台塑電子組

台塑關係企業
FORMOSA PLASTICS GROUP

電子專案組
ELECTRONICS GROUP

自動化系統與解決方案

Automation System and Solutions

Contact Us

台北辦公室　Taipei Office
105 台北市敦化北路201號(台塑大樓 後棟6樓)
Rear Building-6F, No.201, Tung Hwa North Rd., Taipei 105, Taiwan
TEL：+886-2-27122211 Ext.7152
FAX：+886-2-87122938

高雄辦公室　Kaohsiung Office
814 高雄市仁武區水管路100號
No.100, Shuiguan Rd., Renwu Dist., Kaohsiung City 814, Taiwan
TEL：+886-7-3711411 Ext.5163
FAX：+886-7-3727026

台塑電子(寧波)有限公司　Ningbo Office
寧波市北侖區霞浦鎮 台塑關係企業 寧波工業園區
FPG Ningbo Industrial Park, Beilun, Ningbo, China
TEL：+86-574-86902999 Ext.3654/3682
FAX：+86-574-86902939

Website：www.fpc.com.tw

E-mail ：egsales@fpc.com.tw

2016.10

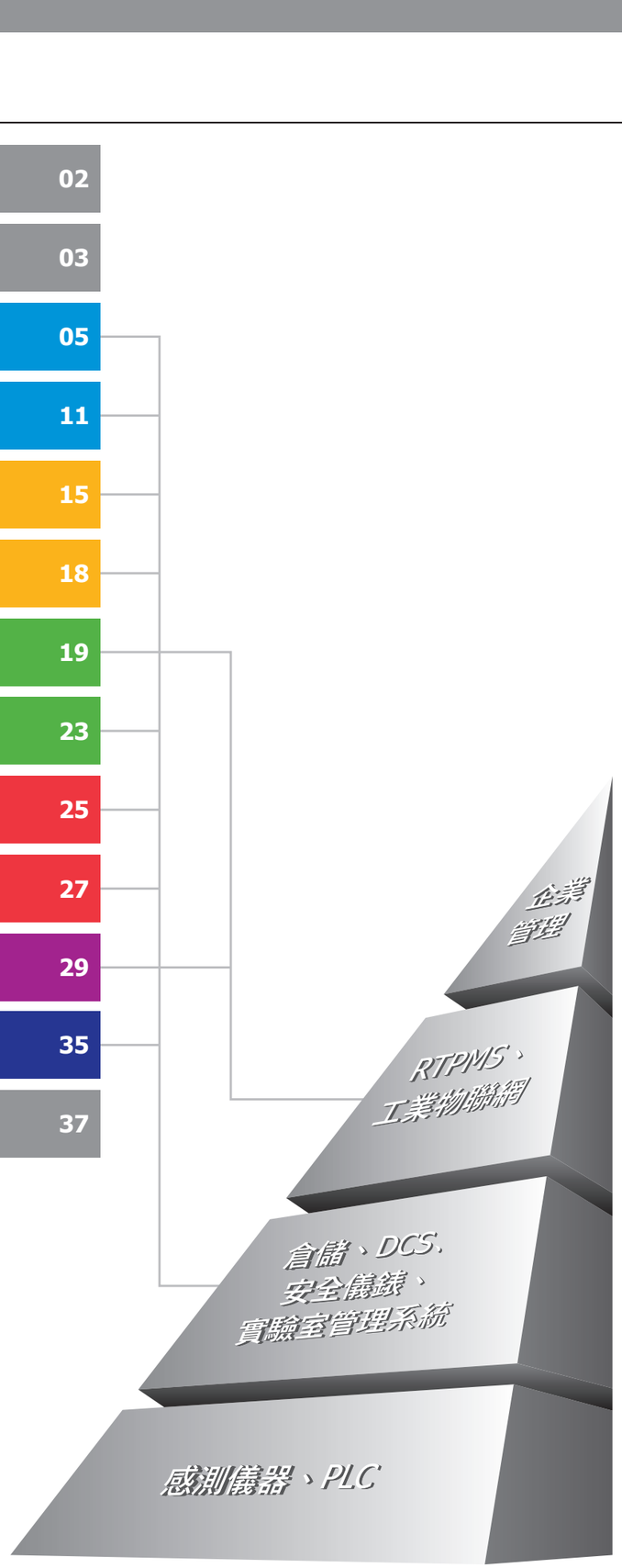
自動化系統與解決方案

創新引領未來 | 智慧驅動科技

Innovation Guide The Future | Intelligent Drive Technology

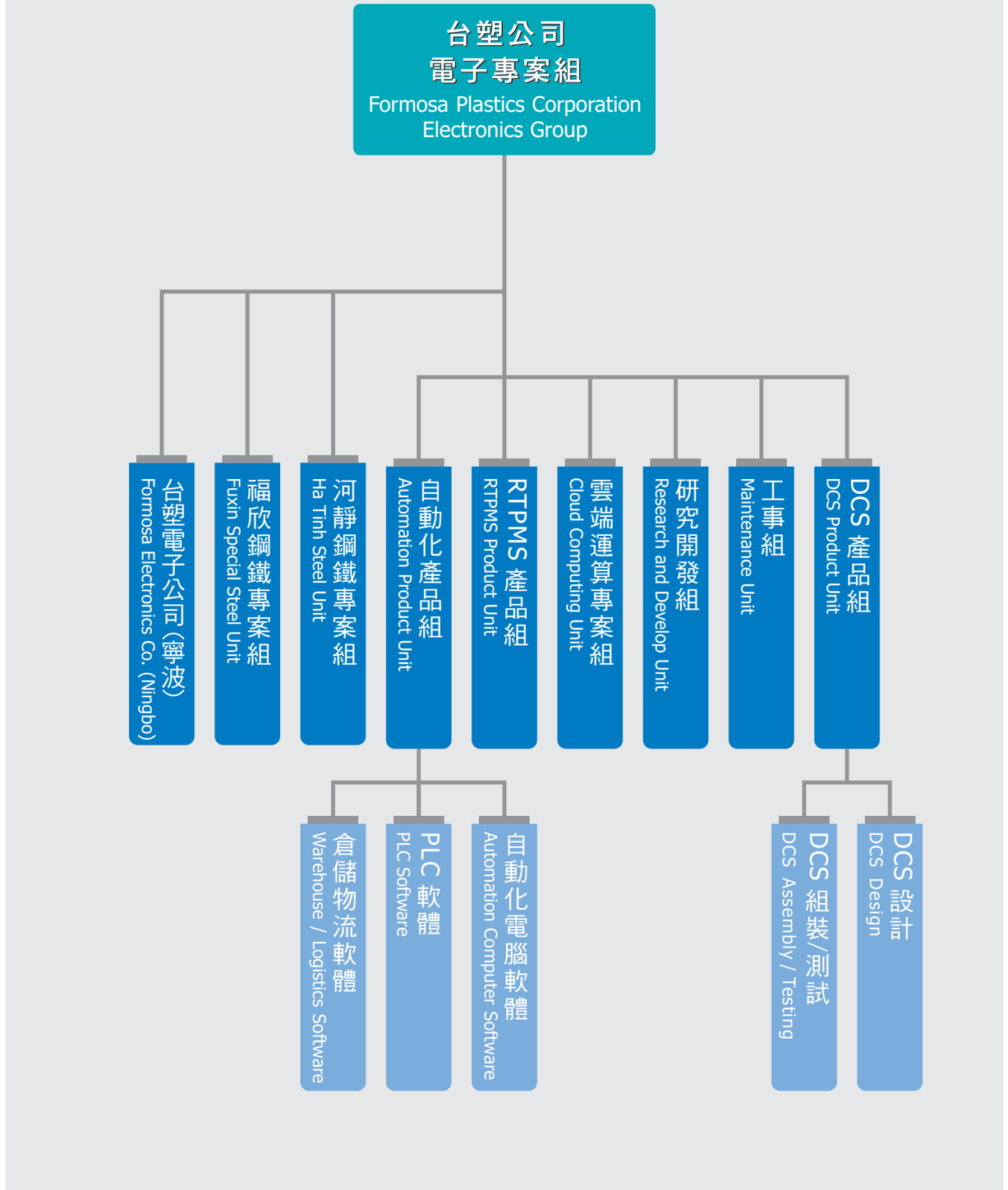
CONTENTS

目 錄



FORMOSA ORGANIZATION STRUCTURE

台 塑 組 織 架 構



FACTORIES DISTRIBUTION OF FORMOSA PLASTICS GROUP

FACTORIES DISTRIBUTION OF FORMOSA PLASTICS GROUP

台 塑 關 係 企 業 生 產 事 業 分 布 圖

台塑關係企業生產事業分布圖

Factories Distribution of Formosa Plastics Group

電子組服務據點 Electronics Group Service Locations

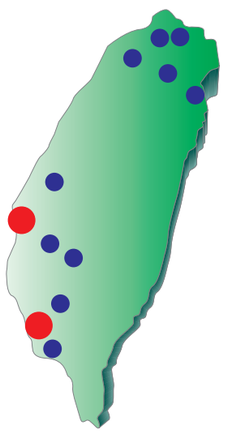
台灣地區 Taiwan

- 台塑仁武廠區：高雄市仁武區水管路100號
  Renwu Plant: No.100, Shuiguan Rd., Renwu Dist., Kaohsiung City
- 台塑麥寮廠區：雲林縣麥寮鄉三盛村台塑工業園區1號
  Mailiao Industrial Park: 1, Formosa Plastics Group Industrial zone, Mailiao, Yun Lin County

其 他 Overseas

- 大陸寧波工業園區：寧波市北侖區霞浦鎮 台塑關係企業 寧波工業園區
  FPG Ningbo Industrial Park, Beilun, Ningbo, China
- 越南河靜廠區：越南河靜省奇英市奇龍社永安經濟區
  Vung Ang Economic Zone, Ky Long District, Ky Anh County, Ha Tinh Province, Vietnam

中國大陸 Mainland China



台 灣 Taiwan

台灣廠區分佈圖

- 高雄廠區 Kaohsiung Plant
- 仁武廠區 Renwu Plant
- 林園廠區 Linyuan Plant
- 嘉義廠區 Chiayi Plant
- 新港廠區 Hsinkang Plant
- 林口廠區 Linkou Plant
- 樹林廠區 Shulin Plant
- 錦興廠區 Jingshin Plant
- 麥寮廠區 Mailiao Industrial Park
- 宜蘭廠區 Yilan Plant
- 彰化廠區 Changhua Plant
- 工三廠區 Kung Shan Plant

印尼、越南 Indonesia, Vietnam

美 國 USA

DCS

DISTRIBUTED CONTROL SYSTEM

分 散 式 控 制 系 統 FORMOSA–FX

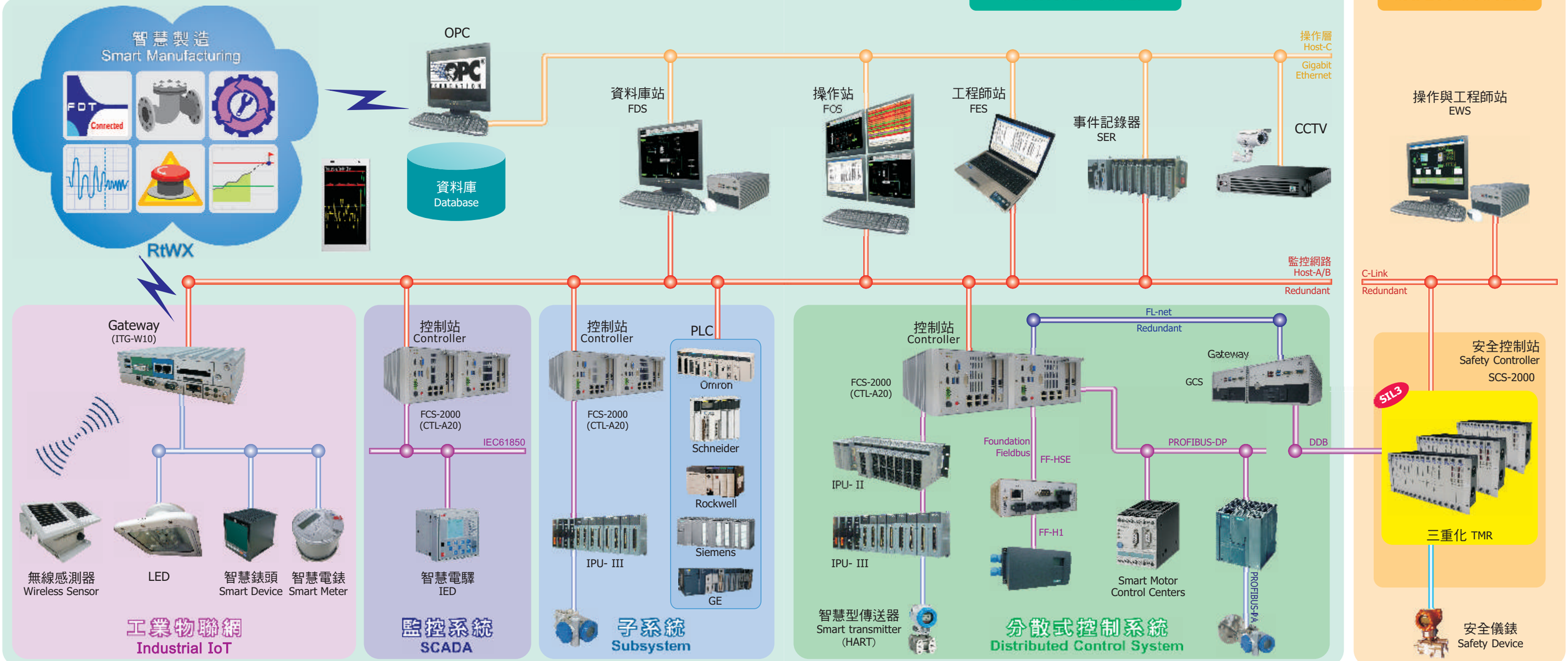
系 統 特 色 System Features

- 跨平台、跨控制器的廣域控制系統，一體化設計與操作介面整合DCS、PLC、SCADA、IED、AMI、CCTV、LED工業照明及智慧系統等。
  Wide area control system crossovers platform and controller with unified engineering and human interface to integrate DCS, PLC, SCADA, IED, AMI, CCTV, LED industrial lighting and intelligent system etc.
- 智慧型導航、強制操作、警報管理之人機介面。
  Intelligent MMI with navigation, force on/off and alarm management.
- 可快速安裝節省更換及維護時間；無縫式切換的熱備源技術。
  Express setup to reduce maintenance efforts and hot standby technology for bumpless switchover.
- 舊機種可順利轉移並相容於MICREX-AX/CX 系統，無零件停產的顧慮。
  Backward compatible with legacy MICREX-AX/CX system for smooth migration and alleviate obsolescence issue.
- 藉由整體解決方案，如:預測控制，預知保養，即時生產管理系統等，可提高生產效率及減少工廠成本。
  Maximize productivity and minimize plant costs with integrated solutions such as predictive control, predictive maintenance, realtime production management system, and so on.

節能 Energy Saving
- 儀錶管理 Plant Asset Management
- 製程最佳化 Advanced Process Control

環保 Eco-friendly
- 管線洩漏偵測 Pipeline Leakage Detection
- 設備安全 Safety

設備可靠 Equipment Reliability
- 老化監視 Breakdown Prediction
- 故障抑止 Failure Prevention



DCS

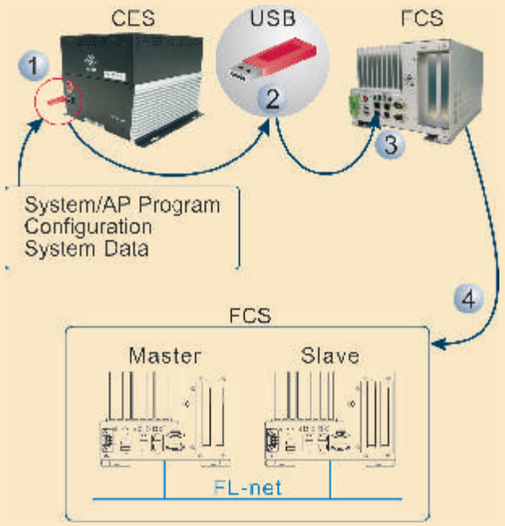
DISTRIBUTED CONTROL SYSTEM

分 散 式 控 制 系 統 FORMOSA−FX

FORMOSA-FX 新機能 FORMOSA-FX New Function

快速備援
Express Backup

當二重化系統其一設備損壞時，可迅速更換並維持二重化系統運作
When one device fails, it can be changed quickly and then keep duplex system working

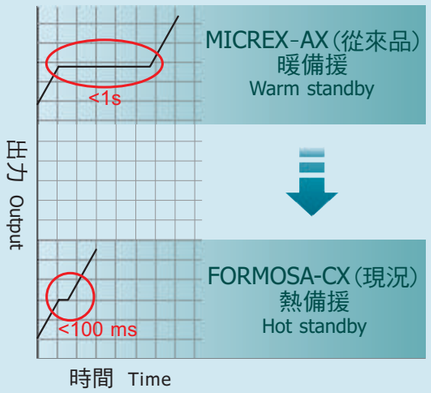


當控制器發生異常時，維修人員可攜帶隨身碟至CES。
When controller fails, maintenance person takes USB flash drive to the CES.

