

Advantech DIN-Rail IPC

Providing Fieldbus Control, Connectivity and Sustainability for Smart Factory



Soft Logic Control



Data Acquisition, Scaling and Processing



Real Time Fieldbus

Advantech
Industrial Automation Group

Enabling an Intelligent Planet

ADVANTECH

The Next Generation IoT Platform



DIN-Rail IPC with I/O

IPC & I/O Integration

Embedded Box PC

Robust & Compact

IPC

Industrial Grade PC

- Fanless Design
- Low Power
- Compact Size
- No Cable
- More Robust

Controller-class ID

- Compact & DIN-rail mount
- Front I/O Access

Modular I/O Integration

- Modular Local I/O
- Fieldbus Solution
- Rich Remote I/O

Open for Easy Deployment

- XPE / WinCE / Linux OS
- I/O R/W & Configure API
- Data Sync Capability

The IoT Platform : APAX Series DIN-Rail IPC

Seamless integration with
Automation and **Information Technology**

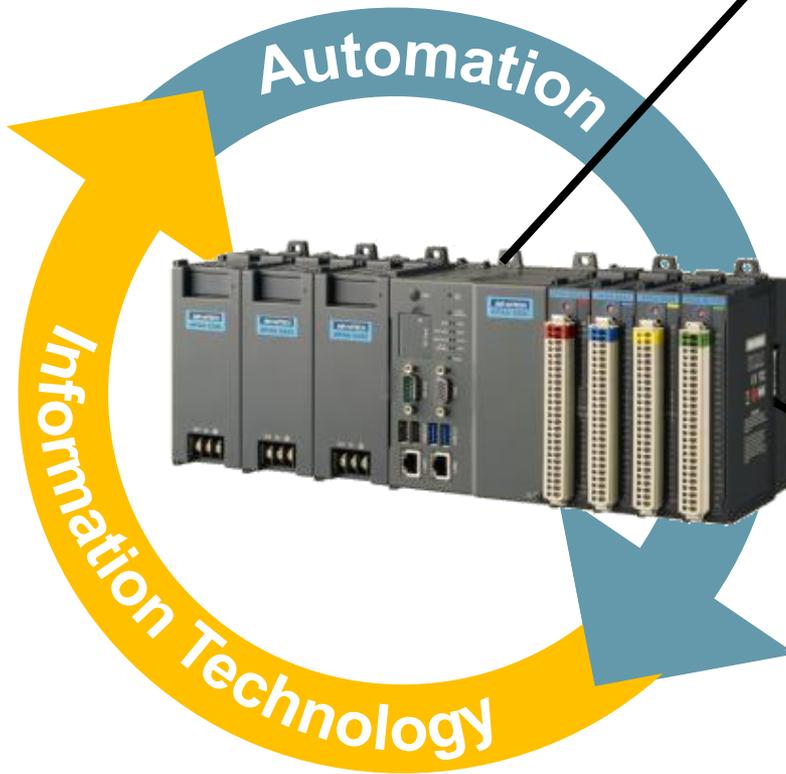


Industrial PC in compact size

- DIN-Rail mountable
- Front wiring access and LED indicator
- Robust H/W design
- Window 7/8.1 support
- LAN Teaming, iAMT, WakeonLAN

Controller Feature

- Real time H/W monitoring
- Modular local I/O
- Remote I/O and device connection
- WDT and RTC support
- Hot swap



The IoT Platform : 3C Seamless Integration



Computing



Connectivity



Control

Real-time APAX BUS

- High Performance CPU
- Various OS support
- One Key Recover
- Fast Boot
- ACPI
- Dual Power Input
- UPS
- Distributed Topology
- Distributed Comport
- Wireless Communication
- mSATA
- mPCIe interface
- APAX Real Time Bus
- Wiring detection(mA)
- Standard API
- SCADA S/W
- 10 Years Lifetime Battery
- High Accuracy RTC
- Watchdog Timer
- Hot swappable
- 1~1kHz AI sampling rate
- Safety value setting

APAX-5580 : DIN-Rail IPC

Small but Powerful, Designed for Smart Factory

- Intel Celeron, Core i3 & Core i7 performance
- Dual power inputs & UPS module increases power reliability
- Real-Time and Deterministic I/O with hot swappable
- Supporting iDoor Fieldbus Technology
- Easily recover OS back to golden image through one key button
- mPCIe slot for wireless communication expansion



Dual CPU to reduce process loading



The distributed topology by standard Ethernet

Automation Controller

- DIN Rail
- Compact size
- Versatile I/O Module

Intelligent Power Design

- Fast Boot from S3
- Battery Module
- 24 Hrs standby

High Reliability

- One key recovery
- System backup
- Status Alert

Hot Swappable

- Easy maintenance without system shutdown

High Flexibility

- Modular and distributed design for system expansion

APAX-5580 : User-Friendly Front Design

Easy Monitoring and Wiring

Boundless Communication
WiFi, GPRS, GPS



Unlimited Storage
SD card slot



Dimension

W 128 x D 106 x H 110 mm



Easy to Diagnostic
Status LED



Easy to Connect
2x USB3.0



Wake on LAN, iAMT
Intel i210-IT, i218-LM



APAX-5580 Powerful Inside Design

Reliable & Powerful Functions

NO MORE battery issue

- Panasonic LITH Battery
- Over 10 years lifecycle

Possibility to Wireless

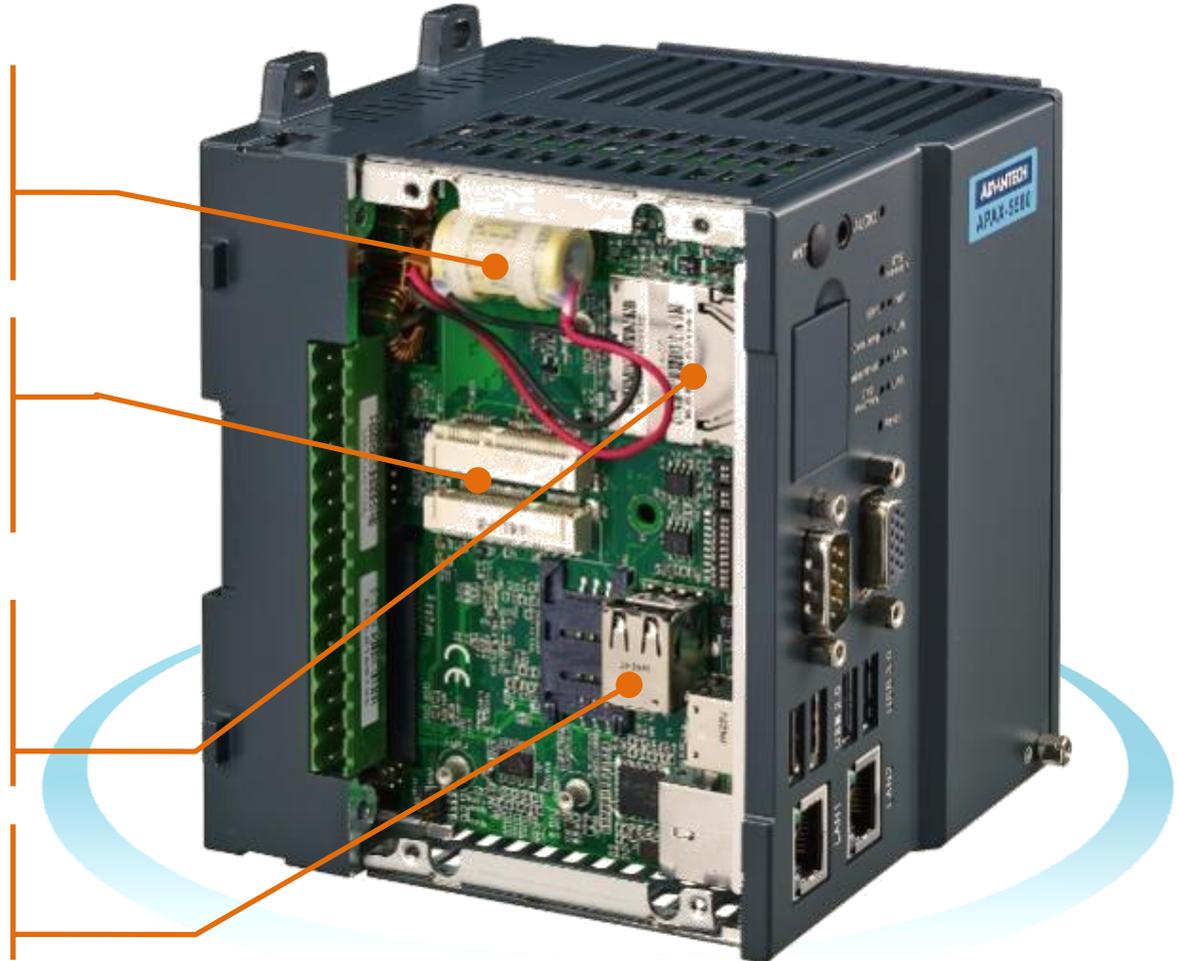
- One half-size mPCIe
- One full-size mPCIe with SIM slot

