Industrial Panel PC
Industrial Panel Controller



iPPC Series
ViewPAC Series
SmartView Series

Long-term stable supply, customizable, high-quality service, fast maintenance



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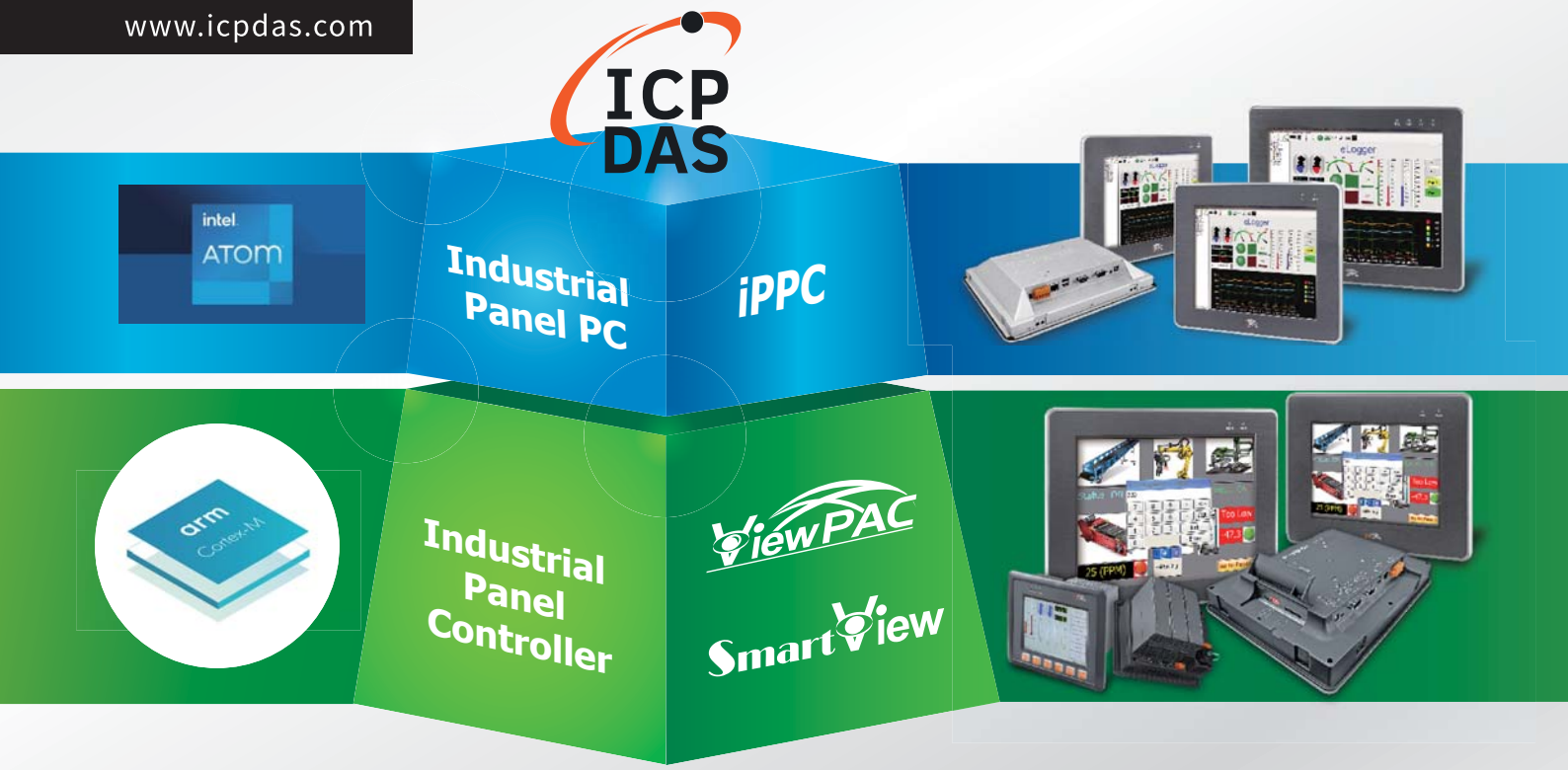
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Introduction

The industrial Panel PC and industrial Panel Controller are programmable automation controllers (PAC), combining features of display, operation, and control. They provide a perfect solution for integrating HMI, data acquisition and control in a single unit. Various models and panel sizes can be selected. They have various built-in communication interfaces for I/O module expansion and provide panel mount design. They follow the NEMA 4/IP65 standard, able to withstand spray water, humidity, and dust. The wide operating temperature range, and the fanless design without moving parts provide excellent reliability. They can be used in various control fields, such as plant automation, machine room monitoring, building automation, small/ medium sized machines and production line management.

Features

Various Operating Systems

Windows IoT
Windows Embedded Compact
Linux

Various Panels Sizes and Resolutions

5.7", 7" ~ 17"TFT LCD with touch Panel and 320 × 240 ~ 1280 × 1024 resolution

Built-in Dual Watchdog Timers

When an operating system or application shuts down, the dual watchdog is responsible to restart the system, which remarkably enhances the stability of a system.

Fanless Design

The fanless design can reduce noise and enhance reliability of a system. It provides an user-friendly HMI touch panel and the machine can stably operate between -20°C and 70°C.

IP65 Panel

The panel mount installation design follows the NEMA 4/IP65 standard, able to withstand spray water, humidity, and dust.

The Best Service

Long-term stable supply.
Provide pre-sales and after-sales technical services.
PCB conformal coating service (Call the manufacturer)

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I/O Expansion Slots

Provides multiple I/O expansion slots, supporting up to 100 I/O, communication, and motion control modules.



Input Protection circuitry

The protection circuitry on both network and power supply protects the system from external signals such as main spikes and ambient electrical noise. In addition, the CPU is isolated three ways from external signals, including 3 kV I/O isolation, 3 kV network isolation, and 1 kV power isolation.

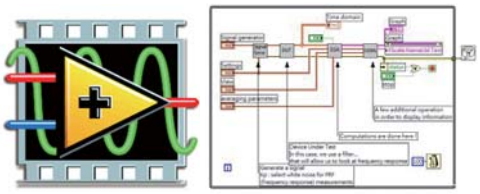


Various Software Development Kits

Visual Studio 2019

Visual Studio 2008

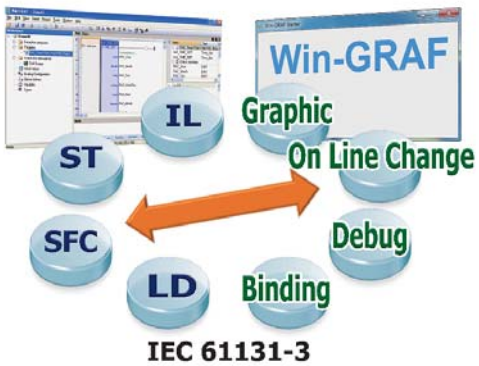
▲ C/C#/VB.net Language



▲ LabView



▲ Creator



▲ Win-GRAF

▲ AVEVA Edge

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Industrial Panel PC/ Panel Controller Family

	iPPC (Industrial Panel PC)			
Model	**iPPC-6831-IoT**	**iPPC-x801-IoT**	**iPPC-6931-IoT**	**iPPC-x901-IoT**
Product Image				
Working system	Windows 10 IoT Enterprise			
Software development kits	Visual Studio .NET DLL Library, AVEVA Edge, eLogger			
Processor (CPU)	E3845 (1.91 GHz, 64-bit four core)		E3950 (1.6 ~ 2.0 GHz, 64-bit quad core)	
LCD	10.4 inches ~ 17 inches		10.4 inches ~ 17 inches	
I/O Expansion	I/O slot (supports I-8K, I-87K modules), RS-232/485, Ethernet	RS-232/485, Ethernet	I/O slot (supports I-8K, I-87K modules), RS-232/485, Ethernet	RS-232/485, Ethernet

	ViewPAC (Industrial Panel Controller)		Win-GRAF ViewPAC	
Model	**VP-x201-CE7**	**VP-x231-CE7**	**VP-x208-CE7**	**VP-x238-CE7**
Product Image				
Working system	WinCE 7.0		WinCE 7.0	
Software development kits	Visual Studio .NET DLL Library , eLogger		Win-GRAF , VS .NET 2005/2008	
Processor (CPU)	Cortex-A8 (1 GHz)			
LCD	7 inches ~ 15 inches	5.7 inches ~ 15 inches	7 inches ~ 15 inches	5.7 inches ~ 15 inches
I/O Expansion	RS-232/485, Ethernet	I/O slots (supports I-8K, I-87K modules) , RS-232/485, Ethernet	RS-232/485, Ethernet	I/O slots (supports I-8K, I-87K modules) , RS-232/485, Ethernet

	AEV (SCADA/HMI Panel Controller)		SmartView
Model	**AEV-x201-CE7**	**AEV-x231-CE7**	**SV-x811**
Product Image			
Working system	WinCE 7.0		Linux-based
Software development kits	AVEVA Edge , VS .NET 2005/2008		Creator
Processor (CPU)	Cortex-A8 (1 GHz)	Cortex-A8 (1 GHz)	64-bit Arm Cortex
LCD	7 inches ~ 15 inches	5.7 inches ~ 15 inches	7 inches ~ 15 inches
I/O Expansion	RS-232/485, Ethernet	I/O slots (supports I-8K, I-87K modules), RS-232/485, Ethernet	I/O slot (supports XV, eXV modules), RS-232/485, Ethernet

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CH1 Software

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1.1 Win-GRAF
(PAC/ Soft PLC Development Kits)



Soft PLC Perfect Solution

Win-GRAF is a powerful PLC-like SoftLogic development software, following IEC 61131-3 Standard Open PLC Languages and running on Windows OS. The Win-GRAF Runtime application can run on any ICP DAS's PAC (Programmable Automation Controller) that supports the Win-GRAF, such as the WinPAC series (WP-5238-CE7, WP-8xx8, WP-8x28-CE7, and WP-9xx8-CE7), the touch panel ViewPAC series (VP-x2x8-CE7) or the XPAC-CE6 series with an advanced CPU (XP-8x38-CE6). Using the Win-GRAF software with ICP DAS's Win-GRAF PACs, users can easily develop an industrial level monitoring system to collect data and monitor devices in various applied fields.

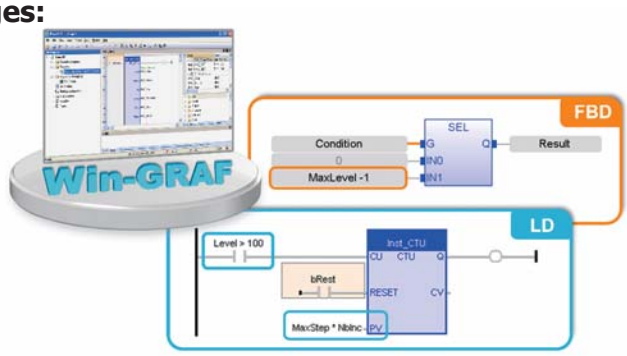
Applications

- Data Acquisition System
- Factory Automation System
- Building Automation
- Remote I/O system
- Wireless Monitoring/ Control System
- Motion Control System .....

Win-GRAF Workbench Features

▶ Follow IEC 61131-3 Standard Open PLC Languages:

1. Ladder Diagram (LD)
2. Function Block Diagram (FBD)
3. Sequential Function Chart (SFC)
4. Structured Text (ST)
5. Instruction List (IL)



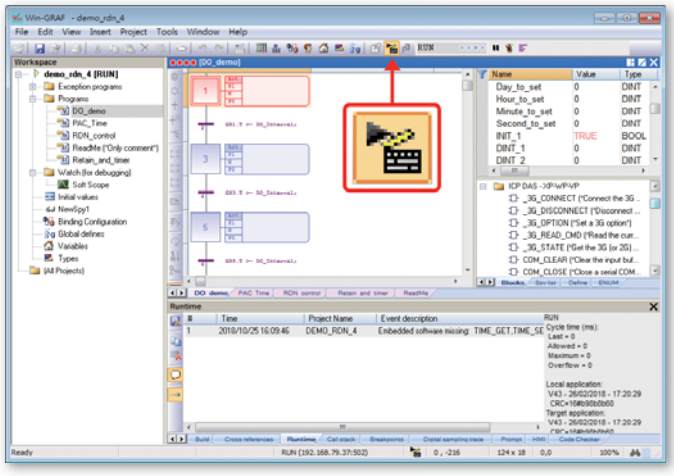
▲Online Debugging/Control/ Monitoring and Offline Simulation

▶ Data Binding (Event Triggered):

Exchange data between 32 PACs.



▲Using ST Syntax in the LD and FBD Program



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▶ Online Change

Replaces the current running project with a new modified one without stopping the project.

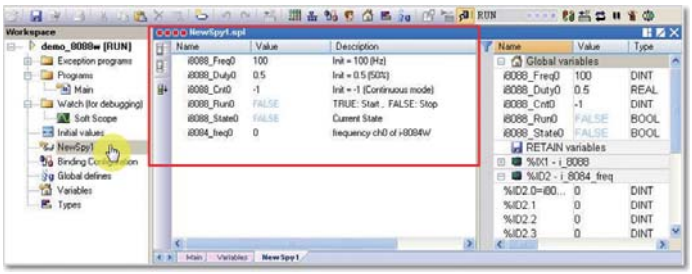


▶Recipe

Applies multiple predefined recipes in PC/Win-GRAF to PAC.

▶Spy List

Shows several selected variables in one Spy List web page.





▶Upload Source Code From the PAC to the PC

You can download the source code of a Win-GRAF project to a PAC, and set a password for the project. If the source code is lost, you can still access it through PAC.

Win-GRAF PAC Features

▶ Supports eLogger HMI

eLogger HMI is a free-of-charge and easy-to-use HMI (Human Machine Interface) software platform developed by ICP DAS. It can be used to design Local HMI and Web Server HMI, supporting remote control of PAC through the browser of PC and smartphones. All Win-GRAF PAC support the eLogger HMI.



▶ Supports Redundant System

▶ Modbus Master Protocol

- ➔ Multi-port Modbus RTU, ASCII Master, RS-232/485/422
- ➔ Modbus TCP Master (Multiple connections)
- ➔ Connects to other Modbus PLC, Modbus Master, Modbus I/O and Modbus devices

▶ Modbus Slave Protocol

- ➔ Multi-port Modbus RTU Slave, RS-232/485/422
- ➔ Modbus TCP Slave (Multiple connections)
- ➔ Connects to PC/SCADA/HMI

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▶ Supports DCON I/O

Supports RS-485 ports to connect the I-7000 series I/O modules, I-87K4/5/8/9 Expansion Unit plus I-87xxxW I/O modules, or RU-87P4/8 Expansion Unit plus I-87xxxW I/O modules.

▶ Supports Temperature/Humidity Modules

DL-100T485 and DL-100TM485

▶ Supports a Variety of I/O Modules

Supports I-8xxxW and I-87xxxW I/O modules, including DI, DO, AI, AO, Relay, AC-IN, Thermistor, Thermocouple, RTD, Strain Gauge, Encoder, PWM output, Counter, Frequency, etc.

▶ Supports File Access & Data Log

▶ Supports Retain Variables

All Win-GRAF PACs support retain variables, suitable for the applications where data change quickly and frequently.

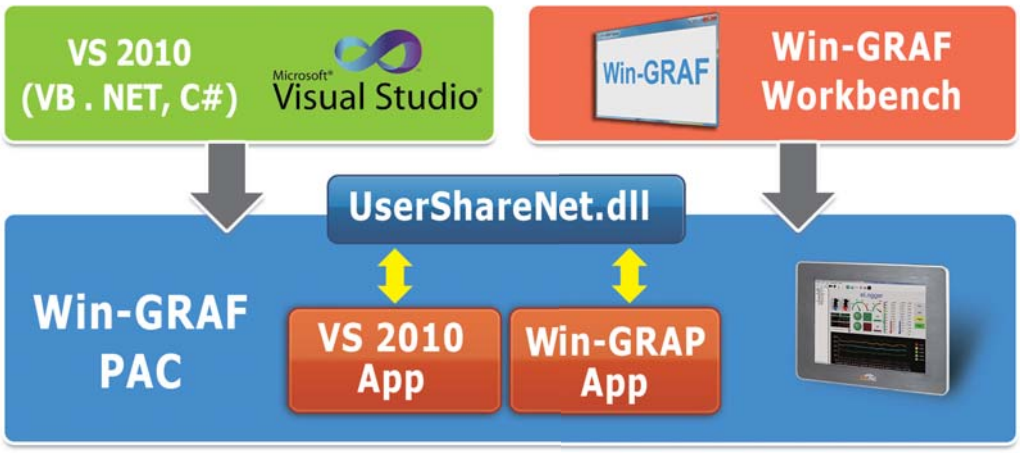
▶ Software/Hardware Encryption Protection

Win-GRAF PAC is equipped with a 64-bit hardware code which can produce an authorization code to prevent illegal copying of your application software. Users can use the user-defined algorithm to protect their Win-GRAF application. Even others copy the application to the same PAC model, as long as they cannot get the source code, the application will not run correctly.



▶ Supports VS 2008 Development

The Win-GRAF PACs of the WinCE series support using VS 2008 (VB.net, C#) to develop users' own HMI and data management programs, and exchange variables with the Win-GRAF control programs.

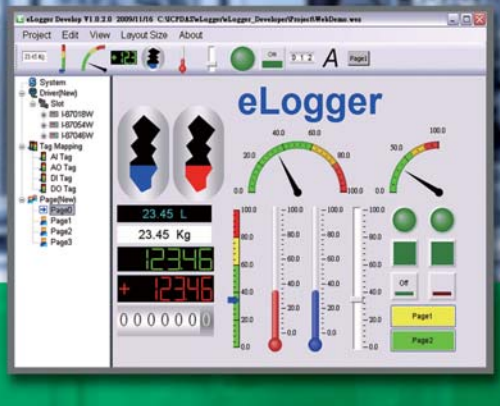


Ordering Information

Win-GRAF Development Software	
Win-GRAF Workbench	Win-GRAF Workbench Software (Large I/O Tags) with one USB Dongle

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1.2 eLogger





Easy-to-use SCADA/HMI Software

eLogger is an easy-to-use software to implement HMI, web HMI and data logger on windows PC and ICPDAS PACs for simple I/O monitor and system control. eLogger is free of charge for 30 tags in PC veriosn and 50 tags in PAC version. It could reduce the cost and shorten the time to market.

The eLogger can quickly and easily develop an application without programming. You can complete it with only five simple steps: configuring I/O modules -> configuring data logger -> designing HMI layout pages -> uploading the project to WinPAC/ViewPAC -> running it.

If you want to add more powerful functions, the eLogger also provides a flexible "shared memory" interface, allowing applications reading and writing the "shared memory" to control I/O. The eLogger currently supports I-87K/ I-8K series I/O modules on local slots, and remote I/O modules with Modbus RTU/ Modbus ASCII/ Modbus TCP communication protocols, providing you with more I/O module choices.

Features

1. Supports PAC

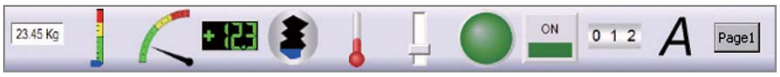
Developer	
PC Windows	Windows 7, Windows 10
Runtime (PC Version)	
PC Windows	Windows 7, Windows 10
Runtime (PAC Version)	
Windows CE 7.0 platform	WP-5000-CE7, WP-8x2x-CE7, ViewPAC-CE7
WES 7 platform	XP-8000-WES7, iPPC series
Windows IoT platform	XP-9000-IoT, AXP-9000-IoT, EMP-9000-IoT

2. Supports Driver

▶ Module on PAC slot	▶ Modbus Master	▶ Modbus TCP master
I-8K Series I-87K Series	M-7000 Series Modbus RTU Devices	ET-7000 Series PET-7000 Series Modbus TCP Devices



3. HMI



Supported Elements : Button, Text Box, Linear Gauge, Angular Gauge, LED, Switch, Tank, Label, Plot, Seven Segment, Thermometer, Slider, Odometer.

4. Web HMI (ASP)



▷ Supported Elements : Text Box, Seven Segment, Label, Button, Picture Toggle, Chart, Linear Gauge and Radial Gauge.

▷ Supported Browsers : Google Chrome、Internet Explorer、Firefox、Safari and Opera。

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5. Trend Charts

Multiple trend charts can be placed. Max. of 5 trend lines in one chart.

6. Value Scaling

7. Support Account Management

8. Remote Maintenance

The remote controlling function of the eLogger Developer can upload projects, web pages, run or stop projects through the Internet.



9. Data Logging

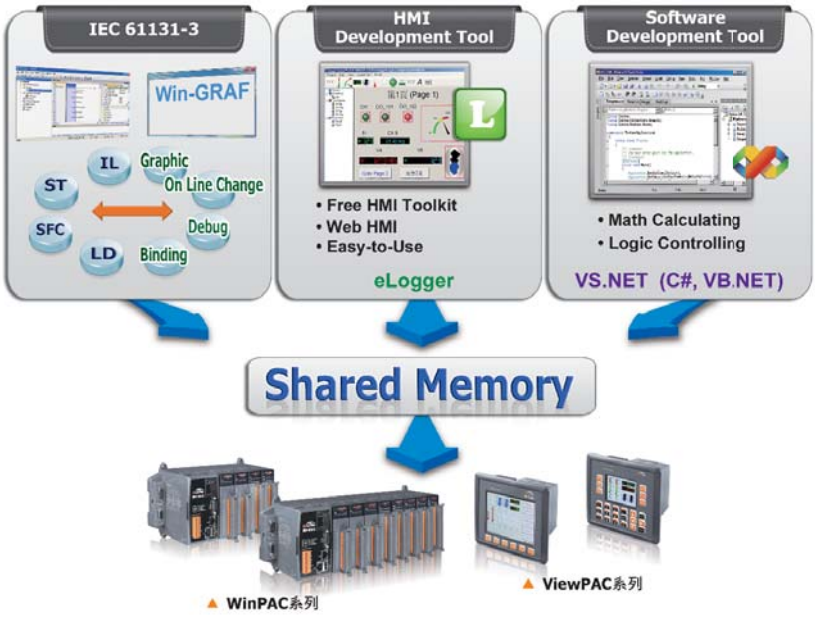
- Local data logging: supports CSV file
- MySQL, Maria DB
- Remote data base: Microsoft SQL Server 2005 or updated version on Windows platform

10. Support ISAPI

You can read and write the shared memory by calling ISAPI URL, helping you design a HMI web page or mobile APP application.

11. Logic Control

With the "Shared Memory," you can choose Win-GRAF or Visual Studio .Net to develop a logic control program. Combining with eLogger, your program can directly read and write the "Shared Memory" to control the I/O. Win-GRAF (IEC61131-3 Standard Open PLC Languages)



12. Support C# programming

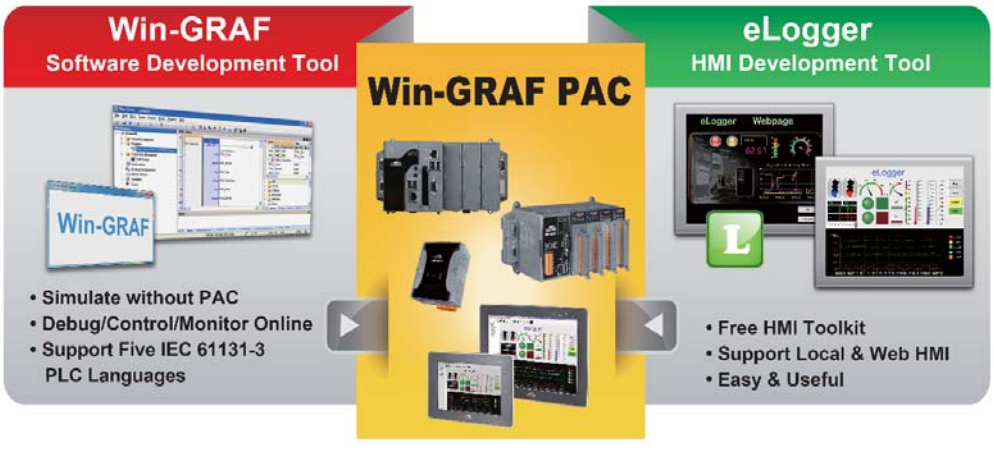
You can use Tag names to develop programs in the built-in program editing box. The calculation result will be sent to the actual control point, for example, AO1=1.23; Supports C# syntax.

13. Supports Modbus TCP Server

The computer in the control center can read and write the local Shared Memory through Modbus TCP.

14. Uses with Win-GRAF

If you are a user of PLC programming language, you can use Win-GRAF to plan a project. When using the HMI, Web HMI or the data logger function of eLogger, there is no need to learn new programs.



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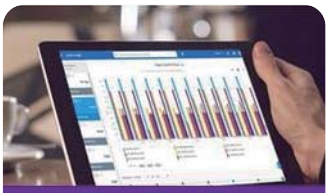
1.3 AVEVA Edge

AVEVA™ Edge | SCADA, HMI and IoT Edge Solution for OEMs, System Integrators and End Users

AVEVA Edge is a comprehensive platform that includes all the tools you'll need to make SCADA and HMI applications that have real power behind them. The development environment allows you to develop once and deploy anywhere. AVEVA Edge supports all Windows runtime platforms (including 32 and 64 bit), ranging from Windows Embedded Compact, Windows Embedded Standard, Windows 8.1/10 and Windows Server Editions, along with built-in support for local or remote (web) based visualization.

- **AVEVA™ Edge** Studio is a development system of AVEVA Edge on Windows. It provides a complete development environment, allowing designing once and deploying anywhere.
- **AVEVA™ Edge** SCADA – The full Windows based runtime offers all the tools you need for advanced SCADA applications.
- **AVEVA™ Edge** HMI – AVEVA Edge for embedded systems such as Windows Embedded operating systems. The small footprint makes AVEVA Edge HMI ideal for embedded and edge machines.
- **AVEVA™ Edge** Compact HMI – Compact HMI is designed especially for Windows CE operating systems.


Collaboration


Remote Work


Standardization


Line-of-Sight Visibility

AVEVA Edge Creates Advantages For You

1. Combining message and automation to increase productivity
2. Studio Moblie Access implements IoT
3. Complete integration of embedded platforms
4. Real-time and rapid technical supports

AVEVA Edge Features

★ SCADA/HMI and templates
★ Easy communication and integration
★ Protection of development cost
★ Design once - Deploy anywhere
★ FDA traceability
★ Redundant mechanism
★ Database
★ Recipes and reports
★ Trend chart
★ Drivers and OPC
★ Solid security
★ Perfect development tool
★ Graphic design tools shorten the development time
★ Advanced alarm system controls the on-site status in real-time.

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AVEVA™ Edge

Easy Step to Meet Your Satisfaction



ViewPAC



WinPAC



XPAC

AVEVA Edge builds powerful graphical displays and takes advantage of the 250+ available communication drivers for all major PLC products. AVEVA Edge includes OPC UA and OPC Classic (HDA and DA), trends, alarms, reports, recipes and built-in SQL database support as standard features.

AVEVA Edge Controllers

AVEVA™ Edge Compact HMI and **AVEVA™ Edge HMI** can integrate with ICP DAS's professional PACs, including WinPAC, ViewPAC, and XPAC-IoT.

	Product Features
AE-WinPAC	A Stable and cost-effective compact SCADA system. Builds a graphic monitoring system of I/O rapidly and easily.
AEV-PAC	Provides HMI/ SCADA system solution with an all-in-one touch panel. Suitable for machine control systems with a narrow space.
AE-XPAC-IoT	XPAC-IoT is a PAC based on Windows 10 IoT Enterprise. It integrates operation, I/O, and operator interface, providing a perfect solution for combining HMI, data acquisition and control into one PAC.

Features of PAC equipped with AVEVA Edge

- Graphic interface as an operation tool
- Supports various ICP DAS's I/O modules with slots
- Saves physical spaces for implementing a system
- Real-time and history alarm/ incidents and trend charts
- Various communication protocols (DCON, Modbus, OPC, TCP/IP...)
- Remote Web monitoring and security
- Redundant system application
- Others (VBScript, E-mail, FTP...)



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Application of the Railway Signal Monitoring System

With the help of the Internet, hardware and software, controlled by the graphic control system, users can efficiently collect and manage important data, analyze the causes of failures, thereby improving the quality of maintenance, increasing efficiency, and reducing the number of equipment failures.

