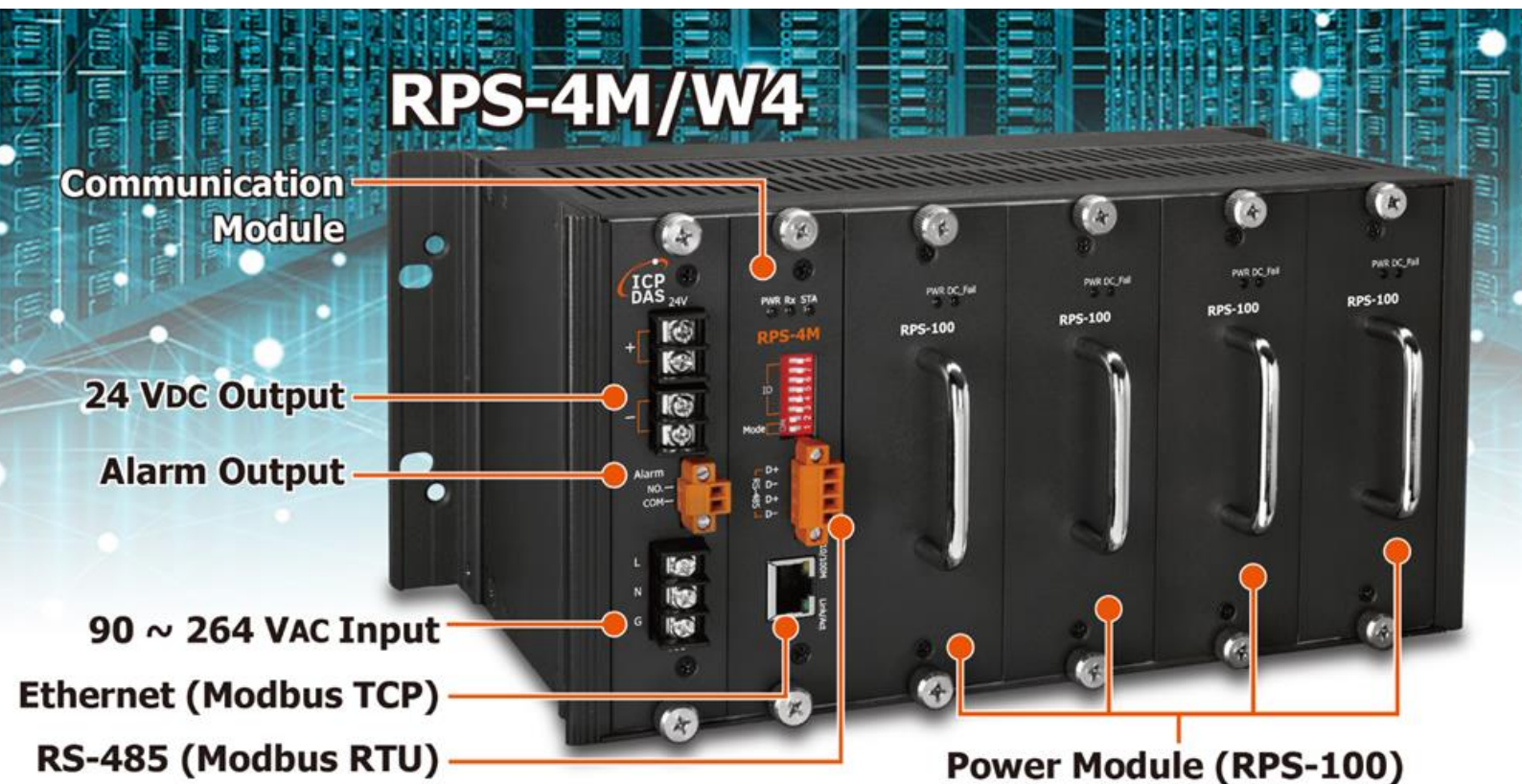


RPS-4M

4-slot Redundant Power Supply

User Manual

Version 1.0.3 Jan. 2023



Warranty

All products manufactured by ICP DAS are under warranty regarding defective materials for a period of one year, beginning from the date of delivery to the original purchaser.

Warning!

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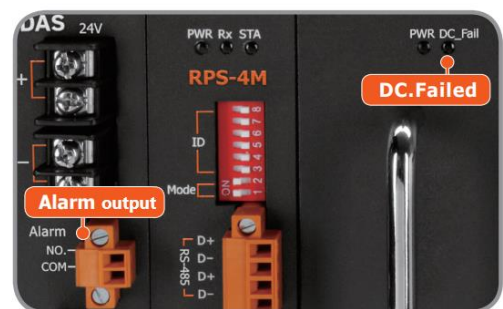
1. Introduction

In response to the requirements of lots of digital DC power supplies in the industry, ICP DAS has developed the RPS series of redundant power supply, which not only adopts the N+1 parallel-connection and load-sharing technology to implement power redundancy, but also adds communication functions to enable that information of power supply can be monitored in real time. Through the communication functions, user can monitor the working status of the power supply of the whole factory in the monitoring center. When the power module is abnormal, it can be found and dealt with in real time. There is no need to send people to inspect and ensure that the power supply is safe. In particular, the equipment in some important industries such as finance, medical treatment and power plants needs stable power supplies to ensure that the equipment keeps working.

Features

- 90 ~ 264 VAC to 24 VDC
- Each slot can be installed a 100 W power module
- The power module supports hot swap
- 4-slot design, realize N+1 redundancy
 - When 4 power modules are fully inserted, it can provide the load capacity of 3 power modules.
 - When one power module fails, it can still guarantee the normal power supply.
- Load Balancing

The current of the built-in "load balancing" will be evenly distributed to each Power Module to avoid overuse and premature failure of a certain power module.
- Built-in power module diagnosis function
 - Temperature
 - Output current
 - Whether it is faulty
 - The used time of each power module
- Supports Modbus RTU/TCP communication. The messages of the diagnostic function can be read via Modbus RTU/TCP.
- If the communication module is faulty, it will only affect the communication and won't affect power input/output



2. Specifications

2.1. Power Module Specifications

Electrical Specification		
Output	DC Voltage	24V
	Rated Current	4.17A
	Current Range	0~4.17A
	Rated Power	100W
	Ripple & Noise(max.)	50mVp-p
	Voltage Tolerance	±1.0%
	Line Regulation	±1.0%
	Load Regulation	±5.0%
	Setup, Rise Time	1300ms,120ms at full load
	Hold Up Time(Typ.)	40ms at full load
Input	Voltage Range	90~264VAC
	Frequency Range	47 ~ 63Hz
	Power Factor(Typ.)	PF=0.961/230VAC at full load, PF=0.985/115VAC at full load
	Efficiency(Typ.)	86%
	AC Current(Type)	1.01A/115VAC 0.51A/230VAC
	Inrush Current	COLD START 30A/115VAC 60A/230VAC
	Leakage Current	Earth<3.5mA ,Touch<0.25mA
Protection	Overload	110%~200% (Automatic recovery)
	Over Voltage	26.4~31.2 VDC (Automatic recovery)
Environment	Working Temperature	-20~50°C
	Working Humidity	5~95%RH Non-condensing.
	Storage Temperature, Humidity	-40~85°C
	Vibration	0.26~6.09 G Frequency Type: Sweep Frequency Frequency Range: 10~55 Hz Displacement: 1.0mm Sweep Rate: 60 minute / cycle Number of cycle: 1 cycle / axis

		Direction: X ,Y and Z axis
	MTBF	100K (hours @ 25°C)
Safety & EMC	Safety Standards	Design to meet IEC 62368-1
	Withstand Voltage	I/P-O/P:3KVAC I/P-FG:1.8KVAC O/P-FG:0.5KVAC
	Isolation Resistance	I/P-O/P, I/P-FG, O/P-FG:>100M Ohms / 500VDC
	EMC Emission	EN 55032 CISPR 32 & FCC Part 15 B CLASS B : System with 4 module in parallel
	EMC Immunity	EN 55022, CISPR 22 & FCC Part 15, EN 61000-3-2, EN 61000-3-3, EN 61204-3 IEC 61000-4-2, IEC 61000-4-3, IEC 61000-4-4, IEC 61000-4-5, IEC 61000-4-6, IEC 61000-4-8, IEC 61000-4-11

Note: This hardware specification is only for one RPS-100 power module. RPS-4M can insert Max. 4 RPS-100 power module.

2.2. System Specifications

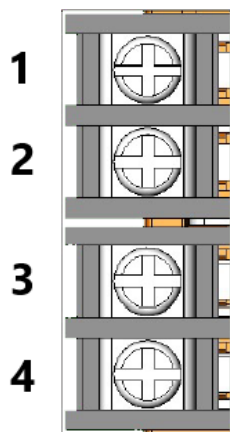
COM Port		
Interface		RS-485
Protocol		Modbus RTU
Data Format		N,8,1 / O,8,1 / E,8,1 / N,8,2
Baud Rate		Hardware Configuration: Fixed 9600 bps
		Software Configuration: 1200 ~ 115200 bps
Node Address		1 ~ 64 for hardware configuration
		1 ~ 255 for software configuration
		* For Modbus RTU, address 0 is auto become to 1
Connector		4-pin screw terminal
Ethernet		
Interface		1 x RJ-45, 10/100 Base-TX
Protocol		Modbus RTU or DCON
Security		Password and IP Filter
Measurement		
Current	Range	0A ~ 5 A
	accuracy	±0.25A
Temperature	Range	0°C ~ 100°C
	accuracy	±5°C
Communication Module LED Indicators		
Power (Green)		1 LED as power indicator (Normal : Light up)
Communication (Green)		1 LED as Modbus Rx indicator (Communicating : Light up)
Status (Orange)		1 LED as Software Modbus WDT (Timeout : Light up)
Power Module LED Indicators		
Power (Green)		1 LED as power indicator (Normal : Light up)
Status (Red)		1 LED as status indicator (Error : Light up)
EMS Protection		
ESD (IEC 61000-4-2)		±4 kV Contact, ±4 kV Air
EFT (IEC 61000-4-4)		±2 kV for power line
Surge (IEC 61000-4-5)		±2 kV for power line
Power Requirements		
Input Voltage Range		90~264VAC, 47 ~ 63Hz
Connector		3-pin screw terminal
Mechanical		

Dimensions (W x L x H)	133 mm x 266 mm x 177 mm
Installation	DIN-Rail
Environment	
Operating Temperature	-20°C ~ +50°C
Storage Temperature	-40°C ~ +85°C
Humidity	10 to 90% RH, Non-condensing

2.3. Pin Assignments



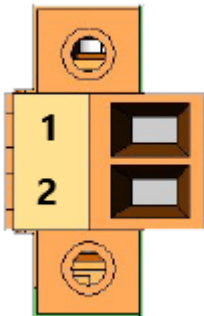
1. DC Output



Pin	Description
1	Power output +24 V _{DC}
2	Power output +24 V _{DC}
3	Ground
4	Ground

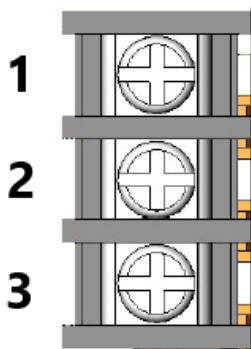
2. Relay Output

When any power module fails, this relay will be turn on.



