	Index
ID 03 00 SS 00 NN	Read Holding Registers	Read one or multi channel analog input data	6-1
ID 04 00 SS 00 NN	Read Input Registers	Read one or multi channel analog input data	6-1

6-1. Read one or multi channel analog input data

Command	ID 03 00 NN 00 CN (CRC) ID 04 00 NN 00 CN (CRC)	
Syntax Description	ID	Address of setting module 1~247
	03 or 04	Function Code
	00 NN	Start channel from NN=00~07
	00 CN	How many channel want to read CN=1~8
Response	ID 03/04 BC ST DATA (CRC)	ID 03 or 04 ……Module command Line BC: Byte Counter ST:01…when Voltage or % of FSR is Positive ST:00…. when Voltage or % of FSR is Negative ST:02…..when fast mode and engineer mode is 2byte ST:03…..when normal mode and engineer mode is 3byte DATA: Analog Input value
	ID 83 ER (CRC)	ID 83 :Function Code ER=00 Syntax error ER=01 Data Format error ER=02 Start channel error ER=03 I/O out of range

Example:

The user can use the function 3 or 4 reads the analog input data by Modbus poll test utility.

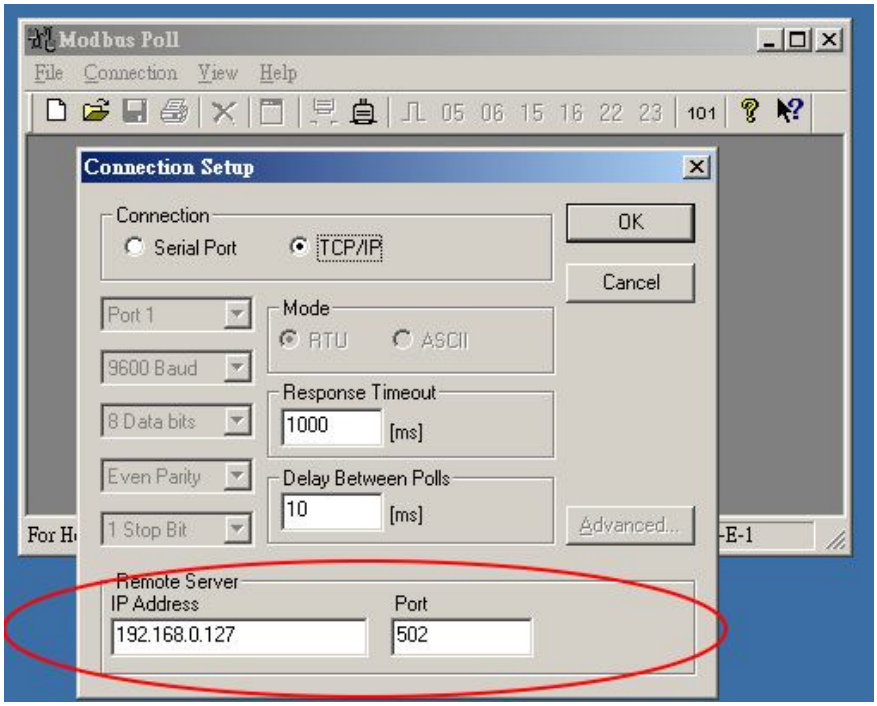
you can download the test utility from the connection below:

http://www.modbustools.com/modbus_poll.html

We use the Modbus TCP protocol to read the channel 0 ~7 as below:

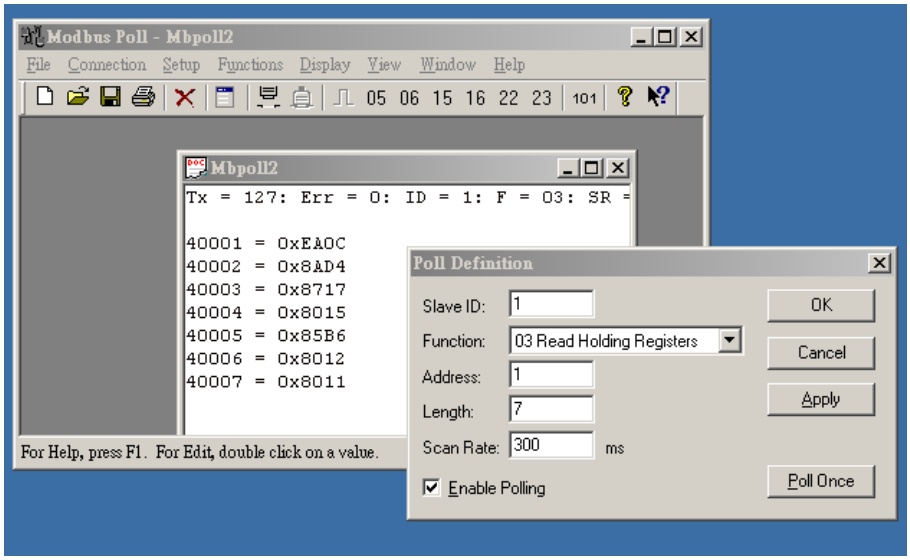
Step1.

Input the C68H's IP and port then press OK button.