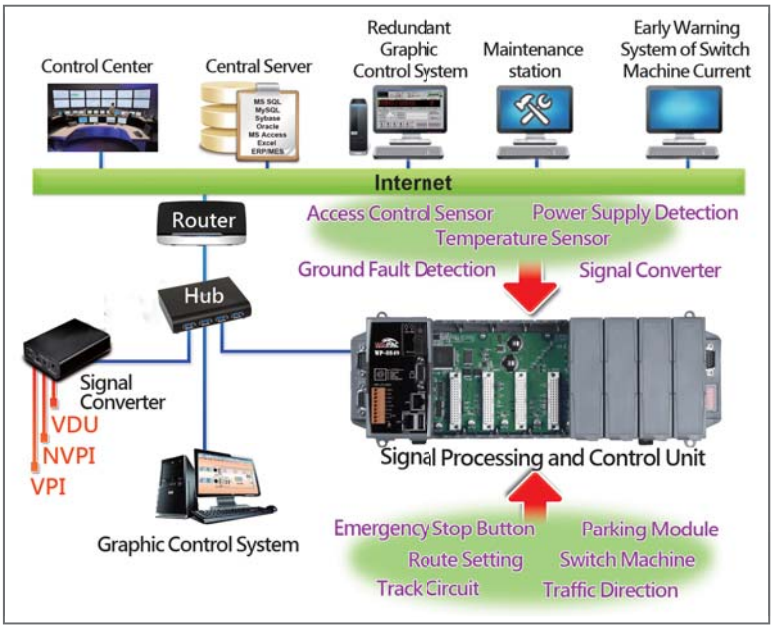
Effective use of the railway signal monitoring system and maintenance mechanism can reduce the troubleshooting time of signaling equipment, ensure road safety, and achieve the goal of punctuality in rail transport, thereby enhancing the reliability and stability of signaling equipment.

The railway signal monitoring system is divided into three parts:

1. Signal converter

2. Signal processing and control unit

3. AVEVA™ Edge graphic control system



AVEVA™ Edge uses graphics to display the signal converter and the signal control unit. There are three main categories: real-time data screen, accumulated data screen, and graph analytics chart. Other pages include alarm management (real-time and historical data query), statistics and analysis reports, threshold parameter settings, database management, setting modification of system operation parameters, and the track operation replay. With the access control function, management personnel can use the AVEVA™ Edge graphic control system in the control room at the station, or use it remotely. The real-time data display shows the following information on the route chart: real-time connectivity status of individual stations, real-time status of monitoring points at each station, speed of track circuit, operating current of track circuit, and switch taming current of each track circuit.

Application of Water Plant Monitoring System

Users can adopt AVEVA Edge as the major data integration platform to collect data and provide a complete database. In addition to the central monitoring system in the control center, other sites can also use AVEVA Edge as an on-site graphic control interface.

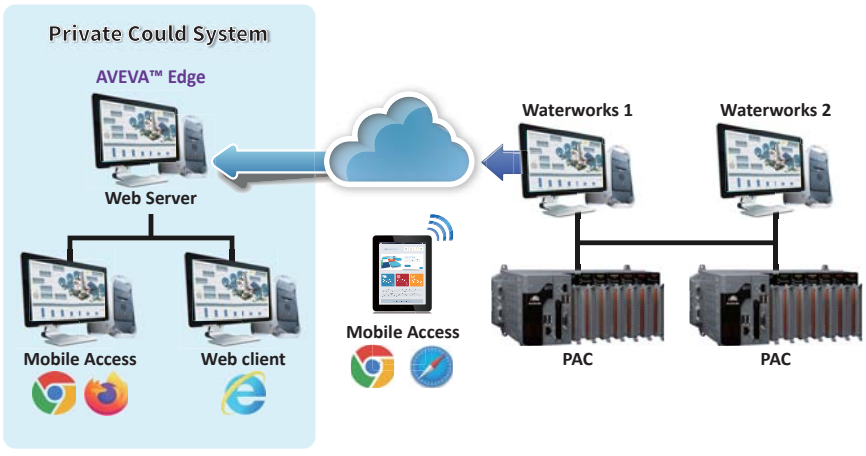
Major Features on the sites

★ Collects information for all sites

★ Provides redundant system for major sites

★ Provides web page and mobile user interface for all sites

★ Provides automatic data recovery function



Benefits of the Monitoring System

AVEVA Edge provides a perfect system structure to connect the control center and the other sites seamlessly.

Major sites can adopt dual modular redundancy to avoid a single system missing important information due to external factors.

The communication between a single site and the control center may be interrupted due to external factors. AVEVA Edge is capable of conducting data recovery after the communication recovers.

It sends all the on-site data to the cloud system, allowing the management personnel of a water plant to browse all the information, thereby conducting analysis and making decisions.

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Application of Gas Pressure Regulation Station Monitoring

Users can integrate information about pressure, flow, leakage, temperature, earthquake, access control, and on-site image at gas pressure regulation stations via wire or wireless communication, and send the data back to the control center instantaneously for management. When an anomaly occurs, the control center can remotely activate an emergency shut-off valve to stop the gas supply, thereby avoiding accidents occurring.

Conducting remote unified monitoring for all gas equipment can increase the benefits of overall gas monitoring system, reduce labor and time costs of gas providers, and ensure people's safety.

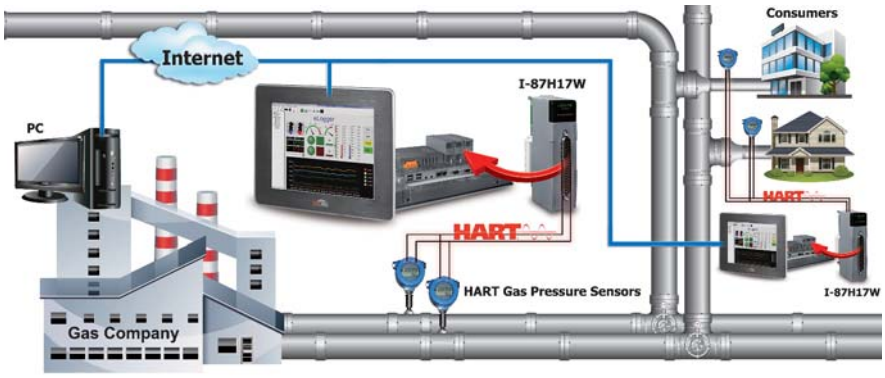
Gas Pressure Regulation Station Monitoring System in Taiwan- AVEVA™ Edge Solution

Overall Monitoring System Structure

About twenty pressure regulation stations in total. Every station requires to monitor pressure and switch status of the control valves of gas lines, and on-site real-time images.

Pressure regulation stations- Monitoring system structure

Users can use a PAC controller, together with AI/DI modules, to monitor pressure of on-site gas lines and the switch status of control valves, and use the graphic control software AVEVA Edge to display and record the data of a pressure regulation station. Together with the seismograph for earthquake detection, when an earthquake occurs, users can immediately stop the gas supply remotely.



Control center- Structure of the monitoring system

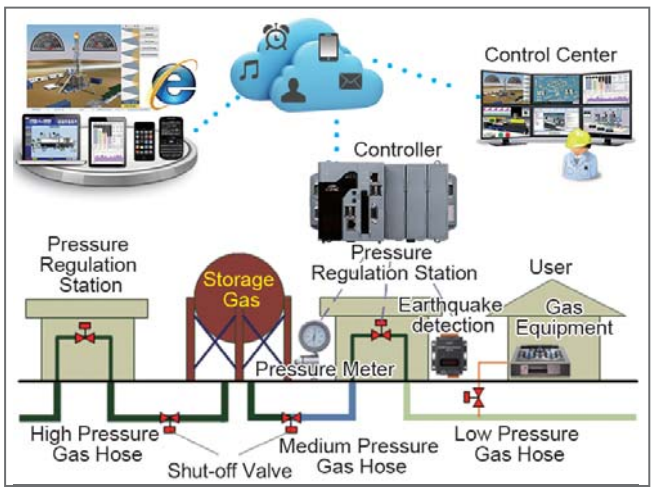
AVEVA Edge, a graphic control software running on the monitoring server, can exchange and integrate information of gas pressure rapidly with the tag variables of the pressure regulation stations through TCP/IP worksheet. The exchanged data includes the real-time information, (for example, inlet/outlet pressure, differential pressure across filters, earthquake monitoring,) the gas pipeline map with gas pressure in each section of pipeline, and the real-time image display on the site.

AVEVA Edge is equipped with the warning function. When the alarm is triggered, it will flash and make a warning sound to notify the management personnel in the control center. AVEVA Edge can be used in conjunction with the GTM-201 modem to send SMS to inform related personnel about the on-site status. Managers being granted permission can remotely monitor the real-time information of equipment at the pressure regulation station through the browser of a computer or smartphone. All the monitoring values will be saved in the database of a server for data analysis or report.

Overall benefits of the monitoring system

Combining AVEVA™ Edge and ICP DAS' s PAC controller and I/O modules in the gas pressure regulation station monitoring system can rapidly achieve the goal of data integration at the pressure regulation station.

The overall benefits of the monitoring system are as follows:



1. Control Center Monitoring:

Users can monitor pressure regulation stations distributed in different places through the Internet, tremendously lowering the difficulties of management.

2. Traceability:

AVEVA Edge can record messages in its database, which allows the management personnel to track the trigger time for an alarm, find out the cause of the problem, and clarify the responsibility.

3. Real-time Data Redundancy:

In the event of Internet outage, all the pressure regulation stations can still operate. Messages will be stored in the on-site controller without causing data loss or the idle time of pressure regulation stations.

4. Real-time Information Monitoring:

Real-time on-site information and image display. In the event of an alarm occurring, users can obtain the cause for the alarm through warning messages, thereby saving the troubleshooting time. The system can be combined with a modem, allowing management personnel to obtain firsthand information immediately.

AVEVA Edge provides a remote monitoring function. Via browser and handheld devices, users won't miss the warning messages, and can monitor the pressure status of pressure regulation stations remotely.

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CH2 iPPC - Industrial Panel PC

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2.1 iPPC - Rugged and Reliable Industrial Panel PC

iPPC series is an industrial panel PC based on Windows operating system, which not only combines computing, I/O integrates functions such as human-machine interface (HMI) and PAC, and Provides a comprehensive solution. iPPC series is an industrial panel PC based on Windows operating system. It not only combines computing, I/O and operation interface functions, but also integrates human machine interface (HMI) and PAC functions. Provides a comprehensive solutions for data acquisition and control. iPPC with powerful Intel Atom CPU energy saving, wide temperature, fanless and no moving parts design improves reliability and maintenance. And has an open software architecture, a variety of software development tools.

Special function

- Built-in non-volatile memory
  - ▶16 KB EEPROM
  - ▶128 KB MRAM
- Dual watchdog Timer
- Redundant power input
- 64-bit hardware serial number, software copy protection
- Backlight control for power saving

System composition

- Intel Atom multi-core CPU
- Built-in 2 GB ~ 8 GB SDRAM
- Built-in 32 GB ~ 64 GB SSD (mSATA)
- Built-in 16 GB ~ 32 GB CF card



Intel multi-core processor

- Intel Atom® x7-E3950
- Intel Atom E3845

Pre-installed operating system

- Windows 10 IoT Enterprise Pre-installed on built-in SSD
- Multi-Language supported
- CF card can be used for system backup and restore

Windows 10 IoT Enterprise LTSC
SSD Pre-Installed

IoT Services

Windows IoT OS is suitable for edge computing applications and Microsoft Azure IoT services.

Platform Development Tool Support

- Provide Windows VC DLL library
- Provide .Net DLL library
- Support HMI design software, eLogger
- Provide VC.NET/C#/VB.NET/LabVIEW and other sample code

SDK

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Software development kits ▶▶▶▶



Panel Enclosure

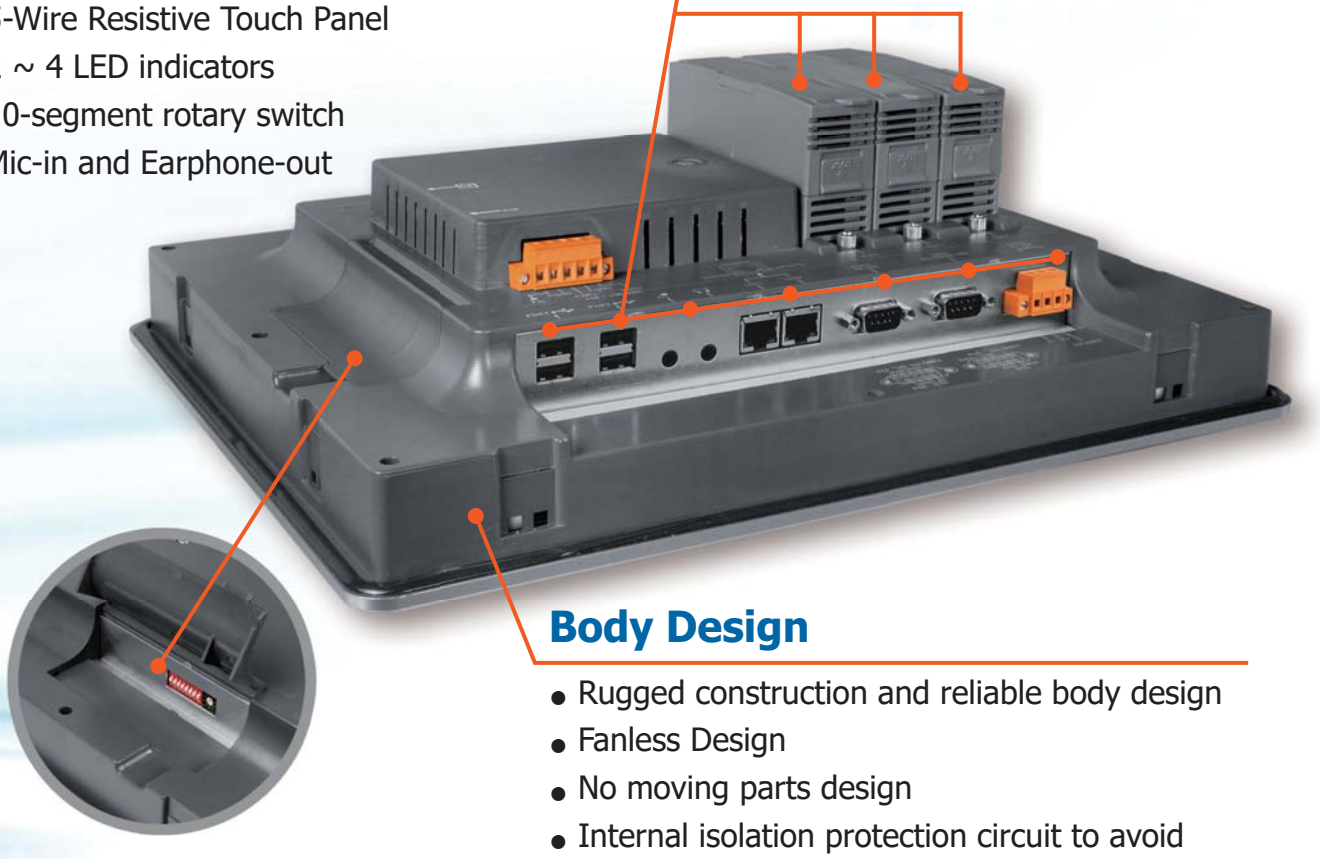
Panel mount design, NEMA 4/IP65 compliant, Resistant to water, moisture and dust.

Human-Machine (HMI) operation

- 10.4" ~ 17" LCD display panel
- 5-Wire Resistive Touch Panel
- 2 ~ 4 LED indicators
- 10-segment rotary switch
- Mic-in and Earphone-out

Rich I/O Expansion Interface

- 2 GbE Ethernet ports
- 2 ~ 4 USB ports
- 2 ~ 3 RS-232 or RS-485 ports
- 3 I/O slots (iPPC-6x31 series only)



Body Design

- Rugged construction and reliable body design
- Fanless Design
- No moving parts design
- Internal isolation protection circuit to avoid damage caused by static electricity and noise
- Operating temperature: -20°C ~ +60°C

Win10 IoT Enterprise

- Built-in embedded lockdown capability
- Built-in device security defense and antivirus functions
- Long-term support and security updates Integrate write filter functionality

Windows 10

Windows compatibility

- Full Windows OS functionality
- Support Universal Windows App with traditional Win32 applications
- Compatible PC programs and software

Windows Compatible

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2.2 iPPC Selection Guide

iPPC - X X X 1 - XX

Display size
- **4**: 10.4 inch LCD display
- **5**: 12.1 inch LCD display
- **6**: 15 inch LCD display
- **7**: 17 inch LCD display

CPU type
- **8**: E3845
- **9**: E3950

Number of I/O slots
- **0**: w/o slot
- **3**: 3 slots

Software package
- **1**: Standard (VC, VB, C#)

Operating System
- **IoT**

Panel PC	10.4" iPPC		12.1" iPPC	
				
Model	**iPPC-4901-IoT**	**iPPC-4801-IoT**	**iPPC-5901-IoT**	**iPPC-5801-IoT**
Size / Resolution	10.4" (800 × 600)		12.1" (800 × 600)	
Backlight life (hours)	50,000		50,000	
Brightness/Contrast	400 cd/m2 (500: 1)		400 cd/m2 (700: 1)	
Touch screen	5-wire resistive, light transmission 80%		5-wire resistive, light transmission 80%	
Main unit				
Intel Atom 64-bit CPU	E3950 1.6 ~ 2.0 GHz Quad-core	E3845 1.91 GHz Quad-core	E3950 1.6 ~ 2.0 GHz Quad-core	E3845 1.91 GHz Quad-core
System memory	8 GB DDR4	4 GB DDR3	8 GB DDR4	4 GB DDR3
Storage	64 GB SSD 32 GB CF Card	64 GB SSD 32 GB CF Card	64 GB SSD 32 GB CF Card	64 GB SSD 32 GB CF Card
Pre-installed operating system	Win10 IoT Enterprise	Win10 IoT Enterprise	Win10 IoT Enterprise	Win10 IoT Enterprise
Non-volatile memory	128 KB MRAM, 16 KB EEPROM			
Others	With 64-bit hardware serial number, real-time clock, dual watchdog timer			
Communication interface / HMI				
I/O expansion slots	0		0	
COM ports	2 × RS-232/RS-422/RS-485		2 × RS-232/RS-422/RS-485	
Ethernet ports	1 × RJ-45, 10/100/1000 Base-TX		1 × RJ-45, 10/100/1000 Base-TX	
USB ports	2 × USB 2.0		2 × USB 2.0	
LED indicators	1 x system light, 1 x power light		1 x System Light, 1 x Power Light, 2 x Custom Light	
Buzzer	Yes		Yes	
10-segment rotary switch	Yes		Yes	
Audio	1 x Earphone-out		1x Mic-in and 1 x Earphone-out	
Power supply				
Input range	+10 ~ 30 VDC (1500 VDC Isolated)		+10 ~ 30 VDC (1500 VDC Isolated)	
Power consumption	22.0 W		27.0 W	
Redundant power input	Yes		Yes	
Mechanical / Environment				
Dimensions (mm)	291 × 229 × 53 (W × L × H)		323 × 254 × 63 (W × L × H)	
Panel cut-out (mm)	274 × 211, ±1 (W × H)		308 × 239, ±1 (W × H)	
Installation	Panel Mounting, VESA Mounting (75 × 75, 100 × 100)			
Ingress Protection Rating	Front panel: NEMA 4/IP65			
Operating/storage temperature	-20 ~ +60°C / -20 ~ +70°C			
Humidity	10 ~ 90% RH relative humidity, Non-condensing			
Certification	CE, FCC			
Casing	Metal			

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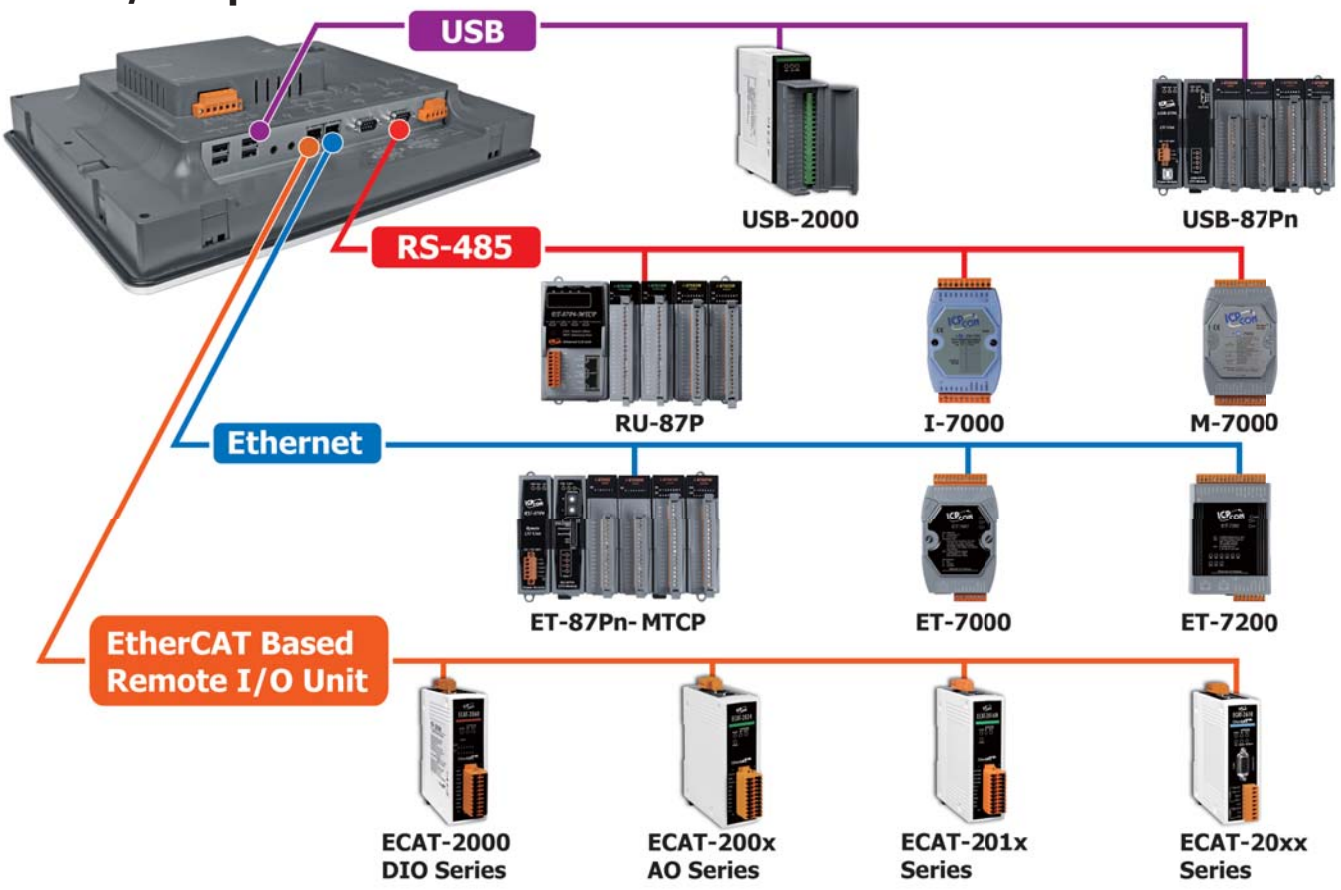


15" iPPC		17" iPPC		15" iPPC with 3 I/O Slots	
					
iPPC-6901-IoT	**iPPC-6801-IoT**	**iPPC-7901-IoT**	**iPPC-7801-IoT**	**iPPC-6931-IoT**	**iPPC-6831-IoT**
15" (1024 × 768)		17" (1280 × 1024)		15" (1024 × 768)	
50,000		50,000		50,000	
400 cd/m2 (700: 1)		350 cd/m2 (700: 1)		400 cd/m2 (700: 1)	
5-wire resistive, light transmission 80%		5-wire resistive, light transmission 80%		5-wire resistive, light transmission 80%	
E3950 1.6 ~ 2.0 GHz Quad-core	E3845 1.91 GHz Quad-core	E3950 1.6 ~ 2.0 GHz Quad-core	E3845 1.91 GHz Quad-core	E3950 1.6 ~ 2.0 GHz Quad-core	E3845 1.91 GHz Quad-core
8 GB DDR4	4 GB DDR3	8 GB DDR4	4 GB DDR3	8 GB DDR4	4 GB DDR3
64 GB SSD 32 GB CF Card	64 GB SSD 32 GB CF Card	64 GB SSD 32 GB CF Card	64 GB SSD 32 GB CF Card	64 GB SSD 32 GB CF Card	64 GB SSD 32 GB CF Card
Win10 IoT Enterprise	Win10 IoT Enterprise	Win10 IoT Enterprise	Win10 IoT Enterprise	Win10 IoT Enterprise	Win10 IoT Enterprise
128 KB MRAM, 16 KB EEPROM					
With 64-bit hardware serial number, real-time clock, dual watchdog timer					
0		0		3	
2 × RS-232/RS-422/RS-485		2 × RS-232/RS-422/RS-485		1 × RS-232, 1 × RS-485, 1 × RS-232/RS-485	
2 × RJ-45, 10/100/1000 Base-TX		2 × RJ-45, 10/100/1000 Base-TX		2 × RJ-45, 10/100/1000 Base-TX	
2 × USB 2.0		4 × USB 2.0		3 × USB 2.0	
1 x System Light, 1 x Power Light, 2 x Custom Light					
Yes		Yes		Yes	
Yes		Yes		Yes	
1x Mic-in and 1 x Earphone-out		1x Mic-in and 1 x Earphone-out		1x Mic-in and 1 x Earphone-out	
+10 ~ 30 VDC (1500 VDC Isolated)		+10 ~ 30 VDC (1500 VDC Isolated)		+10 ~ 30 VDC (1 kV Isolated)	
29.0 W		36.0 W		25.0 W	
Yes		Yes		Yes	
381 × 305 × 63 (W × L × H)		413 × 359 × 69 (W × L × H)		381 × 305 × 88 (W × L × H)	
364 × 288, ±1 (W × H)		394 × 340, ±1 (W × H)		366 × 290, ±1 (W × H)	
Panel Mounting, VESA Mounting (75 × 75, 100 × 100)				Panel Mounting	
Front panel: NEMA 4/IP65					
-20 ~ +60°C / -20 ~ +70°C					
10 ~ 90% RH relative humidity, Non-condensing					
CE, FCC					
Metal				Plastic	

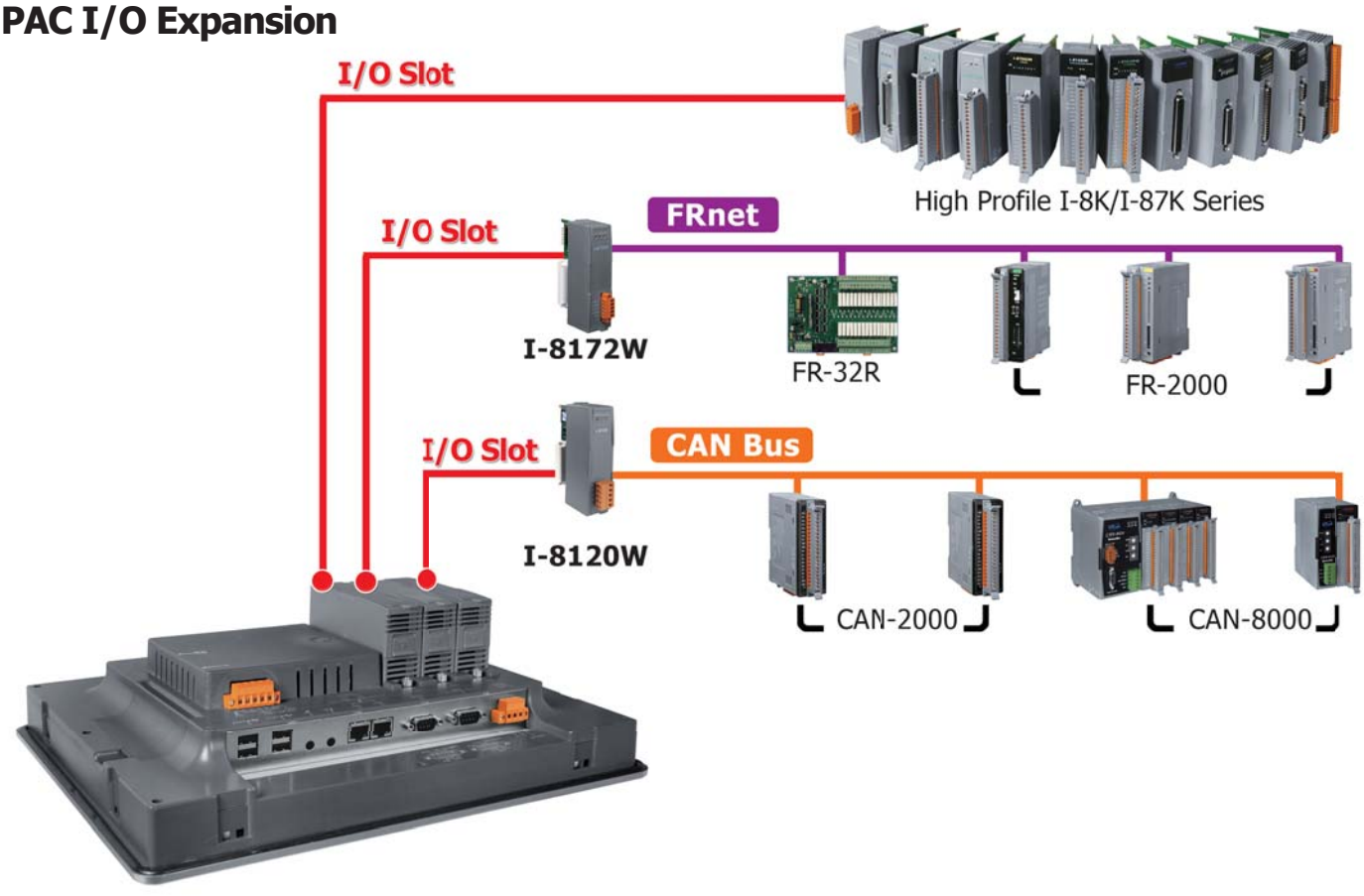
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2.3 iPPC I/O Expansion

