

Advantech DIN-Rail IPC

Providing Fieldbus Control, Connectivity and Sustainability for Smart Factory



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**

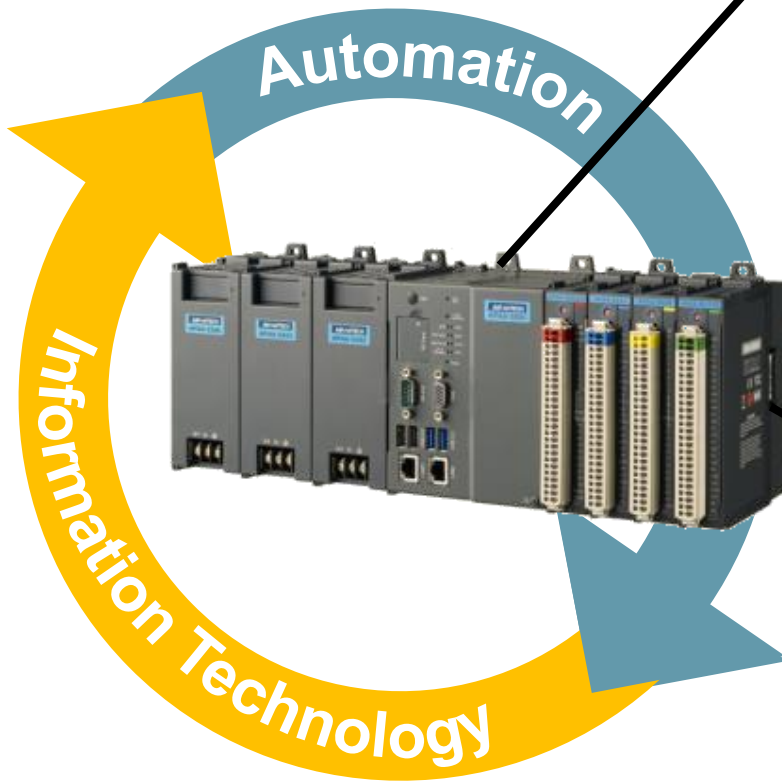


Industrial PC in compact size

- 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

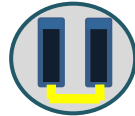
APAX-5580 : DIN-Rail IPC

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

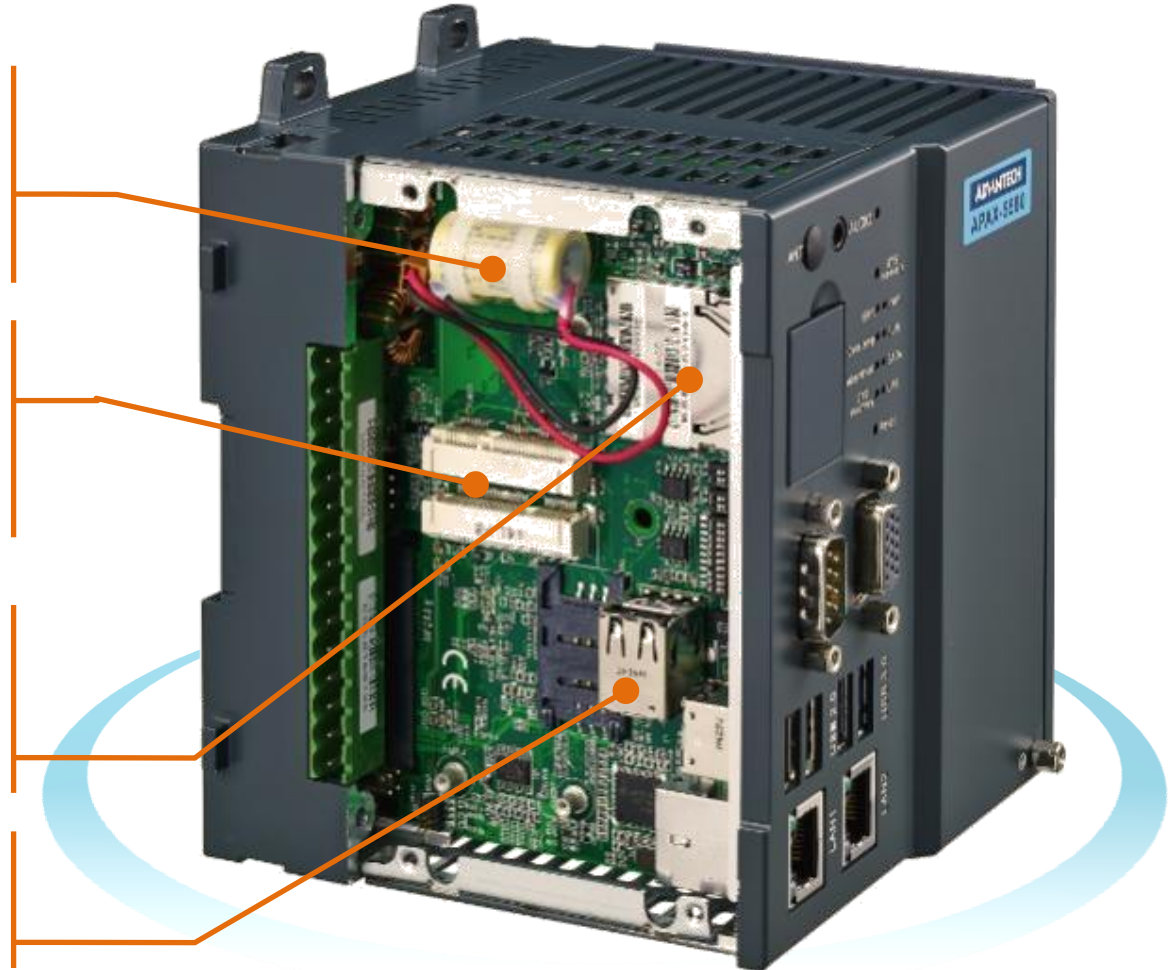
- One half-size mPCIe
- One full-size mPCIe with SIM slot