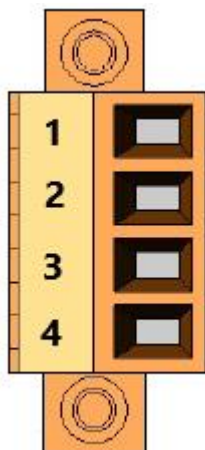
Pin	Description
1	Relay output: NO.
2	Relay output: COM
Form A, 5A	

3. A.C. Power Input



Pin	Description
1	Live Wire (L)
2	Naught wire (N)
3	Earth Wire (G)

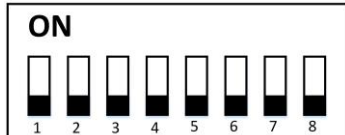
4. RS-485 Interface



Pin	Description
1	Data+ (D+)
2	Data- (D-)
3	Data+ (D+)
4	Data- (D-)

2.4. DIP Switch Configuration

2.4.1. Normal Mode



When the RPS-4M DIP is powered on and the DIP switch 1 and 2 are OFF, this is in Normal mode. In this mode, the DIP switch 3 ~ 8 can be ignored, and all communication parameters are specified by the software. The factory default parameters are as follows:

Protocol:	Modbus RTU/TCP
IP address:	192.168.255.1
Mask:	255.255.0.0
Gateway:	192.168.0.1
Modbus TCP Port:	502
Address:	01
Baud Rate:	9600 bps
Data Format:	N, 8, 1
Web Password:	admin

In this mode, the parameters are configurable via the web but Modbus commands.

2.4.2. Initial Mode

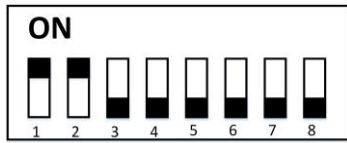


When the RPS-4M is powered on and the DIP switch position 1 is OFF and position 2 is ON, this is in Initial mode. In this mode, the DIP switch positions 3 ~ 8 will be ignored and the communication parameters will be set as shown in the following table:

Protocol:	Modbus RTU/TCP
IP address:	192.168.255.1
Mask:	255.255.0.0
Gateway:	192.168.0.1
Modbus TCP Port:	502
Address:	01 (0x01)
Baud Rate:	9600 bps
Data Format:	N,8,1
Web Password:	admin

In this mode, the communication parameters can be set through the web page or Modbus commands, and they will take effect the next time it is started in Normal Mode.

2.4.3. Hardware Mode



When the RPS-4M DIP is powered on and the DIP switch position 1 and 2 are ON, it is in Hardware mode. In this mode, the Modbus station number is set by the DIP switch positions 3 ~ 8, and other communication parameters apply the original software settings:

Protocol:	Modbus RTU/TCP
IP address:	Configured by software
Mask:	Configured by software
Gateway:	Configured by software
Modbus TCP Port:	Configured by software
Address:	01 + Pin 3 to 8 of DIP switch (01 to 64)
Baud Rate:	Configured by software
Data Format:	Configured by software
Web Password:	admin

In this mode, communication parameters can only be set via the web page, and communication parameters cannot be set via Modbus commands.

3.Modbus TCP/RTU Protocol

The RPS-4M module supports the Modbus TCP/RTU protocol, with communication baud rates ranging from 1200 bps to 115200 bps. The data bits, parity and stop bits are supported 8N1, 8N2, 8E1 and 8O1. The following Modbus functions are supported.

Function Code	Description
0x01	Read the coils (DO)
0x02	Read the discrete inputs (DI)
0x03	Read multiple holding registers (AO)
0x04	Read multiple input registers (AI)
0x05	Write a single coil (DO)
0x06	Write a single holding register (AO)
0x0F	Write multiple coils (DO)
0x10	Write multiple holding registers (AO)

Error Response

Byte	Description	Length (Byte)	Value
00	Address	1	1 ~ 247
01	Function Code	1	Function Code + 0x80
02	Exception Code	1	02: Register not support 03: Modbus format invalid

Note: If a CRC mismatch occurs, the module will not respond.

3.1. Modbus Address Mapping

The 0xxxx address of DO can be used to read/write the value, and the 1xxxx address of DI can only be used to read the value.

Address		Description	Attribute
DO	DI		
00001	10001	Power module exists in slot 1 (1: exist, 0: not)	R
00002	10002	Power module exists in slot 2 (1: exist, 0: not)	R
00003	10003	Power module exists in slot 3 (1: exist, 0: not)	R
00004	10004	Power module exists in slot 4 (1: exist, 0: not)	R
00009	10009	Power module working status in slot 1 (1: normal, 0: abnormal)	R
00010	10010	Power module working status in slot 2 (1: normal, 0: abnormal)	R
00011	10011	Power module working status in slot 3 (1: normal, 0: abnormal)	R
00012	10012	Power module working status in slot 4 (1: normal, 0: abnormal)	R
00021	10021	Whole power supply units working status (1: all power modules are normal, 0: abnormal)	R
00101	10101	Host WDT (1: enable, 0 disable) This is used to monitor if the host is alive.	R / W
00102	10102	Host WDT timeout flag. If the WDT is timeout, sending a Modbus command or write 1 to this register address to clear flag.	R / W
Note: When the watchdog timeout occurs, the STA indicator will start to flash			
00501	10501	Reboot (1: reboot, 0: N/A)	W

The 4xxxx address of AO can be used to read/write the value, and the 1xxxx address of AI can only be used to read the value.

Address		Description	Attribute
AI	AO		
30001	40001	Current time: Year	R
30002	40002	Current time: Month	R
30003	40003	Current time: Day	R
30004	40004	Current time: Day of week (1~7: Mon. ~ Sun.)	R
30005	40005	Current time: Hour	R

30006	40006	Current time: Minute	R
30007	40007	Current time: Second	R
Note: If the user wants to correct the time, use the function code 0x10 to write values into the 7 registers at the same time			
30011	40011	Power supply unit 0 current load, Unit: 10 mA	R
30012	40012	Power supply unit 1 current load, Unit: 10 mA	R
30013	40013	Power supply unit 2 current load, Unit: 10 mA	R
30014	40014	Power supply unit 3 current load, Unit: 10 mA	R
30019	40019	Power supply unit 0 temperature, Unit: 0.1 °C	R
30020	40020	Power supply unit 1 temperature, Unit: 0.1 °C	R
30021	40021	Power supply unit 2 temperature, Unit: 0.1 °C	R
30022	40022	Power supply unit 3 temperature, Unit: 0.1 °C	R
30027	40027	Power supply unit 0 current running time, Unit: 1 hour	R
30028	40028	Power supply unit 1 current running time, Unit: 1 hour	R
30029	40029	Power supply unit 2 current running time, Unit: 1 hour	R
30030	40030	Power supply unit 3 current running time, Unit: 1 hour	R
Note: The current running time is the accumulation from the start of the module to the current time, less than 1 hour will not be included in the calculation			
30035	40035	Power supply unit 0 total running time, Unit: 1 hour	R
30036	40036	Power supply unit 1 total running time, Unit: 1 hour	R
30037	40037	Power supply unit 2 total running time, Unit: 1 hour	R
30038	40038	Power supply unit 3 total running time, Unit: 1 hour	R
Note: The total running time is the sum of the usage time of each time the module is turned on, less than 1 hour will not be included in the calculation			
30051	40051	Power supply unit 1 start date (year)	R
30052	40052	Power supply unit 1 start date (month)	R
30053	40053	Power supply unit 1 start date (day)	R
30054	40054	Power supply unit 1 start date (hour)	R
30055	40055	Power supply unit 1 start date (minute)	R
30056	40056	Power supply unit 1 start date (second)	R
30057	40057	Power supply unit 2 start date (year)	R
30058	40058	Power supply unit 2 start date (month)	R
30059	40059	Power supply unit 2 start date (day)	R

30060	40060	Power supply unit 2 start date (hour)	R
30061	40061	Power supply unit 2 start date (minute)	R
30062	40062	Power supply unit 2 start date (second)	R
30063	40063	Power supply unit 3 start date (year)	R
30064	40064	Power supply unit 3 start date (month)	R
30065	40065	Power supply unit 3 start date (day)	R
30066	40066	Power supply unit 3 start date (hour)	R
30067	40067	Power supply unit 3 start date (minute)	R
30068	40068	Power supply unit 3 start date (second)	R
30069	40069	Power supply unit 4 start date (year)	R
30070	40070	Power supply unit 4 start date (month)	R
30071	40071	Power supply unit 4 start date (day)	R
30072	40072	Power supply unit 4 start date (hour)	R
30073	40073	Power supply unit 4 start date (minute)	R
30074	40074	Power supply unit 4 start date (second)	R
Note: The start date will be recorded when the power module is used for the first time after leaving the factory			
30401	40401	IP0	R
30402	40402	IP1	R
30403	40403	IP2	R
30404	40404	IP3	R
Note: The current IP of the module is read as "IP0. IP1. IP2. IP3"			
30405	40405	MAC0	R
30406	40406	MAC1	R
30407	40407	MAC2	R
30408	40408	MAC3	R
30409	40409	MAC4	R
30410	40410	MAC5	R
Note: The current MAC of the module is read as "MAC0. MAC1. MAC2. MAC3. MAC4. MAC5"			
30481	40481	Firmware version(High word HHHH)	R
30482	40482	Firmware version(Low word LLLL)	R
Note: The Firmware version of the module is read as "HHHH.LLLL" (Ex: HHHH=0001, LLLL=0100 => 1.01)			
30483	40483	Module name (High word)	R
30484	40484	Module name (Low word)	R
Note: The name of the module is read as "HHHHLLLL"			

(Ex: 0x52505300 = "RPS")			
30501	40501	Node ID (writable only for Initial Mode)	R / W
30502	40502	RS-485 Communication Parameters (writable only for Initial Mode)	R / W
30505	40505	Host WDT timeout, unit: 100ms	R / W

RS-485 Communication Parameters

Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Reserved		Data Bit, Parity, Stop Bit		Reserved	Buad Rate		

Buad Rate (Bit 0 ~ Bit 2)

Code	0	1	2	3	4	5	6	7
Baud	1200	2400	4800	9600	19200	38400	57600	115200

Data Bit, Parity and Stop Bit (Bit 4 ~ Bit 5)

Code	0	1	2	3
Format	8, N, 1	8, N, 2	8, E, 1	8, O, 1

For example, if set configuration 0x37, it means Data rate is 115200 bps, Data bits are 8 bits, Parity is odd and Stop bit is 1 bit.