Remote I/O Expansion



PAC I/O Expansion

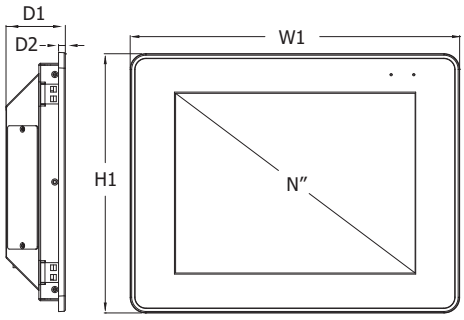


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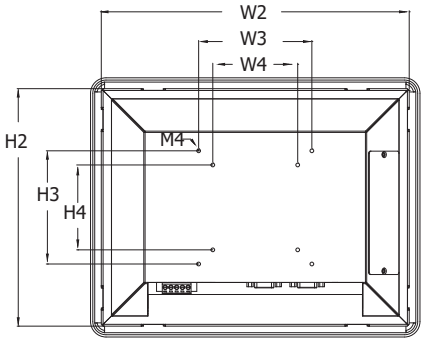
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2.4 iPPC Dimensions

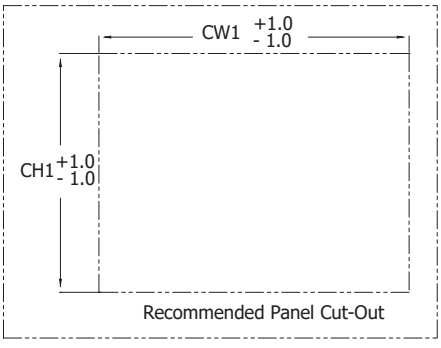
Model	Size (Inch)	Width (mm)				Height (mm)				Depth (mm)		Cut-out (mm)	
	N"	W1	W2	W3	W4	H1	H2	H3	H4	D1	D2	CW1	CH1
iPPC-4801 **iPPC-4901**	10.4"	291.0	272.0	100.0	75.0	229.0	209.8	100.0	75.0	53.0	6.0	274.0	211.0
iPPC-5801 **iPPC-5901**	12.1"	323.0	305.2	100.0	75.0	254.0	236.2	100.0	75.0	63.0	6.0	308.0	239.0
iPPC-6801 **iPPC-6901**	15"	381.0	359.8	100.0	75.0	305.0	283.8	100.0	75.0	63.0	6.0	364.0	288.0
iPPC-7801 **iPPC-7901**	17"	413.0	391.7	100.0	75.0	359.0	337.8	100.0	75.0	69.0	6.4	394.0	340.0



Left view | Front view

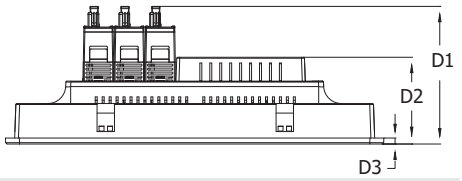


Rear view

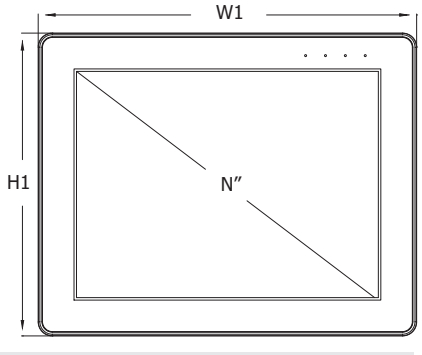


Front View (Panel Cut-out)

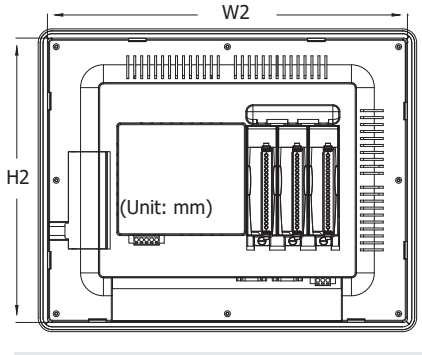
Model	Size (Inch)	Width (mm)		Height (mm)		Depth (mm)			Cut-out (mm)	
	N"	W1	W2	H1	H2	D1	D2	D3	CW1	CH1
iPPC-6831 **iPPC-6931**	15"	381.0	362.0	305.0	286.0	139.0	87.2	6.0	364.0	288.0



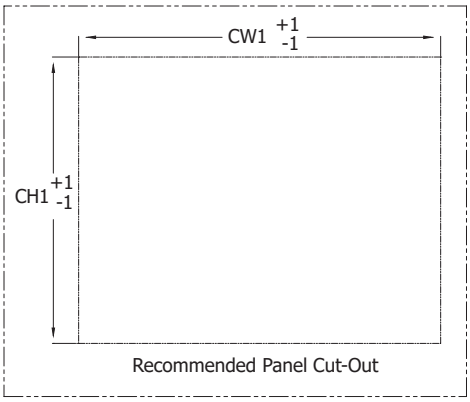
Top view



Front view



Rear view

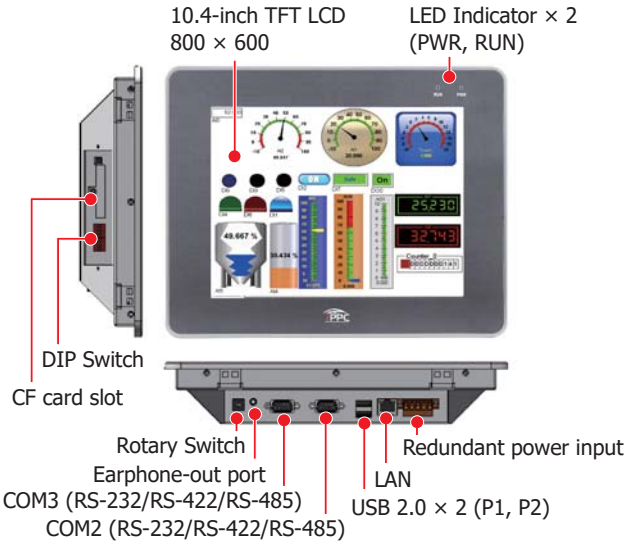


Front View (Panel Cut-out)

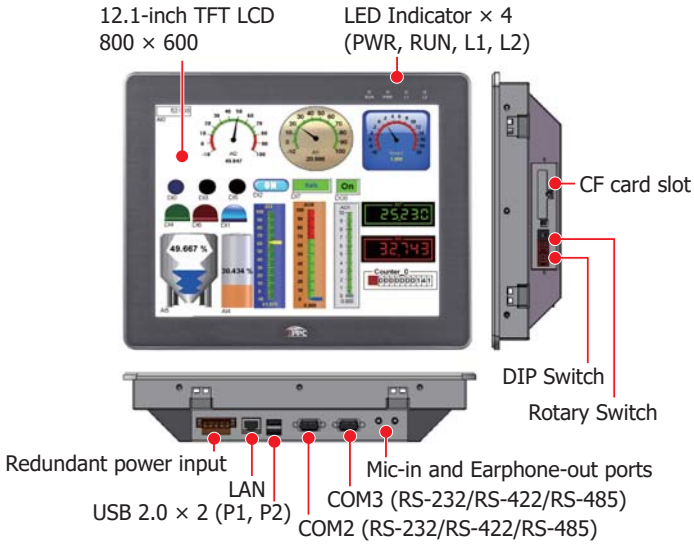
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2.5 iPPC Appearance

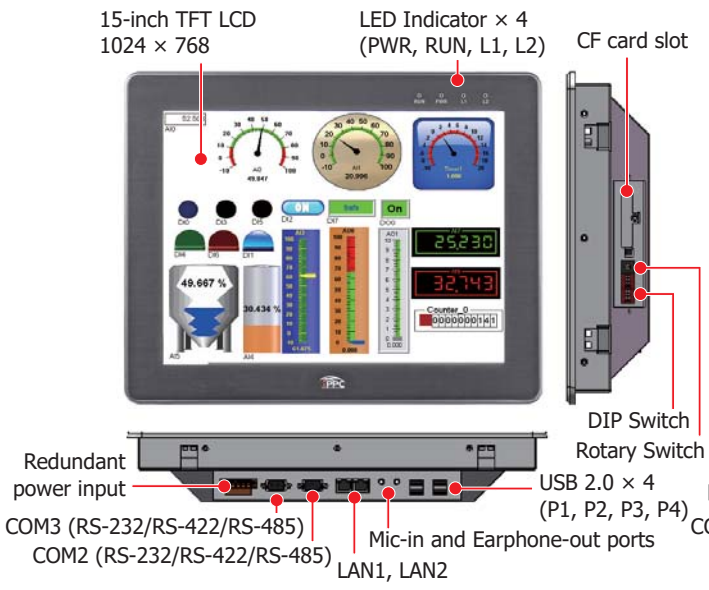
iPPC-4x01



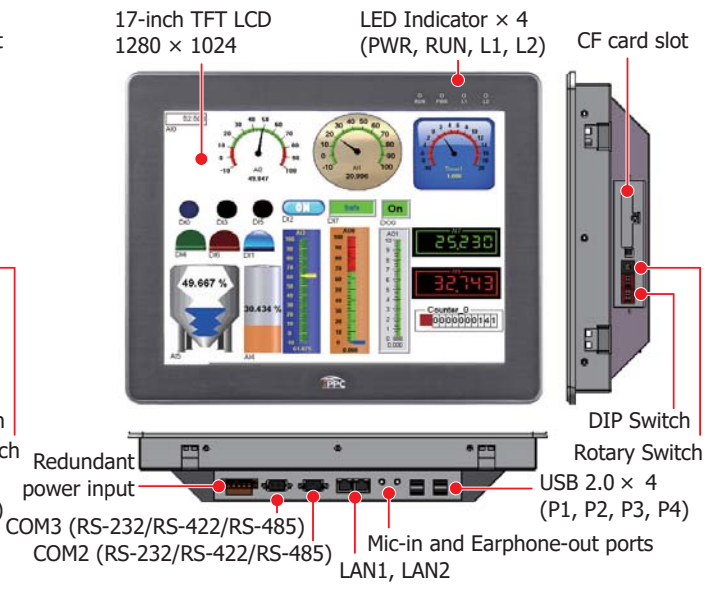
iPPC-5x01



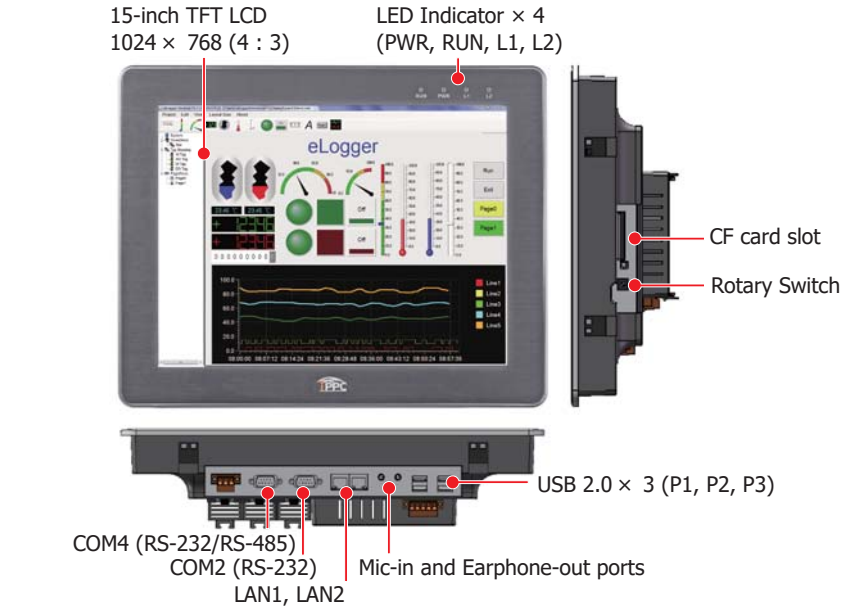
iPPC-6x01

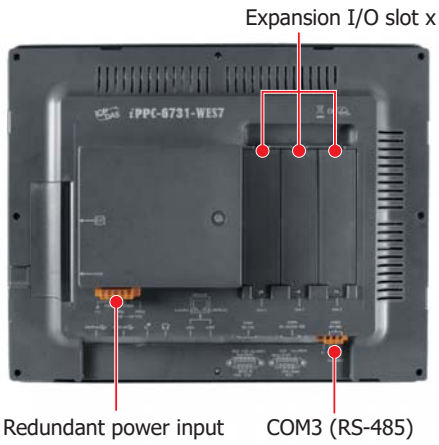


iPPC-7x01



iPPC-6x31





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2.6 Application of Industrial Panel PC

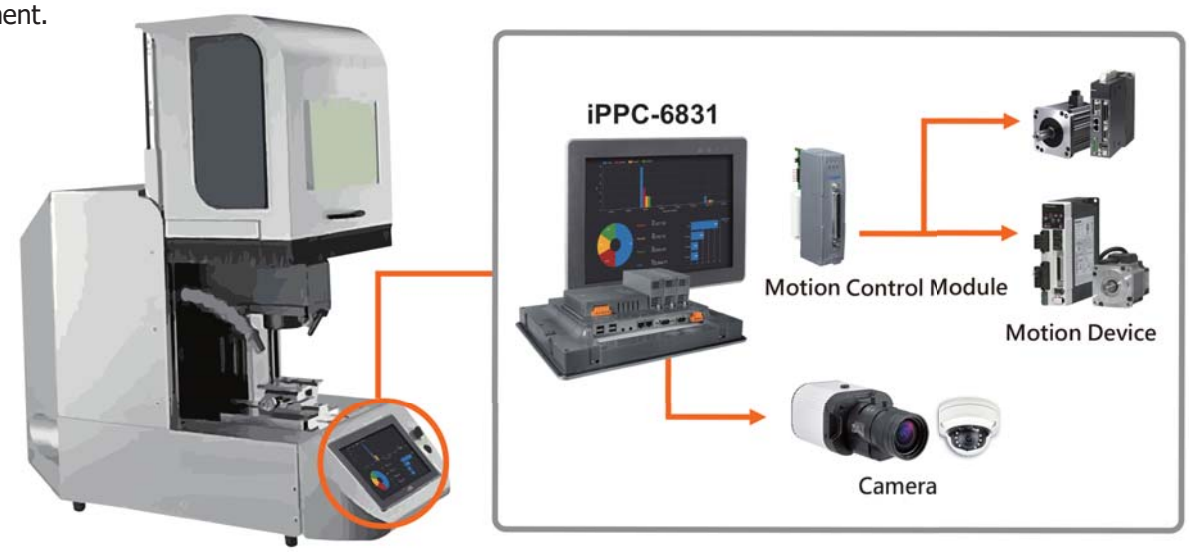
Smart Factory and Manufacturing

Smart factories in the industry 4.0 era is about manufacturing automation, smart manufacturing, and the connection with IoT and Big data. ICP DAS's iPPC products can perfectly combine Fieldbus protocols, remote I/O modules, gateways, converters, wireless and remote management structures, such as 2G/3G/4G, WLAN, Zigbee, GPS, IR, and DSSS RF to connect with manufacturing systems, equipment, and on-site sensors in factories; iPPC is applied in the field from simple machine availability monitoring to products monitoring and smart automation controls. iPPC helps operators control the on-site status in real time, and provides stable operations, thereby increasing productivity, reducing mistakes, and upgrading factories.



Smart Automation Equipment

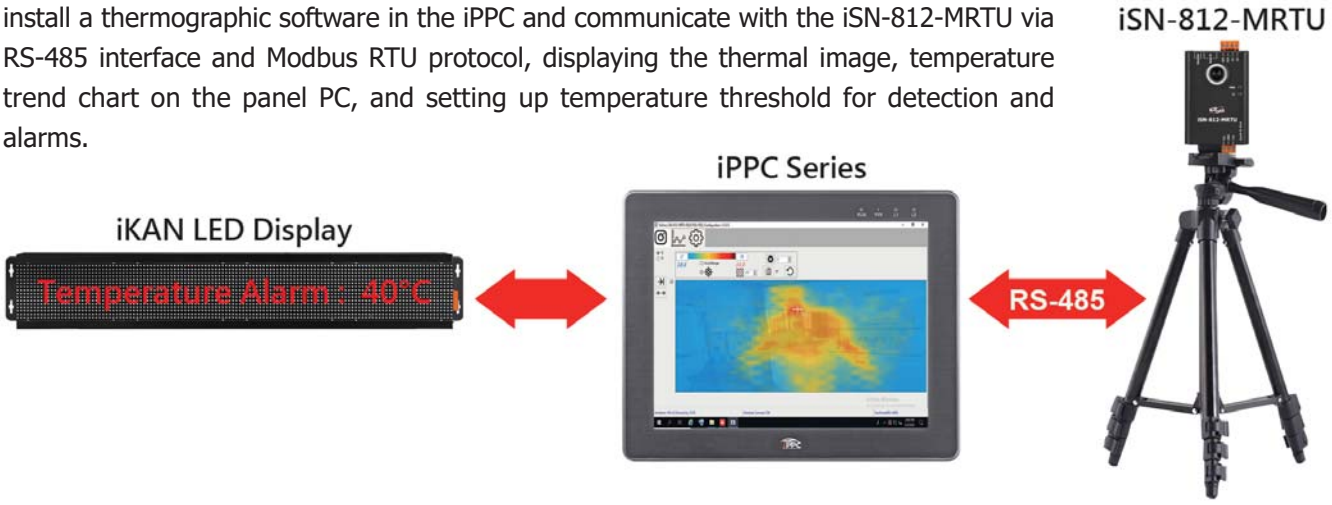
Through the open architecture of the ICP DAS's iPPC, users can use different development tools to design the controlling programs of the automation equipment, such as laser engraver, 3D engraver, and AGV. Users can also flexibly configure the HMI, allowing operators to operate the equipment and monitor data intuitively. If there is a space limit, and the integration of controllers, I/O modules, HMI is needed, the iPPC-6x31 has three I/O slots for various I/O expansion. The unified, compact, and flexible I/O configuration is suitable for various automation control equipment.



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iPPC Application : Non-contact Temperature Measurement

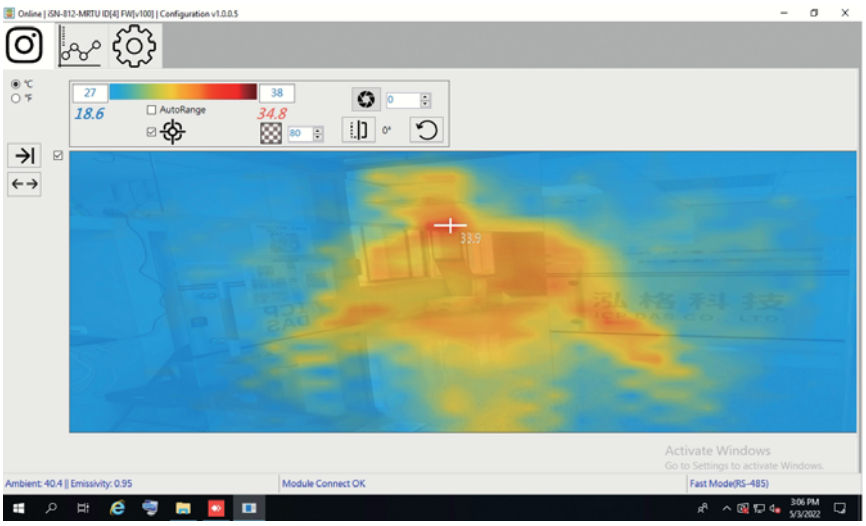
The iPPC series is an industrial touch panel PC for Windows operating system. Users can install a thermographic software in the iPPC and communicate with the iSN-812-MRTU via RS-485 interface and Modbus RTU protocol, displaying the thermal image, temperature trend chart on the panel PC, and setting up temperature threshold for detection and alarms.



※ Software

- Temperature threshold setting
- Temperature threshold alarms
- Temperature trend chart
- Daily temperature records
- Thermal image display
- Overturn and rotate thermal images
- Mark the high temperature for thermal images
- Regular screenshot for thermal images

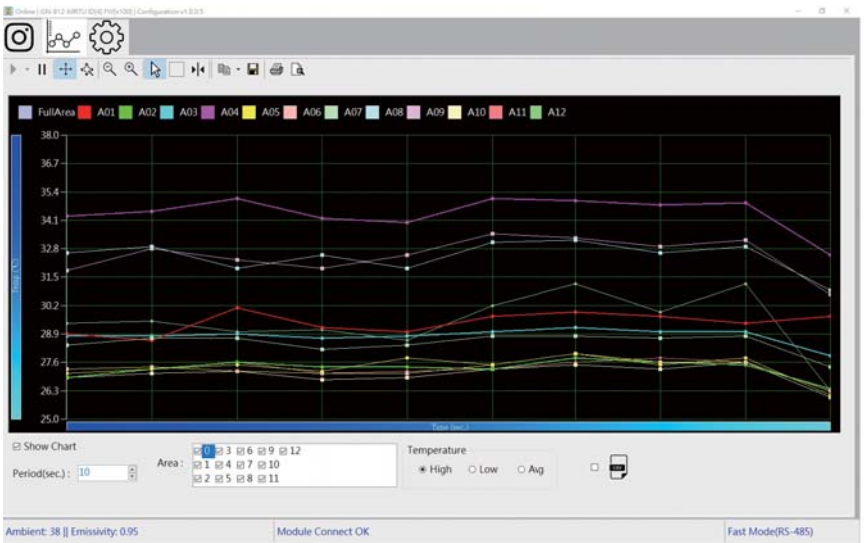
▼ Thermal Image Display



※ Features

- 5.7" ~ 15" LCD display panel
- Resistive touch panel
- 2~4 LED indicator lights
- Rotary switch with 10 positions
- Earphone output and sound input
- Standard Ethernet communication interface
- RS-232/422/485 communication interface

▼ Temperature Trend Chart



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CH3 ViewPAC - Industrial Panel Controller

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3.2 ViewPAC Selection Guide 30

3.3 Applications 33



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3.1 ViewPAC -Industrial Panel Controller

ViewPAC series is an ARM CPU-based industrial panel controller that combines display, computing, I/O and control functions. It goes beyond the traditional concept that the original HMI and controller are independent and avoids many problems caused by the communication between HMI and controller.



Body Design

- Rugged construction andreliable body design
- Fanless
- No moving parts
- Operating temperature: -20°C ~ +70°C (Only for VP-x231 series)

Special Function

- Built-in non-volatile memory
  - ▶16KB EEPROM
  - ▶128 KB MRAM or 512 KB dual battery
- Dual Watchdog timer
- PoE power supply / redundant power input
- Backlight control for power and energy saving
- 64-bit hardware serial number, software copy-proof protection

System Composition

- ARM CPU
- Built-in 512 MB SDRAM
- Built-in 256 MB on-board Flash
- Built-in 4 GB microSD card

Pre-installed operating system

- Windows Embedded Compact 7
- OS is pre-installed on the built-in flash disk
- OS supports 9 languages



Operating System Features

- Hard real-time capability
- Web/FTP/Telnet server
- Supports Visual Studio.NET development kit for PC

Windows Embedded Compact 7

Platform Development Tool Support

- Provide Windows VC DLL library
- Provide .Net Framework DLL library
- Support HMI design software eLogger
- Provide sample code such as VC.NET/C#/VB.NET



ARM Processor

- Arm Cortex-A8
- Energy saving and low operating temperature

arm

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Software Development Tools ▶▶▶▶







Human-machine operation

- 5.7" ~ 15" LCD display panel
- Resistive touch panel
- 2 ~ 4 LED indicators
- 10-segment rotary switch
- Mic-in and Earphone-out
- 6 rubber buttons (VP-123x series only)

Rich I/O Expansion Interface

- 1 Ethernet port
- 1 ~ 2 USB ports
- 2 ~ 3 RS-232 or RS-485 ports
- 3 I/O slots (VP-x231 series only)

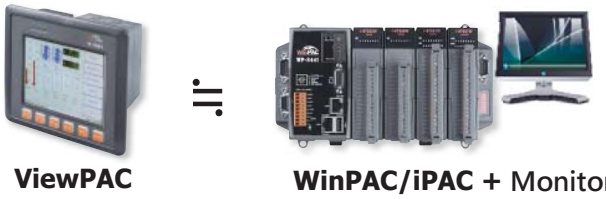


Panel Enclosure

Panel mount design, NEMA 4/IP65 compliant, Resistant to water, moisture and dust.