Reliability

- One inter SD slot for System backup






Security

- One internal USB slot



APAX-5580 : Powerful Inside Design

[Tips] Possibility to Wireless : mPCIe Solutions

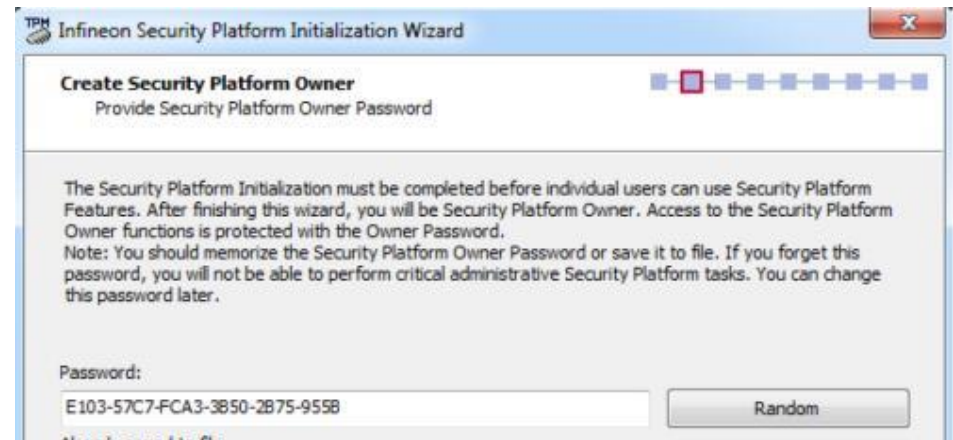
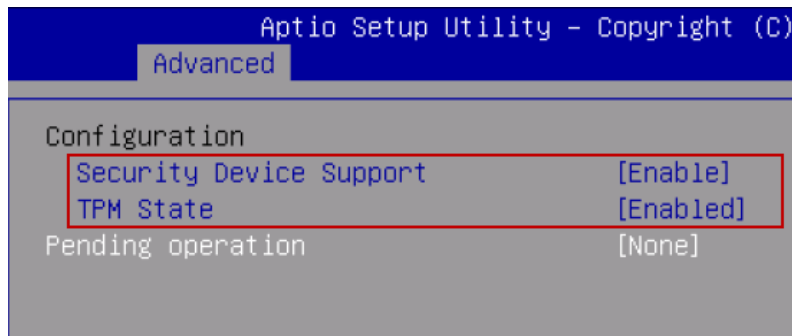
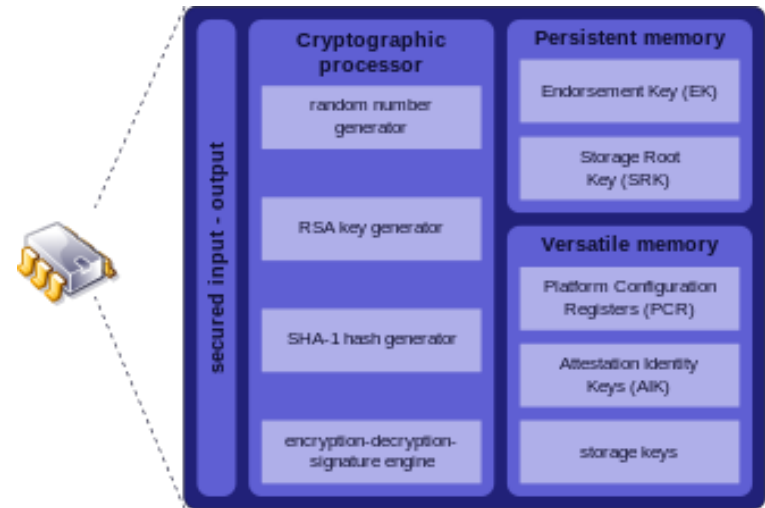
Advantech P/N	Description	Form Factor	Temperature	Cable	Antenna
EWM-W153H01E 	802.11 b/g/n 1T1R w/ BT4.0, Atheros AR9485+AR3012	Half size Mini	0 ~ 60°C	1750005885 1750006010 1750006043	1750000318 1750003222 1750003418
EWM-W135H01E 	802.11 a/b/g/n, Atheros AR9382, 2T2R	Half size Mini	-10 ~ 70°C	1750005885 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

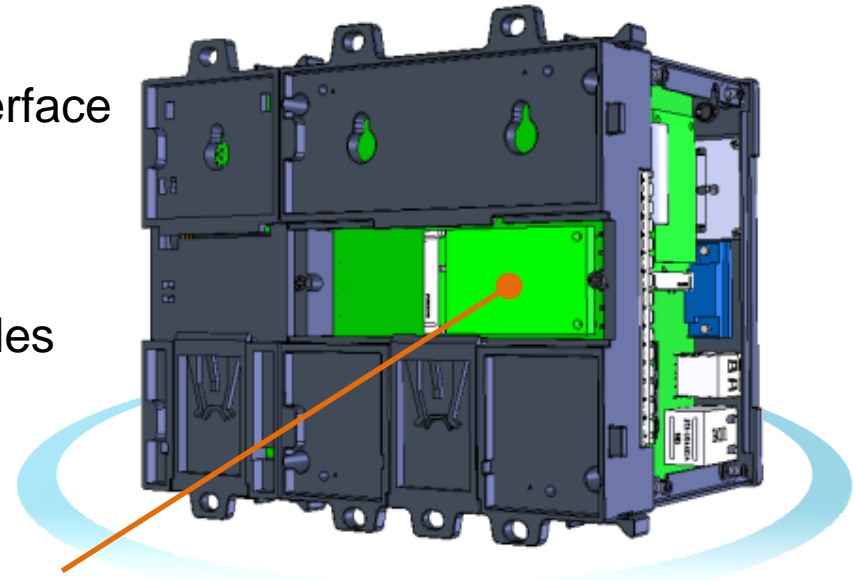
Provide the higher level of **Vibration** protection

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



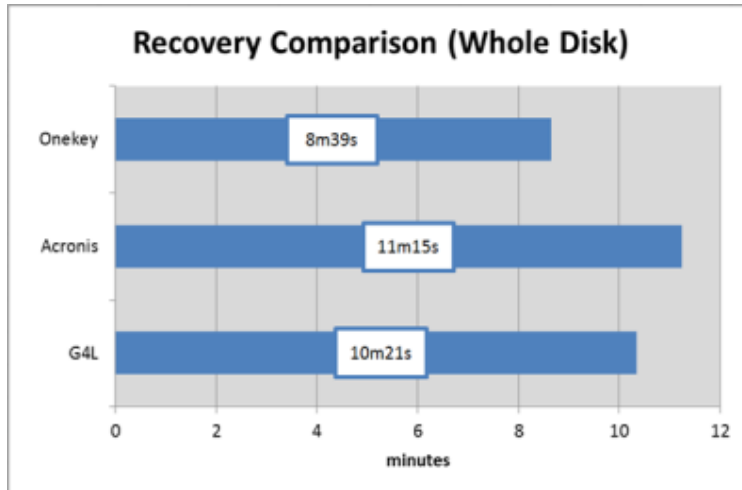
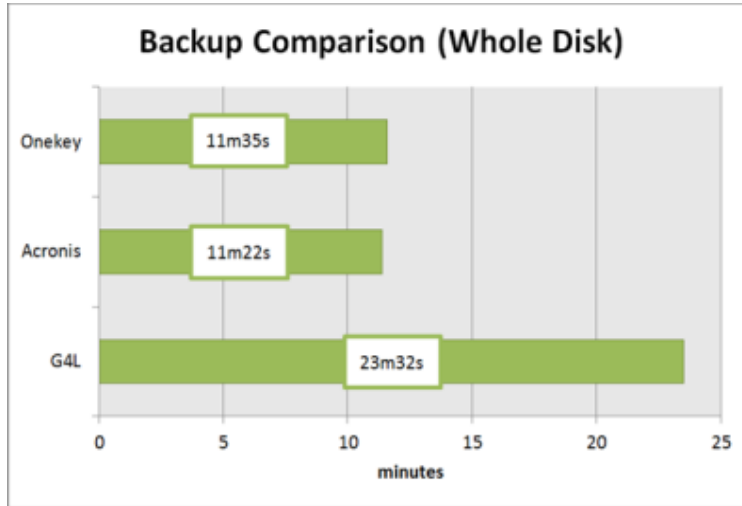
mSATA for
System Storage