1. Step1: 製作還原隨身碟。
   Make recovery USB flash drive.
2. Step2: 將隨身碟移至新控制器。
   Plug the USB flash drive into the new controller.
3. Step3: 開機後，控制器將自動回復所有設定及程式。
   Power on the controller, all settings and programs will be recovered automatically.
4. Step4: 替換控制器。
   Replace the controller.

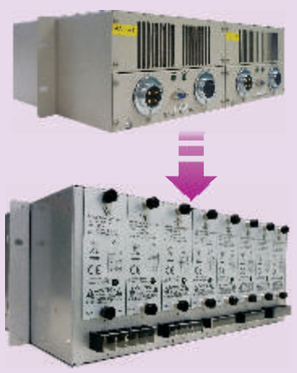
主從切換時間縮短
Reduce master/ slave switchover time

「暖備援」提昇為「熱備援」
Upgrade from warm standby to hot standby



高可靠度電源
High Reliability Power

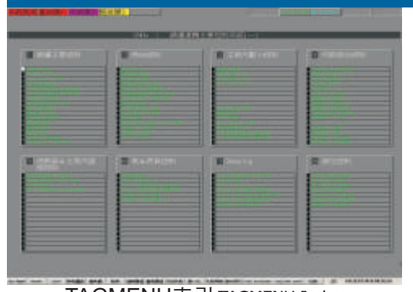
「二重」冗餘提昇為「多重」，均流且無風扇
Upgrade from duplex to multi-redundancy, load sharing and fanless.

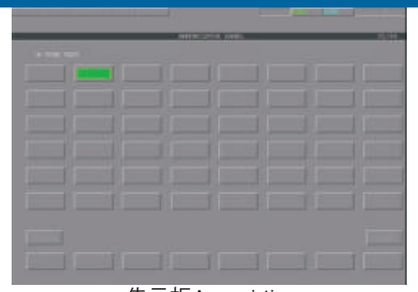


二重化（從前品）
Duplex

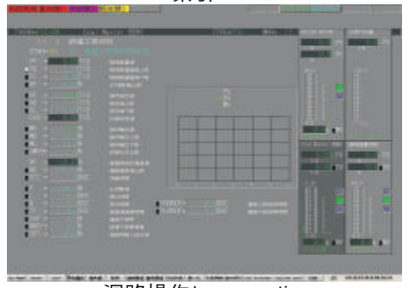
多重化（現況）
Multi-redundancy

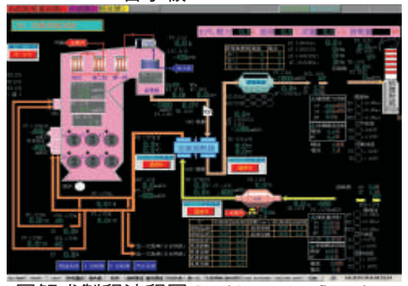
操作監視畫面 Operator Station Screenshots


TAGMENU索引 TAGMENU Index

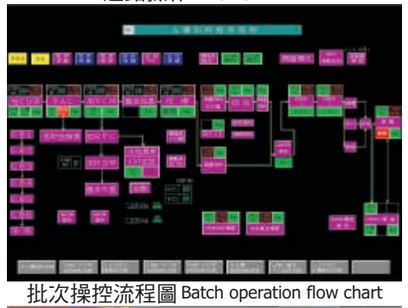

告示板 Annunciation


可自訂工作列（多國語）Customizable toolbar (Multi language)

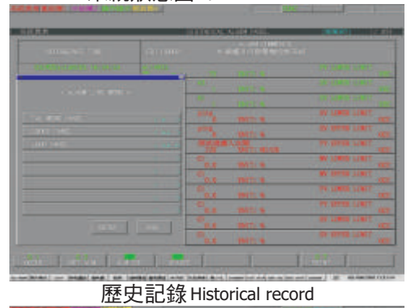

迴路操作 Loop operation


圖解式製程流程圖 Graphic process flow chart


系統狀態圖 System condition


批次操控流程圖 Batch operation flow chart

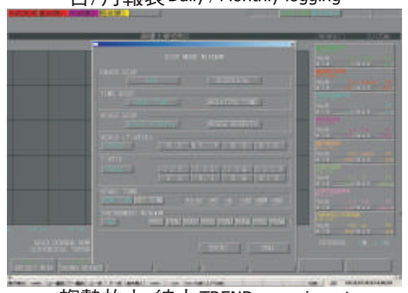

同一螢幕四分割 Multi screen


歷史記錄 Historical record


日/月報表 Daily / Monthly logging


趨勢圖 TREND diagram


迴路群組索引 GROUP index


趨勢放大/縮小 TREND zoom in/out


迴路操作警報設定 Loop operation alarm setting

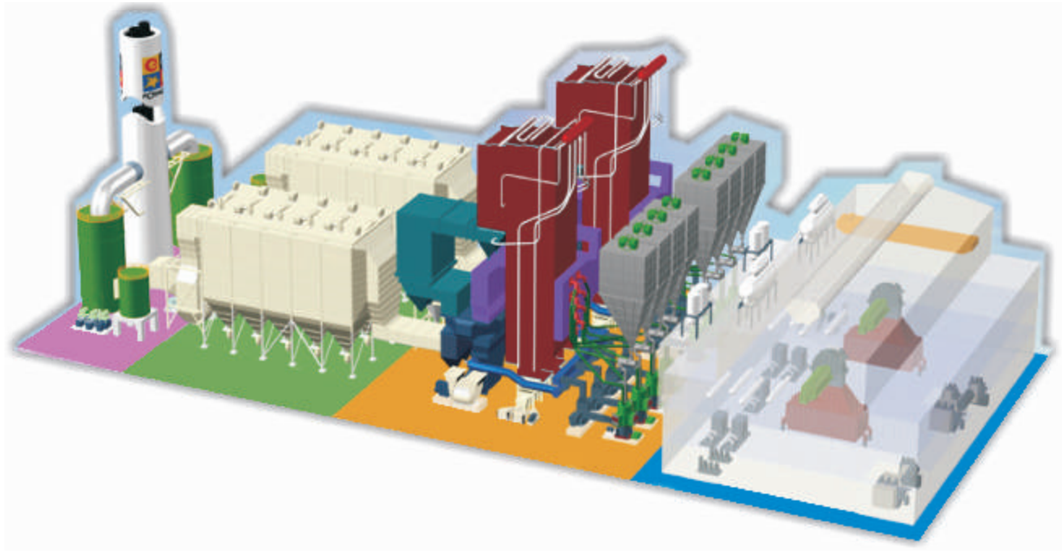

警報履歷 Historical alarm

DISTRIBUTED CONTROL SYSTEM

分 散 式 控 制 系 統 FORMOSA–FX

完整的電廠控制方案 Total Solutions for Power Plant Control

藉由 DCS 中控系統，實現全廠區自動化控制
Full automatic control by DCS central control system



子系統整合 Subsystem Integration

輸煤系統
Coal Conveyor System

水處理系統
Water Treatment System

飛灰系統
Fly Ash System

鍋爐系統 Boiler System

石灰石注入系統
Limestone Feeding System

砂注入系統
Sand Feeding System

底灰系統
Bottom Ash System

吹灰系統
Soot Blower System

汽/發電機系統 Turbine / Generator System

汽機控制
Turbine control

汽機軸心監視
Shaft minitoring

汽/發電機潤滑油系統
Turbine/ Generator oil system

發電機控制系統
Generator Control System

相容既有機種 Migration

相容既有之控制語言、降低系統轉換之工程費用
Control language is compatible. Reduce the engineering cost of system migration

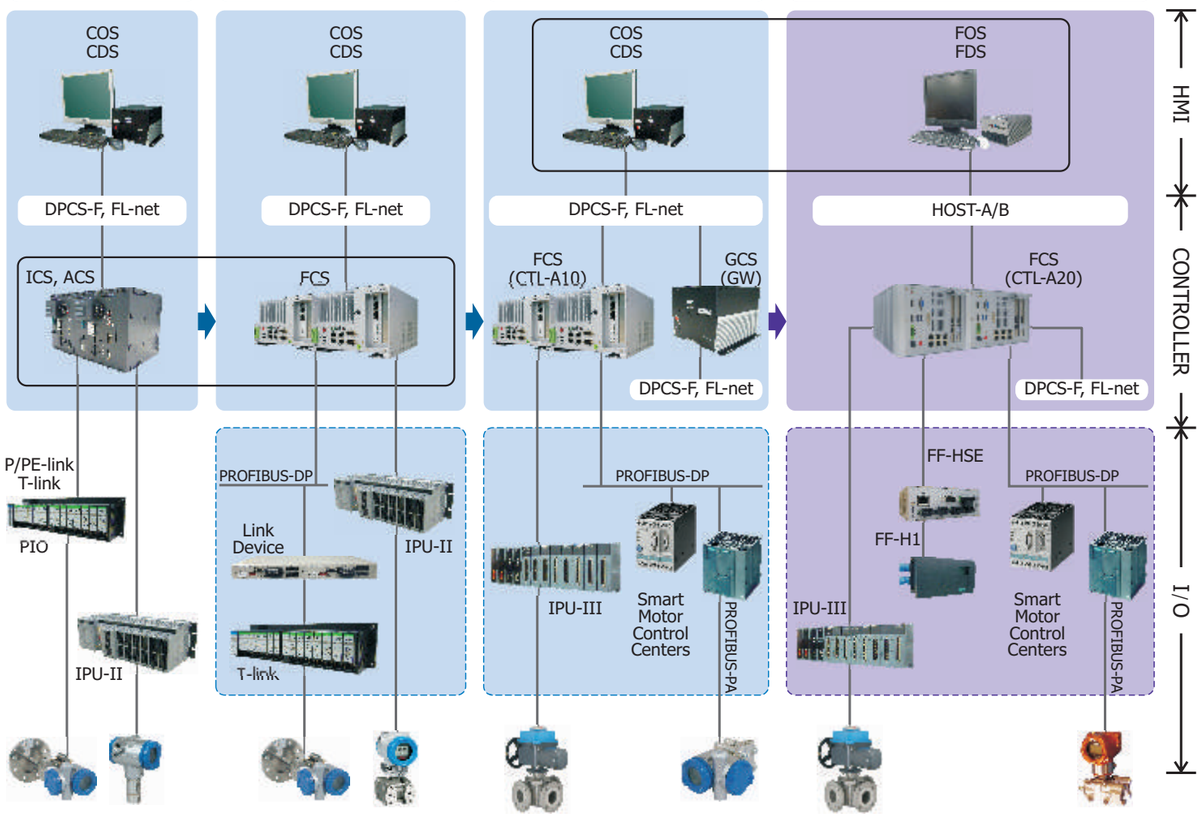
Years	1985	1990	1995	2000	2005	2010	2015
Generation	3rd		4th	5th		6th	7th
Series name	MICREX-PIII		MICREX-IX	MICREX-AX		FORMOSA-CX	FORMOSA-FX

既設 MICREX-AX / FORMOSA-CX 系統可以分二階段進行更換至 FORMOSA-FX:
Two phases to migrate from the MICREX-AX/ FORMOSA-CX system

1、更換人機或控制器：在不換 I/O 與控制邏輯情形下，更換人機與控制器以解決 AX/CX 備品取得之問題。
HMI and Controller : Inherit original I/O, control logic, migrate the HMI stations and controller to alleviate obsolescence issues.

2、更換 I/O：FX 控制器可支援 IPU-II/III、 PROFIBUS 現場總線。
I/O: Combine legacy I/O with the next generation IPU-II/III and the fieldbus such as PROFIBUS.

Replacement of MMI only with CX | Partial replacement, but existing PIO | Combined use with former system and PROFIBUS | Replacement of MMI



PMS

POWER MANAGEMENT SYSTEM

電 力 管 理 系 統

電力管理系統(Power Management System，簡稱PMS) 因應廠區電力系統異常發生，造成電力不足或電力過剩時，系統能迅速反應執行自動卸載或動態煞車等功能，有效防止廠區全黑發生，保障廠區安全運轉。

When the abnormality of power system causing an electrical shortage or power surplus, Power Management System called PMS can carry out Load Shedding or Dynamic Braking very quickly in order to prevent the plant "all black" and guarantee the safety operation.

電力管理系統(PMS) Power Management System

台塑企業麥寮園區運轉自1997年以來即使發生729 全台大停電及921大地震未發生全黑。

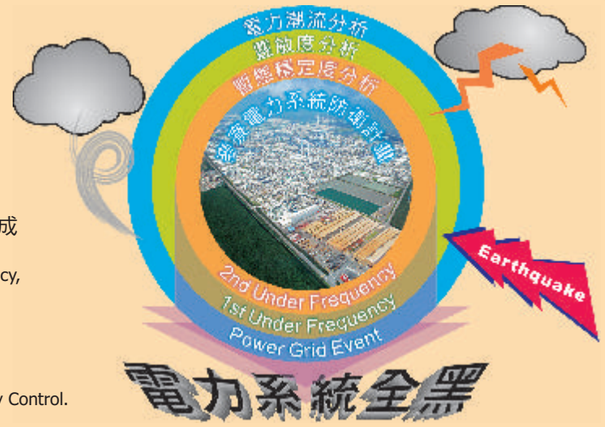
The Formosa MAI-LIAO Industrial Park has been operating from 1997 never all black even encountered serious disasters like the 729 power failure and the 921 earthquake.

電網異常事件觸發、第一段低頻觸發、第二段低頻觸發構成三段式深度防禦機制。

Three levels defense in depth strategy: Power Grid Event, 1st Under Frequency, and 2nd Under Frequency.

自動卸載、動態煞車及自動頻率控制三種保護方法。

Three protection methods: Load Shedding, Dynamic Braking, Auto Frequency Control.



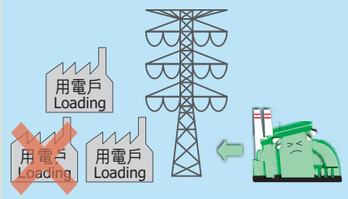
沒有PMS的隱患 Hidden danger without PMS

規模較大的廠區雖自備有發電機組供電並與外電併聯，但非常不幸地，很多廠區與外電解聯時，自備的發電機組往往因為系統低頻或高頻造成發電機組連鎖跳脫，廠區仍無法防止全黑發生；電力系統異常時，使用人工調度的方式因應，不僅無法精確地計算卸載量和合適地選擇卸載對象，而且反應速度太慢，幾乎沒有成功的機會。

Some larger plants own self-built generators to supply power and in parallel with great power (for example: Taiwan Power Company), but unfortunately when the plants are not in parallel with great power suddenly, the generators often trip because of under frequency or over frequency and the plant are unable to prevent "all black". Manual processing can not calculate the shedding power and select the shedding feeders accurately and quickly in advance. There are almost no opportunity of success without PMS.

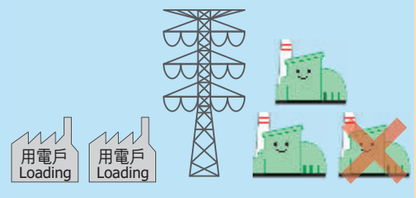
自動卸載 Load Shedding

用電量 > 供電量
Load Power > Produce Power

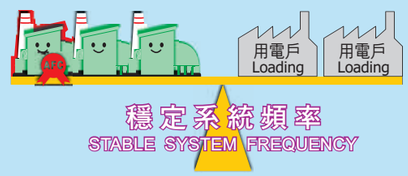


動態煞車 Dynamic Braking

用電量 < 供電量
Load Power < Produce Power



自動頻率控制 Auto Frequency Control

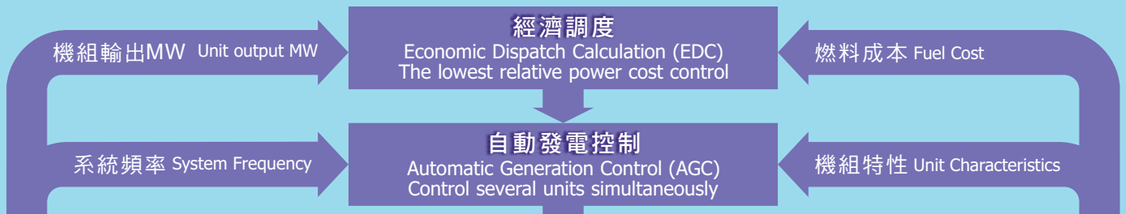


PMS作動(LS/DB)時，GMS不輸出
When PMS is triggered (LS/DB) GMS does not output

GMS可配合調度模擬系統做安全性經濟調度模擬
GMS with DSS can simulate the security EDC

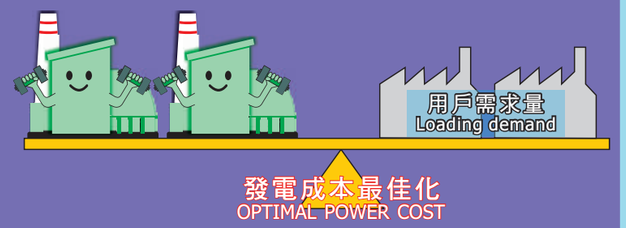
發電量MW/ 負載MW / CB/ DS狀態
Actual unit MW/ Load MW / CB / DS status

發電管理系統(GMS) Generation Management System



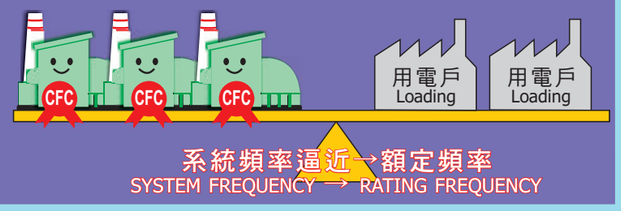
需量控制 Demand Control

調整各機組逼近最佳發電量
GMS adjust several units to optimal generation set-point.