Reliability

- One inter SD slot for System backup

Security

- One internal USB slot



APAX-5580 : Powerful Inside Design

[Tips] Possibility to Wireless : mPCIe Solutions

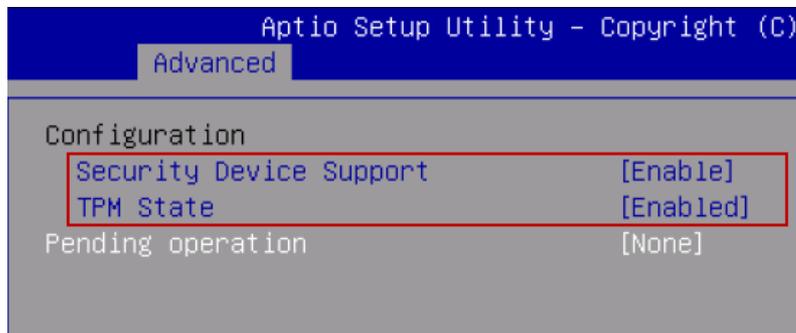
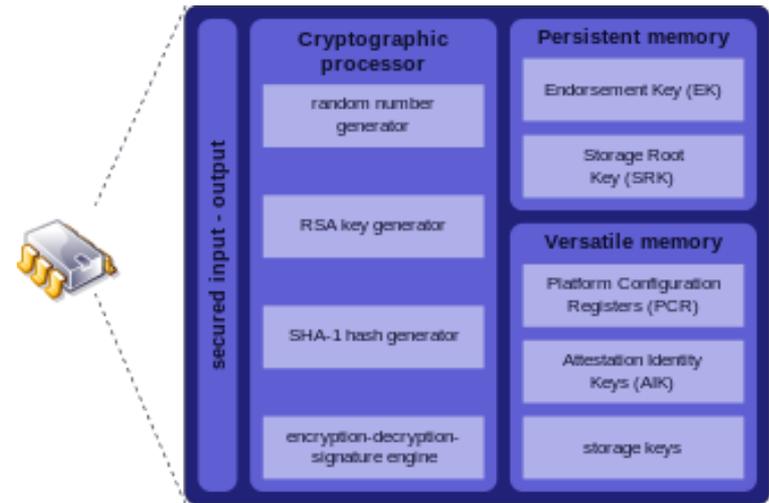
Advantech P/N	Description	Form Factor	Temperature	Cable	Antenna
EWM-W153H01E 	802.11 b/g/n 1T1R w/ BT4.0, Atheros AR9485+AR3012	Half size Mini	0 ~ 60°C	1750005885 1750006010 1750006043	1750000318 1750003222 1750003418
EWM-W135H01E 	802.11 a/b/g/n, Atheros AR9382, 2T2R	Half size Mini	-10 ~ 70°C	1750005885 1750006010 1750006043	1750002842
NEW EWM-W158F01E 	Advantech 802.11 a/b/g/n, Atheros AR9592-AR1B, 2T2R	Full Size Mini	-40 ~ 85°C	1750005885 1750006010 1750006043	1750002842
EWM-C106FT02E (WCDMA) 	7.2 Mbps HSUPA w/o SIM Slot, WCDMA module, Tri-band WCDMA 850/ 1900/ 2100 MHz, Quad-band GSM/ GPRS/ EDGE, w/o voice function	Full Size Mini w/o SIM slot	-20 ~ 65°C	1750006264 1750006009	1750005865 1750006426
NEW EWM-C118HD01E (WCDMA) 	3.75G UMTS/HSPA, SARA-U270, w/ SIM Slot, Dual-band WCDMA (900, 2100 MHz), Dual-band GSM/GPRS/EDGE, w/o voice function	Half-size w/ SIM slot	-40 ~ 85°C	1750006264 1750006009	1750005865 1750006426

APAX-5580 : Powerful Inside Design

[Tips] Security : Add-on Function by Mini Card

Trusted Platform Module (TPM)

A dedicated microprocessor designed to secure hardware by integrating cryptographic keys into devices



APAX-5580 : Reliable Back Design

mSATA Operation Disk

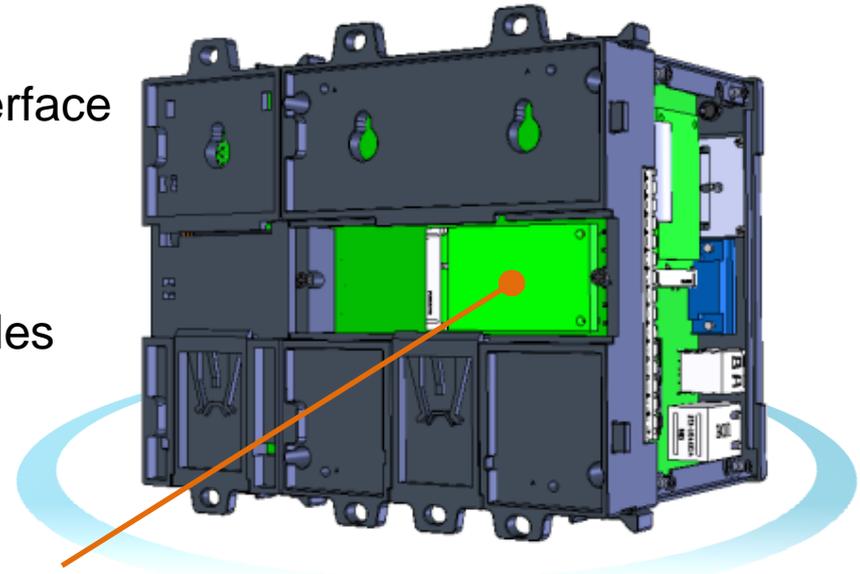
Provide the higher level of **Vibration** protection

mSATA

- Solid State Disk (SSD) with mini PCIe interface
- Small size with 16/32/64/128G option
- Transfer mode: SATA III
- Vibration Resistance: 20G, peak
- Endurance: 2,000,000 program/erase cycles