- 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



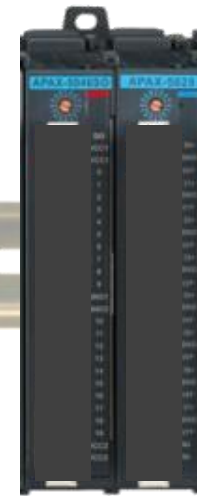
Power Supply

Embedded IPC

iDoor

mPCIe

I/O



Software



Enabling an Intelligent Planet



APAX System : H/W Feature

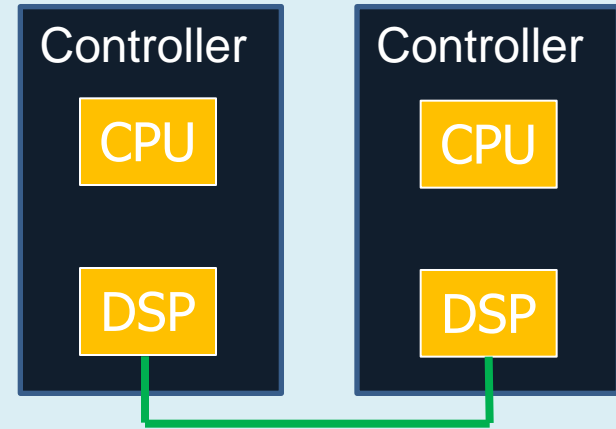


Flexible Topology



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

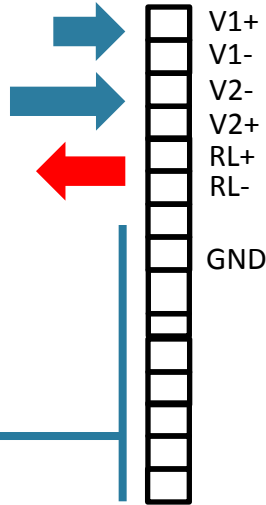


Dual Power Input

Relay Output

- V1 or V2 failure Alert
- Standby and PowerOn Detection

Smart Battery

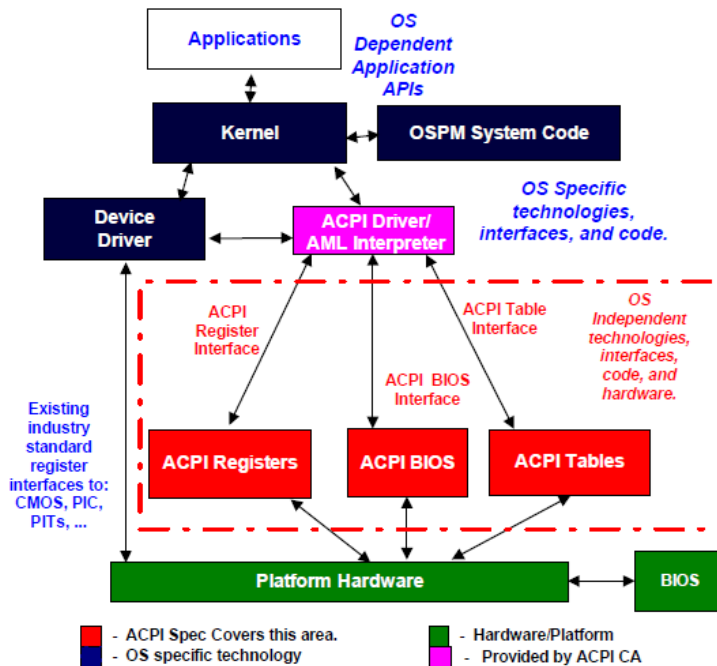


APAX System : Power Supply



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

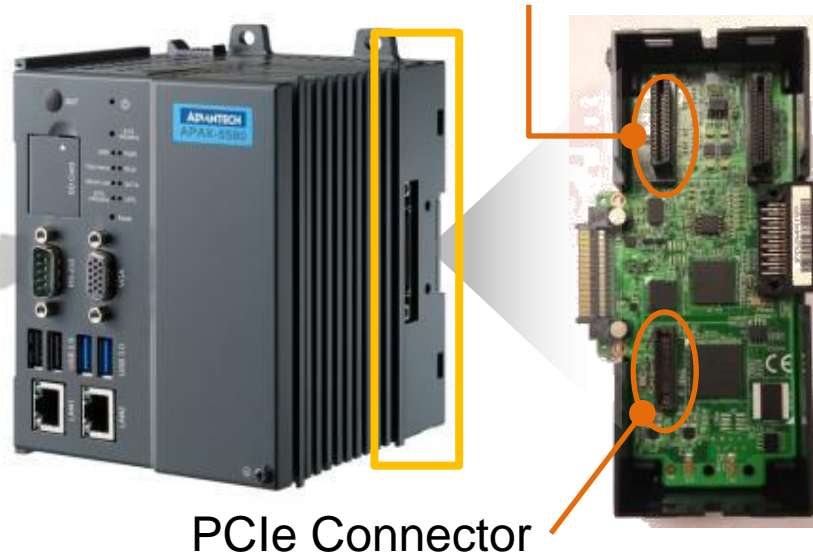
APAX-5402

APAX-5002

APAX-5002



APAX Connector



PCIe Connector

[Tips] Naming Rule

APAX-5402-E2 A0 A E

Module slot #
2,4

Onboard PCIe slot #
1,2

Onboard APAX slot #
1,2

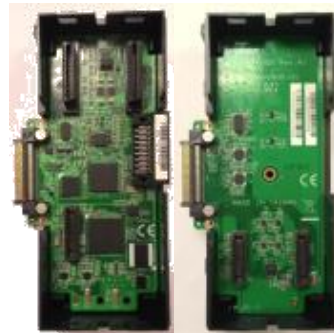
Version Control
A~Z

RoHS

e.g. APAX-5402-E2A1AE

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

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



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






ETHERNET 
POWERLINK



SERCOS
the automation bus




hilscher
COMPETENCE IN
COMMUNICATION

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


IEEE 1588



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

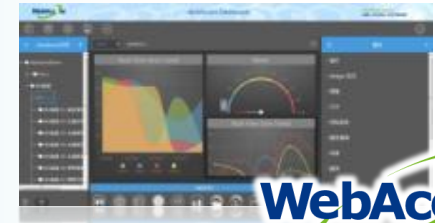
Empower by Vertical S/W,
Seamless integration by open API