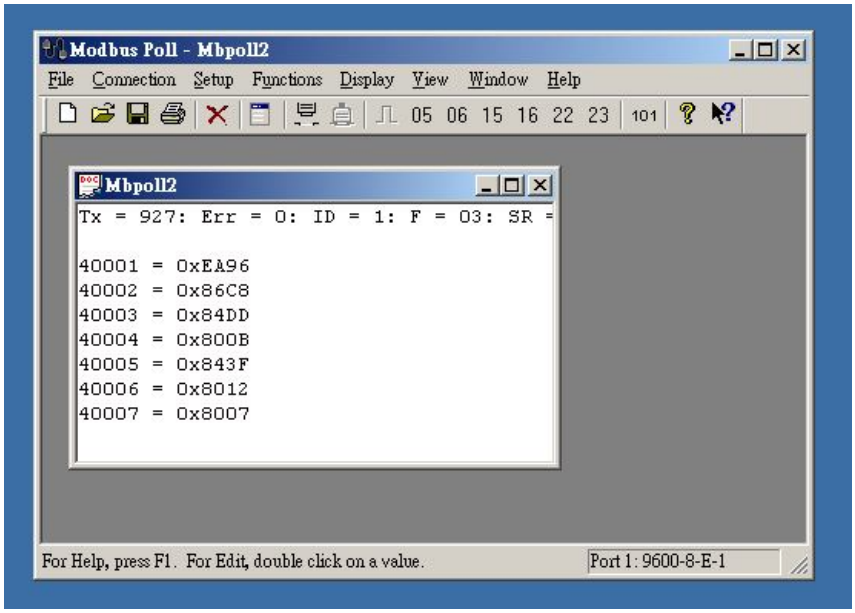
Step2.

Click the setup then select poll definition then press “OK” button.



Step3.

We can see the Channel0~Chanel7 hex data.



Additional modbus RTU command set

Command List	Function Description	Index
ID 46 00 00	Read the module's name	6-2
ID 46 04 IP 00 00 00	Set up the module's address	6-3
ID 46 05 00	Read the module's configuration	6-5

6-2.Read the module's name

Command	ID 46 00 00 (CRC)	
Syntax Description	ID	Address of setting module 01~247
	46	Function code
	00	Read module's name
	00	Reserved code
Response	ID 46 00 00 0C 68 00 (CRC)	ID 46 00 00 ….Module command Line 0C 68 :Module's Name is C68H
	ID C6 00 (CRC)	ID C6 (CRC) C6:Error function code 00 : Reserved code

Example:
Send Command:" 01 46 00 00" …….Read the TRP-C68's name,
Response:" 01 46 00 00 0C 68 00 "……Module's name is C68,
Error Response: "01 C6 00 "……Error code.

6-3. 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 ….Command valid.
	ID C6 00 (CRC)	ID C6 (CRC) C6:Error function code 00 : Reserved code

Example:

Send Command:" 01 46 04 02 0 0 0" …….Set up the new ID is "02",

Response:" 01 46 04 00 00 00 00 "……New ID changes to 02 ,

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

6-4. 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 **TT DD** 00 00 (CRC)	ID 46 05 00 ……Module command Line TT: Analog Input type….See 6-4-1. DD: Data format…..See 6-4-2.
	ID C6 00 (CRC)	ID C6 (CRC) C6:Error function code 00 : Reserved code

Example:

Send Command: 01 46 05 00" " .

Response:" 01 46 05 00 08 20 00 00 "……ID=01,TT=08,DD=20.

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

6-4-1.TT: Analog input type

Type Code		08	09	0A	0B	0C	0D
Voltage:		±10V	±5V	±2.5V	±1.25V	±650mV	±20mA
% of FSR		±100 %	±100 %	±100 %	±100 %	±100 %	±100 %
2'S complement	Fast Mode	0000~8000~FFFF	0000~8000~FFFF	0000~8000~FFFF	0000~8000~FFFF	0000~8000~FFFF	0000~8000~FFFF
	Normal Mode	000000~800000~FFFFFF	000000~800000~FFFFF	000000~800000~FFFFF	000000~800000~FFFFF	000000~800000~FFFFF	000000~800000~FFFFF

6-4-2.DD: Data format setting ***Default**

Bit	7	6	5	4	3	2	1	0
Function	Rejection ***0=60Hz** 1=50Hz	Checksum ***0:Disable** 1:Enable	Mode ***0=Normal** 1=Fast	0	0	Perform Voltage 0:Disable 1:Enable:	Engineer Unit Format ***00**=Voltage 01=Percent 10=2's Complement HEX Format	

6-4. Set up the module's configuration

Command	ID 46 06 00 TT DD 00 00 (CRC)	
Syntax Description	ID	Address of setting module 1~247
	46	Function Code
	06	Set up module's configuration
	00 **TT DD** 00 00	TT: Analog Input type….See 6-4-1. DD: Data format….See 6-4-2.
Response	01 46 06 00 00 00 00 00 (CRC)	ID 46 06 00 ……Module command Line 00 00 00 00 : Reserved code
	ID C6 00 (CRC)	ID C6 (CRC) C6:Error function code 00 : Reserved code

Example:

Send Command:"01 46 06 00 08 20 00 00"…….Set up TRP-C68H's configuration,

Response:" 01 46 06 00 00 00 00 00 "…Command valid!,

6-6. 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	01 46 07 18 01 17 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:Error function code 00 : Reserved code

Example:

Send Command:" 01 46 07 00" …….Set up TRP-C68H's configuration,

Response:" 01 46 07 18 01 00"…2018 /01/18 TRP-C68H Firmware Version,

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

8. Application