定頻率控制 Constant Frequency Control, CFC

當區域電力系統在獨立運轉情況下，可同時控制多發電機組執行定頻率控制。
GMS can control several units simultaneously to hold the grid frequency when the area power grid is isolated.

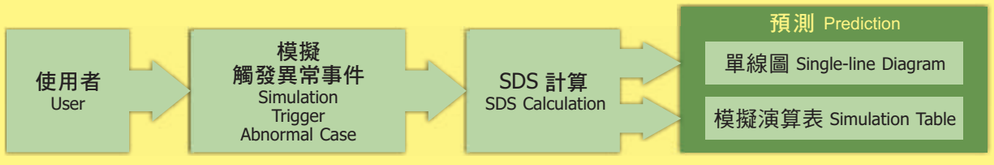


調度模擬系統(DSS) Dispatch Simulation System

1、經故障分析模擬訓練，幫助調度員對於系統故障影響所及先行判斷。
The fault analysis simulation training can help the dispatchers to judge the system failures in advance.

2、經過安全調度模擬模式，產生預測的單線圖及模擬演算表作為安全調度的參考。
After security dispatch simulation (SDS) mode, the prediction single-line diagram and simulation table can be used as the policy for the security dispatch operation.

3、模擬演算表包括自動卸載及動態煞車。
The simulation table includes the load shedding (LS) and dynamic.



POWER MANAGEMENT SYSTEM

電 力 管 理 系 統

SCADA (Supervisory Control And Data Acquisition)

優 點 Advantage

1、確保供電品質
Ensure the quality of power supply

2、縮短停電時間
Shorten the time of power failure

3、降低維護費用
Reduce the maintenance costs

4、集中管理
Centralized management

5、自動抄表
Automatic meter reading

6、預知保養
Preventive maintenance

7、故障紀錄
Fault record

8、追蹤事故及分析
Event tracking and analysis

整合及應用 Integration and application

1、支持國際標準通信
Support the international standard protocol

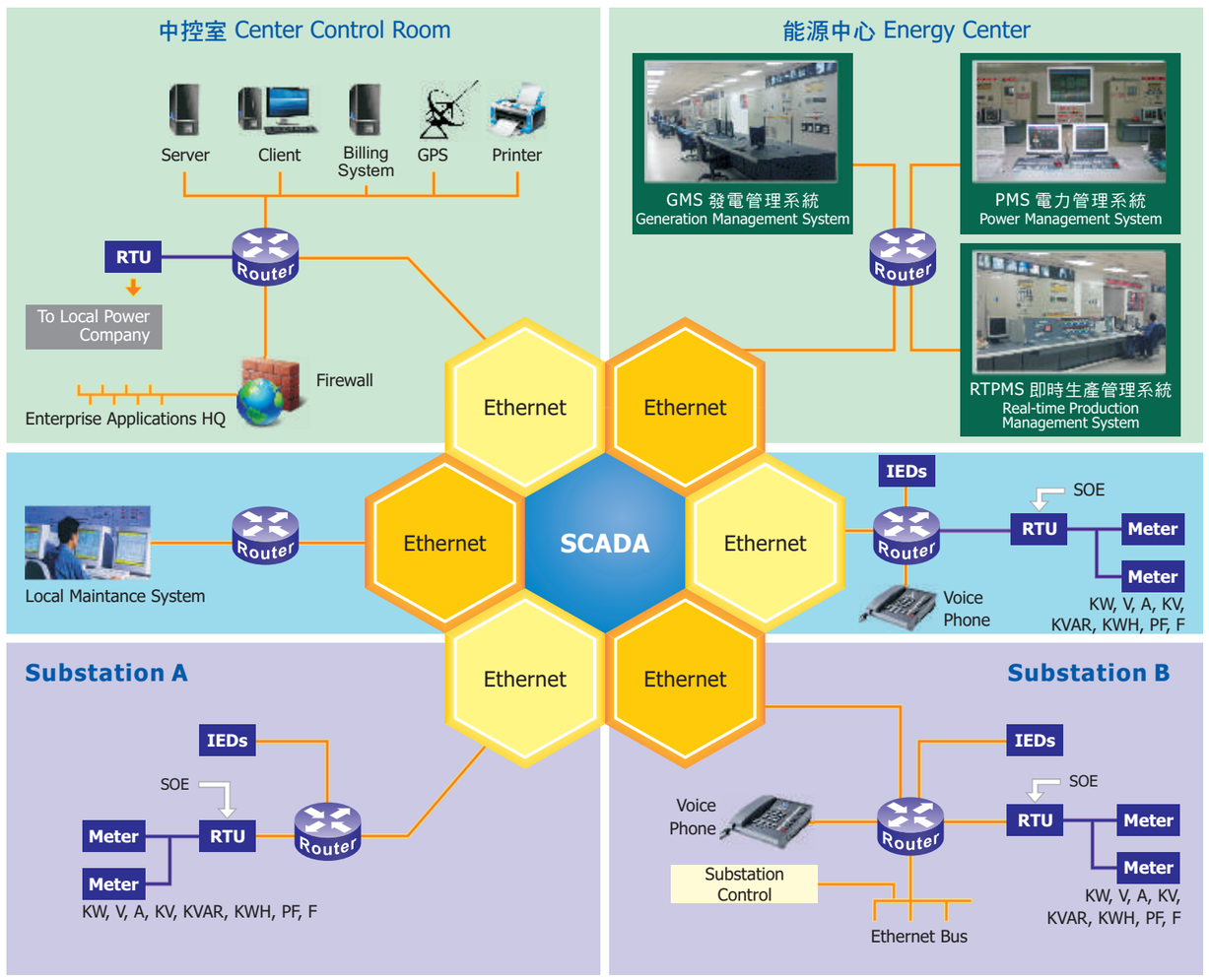
2、節能需求
Demand for energy saving

3、自動計費
Automatic billing

4、保護協調分析
Protection coordination and analysis

5、安全防護及管理系統整合
Security and management system integration

6、需量
Demand control



電力管理系統(PMS)實績
PMS Achievement

台灣地區 Taiwan

1. 台化彰化廠區PMS裝置(257MW)
Formosa Chemical & Fiber Corp. (G6 PMS)
2. 台塑石化CFB PMS裝置(300MW)
Formosa Petrochemical Corp. (CFB PMS)
3. 塑化海豐廠區PMS裝置(380MW)
Formosa Petrochemical Corp. (Hi-Fong PMS)
4. 塑化麥寮廠區PMS裝置(2200MW)
Formosa Petrochemical Corp. (Mai-Liao PMS)
5. 台化新港廠區PMS裝置(350MW)
Formosa Chemical & Fiber Corp. (Sk3 PMS)
6. 台塑仁武廠區PMS裝置(340MW)
FPC (Ren-Wu PMS)
7. 台塑華亞廠區PMS裝置(300MW)
Hwa Ya Power Corp. (HY-1 PMS)

大陸地區 China

1. 寧波台化電廠PMS裝置(450MW)
Formosa Power (NB) Corp. (NB-1 PMS)
2. 南亞崑山廠區PMS裝置(150MW)
Nan Ya Plastics Corp. (Kunshan PMS)
3. 新浦化工PMS裝置(240MW)
SP Chemicals (Captive Power Plant)

國外地區 Others

1. 印度尼西亞集偉電廠TK-3 PMS裝置(70MW)
Pt. PKTK Corp. Indonesia (TK3 PMS)
2. 越南台化電廠PMS裝置(300MW)
Formosa Industries Corp. (VN-1 PMS)
3. 美國德州廠區PMS裝置(941MW)
Formosa Plastics USA Corp. (Texas Utility Plant PMS)
4. 菲律賓APEC電廠PMS裝置(52MW)
Philippine (APEC PMS)
5. 越南河靜鋼鐵廠PMS裝置(650MW)
Vietnam Ha Tinh Steel PMS
6. 菲律賓ANDA電廠PMS裝置(84MW)
Philippine (ANDA PMS)
7. 印度尼西亞集偉廠TK-4 PMS裝置(100MW)
Pt. PKTK Corp. Indonesia (TK4 PMS)
8. 越南台化電廠VN-3 PMS裝置(150MW)
Formosa Industries Corp. (VN-3 PMS)

SAFETY INSTRUMENTED SYSTEM

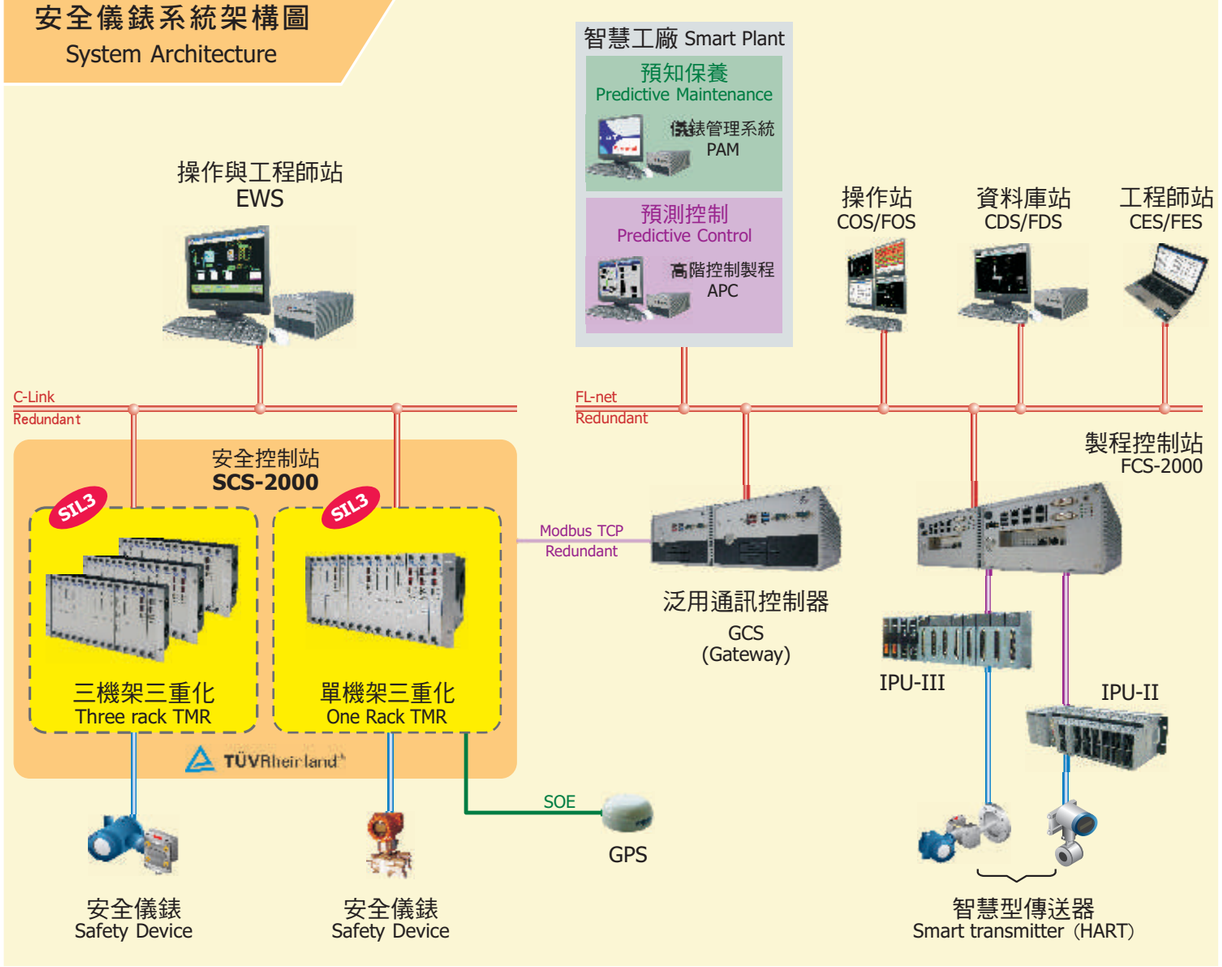
安 全 儀 錶 系 統 SCS2000

安全儀錶系統特色 System Features

- **具使用實績的安全系統**
  Proven-In-Use technology
  →核電廠廣泛使用
  Widely used in nuclear industry
  →通過化學製程及鍋爐之安全認證
  Safety certification for chemical process (IEC-61508 Rev 2 & IEC-61511) and boiler (NFPA 85)
- **易於檢查及驗證**
  Verification and Validation
  →實際控制邏輯可於人機顯示
  Logic diagram ═ Control process
- **三重化冗餘架構**
  Triple Module Redundancy (TMR)
  →硬體容錯能力較二重化高
  Higher hardware fault tolerance than DMR

FCS	FORMOSA Control Station
COS/FOS	CX/FX Operator Station
CDS/FDS	CDS/FDS
CES/FES	CX/FX Engineering Station
GCS	Generic Communication Station
PAM	Plant Asset Management
APC	Advanced Process Control
EWS	Engineering Workstation
DMR	Dual Module Redundancy
TMR	Triple Module Redundancy
SOE	Sequence of Event

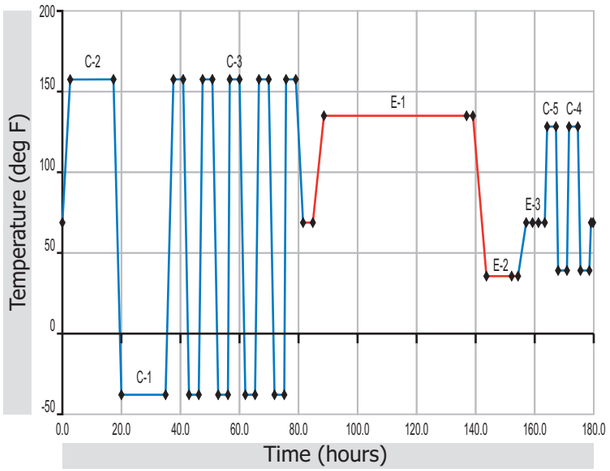
安全儀錶系統架構圖 System Architecture



通過美國核能級與歐洲功能安全標準雙認證
Certified with both USNRC and IEC61508 Functional safety standards

核級與歐洲雙標準環境耐受測試

TÜV and EPRI Environmental Stress Test
Blue = TUV Requirements Red = EPRI Requirements

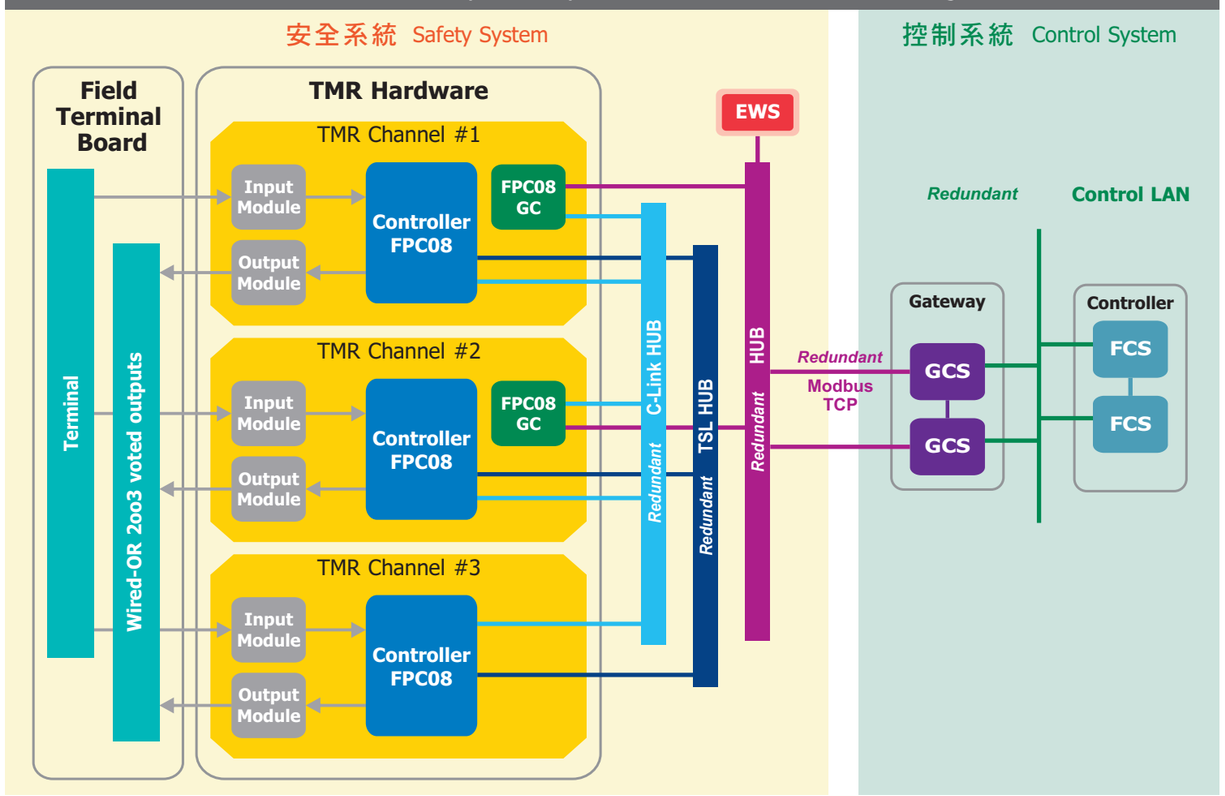


核級與歐洲雙標準EMC電磁耐受測試

TÜV and EPRI EMC Tests

EMC Test Name	Title	IEC Standard	Compatible MIL-STD-461E
ESD1	Electrostatic Discharge Immunity	IEC 61000-4-2	—
REF1	Immunity to radiated, RF, EM fields amplitude modulated	IEC 61000-4-3	RS103
CRI1	Immunity to conducted disturbances induced by RF	IEC 61000-4-6	CS114
BURST1	Electrical fast transient immunity	IEC 61000-4-4	CS115
SURGE1	Ring Wave Immunity	IEC 61000-4-5	CS116
EI1/EI2	Emitted Interference	IEC 61000-6-4	CE101, CE102 RE101, RE102
MAG1	Power frequency magnetic field immunity	IEC 61000-4-8	RS101
VV1/VV2	Voltage Variation	IEC 61326-3-1	—
MV1	Conducted Common Mode Voltage	IEC 61000-4-16	CS101