All-in-one

- PAC+HMI integrated solution
- Reduce system cost and save space



ViewPAC = **WinPAC/iPAC** + Monitor

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3.2 ViewPAC Selection Guide

VP - X X 0 X - XX

Display size
2: 7 inch LCD display
3: 8.4 inch LCD display
4: 10.4 inch LCD display
5: 12.1 inch LCD display
6: 15 inch LCD display

CPU type
2: Cortex-A8

Number of I/O slots
0: w/o slot

Software
1: Standard
8: Win-GRAF

Operating system
CE7: WinCE7

Industrial panel controller (Without I/O slot)	**7" ViewPAC**		**8.4" ViewPAC**	
	 		 	
Model	**VP-2201-CE7**	**VP-2208-CE7**	**VP-3201-CE7**	**VP-3208-CE7**
Size / Resolution	7" 16:9 (800 × 400)		8.4" (800 × 600)	
Backlight life (hours)	20,000		50,000	
Brightness/Contrast	400 cd/m2 (16 bit RGB 64K)		400 cd/m2 (16 bit RGB 64K)	
Touch screen	4-wire resistive, light transmission 80%		5-wire resistive, light transmission 80%	
Main unit				
CPU	Cortex-A8, 1.0 GHz		Cortex-A8, 1.0 GHz	
System memory	512 MB SDRAM		512 MB SDRAM	
Storage	256 MB Flash / 4 GB microSD card		256 MB Flash / 4 GB microSD card+ SD adapter card	
Pre-installed operating system	Windows CE 7.0		Windows CE 7.0	
Preinstalled software	No	Win-GRAF Soft PLC	No	Win-GRAF Soft PLC
Non-volatile memory	128 KB MRAM, 16 KB EEPROM			
Others	With 64-bit hardware serial number, real-time clock, dual watchdog timer			
Communication interface / HMI				
I/O expansion slots	0		0	
COM ports	2 × RS-232/RS-485		1 × RS-485 , 2 × RS-232/RS-485	
Ethernet ports	1 × RJ-45, 10/100/1000 Base-TX		1 × RJ-45, 10/100/1000 Base-TX	
USB ports	2 × USB 2.0		2 × USB 2.0	
LED indicators	1 x system , 1 x power		1 x system , 1 x power	
Buzzer	Yes		Yes	
10-segment rotary switch	Yes		Yes	
Audio	1 x Earphone-out		1 x Earphone-out	
Power supply				
Input range	+12 ~ 48 VDC		+12 ~ 48 VDC	
Power consumption	6.0 W		7.5 W	
Powered from PoE	Yes, IEEE 802.3af			
Mechanical / Environment				
Dimensions (mm)	213 × 148 × 44 (W × L × H)		249 × 207 × 64 (W × L × H)	
Panel cut-out (mm)	197 × 133, ±1 (W × H)		235 × 193, ±1 (W × H)	
Installation	Panel Mounting, VESA Mounting (75 × 75, 100 × 100)			
Ingress Protection Rating	Front panel: NEMA 4/ IP65			
Operating/storage temperature	-10 ~ +60°C / -20 ~ +70°C			
Humidity	10 ~ 90% RH relative humidity, Non-condensing			
Certification	CE, FCC			
Casing	Plastic			

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10.4" ViewPAC		12.1" ViewPAC		15" ViewPAC	
					
VP-4201-CE7	**VP-4208-CE7**	**VP-5201-CE7**	**VP-5208-CE7**	**VP-6201-CE7**	**VP-6208-CE7**
10.4" (800 × 600)		12.1" (800 × 600)		15" (1024 × 768)	
50,000		50,000		50,000	
400 cd/m2 (16 bit RGB 64K)		400 cd/m2 (16 bit RGB 64K)		400 cd/m2 (16 bit RGB 64K)	
5-wire resistive, light transmission 80%		5-wire resistive, light transmission 80%		5-wire resistive, light transmission 80%	
Cortex-A8, 1.0 GHz		Cortex-A8, 1.0 GHz		Cortex-A8, 1.0 GHz	
512 MB SDRAM		512 MB SDRAM		512 MB SDRAM	
256 MB Flash 4 GB microSD card+ SD adapter card		256 MB Flash 4 GB microSD card+ SD adapter card		256 MB Flash 4 GB microSD card+ SD adapter card	
Windows CE 7.0		Windows CE 7.0		Windows CE 7.0	
No	Win-GRAF Soft PLC	No	Win-GRAF Soft PLC	No	Win-GRAF Soft PLC
128 KB MRAM, 16 KB EEPROM					
With 64-bit hardware serial number, real-time clock, dual watchdog timer					
0		0		0	
1 × RS-485 , 2 × RS-232/RS-485		1 × RS-485 , 2 × RS-232/RS-485		1 × RS-485 , 2 × RS-232/RS-485	
1 × RJ-45, 10/100/1000 Base-TX		1 × RJ-45, 10/100/1000 Base-TX		1 × RJ-45, 10/100/1000 Base-TX	
2 × USB 2.0		2 × USB 2.0		2 × USB 2.0	
1 x system , 1 x power		1 x system , 1 x power		1 x system , 1 x power	
Yes		Yes		Yes	
Yes		Yes		Yes	
1 x Earphone-out		1 x Earphone-out		1 x Earphone-out	
+12 ~ 48 VDC		+12 ~ 48 VDC		+12 ~ 48 VDC	
13.0 W		14.0 W		16.0 W	
Yes, IEEE 802.3af					
291 × 229 × 54 (W × L × H)		324 × 255 × 64 (W × L × H)		381 × 305 × 63 (W × L × H)	
277 × 215, ±1 (W × H)		310 × 241, ±1 (W × H)		362 × 286, ±1 (W × H)	
Panel Mounting, VESA Mounting (75 × 75, 100 × 100)					
Front panel: NEMA 4/ IP65					
-10~ +60°C / -20 ~ +70°C					
10 ~ 90% RH relative humidity, Non-condensing					
CE, FCC					
Plastic					

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VP - X X 3 X - XX

Display size
1: 5.7 inch LCD display
4: 10.4 inch LCD display
6: 15 inch LCD display

CPU type
2: Cortex-A8

Number of I/O slots
3: 3 slots

Software
1: Standard
8: Win-GRAF

Operating system
CE7: WinCE7

Industrial panel controller (3 I/O slots)	5.7" ViewPAC		10.4" ViewPAC		15" ViewPAC	
						
Model	**VP-1231-CE7**	**VP-1238-CE7**	**VP-4231-CE7**	**VP-4238-CE7**	**VP-6231-CE7**	**VP-6238-CE7**
Size / Resolution	5.7" 16:9 (640 × 480)		10.4" (800 × 600)		15" (1024 × 768)	
Backlight life (hours)	20,000		50,000		50,000	
Brightness/Contrast	400 cd/m2 (16 bit RGB 64K)		400 cd/m2 (16 bit RGB 64K)		400 cd/m2 (16 bit RGB 64K)	
Touch screen	4-wire resistive, light transmission 80%		5-wire resistive, light transmission 80%		5-wire resistive, light transmission 80%	
Main unit						
CPU	Cortex-A8 1.0 GHz		Cortex-A8 1.0 GHz		Cortex-A8 1.0 GHz	
System memory	512 MB SDRAM		512 MB SDRAM		512 MB SDRAM	
Storage	256 MB Flash 4 GB microSD card		256 MB Flash 4 GB microSD Card+SD adapter card		256 MB Flash 4 GB microSD Card+SD adapter card	
Pre-installed operating system	Windows CE 7.0					
Preinstalled software	No	Win-GRAF Soft PLC	No	Win-GRAF Soft PLC	No	Win-GRAF Soft PLC
Non-volatile memory	128 KB MRAM, 16 KB EEPROM					
Others	With 64-bit hardware serial number, real-time clock, dual watchdog timer					
Communication interface / HMI						
I/O expansion slots	3		3		3	
COM ports	1 × RS-232, 1 × RS-485		1 × RS-232, 1 × RS-485		1 × RS-232, 1 × RS-485	
Ethernet ports	1 × RJ-45, 10/100/1000 Base-TX		1 × RJ-45, 10/100/1000 Base-TX		1 × RJ-45, 10/100/1000 Base-TX	
USB ports	1 × USB 2.0		2 × USB 2.0		2 × USB 2.0	
LED indicators	1 x System , 1 x Power , 1 x Ethernet, 3 x Programmable		1 x system , 1 x power		1 x system , 1 x power	
Buzzer	Yes		Yes		Yes	
10-segment rotary switch	Yes		Yes		Yes	
Audio	1x Mic-in and 1 x Earphone-out		1 x Earphone-out		1x Mic-in and 1 x Earphone-out	
Rubber buttons	6 keys		No		No	
Power supply						
Input range	+10 ~ 30 VDC		+10 ~ 30 VDC		+10 ~ 30 VDC	
Power consumption	7.2 W		10.8 W		13.0 W	
Redundant power input	Yes		Yes		Yes	
Mechanical / Environment						
Dimensions (mm)	182 × 158 × 125 (W × L × H)		291 × 229 × 129 (W × L × H)		381 × 305 × 139 (W × L × H)	
Panel cut-out (mm)	153 × 136, ±1 (W × H)		276 × 214, ±1 (W × H)		366 × 290, ±1 (W × H)	
Operating/storage temperature	-20 ~ +70°C / -30 ~ +80°C		-20 ~ +70°C / -30 ~ +80°C		-10 ~ +60°C / -20 ~ +70°C	
Humidity	10 ~ 90% RH relative humidity, Non-condensing					
Installation	Panel Mounting					
Ingress Protection Rating	Front panel : NEMA4 / IP65					
Certification	CE, FCC					
Casing	Plastic					

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ViewPAC -Applied to Touch IoT paperless recorder

5.7 inch touch paperless recorder application

microSD Slot

- microSD card for data storage

5.7" LCD Display Panel

- Resistive touch panel
- Backlight control for power and energy saving

6 rubber buttons

- Customizable functions

USB interface

- USB disk data storage



Ethernet/RS-232/RS-485 port

- Expand remote I/O modules
- Add I/O channels

I/O Expansion Interface

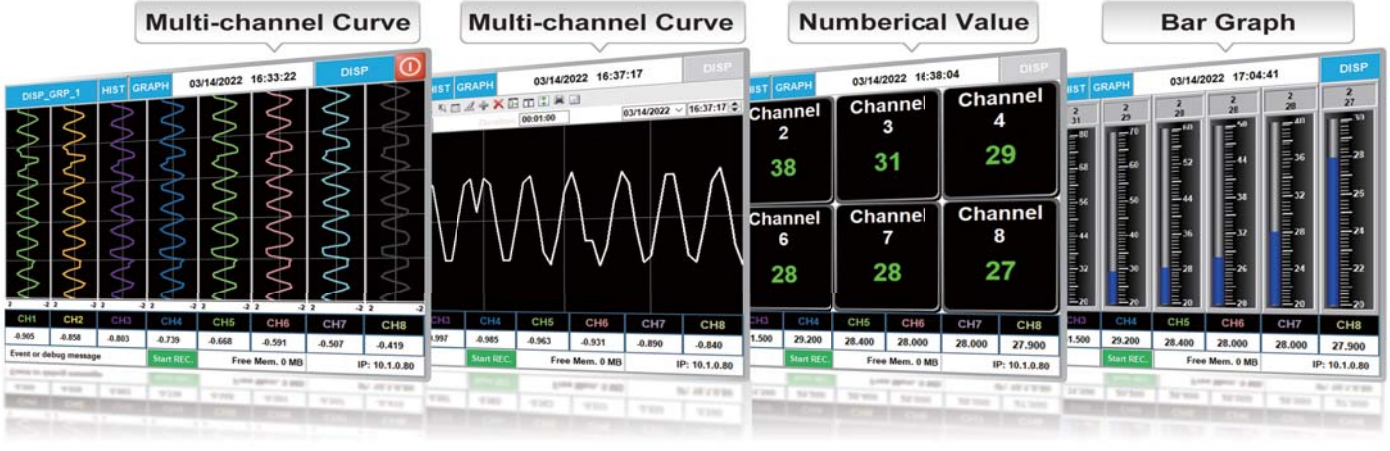
- 3 I/O expansion slots
- Supports up to 100 I/O modules

※ Software

- Provides templates for paperless recorders
- Free software elogger Developer enbles to edit display screen and I/O function planning
- Free 50 tag elogger runtime (registration required)
- Instant and historical alert function
- Event management and event triggering work
- Reports (daily, weekly and monthly)
- Alarm comment function
- Email alert triggering function
- Batch control
- 100 milliseconds data access speed and data processing tools
- Dynamic data exchange function
- Search and export data by time and range

※ Features

- 5.7” TFT color LCD, touch screen and high resolution
- Provides I/O slot - flexible I/O expansion
- Up to 96 digital inputs/ Up to 96 digital outputs
- Up to 48 analog inputs / up to 24 analog outputs
- Customize the functions of the 6 buttons on the front panel
- SD card and USB flash drive for data storage
- Standard Ethernet communication interface
- RS-232/422/485 communication interface
- IP65 grade for waterproof and dustproof



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Application of ViewPAC panel controller and I/O module in temperature monitoring of vaccine storage

Using the temperature monitoring solution of ViewPAC's panel controller and I/O module, the vaccine warehouse can have the ability of self-monitoring both its temperature & equipment status, which keeps the environment in the warehouse in a constant low temperature to maintain the stability and antigenicity of the vaccine .

ICP DAS Vaccine Storage Monitoring Solution

A medical and health center in Kaohsiung is the most important vaccine storage center in the Kaohsiung area.
When the vaccine departs from the local vaccine manufacturers or the local cold storage warehouses of foreign vaccine manufacturers, they would be transported to the medical and health centers in various regions for storage, and then distributed to the major local medical institutions and schools. Therefore, the monitoring and management of vaccine storage spaces have become the Important issue for the medical and health centers in Kaohsiung.
In this case, ICP DAS' I/O modules (I-87017ZW-G, I-87053W-G, I-87055W-G, M-7015P-G) are used as the cold vaccine storage room/freezer as well as the transmissions of the electronic and analog signals for the compressor, and use the industrial panel controller ViewPAC for monitoring and abnormal alarms.
When the temperature and equipment operate abnormally, in addition to activating the alarm system and sending an alarm message to the administrator, relevant emergency response measures can also be activated at the same time.



※ Benefits

1. Each vaccine storage room can self-monitor whether the temperature and equipment status are malfunctioning and send out the alarm message. Meanwhile, it would perform the temperature recovery action in order to reach its indoor constant temperature state. This helps reduce the time for personnel to troubleshoot problems, it also reduces the risk of vaccine damage.

2. In addition to providing the alarm function, the ViewPAC controller is also connected with the security alarm system. When the abnormal situation cannot be eliminated by itself, the system can notify the personnel in each area to deal with the emergency. At the same time, ViewPAC can also send a message of abnormal status to notify maintenance personnel or equipment manufacturers, which can achieve 24-hour monitoring in order to protect the vaccine from damage due to abnormal temperature.

3. ViewPAC series controller can record and save current and voltage data from the cooling system's compressor equipment. To achieve the goal of predictive maintenance, the manager can evaluate and organize the machine maintenance of the compressor equipment using the report data and graph.

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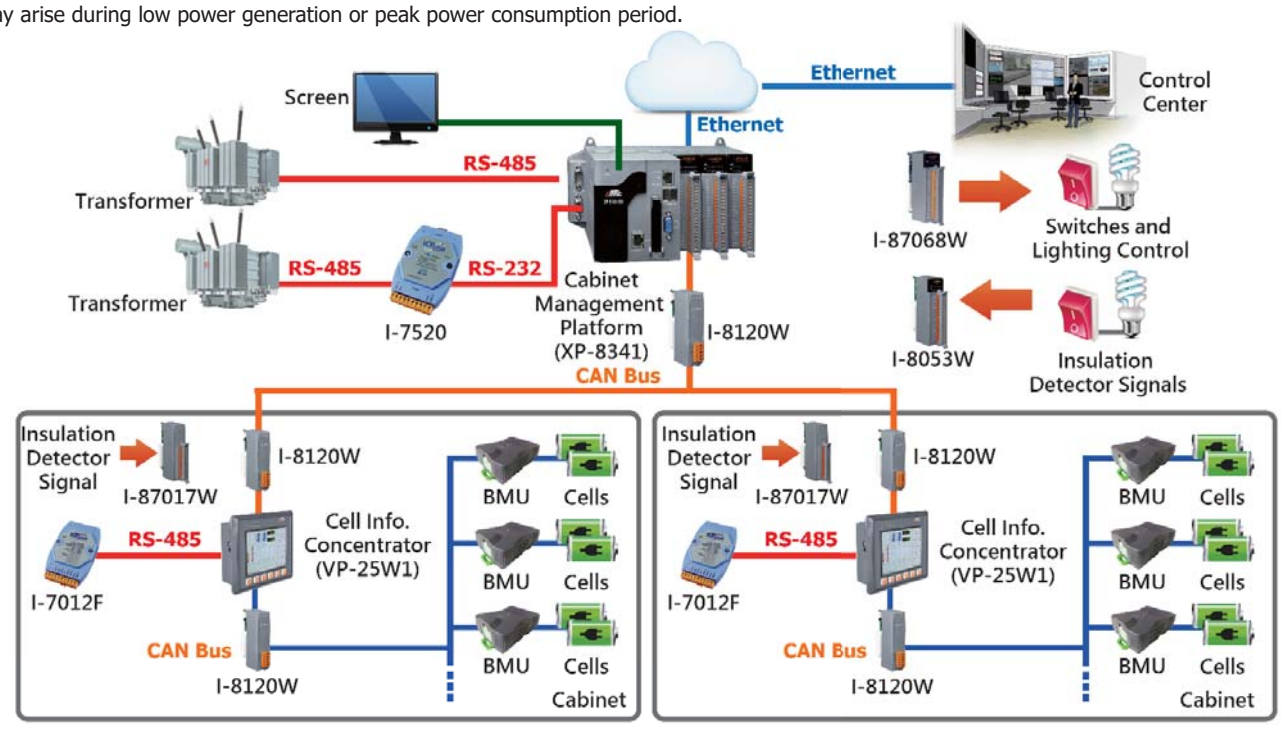
Energy Storage Monitoring - the Application of Wind and Solar Energy Storage Project

A monitoring system that provides scalability, expandability and high stability is established to monitor wind power generation, solar power generation and energy storage by adopting a battery information concentrator (ViewPAC) and a battery cabinet management platform (XPAC) in a solution provided by ICP DAS, together with the battery management unit (BMU) developed by the customer, which operate based on the highly fault-tolerant and fault-detectable CAN Bus protocol.

ICP DAS Solution Tailored for the Zhangbei Demonstration Project

Located in Zhangbei City, Hebei Province, China, the project implements the world's first wind and solar energy storage and transmission construction concepts and technical routes. This model is a new energy comprehensive demonstration project integrating wind power, photovoltaic cells, energy storage devices and smart power transmission.

By taking the instability of wind and solar power generation and the high and low peak times for power consumption from the grid into consideration, any excess power can be stored during off-peak or maximum power generation times. The power energy previously stored in the storage station can then be fed back to the grid to supplement the gap in power demand, and solve any problems related to power demand that may arise during low power generation or peak power consumption period.



Each group of systems includes a battery cabinet management platform, which can connect to 12 battery information concentrators, and each battery information concentrator can connect to 18 BMUs. The BMU is responsible for collecting battery pack information and providing this information to the battery information concentrator and battery management platform through the CAN Bus.

The battery information concentrator also continuously detects the current and voltage signals fed back by the battery cabinet insulation detector through I-7012F and I-87017W, and reports them regularly. It avoids equipment damage or industrial safety accidents caused by insulation failure. Through the battery information centralized screen and resistive touch screen, you can switch pages to obtain detailed information of all battery packs in the battery cabinet, which is convenient for daily maintenance.



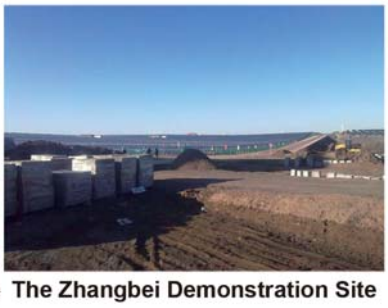
Normal Functioning while in Low Temperature



Interface of Battery Packs



CANBUS Communication module I-8120W



The Zhangbei Demonstration Site

※ Benefits

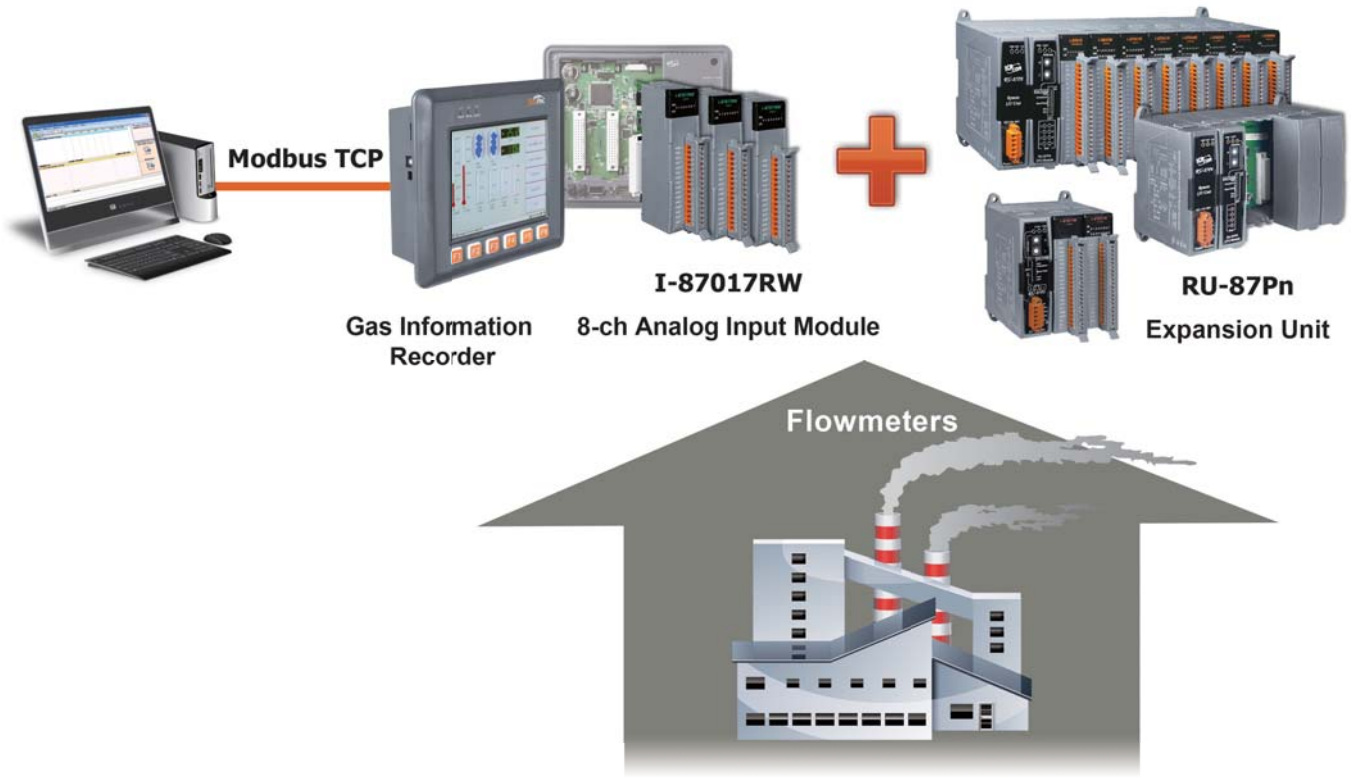
- In the harsh environment, whether it is a temperature of -30°C to 85°C, or an altitude of higher than 4000 meters, the battery management system can operate normally.
- Highly fault-tolerant and fault-detectable capability of the CAN Bus in a noisy electrical environment, the entire on-line system operates reliably, saving a lot of space, and ensuring that the convenience of maintenance is facilitated.
- EMI testing and high and low temperature testing services are also provided to ensure that the customers feel satisfied.

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Application of Flow Metering System

ICP DAS ViewPAC is applied to perfectly integrate HMI, data acquisition, logic operation, data storage and control functions. The I/O expansion slot and RS232/RS485 interface on the rear panel can be matched with I-87K series and other modules according to the requirements on-site.

It can collect the signals from field flow sensors and centrally manage the flow information of multiple channels, then accumulate/ store information and provide reports based on the relevant algorithms. And then it provides the communication protocols such as Modbus TCP to communicate with the host computer to form a flow measurement system. The system can be used in the natural gas, petroleum, chemical, power and other Industries.



※ Benefits

1. The gas information collector uses high-level programming language to develop its own software platform. Users can connect to ViewPAC to complete various operations without using peripheral devices such as monitors, a mouse, and keyboards, which helps avoid various peripheral device connections or settings.
2. The I-87017RW or I-87017HCW collects the voltage or current signal by outputting the voltage or current signal from various sensors such as on-site flowmeter and pressure gauge.
3. The customer calculates the current flow rate according to the relevant calculations and makes statistics, which calculates the corresponding hourly/daily/ monthly/ annual consumption usages according to the settlement time at 8 o'clock every day, and then generates the corresponding report and saves it. The historical data can be saved in the form of files, which is convenient for copying, backup and transplantation.
4. Allows Modbus TCP port for third-party software to read data
5. The high-efficiency computing ability and clock accuracy of the controller are combined with the high-precision I-87K series acquisition module to accurately calculate the current pipeline flow and the other important data.
6. The expandability of ViewPAC can be used with ICP DAS' RU-87Pn series expansion unit to increase the number of signals collected on-site.
7. The RS-485 port of the controller can be connected to RS-485 slave devices to read different data.

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4

CH4 AEV - SCADA/HMI Panel Controller

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4.1 AEV -SCADA/HMI Panel Controller

AEV series features a built-in runtime version of the AVEVA Edge Compact HMI, which combines computing, I/O and operator interface into a single operational element, providing the best solution for a PAC with HMI, data acquisition and stand-alone control.

AEV series with 3 I/O slots

Panel enclosure

Panel mount design, NEMA 4/IP65 compliant, Resistant to water, moisture and dust.

Body Design

- Rugged construction and reliable body design
- Fanless Design
- No moving parts design
- Operating temperature: -20°C ~ +70°C (AEV-x231 series only)

Rich I/O expansion interface

- 1 Ethernet port
- 1 ~ 2 USB ports
- 2 ~ 3 RS-232 or RS-485 ports
- 3 I/O slots (AEV-x231 series only)



Human-machine operation

- 5.7" ~ 15" LCD display panel
- Resistive Touch Panel
- 2 ~ 4 LED indicators
- 10-segment rotary switch
- Headphone output and audio input
- 6 rubber buttons (AEV-1231 series only)

Special function

- Built-in AVEVA Edge Runtime Edition license
- Built-in non-volatile memory
- Dual watchdog timer
- Support Modbus, OPC, TCP/IP client/server
- Built-in DCON driver supports ICP DAS Distributed I/O Modules
- Simple and fast connection to IOT
- Backlight control for power saving

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AEV series equipped with low-power ARM Cortex-A8 hyper-threaded processor, 0 or 3 sets of I/O expansion slots, multi-size TFT color LCD and various peripheral communication interfaces. The I/O slot can be used with ICP DAS' I-8K and I-87K series I/O modules and other interfaces can be used with Ethernet I/O modules and RS-485 I/O modules for remote I/O expansion.

These AEV series PAC also features with the powerful AVEVA Edge runtime edition.

AVEVA Edge is the most powerful, integrated collection of e-automation development tool that includes all the building blocks needed to develop HMI and SCADA systems. Compared to traditional IPC+PLC solutions, AVEVA Edge PAC reduces overall system cost, space and gives you all the best features of IPC and PLC.

AEV series without I/O slots

Special function

- Built-in AVEVA Edge Runtime Edition license
- Built-in non-volatile memory
- Dual watchdog timer
- Support Modbus, OPC, TCP/IP client/server
- Built-in DCON driver supports ICP DAS Distributed I/O Modules
- Simple and fast connection to IOT

Panel enclosure

Panel mount design, NEMA 4/IP65 compliant, Resistant to water, moisture and dust.

Body Design

- Rugged construction and reliable body design
- Fanless Design
- Internal isolation protection circuit to avoid damage caused by static electricity and noise
- Operating temperature: -20°C ~ +60°C



Human-machine operation

- 7" ~ 15" LCD display panel
- Resistive Touch Panel
- 2 ~ 4 LED indicators
- 10-segment rotary switch
- Headphone output and audio input

System composition

- ARM CPU
- Built-in 512 MB SDRAM
- Built-in 256 MB on-board Flash
- Built-in 4 GB microSD card

Rich I/O expansion interface

- 1 Ethernet port
- 1 ~ 2 USB ports
- 2 ~ 3 RS-232 or RS-485 ports
- Backlight control for power saving

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4.2 AVEVA Edge

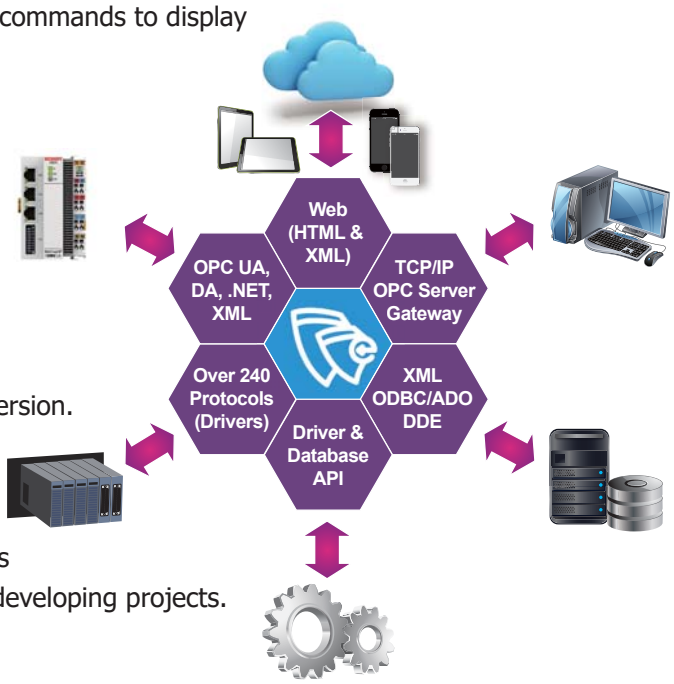
AVEVA Edge is a powerful total solution that includes the tools you need to create powerful SCADA and HMI applications. Develop your project once, then deploy and run it anywhere. When AVEVA Edge is running, in addition to supporting local operations, it also supports remote browsing (web page) monitoring.

AVEVA Edge Studio - Graphical integration development tool

- Instant & historical alerts and SPC function
- Reporting Tools - Export reports in RTF, XML, PDF, HTML, and CSV formats
- Traceable history of operator actions and internal system activities
- Schedule application behavior triggered by tag changes, date/time, frequency, or any trigger.
- VBScript and AVEVA Edge's scripting languages
- Recipe management tool - effectively manage the output parameters and quantity of the production line
- Trend Graph - Provides friendly and intuitive GUI control commands to display real-time data or historical data in the database
- Provide Redundancy demo by ICP DAS

Development Costs

Software that is backward compatible.
Projects developed in the old version of the software can still be opened and edited in the new version of the software without any modification. With the built-in conversion tool, you don't have to spend extra time re-editing old projects to adapt to the new software version.



Graphical design tools that shorten development time

The graphical design tools based on click and drag methods that are easy to learn and can greatly shorten the time of developing projects.

Develop Once - Deploy Anywhere

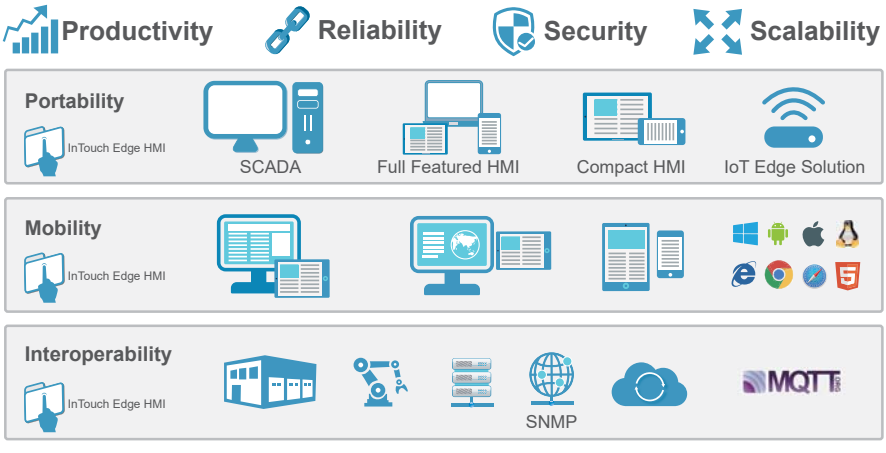
Use the same development environment to design and deploy projects to a wide range of platforms, such as Windows Embedded, Windows CE, Windows 8.1, Windows 10, etc.

