# Win-GRAF Redundant PAC

Switching in 200 ms

- Linux Kernel 4.1.15
- Embedded Win-GRAF SoftLogic (IEC 61131-3)
- Supports Dual PAC Redundant System, Fast Switching within 200 ms
- Real-Time Capability (Built-in Xenomai Real-Time Core Architecture)
- Memory
  - 1 GB DDR3 RAM and 8 GB eMMC Flash
  - 64 KB FRAM and 128 KB MRAM Memory
  - 1 x microSD Socket
- Communication Ports
  - 3 x 10/100/1000M BASE-T Ethernet Ports
  - 4 Serial Ports (RS-232/485/422)
  - 2 x USB 2.0 Host Ports
- 64-bit Hardware Serial Number for Software Protection

RPAC-2658M
Win-GRAF based LinPAC-2000

The **RPAC-2658M** is the new generation Linux based Win-GRAF PAC (Programmable Automation Controller) from ICP DAS. This PAC is equipped with a Quad-core Cortex-A9 CPU (1 GHz) and runs a Linux operating system. The RPAC-2658M can store application programs, files and data via the built-in microSD.

The advantages of running Linux on a Win-GRAF PAC device include real-time capability, achievable deterministic control, and the ability for PAC to have a PC-like operating environment. The PAC is capable of running Win-GRAF (IEC 61131-3 standard) software to develop logical control applications and also support C to develop data management applications that can exchange data with Win-GRAF applications. So the application development becomes more convenient and practical.

Xenomai Real-time Operating System (RTOS)

The RPAC-2658M adopts a hard real-time operating system (RTOS) named Xenomai, which uses dual core technology —Linux Kernel (Real-time expansion) and Real-time microkernel. Given that the RPAC-2658M embeds the controller backup switching mechanism into this real-time kernel so that it can be examined immediately. The control between the two controllers can be fast switched within 200 ms.
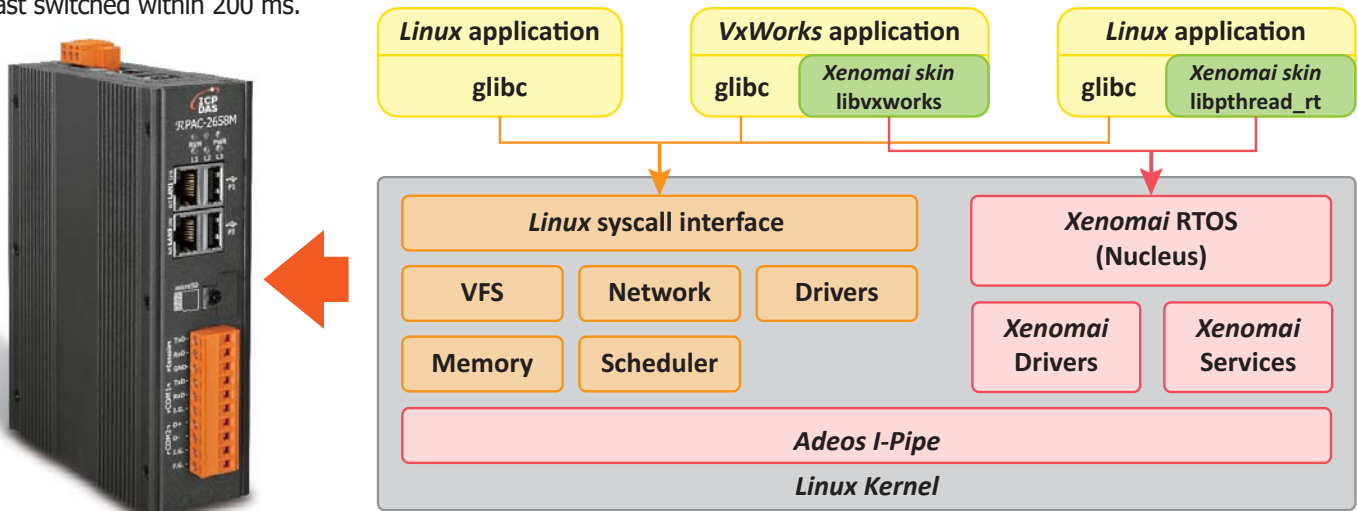
Applications