Note: All Reserved bits should be zero.

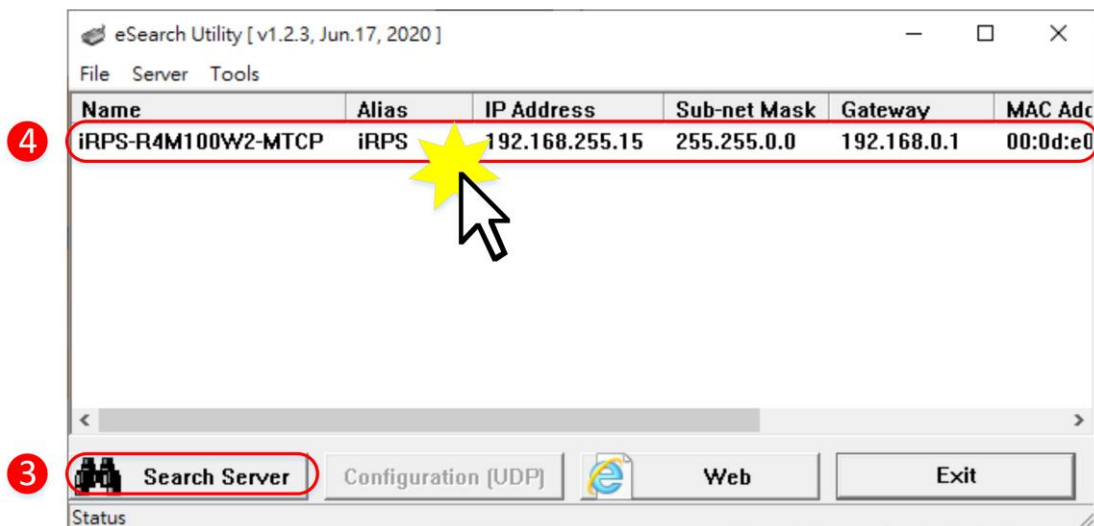
4. Web Setting

4.1. Configuring Network Settings

1. Downloaded the eSearch Utility and installed according to the installation instructions. The eSearch Utility can be obtained from the ICP DAS web site. The location of the download addresses is shown below:

<https://www.icpdas.com/en/download/index.php?nation=US&kind1=&model=&kw=eSearch>

2. Double click the eSearch Utility shortcut on the desktop.
3. Click the “Search Servers” button to search your RPS-4M .
4. Once the search process is complete, double-click the name of the RPS-4M to open the “Configure Server” dialog box.



Factory Default Settings of RPS-4M Module:

IP Address	192.168.255.1
Subnet Mask	255.255.0.0
Gateway	192.168.0.1
Web password	admin

5. Enter the network settings information, including the IP, Mask and Gateway addresses, and then click “OK” button.

Configure Server (UDP)

Server Name : iRPS-R4M100W2-MTCP

DHCP: 0: OFF Sub-net Mask : 255.255.0.0 Alias: iRPS

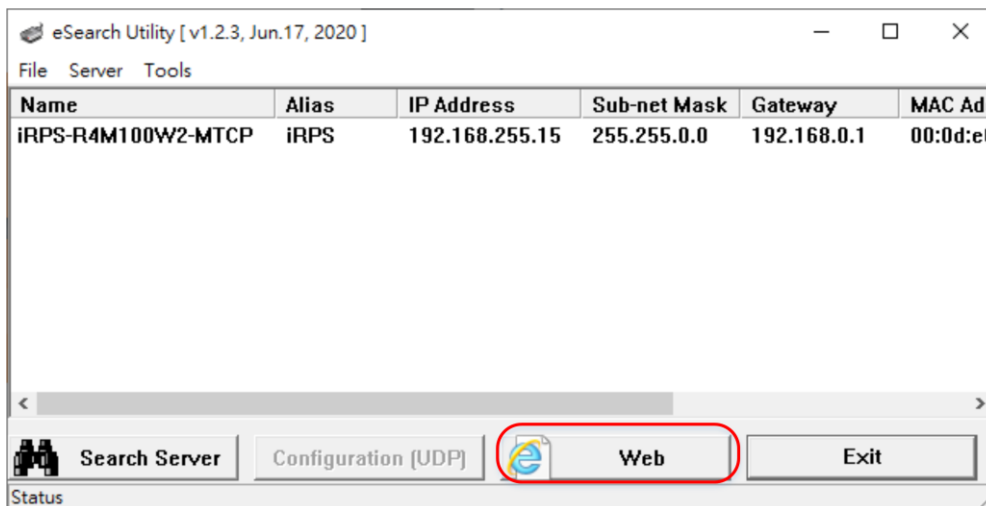
IP Address : 192.168.255.15 Gateway : 192.168.0.1 MAC: 00:0d:e0:44:55:66

Warning!!
Contact your Network Administrator to get correct configuration before any changing!

OK Cancel

4.2. Home Page

1. Press the “Web” button



2. Enter a password (the factory default password is “admin”), and then click the “Submit” button to continue.

IoT Power Supply

192.168.255.160

ICP DAS Redundant Power Supply (RPS)

Home | Port1 | Network | Filter | Monitor | Password | Logout

The system is logged out.
To enter the web configuration, please type password in the following field.

Login password Submit


When using IE, please disable its cache as follows.
Menu items: Tools / Internet Options... / General / Temporary Internet Files / Settings... / Every visit to the page

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3. The Home link connects to the main page. The software and hardware information section includes information related to the Model Name, the current Firmware version, the IP Address, the current position of the Initial Switch, the Alias, the MAC Address, and the TCP Port, and the Serial Port.

IoT Power Supply

192.168.255.160



Redundant Power Supply (RPS)

[Home](#) | [Port1](#) | [Network](#) | [Filter](#) | [Monitor](#) | [Password](#) | [Logout](#)

Model Name	RPS-4M	Alias Name	RPS
Firmware Version	B1.0.1 [Jun.25 2021]	MAC Address	00-0d-e0-16-46-06
IP Address	192.168.255.160	TCP Port Timeout (Socket Watchdog, Seconds)	180
Initial Switch	OFF	System Idle (Network Watchdog, Seconds)	0

Current port settings:

TCP Port Settings	Value
Local TCP Port	502

Serial Port Settings	
Baud Rate (bps)	9600 bps
Line Control	8, N, 1

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4.3. Port Page

1. Click the “Port1” tab to display the Port1 Settings page.

2. Select the appropriate Baud Rate, Data Format (e.g., 19200, 8N1) from the relevant drop down options.
3. Click “Submit” to save your settings.

4.4. Network Page

1. Click Network tab to enter Network page.

IoT Power Supply

Redundant Power Supply (RPS)

Home | Port1 | **Network** | Filter | Monitor | Password | Logout

Model Name	RPS-4M	Alias Name	RPS
Firmware Version	B1.0.1 [Jun.25 2021]	MAC Address	00-0d-e0-16-46-06
IP Address	192.168.255.160	TCP Port Timeout (Socket Watchdog, Seconds)	180
Initial Switch	OFF	System Idle (Network Watchdog, Seconds)	0

IP Address Selection

Address Type	Static IP
Static IP Address	192 . 168 . 255 . 160
Subnet Mask	255 . 255 . 0 . 0
Default Gateway	192 . 168 . 0 . 1
MAC Address	00-0d-e0-16-46-06 (Format: FF-FF-FF-FF-FF-FF)

Update Settings

2. The following is an overview of the parameters contained in the IP Address Selection section:

Item	Description
Address Type	Static IP: If no DHCP server is installed on the network, the network settings can be configured manually.
	DHCP: The Dynamic Host Configuration Protocol (DHCP) is a network application protocol that automatically assigns an IP address to each device
Static Address	This parameter is used to assign a specific IP address.
Subnet Mask	This parameter is used to assign the subnet mask for the RPS-4M. The subnet mask indicates which portion of the IP address is used to identify the local network or subnet.
Default Gateway	This parameter is used to assign the IP Address of the Gateway.
MAC Address	This parameter is used to set a user-defined MAC address.

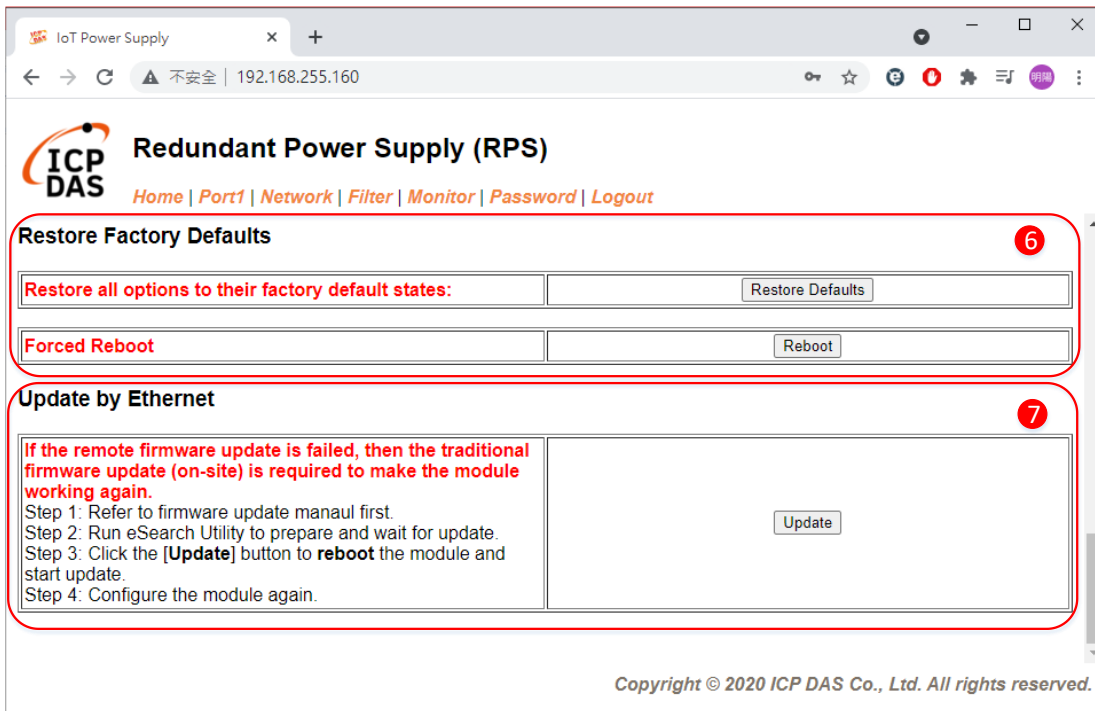
The screenshot shows the web interface of the IoT Power Supply (RPS) device. The browser address bar shows the URL 192.168.255.160. The page title is "Redundant Power Supply (RPS)". The navigation menu includes Home, Port1, Network, Filter, Monitor, Password, and Logout. The main content area is divided into three sections:

- General Settings (3):** This section contains several configuration fields:
 - Ethernet Speed: Auto (Auto=10/100 Mbps Auto-negotiation)
 - HTTP port: 80 (Default= 80)
 - Alias Name: RPS (Max. 18 chars)
 - TCP Port Timeout (Socket Watchdog): 180 (0 ~ 86400 seconds, Default: 180, Disable: 0)
 - Web Auto-logout: 10 (1 ~ 65535 minutes, Default: 10, Disable: 0)
 - UDP Configuration: Enable (Enable/Disable the UDP Configuration, Enable=default.)
- Time Synchronization (4):** This section contains:
 - User define time: Copy from this PC (selected), 2021/06/25, 16:06:54.639, Fri
 - User keyin: 2021 / 01 / 03, 00 : 00 : 00, Sun
 - Module current time: 2021/06/25, 16:06:53, Fri
- Modbus Settings (5):** This section contains:
 - Node ID: 1 (Default: 255)

3. The following is an overview of the parameters contained in the General Settings section:

Item	Description
HTTP Port	This parameter is used to assign specific a HTTP port of RPS-4M. The RPS-4M needs to be restarted when the HTTP port is changed. You need manually type the new HTTP port in the address bar of the browser. The default is 80.
Alias Name	This parameter is used to assign an alias for each RPS-4M to assist with easy identification.
TCP Port Timeout	This parameter is used to configure the TCP Port timeout value. If there is no activity on the network for a specific period of time, RPS-4M will close the connection to the client.
Web Auto-logout	This parameter is used to configure the automatic logout value. If there is no activity on the web server for a certain period of time, the current user account will be automatically logged out.
UDP Configuration	This parameter is used to enable or disable UDP configuration

4. Time Synchronization section can correct the time with the computer or customize the time
5. User can change the Modbus node ID in Modbus Setting section.



6. Restore Factory Defaults section include two part:

Item	Description
Restore Defaults	Reset all parameters to their original factory default settings
Reboot	Force the RPS-4M to reboot or to remotely reboot the device.

7. Update by Ethernet function can update firmware remotely. Traditional firmware update requires adjusting the Init/Run Switch and reboots the module manually for the initialization of firmware update, while new firmware allows user to initialize the module via web interface without adjusting the hardware switch. Initialization via web is useful when module is installed in remote site and can be accessed by a remote PC via TeamViewer
For more details, refer to appendix A.

4.5. Filter Page

The Accessible IP (filter is disabled when all zero) Settings page is used to query or edit the IP Filter List. The IP Filter List restricts the access of packets based on the IP header. If one or more IP address are saved to the IP Filter table, only clients whose IP is specified in the IP Filter List can access the RPS-4M.

IoT Power Supply

192.168.255.1

Redundant Power Supply (RPS)

Home | Port1 | Network | Filter | Monitor | Password | Logout

Model Name	RPS-4M	Alias Name	RPS
Firmware Version	B1.0.1 [Jun.25 2021]	MAC Address	00-0d-e0-16-46-06
IP Address	192.168.255.160	TCP Port Timeout (Socket Watchdog, Seconds)	180
Initial Switch	OFF	System Idle (Network Watchdog, Seconds)	0

Accessible IP (filter is disabled when all zero):

IP Filter List	IP Address
IP0:	0.0.0.0
IP1:	0.0.0.0
IP2:	0.0.0.0
IP3:	0.0.0.0
IP4:	0.0.0.0

☐ Add . . . To The List

☒ Delete IP# (Number: 0 ~ 4)

☐ Delete ALL

☐ Save Configuration (finish)

Note: Remember to include the IP address of your configuration computer.

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The following is an overview of the parameters contained in the Accessible IP section:


Item	Description
Add "IP" to the list	Add an IP address to the IP Filter List.
Delete IP# "Number"	Delete a specific IP# (Number = 0 to 4) address from the IP Filter List
Delete All	Delete all items from the IP Filter List.
Save Configuration(finish)	Save a new IP Filter List to the Flash memory

4.6. Monitor Page

User can check of the IPs which connect to RPS-4M.

IoT Power Supply

192.168.255.1



Redundant Power Supply (RPS)

[Home](#) | [Port1](#) | [Network](#) | [Filter](#) | [Monitor](#) | [Password](#) | [Logout](#)

Current Connection Status:

Port Number	Port 1
Application Mode	Server
Connected IP1:	0.0.0.0
IP2:	0.0.0.0
IP3:	0.0.0.0
IP4:	0.0.0.0
Available Connections:	32
Queued MB Requests:	0
Busy Error:	-
First Error (Hex):	0,0,0
Last Error (Hex):	0,0,0

Clear Last Error

Note:
1. [Click here](#) for error codes and descriptions.
2. The "Busy Error" can happen when too many Modbus requests are queued and waiting for process. Set a larger timeout and scan-time value on all master software (clients) for fixing this problem.

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4.7. Password Page

After clicking the Password tab, the Change Password page will be displayed.
The following are the steps for changing password.

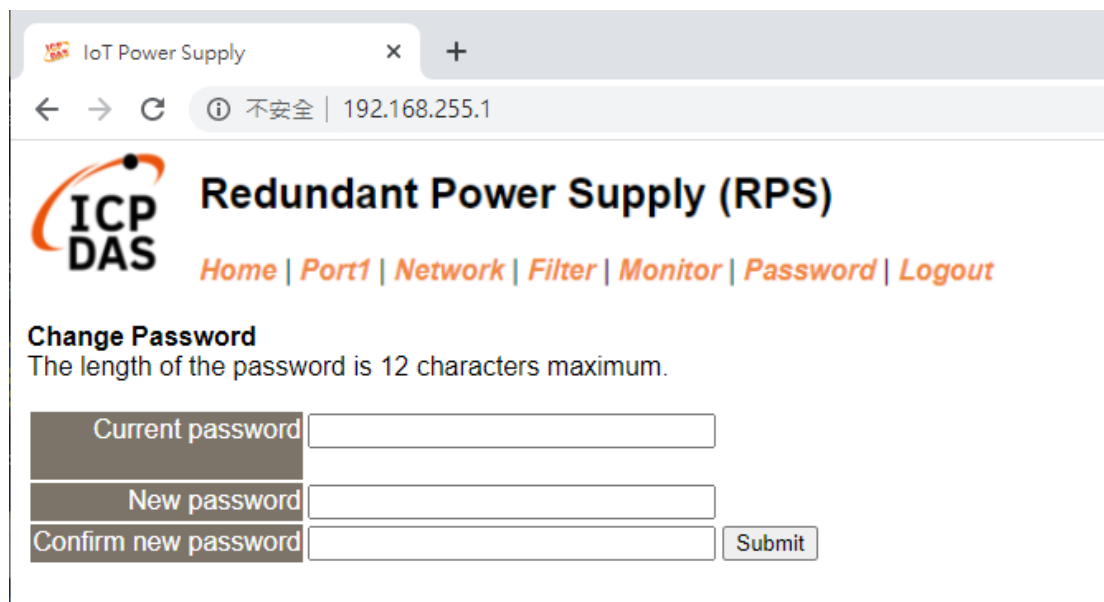
Step 1: Enter the old password in the “Current password” field

(Note: Use the default password “admin”, when change password for the first time.)

Step 2: Enter a new password in the “New password” field ◦

Step 3: Re-enter the new password in the “Confirm new password” field.

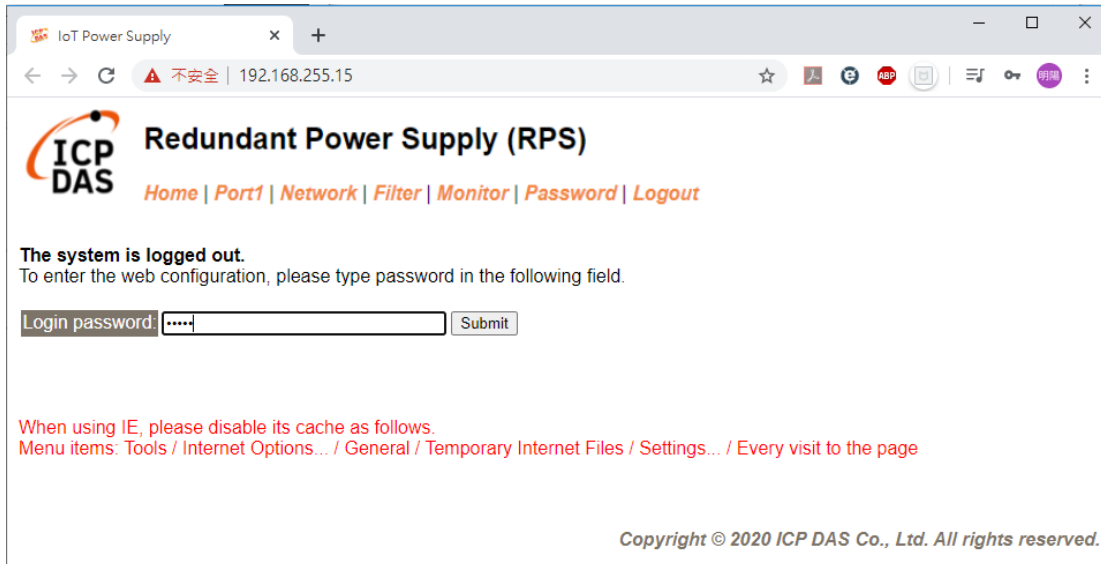
Step 4: Click the “Submit” button to update the password.



The screenshot shows a web browser window with the title "IoT Power Supply". The address bar shows "192.168.255.1" with a warning icon and the text "不安全". The page header features the ICP DAS logo and the title "Redundant Power Supply (RPS)". Below the title is a navigation menu with links: Home, Port1, Network, Filter, Monitor, Password, and Logout. The main content area is titled "Change Password" and includes a note: "The length of the password is 12 characters maximum." There are three input fields labeled "Current password", "New password", and "Confirm new password". A "Submit" button is located to the right of the "Confirm new password" field.

4.8. Logout Page

After clicking the Logout tab, you will be immediately logged out from the system and be returned to the login page.