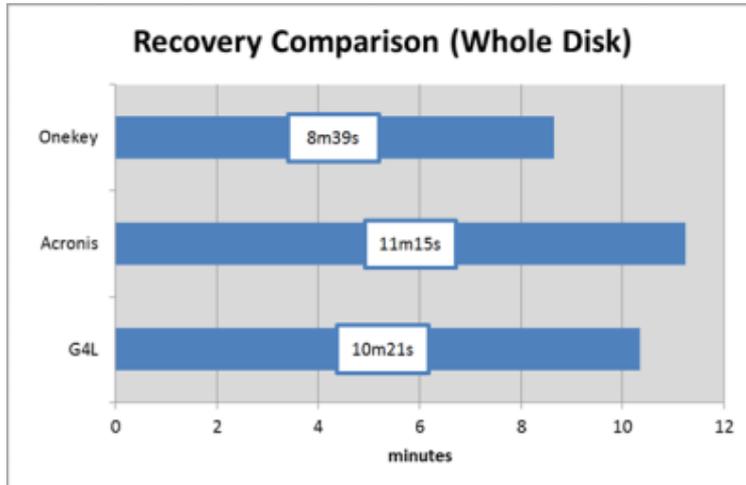
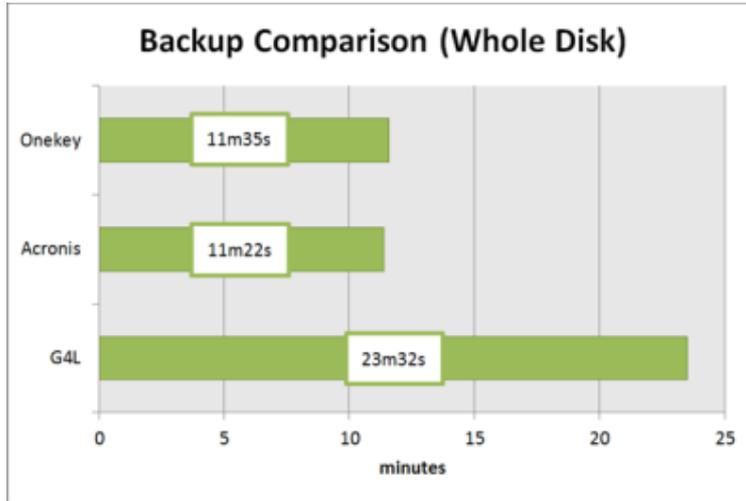
mSATA for
System Storage



- SQF-SMSM4-16G-S8E SQF MSATA 820 16G MLC 4-CH (-40~85°C)
- SQF-SMSM4-32G-S8E SQF MSATA 820 32G MLC 4-CH (-40~85°C)

APAX-5580 : One Key Recovery

One Key Recovery



- No additional software tool
- Save the backup image in SD card
- Just PRESS SYS recovery button **10s**



APAX-5580 : Focused Market Segments

Embedded IPC Market

- Compact & Reliable; Front I/O Accessible
- Modular Flexibility for PSU, Connectivity & I/O
- High C/P Advantage

Control PC Market

- Competitive Platform with Popular Control software Collaboration, ex. CoDeSys, No. 1 in Europe

SCADA PC Market

- Built-in WebAccess, Fully Integrated and One-stop shop

APAX System - LEGO Your Control Platform



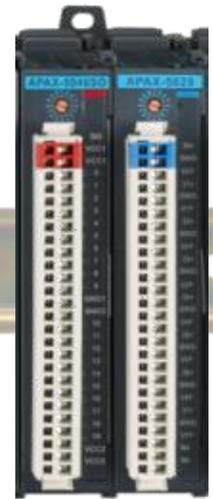
Power Supply

Embedded IPC

iDoor

mPCIe

I/O



Software



Enabling an Intelligent Planet



APAX System : H/W Feature

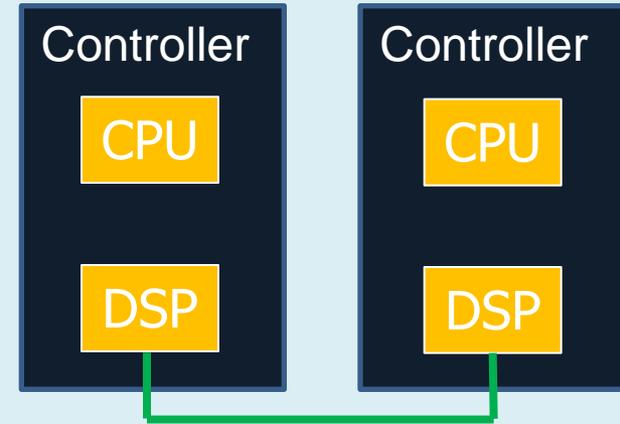


Flexible Topology



APAX Controller Platform with Centralized and Distributed I/O System

Dual Core Design



- Reduce data process loading
- Data sync by local bus

APAX System : Power Supply



Different Configuration Ways

Provides different **Robust** level of Power System

1 Single Power Supply



2 Dual Power Supply



3 Dual Power Supply with Battery Support



- APAX-5343 90 ~ 264VAC Power Supply
- APAX-5340 5000mA battery Module ACPI support

APAX System : Power Supply



4 Power Connector

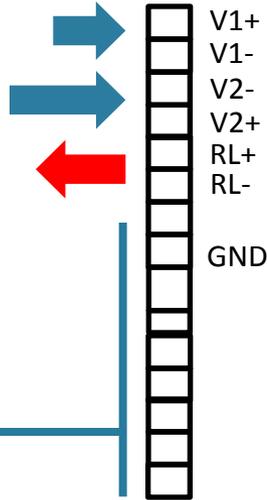


Dual Power Input

Relay Output

- V1 or V2 failure Alert
- Standby and PowerOn Detection

Smart Battery

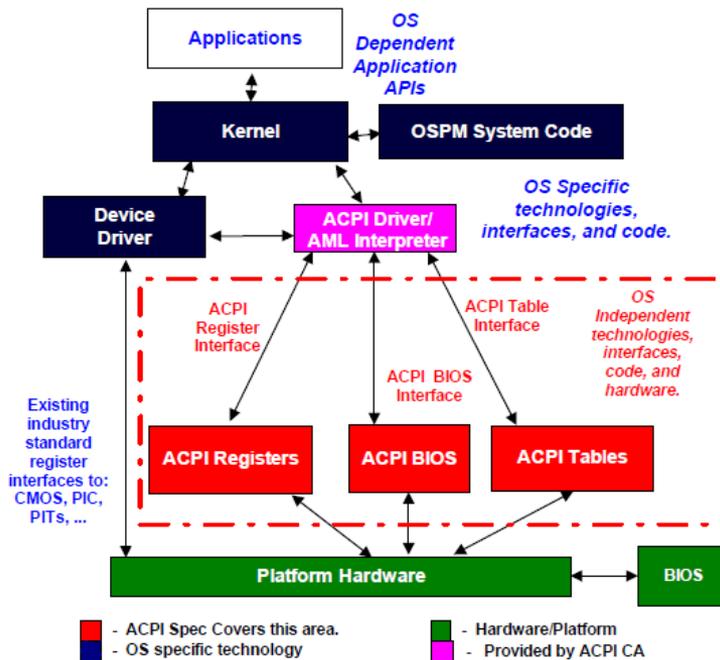


APAX System : Power Supply

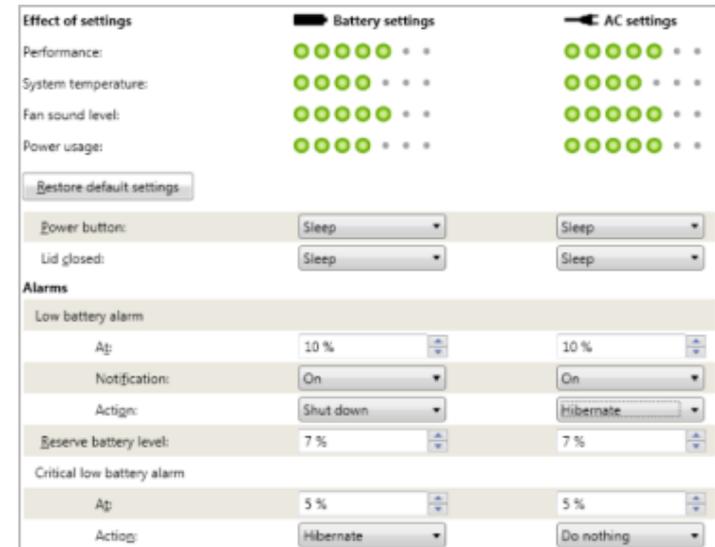


4 Power Connector – Smart Battery

Advanced Configuration & Power Interface



- Device/power/control mgmt.
- RTC alarm
- System Events
- Battery mgmt.
- Thermal mgmt.