Modbus TCP I/O

Win-GRAF PAC

RPAC-2658M

Ethernet   **Modbus TCP I/O**

ET-7000 I/O   Win-GRAF PAC   iDCS-8830 + Redundancy I/O
VP-x208-CE7

Modbus RTU I/O

Win-GRAF PAC

RPAC-2658M

RS-485   **Modbus RTU I/O**

(Max. 32 PCS)

tM Series I/O   M-7000 I/O   M-2000 I/O

DCON I/O

Win-GRAF PAC

RPAC-2658M

RS-485   **DCON I/O**

I-7000 I/O   M-7000 I/O   tM Series I/O   RU-87P8 + I-87KW

Win-GRAF Applications

Schedule-Control Utility

Free Scheduling Tool

All Win-GRAF PACs support the Schedule-Control feature. A PAC can control scheduling for up to 10 Targets. Each Target can control a Boolean (BOOL), an Integer (DINT) and a real (REAL) variable, and up to 5 weekly schedules can be set quarterly or annually. Also, up to 15 time periods can be set for a schedule.
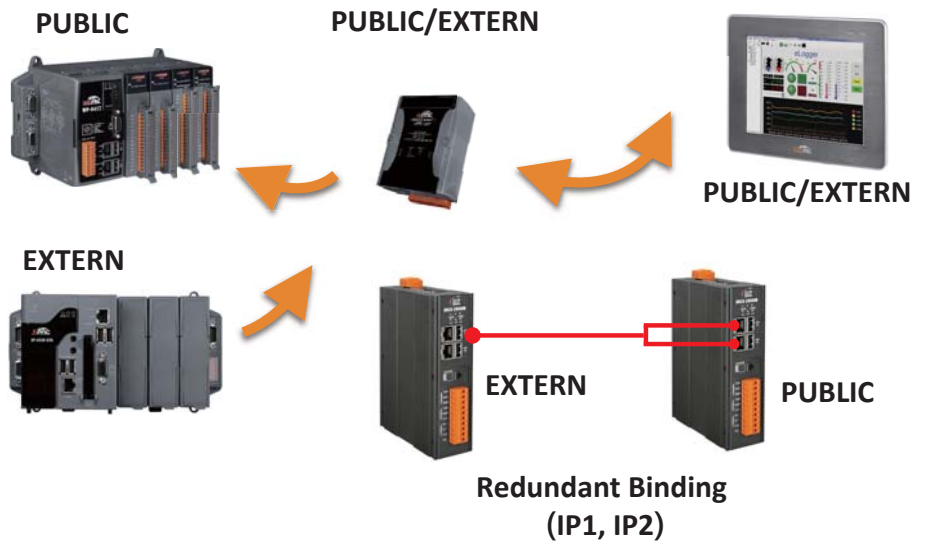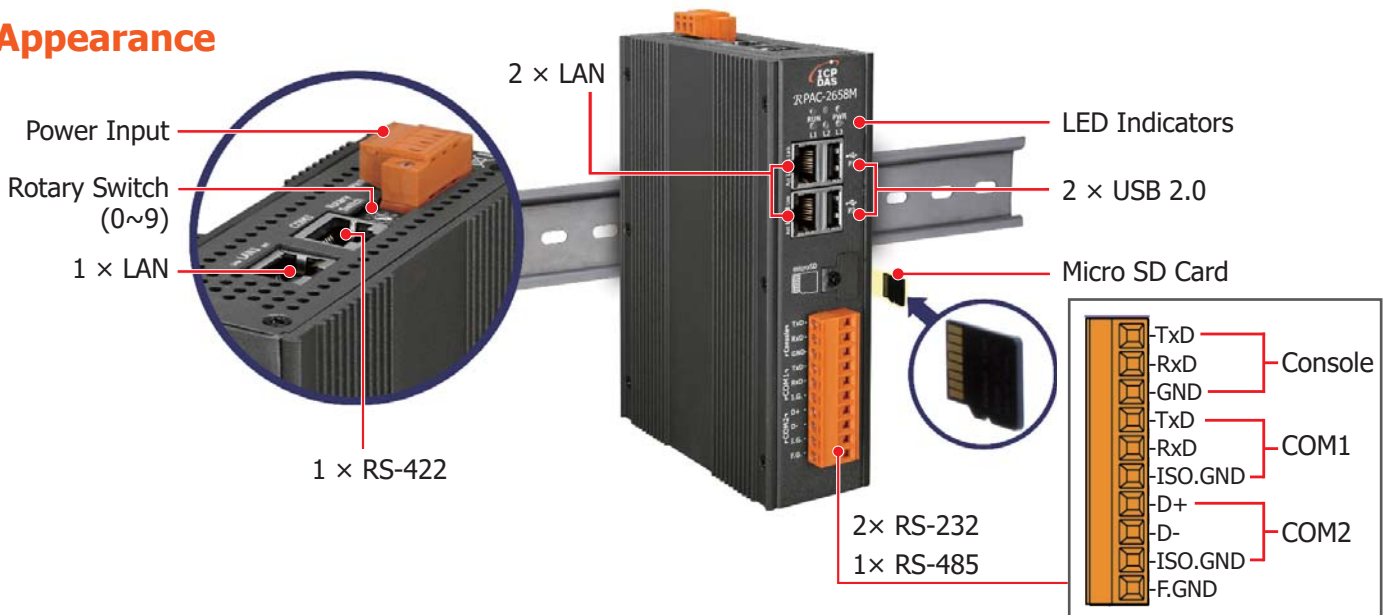