5.RPS Utility

5.1. Introduction

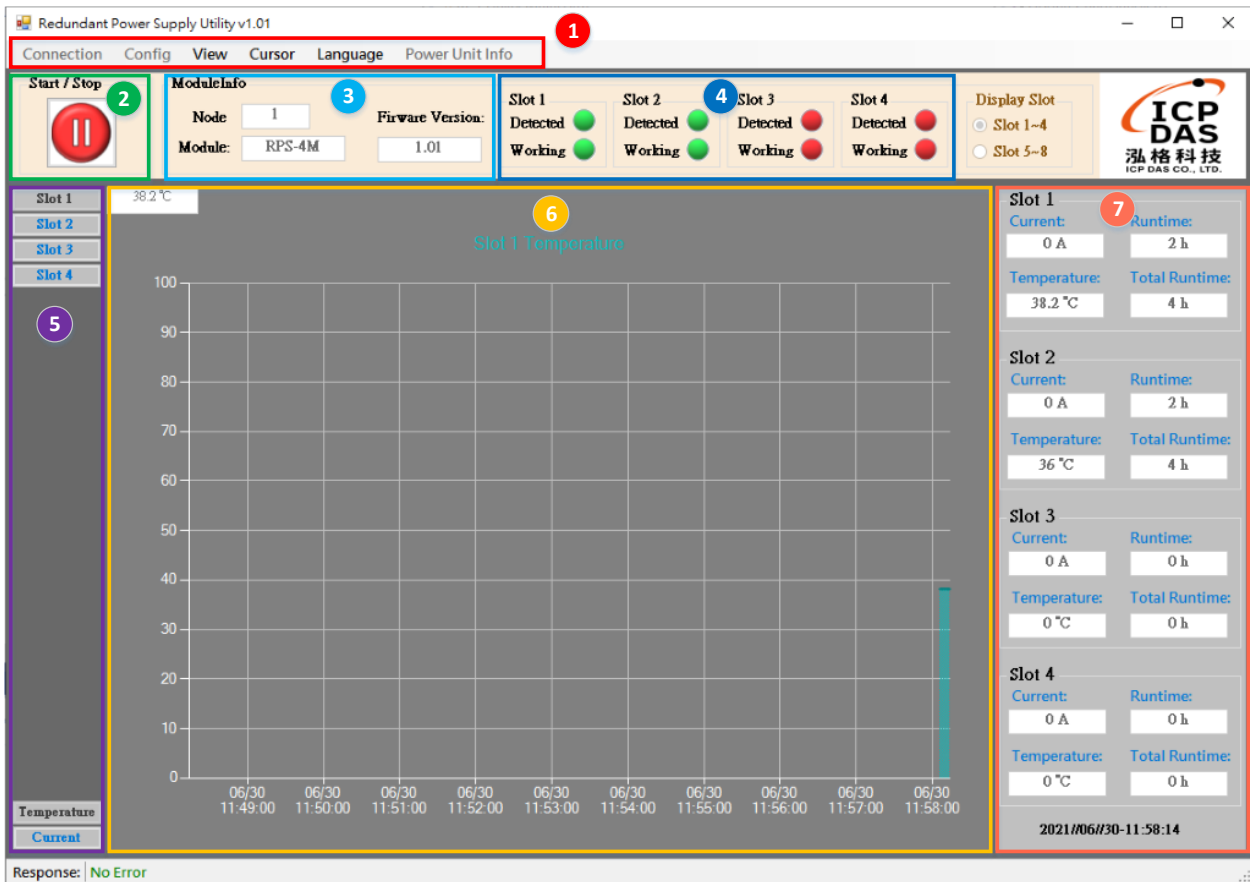
This chapter describes how to use the RPS_Utility developed by ICP DAS. This tool needs to be used with a redundant power supply developed by ICP DAS (such as RPS-4M). This tool is installed on the PC side, and collects the data of the redundant power supply through COM Port or Ethernet. RPS_Utility displays the data on the screen, and provides on-site engineers to inspect the redundant power supply and set the system parameters.

At present, ICP DAS's RPS-4M provides RS-485 and Ethernet communication interfaces. When PC-side users connect with RPS-4M through RS-485 communication, they need to use a conversion module (e.g., ICP DAS's I-7561, I-7520, etc.) convert the RS-232 or USB communication interface on the PC to the RS-485 communication interface. When connecting to the RPS-4M through the Ethernet interface, the user need to use the network cable and correctly set the IP related information.

The software features are as follows:

- Communicate with ICP DAS redundant power supply via Modbus RTU or Modbus TCP protocol
- Instantly view the measured value of the redundant power supply
- Instantly set the parameters of the redundant power supply system
- Provide data recording function

5.2. User interface introduction



1. [Toolbar]:

Configure Utility and Module

2. [Start/End Monitoring]:

Start/stop real-time monitoring function

3. [Module Basic Information]:

Get the module type and firmware version after connecting with the module

4. [Real-time power module status 1]:

After starting the real-time monitoring function, you can check if there is a power module in the slot and if this power module is broken.

5. [Choose which run chart to be display]:

Select which slot and which run chart type to be displayed in block 6

6. [Run chart]:

Run chart of power module current and temperature

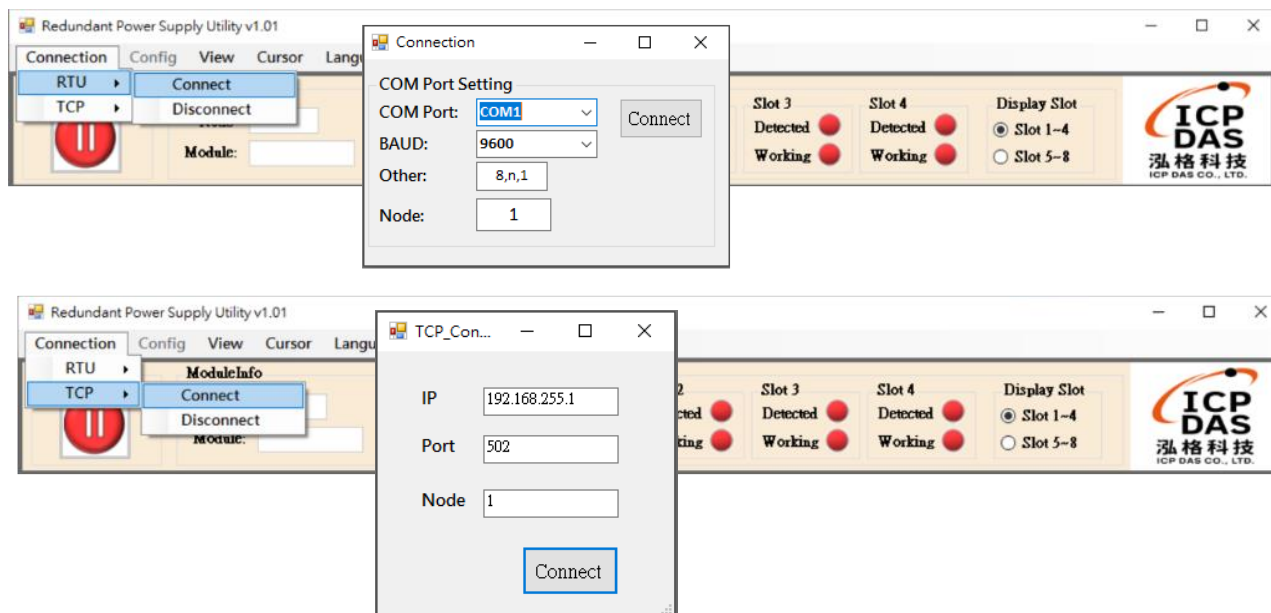
7. [Real-time power module status 2]:

After starting the real-time monitoring function, you can view the current, temperature, and usage time of the power module in the slot.

[Toolbar]

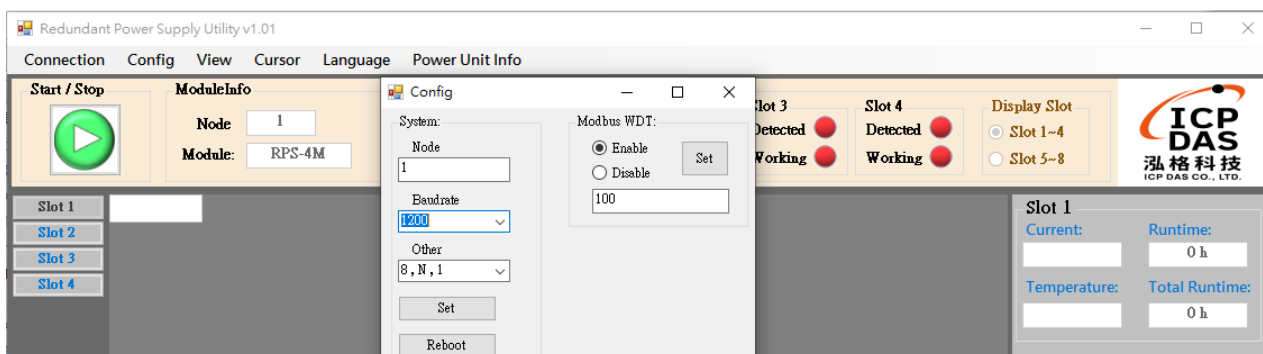
[Connection]:

The user can choose to use Modbus RTU or Modbus TCP and needs to fill in the corresponding parameters to connect to RPS-4M.