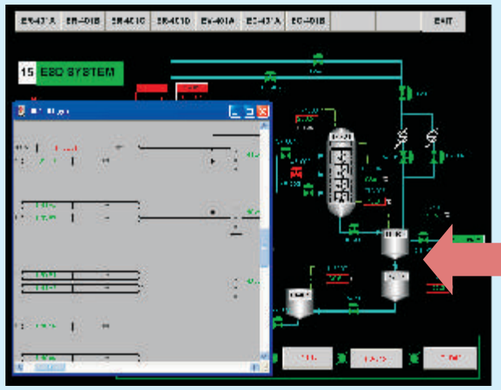
三重化採三選二投票表決，硬體容錯能力高於二重化系統
The TMR of SCS-2000 votes 2oo3 (2 out of 3) and the hardware fault tolerance is higher than DMR



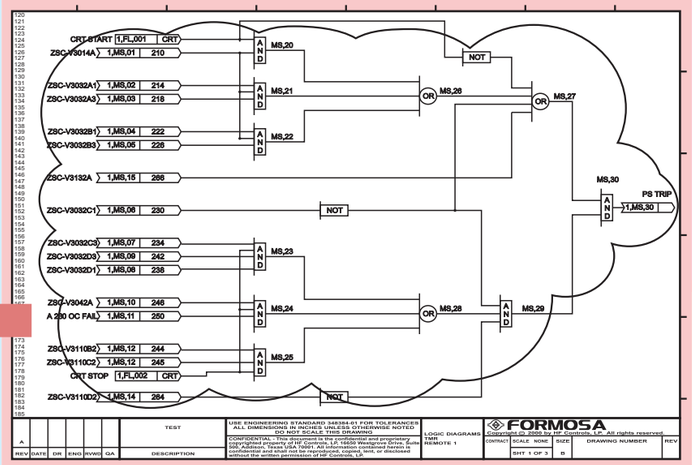
一步到位
OneStep

操作圖面可顯示邏輯圖，且100% 等於實際製程邏輯，不會因設計變更產生不一致，便於第三方檢證
The Logic diagram 100% the same as control process of controller and compliant even after modification

邏輯圖可顯示觸發原因於操作畫面
Logic diagram with diagnostic & dynamic display on the operation screen

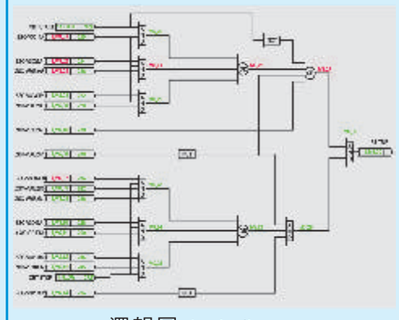


邏輯設計於AutoCAD上完成
Logic are designed on AutoCAD

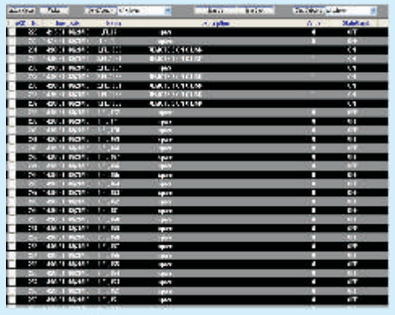


自動轉成控制邏輯與邏輯圖
Automatically converted to control code and logic diagram

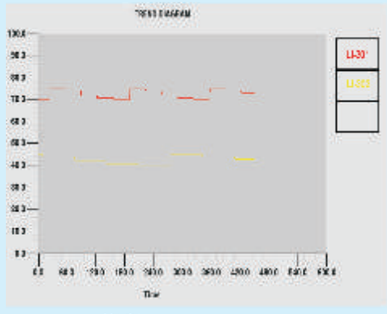
操作維護畫面 OPERATOR SCREEN



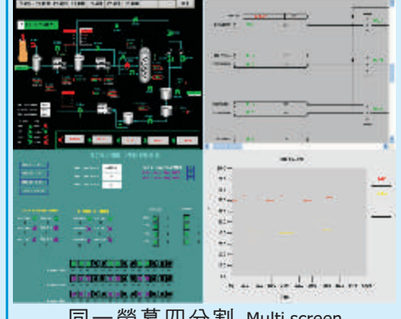
邏輯圖 Logic diagram



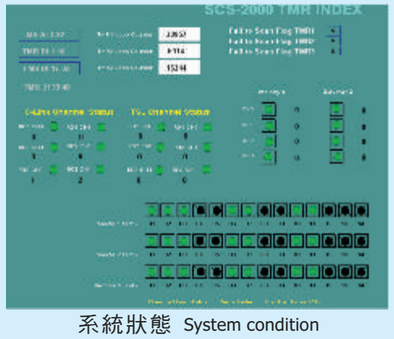
警報履歷 Historical alarm



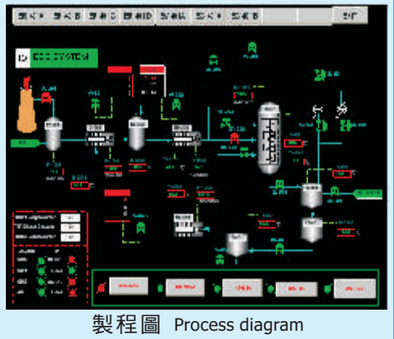
趨勢圖 Trend diagram



同一螢幕四分割 Multi screen



系統狀態 System condition



製程圖 Process diagram

簡化IEC61511安全生命週期
Simplify the Safety Lifecycle in IEC61511

分析 Analysis

- 危害風險及評估 Hazard and Risk Assessment
- 分配安全功能至各保護層 Allocation of Safety Functions to Protection Layers
- 擬定安全儀錶之安全需求規範 Safety Requirements Specification (SRS) for the Safety Instrumented System (SIS)

實現 Realization

- 安全儀錶系統之設計工程 Design And Engineering of Safety Instrumented System (SIS)
- 其他風險降低方法之設計及開發 Design And Development of other means of risk reduction
- 安裝，試車及確認 Installation, Commissioning and Validation

操作 Operation

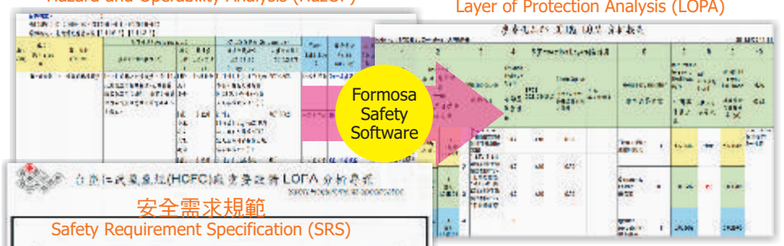
- 操作維護 Operation and Maintenance
- 系統修改 Modification
- 系統除役 Decommissioning

驗算與驗證 Verification And Validation (V&V)

專業認證團隊提供IEC61511全生命週期輔導與驗證簽章服務
Certified Engineers for IEC61511 full life cycle

危害與可操作性分析 Hazard and Operability Analysis (HazOP)

保護層分析 Layer of Protection Analysis (LOPA)



安全需求規範 Safety Requirement Specification (SRS)

SIL驗算報告 SIL Validation

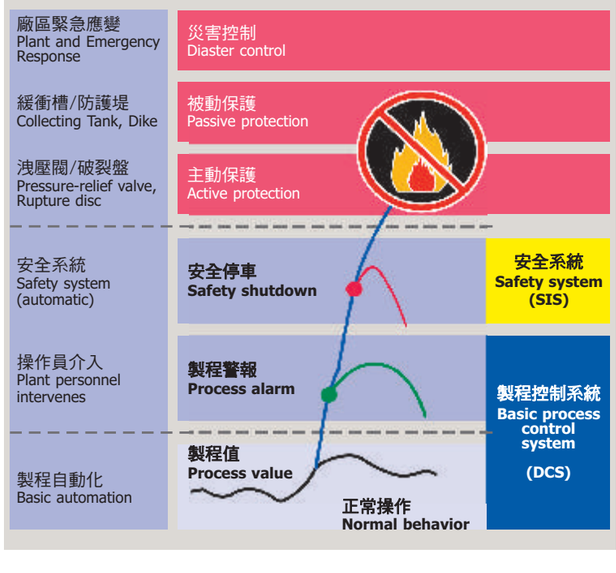
應用軟體設計及驗證規劃書 Application software design and verification process

工廠驗收測試(FAT)計劃書 Factory Acceptance Testing

安裝和試車、驗證規劃書 Installation and commissioning/ Validation

三重化系統可達SIL3等級，降低1千至1萬倍之風險
The TMR of SCS-2000 supports up to SIL3 reducing risk by 1000-10000 times

當製程偏離正常DCS操作範圍時，安全儀錶系統SIS立刻執行緊急遮斷，避免災害發生
If process out of control, the SIS (Safety Instrumented Systems) bring process back to safe state.



安全需求規範 Safety Requirement Specification (SRS)		
安全完整性等級 Safety Integrity Level	風險降低因子 Risk Reduction Factor	
SIL3	<10000	
SIL2	<1000	
SIL1	<100	

RTPMS

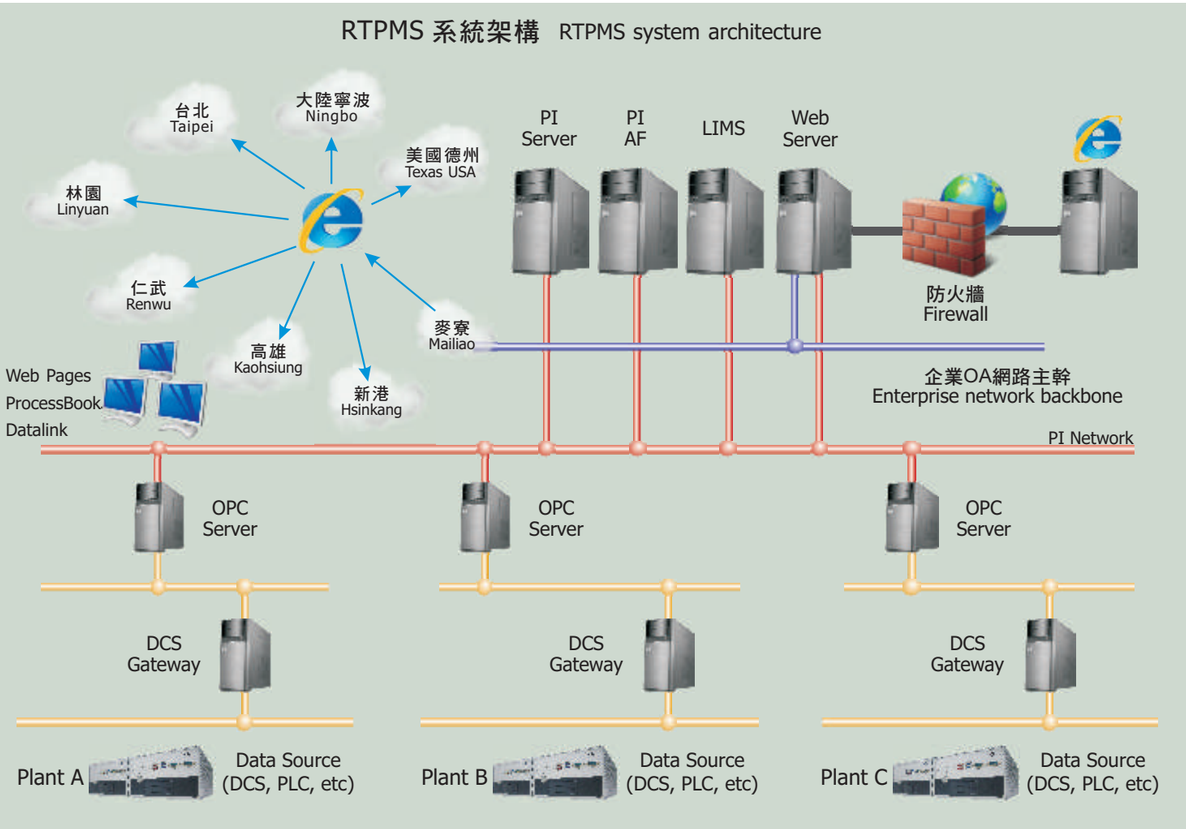
REAL-TIME PRODUCTION MANAGEMENT SYSTEM

管 控 一 體 化 系 統

本公司開發的管控一體化系統透過網路將生產廠 DCS、工安環保監測、品質、保養系統等數據集中收集至單一的即時數據庫內，配合人機介面設計及統計分析軟體，設計出各種功能與報表，提供各級主管重要生產管理決策訊息，並做為生產廠從事去瓶頸、設備效能指標及過程控制優化評估等有效工具。另外，它更是執行質能平衡、生產計畫排程、企業資源規劃系統(ERP)與決策支援系統(DSS)等高階管理應用的基礎。

Real-time production management system developed by our company can centralized collection the system data such as DCS, industrial safety and environmental monitoring, inspection and maintenance to single real-time database through Internet. Assorting with statistical analysis software and human machine interface to design various function and reports, then provide important information of production managerial decision for staff at all levels, and take it as an effective tool of production plant to engage in debottleneck, equipment efficacy index and optimization assessment for process control. Moreover, this is the foundation of high level management applications such as the implementation of mass and energy balance, production planning and scheduling, enterprise resource planning (ERP) system and decision support system (DSS).

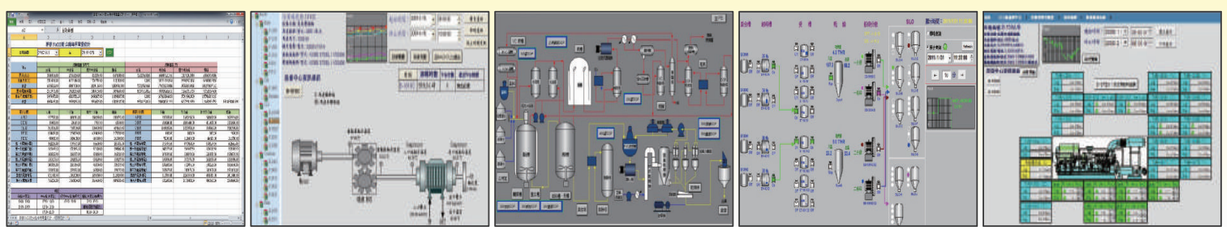
RTPMS 系統架構 RTPMS system architecture



十年以上的 RTPMS 經驗 More than a decade of RTPMS development experience

橫跨5 個事業部，40 個大型生產工廠，超過30 種以上的產品線，2,000 個以上的原創功能，完整涵蓋台塑生產管理經驗，及所有化工廠即時管理應用範疇。

Across five business division, forty-five large-scale production plants, more than thirty kinds of product lines, more than two thousand five hundred original function, complete coverage of production management experience from Formosa Plastics Corporation and real-time management applications category of all chemical factories.



掌握即時關鍵訊息 Grasp instant key messages

生產訊息 Production Message	▸ 生管：每班/日/月生產訊息彙整、成品庫存調度、生產產量計畫達成率(差異率)、排程預覽… Product Management: aggregate production message for each class/ day/ month, dispatch finished goods on hand, production output conversion rate (variance ratio), scheduling preview... ▸ 品管：成品判級出貨、追蹤客訴、檢驗資料、品質統計、最適成品予適當客戶… Quality Control: finished goods grading and shipment, inspection data, quality statistics... ▸ 產銷：廠內庫存、過程能力、追蹤客訴、最適成品予適當客戶… Production and Marketing: factory stock, process capability, customer complaints tracking, shipment scheduling...
過程訊息 Process Message	▸ 技術：過程變數、控制參數、成品品質、異常警報、異常排除 SOP … Process: process variables, control parameters, product quality, abnormal alarms, abnormal exclusion SOP... ▸ 設備：關鍵設備運轉監測值、運轉數據、狀況監控、維護保養、異常警報、設備作業效率趨勢、異常預防預警機制… Equipment: key equipment operation monitoring, operation data, condition monitoring, maintenance, abnormal alarms, efficiency trends of equipment operation, abnormal early-warning mechanism...
能源訊息 Energy Message	▸ 產耗：各項能源產出/耗用量、能源供需現況、能源日報、異常警報… Production and Consumption: output/ consumption of each energy, energy supply and demand situation, energy management daily report, abnormal alarms... ▸ 排放：廢棄物排放狀況、超限警報… Emissions: waste discharge status, emissions exceeding alarms...