Easy to Communicate and Integrate

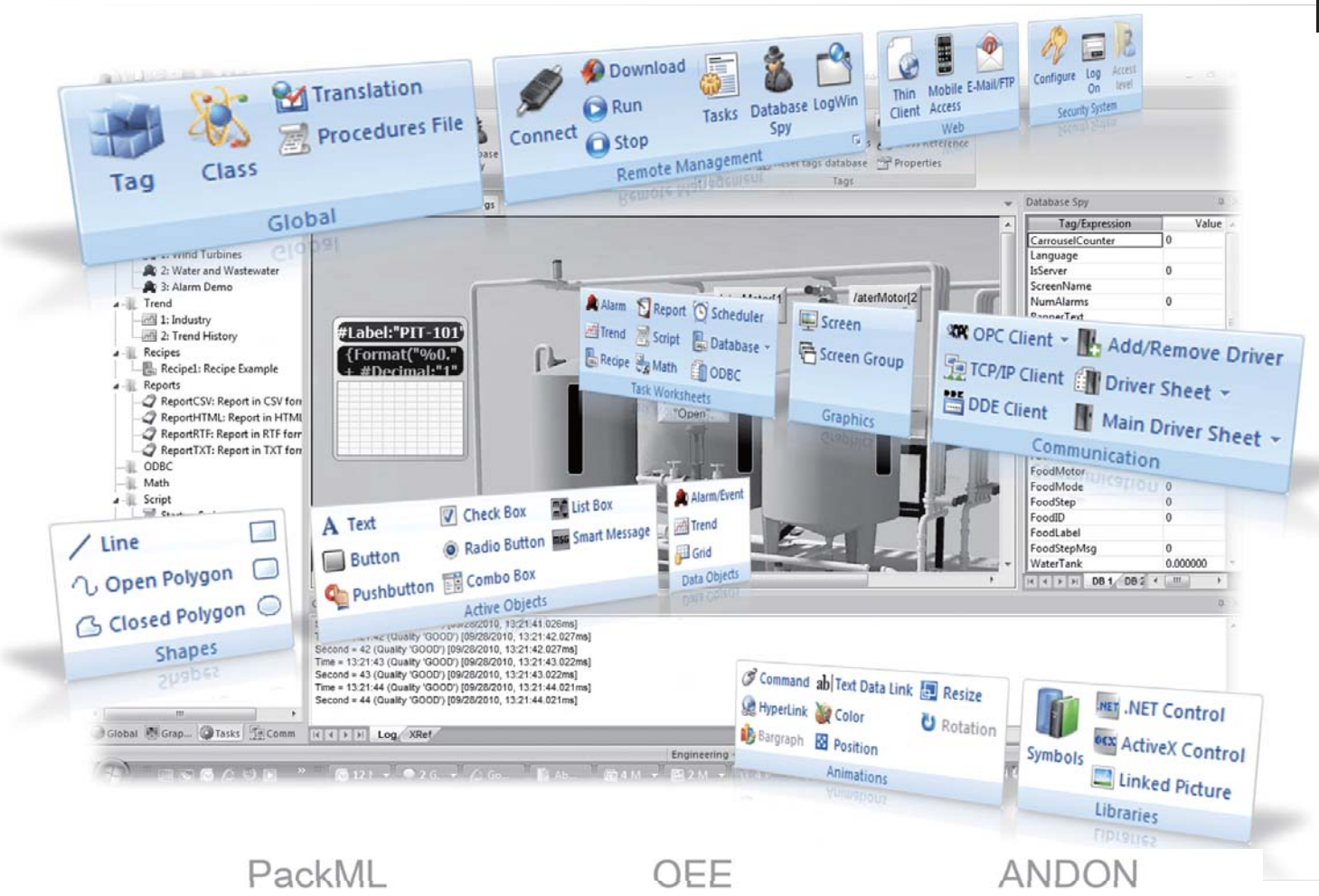
- Be able to communicate with various devices, easy integration of process and ERP

Drivers and OPC

- Developed over 250 drivers for major device manufacturers and provided driver development kits to help develop customized proprietary protocol drivers.
- Supports OPC DA (server/client), OPC HDA (server), UA (server/client), OPC .NET 3.0 (client) and OPC XML; OPC DA and UA are also available for Windows CE work environment.



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PackML OEE ANDON



Security

Support for group and user accounts, e-signatures, and traceability. Integrate your project to the Active Directory.

SCADA/HMI and templates

AVEVA Edge design tool can create dynamic images or combine pictures with a wide variety of assemblies.
It supports multi-touch that allows users to develop projects using familiar multi-touch functions such as swipe, zoom or rotate gestures. AVEVA Edge also provides popular templates such as Andon, OEE, and PackML.

FDA traceability

Take advantage of built-in functionality to create 21 CFR part 11 compliant projects with traceability and e-signatures. These features are often used for pharmaceutical and food applications but can be used for any application where traceability is a requirement.

Backup

For critical applications where data is vital, AVEVA Edge supports web server, database and overall system redundancy to protect your information

Database

Connect to any SQL database (Microsoft SQL, MySQL, Sybase, Oracle), or Microsoft Access or Excel, and ERP/MES systems (including SAP), even from Windows Embedded Compact Edition. The flexible built in interface doesn't require knowledge of SQL. A patented solution allows for communication with SQL and relational databases running on any supported platform.

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4.3 AEV Selection Guide

AEV - X 2 X 1 - CE7

Display size
1: 5.7 inch LCD display
2: 7 inch LCD display
3: 8.4 inch LCD display
4: 10.4 inch LCD display
5: 12.1 inch LCD display
6: 15 inch LCD display

CPU type
2: Cortex-A8

Number of I/O slots
0: w/o slot
3: 3 slots

Operating system
CE7: WinCE7

	5.7" AEV PAC	10.4" AEV PAC	15" AEV PAC
AEV SCADA/HMI panel controller			
Model	**AEV-1231-CE7**	**AEV-4231-CE7**	**AEV-6231-CE7**
	AEV-1231-CE7-1500	**AEV-4231-CE7-1500**	**AEV-6231-CE7-1500**
Size / Resolution	5.7" 16:9 (640 × 480)	10.4" (800 × 600)	15" (1024 × 768)
Backlight life (hours)	20,000	50,000	50,000
Brightness/Contrast	400 cd/m2 (16 bit RGB 64K)		
Touch screen	4-wire resistive, light transmission 80%	5-wire resistive, light transmission 80%	
Main unit			
CPU	Cortex-A8 / 1.0 GHz		
System memory	512 MB SDRAM		
Storage	256 MB Flash / 4 GB microSD card	256 MB Flash / 4 GB microSD card+SD adapter card	
Pre-installed operating system	Windows CE 7.0		
Preinstalled software	AVEVA Edge 300 tags (Preset)		
	AVEVA Edge 1500 tags		
Non-volatile memory	128 KB MRAM, 16 KB EEPROM		
Others	With 64-bit hardware serial number, real-time clock, dual watchdog timer		
Communication interface / HMI			
I/O expansion slots	3		
COM ports	1 × RS-232, 1 × RS-485		
Ethernet ports	1 × RJ-45, 10/100/1000 Base-TX		
USB ports	1 × USB 2.0	2 × USB 2.0	
LED indicators	1 x System , 1 x Power , 1 x Ethernet, 3x Programmable	1 x system , 1 x power	
Buzzer	Yes		
10-segment rotary switch	Yes		
Audio	1x Mic-in and 1 x Earphone-out	1 x Earphone-out	1x Mic-in and 1 x Earphone-out
Rubber buttons	6 keys	No	No
Power supply			
Input range	+10 ~ 30 VDC		
Power consumption	7.2 W	10.8 W	13.0 W
Redundant power input	No	Yes	
Powered from PoE	No		
Mechanical / Environment			
Dimensions (mm)	182 × 158 × 125 (W × L × H)	291 × 229 × 129 (W × L × H)	381 × 305 × 139 (W × L × H)
Panel cut-out (mm)	153 × 136, ±1 (W × H)	276 × 214, ±1 (W × H)	366 × 290, ±1 (W × H)
Operating/storage temperature	-20 ~ +70°C / -30 ~ +80°C	-20 ~ +70°C / -30 ~ +80°C	-10 ~ +60°C / -20 ~ +70°C
Humidity	10 ~ 90% RH relative humidity, Non-condensing		
Installation	Panel Mounting		
Ingress Protection Rating	Front panel: NEMA 4/ IP65		
Certification	CE, FCC		

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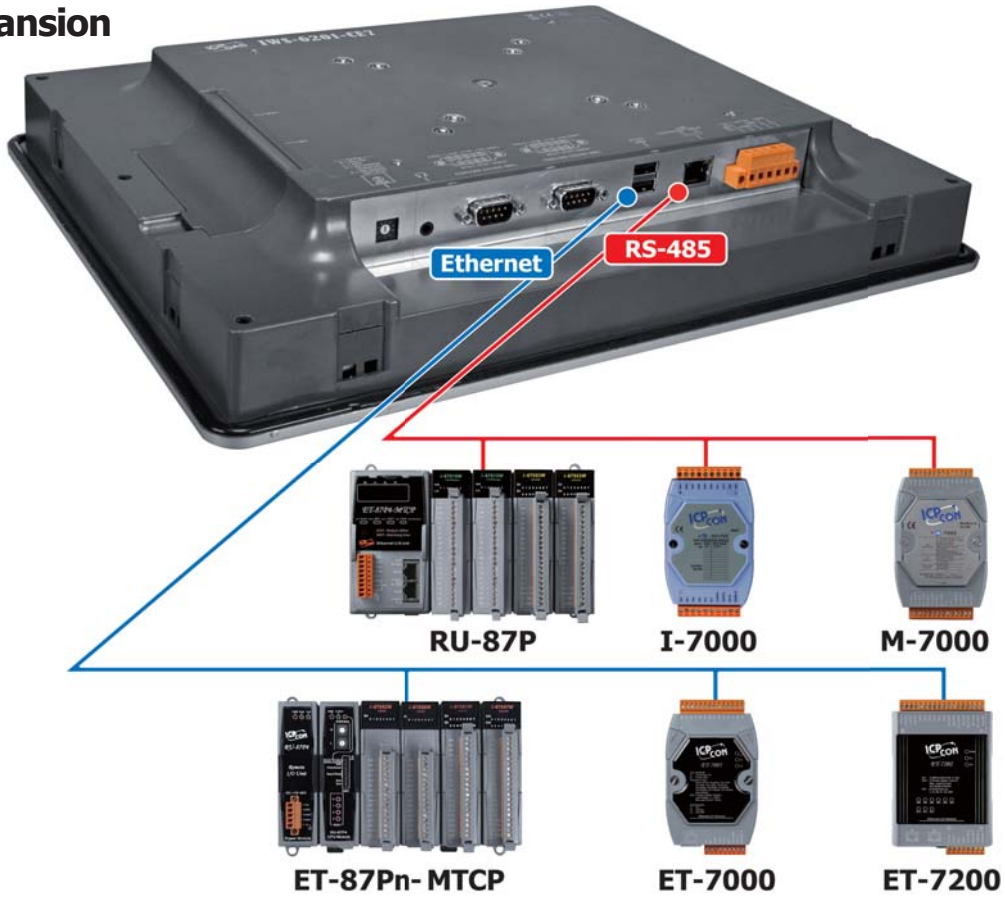


AEV SCADA/HMI panel controller	AEV PAC				
					
Model	**AEV-2201-CE7**	**AEV-3201-CE7**	**AEV-4201-CE7**	**AEV-5201-CE7**	**AEV-6201-CE7**
	AEV-2201-CE7-1500	**AEV-3201-CE7-1500**	**AEV-4201-CE7-1500**	**AEV-5201-CE7-1500**	**AEV-6201-CE7-1500**
Size / Resolution	7" 16:9 (800 × 400)	8.4" (800 × 600)	10.4" (800 × 600)	12.1" (800 × 600)	15" (1024 × 768)
Backlight life (hours)	20,000	50,000	50,000	50,000	50,000
Brightness/Contrast	400 cd/m2 (16 bit RGB 64K)				
Touch screen	4-wire resistive, light transmission 80%	5-wire resistive, light transmission 80%			
Main unit					
CPU	Cortex-A8, 1.0 GHz				
System memory	512 MB SDRAM				
Storage	256 MB Flash 4 GB microSD card	256 MB Flash 4 GB microSD card+SD adapter card			
Pre-installed operating system	Windows CE 7.0				
Preinstalled software	AVEVA Edge 300 tags (Preset)				
	AVEVA Edge 1500 tags				
Non-volatile memory	128 KB MRAM, 16 KB EEPROM				
Others	With 64-bit hardware serial number, real-time clock, dual watchdog timer				
Communication interface / HMI					
I/O expansion slots	0				
COM ports	2 × RS-232/RS-485	1 × RS-485 , 2 × RS-232/RS-485			
Ethernet ports	1 × RJ-45, 10/100/1000 Base-TX				
USB ports	2 × USB 2.0				
LED indicators	1 x system , 1 x power				
Buzzer	Yes				
10-segment rotary switch	Yes				
Audio	1 x Earphone-out				
Rubber buttons	No				
Power supply					
Input range	+12 ~ 48 VDC				
Power consumption	6.0 W	7.5 W	13.0 W	14.0 W	16.0 W
Redundant power input	No				
Powered from PoE	有 , IEEE 802.3af				
Mechanical / Environment					
Dimensions (mm)	213 × 148 × 44 (W × L × H)	249 × 207 × 64 (W × L × H)	291 × 229 × 54 (W × L × H)	324 × 255 × 64 (W× L×H)	381 × 305 × 63 (W × L × H)
Panel cut-out (mm)	197 × 133, ±1 (W × H)	235 × 193, ±1 (W × H)	277 × 215, ±1 (W × H)	310 × 241, ±1 (W × H)	362 × 286, ±1 (W × H)
Operating/storage temperature	-20 ~ +60°C / -20 ~ +70°C				
Humidity	10 ~ 90% RH relative humidity, Non-condensing				
Installation	Panel Mounting, VESA Mounting (75 × 75, 100 × 100)				
Ingress Protection Rating	Front panel: NEMA 4/ IP65				
Certification	CE, FCC				

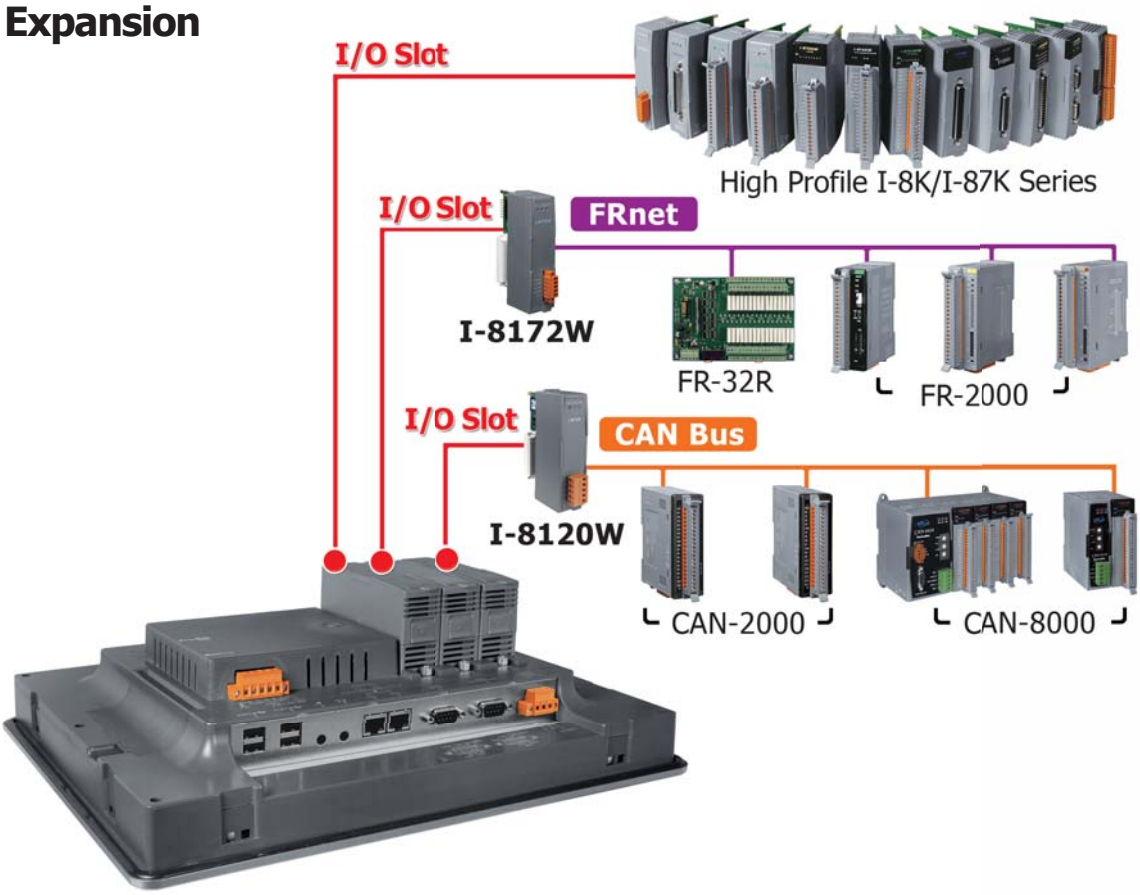
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4.4 I/O Expansion

Remote I/O Expansion



PAC I/O Expansion

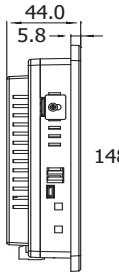


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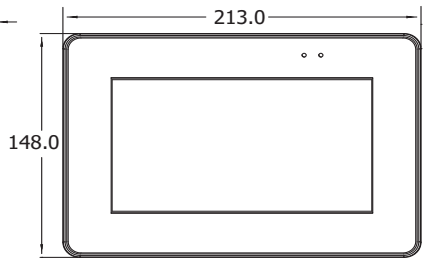
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4.5 Dimensions and Appearance

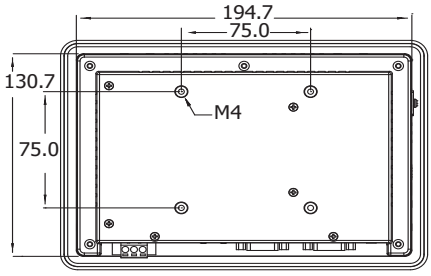
VP-220X / AEV-2201 Dimensions & Appearance



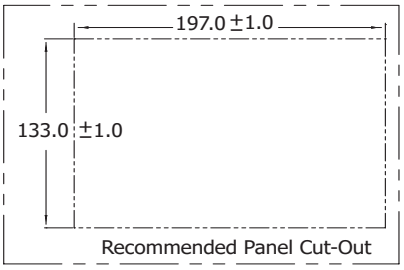
Left view



Front view

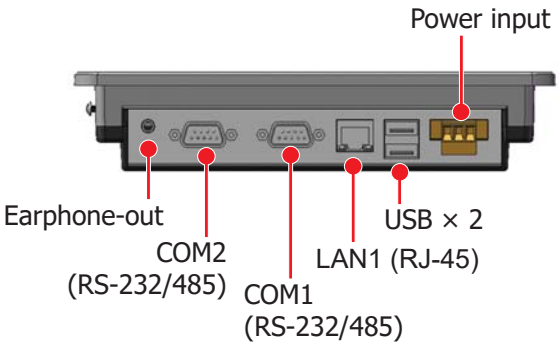


Rear view

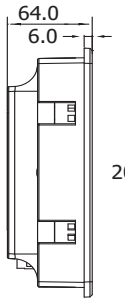


Front View (Panel Cut-out)

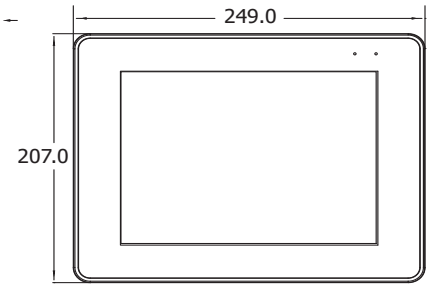




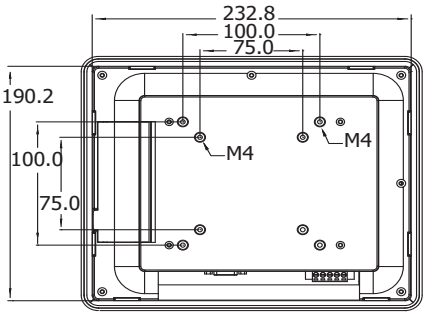
VP-320X / AEV-3201 Dimensions & Appearance



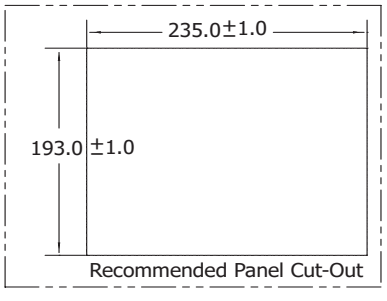
Left view



Front view

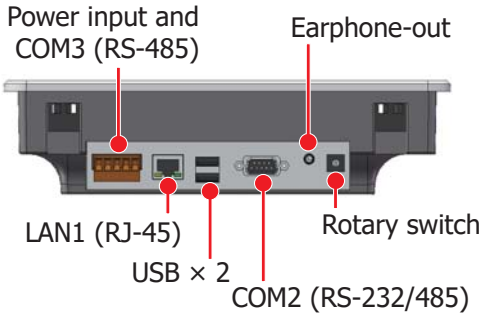


Rear view



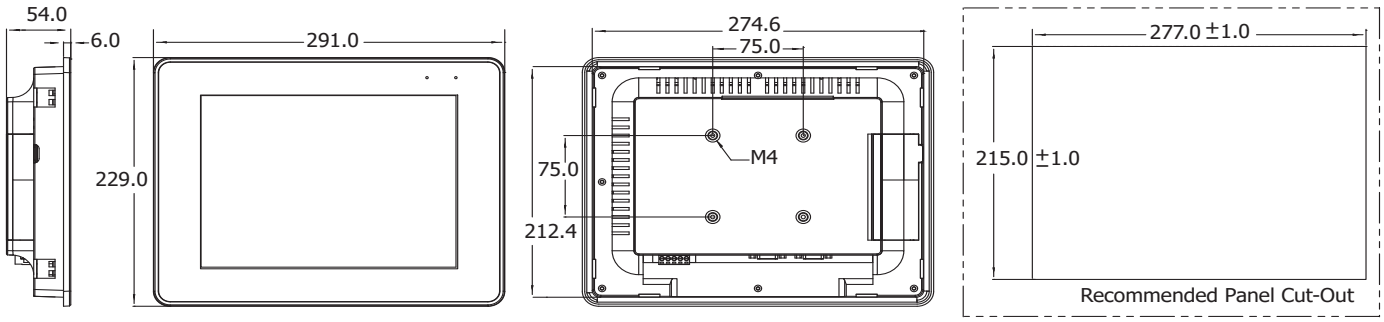
Front View (Panel Cut-out)



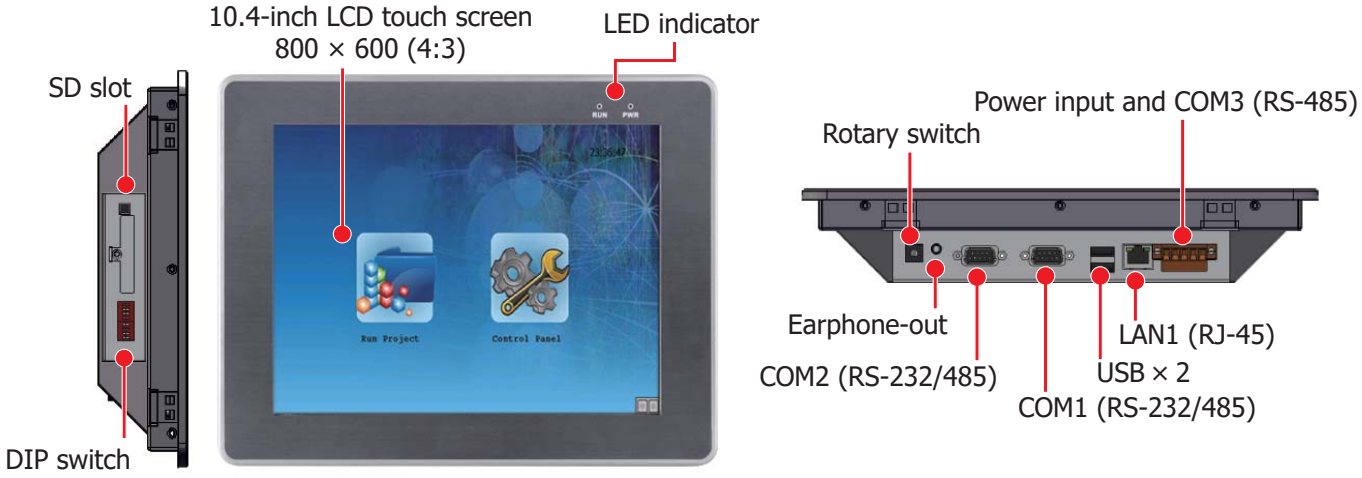


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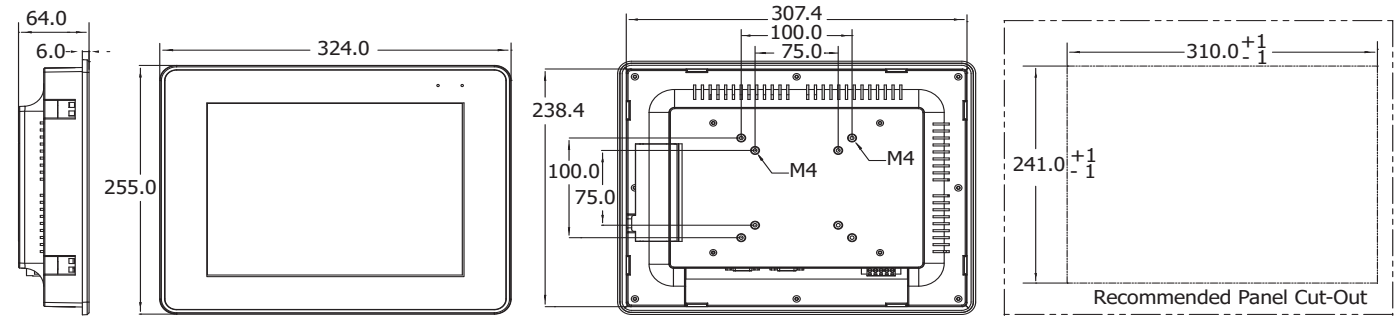
VP-420X / AEV-4201 Dimensions & Appearance



Left view | Front view | Rear view | Front View (Panel Cut-out)



VP-520X / AEV-5201 Dimensions & Appearance



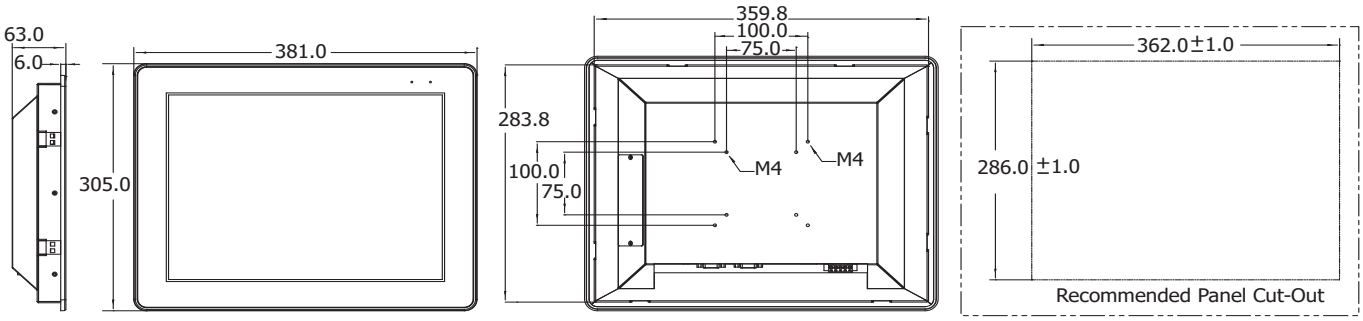
Left view | Front view | Rear view | Front View (Panel Cut-out)



