



LP-2648M

Linux based Metal PAC
with Cortex-A53 CPU and LAN Ports

Features

- Cortex-A53 CPU, 1.4 GHz, quad-core
- Ubuntu 22.04 (Linux Kernel 6.1.33)
- 2 GB DDR3 RAM and 8 GB eMMC Flash
- Embedded Win-GRAF SoftLogic (IEC 61131-3)
- Real-Time Capability (Built-in Xenomai Real-Time Core Architecture)
- 64-bit Hardware Serial Number for Software Protection
- 2 10/100/1000M Ethernet Ports
- 2 Serial Ports (RS-232/485)



Introduction

The **Win-GRAF LinPAC-2000 Series (LP-2648M)** is ICP DAS' s next-generation Linux-based Win-GRAF PAC for industrial automation. Powered by a 1.4 GHz quad-core Cortex-A53 processor, it provides a stable and efficient control platform, with a built-in microSD card for storing applications, image files, and data.

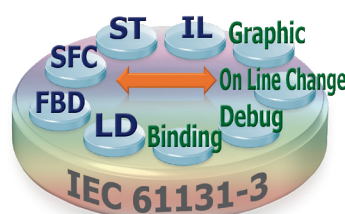
Running on Linux, the LP-2648M offers real-time capability, high performance, precise control, and a PC-like operating environment. In addition to supporting Win-GRAF (IEC 61131-3) for control programming, it also supports C/C++ for data management applications, with seamless data exchange between C/C++ and Win-GRAF programs for more flexible system integration.

Win-GRAF

Win-GRAF is a soft logic programming platform compliant with the IEC 61131-3 standard, designed for developing industrial control and automation solutions. It serves as a framework that allows users to create customized applications for various industrial systems, such as Programmable Logic Controllers (PLCs), Remote Terminal Units (RTUs), and embedded controllers. The Workbench supports all IEC 61131-3 programming languages, including Structured Text (ST), Function Block Diagram (FBD), Ladder Diagram (LD), Instruction List (IL), and Sequential Function Chart (SFC). With diverse libraries and built-in function blocks, it works seamlessly with all ICP DAS Win-GRAF controllers for fast and efficient development.

The features of the Win-GRAF:

- IEC 61131-3 Standard Open PLC Syntax (LD, FBD, SFC, ST, IL)
- Open Architecture: to integrate and customize for specific applications
- Event Triggered Data Binding (Exchange Data between PACs)
- Provide IDE: includes a user-friendly graphical user interface
- On Line Program Modification
- Various Protocols
- Plenty of Functions, Function Blocks, I/O Boards
- Redundancy