RTPMS 管控一體化功能模塊 ▶ 五大管理方向，40 項以上功能模塊

RTPMS Features ▶ Five direction of management and more than forty functional modules.

績效管理 Performance management	生產管理 Production management		設備管理 Equipment management
生產目標達成率 Production target achievement rate	生產排程 Production scheduling	過程控制趨勢監視 Process control and trend monitoring	設備狀態即時監視 Device status real-time monitoring
批次生產效率 Batch production efficiency	觸媒耗用管理 Catalyst consumption management	品質管理 Quality management	設備修護履歷、費用、備料 Equipment maintenance history, costs and preparation
班操作績效指標 Class operation performance indicator	批次配方管理 Batch recipe management	製程參數優化 Technologic parameter optimization	運轉時數統計與備品更換提示 Operating hours statistics and spare replacement reminder
原輔料耗用及成本管制 Consumption of raw materials and cost control	成品產量及庫存 Output and stock of finished goods	生產歷史追溯功能 Production history tracing function	設備負荷與效能指標 Equipment loading and efficiency index
產率、良率、回收率管制 Control of productivity, defect-free rate and recovery percentage	台帳系統集成 Accounts system integration	廢水、廢液管理 Wastewater management	設備異常預警功能 Equipment abnormal early-warning mechanism
安環衛管理 Environmental health and safety management	電子交代簿功能 Electronic account book function	操作紀錄自動出表 Automatic report of operation record	**異常管理** Exception management
環境監測系統 Two access control system	製程總覽廣告牌 Process overview billboard	成品罐裝、交運管理 Canned goods, delivery management	環境異常報警 Environmental abnormal alarm
二道門禁系統 Environmental monitoring system	冷卻水塔操作優化 Operation optimization of cooling tower	原輔料耗用管理 Raw material consumption management	品質異常報警、趨勢、合格率 Abnormal quality alarms, trend and qualified rate
消防火警系統 Fire Fighting and fire alarm system	水電氣汽公輔耗用統計 Water, electricity, gas, steam, public and auxiliary consumption statistics	製程技術圖文管理 Technologic graph and article management	設備異常報警與預知保養 Malfunction alarm and predictive maintenance of equipment
主動式通報及預警系統 Active notification and early-warning system	生產自動報表 Automatic report of production management	水、電、蒸汽平衡圖管理 Balance diagram of water, electricity and steam	控制程序異常報警 Abnormal alarm and predictive function of control program
安環衛作業環境集成 Integrated environmental health and safety operating environment	停開車異常統計 Abnormal statistics of shutdown and reboot	成品出貨管理 Finished goods shipment management	

RTPMS

REAL-TIME PRODUCTION MANAGEMENT SYSTEM

管 控 一 體 化 系 統

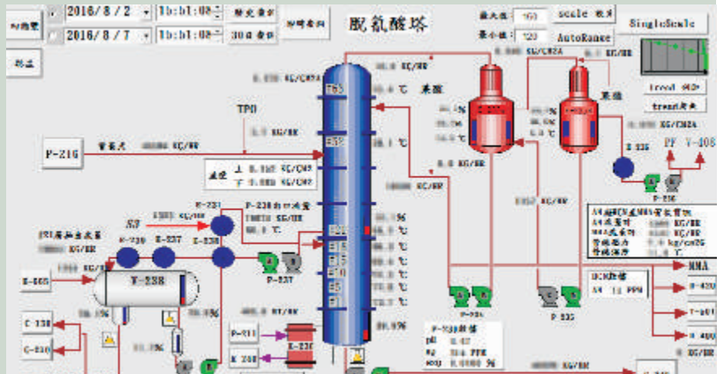
管控一體化四大類功能 Functional classification of Real-time production management

即時監控管理 Real-time monitoring management

即時監控管理屬於管控一體化必備的基礎功能，包括系統流程圖即時監控、即時報警、即時趨勢和即時報表。生產管理人員通過系統流程圖和即時趨勢圖就能夠即時觀測到生產現場的各項指標，從而獲得充分的生產資訊，監視生產進行狀態，瞭解即時生產情況，即時處理報警資訊。

Real-time monitoring management is the essential basic function of Real-Time Production Management System, including real-time monitoring by system flow chart, real-time alarm, instant trend and real-time report. Production engineer can observe every index of the production site immediately through system flow chart and instant trend chart, then obtain entire production information, monitor production status, realize real-time production situation and deal with real-time alarm.

- 趨勢分析管理。
  Trend analysis management.
- 工作規範管理。
  Job specification management.

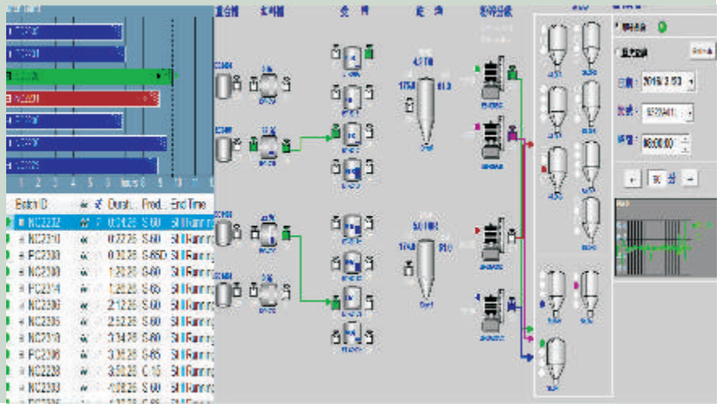


批次生產管理 Batch production management

以生產批次為主線，記錄生產過程中每一步操作，包括從原料、中間品到產成品的各個環節上批次、品質及設備運行資訊，以圖、表方式反應生產期間各主要參數(如溫度、壓力、檢化驗資料等)的詳細走勢變化曲線，以及投入、產出數量和報警情況，形成批次生產記錄;真實反映該批次製造和檢驗的全部情況，供生產過程追溯使用，將這些資料提供給有關技術人員進行比對、分析、總結生產經驗，達到指導生產、提高產量和品質的目的。

Using production batch as main line to record every operating step in the production process, including the batch, quality and equipment operation information on each segment from raw materials, intermediate goods to product, then exhibit the trend curve of main parameters (such as temperature, pressure, examination data, etc.) during production through graph or table in detail also using the number of input/output and alarm situation to generate the batch production record. Truly reflect all situation of manufacture and inspection from the batch and then provide it to trace the production process. To achieve the purpose of guiding production, improving productivity and quality by offering the data for technician to compare, analyze and summarize production experience.

- 產成品的追溯。
  Product traceability.
- 生產操作過程的追溯。
  Production operation process traceability.
- 生產組織的追溯。
  Production organization traceability.
- 製程品質的追溯。
  Process quality traceability.
- 製程控制參數的追溯。
  Tracing the process control parameters.

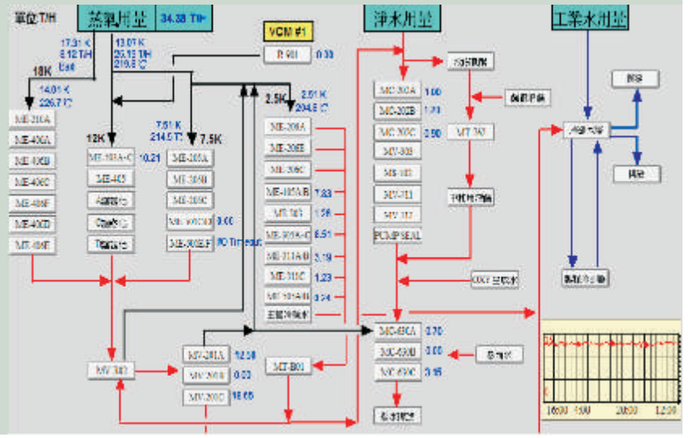


生產調度管理 Production scheduling management

依據生產作業計畫，以及生產過程中的原料、產品、品質、設備、公用工程等多方面的資訊，對生產作業計畫執行情況進行監督、檢查，結合現場製程控制狀況形成生產調度資訊，糾正執行中的偏差，使生產製造活動穩定執行。

Supervising and examining the implementation of production operation plan by the production plan and the information during production process such as raw materials, products, quality, equipment, utilities, etc., and combining with on-site process control state to become the production scheduling information to correct the deviation during implementation, so that the manufacturing activity can run stably.

- 調度資訊的生成、保持與發布。
  Generation, maintenance and release of scheduling information.
- 重大調度事件管理。
  Major scheduling event management.
- 管理調度任務，並監控調度執行情況。
  Manageing the scheduling tasks and monitoring the implementation of scheduling.

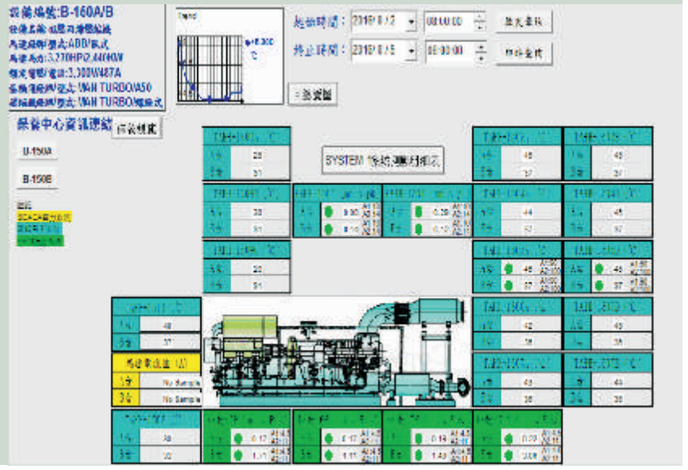


設備管理 Equipment management

針對企業主要生產設備從購置計畫、到貨、使用、保養、維護到報廢整個生命週期各個階段的有關資訊進行收集、整理、分析，即時監控設備運行狀態，建立設備台帳，將設備的日常維護、運行、點巡檢、潤滑、維修都納入到系統，使設備的動、靜態資訊能集中到一個平臺進行管理。

To collect, arrange and analyze the information in connection with the entire life cycle from purchasing plan, delivery, using, upkeep, maintenance to scrap based on enterprise's main production equipment. Monitoring the equipment running state in real-time and establishing the equipment accounting. Including equipment daily maintenance, operation, inspection, lubrication and maintenance into the system, then we can concentrated manage the dynamic and static information of equipment on a platform.

- 建立完整、規範的設備檔案。
  Establish complete and standardized equipment files.
- 建立定期巡檢、點檢、潤滑操作規範，實現預防性維護、預知保養。
  Establish regular inspection, lubrication operation specification and implement the preventive maintenance and the predictive maintenance.
- 建立設備管理知識庫。
  Building equipment management knowledge bank.
- 特種設備管理。
  Special equipment management.
- 備品備件管理。
  Spare parts management.



LABORATORY INFORMATION MANAGEMENT SYSTEM

實 驗 室 資 訊 管 理 系 統

集樣品、資源管理、事務管理、網路管理、數據管理(採集、傳輸、處理、輸出、發佈)、報表管理等諸多模塊為一體，組成一套完整的實驗室綜合管理和產品品質監控體系，既能滿足外部的日常管理要求，又能保證實驗室分析數據的嚴格管理和控制。

Laboratory information management system integrate several module such as samples, resource management, transaction management, network management, data management (collection, transmission, processing, output and release), report management as a whole to compose a complete system of laboratory comprehensive management and product quality monitoring. This system can not only meet the requirements for external daily management but also ensure strict management and control of laboratory analysis data.

提供全方位管理方案 Provide comprehensive management program

實驗室訊息管理系統具備五大管理項目，提供零死角的管理架構，內容包括人員、設備、物料、檢驗方法以及環境安全。

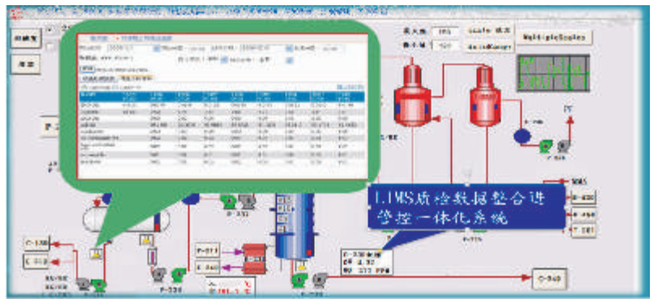
Laboratory information management system has five management projects to provide zero dead space management architecture, including personnel, equipment, materials, inspection methods and environmental safety.

- 人員管理：人員、客戶、工作、組織架構與權責管理。
  Personnel management: personnel, customers, work, organizational structure and management of authority and responsibility.
- 設備管理：試驗設備、校驗、公輔用量管理。
  Equipment management: test equipment, calibration, public and auxiliary consumption management.
- 物料管理：標準樣品、物料存量管理。
  Material management: standard samples, material inventory management.
- 檢驗方法管理：試樣追蹤、數據報告、標準規程、異常管理。
  Management of Inspection methods: sample tracking, data reporting, standard procedures and exception management.
- 環境安全管理：環境、安全、衛生管理。
  Environmental safety management: environment, safety and sanitation management.

超過10年以上的發展經驗 More than a decade of development experience

台塑公司從1999 年就開始發展LIMS，目前在台灣廠區、大陸廠區皆已經導入LIMS，成為一個整合的單一LIMS 平台。並整合 OSIsoft 提供的過程訊息管理系統(PIMS)經驗，即時發送質量數據，迅速提供工廠運作參數參考，建構即時生產管控一體化系統。

LIMS has been developed by Formosa Plastics Corporation from 1999 and we have imported LIMS into Taiwan plant and China plant to integrate as a single LIMS platform. LIMS combined with the experience of Process Information Management Systems (PIMS) provided by OSIsoft. LIMS can send quality data immediately to provide factory operation parameters as reference quickly and construct real-time production control integration system.



實驗室訊息管理系統解決方案
Laboratory information management system solutions

即時分析結果查詢 Instantly query analytic result

- 依照客戶區分，即時查詢樣品分析結果。
  To query analytic result of samples in real-time and to distinguish by customer.
- 依據管理需求查詢及處理異常的樣品品質。
  To query and deal with abnormal sample quality according to the requirements of management.
- 結合異常處理回復功能，紀錄異常發生原因，提供預防措施擬定的依據。
  Combining with the exception handling recovery function to record the cause of abnormal and providing these recording as the basis of formulating preventive measures.

設備數據擷取上傳 Snapshot and upload data of equipment

- 儀器聯機整合的困難在於如何使用單一的軟體，接收世界各國不同品牌的儀器輸出格式。
  The difficulty of online instruments integration is using a single software to receive instrument output format of different brands around the world.
- 台塑檢驗中心超過200台儀器被整合至 Sample Manager。
  Formosa Plastics inspection center has more than two hundred instruments integrated into Sample Manager.

品質控管與統計 Quality control and statistics

- 協助企業為自身產品質量把關以及符合法定相關規範。
  To assist enterprises with ensuring the quality of their products and comply with the statutory norms.
- 嚴密監控各項檢驗數據，提供客戶最優質產品，大量的檢驗數據統計協助了解品質變動趨勢。
  To monitor each inspection data strictly, then providing the best quality products to customers and using lots of statistical inspection data to assist with understanding the quality trends.

主動式異常通知 Active exception notification

- 主動式異常管理就是藉由設定各式的異常管制條件，當獲得質量結果的同時，由計算機自動判斷是否異常？異常的等級為何？應該通知哪些相關人員？並自動透過簡訊或電子郵件完成通知的動作。
  When active exception management obtained quality statistics result setting by various abnormal control conditions, it can automatically determine abnormity, abnormal level and should send notification to which personnel, then automatically send out notification through SMS or e-mail.

客製化報表開發 Customized report development

- 開發各式中英文報表、統計圖表。
  To develop all kinds of reports in Chinese or English and statistical charts.
- 報表由客戶端瀏覽器列印，沒有版本管制問題。
  Reports can print from the client browser therefore there is no problem about version control.

儀器校正與保養 Instrument calibration and maintenance

- 儀器設備長期使用，檢測數據誤差難免會增加，透過電腦化管理，可以得知設備何時該做保養，避免檢測精準度下降。
  Detection data may increase deviation after instrument equipment is used for a long time. We can know when to do maintenance for equipment and avoid detection accuracy drops through computerized management.

