
RPAC User Manual

Redundancy system setup and usage instructions

Chapter 1 Redundancy system setup and usage instructions

The redundancy system is achieved using two RPACs. When the currently running RPAC (Active PAC) loses system control, it will automatically switch to the standby RPAC (Passive PAC) through a switching mechanism. Before the switch, the Active PAC will continuously back up the data to the Passive PAC through the data synchronization port to ensure data consistency and real-time performance.

Example usage:

1 RPAC-2858M * 2

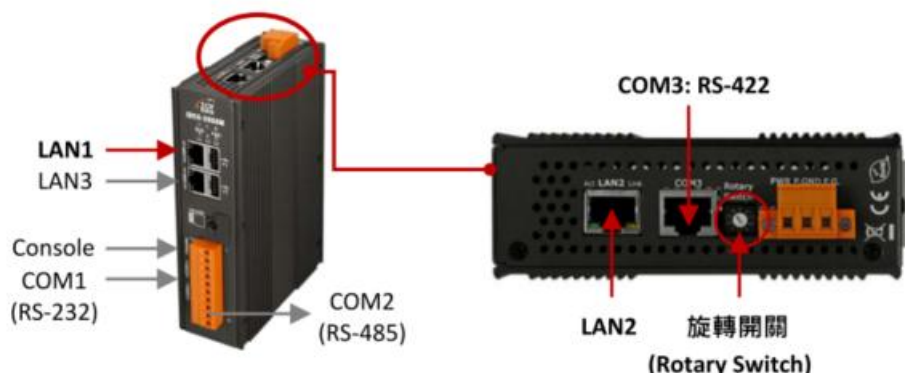


Table 1: Communication Port Description

Communication Port	Description
Up Link	LAN1, connected to graphical control or human-machine interface
Down Link	LAN3, web-based configuration interface/connection to Win-GRAF Workbench software/connection to I/O devices, such as: ET-7K, DL-100-SE...
Data-Sync	LAN2, the data synchronization channel, synchronizes data to Passive PAC.
Heart-beat	COM3 detects whether the two PACs are operating normally and synchronizes their settings.

Table 2: PAC Role Definition

Name	Description
Main PAC	Rotary switch is located at position 7 of PAC.
Backup PAC	Rotary switch is located at position 9 of PAC.
Active PAC	The PAC with control is activated (L3 indicator light is on).
Passive PAC	Backup PAC without control (L3 indicator light is off)