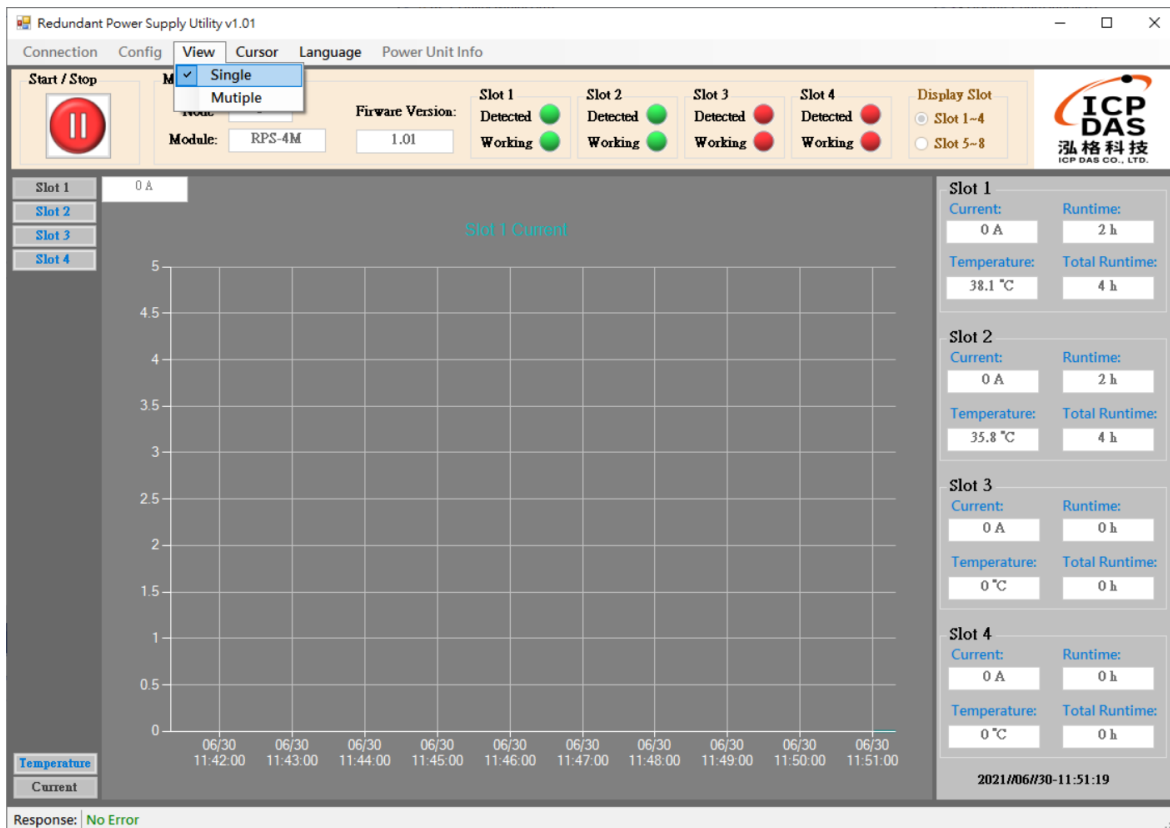
[Config]:

When RPS-4M is in Initial mode, the RS-485 parameters of the module can be set through this function on the left side of the interface. In addition, the Modbus watchdog function can be set in any mode on the right side of the interface (and the unit is 100ms).



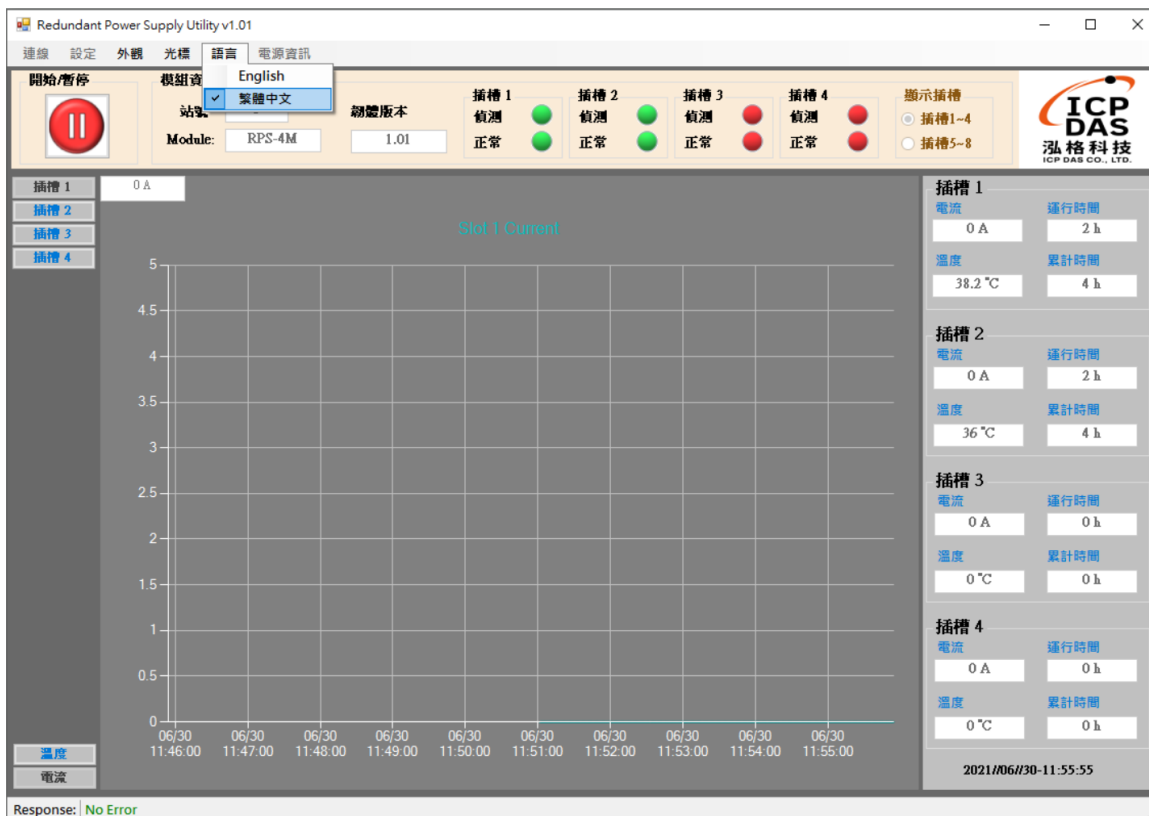
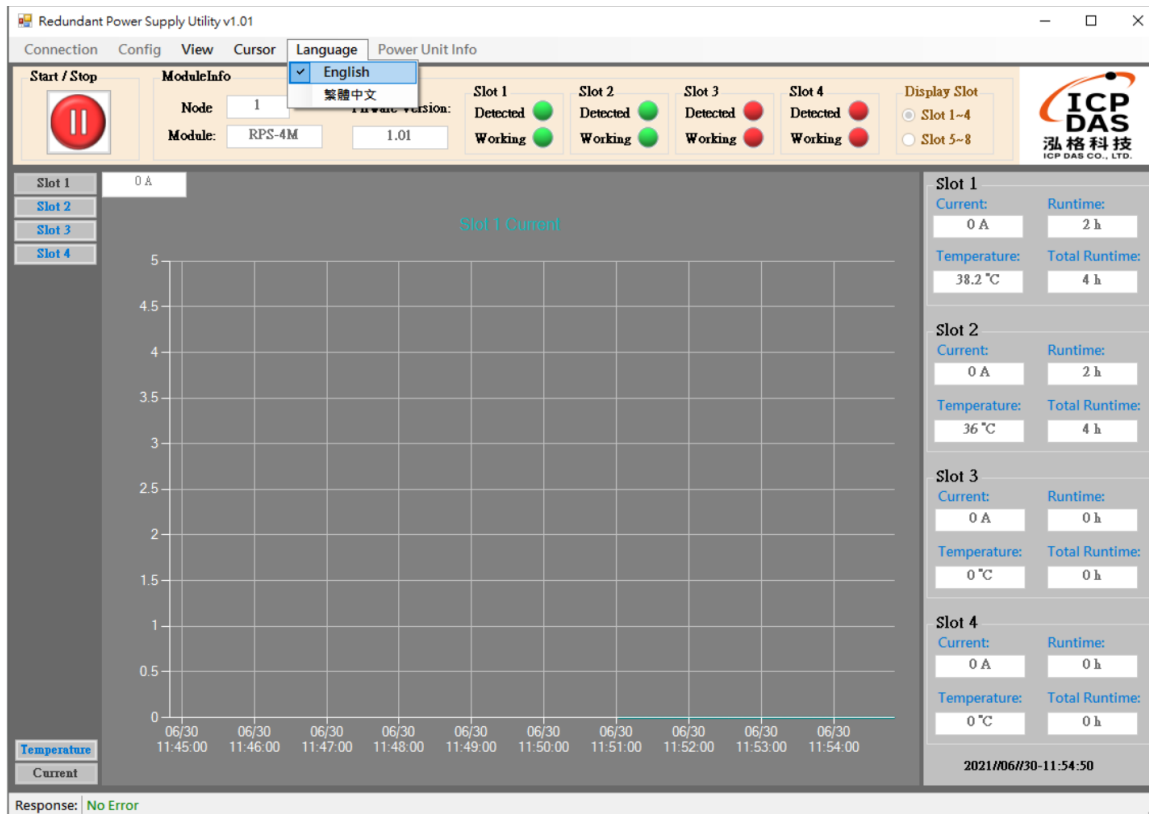
[View]:

Set the run chart display mode, which can display the run chart for a single slot or four slots



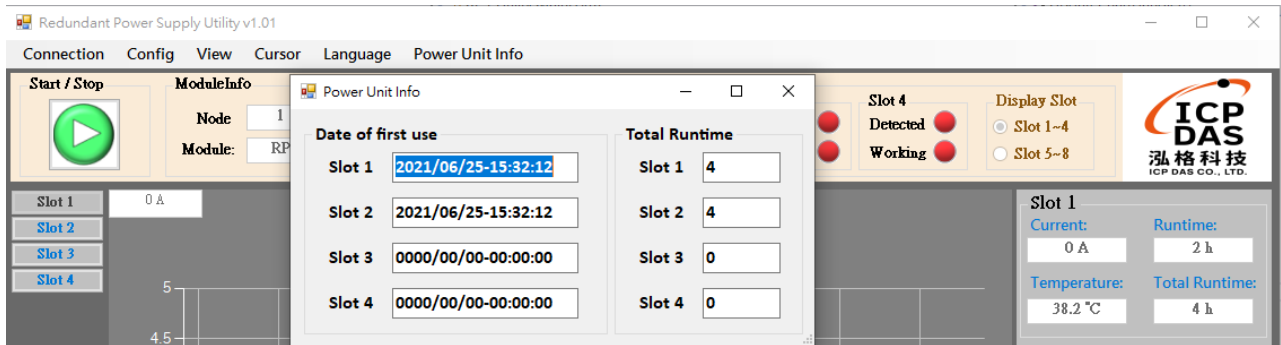
[Language]:

Choose the language of the interface

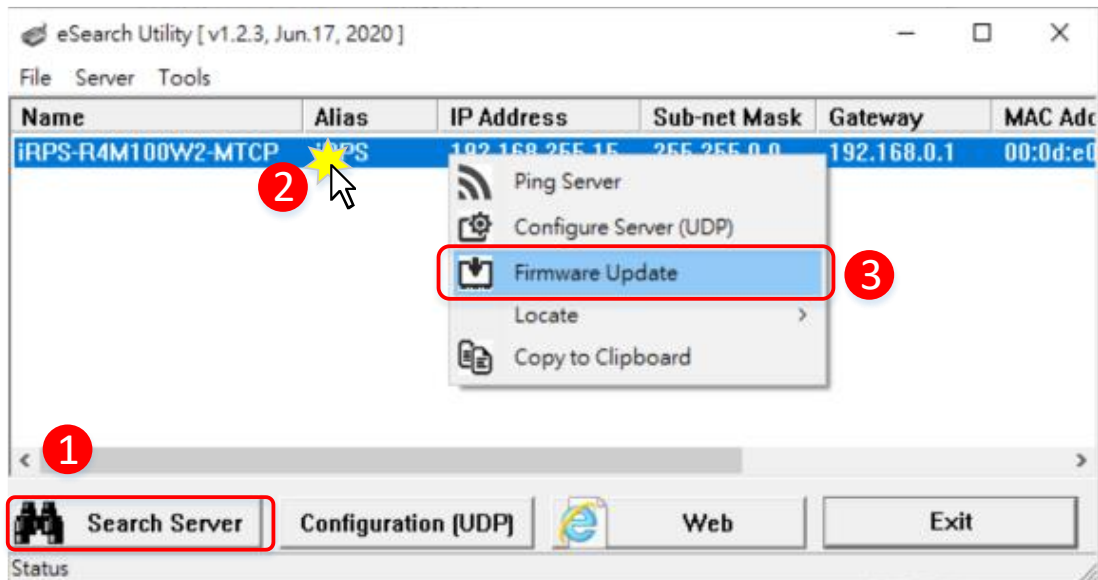


[Power Unit Info]:

The date when the power module was used and the accumulated running time.