Power Manager

Set and Monitors System Policies

User interface : Allow User Input to Policy

APAX System : Expansion Way



APAX-5580

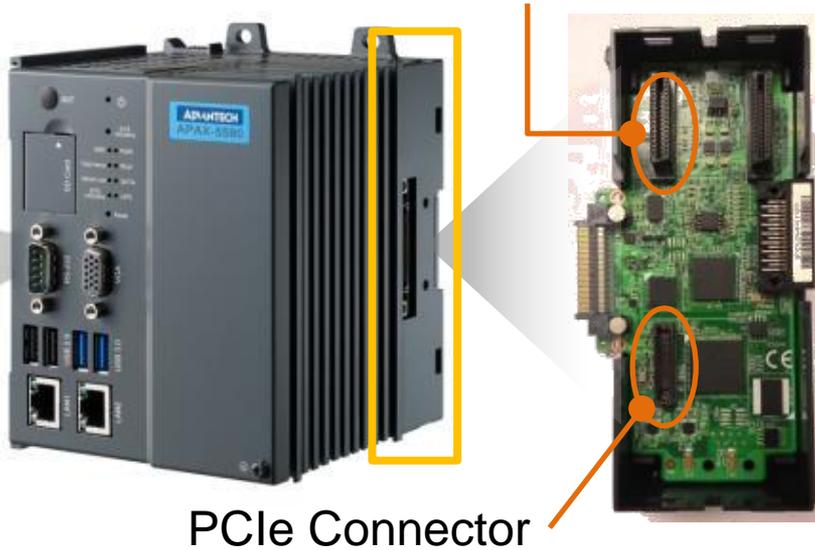
APAX-5402

APAX-5002

APAX-5002



APAX Connector



PCIe Connector



- APAX-5402-E1A2AE
- APAX-5402-E2A0AE

[Tips] Naming Rule

APAX-5402-E2 A0 A E

Module slot #
2,4

Onboard PCIe slot #
1,2

Onboard APAX slot #
1,2

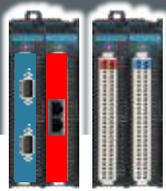
Version Control
A~Z

RoHS

e.g. APAX-5402-E2A1AE

2-slot expansion module with 2 PCI express and 1 APAX Bus

APAX System : Sensing and Control I/O



Provide the Modular I/O module



Extend the capacity of the sensing in Digital , Analog and Counter signal

- APAX-5402-E2A1 2-slot PCI express and APAX Bus module
- APAX-5000 I/O APAX I/O Module

APAX System : Communication I/O



Provide the Flexibility of Com Port Expansion



APAX local Com port

APAX Remote Com port

Easy to expand your serial interface in local and remote area

- APAX-5402-E2A0 2-slot PCI express module
- APAX-5490 Local Communication Module
- APAX-5090 Remote Communication Module

Data gateway
Protocol converter

APAX System : Fieldbus Connection



Provide the different Fieldbus solution by iDoor



Extend the different Fieldbus interface to connect to other device

- APAX-5402-E2A0 2-slot PCI express module
- APAX-5435 APAX PCIe module support iDoor.
(Maximum 2 pcs with one 5580)

[Tips] in Vertical Applications

Industrial Fieldbus

Multi-Fieldbus for vertical usage



Communication

Wireless solution

- WiFi, GPS, 3G, LTE
- Bluetooth, Zigbee, RFID

Smart I/O & Comm.

Various I/O in different application

- Isolated RS-232, RS-422/485
- Non-isolated RS-232, RS-422/485
- Isolated Digital I/O, Analog I/O

Multiple I/O & Peripheral

Various I/O in different application

- Storage: CFast, MRAM, USB dongle, USB 3.0
- Network: IEEE 1588, GigaLAN, PoE
- Display: HDMI, iLink



APAX System : Data Storage



Provide the Standard Interface for 2.5" SATA



***Extend the storage space for big data and
raise the system reliability***

- APAX-5402-E2A0 2-slot PCI express module
- APAX-5430 APAX SATA Module Maximum 2 pcs with one 5580, Support RAID 0/1

APAX System : Data Storage



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APAX System : Software

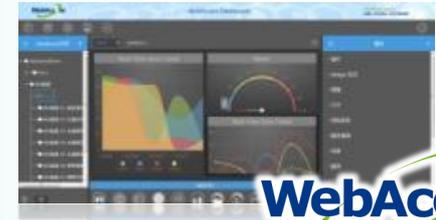
Empower by Vertical S/W,
Seamless integration by open API



Softlogic



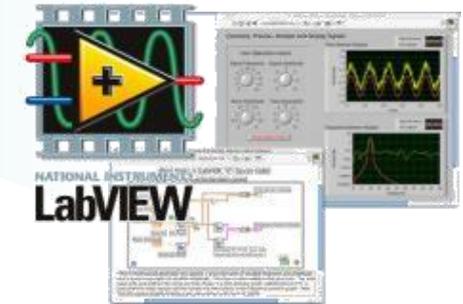
SCADA



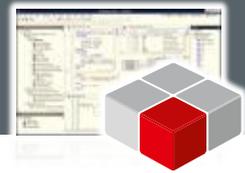
SCADA



Test Automation



APAX System : Software



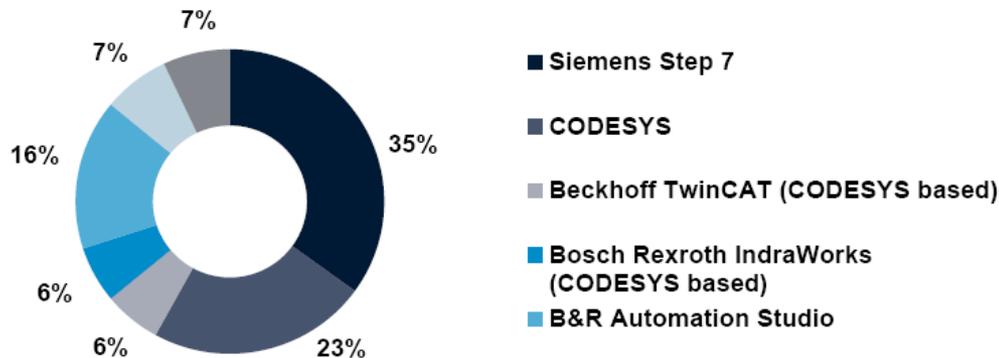
CODESYS : World NO.1 Control Software

CODESYS

Survey conducted by one of the most important German Automation Magazines "Computer&AUTOMATION", ITQ and two German Universities (9/2011):

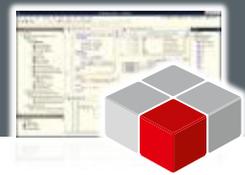
70 companies (machine- and plant manufacturers) were interviewed. One of the questions asked was: *Which development tool do you use to program your controller systems?*

Result: PLC Benchmark



- No more proprietary programming system
- One tool for control, communication and HMI
- Turn your windows IPC to powerful controller with hard real time

APAX System : Software



CODESYS

CODESYS : Features

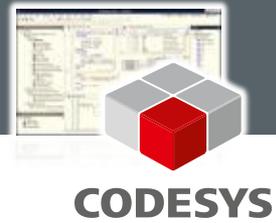
Features of the Development Environment

- The CODESYS Development System is offered free of charge (www.codesys.com/download)
- Support for creating structured and efficient applications – all in one tool from configuration to commissioning
- Optional object-oriented programming according to IEC 61131-3 (3rd Edition), also blended with functional programming within the project
- Tried and tested library design with documentation capability – integrated directly into the development environment
- Multi-platform development and application reusability thanks to exchangeable target system descriptions for all CODESYS-compatible devices
- Versatile extensibility with a modular design and available add-ons
- Clear user interface and customizable windows