PAC indicator light description



RUN

L1

L2

PWR

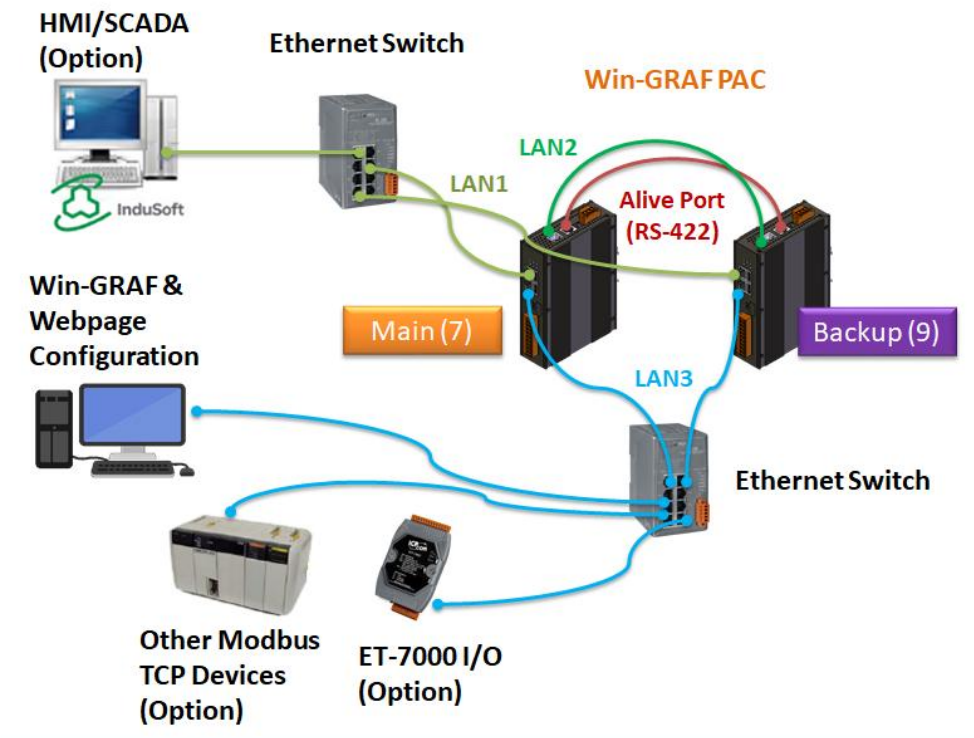
L3

LED Indicator	Color	Meaning
RUN	Green	Power on and OS is running (Flashing state)
PWR	Red	Power is on
L1	Green	User programmable LED & hardware error indicator
L2	Orange	User programmable LED
L3	Red	Redundancy status indicator (Active PAC)

To use the Redundancy System, you must have two RPAC-2858M servers: one as the Main PAC and the other as the Backup PAC. In Redundancy mode, for the Up Link network IP, only one server needs to be configured with the Active IP; the other server's IP will automatically be the Active IP + 1. For example: Active PAC: 192.168.255.1 → Passive PAC: 192.168.255.2

1.1 Setting steps

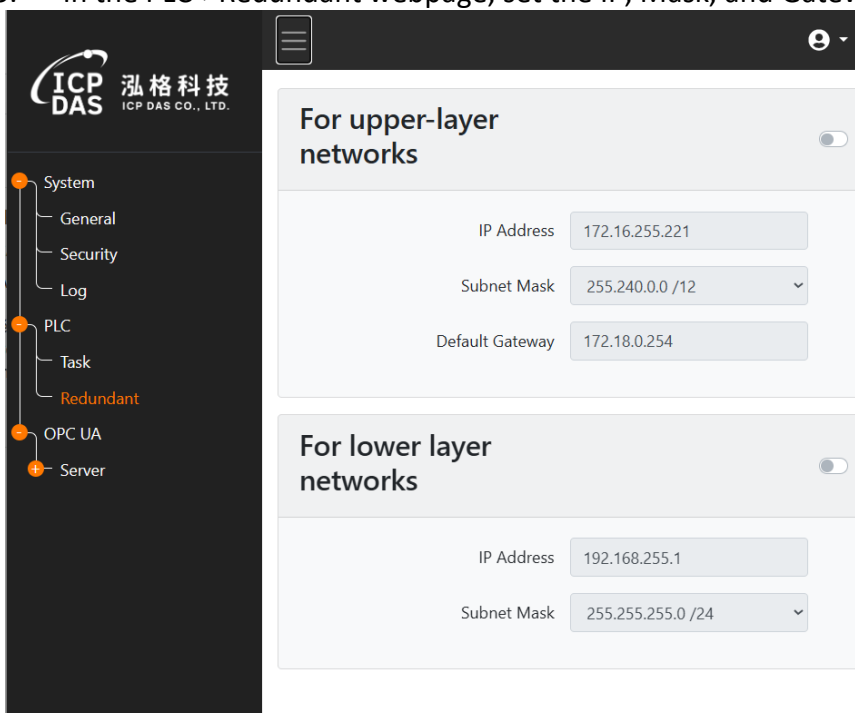
- 1. Turn the Main PAC rotary switch to position 7, and the Backup PAC rotary switch to position 9.
- 2. Connect the power supply and network cables. The wiring structure is as follows:



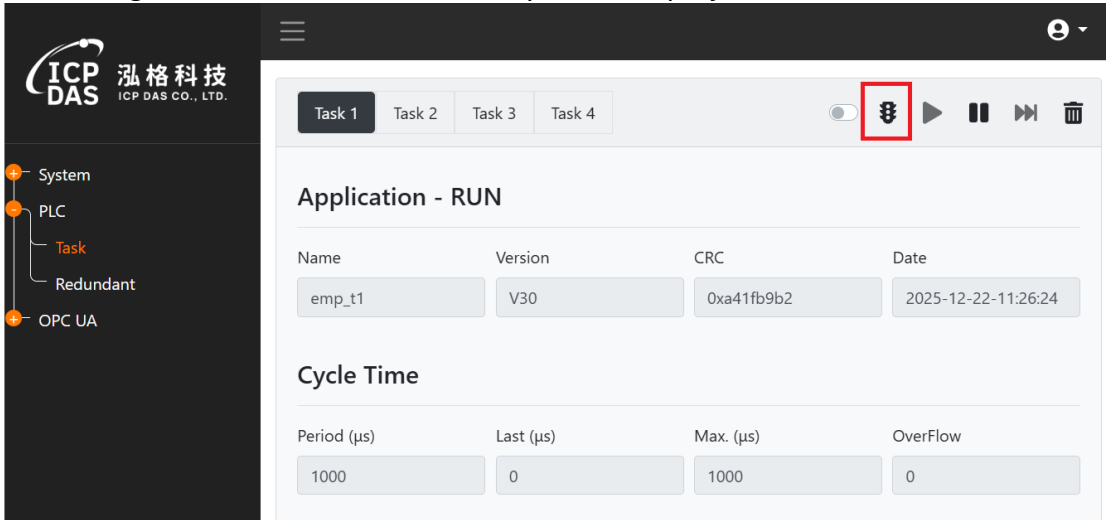
- Two RPAC Alive ports, interconnected via Ethernet patch cables.
 - Two RPAC Data Sync ports (LAN2), interconnected via Ethernet patch cables.
 - Two RPAC Up Links (LAN1), connected to a switch or hub.
 - Two RPAC Down Links (LAN3), connected to a switch or hub.
(Note: The IP addresses of the two RPACs must be configured differently beforehand; using the default IPs will result in IP conflicts.)
 - Connect the computer with web browsing and project settings to the RPAC Down Link (LAN3).
3. Enter the Active PAC IP (LAN 3 IP) into your browser. You can use the eSearch Utility software (http://www.icpdas.com/en/product/guide+Software+Utility_Driver+eSearch__Utility) to search and access the web-based RPAC configuration settings.



4. Login Account: Default username: admin and password: admin (Password needs to be changed after first login).
5. In the PLC->Redundant webpage, set the IP, Mask, and Gateway, and then click Save Setting.



- After completing the settings, in the PLC->Task webpage, for Task 1, click "Stop" and then "Start" for the settings to take effect. If the user project has not yet been downloaded, the settings will take effect automatically after the project is downloaded.



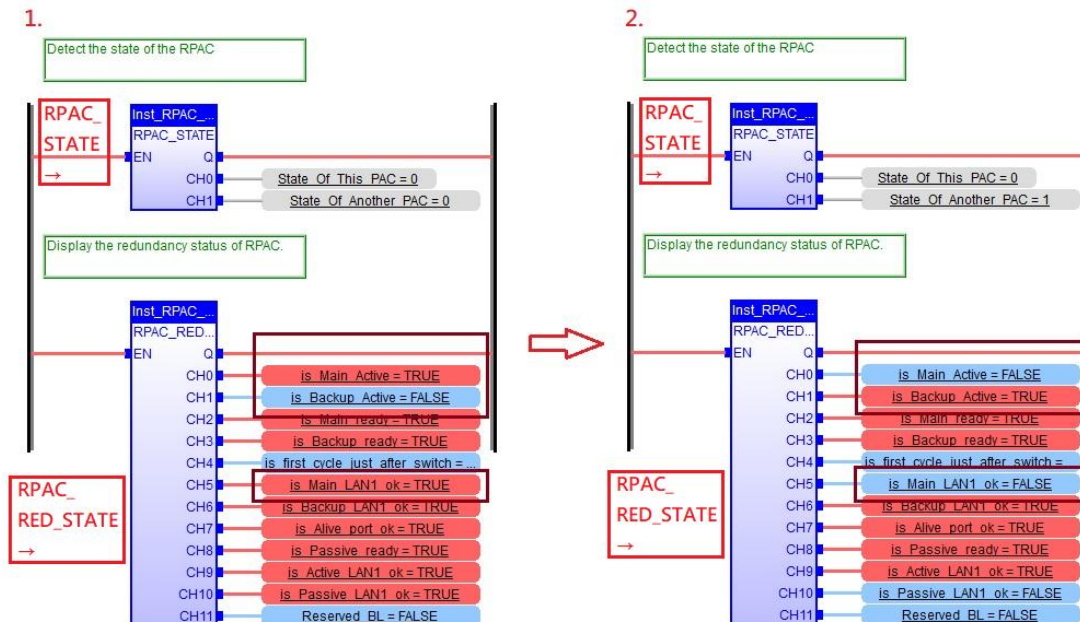
1.2 How to use Redundancy

This example will use the following demo.