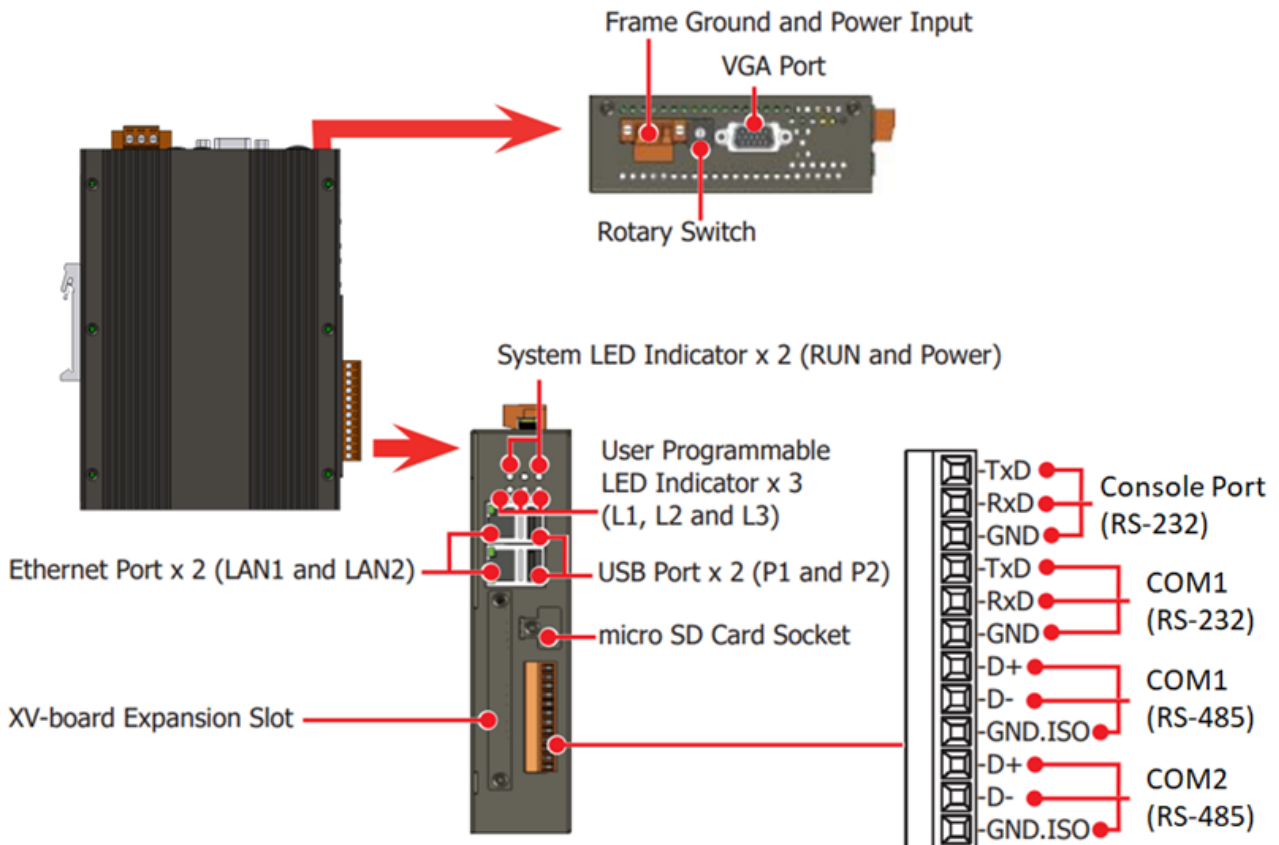
■ PAC Specifications

Models		LP-2648M
System Software		
OS	Ubuntu 22.04 (Linux Kernel 6.1.33)	
Embedded Service	SSH Server, Web Server	
Development Software		
Win-GRAF Software	Win-GRAF	IEC 61131-3 standard
	Languages	LD, ST, FBD, SFC, IL
	Scan Time	1 ~ 15 ms for normal program; 15 ~ 50 ms for complex or large program
	Protocol	OPC UA Server · Modbus TCP/IP (Server/Client) · Modbus RTU/ASCII (Master/Slave) · DCON · User-defined protocols
Non Win-GRAF	GCC 11.4.0 (C, C++)	
CPU Module		
CPU	Cortex-A53 CPU, 1.4GHz, Quad-core	
DDR3 SDRAM	2 GB	
Flash	8 GB eMMC	
MRAM	128 KB	
FRAM	64 KB	
Storage	4 GB microSD card (up to 32 GB)	
RTC (Real Time Clock)	Provides seconds, minutes, hours, dates, day of week, month, year	
64-bit Hardware Serial Number	Yes, for Software Copy Protection	
Watchdog Timer	Yes	
LED Indicators	1 x System, 1 x Power, 2 x Programmable, 1 x Redundancy	
Rotary Switch	1 x 10 Position (0 ~ 9)	
VGA & Communication Ports		
Ethernet	2 x RJ-45, 10/100/1000 Based-TX (Auto-negotiating, Auto MDI/MDI-X, LED indicators)	
USB 2.0 (host)	2	
Console	RS-232 (RxD, TxD and GND); Non-isolated	
COM 1	RS-232/ RS-485; 2500 VDC isolated	
COM 2	RS-485 (Data+, Data-); 2500 VDC isolated	
Mechanical		
Casing	Metal	
Dimensions (W x L x H)	42 mm x 164 mm x 129 mm	
Ingress Protection Rating	IP30 (Aluminum)	
Installation	DIN-Rail Mounting	
Environmental		
Operating Temperature	-25 ~ +75 °C	
Storage Temperature	-40 ~ +80 °C	
Ambient Relative Humidity	10 ~ 90% RH (non-condensing)	
Power		
Input Range	+12 ~ 48 VDC	
Consumption	4.8 W (0.2 A @ 24 VDC)	