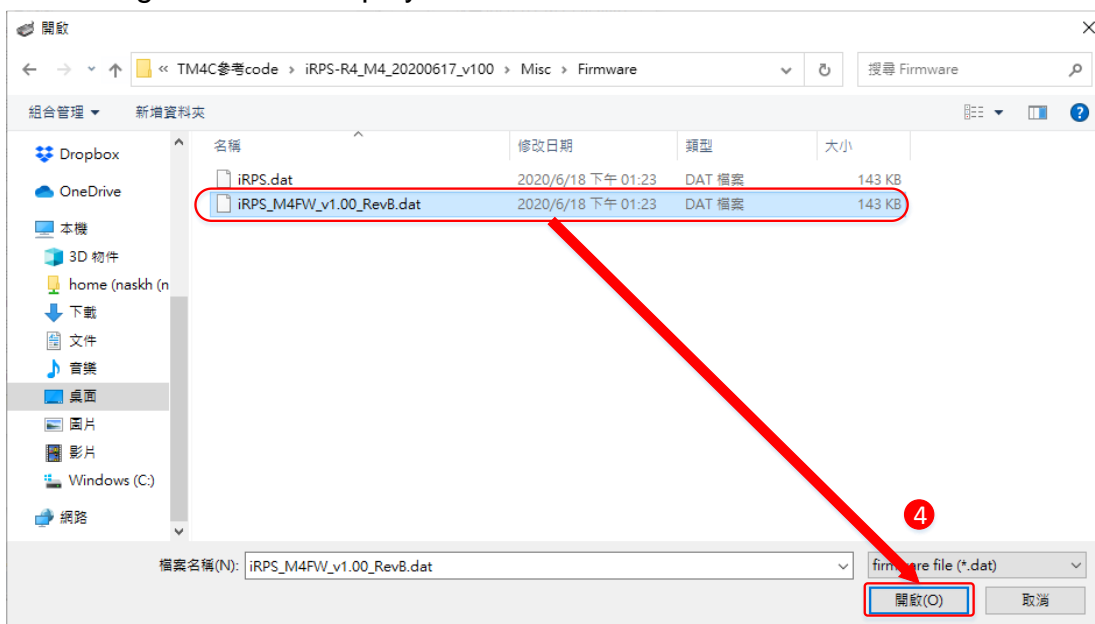
6. Appendix A: Firmware Update



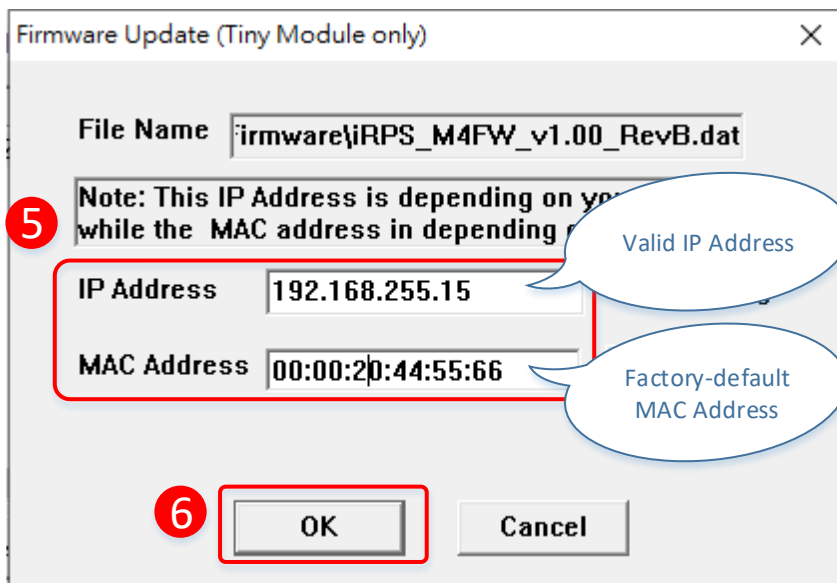
Step 1: In the eSearch Utility, click the “Search Servers” button to search for any RPS-4M modules connected to the network .

Step 2: Right click on the name of the RPS-4M module to be updated.

Step 3: Select the “Firmware Update” item from the popup menu and the “Open” dialog box will be displayed.



Step 4: In the “Open” dialog box, select the firmware file that will be used to update the module and then click the “Open” button.



Step 5: Assign a valid IP Address (can be different with the current IP) and the factory-default MAC Address for the RPS-4M module. If this IP address is invalid (e.g. IP Address: 0.0.0.0) or a user-defined MAC address is assigned. Refer to note 2 and note 3 for more details.

Step 6: Click the “OK” button.

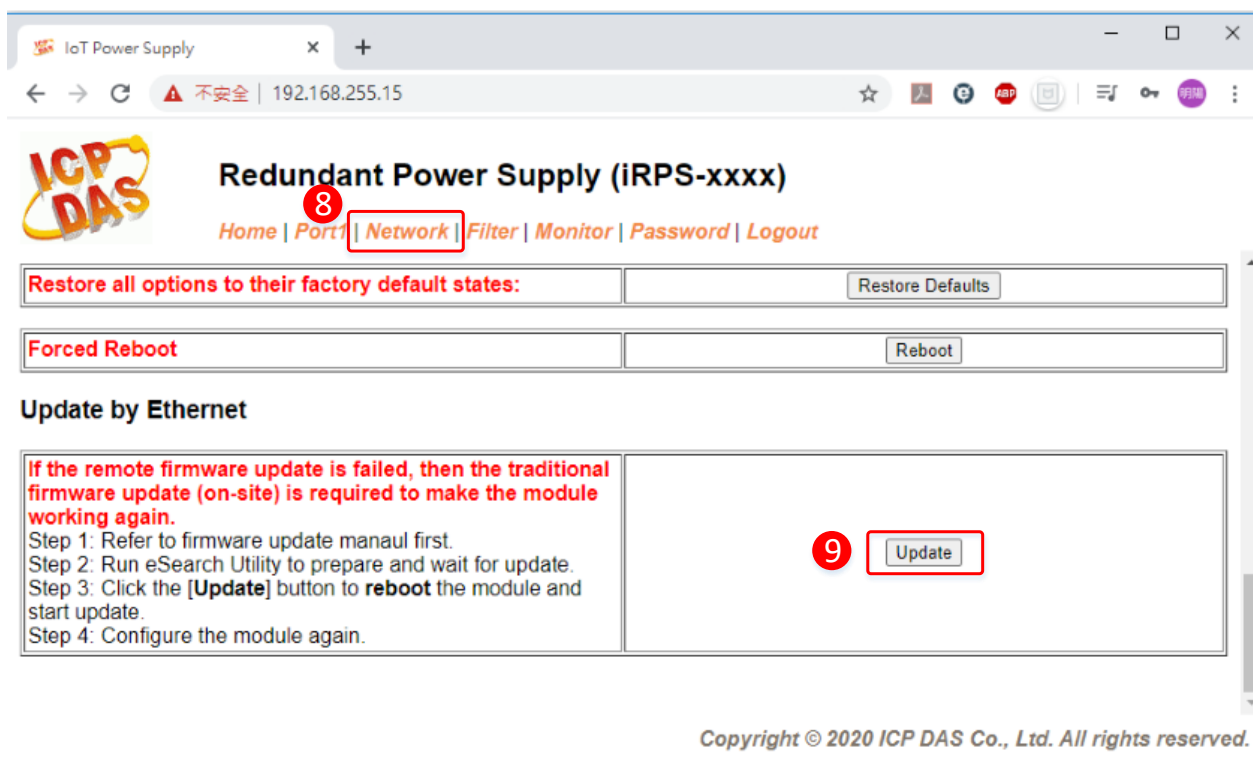
Waiting for a request from this MAC address.

```
C:\WINDOWS\system32\cmd.exe
Waiting request from MAC 00-00-20-44-55-66 (IP:192.168.255.15)
Starting BOOTP/TFTP Server ...
% Complete: 0%
```

Step 7: You are now ready to update the firmware. A Command Prompt windows will be displayed the progress of the update.

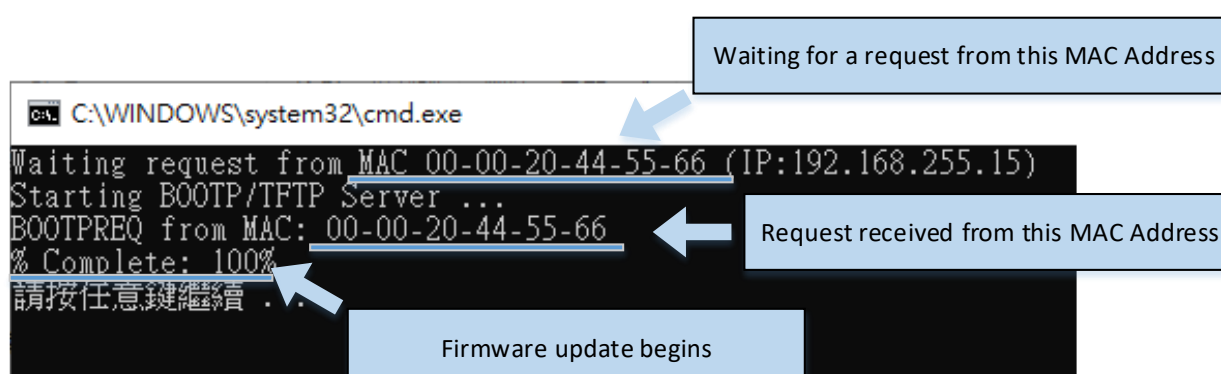
Step 8: Click the “Network Setting” tab to display the Network Settings page

Step 9: Click the “Update” button in the “Remote Firmware Update” section to start the update



Step 10: Confirm that the two MAC addresses (factory-default) listed in the Command Prompt window, "Waiting request from MAC x.x.x.x" and "BOOTPREQ from MAC: x.x.x.x", are the same, as indicated in the image below. If these addresses do not match, the update cannot proceed. Refer to note4 below for more details.