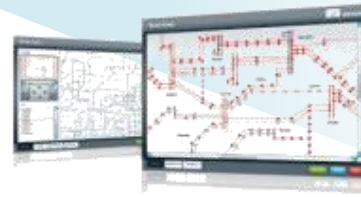
Softlogic



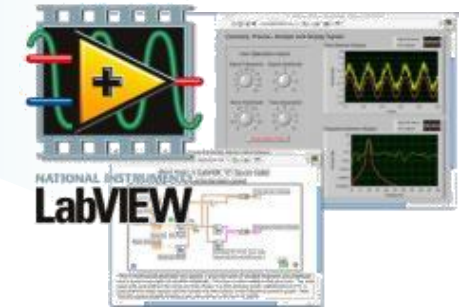
SCADA



SCADA



Test Automation



APAX System : Software



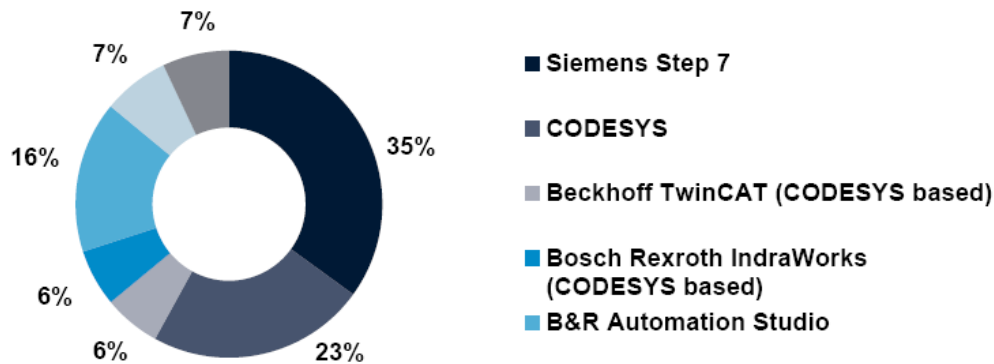
CODESYS : World NO.1 Control Software

CODESYS

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

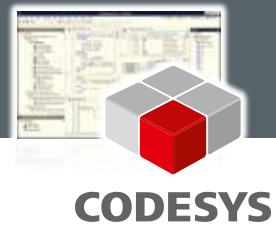
70 companies (machine- and plant manufacturers) were interviewed. One of the questions asked was: *Which development tool do you use to program your controller systems?*

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 : Features

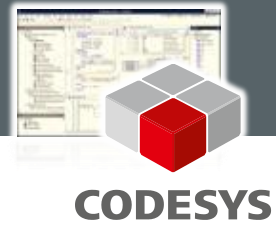
Features of the Development Environment

- 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

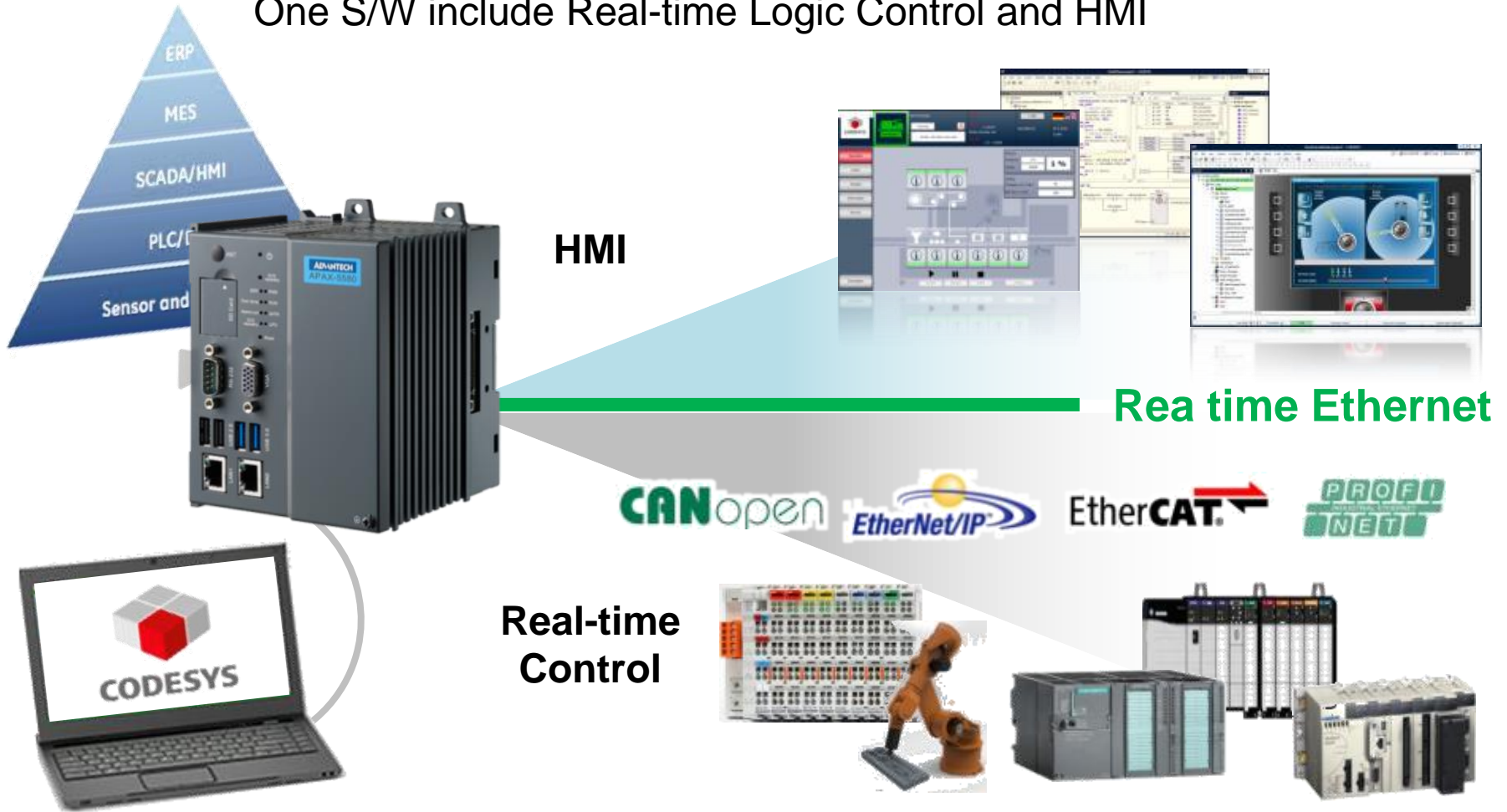
- Tried and tested a million times over
- Practice-oriented for fast creation of simple applications
- Powerful for large-scale projects and extensible by add-on tools
- Harmonized tools with consistent designs for functionality and operation
- Customizable functionality and user interface of the development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