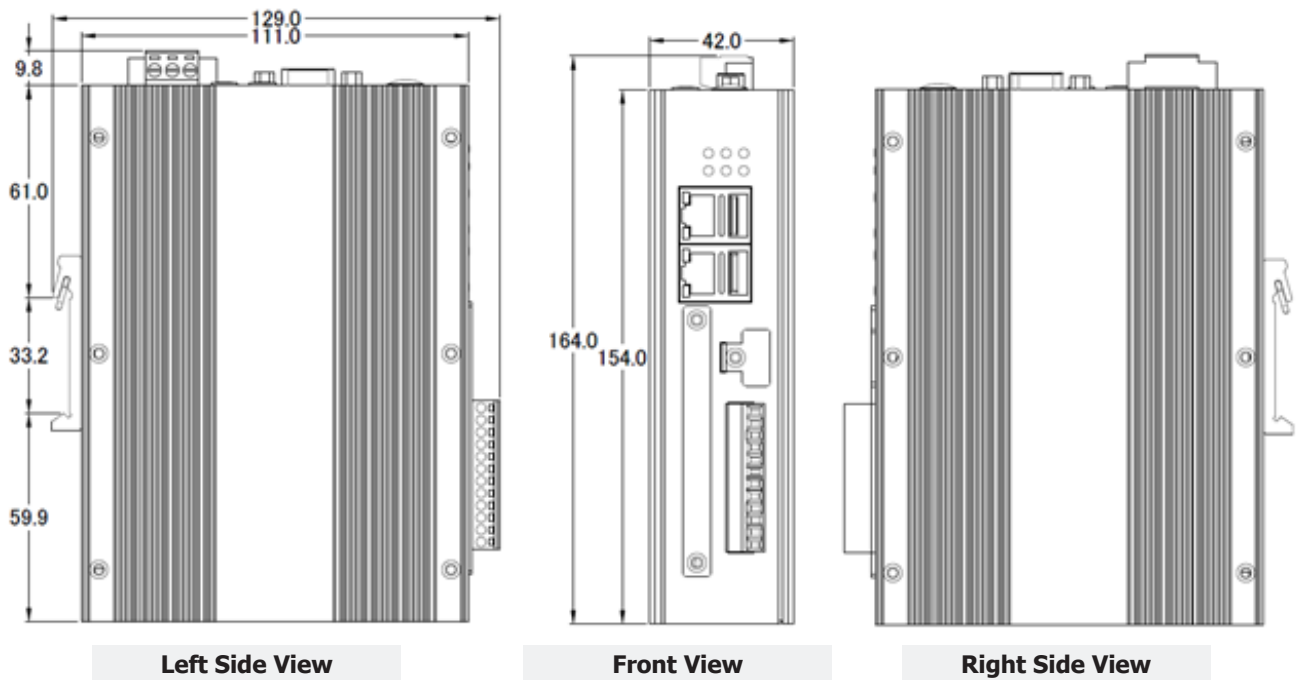
Win-GRAF Specifications

Modules	LP-2648M
Protocols (Note that certain protocols require optional devices)	
OPC UA Server	The OPC UA Server is an application that provides data and information, serving as the core of OPC UA technology. It is responsible for managing, collecting, storing, and distributing data. Acting as a central controller, the OPC UA Server connects with various clients to facilitate data access and exchange.
Modbus TCP/IP Master	Supports connection of up to 200 IP devices
Modbus TCP/IP Slave	Supported. Up to 64 connections via the Ethernet port (LAN1).
Modbus RTU/ASCII Master	Supported. Up to 3 communication ports available.
Modbus RTU Slave	Supported. Up to 3 communication ports available.
User-defined Protocol	Supported. Up to 3 communication ports available.
Functions	
Password Protection	Equipped with a built-in 64-bit (8-byte) hardware serial number and a proprietary algorithm to generate authentication codes, effectively protecting the security of Win-GRAF programs.
Data Binding	Supported. Enables data exchange between Win-GRAF Runtime devices.
Online Program Modification	Supports online change functionality.
Retain Variables	Supported. Provides up to 128K bytes of non-volatile memory for data retention after power loss.
File Access & Data Log	Supports file Read/Write.
Additional I/O Module Support	
Modbus TCP I/O	Supports ET-7000 series, I-8KE4/8-MTCP, and tPET/tET series I/O modules.
Modbus RTU I/O	Supports M-7000 series, tM series, and LC series I/O modules.
DCON Remote I/O	Supports I-7000 series, M-7000 series, and I-87K expansion units.

Appearance



Dimensions



Ordering Information

LP-2648M CR	Win-GRAF based PAC with Quad-core Cortex-A53 CPU, Linux OS and 2 LAN Ports (RoHS)
XV-Board	Add-on I/O Expansion Board