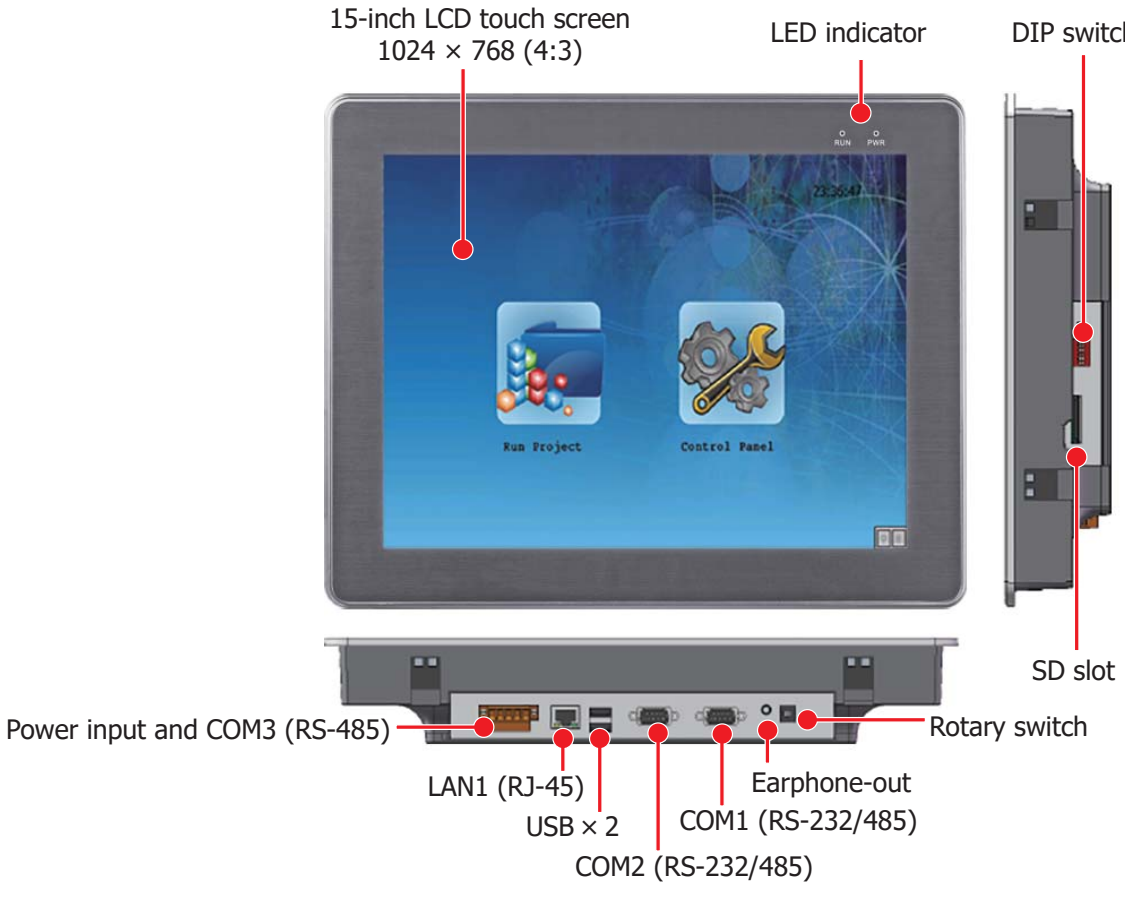
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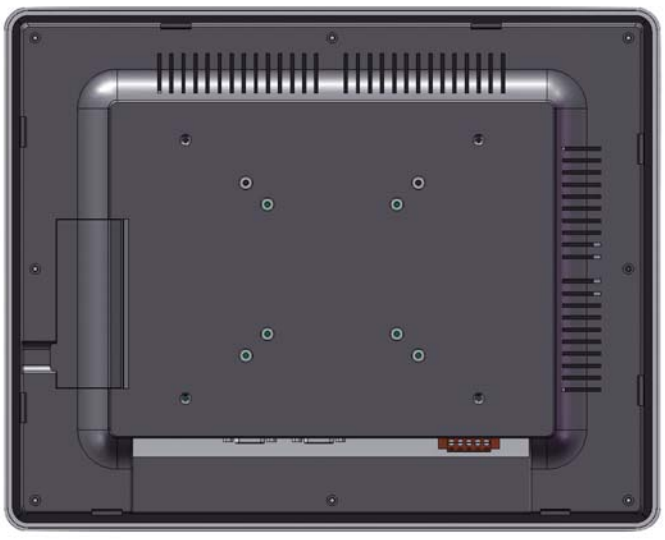
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VP-620X / AEV-6201 Dimensions & Appearance



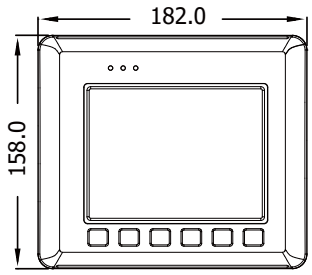
Left view | Front view | Rear view | Front View (Panel Cut-out)



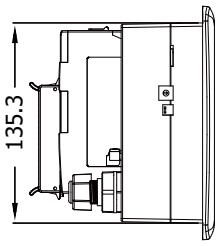


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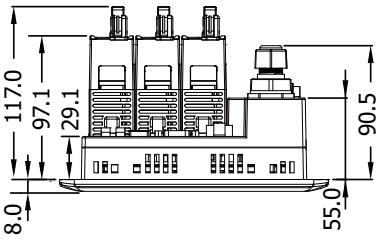
VP-123X/AEV-1231 Dimensions & Appearance



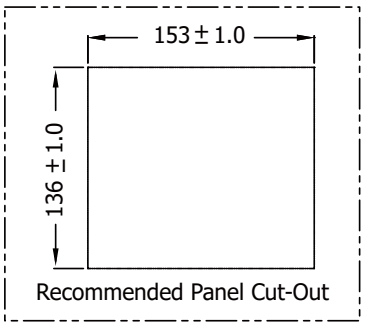
Front view



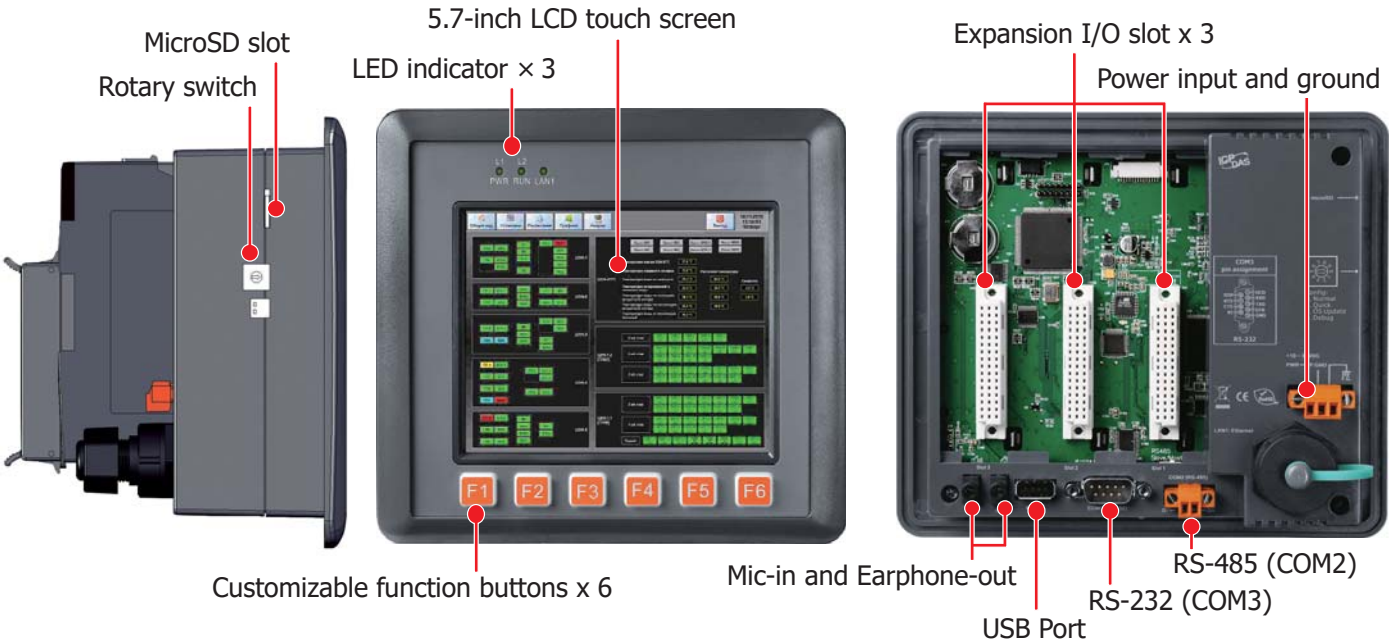
Left view

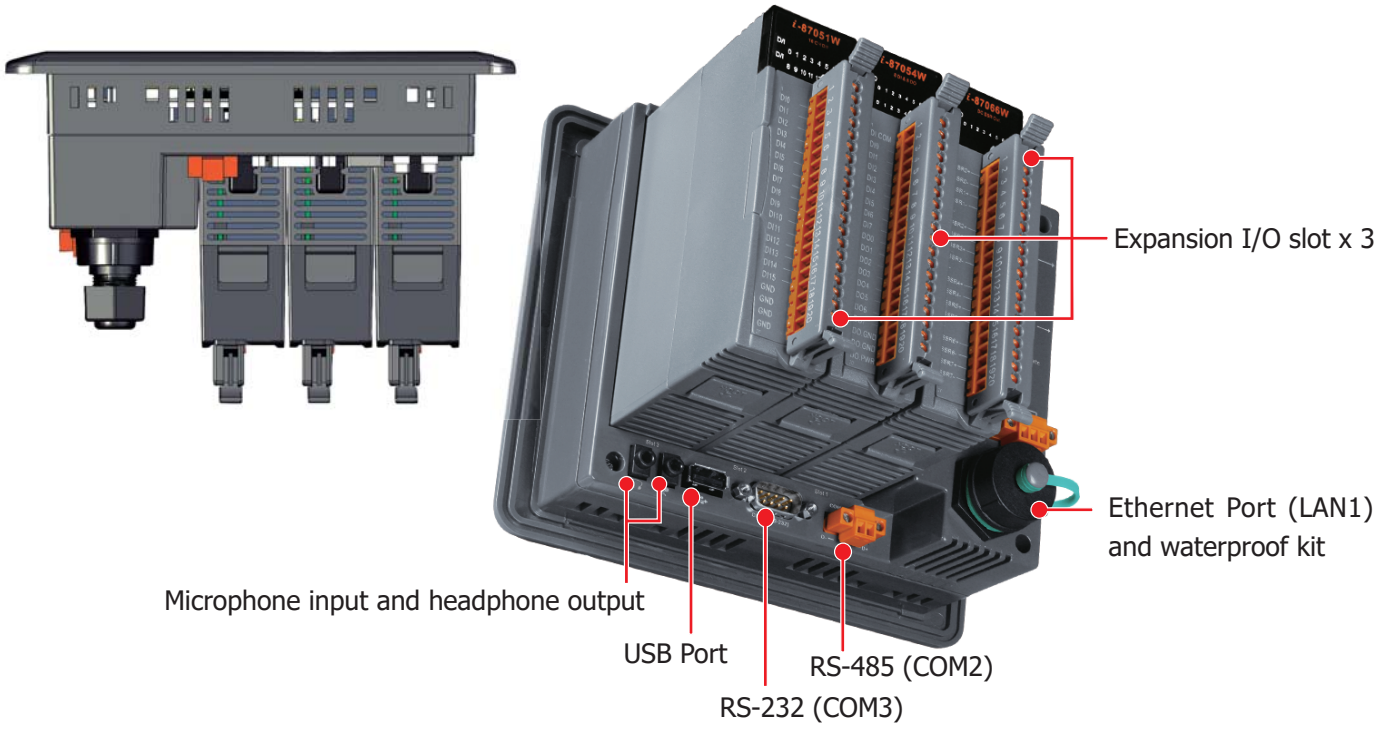


Top view



Front View (Panel Cut-out)

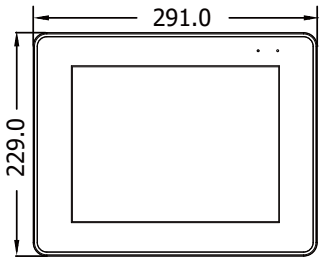




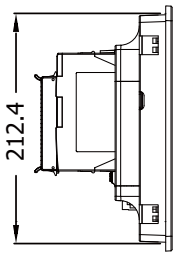
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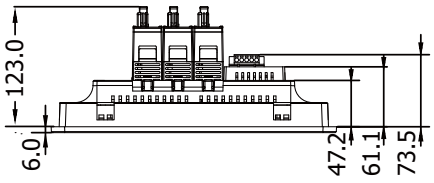
VP-423X/AEV-4231 Dimensions & Appearance



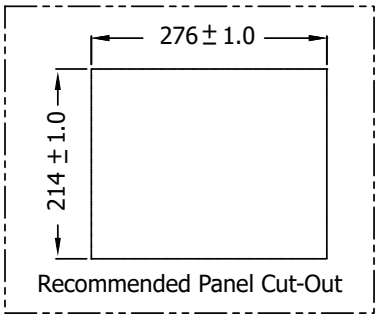
Front view



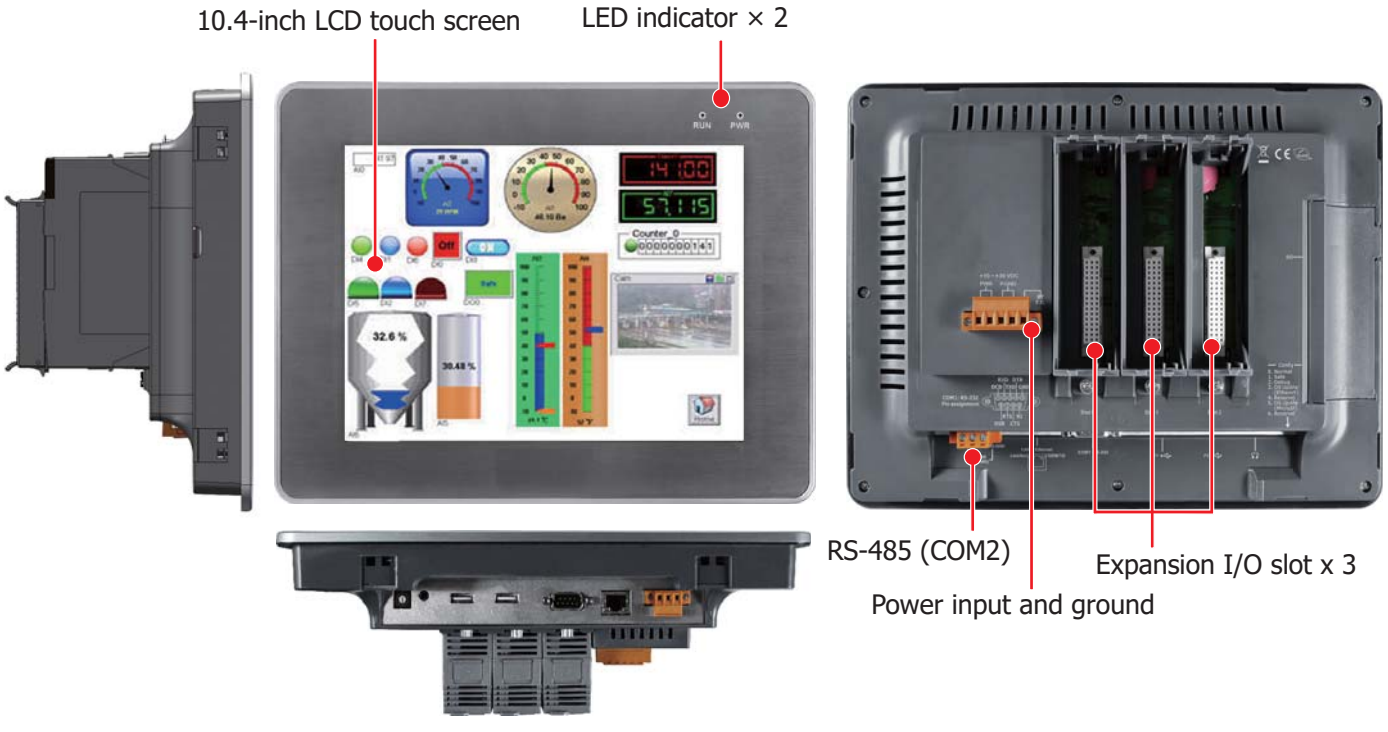
Left view

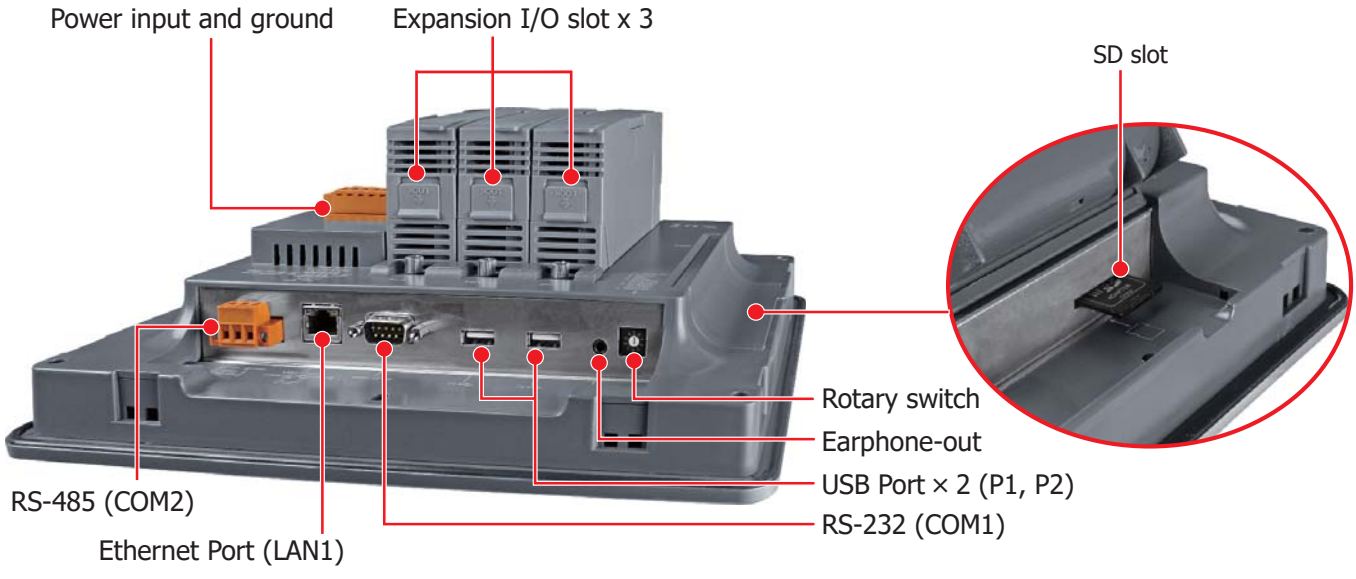


Top view



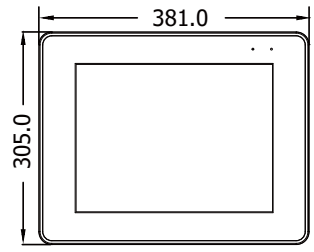
Front View (Panel Cut-out)



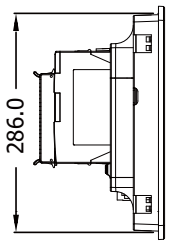


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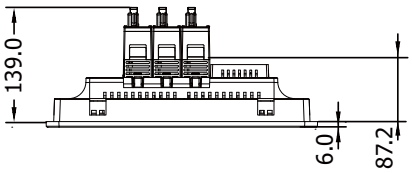
VP-623X/AEV-6231 Dimensions & Appearance



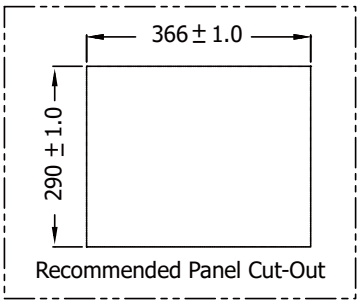
Front view



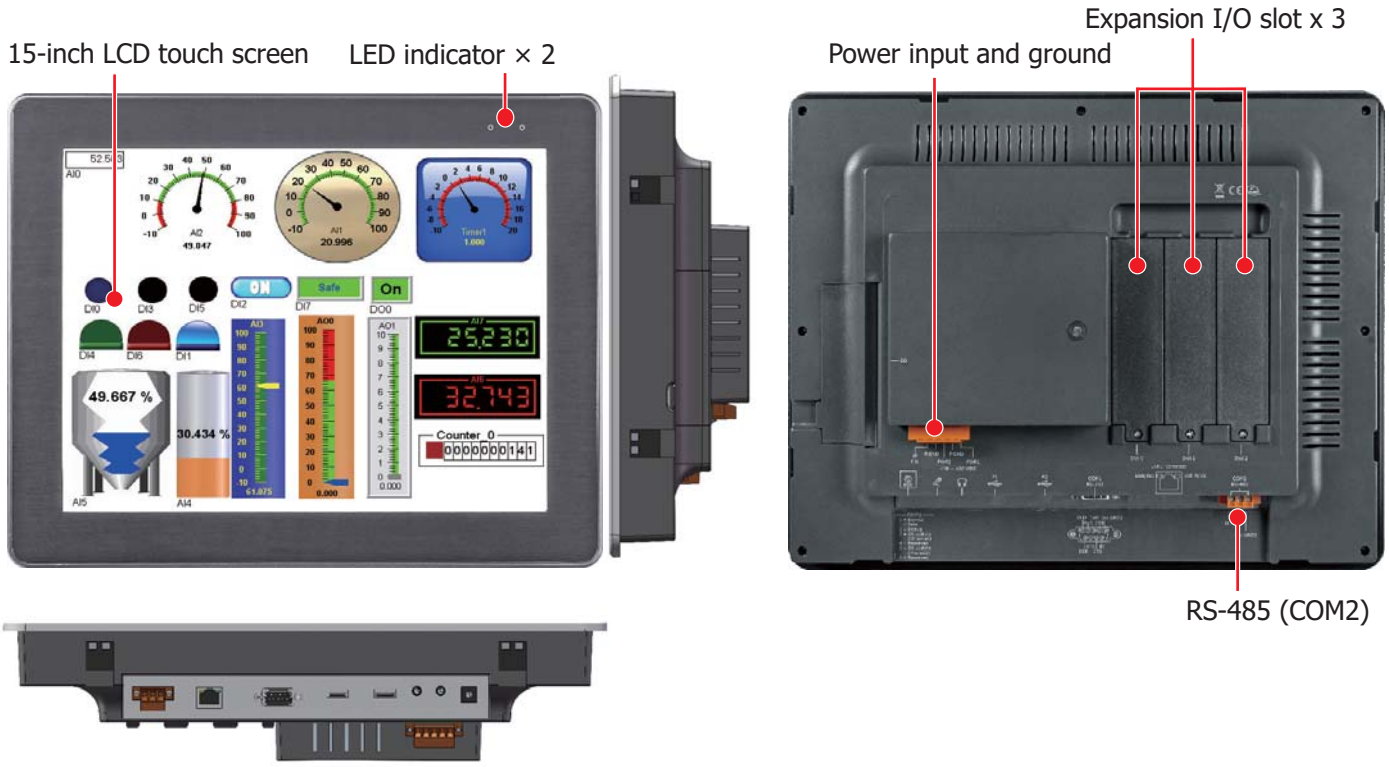
Left view

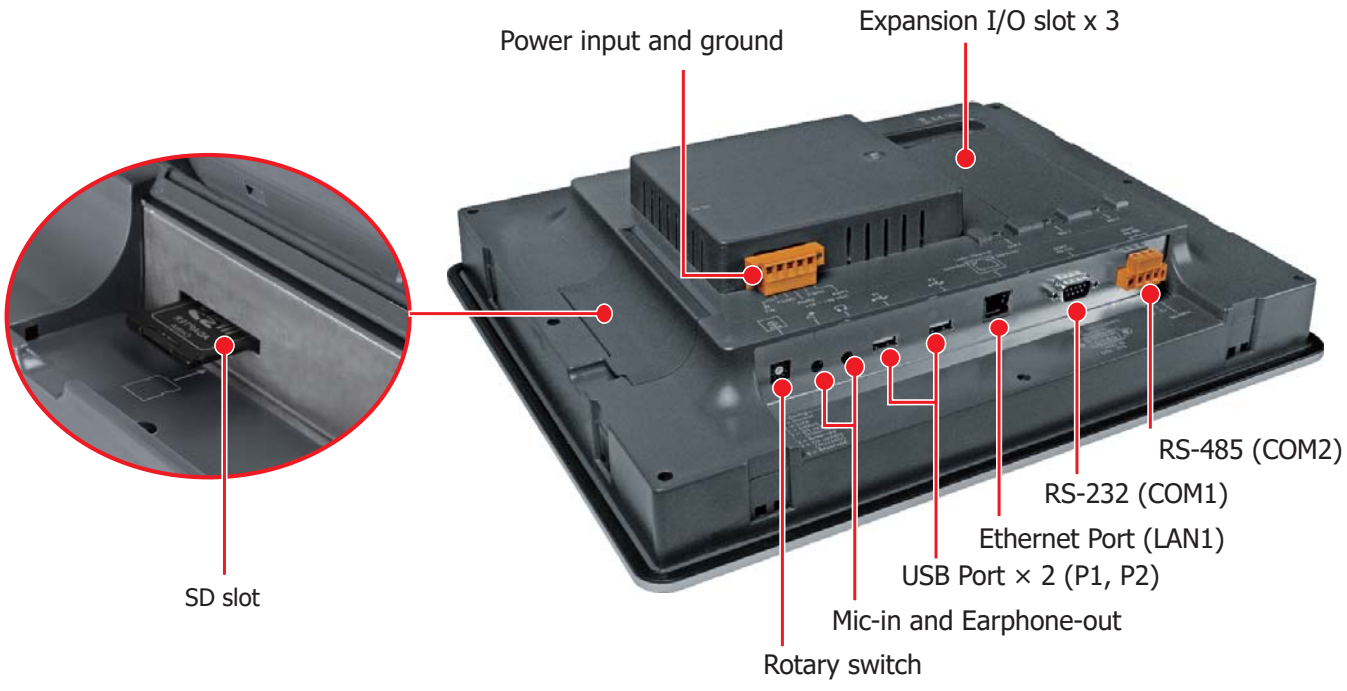


Top view



Front View (Panel Cut-out)





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CH5 Industrial I/O Modules

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CH5 Industrial I/O Modules

There are two types of I/O modules, parallel and serial. Both type of the modules can be plugged into the slots of PAC series. But only the serial module can be used in remote I/O units, such as RU-87Pn and ET-87Pn. Up to now, over 100 I/O, communication and motion control modules are available. For the new generation PACs, only the high profi le I-8KW and I-87KW I/O modules can be used.

Parallel I/O Modules (I-8KW Series) Includes

- High speed A/D: 100 k samples/second
- High speed D/A: 30 k (-10 ~ +10 V)
- High speed DI & DO: All Digital I/O modules provide visual indication of status via LED indicators
- High speed stepping/Servo motion control modules
- High speed encoder modules
- High performance Counter/Frequency modules
- High speed multi-channel RS-232/422/485 modules
- CAN bus communication modules

Serial I/O modules (I-87KW Series) Includes

- RTD Input modules
- Thermocouple Input modules
- Strain Gauge Input modules
- VW Input modules
- High resolution multi-channel Analog Input modules
- Isolated multi-channel D/A modules
- Counter/Frequency modules
- Digital Input and Digital Output modules with Latch and counter function



Comparison Table of I-8KW Series and I-87KW Series		
Items	**I-8KW Series**	**I-87KW Series**
Communication Interface	Parallel Bus	Serial Bus
Communication Protocol	-	Yes
DI with latched function	-	Yes
DI with latched function	-	Yes (100 Hz)
Power on value	-	Yes
Safe value	-	Yes
Programmable slew-rate for AO module	-	Yes

Supported I/O Modules		
Items	**I-8K series I/O Module**	**I-87K series I/O Module**
ViewPAC	Yes	Yes
iPPC-6x31-IoT	Yes	Yes
AEV	Yes	Yes

Note: Not all I/O modules or communication modules with complex functions are supported by any software development tools.

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5.1 I/O Features

Dual Watchdog Operation

The I-87K I/O modules include an internal Dual Watchdog. It is the combination of module watchdog and host watchdog. The module watchdog is a hardware watchdog designed to reset the micro-controller of the module when the module fails. This mechanism can keep the module work continuously without disruption. The host watchdog is a software watchdog that monitors the operating status of the PAC. When the PAC fails, the outputs of the module will be set to the safe values to prevent any erroneous operations. With Dual Watchdog, the control system is more reliable and stable.