WAREHOUSE MANAGEMENT SYSTEM

倉 儲 管 理 系 統 物流 Logistics

【物 流】強化企業競爭優勢 【Logistics】 Strengthen enterprise competitive advantage

近年來由於世界經濟得全球化、貿易的自由化、產品生命週期的縮短、客戶要求服務水平的提升、企業流程再造等因素，【物流】已成為全球企業關注的焦點，做好物流工作以降低營運成本、提高顧客服務水平，並滿足顧客的要求已成為企業強化競爭優勢的武器。

In recent years, the world economy was globalization, liberalization of trade, shorter product life cycle, enhance customer service levels, business process reengineering and other factors, [Logistics] has become the focus of attention of the global business, good logistics to reduce operating costs, improve customer service levels and customer satisfaction has become a weapon to strengthen the competitive advantage.

- 倉儲庫存統一由WMS控管(含自動倉)。
  Warehouse Stock handle by the WMS Controls (including automatic warehouse).
- 容易落實盤點，確保料帳相符。
  Easy to cycle counting inventory and be sure the material is posted.
- 訊息皆在電腦間傳送，方便可靠。
  Messages are transmitted between computers, convenient and reliable.
- 可針對入出庫做統計分析，並列印報表。
  Statistical analysis can be done for the library, and print reports.
- 庫存料品能輕鬆查詢實際存放位置，無人員交接問題。
  Inventory items can easily query the actual storage location, no transfer of personnel issues.
- 入出庫料品皆由電腦重複確認，避免人為疏失。
  Into and out of the item by a computer duplicate acknowledgment, to avoid human error.
- 所有人員依各自帳號權限操作，方便安全性管理。
  All personnel in accordance with their respective account permission to operate, convenient and safe management.
- 入出庫動作皆紀錄在數據庫，方便日後追蹤查詢。
  Into and out of action all records in the database to facilitate tracking inquiries in the future.
- 控管全企業倉儲料帳，可即時調配各廠之供需。
  Handling enterprise-wide storage material posted, immediate deployment of the supply and demand of the plant.

WMS 整合平台架構 WMS Integration Platform Architecture

倉儲管理系統(WMS) Warehouse Management System

儲位資料 Location data	儲區規劃 Storage area planning	貨主資料 Owner information	貨品資料 Products Information	供應商資料 Supplier Information	
收貨預約 Receiving	貨品驗收 Goods acceptance	入庫上架 Storage shelves	出庫預約 Put-away reservation	出庫揀約 Out-bound for picking	批次出庫 Batch out-bound
庫存查詢(即時、日結) Stock query (Realtime, day-end)		流量查詢 Traffic inquiry	拆箱補貨(即時、閒時) Un-packing and supply (Realtime, Batch)	儲位轉移 Location Transfer	盤點操作 Cycle counting	貨主買賣 Owner transfer
碼頭管理 Yard Management		流量加工 Distribution Processing	代採購作業 On behalf of the procurement	倉儲計費 Warehouse fare accounting	員工獎金 Employee bonus


AS/RS


RF系統
RF system


車機系統
Car machine system

Barcode

運輸管理系統(TMS) Transportation Management System

車輛管理 Vehicle Management	物流士管理 Logistics Operator Management	配送點管理 Distribution management	路線管理 Route management
智能排派 Smart distribution suggestion	長途轉運 Long-distance transport	運費結算 Logistics fee calculation	成本計算 Cost calculation

第三方GPS系統(選配) Third-party system GPS (Optional)


車機
Car Machine


3G/4G網路


GPS

- 訂單追蹤 Order Tracking
- 物流追蹤 Logistics Tracking
- 進度回報 Status report
- 行車日誌 Truck running log
- 溫度監控 Temperature Monitoring

訂單管理系統(OMS) Order Management System


供應商 Supplier


貨主 Owner


客戶 Client


訂單輸入 Order Entry


EDI: EXCEL, txt


主管 Manager


員工 Staff


統計分析 Statistical Analysis


客戶服務 Customer service


客戶網站
Customer Website

電子下單 Electronic orders	合約查詢 Contract inquiry
訂單查詢 Order inquiry	帳單查詢 Billing inquiries
庫存查詢 Stock Search	客訴處理 Handling customer complaints
統計分析 Statistical Analysis	

最專業的系統整合專家
The most professional experts of system integration

累積30餘年系統整合經驗，不論是傳統倉或自動倉，我們都能提供完整的解決方案，更能依照您的需求，客製化設計適合您的系統。

Accumulated 30 years of experience in systems integration, whether traditional or automated warehouse storage, we can provide a complete solution, more according to your needs, custom designed to fit your system.

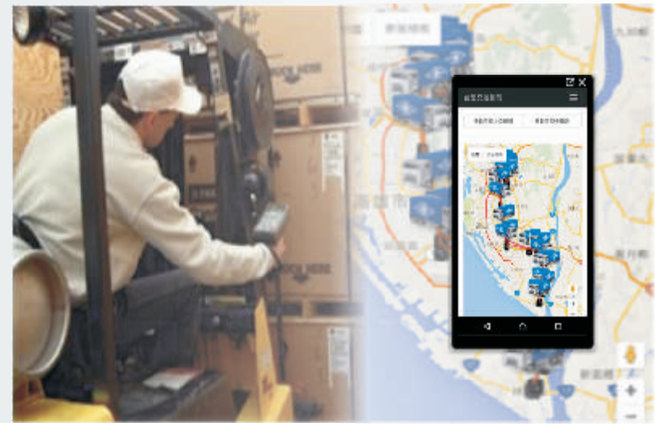
- 物流控制是我們的核心技術，整合各種自動化設備是我們的專長。
  Material flow control is our core technology, the integration of various automation equipment is our specialty.
- 自行研發物流追蹤技術，時時掌握貨品的即時動態，當異常發生時，也可在最短的時間內解決。
  R&D from the line tracking of logistics, always grasp the real-time dynamics of the goods, when an exception occurs, but also in the shortest possible time Inner resolve.
- 藉由多年系統整合經驗，我們提供客戶系統設計、物流動線規劃、整廠改造再生及技術顧問等全方位服務。
  Integration through years of experience by the system, we provide customer's system design, material flow line planning, the whole plant transformation and regeneration techniques Consultants and other full-service.

管理電腦化
Computerized management

將倉儲導入信息化，由電腦負責資料管理，確保庫存資料之迅速正確，並整合ERP系統(訂單端)/MES(製造端)，進行單據及料帳的管控，其軟體特性包含有：

The warehousing import information from the computer responsible for data management, to ensure the rapid inventory data of the right, and the integration of ERP systems (order side)/ MES (factory side), and control of the documents were posted material, which has software features include:

- 結合RF無線電及條碼系統，達到無紙化作業環境。
  Integrating with RF radio and barcode system to achieve paperless environment.
- 提供既有ERP/MES系統介面，達到即時連線功能。
  Providing both ERP/MES system interface, to achieve instant connection function.
- 即時掌握庫存最新狀況。
  Providing the real time inventory.
- 使用圖形化人機介面。
  Use graphical user interface.



AUTOMATED STORAGE / RETRIEVAL SYSTEM

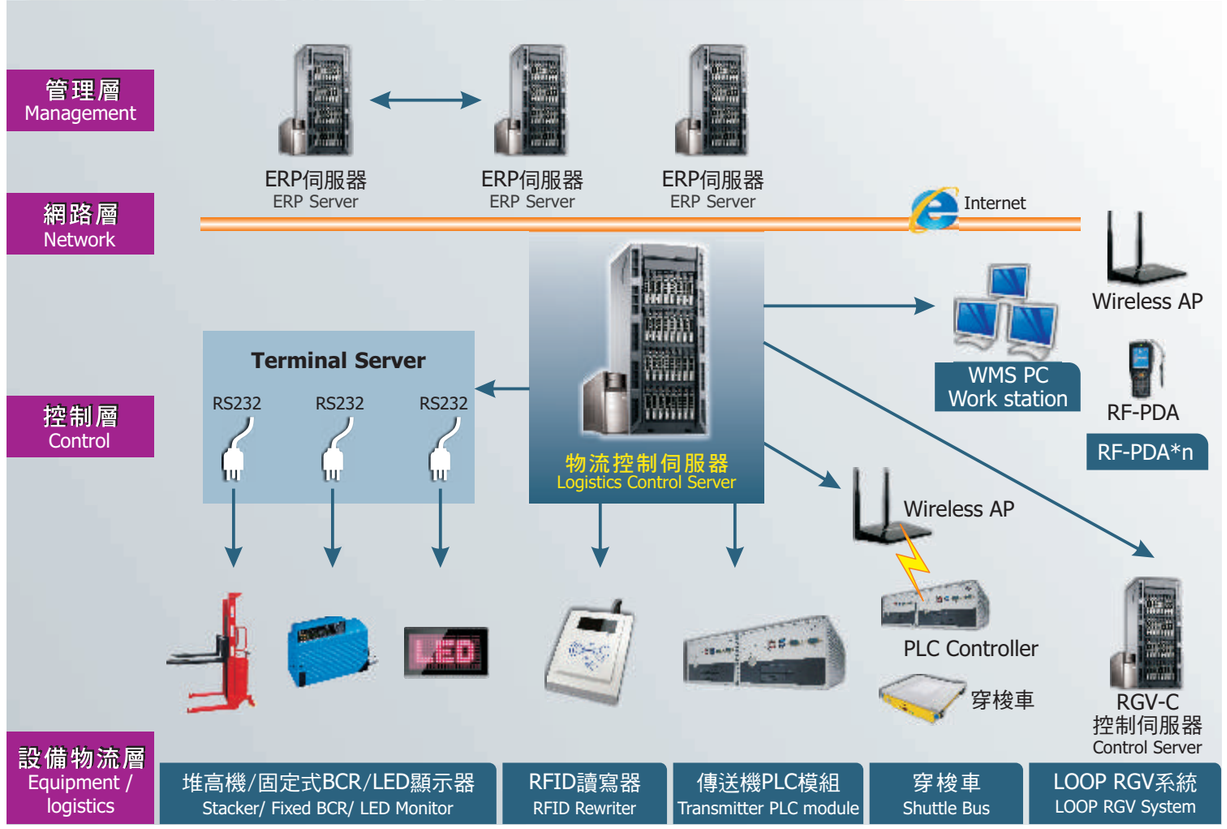
自 動 倉 儲 系 統

隨著 IT 業的興起，愈來愈多的企業走上信息化之路，傳統的倉儲作業模式已不能滿足企業發展的需要，如何能即時在客戶需求的時間和地點提供適當的產品，如何能協調企業自身的供需並能即時反應物流最新狀態，自動倉儲系統為企業信息化管理提供完整的解決方案。

With the rise of IT industry, more and more enterprises to embark on the road of information technology, traditional warehousing operation mode can not meet the needs of enterprise development, how can we provide the right products at the immediate time and place customer needs, how can coordinating supply and demand their immediate reaction and can stream up to date automatic storage system for enterprise information management to provide a complete solution.

自動倉儲系統(AS/RS) 是由高層立體貨架/堆高機/各種類型的叉車/出入庫系統/無人搬運庫/物流控制系統以及接口設備組成自動化系統，該系統能充份利用儲存空間，通過電腦來實現設備的聯機控制，以先入先出為原則，迅速準確地處理物品，合理地進行庫存管理及數據處理，通過檢查和維護，防止不良庫存，以提高企業管理水平和效率。

Automated Storage & Retrieval System (AS/RS) is a system integrate with the shelf/ stacker/ various types warehousing system/ automated transportation vehicle/ logistics control systems and automation systems consisting of interface devices, the system can take full advantage of storage space, by computer control equipment to achieve line to be the first-in first-out principle, quickly and accurately processed goods, reasonable inventory management and data processing, through inspection and maintenance, to prevent bad inventory to improve enterprise management level and efficiency.



自動倉儲控制程式是整個自動倉儲系統的中樞神經，透過倉儲程式的庫存管理、作業管理及自動控制來指揮整個倉庫的運作，功能概述如下：

Automatic storage control program is the entire central nervous system, automated warehousing, inventory management through storage programs, job management and automatic control to direct the operation of the entire warehouse functions outlined below :

- 公用數據基本設定。
  Basic common parameters setting.
- 使用者權限數據設定，讓操作人員依自己的權限使用系統功能。
  User permissions setting, allowing the operator to use the system function according to their own system permission.
- 入出庫作業：入庫作業數據設定與出庫作業執行，保存完整的維護使用記錄。
  Warehouse In/ Out Bound Operations : Warehouse operations and maintenance data setting and logging.
- 查詢維護：提供設備狀態數據查詢維護，提供庫存庫位數據查詢維護，提供異動歷史數據查詢。
  Maintenance/ Query : Provide to query the device status data, Provide to query and maintenance the stock location data and inventory data, Provide to query the transaction history data.
- 報表列印：列印相關庫存統計報表。
  Report printing : Print related inventory statistics report.
- 設備控制：連結系統使用設備，如堆舵機、PLC、字幕機等。
  Device Control : Link system devices, such as Stock crane, PLC, LED Display and other devices.
- 物流控制：整合設備、物流、數據流等流程控制。
  Material flow control : the integration of equipment, logistics, data flow control and other processes.

Industrial Internet of Things

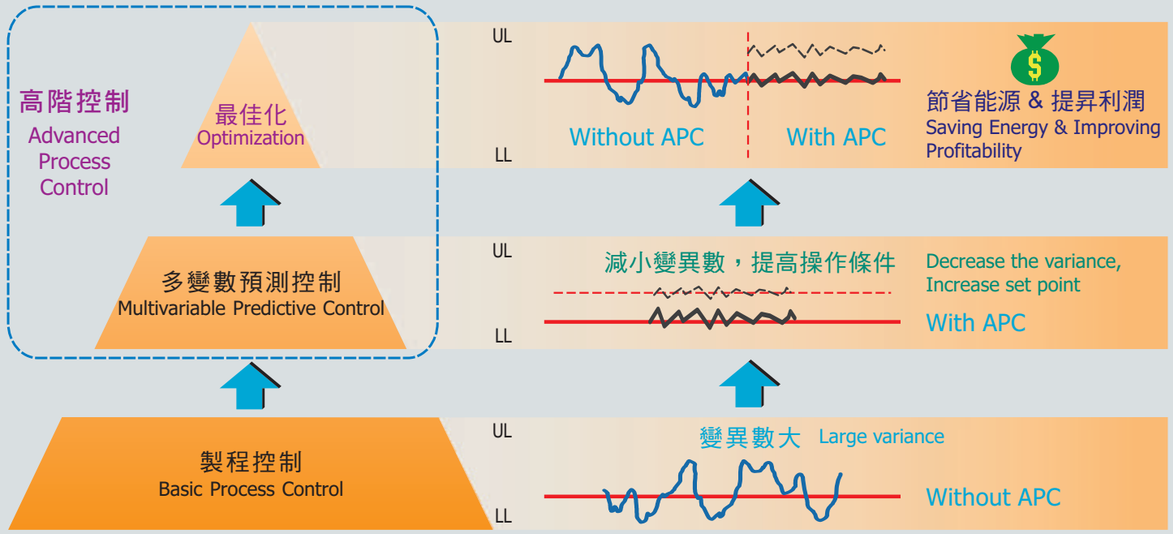
工業物聯網 RtWX 工業4.0

RtWX 智慧製造應用例 Smart manufacture application examples

預測控制 Predictive Control

以高階控制達成預測控制，減少製程原料、水電成本30%~70%。

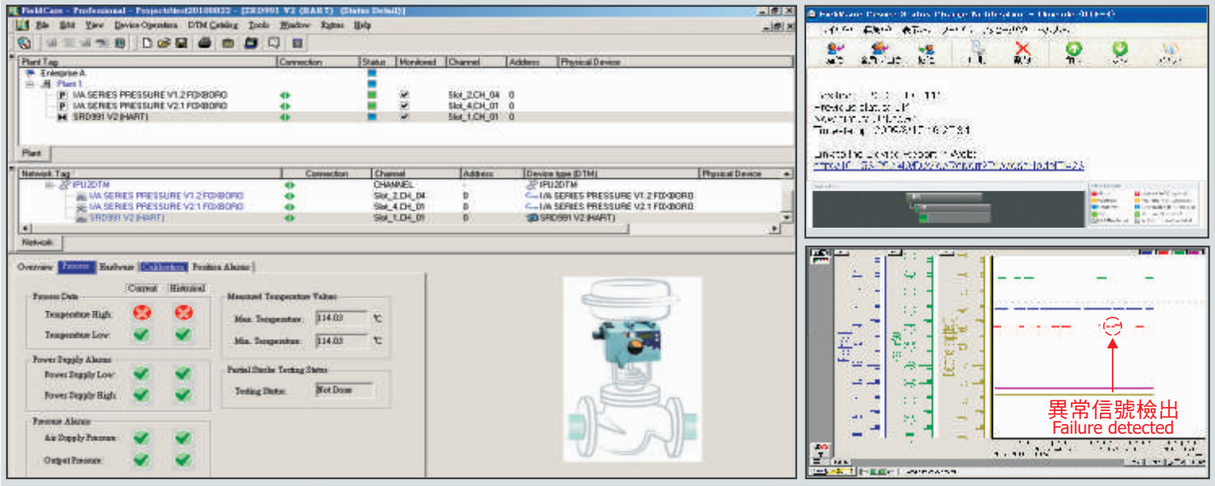
Apply Advanced Process Control (APC) to achieve predictive control technique and reduce about 30~70% raw materials, water and electricity cost.