Data Binding

Event-triggered Data Binding

Through this data-biding feature, PAC can exchange data with other PACs as long as the data is set as PUBLIC or EXTERN PAC, avoiding the complicated and time-consuming design of writing a communication programs.

This design can support up to 32 PACs for data binding. In addition, if the PUBLIC PAC has two LAN ports, it can achieve redundant data binding. If one of the LAN port is disconnected, the another LAN port will take over the data binding immediatly.

PUBLIC   PUBLIC/EXTERN

EXTERN   PUBLIC/EXTERN

EXTERN   PUBLIC

Redundant Binding (IP1, IP2)

Appearance

- Power Input
- Rotary Switch (0~9)
- 1 × LAN
- 1 × RS-422
- 2 × LAN
- LED Indicators
- 2 × USB 2.0
- Micro SD Card
- 2× RS-232
- 1× RS-485

- TxD
- RxD
- GND — Console
- TxD
- RxD
- ISO.GND — COM1
- D+
- D-
- ISO.GND — COM2
- F.GND

Win-GRAF Redundant System

● Higher Security

The redundant system is mainly communicated primarily over LAN1, LAN2, or COM3 (RS-422). When the Active-PAC detects hardware, software or communication exceptions, the switchover mechanism are triggered, which means that the other PAC takes control of the system. This allows the program to operate normally even if two cables are disconnected.

● Unique Public IP

The redundant system Win-GRAF provides a unique public IP address for SCADA/HMI access without the need to determine the Active IP address.

SCADA/HMI

IP1

Main PAC (IP1)

Backup PAC (IP1+1)
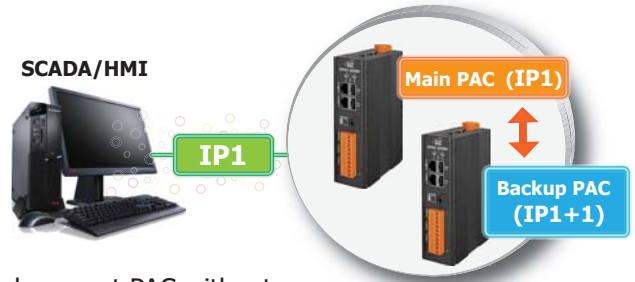
● Easy Maintenance

In the event of a redundant system failure, the operator can separately shut down and remove the faulty PAC and deploy a replacement PAC without reinstalling all files. The normal PAC will automatically send the Win- GRAF project and data to the new PAC.

● Customized Security Mechanism

Users can design a security mechanism in the program. For example, if Active-PAC cannot connect to SCADA because LAN1 or RS-485 is broken or damaged, it will automatically restart and release its control authority to the other PACs.

● I/O Redundancy

In addition to PAC redundancy, users can choose the iDCS-8830 modular remote I/O system to provide I/O redundancy.

● Simplification of the Programming Process

Users do not have to specify which files or data to send to the replacement PAC because the redundant system Win-GRAF will automatically handles these tasks.

InduSoft

Control LAN

(LAN1: Active IP)   **(LAN1: Active IP+1)**

RPAC-2658M

(COM3: Heartbeat)

Main   **(LAN2: Sync)**   **Backup**

I/O LAN

iDCS-8830 & Redundancy I/O

I/O Devices