Step 11: Once the update is complete (i.e., when the progress indicator reaches 100%), close the Command Prompt window.

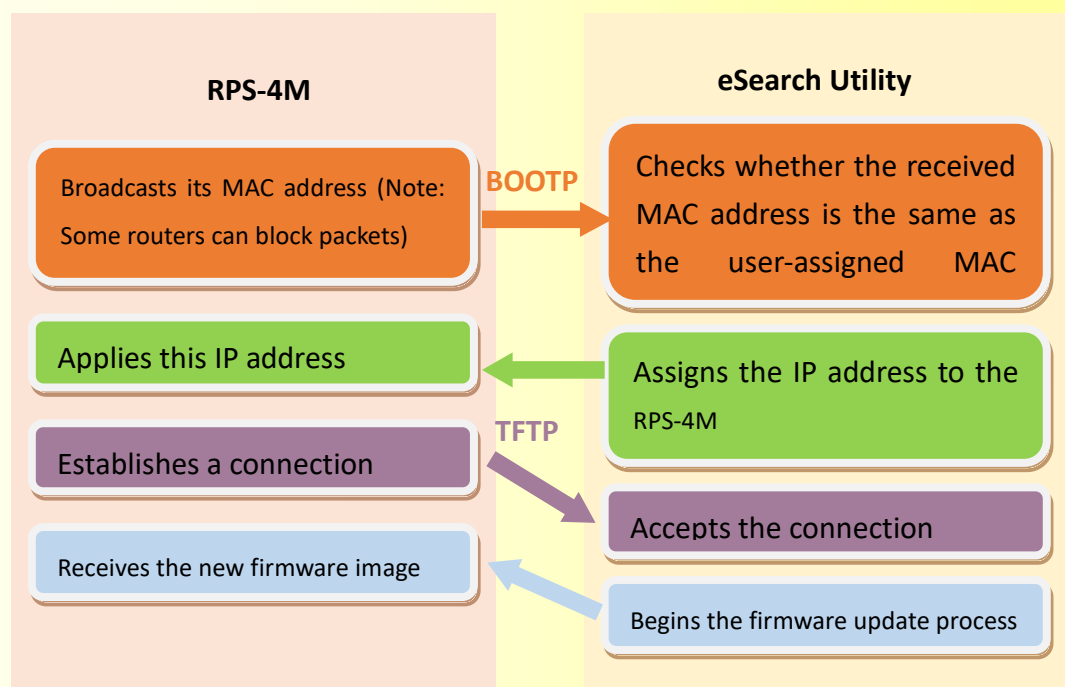


Note 1: If the IP address settings do not work correctly (e.g. there is no response to a ping command), please contact your network administrator to obtain a valid IP address for the RPS-4M module.

Note 2: If the settings displayed in the IP address field of the firmware update window is incorrect or invalid (e.g. IP address: 0.0.0.0), then a valid IP address must be manually specified for the RPS-4M in order to process the update operation. Please contact your network administrator to obtain a valid IP address before proceeding.

Note 3: When updating the firmware, the factory-default MAC address is used rather than the user-defined MAC address. Thus, the MAC address (user-defined) displayed in the firmware update window may not be the one required. If this is the case, the factory-default MAC address should be manually entered into the MAC Address field, or restore the MAC address to the factory-default settings via the web configuration pages.

Note 4: The “BOOTPREQ from MAC: xx-xx-xx-xx-xx-xx” message indicates there is a module with the factory-default MAC address “xx-xx...” that is asking for the firmware to be updated. The update process will not begin if you assign a user-defined MAC address in the firmware update window, since the addresses do not match. If this situation occurs, repeat the update procedure and manually enter the factory-default MAC address in the firmware update window, as described in Step 5. The firmware update procedure is illustrated in the figure below



Note 5: BOOTP (Bootstrap Protocol) is defined in RFC-951 and uses UDP ports 67 and 68.

Note 6: TFTP (Trivial File Transfer Protocol) is defined in RFC-1350 and uses UDP port 69

7. Appendix B: Modbus Protocol

7.1. Function 01 - Read Coils

This function code is used to read the value at addresses 0xxxx.

Request

Byte	Description	Value
00	Module ID	1 ~ 247
01	Function Code	0x01
02 – 03	Reference Address	Refer to section 3.1 – Address 0xxxx
04 – 05	Bit Count	Number of bit (B) to read

Response

Byte	Description	Value
00	Module ID	1 ~ 247
01	Function Code	0x01
02	Byte Count	Response data byte N = B/7
03 – (N+2)	Bit Value	Response bit data

Error Response

Byte	Description	Value
00	Module ID	1 ~ 247
01	Function Code	0x81
02	Exception Code	Refer to section 3 – Error Response

7.2. Function 02 - Read Discrete Inputs

This function code is used to read the value at addresses 1xxxx.

Request

Byte	Description	Value
00	Module ID	1 ~ 247
01	Function Code	0x02
02 – 03	Reference Address	Refer to section 3.1 – Address 1xxxx
04 – 05	Bit Count	Number of bit (B) to read

Response

Byte	Description	Value
00	Module ID	1 ~ 247
01	Function Code	0x02
02	Byte Count	Response data byte N = B/7
03 – (N+2)	Bit Value	Response bit data

Error Response

Byte	Description	Value
00	Module ID	1 ~ 247
01	Function Code	0x82
02	Exception Code	Refer to section 3 – Error Response

7.3. Function 03 - Read Multiple Holding Registers

This function code is used to read the value at addresses 4xxxx.

Request

Byte	Description	Value
00	Module ID	1 ~ 247
01	Function Code	0x03
02 – 03	Reference Address	Refer to section 3.1 – Address 4xxxx
04 – 05	Word Count	Number of word (W) to read

Response

Byte	Description	Value
00	Module ID	1 ~ 247
01	Function Code	0x03
02	Byte Count	Response data byte N = W*2
03 – (N+2)	Word Value	Response word data

Error Response

Byte	Description	Value
00	Module ID	1 ~ 247
01	Function Code	0x83
02	Exception Code	Refer to section 3 – Error Response

7.4. Function 04 - Read Multiple Input Registers

This function code is used to read the value at addresses 3xxxx.

Request

Byte	Description	Value
00	Module ID	1 ~ 247
01	Function Code	0x04
02 – 03	Reference Address	Refer to section 3.1 – Address 3xxxx
04 – 05	Word Count	Number of word (W) to read

Response

Byte	Description	Value
00	Module ID	1 ~ 247
01	Function Code	0x04
02	Byte Count	Response data byte N = W*2
03 – (N+2)	Word Value	Response word data

Error Response

Byte	Description	Value
00	Module ID	1 ~ 247
01	Function Code	0x84
02	Exception Code	Refer to section 3 – Error Response

7.5. Function 05 – Write Single Coil

This function code is used to write a value to addresses 0xxxx.

Request

Byte	Description	Value
00	Module ID	1 ~ 247
01	Function Code	0x05
02 – 03	Reference Address	Refer to section 3.1 – Address 0xxxx
04 – 05	Output Value	Output ON: 0xFF00 Output OFF: 0x0000

Response

Byte	Description	Value
00	Module ID	1 ~ 247
01	Function Code	0x05
02 – 03	Reference Address	The same as byte 02 – 03 of request
04 – 05	Output Value	The same as byte 04 – 05 of request

Error Response

Byte	Description	Value
00	Module ID	1 ~ 247
01	Function Code	0x85
02	Exception Code	Refer to section 3 – Error Response

7.6. Function 06 – Write Single Holding Register

This function code is used to write a value to addresses 4xxxx.

Request

Byte	Description	Value
00	Module ID	1 ~ 247
01	Function Code	0x06
02 – 03	Reference Address	Refer to section 3.1 – Address 0xxxx
04 – 05	Output Value	A word value

Response

Byte	Description	Value
00	Module ID	1 ~ 247
01	Function Code	0x06
02 – 03	Reference Address	The same as byte 02 – 03 of request
04 – 05	Output Value	The same as byte 04 – 05 of request

Error Response

Byte	Description	Value
00	Module ID	1 ~ 247
01	Function Code	0x86
02	Exception Code	Refer to section 3 – Error Response

7.7. Function 15 – Write Multiple Coils

This function code is used to write values to addresses 0xxxx.

Request

Byte	Description	Value
00	Module ID	1 ~ 247
01	Function Code	0x0F
02 – 03	Reference Address	Refer to section 3.1 – Address 0xxxx
04 – 05	Bit Count	Number of bit (B) to write
06	Byte Count	Byte number N = B/7
07 – (N +6)	Write Data	A bit corresponds to a channel. Output ON: The bit = 1 Output OFF: The bit = 0

Response

Byte	Description	Value
00	Module ID	1 ~ 247
01	Function Code	0x0F
02 – 03	Reference Address	The same as byte 02 – 03 of request
04 – 05	Output Value	The same as byte 04 – 05 of request

Error Response

Byte	Description	Value
00	Module ID	1 ~ 247
01	Function Code	0x8F
02	Exception Code	Refer to section 3 – Error Response

7.8. Function 16 – Write Multiple Holding Registers

This function code is used to write values to addresses 4xxxx.

Request

Byte	Description	Value
00	Module ID	1 ~ 247
01	Function Code	0x10
02 – 03	Reference Address	Refer to section 3.1 – Address 0xxxx
04 – 05	Word Count	Number of word (W) to write
06	Byte Count	Byte number N = W*2
07 – (N +6)	Write Data	Multiple word data

Response

Byte	Description	Value
00	Module ID	1 ~ 247
01	Function Code	0x10
02 – 03	Reference Address	The same as byte 02 – 03 of request
04 – 05	Output Value	The same as byte 04 – 05 of request

Error Response

Byte	Description	Value
00	Module ID	1 ~ 247
01	Function Code	0x90
02	Exception Code	Refer to section 3 – Error Response

8.FAQ

9.Revision History

Revision	Date	Description of Change
1.03	2023/01/06	Add Communication Module (RPS-4M) and Power Module (RPS-100) LED definitions. Add Power Module (RPS-100) MTBF. Add Chapter 8 & 9.
1.00	2021/06/16	Document release.