預知保養 Predictive Maintenance

以儀錶管理達成預知保養，減少20%~30%定期保養維護成本。

With Plant Asset Management (PAM) and intelligent field devices, operators and maintenance personnel can be more predictive and proactive to prevent downtime, and reduce maintenance costs about 20~30%.



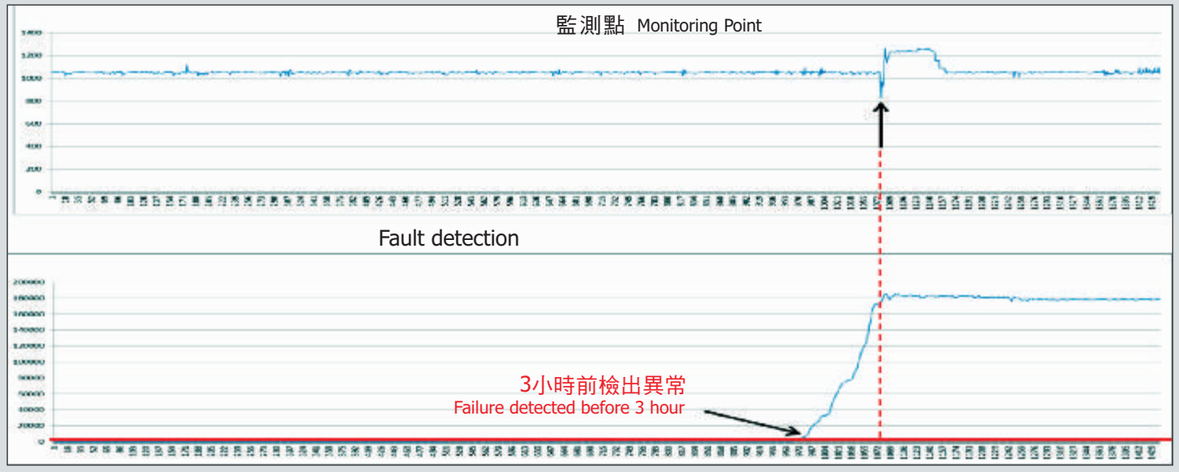
自我診斷歷史記錄	智慧儀錶重要參數趨勢	Web遠端查詢與Email主動提示
Historical view of device health	Presents diagnostics of intelligent devices in trend charts	Web-enabled interface and email notification

預修保養 Proactive Maintenance

保養策略 Maintenance strategy	技術需求 Technique needed	生產改善 Production improvement (%)
被動保養 Reactive	維護費用高 Large maintenance budget	-3%
預防保養 Preventive	週期性更換零件 Periodic component replacement	0%
預知保養 Predictive	線上監測振動與磨耗 Monitoring of vibration, wear debris	1%
預修保養 Proactive	監測並修正造成問題的真因，例如:沾污 Monitoring and correction of failure root causes, e.g. contamination	3%

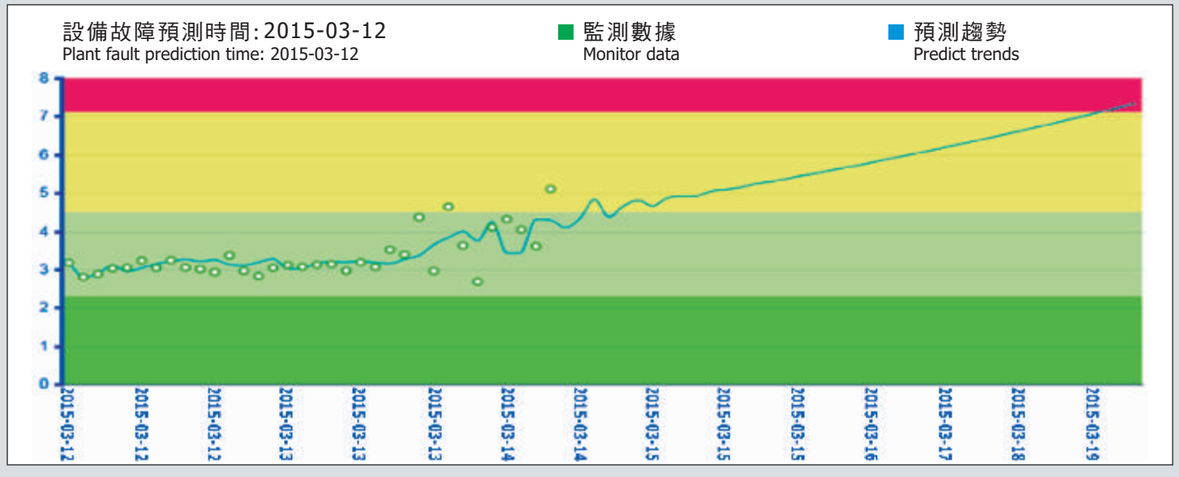
▼ 製程故障抑止-減少誤判/提早預警 Process Fault Suppress – Reduce False Alarm/ Early Warning

前30分鐘 Estimation fault before 30 mins



▼ 設備老化監視-振動分析 Plant ageing monitoring – Vibration analysis

前三天 ~ 一週 Evaluate plant status before three days or week.



Industrial Internet of Things

工業物聯網 RtWX 工業4.0

廠師型解決方案
Maker for your requirement

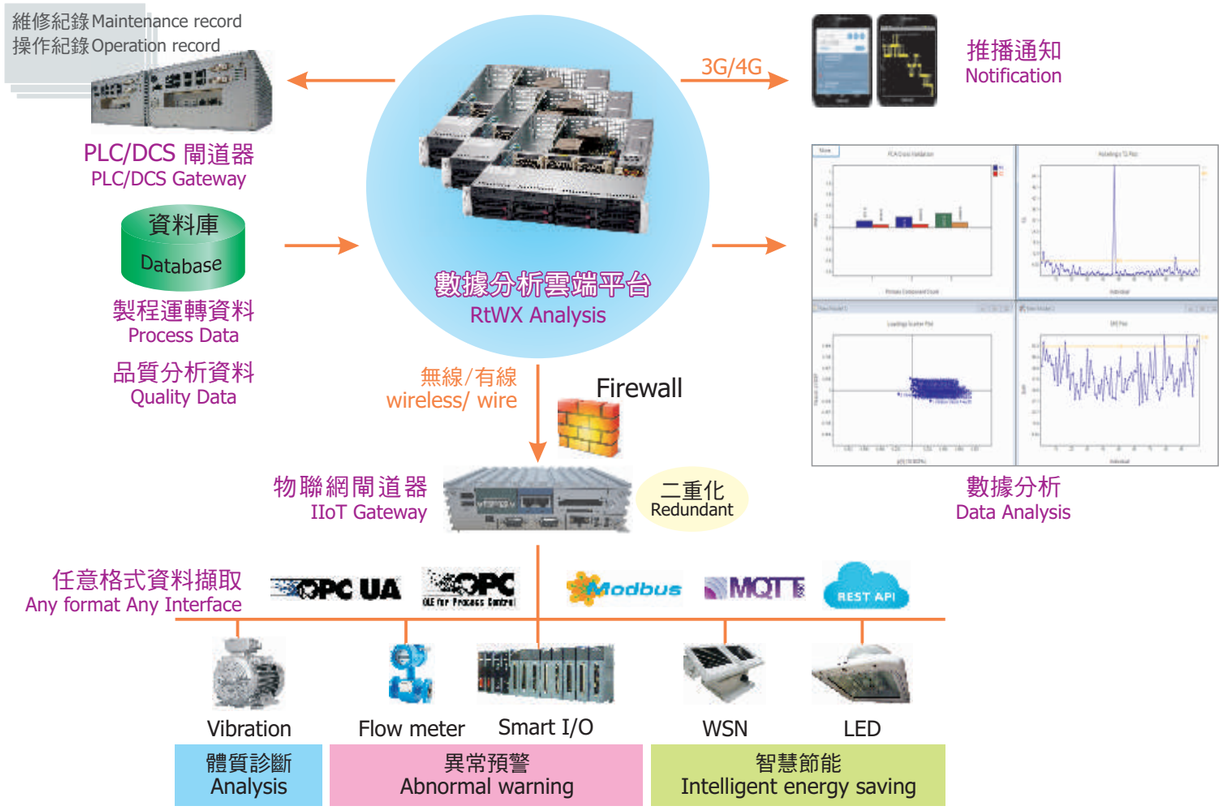
快速量身訂做客製化軟體
Customizable and Fast Delivery

可依產業別量身訂做客製化軟體，有別於其他競爭者為套裝軟體。
Industry dependent software best suit able to your business.

協助中小企業成長
We grow with you

未上櫃 Startup → 上櫃 Small Business → 上市 Enterprise

RtWX 物聯網架構圖
RtWX IIoT Architecture



案例說明

【案例 1】精進加工機效率 To optimize machine efficiency

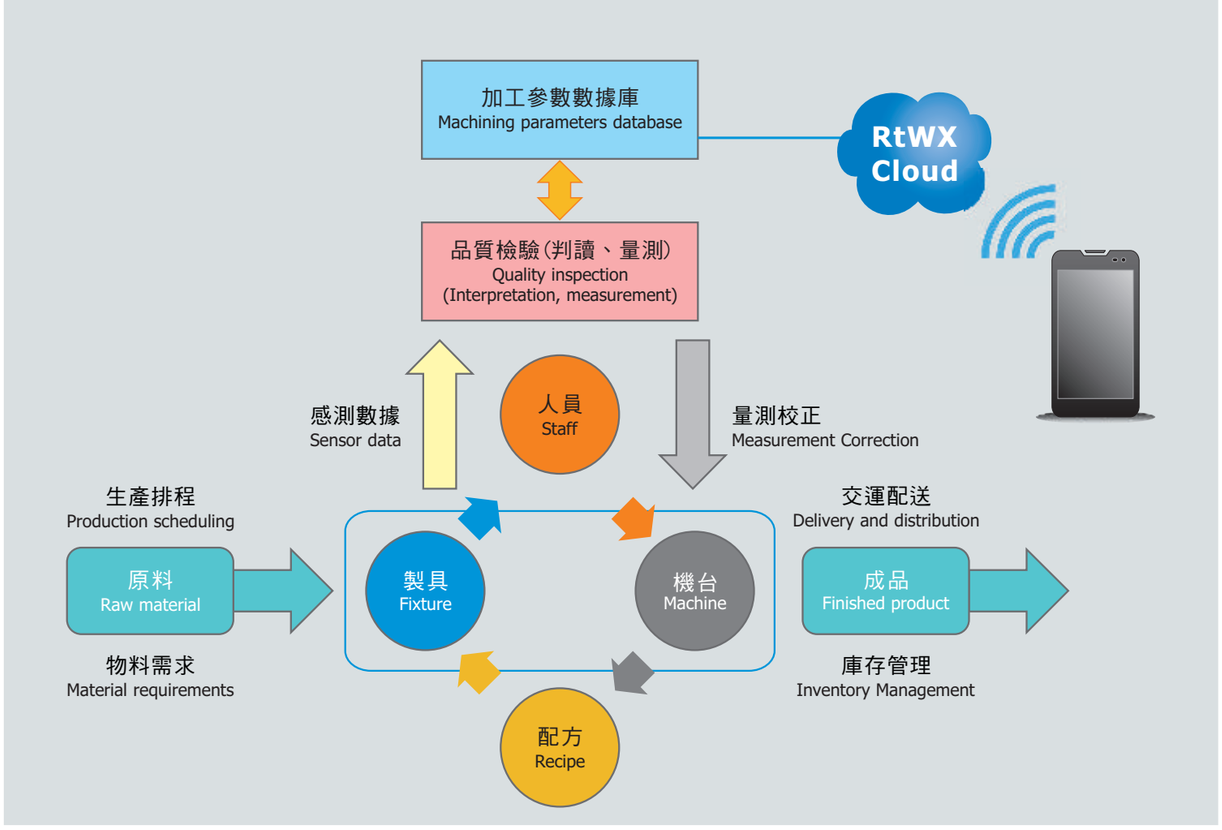
生產排程的優化和調度需即時掌握各設備機台之狀況。為達成配方管理，減少人為輸入錯誤與重覆性的工作（如資料設定），以機台連線，即時檢知加工工件狀態，並與數據庫比對反應與下達機台修正參數，是最佳解決方案。機台連線最主要的工作便基於通信協定的定義，用以傳送與解譯資料。通常通信協定會因各機台之不同，而有不同的定義。

Production scheduling optimization and scheduling for an immediate grasp of the machine equipment situation. To achieve recipe management, reduce human input errors and repetitive work (such as a data set) to connect the machine instantly detecting the state of the workpiece, and with the ratio of the database. The reaction with the machine issued a correction parameter, it is the best solution. The main work machine connection will be based on a given communication protocol, for transmitting and interpreting data. Normal communication protocol will vary depending on each machine it, but there are different definitions.

收集機台狀況，提供管理者、現場人員即時加工參數、量測數據、監控機台狀態、記錄機台維修狀況，並查詢設備資訊，包含以下:

Collecting machine, and to provide managers, field staff instant processing parameters, measurement data, monitor the machine status, recording Machine repair and query the device information, including the following:

- 設備故障原因分析 Equipment failure analysis
- 故障頻率分析 Failure frequency analysis
- 生產歷程精準回溯 Precisely production history backtracking
- 設備稼動率 Utilization rate of equipment
- 設備維修時間分析 Maintenance time analyzing OEE
- 設備綜合效率 Overall equipment efficiency



Industrial Internet of Things

工業物聯網 RtWX 工業4.0

案例說明

【案例 2】產品差異化與品質改善 Product differentiation and quality improvement

設備服務平台 Equipment service platform
- 設備監測與異常診斷
  Equipment monitoring and diagnostic abnormality
- 問題診斷分析
  Diagnosis of the problem

客戶端 Client
- 問題發生時可迅速獲得解決
  Can be resolved quickly when the problem occurred
- 使用時可即時取得運轉資訊
  Get realtime information about the operation
- 停機時能取得支援快速復工
  Downtime can achieve rapid return to work support

供應商 Supplier
- 故障診斷與報修服務
  Fault diagnosis and repair service
- 客戶關係管理
  Custome Relationship Management

維護人員透過產品上之條碼查閱該零件資訊。
Maintenance staff through the bar code on the product get the parts information.

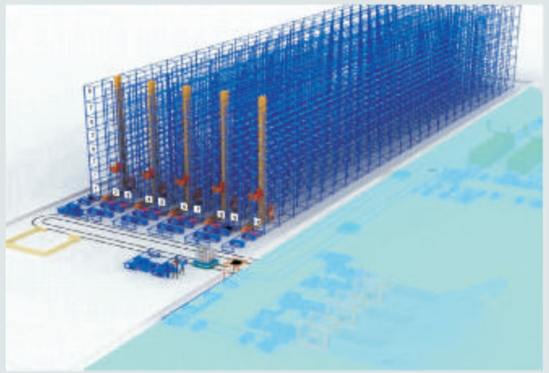
維護人員將設計與實際圖面比較出實際差異，分析問題發生原因。
Maintenance staff compare the design drawing and actual differences, analyze problems cause.

維護人員將操作條件與設備運轉紀錄登錄雲端作為產品差異化改善目標。
Maintenance stuff will record the operating conditions and equipment log into cloud as a product differentiated targets for supplier product differentiation improvement reference.

【案例 3】虛擬工廠 Virtual factory

考慮現實工廠的狀況使虛擬工廠運行，進行動畫處理的模擬功能在工廠尚未進入建置階段前，就能事先了解工廠的建置甚至運作狀況，並減少實體建置所耗費的成本與時間。

Virtual reality makes status plant plant operations, animated analog functions in the plant has not yet entered the pre-build phase, the plant will be able to build even prior knowledge of operating conditions, and to reduce the physical build costs and time-consuming.



工廠與倉儲
Factory and Warehousing

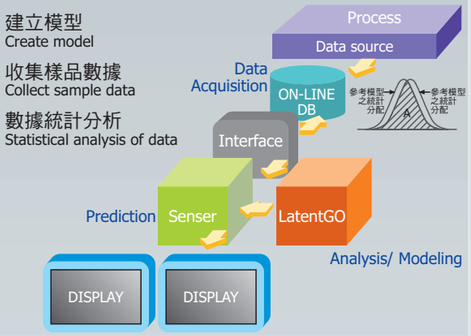
儲區
Storage areas

【案例 4】虛擬量測系統(VMS) Virtual measurement system

虛擬量測系統(VMS)對於生產廠之最大功效為能線上即時推估每個工件之品質狀況。生產製程的關鍵品質參數，通常需經由採樣後送至化驗室進行人為操作以取得量化結果，或利用線上的分析儀器以特定的分析週期進行品質量測;取樣分析週期過長、設備可靠度不高、設備與維護昂貴等量測作業特性，有時並不能滿足品管單位與高階製程控制等應用需求;利用其他製程感測資訊即時地來推論感興趣的品質參數，此方式稱之為虛擬量測系統，可用以提高產品品質並符合改善作業需求。

Virtual measurement system (VMS) for maximum efficiency of the plant is able to produce instant online collocation quality status of each workpiece. Produce process key quality parameters, usually available through after sampling to the laboratory for human action in order to obtain quantitative results, or use line analysis on the instrument to a particular analysis cycle quality measurements, sampling and analysis cycle is too long, the device reliability is not high, and the device expensive to maintain equal measure job characteristics, and sometimes can not meet the application requirements and quality control unit and high-end process control, the use of other system sensing information instantly to infer the quality parameters of interest, in this way is called virtual measurement system can be used to improve product quality and meet the needs of the job.