Name	Platform
rdn_test	RPAC series products

This section uses the project rdn_test to illustrate how to use Redundancy. This project is used to observe the connection status of the communication ports between two RPACs. When uploading the Win-GRAF program to the RPAC, the power to the Passive PAC needs to be turned off first. After the program has finished uploading to the Active PAC, the Backup PAC should be powered on.

Taking the following diagram as an example, the left side of the diagram shows that the current communication port connection status is normal; conversely, the right side of the diagram will show a blue "FALSE" in the RPAC_RED_STATE FB output. For instance, when the Main PAC Up-Link (Eth0) network line is removed, the variable is_Main_LAN1_ok in the project will change from TRUE to FALSE. At this time, due to a problem with the Main PAC Up-Link (Eth0), control will switch to the Backup PAC. Originally, the Main PAC was the Active PAC and the Backup PAC was the Passive PAC, but due to an unexpected switch in control, the Main PAC becomes the Passive PAC and the Backup PAC becomes the Active PAC.



The following are commonly used functions and FBs in RPAC Redundant Systems.

Name	Function
GetActiveRTStat	Displays the status of the active runtime.
GetActiveExStat	Displays the attached state of the active runtime.
ActiveRTSwitch	A function to switch between Active PAC and Passive PAC.
ActiveSYNSwitch	Function to switch the Data-Sync LAN port.
RPAC_STATE	This displays the status of RPAC in Redundancy.
RPAC_RED_STATE	Check the status of RPAC.
RPAC_2000_LED	RPAC-2XXX L1 and L2 LED outputs.

✖In the Win-GRAF FB project, click on Function Block and then press F1 to learn about the Function Block's functions through a web page.

The following situations will cause a switchover:

1. Main RPAC Up-Link disconnection
2. Main RPAC Down-Link disconnection
3. Main RPAC power off
4. Main RPAC hardware diagnostic malfunction
5. Program switching, using FB ACTIVERTSWITCH

The following information will be automatically backed up:

1. Win-GRAF Project
2. Variable Values
3. PAC Hardware RTC (Real Time Clock)
4. Retained FBs & Functions

The following data will not be backed up:

1. Private data within the FB instance
- (Including time functions related to TON, TOF, TMU, and TMD; please use TIME variables instead for automatic backup)

2. Files within the Active PAC
3. Additional Serial Ports set by the user using COM_OPEN()
4. Data stored in the PAC FRAM Memory

1.3 **List of Application Names**

The following table provides explanations of commonly used names in the settings.

Name	Explanation
Active PAC	The running PAC can be switched to a Passive PAC.
Passive PAC	Standby machine, PAC to be run, can be switched to Active PAC.
Main PAC	Main unit, rotary switch position 7, set Redundancy IP on this unit.
Backup PAC	Standby unit, rotate switch position 9, IP = Redundancy IP + 1
Redundancy IP	Backup IP, set after logging into the website.
Active IP	Active PAC IP, also known as Redundancy IP

1.4 Problem Solving

Question 1: Where can I download eSearch Utility?

Description:

You can download it from the following website or by following these steps.

URL :

<https://www.icpdas.com/tw/download/show.php?num=6710&nation=TW&kind1=&model=&kw=esearch>

1. Search for "eSearch Utility" on the ICPDAS website → 2. Click "Download" → 3. Click "eSearch Utility Windows Version" → 4. Click to download.

1. 

2.  **eSearch Utility**
eSearch Utility 是一套方便使用組，包含 tDS-700/tGW-700、快速取得不同模組的 IP 設定資料。
 

3.  **工具軟體**

檔案名稱
eSearch Utility Windows 版
eSearch Utility Linux 版

4. 

檔案名稱	版本	檔案日期	大小	備註
eSearch_Utility_setup_Windows_v130.exe	v1.3.0	2022-08-15	3.9 MB	
WhatsNew.txt		2022-08-15		

Question 2: RPAC Function Blocks are not listed in the Blocks option.

Description:

To use the RPAC-specific FB, please download the RPAC_Module compressed file from the product website's download center. After decompression, place it at the following address (the location may vary depending on the version), and then restart Win-GRAF Workbench.

C:\Users\Public\Documents\Win-GRAF Workbench\Win-GRAF Wb 14.0\HwDef