CODESYS Engineering – Benefits at a Glance

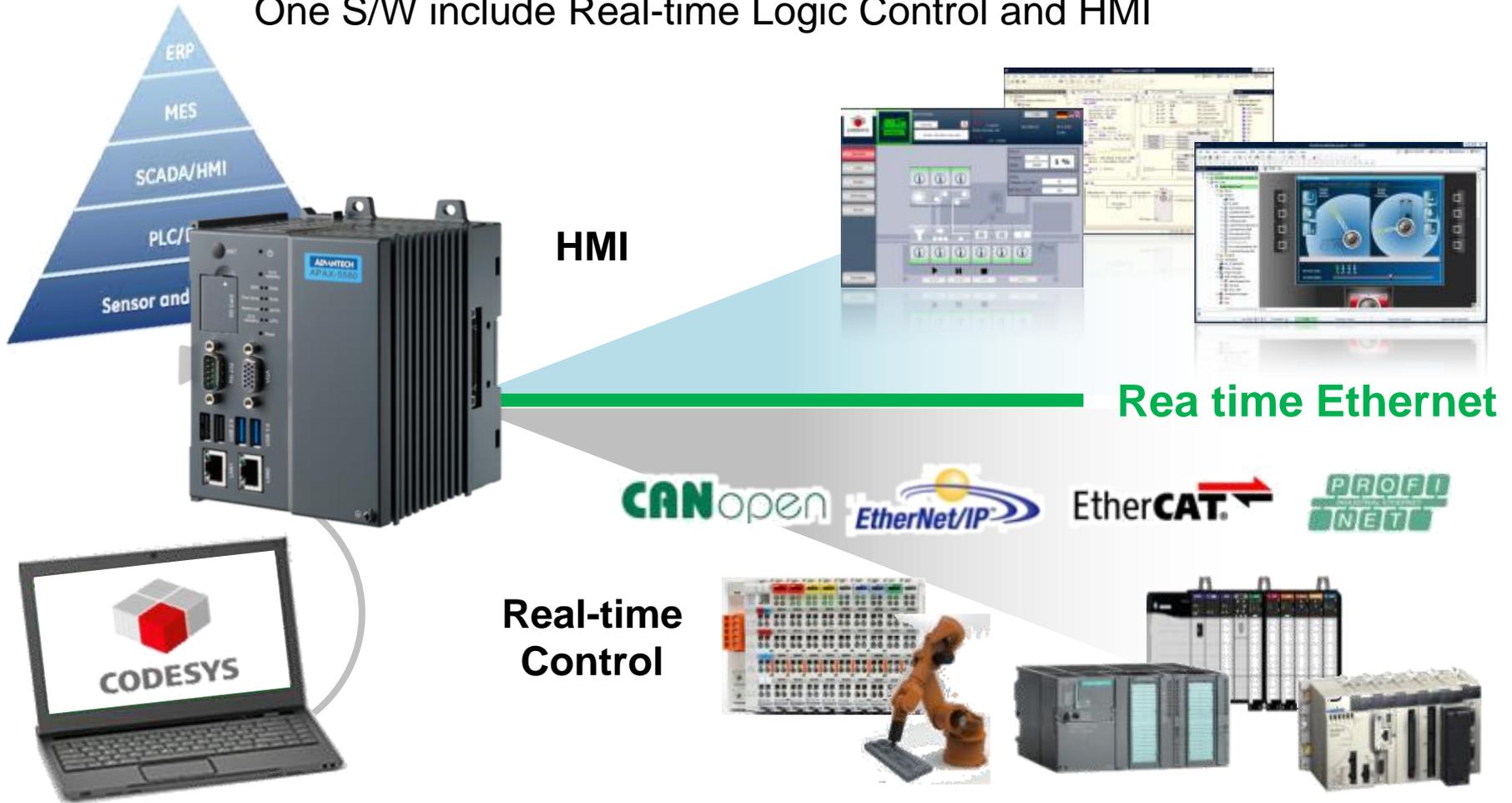
- Tried and tested a million times over
- Practice-oriented for fast creation of simple applications
- Powerful for large-scale projects and extensible by add-on tools
- Harmonized tools with consistent designs for functionality and operation
- Customizable functionality and user interface of the development environment

APAX System : Software

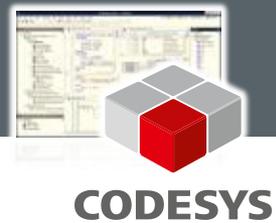


CODESYS : IEC-61131-3 Softlogic Solution

One S/W include Real-time Logic Control and HMI



APAX System : Software

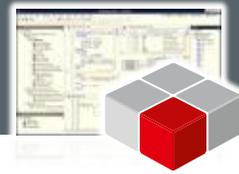


CODESYS : Visualization

- Ability to create visualization objects with a parameter interface:
For each IEC 61131-3 function block, one or more appropriate visualizations can be created.
- Creating customized elements in IEC 61131-3, which can be used in all display variants
- Adjusting the same visualization to different designs, without effort, via visualization styles
- PLC functionality and visualization in one device. No communication effort because of direct access to variables



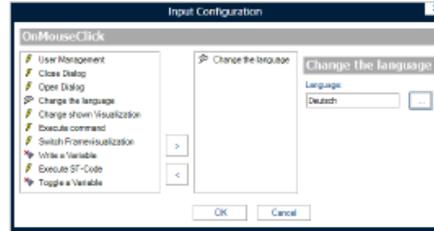
APAX System : Software



CODESYS

CODESYS : Visualization

- Realtime trace and recording
- Recipe Mangement
- Alarming management
- User management
- Image switching
- Language switching
- Graphic editor



Switching Language

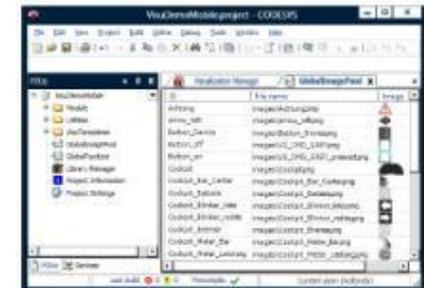
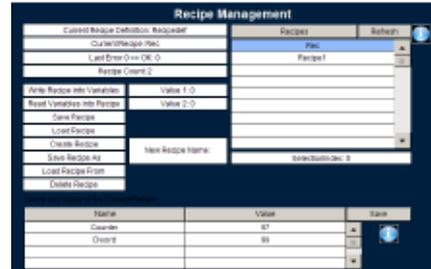


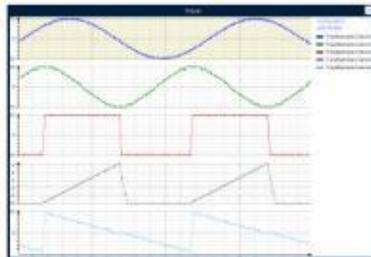
Image Switching



Recipe Management



User Management



Trace/Trend



Visualization Styles

Format template for the visualization

Time	Message	Severity	Acknowledged	Acknowledged by	State
20.07.2013 08:20:14	Prozessdruck Sensor 42-...	Warning	20.07.2013 08:20:14	Admin	Active
20.07.2013 08:13:14	Alarm 1: over connection to cell	Warning	20.07.2013 08:13:14	Admin	Active
20.07.2013 08:11:14	Alarm 1: over connection to cell	Warning	20.07.2013 08:11:14	Admin	Active
20.07.2013 08:10:14	Alarm 2: ...	Warning	20.07.2013 08:10:14	Admin	Active
20.07.2013 08:10:14	Alarm 25: ...	Warning	20.07.2013 08:10:14	Admin	Active
20.07.2013 08:10:14	Alarm 25: ...	Warning	20.07.2013 08:10:14	Admin	Active

Alarm Management

APAX in the Scope of Industry 4.0

MES & Production Profile

- Information between the front-end equipment & MES application
- Production Traceability

Production Testing Equipment

- Machine Vision
- Motion I/O Cards
- Computing Platform
- Controller

Factory Environmental Monitoring

- Electricity Monitoring
- Factory Waste Water
- Energy Management

Predictive & Maintenance

- Production Performance Analysis
- Machine Status
- Abnormal Diagnosis
- Sensor Measurement

Machine Automation

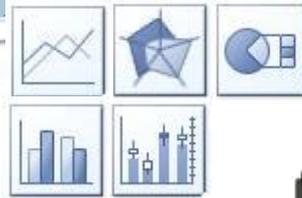
- Industrial Robots
- Automated Guided Vehicle
- Industrial Machinery

Connect to Everything, Reaction in Time

Advantech APAX-5580, the New Control Platform for Handling Control and Information