APAX System : Software

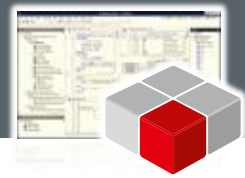


CODESYS : IEC-61131-3 Softlogic Solution

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



APAX System : Software



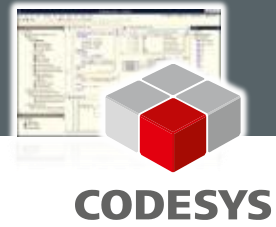
CODESYS

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

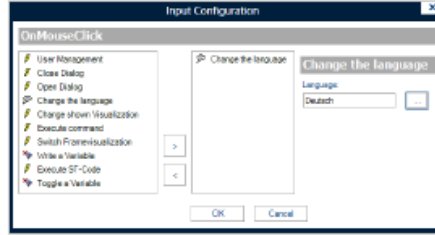


APAX System : Software



CODESYS : Visualization

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



Switching Language

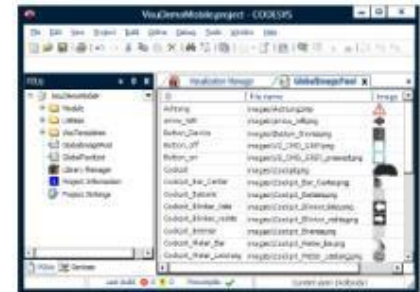
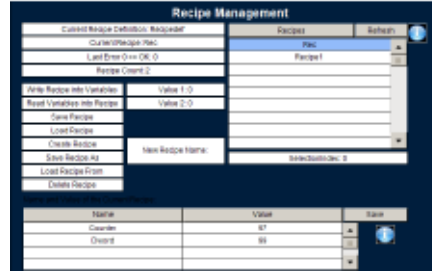


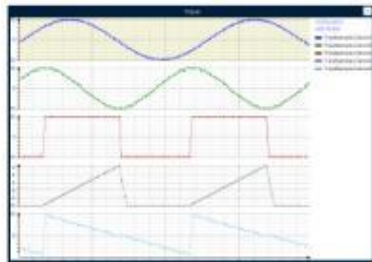
Image Switching



Recipe Management



User Management



Trace/Trend



Visualization Styles

Format template for the visualization

Time	Message	Status	User
2007-2013-08-20 10:00:00	Process pressure is too low	Active	
2007-2013-08-20 10:05:00	Process pressure is too high	Active	
2007-2013-08-20 10:10:00	Process pressure is too low	Active	
2007-2013-08-20 10:15:00	Process pressure is too high	Active	
2007-2013-08-20 10:20:00	Process pressure is too low	Active	
2007-2013-08-20 10:25:00	Process pressure is too high	Active	
2007-2013-08-20 10:30:00	Process pressure is too low	Active	
2007-2013-08-20 10:35:00	Process pressure is too high	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