Power On Value and Safe Value of Digital/Analog Output

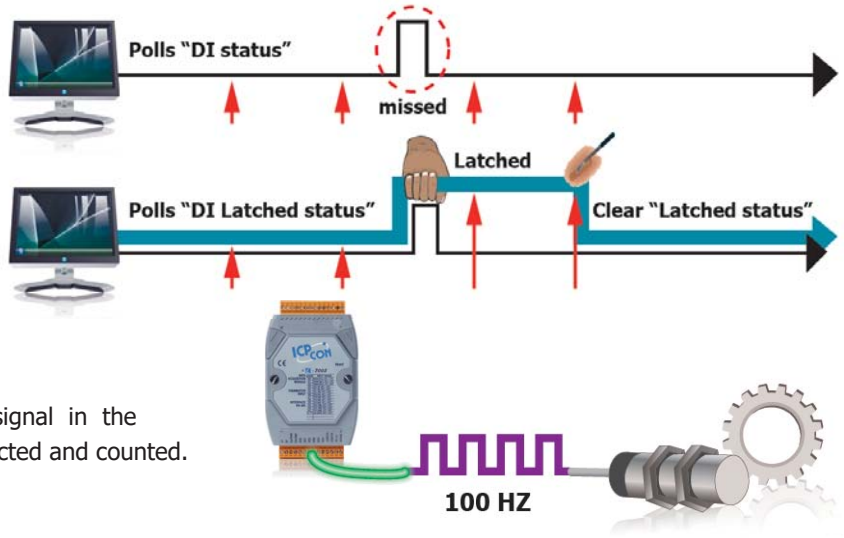
Besides setting by the set digital/analog output commands, the digital/analog outputs can be set under two other conditions. When the host watchdog is enabled and a host watchdog timeout occurs, the "safe value" is loaded into the digital/analog output ports. The set digital/analog output commands have no eff ect on the digital/analog output ports until the host watchdog timeout status is cleared. The host watchdog timeout status is saved in the EEPROM. The status is not changed even after power-on reset. It can be cleared only by the reset host watchdog timeout status command ~AA1. See Section A.2 for host watchdog details. When the module is powered on and the host watchdog timeout status is cleared, the "power-on value" is loaded into the digital/analog output ports. If the host watchdog timeout status is not cleared on power-on, then the safe value is loaded into the digital/analog output ports. Both the safe value and power-on value are set by the ~AA5V command.

Advanced DI Functions of I-87K Series I/O Module

DI channel is not only for reading digital input status but also provides several advanced functions in the meanwhile.

- **DI Latch Function**

All DI channels provide Latch function to keep the high/low events in the internal registers of the module. In general, the host controller polls modules one by one to get all DI status. Because RS-485 is a low speed fi eld bus, the polling will take time and probably miss a short duration signal. With the DI latch function, the short duration (>=5ms) signal will not be lost any more.



- **Low Speed Counter**

The DI module automatically counts the DI signal in the background. The signal under 100Hz can be detected and counted.

Overvoltage Protection

Many of our analog input modules provide high overvoltage protection for the analog input channels. When user picks wrong line accidentally or high voltage spike is applied to the analog input terminals, the module will not be broken and can still get the correct readings. This feature improves the reliability, reduces maintenance frequency, and makes the whole system more robust.

Open Wire Detection

The thermocouple, RTD and thermistor sensors are widely used in temperature control applications. If the system can not monitor the open wire status of the sensors, it may be very dangerous and cause large damage to life and property. When the wire of sensor is broken and the controller does not know the open wire status, the system may heat the boiler continuously and result in fi re or explosion. Our thermocouple, RTD, thermistor modules provide open wire detection and make the system safer.

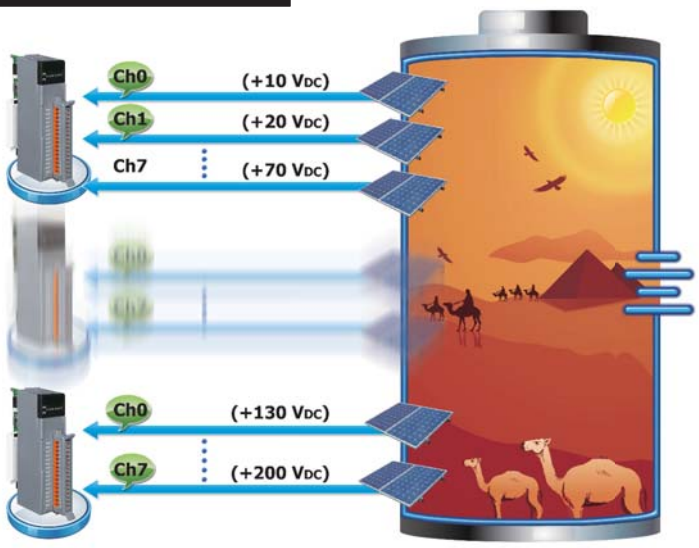
Over-current Protection

For the current measurement module, it may be damaged when there is high current or voltage introduced into the current loop. The protection for current measurement is improved to ±120 VDC and ±1000 mA.. A high current or voltage in the current loop will not damage the current measurement, so the whole system can work normally

Virtual Channel to Channel Isolation

The "R" and "Z" version of analog input modules provide ±400 VDC virtual channel to channel isolation to avoid the noise interference from adjacent channel in the industrial environment. To name a few of the modules, they are I-87017RW, I-87017ZW, I-87018RW, I-87018ZW, I-87019RW, and I-87019ZW. Though it is not real channel to channel isolation, there is only 1uA leakage current between two adjacent channels and the interference is very small and can be negligible.

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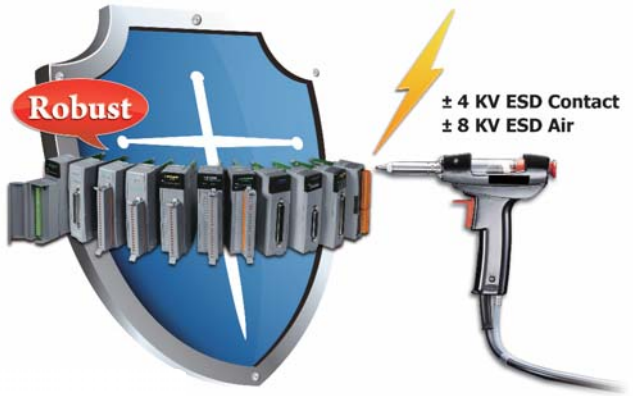


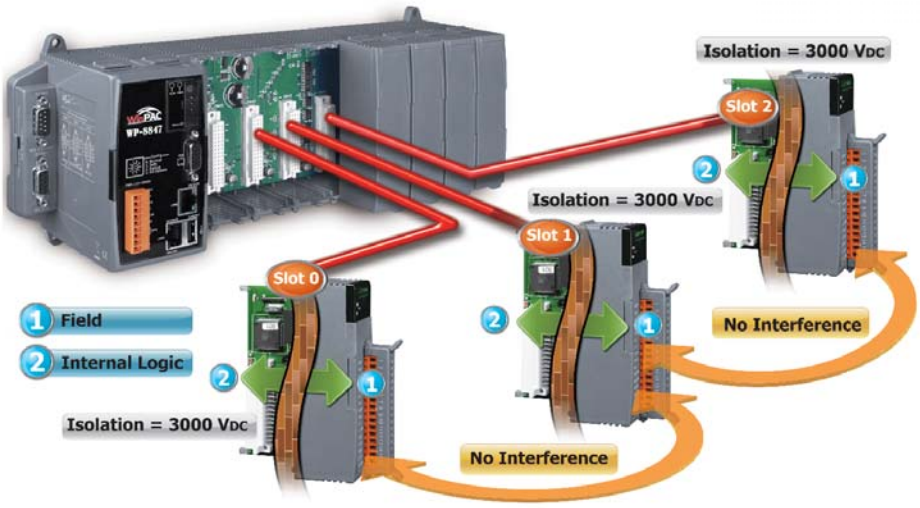
Common Voltage Protection

The typical application is to monitor the charging status of the batteries in series. The voltage of each battery is +10 VDC so the first battery is +10 VDC, the second battery is +20 VDC etc. The differential voltage of the 20th battery is only +10 VDC between vin+ and vin- terminal, while the common voltage is up to 200 VDC. If the common voltage of the analog input module is not large enough, then it can not measure the correct voltage of the battery in charging. ICP DAS analog input modules provide ±200 VDC high common voltage for industrial applications.

ESD Protection

In the industrial environment there are many noise, spike, electrostatic etc.. If the module is not strong enough, it is very easy to be damaged. The I-8KW and I-87KW modules all pass ±4 KV ESD contact and ±8 KV ESD air tests by static electricity gun in our laboratory. The test procedures follow the IEC 61000-4-2 standard. Our modules are immunity to the electrostatic discharges by using components that can clamp and resist to the high voltages defined by IEC 61000-4-2 standard.



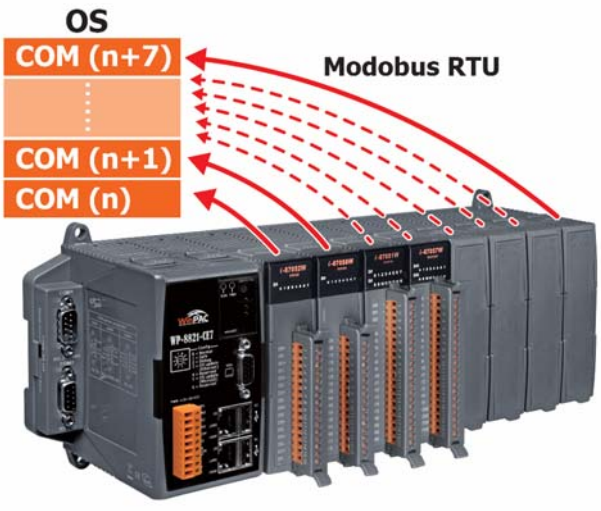


3000 VDC Isolation

The I-8K and I-87K series have 3000 VDC isolation between the field and the internal logic. This isolation prevents the noise from the field to the internal logic that can damage the module. It is recommended to choose isolated modules that will be plugged into controller. There will be no interference from the adjacent slot because the noise from the adjacent slot is isolated.

5.2 High-speed Temperature Input Module

Model	Analog Input			
	Channels	Resolution	Sampling Rate	Sensor
I-8015W	8	16-bit	100 Hz/ch	2/3-Wire RTD (Pt100, Pt1000, Ni120, Cu50, Cu100, Cu1000)
I-8015W-12	12			
I-8018W	8	16-bit	100 Hz/ch	Thermocouple (J, K, T, E, R, S, B,N, C, L, M, LDIN43710)
I-8018W-16	16			



- 100 Hz high-speed sampling rate for each channel
- Modbus RTU protocol
- 921k bps UART communication
- Each module occupies one COM port
- COM port driver available on PACs with Windows 10 IoT, WES7, WinCE 6.0, WinCE 7.0, Linux

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5.2 Analog Input Modules



Model	Analog Input				
	Channels	Resolution	Sampling Rate	Input Range	Sensor
I-87004W (*1)	4	12-bit	1 Hz	-	DS18B20 (-55 ~ +125°C)
I-87005W (*2)	8	16-bit	8 Hz	-	Thermistor
I-87013W	4	16-bit	10 Hz	-	RTD: Pt100, Pt1000, Cu50, Ni120
I-8014W	8/16	16-bit	250/45/25 kHz	±10 V, ±5 V, ±2.5 V, ±1.25 V, ±20 mA (with external 125 Ω resistor)	-
I-8014CW	8			±20 mA	-
I-87015W	7	16-bit	12 Hz	-	RTD: Pt100, Pt1000, Cu50, Cu100, Cu1000, Ni120
I-87015PW				-	
I-8017HW	8/16	14-bit	90/16 kHz	±10 V, ±5 V, ±2.5 V, ±1.25 V, ±20 mA (with external 125 Ω resistor)	-
I-8017HCW	8/16	14-bit	90/16 kHz	±10 V, ±5 V, ±2.5 V, ±1.25 V, ±20 mA (jumper)	-
I-8017DW					
I-87017W	8	16-bit	10/60 Hz	±10 V, ±5 V, ±1 V, ±0.5 V, ±150 mV, ±20 mA, 4 ~ 20 mA (with external 125 Ω resistor)	-
I-87017DW	8/16				
I-87017RW	8				
I-87017ZW	10/20	16-bit/ 12-bit	10/50 Hz	±10 V, ±5 V, ±1 V, ±0.5 V, ±150 mV, ±20 mA, 4 ~ 20 mA (jumper)	-
I-87017W-A5	8			±50 V, ±150 V	-
I-87017W-RMS	8	16-bit	10 Hz	0 ~ +10 Vrms, 0 ~ +5 Vrms, 0 ~ 1 Vrms, 0 ~ 500 mVrms, 0 ~ 150 mVrms	-
I-87017RCW	8	16-bit	10/60 Hz	0 ~ 20 mA, +4 ~ 20 mA, ±20 mA	-
I-87018W	8	16-bit	10 Hz	±2.5 V, ±1 V, ±500 mV, ±100 mV, ±50 mV, ±15 mV, ±20 mA (with external 125 Ω resistor)	Thermocouple (J, K, T, E, R, S, B, N. C, L, M)
I-87018RW					
I-87018PW-G/S	8			±2.5 V, ±1 V, ±500 mV, ±100 mV, ±50 mV, ±15 mV, ±20 mA, 0 ~ 20 mA, 4 ~ 2 0 mA (with external 125 Ω resistor)	
I-87018ZW-G/S	10				
I-87018ZW-G/S2					
I-87019PW-G/S	8	16-bit	8 Hz	±2.5 V, ±1 V, ±500 mV, ±100 mV, ±50 mV, ±15 mV, ±20 mA, 0 ~ 20 mA, 4 ~ 20 mA (jumper)	
I-87019RW	8				
I-87019ZW-G/S	10				
I-87019ZW-G/S2					



I-87018PW-G/S



I-87018ZW-G/S
= I-87018ZW Connects DB-1820 Directly



I-87019PW-G/S



I-87019ZW-G/S
= I-87019ZW Connects DB-1820 Directly



I-87018ZW-G/S2
= I-87018ZW Connect DN-1822 Directly and CA-252518D-1 1.8 m Cable



I-87019ZW-G/S2
= I-87019ZW Connect DN-1822 Directly and CA-252518D-1 1.8 m Cable

(*1): I-87004 has 4 ports, each port can link 20x DS18B20, total 80 sensors
(*2): I-87005 also includes 8 channel DO (Open Collector, sink, 700 mA)

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5.3 Analog Output Modules 

Model Name	Analog Outputs					
	Channels	Resolution	Response Time	Output Range	Wiring Current Output	channel to channel Isolation
I-87022W	2	12-bit	10 ms per channel	0 ~ 10 V, ±10 V, 0 ~ 20 mA, 4 ~ 20 mA	Sink	Yes, 3 kv
I-87024W	4	14-bit		0 ~ 5 V, ±5 V, 0 ~ 10 V, ±10 V, 0 ~ 20 mA, 4 ~ 20 mA		-
I-87024RW						
I-87024DW						
I-87024CW		12-bit		0 ~ 20 mA, 4 ~ 20 mA		Yes, 1 kv
I-87024UW		16-bit		0 ~ 5 V, ±5 V, 0 ~ 10 V, ±10 V, 0 ~ 20 mA, 4 ~ 20 mA	Source	-
I-87028CW	8	12-bit		0 ~ 20 mA, 4 ~ 20 mA	Sink	Yes, 1 kv
I-87028CDW						Yes, 3 kv
I-87028UW		16-bit		0 ~ 5 V, ±5 V, 0 ~ 10 V, ±10 V, 0 ~ 20 mA, 4 ~ 20 mA	Source	-
I-87028VW		12-bit		0 ~ 10 V	-	Yes, 2 kv
I-87028VW-20V				0 ~ 20 V		
I-8024W	4	14-bit	25 us per channel	±10 V, ±20 mA	Sink	-
I-8024UW	4	16-bit	105 us per channel	0 ~ 5 V, ±5 V, 0 ~ 10 V, ±10 V, 0 ~ 20 mA, 4 ~ 20 mA	Source	-
I-8028UW	8					

5.4 Digital Input Modules/Digital Output Modules

Model Name	Digital Input		
	Channels	Contact	ON Voltage Level
I-8040W	32	Wet	10 ~ 30 VDC
I-8040PW			19 ~ 30 VDC
I-8040PW-A1			3.5 ~ 30 VDC
I-8046W	16	Dry	Connect to GND
I-8048W (*)	8	Dry + Wet	4 ~ 30 VDC
I-8051W	16	Dry	Connect to GND
I-8052W	8	Wet	10 ~ 30 VDC
I-8053W	16		
I-8053PW	16		19 ~ 30 VDC
I-8053W-A1	16		3.5 ~ 30 VDC
I-8058W	8	AC, Differential	80 ~ 250 VAC
I-87040W	32	Wet	10 ~ 30 VDC
I-87040PW			19 ~ 30 VDC
I-87046W-G	16	Dry	Connect to GND
I-87051W-G			
I-87052W-G	8	Wet	3.5 ~ 30 VDC
I-87058W-G		AC, Differential	80 ~ 250 VAC
I-87059W-G			10 ~ 80 VAC
I-87053W-G	16	Dry + Wet	3.5 ~ 30 VDC
I-87053PW-G			19 ~ 30 VDC
I-87053W-A2			19 ~ 50 VDC
I-87053W-A5			68 ~ 150 VDC
I-87053W-AC1		Wet	10 ~ 80 VAC
I-87053W-E5			68 ~ 150 VDC
(*) : I-8048W is a 8-ch digital input interrupt module.			

Model Name	Digital Output			
	Channels	Type	Sink/Source	Max. Load
I-8037W	16	Open Collector	Source (PNP)	100 mA
I-8041W	32		Sink (NPN)	100 mA
I-8041PW				100 mA
I-8041AW			Source (PNP)	100 mA
I-8057W	16	Open Collector	Sink (NPN)	100 mA
I-8057PW				700 mA
I-87037W	16	Open Emitter	Source (PNP)	700 mA
I-87041W	32	Open Collector	Sink (NPN)	100 mA
I-87041PW				200 mA
I-87057W	16			100 mA
I-87057PW	16			700 mA

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Digital Modules

Model	DI (Digital Input)			DO (Digital Output)			
	Channels	Contact	ON Voltage Level	Channels	Type	Sink/Source	Max. Load
I-8042W	16	Wet	10 ~ 30 VDC	16	Open Collector	Sink (NPN)	100 mA
I-8050W (*)							100 mA
I-8054W	8			8			700 mA
I-8055W		Dry	Connect to GND				100 mA
I-87042W	16	Wet	3.5 ~ 30 VDC	16	Open Collector	Sink (NPN)	100 mA
I-87054W	8			8			700 mA
I-87055W		Dry	Connect to GND				100 mA

(*) : I-8050W is a 16-ch universal digital input/output module.



I-8017DW,
I-87017DW
8/16-ch AI Module



I-87024DW,
I-87028CDW,
4/8-ch AO Module



I-8040W, I-87040W Series,
32-ch Isolated DI Module



I-8041W, I-87041W Series,
32-ch Isolated DO Module



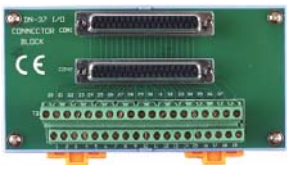
I-8042W, I-87042W Series,
16-ch Isolated DI &
16-ch Isolated DO Module





DN-37-381-A

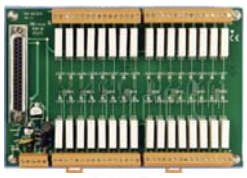
Female DB37 to Screw Terminal Board (Pitch= 3.81 mm) with DIN-rail Mounting
Dimensions: 99 mm x 81 mm
Include: CA-3710A (DB37 Male to Female Cable, 90°, 1 M)





DN-37-A

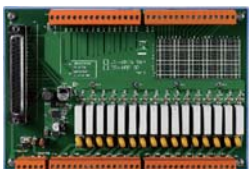
Female DB37 to Screw Terminal Board (Pitch= 5.08 mm) with DIN-rail Mounting
Dimensions: 144 mm x 72 mm
Include: CA-3710A (DB37 Male to Female Cable, 90°, 1 M)





DN-8K32R CR

32-channel Relay (Form A, 3A) Output Board (Pitch= 3.81 mm) with DIN-rail Mounting
Dimensions: 174 mm x 118 mm
Include: CA-3705A (DB37 Male to Female Cable, 90°, 0.5 M)





DN-8K16P16R

16-channel digital input terminal and 16-channel relay output board (Pitch= 3.81 mm) with DIN-rail Mounting
Dimensions: 174 mm x 118 mm
Include: CA-3705A (DB37 Male to Female Cable, 90°, 0.5 M)

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5.5 Multi-Function/Strain Gauge Modules



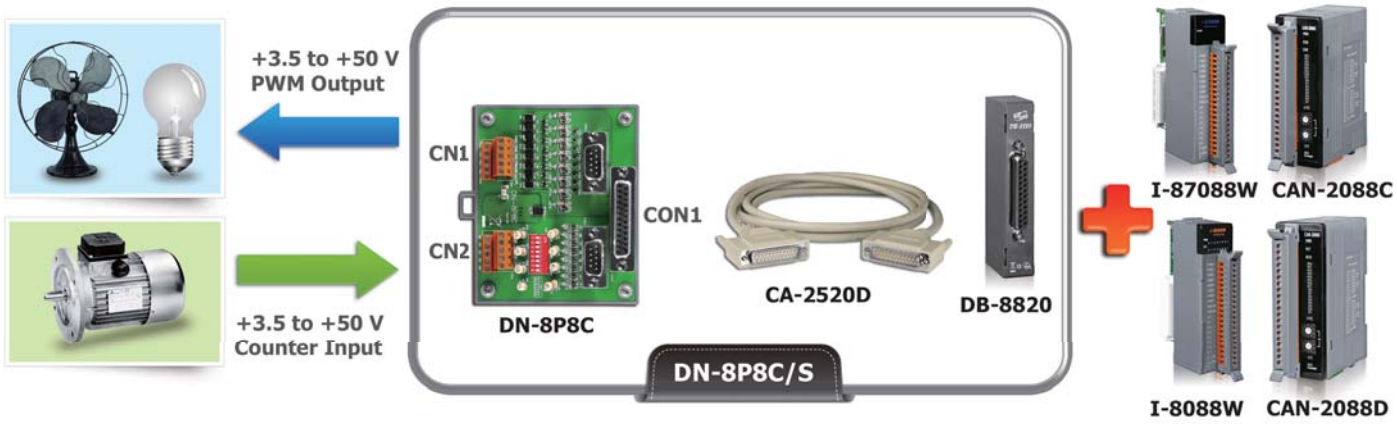
Model	Analog Inputs		Analog Outputs	Digital Inputs	Digital Outputs
	Channels	Sampling Rate			
I-87016W	2 (Strain Gauges) (Full-bridge, Half-bridge, Quarter-bridge)	10 Hz	2 (Voltage, Current)	2 (Wet, Sink)	2 (Open Collector, Sink)
I-87026PW	6 (Voltage, Current)	10/60 Hz			
I-8026W		9 kHz			

5.6 Relay Modules

Model	Channels	Type	Contact	Load Current	
I-8060W	6	Power Relay	Form C	0.5 A @ 125 VAC, 0.25 A @ 250 VAC, 2 A @ 30 VDC	
I-8063W (*)	4	Power Relay	Form C	5 A (NO)/3 A (NC) @ 30 VDC 5 A (NO)/3 A (NC) @ 277 VAC	
I-8064W	8	Power Relay	Form A	5 A @ 250 VAC, 5 A @ 30 VDC	
I-8068W	8	Power Relay	Form A × 4 Form C × 4	Form A: 5 A @ 250 VAC/28 VDC	Form C: 5 A (NO) @ 277 VAC/30 VDC 3 A (NC) @ 277 VAC/30 VDC
I-8069W	8	PhotoMOS	Form A	1 A @ 60 VDC	
I-87061W	16	Power Relay	Form A	10 A @ 250 VAC/24 VDC	
I-87061PW				3 A @ 250 VAC/24 VDC	
I-87063W (*)	4	Power Relay	Form C	5 A (NO)/3 A (NC) @ 30 VDC 5 A (NO)/3 A (NC) @ 277 VAC	
I-87064W	8	Power Relay	Form A	5.0 A @ 250 VAC/30 VDC	
I-87065W	8	AC SSR	Form A	1.0 A @ 265 VAC	
I-87066W	8	DC SSR	Form A	1.0 A @ 30 VDC	
I-87068W	8	PhotoMOS	Form A × 4 Form C × 4	Form A: 8 A @ 250 VAC/28 VDC	Form C: 5 A (NO) @ 277 VAC/30 VDC 3 A (NC) @ 277 VAC/30 VDC
I-87068W-2A		Signal Relay		Form A: 2 A @ 30 VDC 0.24 A @ 220 VDC 0.25 A @ 250 VAC	Form C: 2 A @ 30 VDC 0.24 A @ 220 VDC 0.25 A @ 250 VAC
I-87069W	8	PhotoMOS	Form A	0.13 A, 350 V Max. at DC/AC	
I-87069PW				1.0 A, 80 V Max. at DC/AC	
(*): I-8063W and I-87063W also have 4 DI (Wet contact, sink and source)					

5.7 Counter/Frequency/PWM Modules

Model	Counter/Frequency Input					PWM Output		
	Channels	Counter	Signal	Speed	Frequency Accuracy	Channels	Type	
I-87082W	2	32-bit	Up	100 kHz	1 Hz	2	Open Collector	
I-8084W	4/8	32-bit	Up, CW/CCW, A/B, Pulse/Dir	250 kHz	0.1 Hz	-	-	
I-87084W						-	-	
I-8088W	-	-	-	-	-	8	PWM	Duty: 0.1 ~ 99.9%
I-87088W	8	32-bit	Up	1 MHz				Freq: 1 ~ 500 KHz



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5.8 Motion Control Modules



Model	Encoder Input				Command Pulse Output				Daughter Board	Other Functions
	Axis	Counter	Input Rate (pps)	Signal	Axis	Speed (pps)	Counter	Signal		
I-8092F	2	32-bit	4 M	CW/CCW, A/B	2	4 M	32-bit	CW/CCW, PULSE/DIR	DN-8237	FRnet Master
I-8093W	3	32-bit	1 M	CW/CCW, A/B, Pulse/Dir	-	-	-	-	-	-
I-8094	4	32-bit	4 M	CW/CCW, A/B	4	4 M	32-bit	CW/CCW, PULSE/DIR	DN-8468	-
I-8094F	4	32-bit	4 M	CW/CCW, A/B	4	4 M	32-bit	CW/CCW, PULSE/DIR	DN-8468	FRnet Master
I-8196F	6	32-bit	12 M	CW/CCW, A/B	6	12 M	32-bit	CW/CCW, PULSE/DIR	DN-8368	FRnet Master

Daughter-Board for two-axis motion controller

DN-8237GB: for general purpose usage

DN-8237MB: for Mitsubishi servo J2 Amplifier

DN-8237YB: for Yaskawa servo Amplifier

DN-8237DB: for Delta ASDA A servo Amplifier

DN-8237PB: for Panasonic servo minas A Amplifier

DN-8237 Series



Dimensions: 110 mm × 107 mm

Daughter-Board for four-axis motion controller

DN-8468GB: for general purpose usage

DN-8468MB: for Mitsubishi servo J2 Amplifier

DN-8468YB: for Yaskawa servo Amplifier

DN-8468DB: for Delta ASDA A servo Amplifier

DN-8468PB: for Panasonic servo minas A Amplifier

DN-8468FB: for FUJI FALDIC-W servo Amplifier

DN-8468 Series



Dimensions: 162 mm × 107 mm

Daughter-Board for six-axis motion controller

DN-8368GB: for general purpose usage

DN-8368MB: for Mitsubishi servo J2 Amplifier

DN-8368UB: for universal snap -on usage

DN-8368 Series



Dimensions: 162 mm × 107 mm

5.9 Serial Communication Modules



Model	Bus	Ports	Type	Isolation	Connector	Accessories
I-8112iW	Parallel	2	RS-232	2500 Vrms	2 × D-Sub9	CA-0915
I-8114W		4		-	D-Sub 37	CA-9-3705
I-8114iW		4		2500 Vrms		
I-8142iW		2	RS-232/485		Terminal Block	-
I-8144iW-G		4				



CA-0915
Line length: 1.5 M



CA-9-3705
Line length: 20 cm



CA-9-3715D
Line length: 1.5 M

5.10 CAN/ CANopen/ DeviceNet Master Modules



Model	Bus	Ports	Max Speed	Protocol
I-8120W	Parallel	1	1 Mbps	CAN 2.0A/2.0B
I-8123W				CANopen
I-87123W	Serial			
I-8124W	Parallel		500 Kbps	DeviceNet
I-87124W	Serial			

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5.11 3G/ 4G/ GPS Modules

Model		Frequency (MHz)	GPS Interface	Max. Download Speed	AT Command	TCP/IP Protocol
	I-8212W-3GWA	2G (GSM/GPRS): 850/900/1800/1900 3G (UMTS/HSDPA/HSUPA): 2100/1900/850	-	9.6 ~ 115.2 Kbps	Support	Support
	I-8213W-3GWA	2G (GSM/GPRS): 850/900/1800/1900 3G (UMTS/HSDPA/HSUPA): 2100/1900/850	Support			
	I-8213W-4GE	2G (GSM/GPRS): 850/900/1800/1900 3G (UMTS/DC-HSPA+): 850/900/2100 4G (FDD LTE): B1/B3/B5/B7/B8/B20		100 Mbps		

Model		GPS Channels	SBAS	GPS Output Interface	GSM/GPRS	Digital Output	Protocol/ Interface	Description
	I-87211W	32	WAAS, EGNOS, MSAS	RS-232	-	2	DCON	GPS Receiver and 2 DO Module

5.12 GPS/ GLONASS Time Sync Module

(currently only supports Linux, Windows is not yet supported)

Model		GNSS	SBAS	Acquisition Time	Cable Length of Antenna
	I-8211W	GPS, GLONASS	WAAS, EGNOS, MSAS	Warm start = 2 seconds (typical) Cold start = 36 seconds (typical)	5 m

※ Introduction

I-8211W-G is a GPS, GLONASS receiver module designed to use GPS, GLONASS satellite time for automatic and precise time synchronization. The I-8211W-G can be inserted into any slot of the LinPAC, and the LinPAC will automatically reduce the RTC drift to 1 ms.