Integration of the field site operation and information analysis



Local and remote synchronous display, easy to monitor by MID



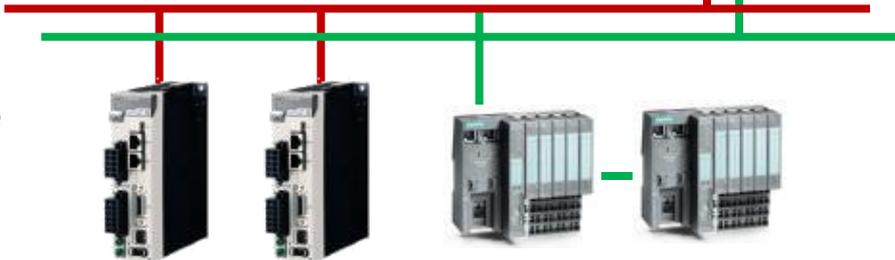
iDoor - CANOpen



Distributed topology for production line monitoring



Supports Real-time Ethernet Protocol



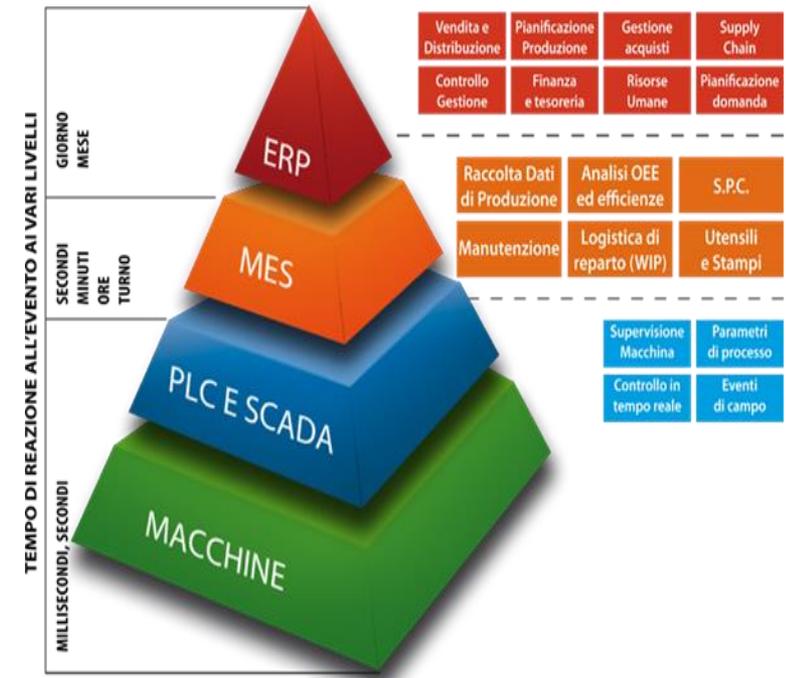
Scope 1 : MES & Production Profile

Integrate Operation Technology and Information Technology

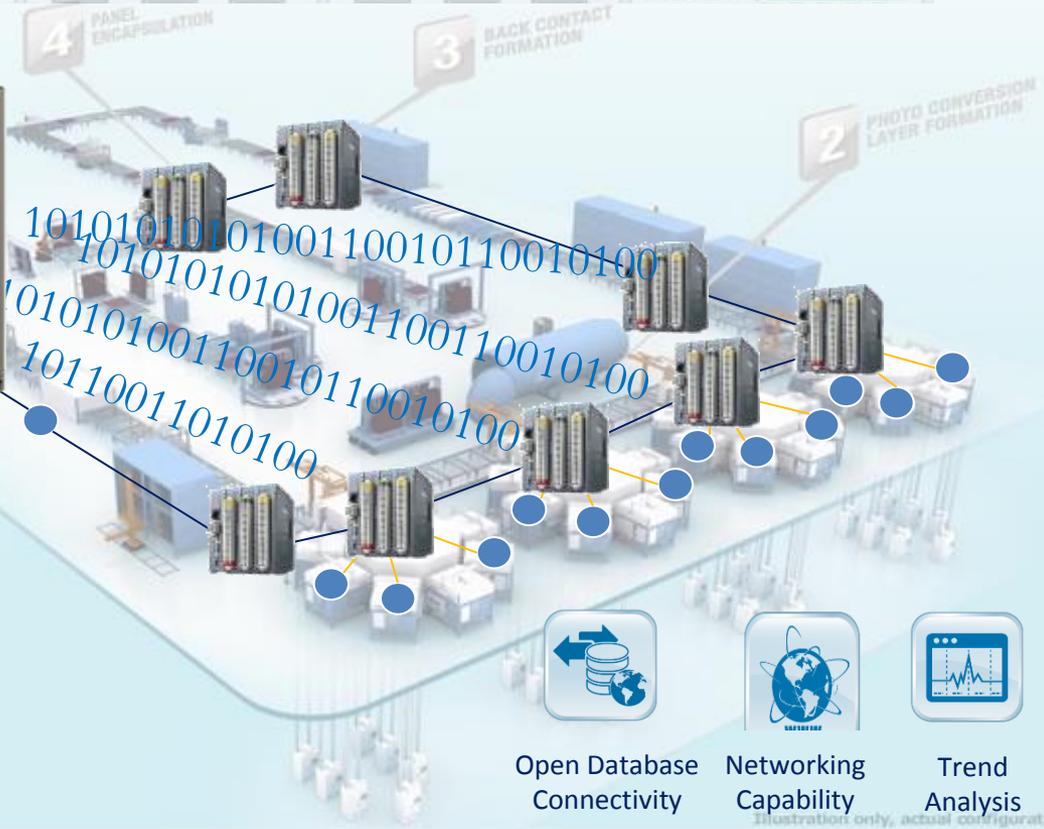
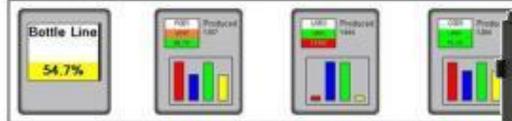
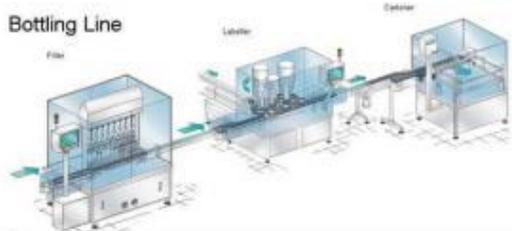


Information Hub

- Network
- Communication
- Data acquisition



Scope 2 : Production Testing Equipment



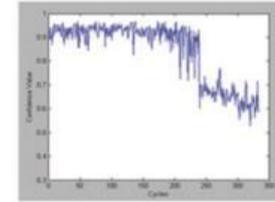
Production Testing

- Real time monitoring
- Easy to access database
- Distributed Station
- Quality Control