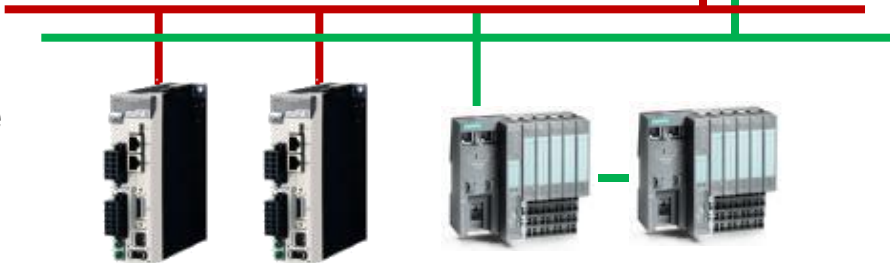
iDoor - CANOpen



Distributed topology for production line monitoring



Supports Real-time Ethernet Protocol



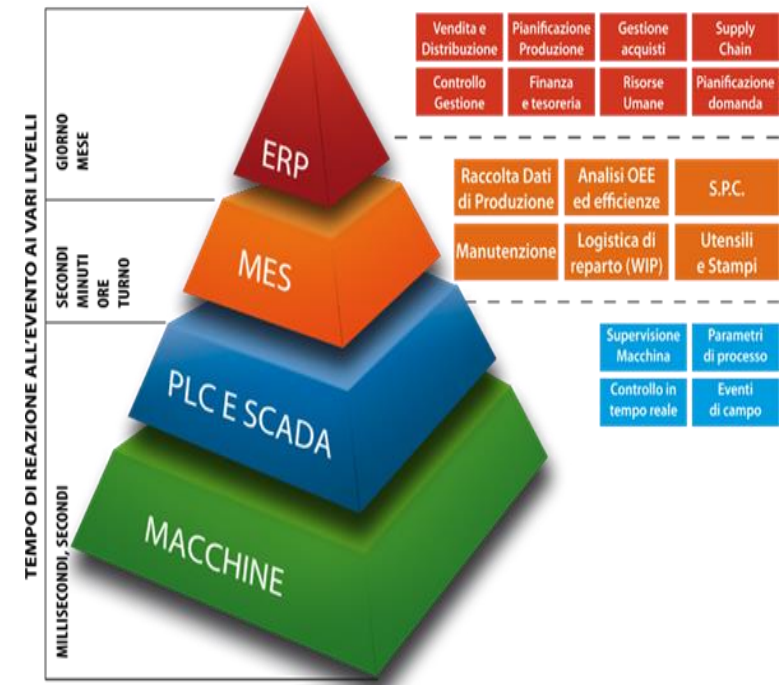
Scope 1 : MES & Production Profile

Integrate Operation Technology and Information Technology

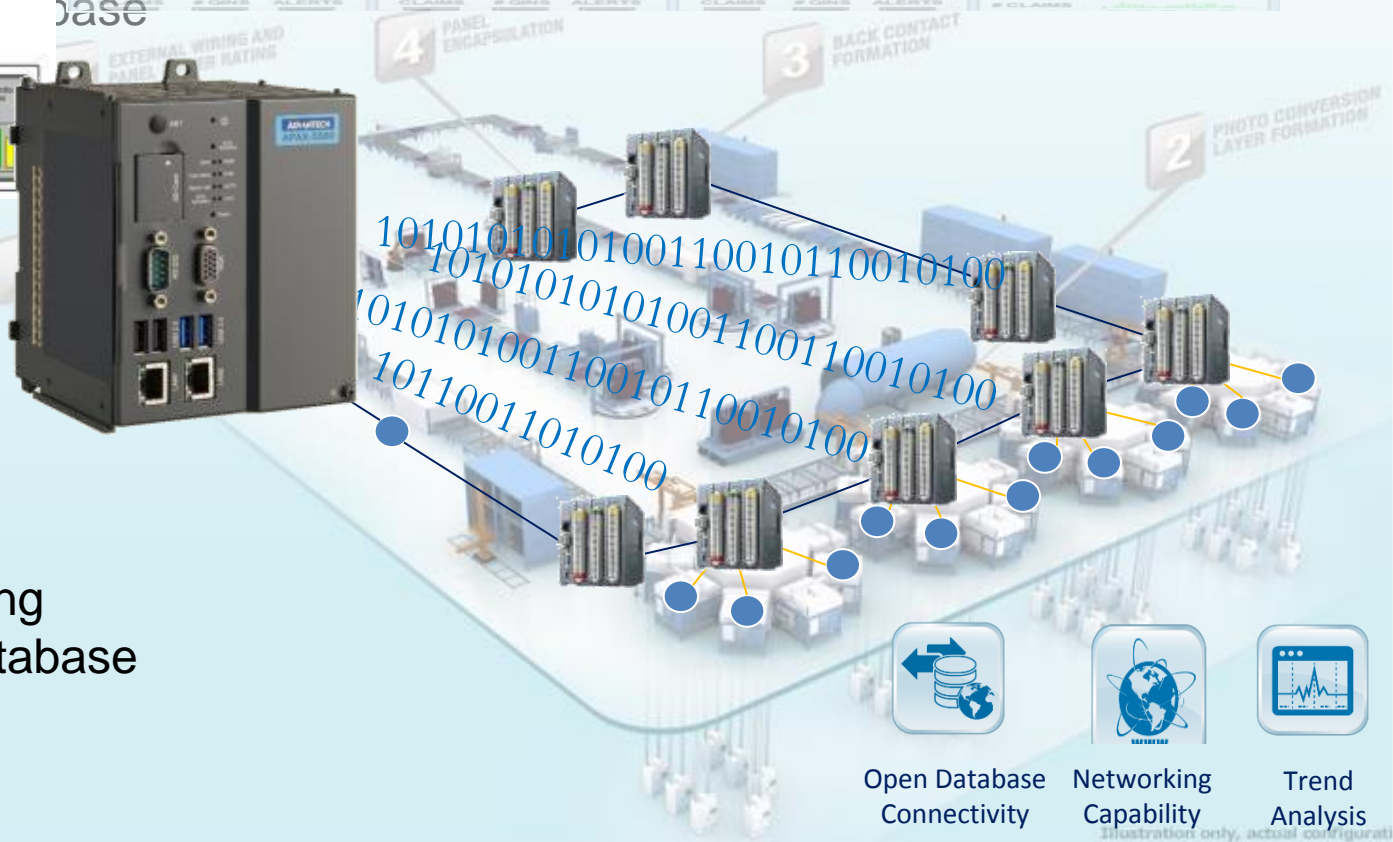
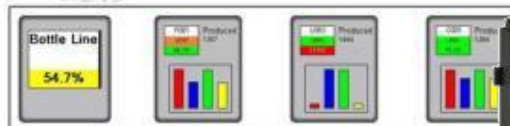
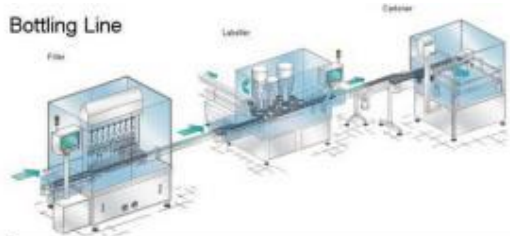


Information Hub

- Network
- Communication
- Data acquisition



Scope 2 : Production Testing Equipment



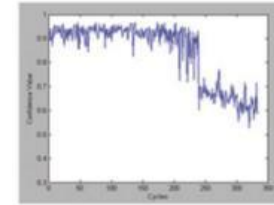
Production Testing

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

Scope 3 : Factory Monitoring & Management

Facility and Machine

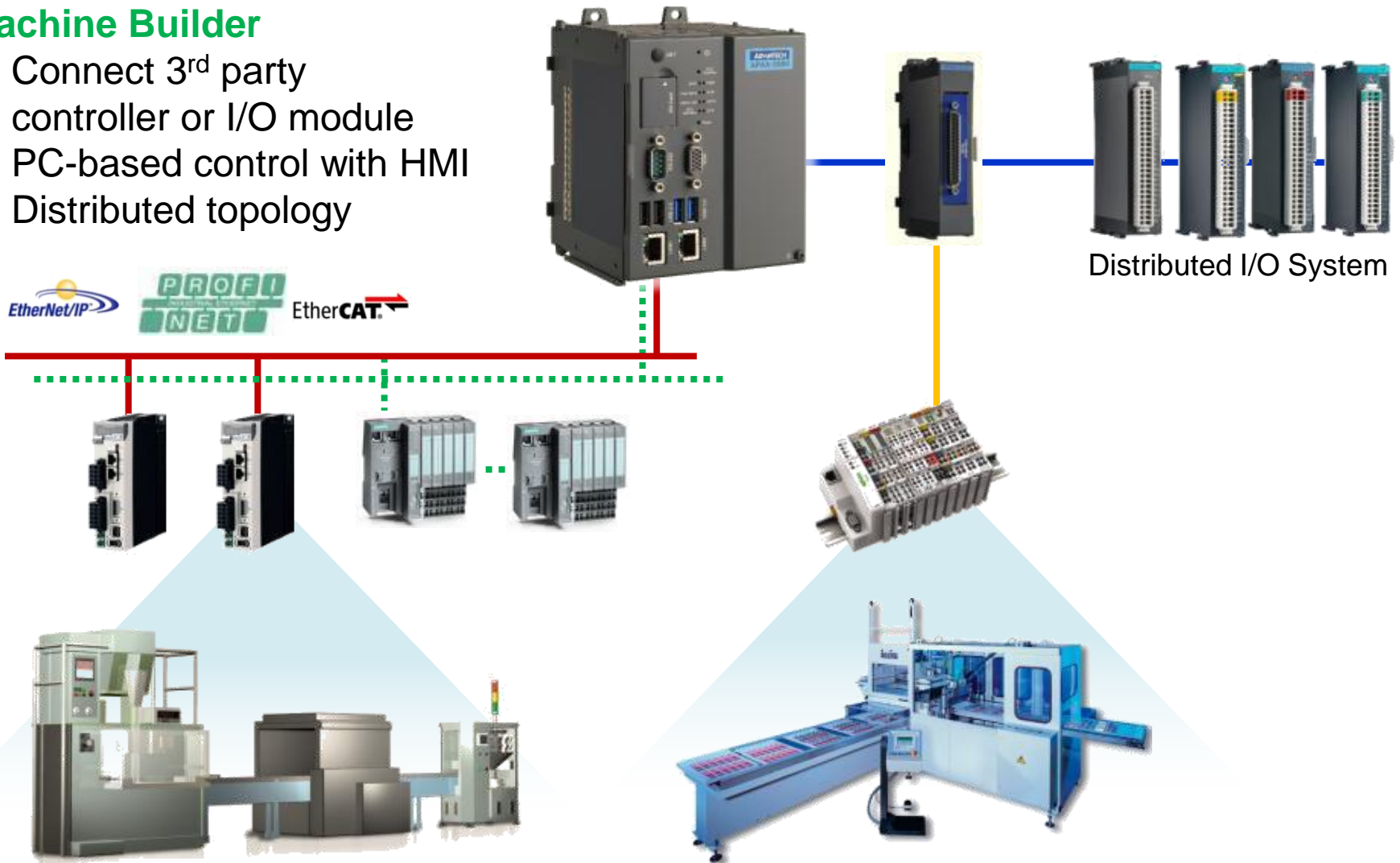
- Status monitoring
- Energy trend
- Maintenance