PS: LinPAC with NTPD package: LP-8x21, LX-8x31



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6.1 SmartView -Multifunctional HMI

SmartView series is a human-machine interface product used in industrial automation. In addition to the process operation and information display of the traditional human-machine interface, it also has modern network communication standard protocols, such as OPC-UA industrial automation standard communication, MQTT IoT active M2M transmission technology, so that the human-machine interface can directly Integration in the context of Industry 4.0.

In terms of mechanism, SmartView has a strong touch panel, which is waterproof and dustproof up to NEMA4/IP65 foreign object protection level, allowing SmartView to operate safely in harsh on-site environments.

Special function

- Built-in SmartView Runtime Edition license
- Built-in non-volatile memory
- Backlight control for power saving
- Linux-based OS
- Dual watchdog timer
- PoE powered

Human-machine operation

- 10", 15" LCD display panel
- Resistive Touch Panel
- 2 ~ 4 LED indicators
- 10-segment rotary switch



System composition

- ARM CPU
- Built-in 2 GB SDRAM
- Built-in 8 GB eMMC disk
- Built-in 4 GB microSD card

Rich I/O expansion interface

- 1 Ethernet port
- 1 ~ 2 USB ports
- 2 ~ 3 RS-232 or RS-485 ports
- 1 I/O expansion slot
- Mic-in and Earphone-out

ARM processor

- 64-bit Arm Cortex CPU
- Powerful multi-core processors boost HMI operation, data calculation, etcs

IoT Communication Protocol



- Support OPC-UA industrial automation standard communication
- Support Modbus RTU/TCP
- Support MQTT IoT transmission technology

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Body Design

- Rugged construction and reliable body design
- Fanless Design
- Internal isolation protection circuit to avoid damage caused by static electricity and noise
- Operating temperature: -20°C ~ +60°C

Panel enclosure

Panel mount design,
NEMA 4/IP65 compliant,
Resistant to water,
moisture and dust.

Creator Development Tools

- Simply drag and drop objects and set the data source to automatically visualize the data
- Windows Integrated Development Software
- Create HMI projects without programming
- Rich and flexible object editing tools
- Write Script to control
- Support multiple languages



SmartView software features

- Remote device data acquisition
- Data Visualization
- Built-in high-performance Script programming
- User account / Access control management
- Integrate alarm detection and recording system, remote equipment data recording system, Recipe database management system, work scheduling.

I/O Expansion



- Various expansion interfaces allow connection different kinds of remote I/O modules
- Provide a variety of local serial modules
- Provide PCIe interface to connect high-speed data acquisition module

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6.2 SmartView IoT Communication Features

Built-in OPC-UA Server

- Provides external system access to HMI internal data.
- For example SCADA, MES/ERP.
- Provides a highly secure communication encrypted connection.
- User account browse, write, read permission planning.



Connect IT and OT, integrate equipment information
Connecting to the Cloud and
Connecting to the IoT





MQTT

OPC UA

Modbus

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Support MQTT: Interactive M2M transmission technology

MQTT is an interactive M2M (Machine-to-Machine) transmission technology that simplifies, accelerates SmartView the exchange of various information between them can ensure that the communication is completed under the condition of safe and reliable information exchange. in SmartView the use of MQTT can greatly simplify the construction and maintenance of industrial application systems, and facilitate quick and easy connection of various devices "Internet of Things"



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6.3 Creator software provides rich and flexible object editing tools for easy browsing, adjustment or management of HMI functions. The software can also integrate commonly used PLC communication protocols, import and export data to shorten the development process, and download or update the SmartView project through the TCP transmission.

Communication protocols of remote equipment data acquisition

- Support Modbus RTU/TCP
- Support OPC-UA Client
- Support MQTT Client

Alarm system

- Provides analog and digital signals detection
- Provides alarm priority and severity
- Runs a self-defined Script as an alarm is triggered, recovered, or checked
- The alarm signals support Dead-Band and Debounce functions
- Automatically exports the alarm records to external storage devices.

Data logger system

- The system automatically collects multiple data according to the settings, adds the time records to the data, and saves it in the database of a server.
- Triggering conditions: time intervals,changed data and control bits.
- The system automatically and simultaneously exports the data records with a CSV file format to an external storage device.

User account management

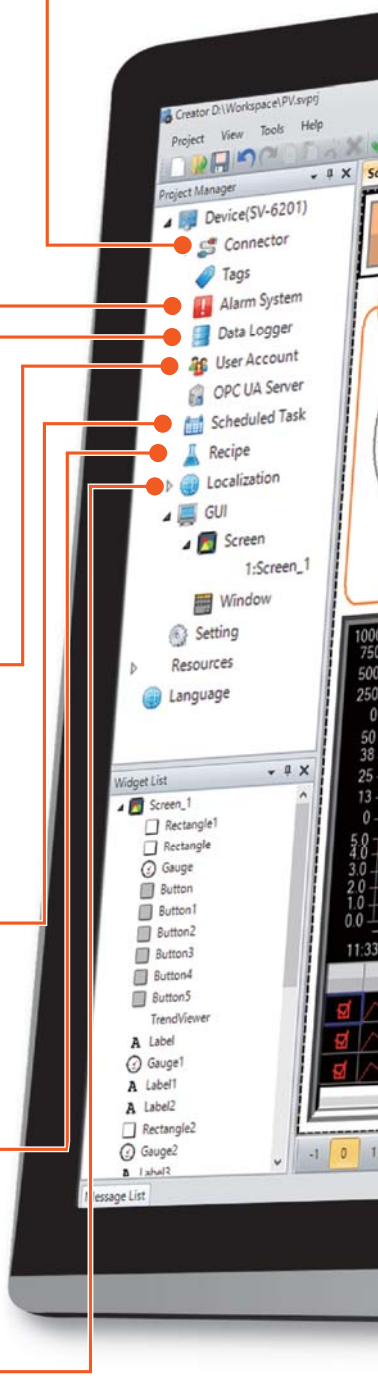
- Provides group and user account management
- Provides on-line account editing information
- Access control management: Object operation and OPC-UA browsing, read and write operations require a privileged account.

Task scheduling

- Arranges for the system to perform tasks according to specific conditions
- Various triggering conditions: date, counter, signal triggering, system event
- Performs tasks with the Script program

Recipe management system

- Manages multiple recipe charts and records with the concept of database
- Supports on-line recipe records editing
- Recipe records can be imported/exported from/to external storage devices



Script program

- Directly controls the appearance, placement position and size of the items on the page, making the content more dynamic.
- Uses high-performance Lua Script 5.4 engine
- Serial Port/TCP communication program design
- Built-in abundant system library
- Expansion I/O module library

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Easy and Simple Screen Designer

- Use the mouse to drag and drop objects to arrange the screen layout and design the interface.
- The property sheet is convenient to quickly design the property function of the object.
- Provide rich visual objects.
- Object status preview, multi-language preview



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6.4 SmartView Selection Guide

SV - X i 1 1

Display size
4: 10.4 inch LCD display
6: 15 inch LCD display

CPU type
8: i.MX8M mini

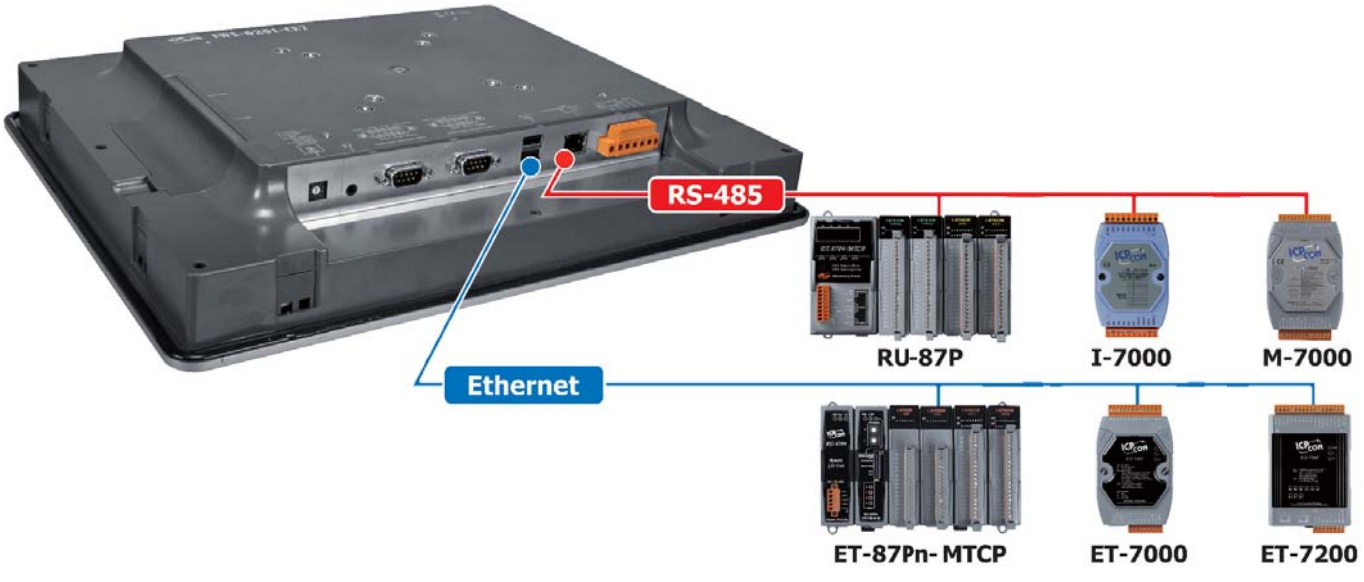
Number of I/O slots
1: 1:1 I/O SLOT

SmartView	10.4" SmartView	15" SmartView
		
Model	**SV-4811**	**SV-6811**
Develop software		
Creator	Creator is an integrated development environment (IDE) design software for SmartView	
Size	10.4"	15"
Resolution	800 × 600	1024 × 768
Backlight life (hours)	50,000	50,000
Brightness	400 cd/m2	400 cd/m2
Color	24 bit RGB 16.7M	24 bit RGB 16.7M
Touch screen	5-wire resistive, light transmission 80%	5-wire resistive, light transmission 80%
Main unit		
CPU	i.MX8M mini	i.MX8M mini
System memory	2 GB SDRAM	2 GB SDRAM
Storage	8 GB eMMC 4 GB microSD card+ SD adapter card	8 GB eMMC 4 GB microSD card+ SD adapter card
Non-volatile memory	128 KB MRAM, 16 KB EEPROM	128 KB MRAM, 16 KB EEPROM
Operating system	Linux-based OS	Linux-based OS
Others	With 64-bit hardware serial number, real-time clock, dual watchdog timer	
Communication interface / HMI		
I/O expansion slots	Yes, eXV-board (PCIe interface) and XV-board (serial interface) expansion cards	
COM ports	1 × RS-485 2 × RS-232/RS-485	1 × RS-485 2 × RS-232/RS-485
Ethernet ports	1 × RJ-45, 10/100/1000 Base-TX	1 × RJ-45, 10/100/1000 Base-TX
USB ports	2 × USB 2.0	2 × USB 2.0
LED indicators	1 x system, 1 x power	1 x system, 1 x power
Buzzer	Yes	Yes
10-segment rotary switch	Yes	Yes
Audio	Earphone-out x1	Earphone-out x1
Power supply		
Input range	+12 ~ 48 VDC	+12 ~ 48 VDC
Power consumption	13.0 W	16.0 W
PoE powered	Yes, IEEE 802.3af	
Mechanical / Environment		
Dimensions (mm)	291 × 229 × 54 (W × L × H)	381 × 305 × 63 (W × L × H)
Panel cut-out (mm)	277 × 215, ±1 (W × H)	362 × 286, ±1 (W × H)
Installation	Panel Mounting, VESA Mounting (75 × 75, 100 × 100)	
Ingress Protection Rating	Front panel: NEMA 4/ IP65	
Operating temperature	-20 ~ +60°C	
Storage temperature	-20 ~ +70°C	
Humidity	10 ~ 90% RH relative humidity, no condensation	
Certification	CE, FCC	
Casing	Metal	

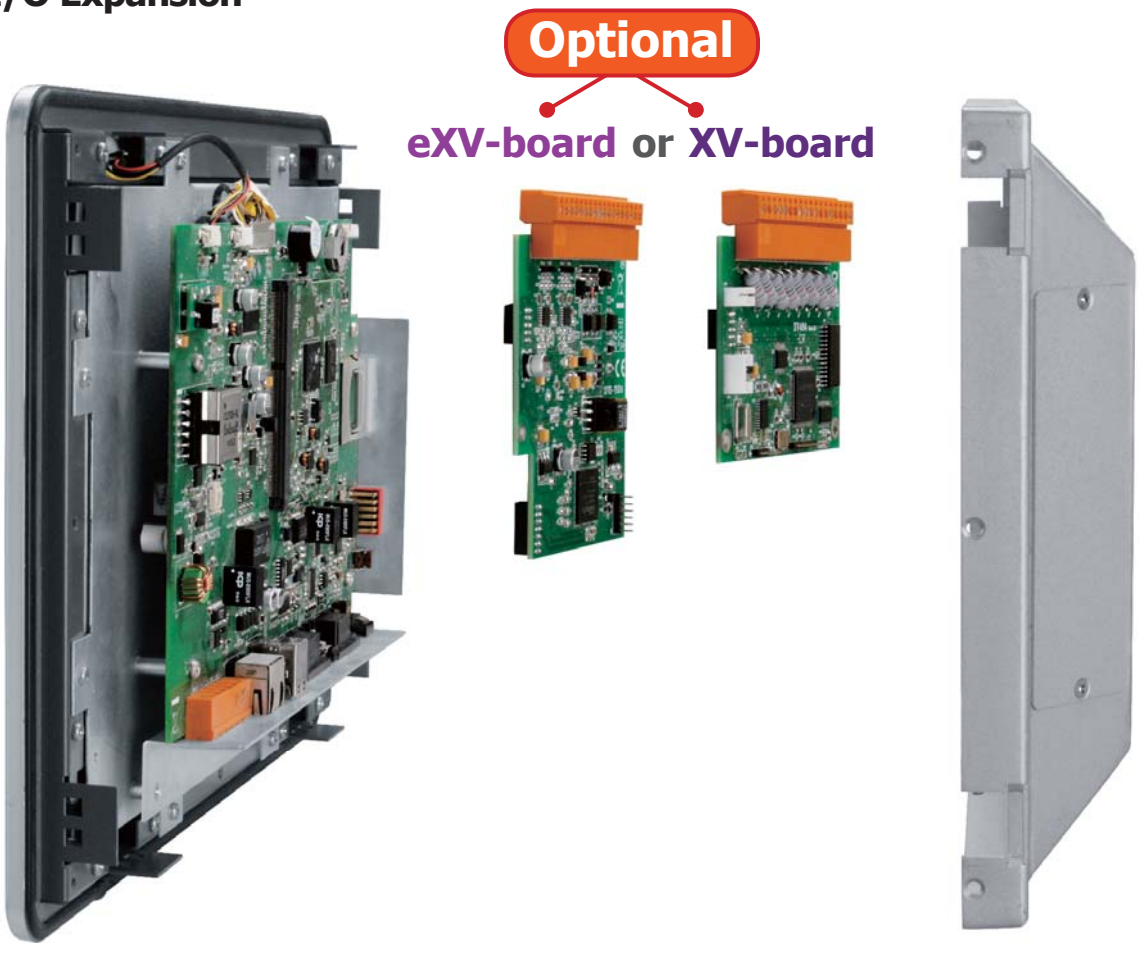
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6.5 I/O Expansion

Remote I/O Expansion



Local I/O Expansion



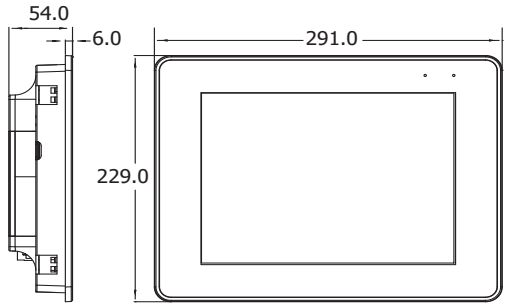
※ Local I/O expansion Board

SmartView series has an I/O expansion bus that supports an optional eXV-board (PCIe interface) or XV-board (serial interface) . It can be used to expand various I/O functions, such as: DI, DO, A/D, D/A, Timer and Counter.

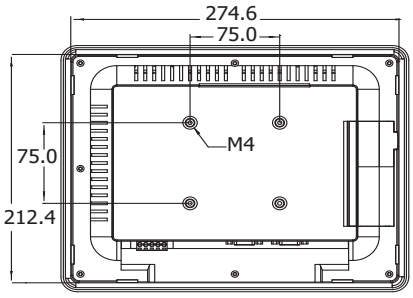
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6.6 SmartView Dimensions and Appearance

SV-4811 Dimensions & Appearance

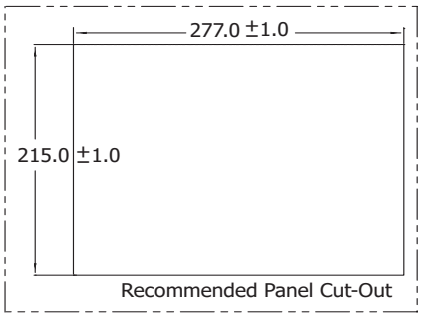


Left view



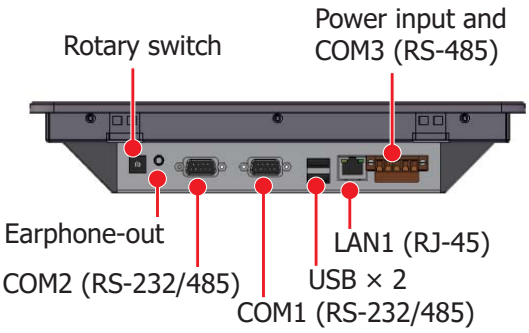
Front view

Rear view

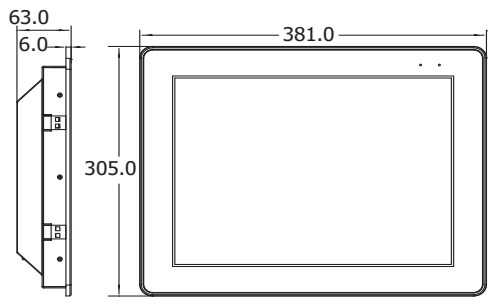


Front View (Panel Cut-out)

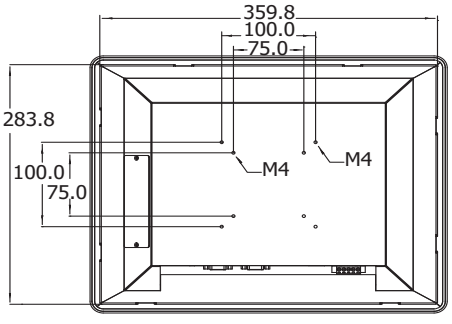




SV-6811 Dimensions & Appearance

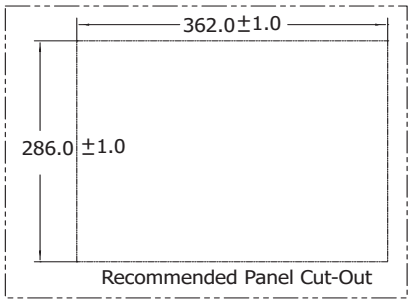


Left view

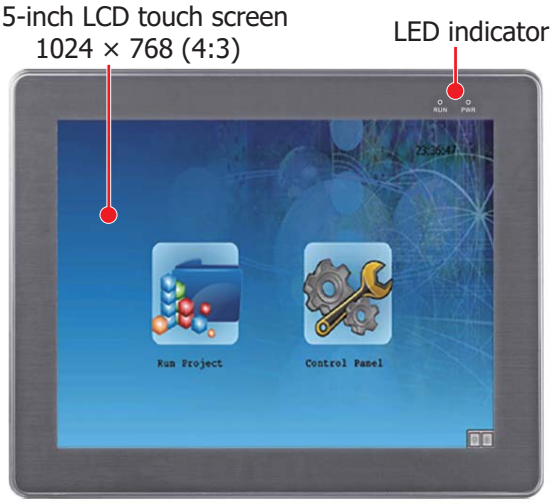


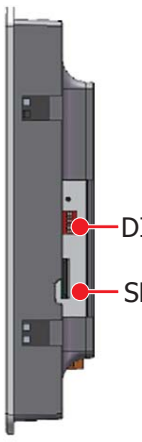
Front view

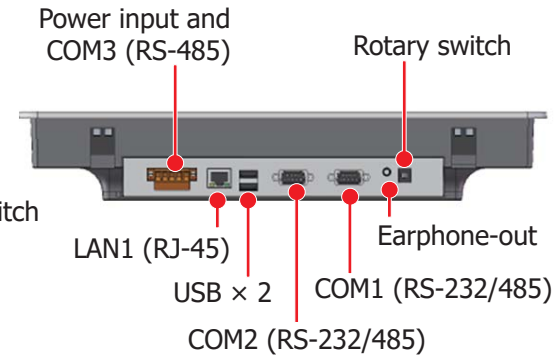
Rear view



Front View (Panel Cut-out)







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6.7 XV-board/ eXV-board series modules

Digital Input/Output Expansion Board



Model	DI (Digital Input)			DO (Digital Output)		
	Channel	Sink/Source	Contact	Channel	Type	Sink/Source
XV107	8	Source	Wet	8	Open Collector	Sink/Source
XV107A	8	Sink		8	Open Emitter	Source
XV110	16	Sink / Source	Wet + Dry	-	-	-
XV111	0	-	-	16	Open Collector	Sink
XV111A	0	-	-	16	Open Emitter	Source
XV116	5	Sink / Source	Wet	6	Power Relay, Form A	-
XV119	-	-	-	9	Signal Relay	-

Multifunction Board



Model	AI (Analog Input)		AO (Analog Output)		DI (Digital Input)		DO (Digital Output)	
	Channel	Type	Channel	Type	Channel	Type	Channel	Type
XV303	-	-	4	Voltage and Current	4	Wet	4	Relay, FormA, 6A
XV305	4	Thermocouple (*1)	-	Voltage and Current	4	Wet	4	Relay, FormA, 6A
XV306	4	Voltage and Current	-	-	4	Wet	4	Relay, FormA, 6A
XV307	-	-	2	Voltage and Current	4	Wet	4	Relay, FormA, 6A
XV308	8	Voltage and Current	-	-	DI+DO=8	Dry, Source	DI+DO=8	Sink
XV310	4	Voltage and Current	2	Voltage and Current	4	Dry, Source	4	Source
XV315	3	RTD: Pt100, Pt1000, Ni120, Cu50, Cu100, Cu1000	3	0 V ~ +5 V, ±5 V, 0 V ~ +10 V, ±10 V	4 (DI / 3 kHz Counter)	WetSink/Source	-	-

(*1): XV305 support Thermocouple: J, K, T, E, R, S, B, N, C, L, M, LDIN43710

Decoder/Frequency/Counter Input

Model	Channel	Encoder	Counter	Frequency	Resolution	Maximum counting rate
XV484	4/8	CW/CCW, Dir/Pulse, AB Phase	Up or Up/Down	Yes	32-bit	200 kHz

PWM Output

Model	Channel	Type	PWM Outpu	Load voltage	Sink/Source	Maximum counting rate
XV488	8	PWM	Internal Power External Power	+5 VDC +3.5 ~ +50 VDC	Sink, Source	500 kHz

RS-485 expansion Board

Model	Channel	Type	Speed
XV511i	4	RS-485	921.6 K

High-speed data acquisition Board

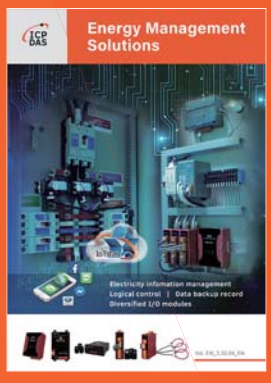
Model	eXV-7H24	eXV-7H16
AI analog input		
Channels	4 (simultaneous differential input)	8 (single-ended input)
Input range	±10 V, ±5 V, ±2.5 V, ±1.25 V, ±0.625 V, ±300 mV, ±150 mV, ±75 mV, ±40 mV, ±20 mV	±10 V, ±5 V
Resolution / Sampling rate	24-bit / 128 kS/s	16-bit / 200 kS/s
AD trigger mode	Software/AI trigger	Software/Analog Input Trigger/External Clock Signal Trigger/ External Digital Signal Trigger (Post/Pre/Delay trigger)
AO analog output		
Channels	2	N/A
Output type	±10 V, ±5 V, 0 ~ +5 V, 0 ~ +10 V	
Encoder input		
Encoder Mode (Frequency Max.)	Quadrant (2 mHz), CW/CCW (6 mHz), Pulse/Dir (6 mHz)	N/A
Contact rating	32-bit	
DI/DO digital input output		
DI channel/type	3 × DI (wet contacts)	4 × DI (wet contacts)
DO channel/type	4 × DO (Sink)	

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IIoT Products

- IIoT Software and Hardware
- Security Identifi cation and Monitoring System
- Environmental Monitoring
- Factory Automation
- Energy Management Soluti
- Vibration Measurement Solution



Energy Management Solution

- Introduction and features
- Applications
- InduSoft
- Power Meter Concentrator
- Smart Power Meter
- True RMS Input Module Voltage Attenuator and
- Current Transformer
- iWSN Solution
- Portable Power Monitoring Suitcase



Intelligent IIoT Edge Controller & I/O Module

- WISE IIoT Edge Controller & I/O Module
- Cloud Management
- Applications
- Product Specifi cation
- Intelligent Surveillance Solution



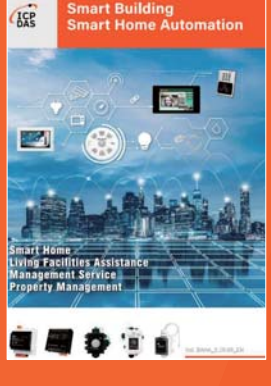
Wireless Solution

- Built-in OPC UA Server Service
- Built-in MQTT Broker Service
- Support Logic Control IFTTT
- Support IoT Cloud Platforms
- Connection and IoTstar Cloud Management
- IIoT Factory Application of MES
- Pumping Station IoT Application
- BA Smart Building IoT Application
- Robotic Arm Co-operation Application



PAC 9000 Series
Flagship Product, Open System

- AXP/ALX-9000 series
- XP-9000-WES7 series
- XP-9000-IoT series
- WP-9000 series
- LX-9000/LP-9000 series
- e-9K Series Module
- I-9K Series Module
- 2000 series PAC
- iBPC Series BoxPC
- Touch Monitor



Smart Building, Smart Home Automation

- Video Intercom & Access Control
- Touch HMI - TouchPAD Series
- Smart Lighting Control
- Energy Saving - PM/PMC Series
- Environmental - DL/CL Series
- Motion Detector - PIR Series
- Wi-Fi Wireless - WF Series
- Infrared Wireless - IR Series
- ZigBee Wireless - ZT Series
- IIoT Server & Concentrator
- LED Display - iKAN Series



Touch HMI Solutions - TouchPAD

- Introduction
- Products
- Remote I/O Modules
- Applications



Full Product Catalog

- PAC Products and BoxPC
- Panel Products
- Remote I/O Module and Unit
- IIoT
- Industrial Communication
- Wireless Solution
- Machine Automation
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