Scope 3 : Factory Monitoring & Management

Facility and Machine

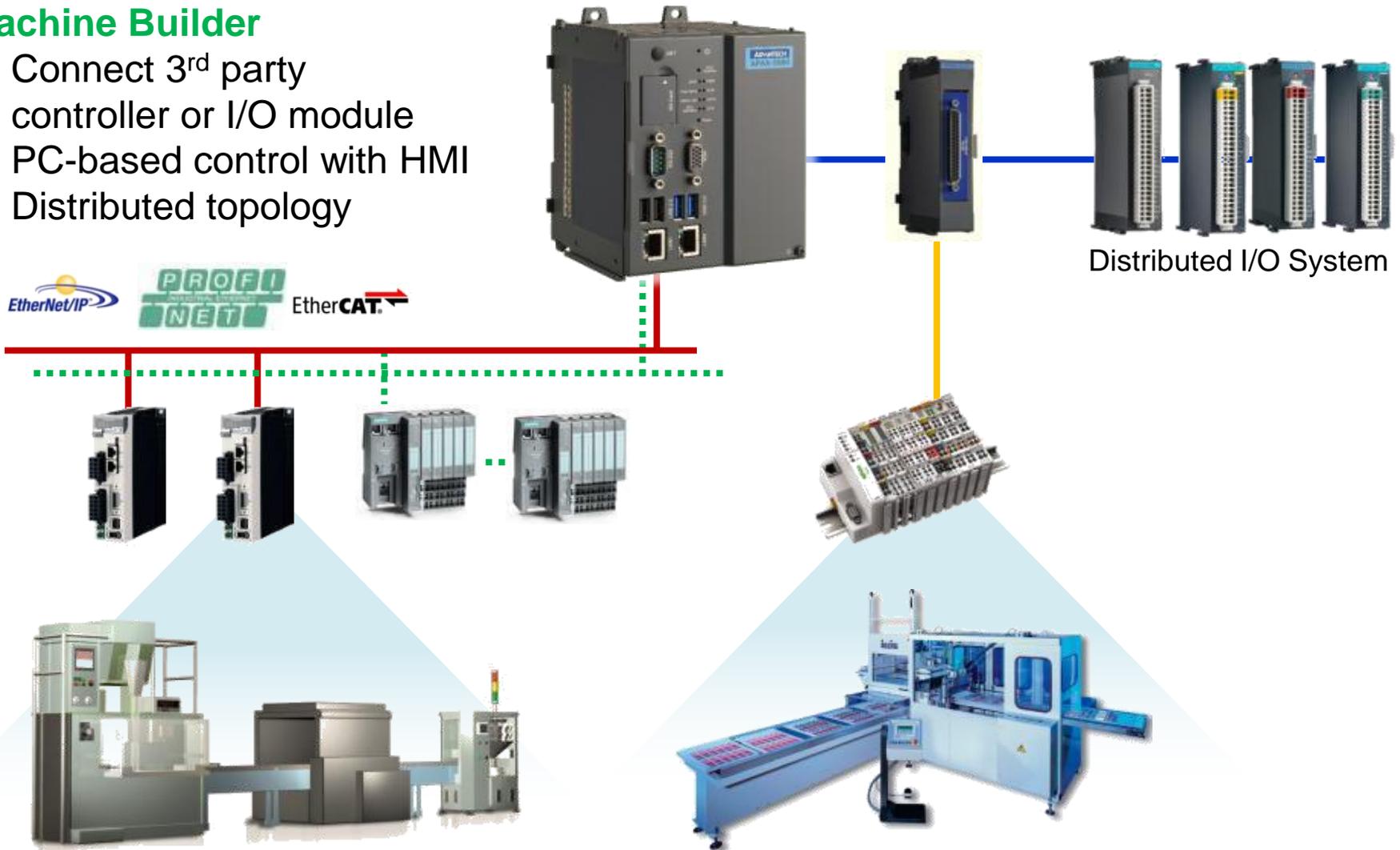
- Status monitoring
- Energy trend
- Maintenance



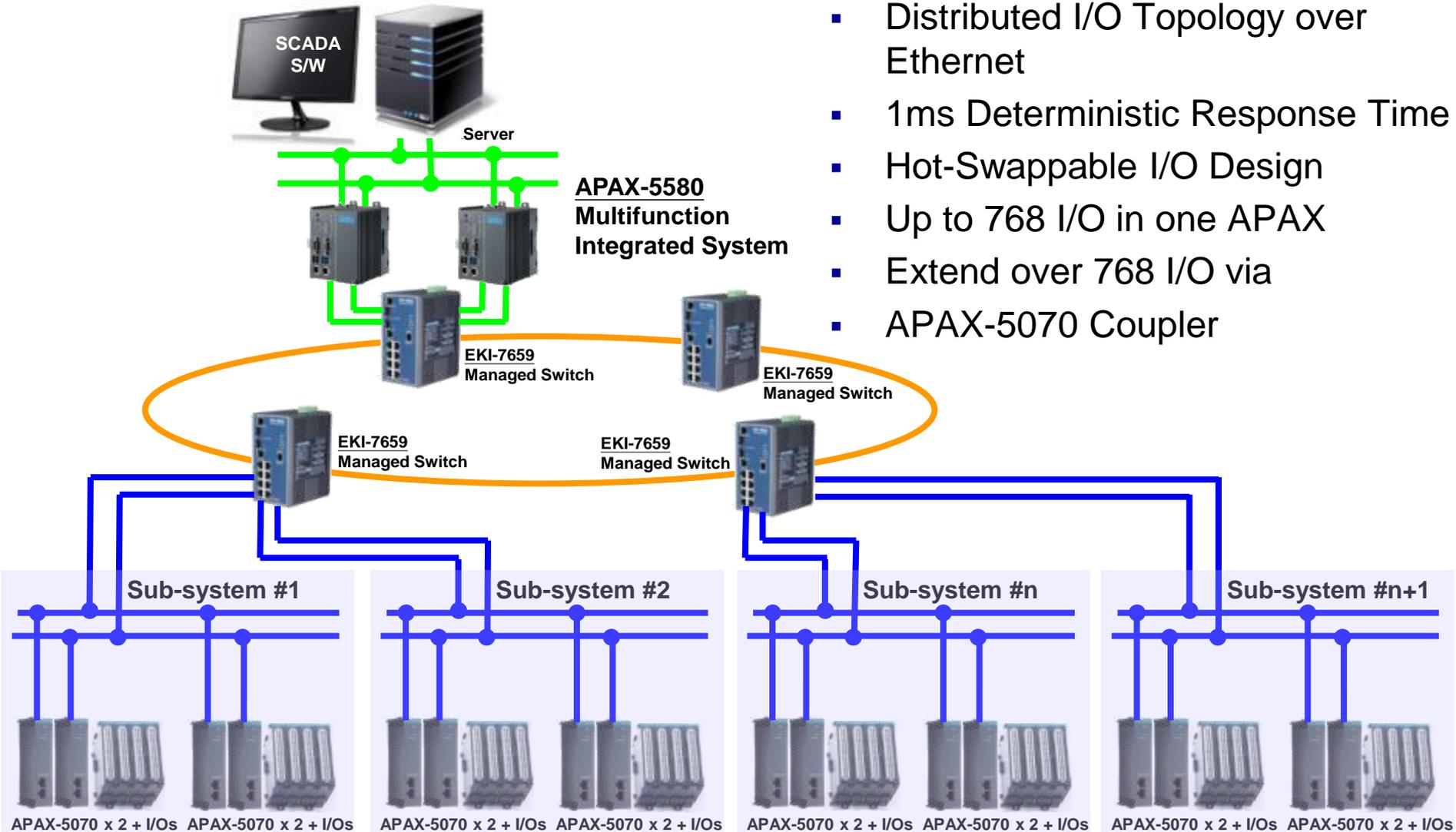
Scope 4 : Motion Automation

Machine Builder

- Connect 3rd party controller or I/O module
- PC-based control with HMI
- Distributed topology