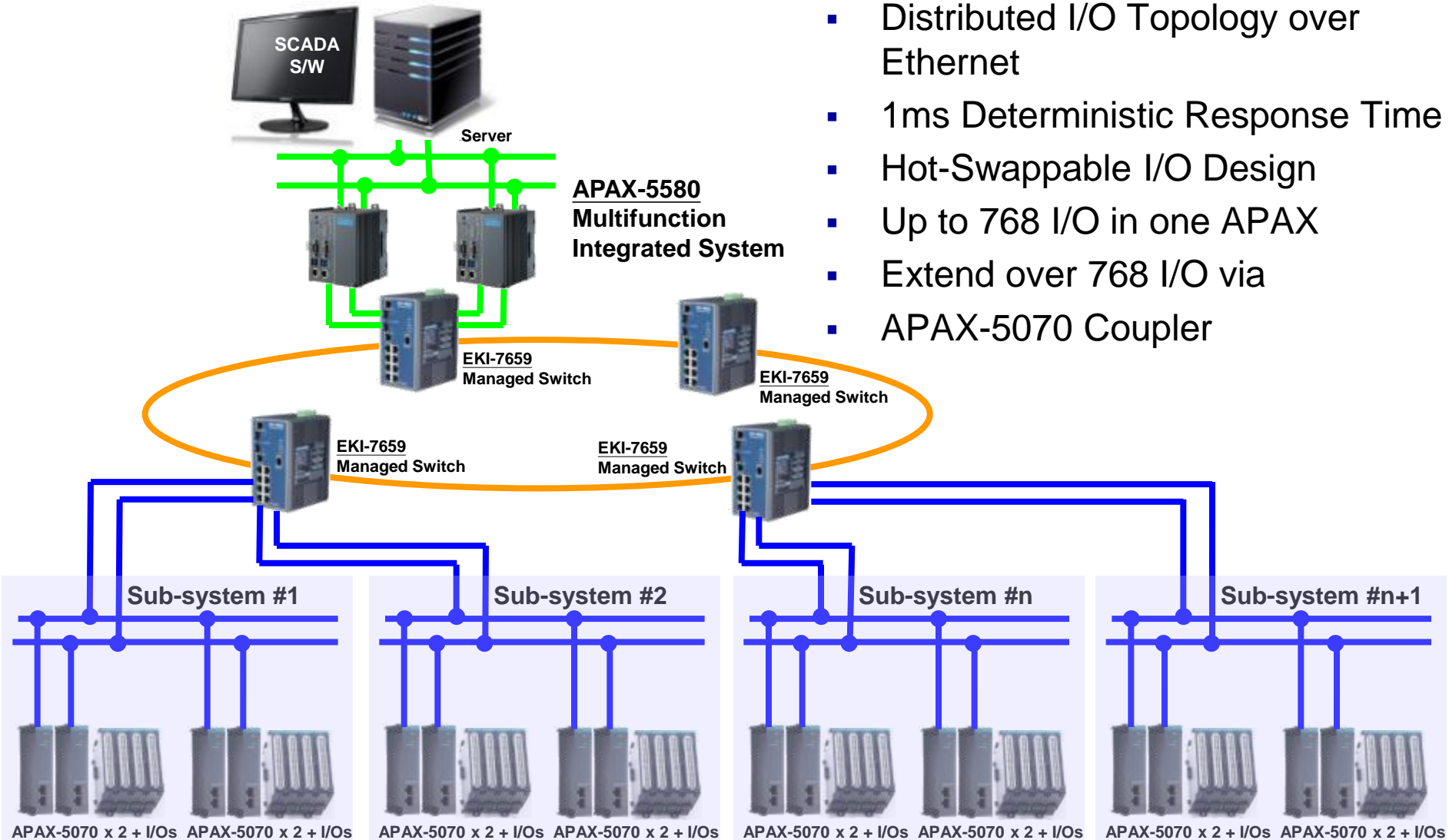
Scope 4 : Motion Automation

Machine Builder

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

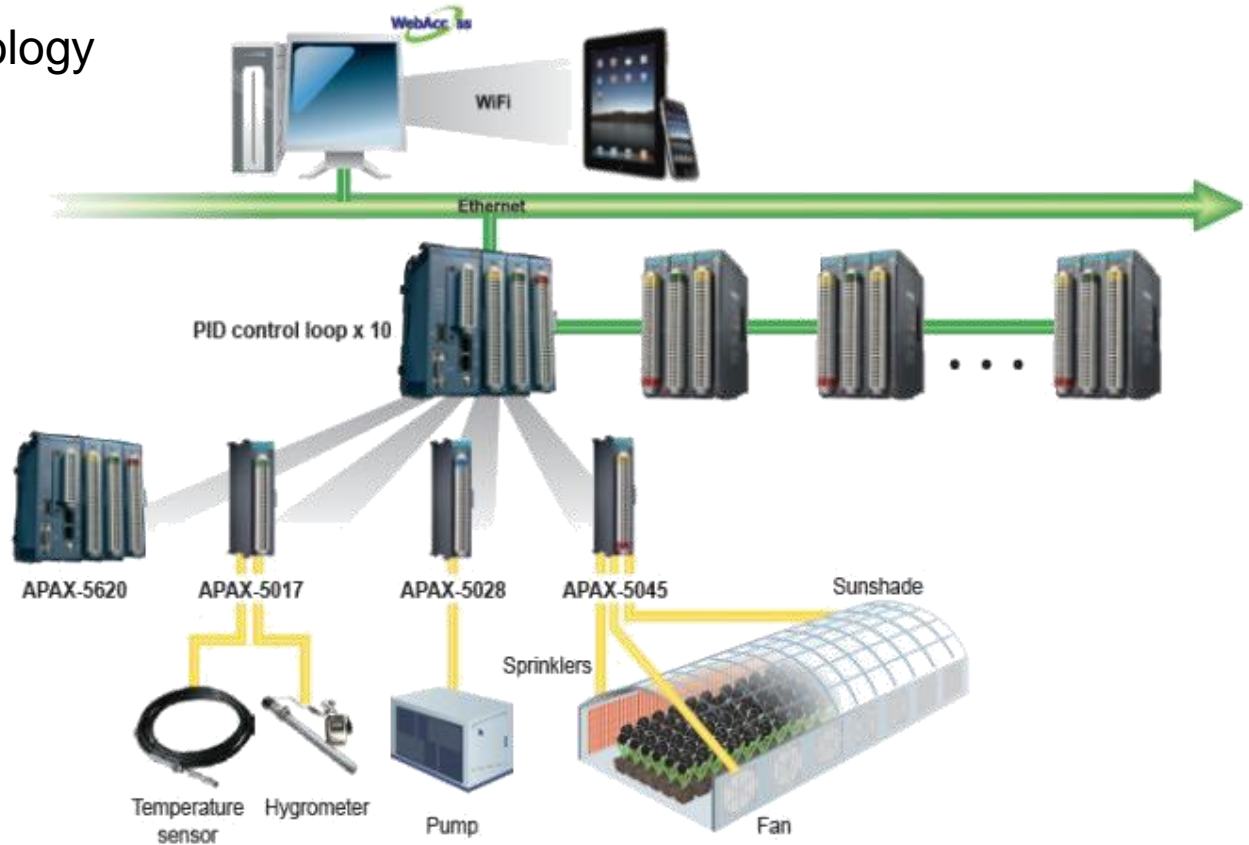


Application : Deterministic Distributed I/O



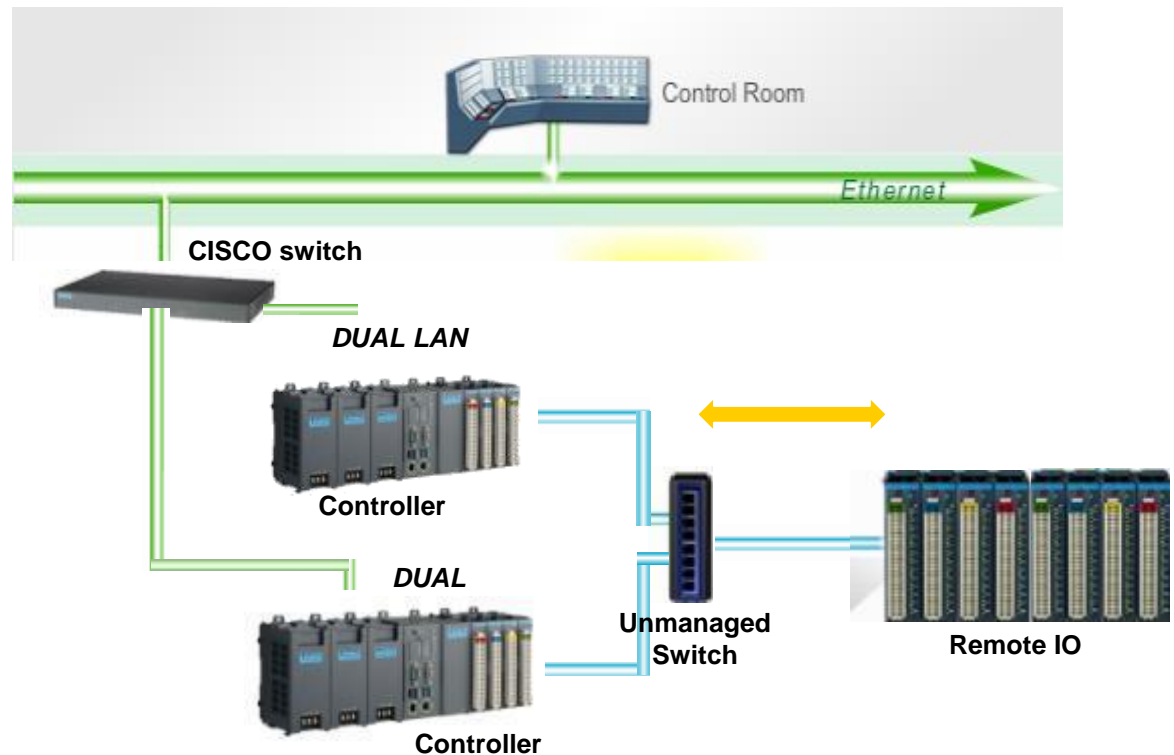
Application : Low Cost Distributed System