1. 建立模型
   Create model
2. 收集樣品數據
   Collect sample data
3. 數據統計分析
   Statistical analysis of data



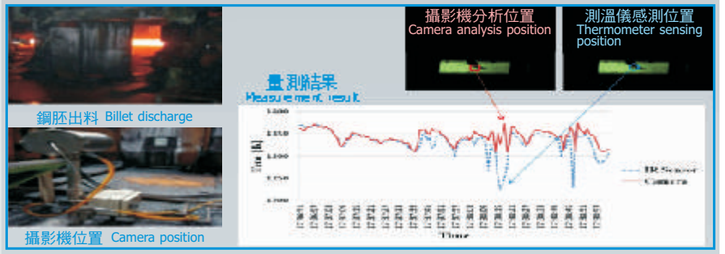
【應用產業 Application industry】

半導體(晶圓)、TFT-LCD廠(玻璃)、鋼鐵(鋼胚)、食品廠、農產品加工。

Semiconductor (wafer), TFT-LCD plant (glass), iron and steel (Slab), food plants, agricultural products processing.

鋼胚應用案例:不易受銹皮影響，具影像處理能力，可量測真正鋼胚溫度

Application case of steel slab: it is not easy to be affected by the rust skin, with image processing ability, can measure the temperature of the real steel slab



農產品(菸葉):菸鹼值檢測

Agricultural products (tobacco leaf): detection of nicotine

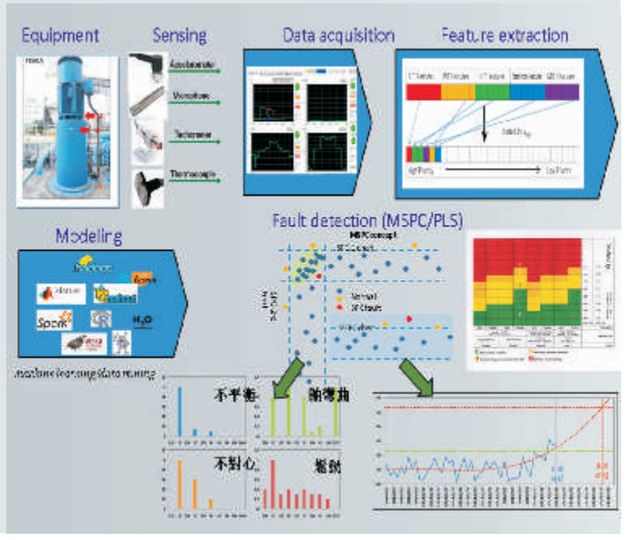
【案例 5】預測危機 Predict crisis

機械故障會大幅影響工廠運作，透過大數據異質資料快速分析所有結構性與非結構性的資料，預測即將發生的障礙，將停工與維修的成本降至最低。

Mechanical failure can significantly affect plant operations, quickly analysis of all structured and unstructured data owned by large heterogeneous data barrier material, predict impending downtime and maintenance costs will be reduced to a minimum.

典型應用是工業物聯網生產線的大數據應用。現代化工業製造生產線安裝有數以千計的小型傳感器，來探測溫度、壓力、熱能、振動和噪聲。因為每隔幾秒就收集一次數據，利用這些數據可以實現很多形式的分析，包括設備診斷、用電量分析、能耗分析、質量事故分析（包括違反生產規定、零部件故障）等。如，在能耗分析方面，在設備生產過程中利用傳感器集中監控所有的生產流程，能夠發現能耗的異常或峰值情形，由此便可在生產過程中優化能源的消耗，對所有流程進行分析將會大大降低能耗。

Typical applications are industrial things big data application. Installation of modern industrial manufacturing several with thousands of small sensors to detect temperature, pressure, heat, vibration and noise. Because every few seconds to close a data set, using these data can achieve a lot forms of analysis, including diagnostic equipment, power consumption analysis Energy consumption analysis, quality accident analysis (including breach of birth Production regulations, parts failure) and the like. For example, in the energy division Analysis side, a set of sensors in the device production process The monitoring of all production processes, energy consumption can be found peak or abnormal situations, which can be in the production process Optimize energy consumption, all processes will be analyzed It will greatly reduce energy consumption.



GATE SECURITY MANAGEMENT SYSTEM

二 道 門 禁 管 理 系 統

【功能說明 Function Description】

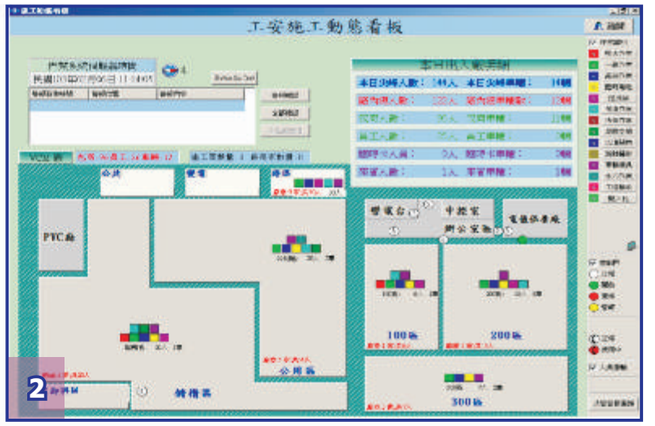
- 即時掌握廠內員工、包商、來賓人數及車輛數量。
  In the real-time control of the factory staff, contractors, the number of guests and the number of vehicles.
- 確保廠內施工人員皆已接受工安課程及安全告知。
  Ensure the factory construction personnel have accepted safety courses and inform security.
- 顯示目前廠內進行工程之施工類別如明火作業、高架作業、侷限空間、吊掛作業等。
  Shows the current engineering construction in categories such as homework assignments, confined space, and elevated the hoisting operation etc..
- 確保廠工安或工安督導員現場到位、確認施工前防護措施及施工後環境清潔。
  Ensure factory safety and industry safety supervisor in place, before the construction site to confirm the protective measures and construction of clean environment.
- 可連結企業網路，每日自動更新數據，各式報表列印(如：每日施工動態、個人及車輛出入廠、進/出廠未讀卡、非法闖入警報紀錄、逾時出入廠等)。
  Link enterprise network daily automatic updates data, all kinds of print statements (such as: daily dynamic construction, personal and vehicle entry and factory, inlet/ factory not read card, illegal intrusion alarm record, more than entry factory).

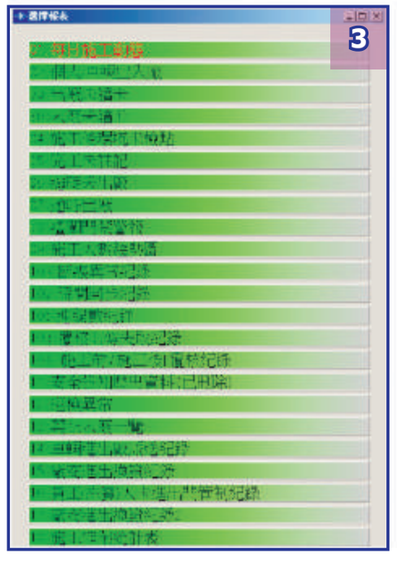
【人員管制門 Personnel Control Door】

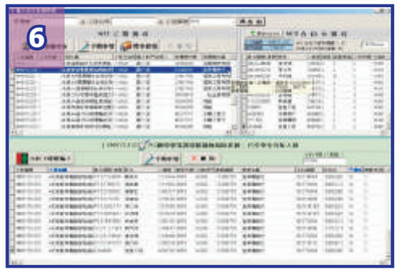
【車輛管制門 Vehicle Control Door】

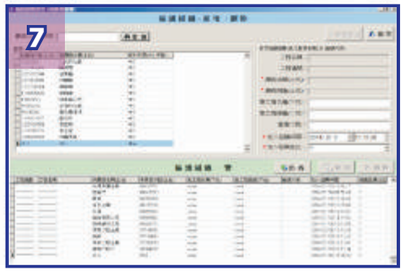
- 管制閘口全天候監視及錄影。
  The control gate-all-weather monitoring and recording.
- 進出管制閘需先經讀卡確認權限後方可通行，有效管制非相關人員進入廠內。
  Access control gate to the first card confirmation authority before passage, effective control of non related personnel to enter the factory.
- 偵測到非法闖入時，立即語音報警嚇阻，警報訊息即時傳回控制站，監視螢幕立即跳出現場畫面。
  To detect illegal intrusion, immediately voice alarm deterrence, warning message immediately sent back control station, monitor immediately jumped out pictures from the scene.
- 每日施工後可掌握各家廠商出廠情形及工安或工安督導員到位環境檢核。
  Daily after construction can master the various manufacturers of factory and industrial safety or safety supervisor in place environmental inspection.
- 控制站影像監控採用雙螢幕顯示，採取電子地圖及監視影像同時顯示，方便使用者操控使用。
  Control station image monitoring using dual screen display, take the electronic map and monitor image shows at the same time, is convenient for users to use manipulation.
- 即時監控所有管制閘畫面、設備狀態及遠程遙控與廣播。
  In the real-time monitoring of all control gate screen devices, remote control and radio.
- 結合監視、門禁、對講、警報系統整合成完整工安系統。
  In the combination of surveillance, access control, intercom alarm system is integrated into a complete system of work safety.

門禁管理系統主要機能
Main functions of access control management system

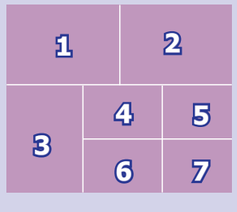








1. 廠區門禁系統
   Factory gate control system
2. 施工動態廣告牌(客製化)
   Construction dynamic billboard (customization)
3. 報表
   Report
4. 核卡作業畫面(1)
   Check card operation screen (1)
5. 核卡作業畫面(2)
   Check card operation screen (2)
6. 安全告知建檔管制
   Inform security control file
7. 協議組織建文件管制
   Agreement to organize the construction of document control



FORMOSA ELECTRONICS PROJECT ACHIEVEMENT

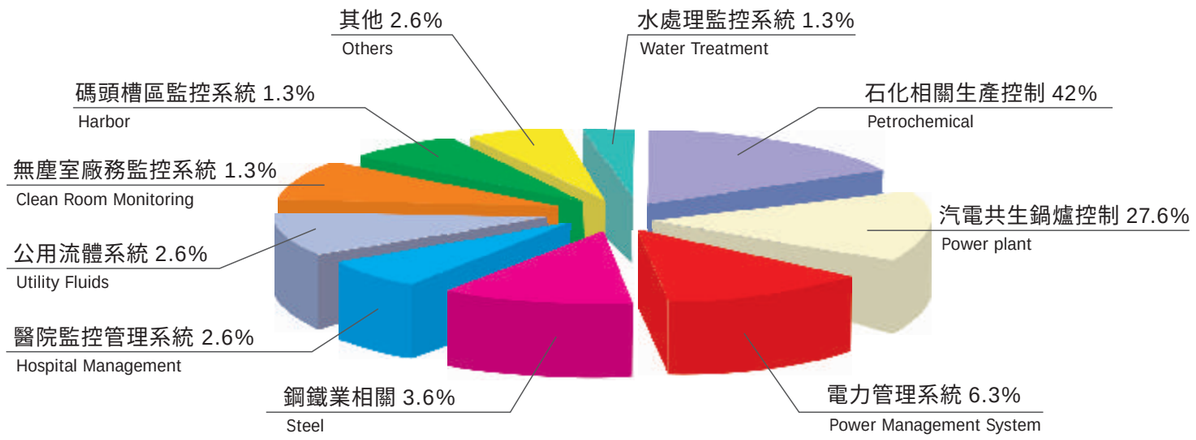
FORMOSA ELECTRONICS PROJECT ACHIEVEMENT

台塑電子組工程實績

DCS 工程實績
DCS Project Achievement

300套以上
Over 300 Projects

資料截止至2016年05月
Last update: 05-2016



台灣地區主要產業實績 Taiwan

200套以上
Over 200 Projects

NO.	項目名稱 Project Name		I /O 點數	交期 Delivery
1	中鋼一號轉爐控制工程	China Steel Corp. (BOF-1)	1,600	1996
2	台塑麥寮PVC控制工程	Formosa Plastics Corp. (Mai-Liao PVC)	11,948	1997
3	麥寮燒鹼廠四期控制工程	Formosa Plastics Corp. (Mai-Liao NaOH)	8,680	2005

大陸地區主要產業實績 China

38套以上
Over 38 Projects

NO.	項目名稱 Project Name		I /O 點數	交期 Delivery
1	台化寧波ABS二期	Formosa ABS (NB) Corp .(Ningbo ABS-II)	6,628	2007
2	中華紙業（寧波）鍋爐控制工程	Ningbo Asia Pulp & Paper Corp. (NBXG-1/2 Co-Generation)	5,623	2005
3	紹興龍盛氨綸彈性纖維工程	Shaoxing Longshan Spandex Corp. (Spandex Plant)	1,288	2005
4	金橋豐益燒鹼DCS系統	Jinqiao Wilmar Chlor-Alkali (Lianyungang) Co., LTD (NaOH)	3,000	2007
5	玖龍天津#1鍋爐控制工程	Nine Dragon TJ-1 Boiler	4,216	2008
6	洛陽孟津電廠MT -1/MT -2	Luo Yang MT-1/ MT - 2	21,164	2009
7	新浦化學苯乙烯DCS工程	SP Chemicals (SM Plant)	3,300	2013
8	北京清華長庚醫院DCS系統	Beijing Tsinghua Changgung Hospital	3,600	2014
9	新浦化學電力管理系統（PMS）	SP Chemicals (Power Management System)	600	2015
10	雲南正邦科技乙烯及公用DCS工程	Yunnan Zhengbang Technology Co., LTD (VAE)	2,000	2015

美國地區主要產業實績 America

5套以上
Over 5 Projects

NO.	項目名稱 Project Name		I /O 點數	交期 Delivery
1	德州CFB鍋爐控制工程	Formosa Plastics USA Corp. (Texas CFB Co-Generation)	6,886	2008
2	SPVC, USA		21,420	2007
3	美國德州鹼廠監控系統	Formosa Plastics USA Corp. (NaOH Plant)	1,376	2009

印尼地區主要產業實績 Indonesia

6套以上
Over 6 Projects

NO.	項目名稱 Project Name		I /O 點數	交期 Delivery
1	印尼PKTK鍋爐控制系統	Pt. PKTK Corp. Indonesia (TK3 Co-Generation)	2,172	1996
2	印尼TK3 更新	Indonesia TK3 Boiler	2,392	2014
3	印尼泗水電廠PMS	Pt. PKTK Corp. Indonesia (TK3 PMS)	1,904	2010

越南地區主要產業實績 Vietnam

8套以上
Over 8 Projects

NO.	項目名稱 Project Name		I /O 點數	交期 Delivery
1	台化越南VN -1 鍋爐控制	Formosa Industries Corp. (VN-1 Co-Generation)	2,830	2003
2	越南慶豐水泥	Vietnam Chinfon Cement	3,000	2013
3	台化越南電廠PMS工程	Formosa Industries Corp. (VN-1 PMS)	900	2003
4	河靜鋼PMS	Vietnam Ha Tinh Steel PMS	1,590	2015
5	河靜鋼水處理	Vietnam Ha Tinh Steel Water Treatment	1,616	2015

菲律賓地區主要產業實績 Philippine

20套以上
Over 20 Projects

NO.	項目名稱 Project Name		I /O 點數	交期 Delivery
1	菲律賓Toledo鍋爐 #1	Philippine Toledo Boiler #1	2,541	2009
2	菲律賓SMC LIMAY鍋爐 #2	Philippine SMC LIMAY #2	3,408	2015
3	菲律賓SMC DAVAO鍋爐 #2	Philippine SMC DAVAO #2	3,408	2015

自動倉儲 / 物流 /PLC / 自動化 實績
AS/ RS/ Logistics/ PLC Achievement

400套以上
Over 400 Projects

台塑企業集團 (FPG)

【台灣塑膠】聚烯、SAP廠、VCM、鹼廠…等

【南亞塑膠】地磚、BOPP、塑門窗、纖維、EPOXY、玻纖布…等

【台灣化學】耐隆、ABS …等

【長庚醫院】嘉義、長庚技術學院…等

【 FPC 】 PE, SAP, VCM, NaOH, and so on.

【 NPC 】 Brick, BOPP, Plastic doors and windows, Fiber, EPOXY, CCL, and so on.

【 FCFC 】 Nilon, ABS, and so on.

【CGMH】 Chia -I, CGUST, and so on.

其他企業 (Others)

AUO 友達光電	友達光電	群創光電	INNOLUX 群創光電
RiTEK 錸德科技	錸德科技	奇美實業	CHIMEI 奇美實業
DEPO	帝寶工業	復盛精密工業	FUSHENG
中日合成化學	中日合成化學	長春石化	長春石化集團
頂新國際集團	頂新集團	溢泰集團	泰 KEMFLO
思念	思念食品	裕國冷凍	裕國集團
M&G晨光文具	晨光文具	玖龍紙業	玖龍紙業(控股)有限公司
交通部高公局	交通部高公局	晉禾企業	晉禾企業股份有限公司