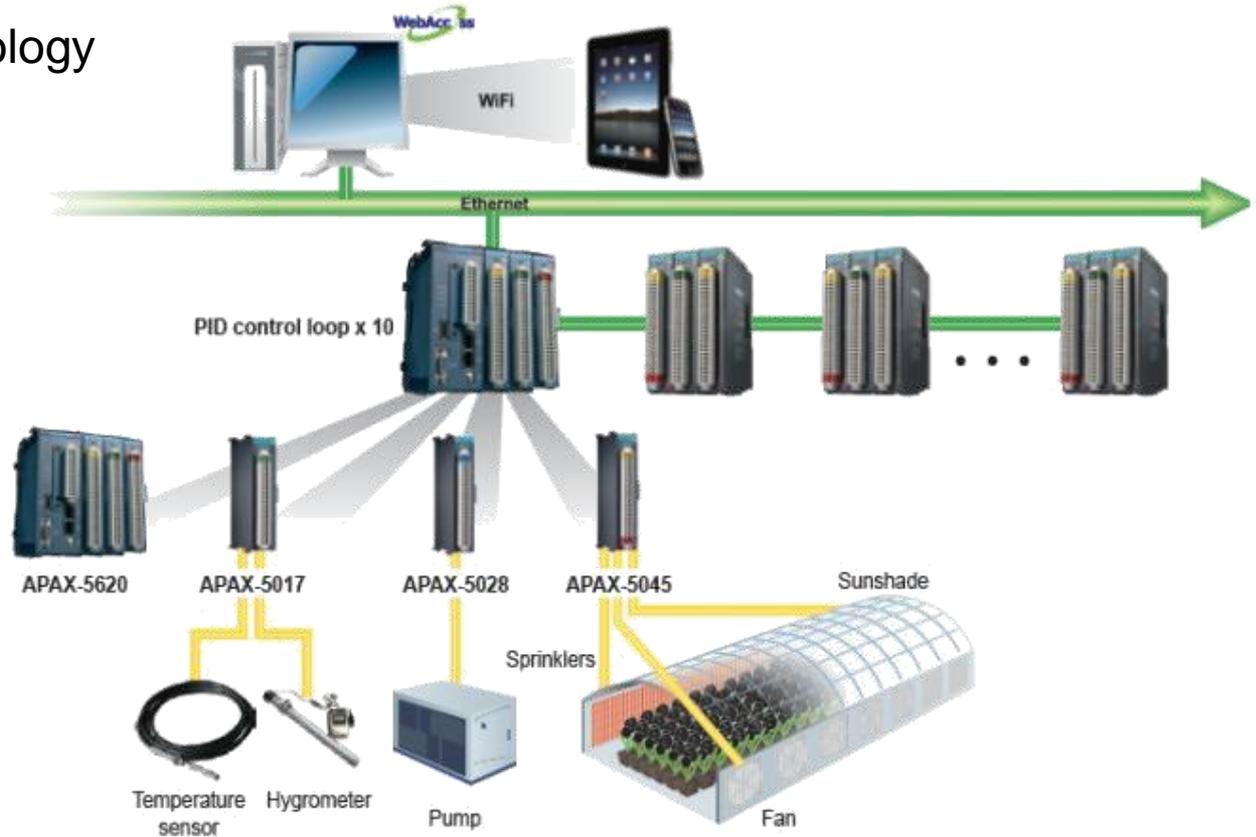


Application : Deterministic Distributed I/O



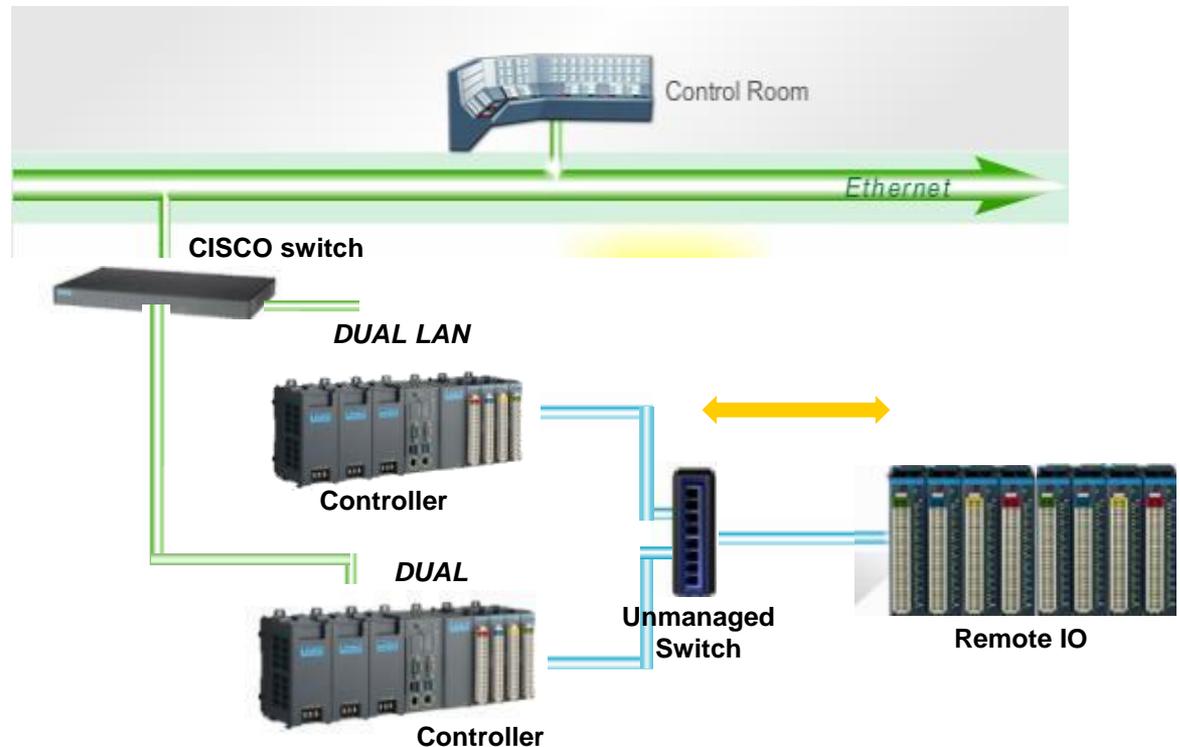
Application : Low Cost Distributed System

- **One CPU** module to control all I/Os in different remote sites in wide area
- **APAX Bus** takes care all remote communication in 1ms real-time manner
- Standard Ethernet Topology



Application : Railway Power Monitoring

- User : Italy Railway 、 Taiwan Railway Corp.
- Application : Control monitoring for power supply system in remote control room
- Products : APAX-5580 with backup System, APAX-5000 I/O



Application : Pump Station Controller

- Pumping stations are facilities including pumps and equipment for pumping fluids from one place to another.
- Applications in a variety of infrastructure systems, such as the supply of water to canals, the drainage of low-lying land, and the removal of sewage to processing sites.

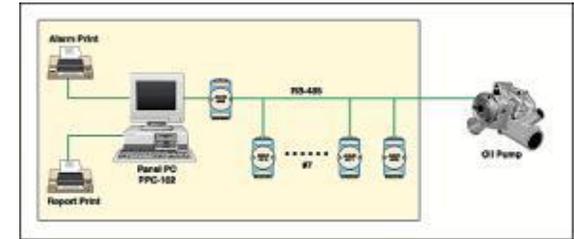
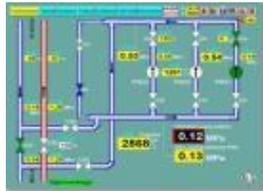
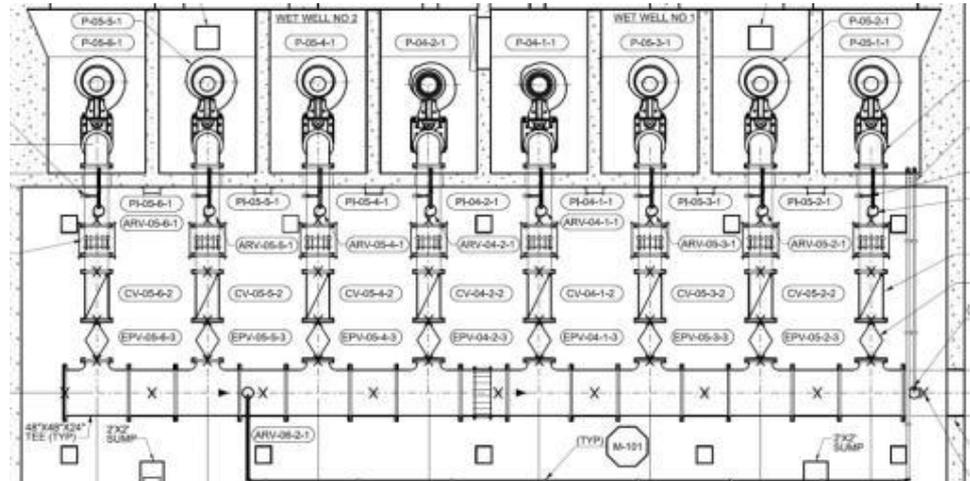
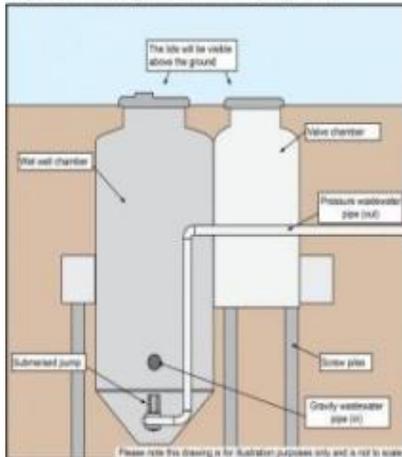


Diagram of an underground wastewater pump station:



THANK
YOU



Enabling an Intelligent Planet

ADVANTECH