- **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.

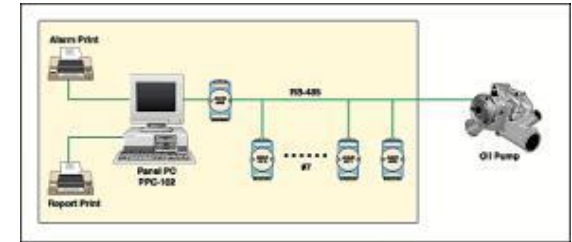
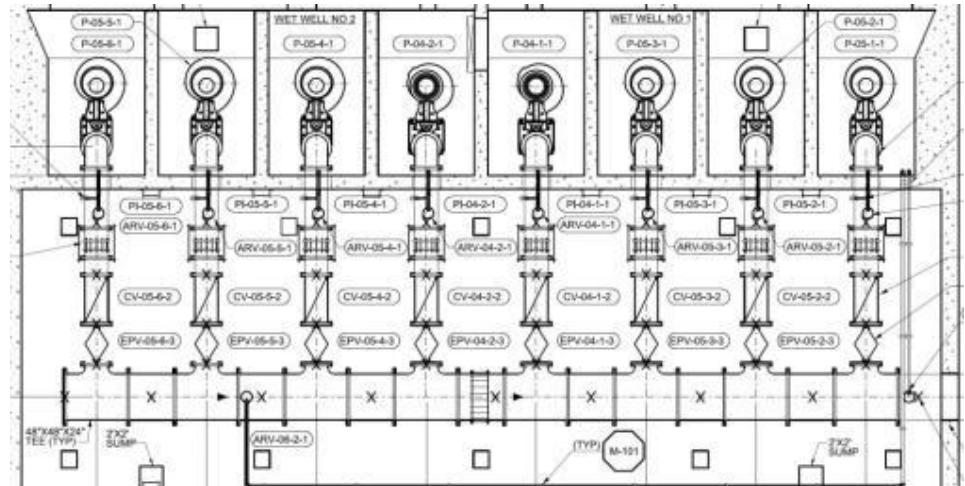
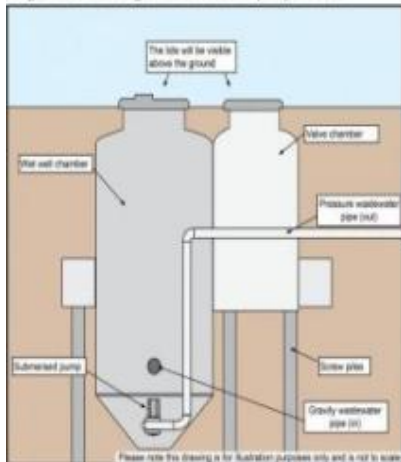


Diagram of an underground wastewater pump station:



THANK
YOU



Enabling an Intelligent Planet

ADVANTECH