



Intelligent Operation Management & Control System (OMC)

System Overview

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Symbol Definition	
	WARNING: Indicates information that a potentially hazardous situation which, if not avoided, could result in serious injury or death.
	RISK OF ELECTRICAL SHOCK: Indicates information that Potential shock hazard where HAZARDOUS LIVE voltages greater than 30V RMS, 42.4V peak, or 60V DC may be accessible.
	ESD HAZARD: Indicates information that Danger of an electro-static discharge to which equipment may be sensitive. Observe precautions for handling electrostatic sensitive devices
	ATTENTION: Identifies information that requires special consideration.
	TIP: Identifies advice or hints for the user.

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Section 1 Introduction

OMC, the intelligent operation management and control system, is independently innovated by SUPCON Technology. It realizes the fusion and reconstruction of autonomous process control, operation efficiency optimization, production operation management to shape safe, green, and efficient production and operation in the full life cycle of the process industry.

OMC system combines the control technology, computer technology, together with technologies including technical modeling, device health management, production and operation technology. Its high-performing million-level distributed real-time database carries massive production and operation data, while the core control system blends together the functionalities of autonomous process control, reliable and safe operation, efficient project management, data mining and value optimization. With these characteristics and the integration of 5T (IT, AT, OT, PT, ET), OMC is designed to present you with an intelligent and safer plant.

OMC is committed to turning projects and plants for a "safe, efficient, green, and intelligent" future. It is suitable for uses in industrial production scenarios, such as mega-level petroleum refinery, million-level ethylene and aromatics refinery, and CTO process.

1.1 Features

Ethernet to Field

"Ethernet to Field" allows a more efficient transmission path for field signals with the application of distributed universal I/O, digital I/O, APL, and wireless sensing. Featuring distributed deployment, high reliability, easy expansion and maintenance, as well as integration, it reduces costs on cabinet rooms and cables, and facilitates calibration and commissioning.

Industrial Operating System + APP

OMC combines the innovative architecture of "Industrial Operating System + APP" with plant models and unified data soft bus, to connect instruments, devices, techniques, and all operational factors in a digitalized fashion and form an open and unified digital base. With the container-based operating system, rapid development and flexible deployment of industrial apps are materialized to empower our customers with experiences and knowledge. We intensified our efforts to help enterprises register a sustainable development in the aspects of data integration, management and application, along with process optimization and business coordination.

Autonomous Operation

In OMC system, the various independently-developed key components such as LoopOptimization, PredictiveControl, Pilot, AlarmManagement foster a better control over the operation and management process. With OMC in place, your plant are able to operate in a steadier, safer, and autonomous way with the dependency on workload greatly reduced.

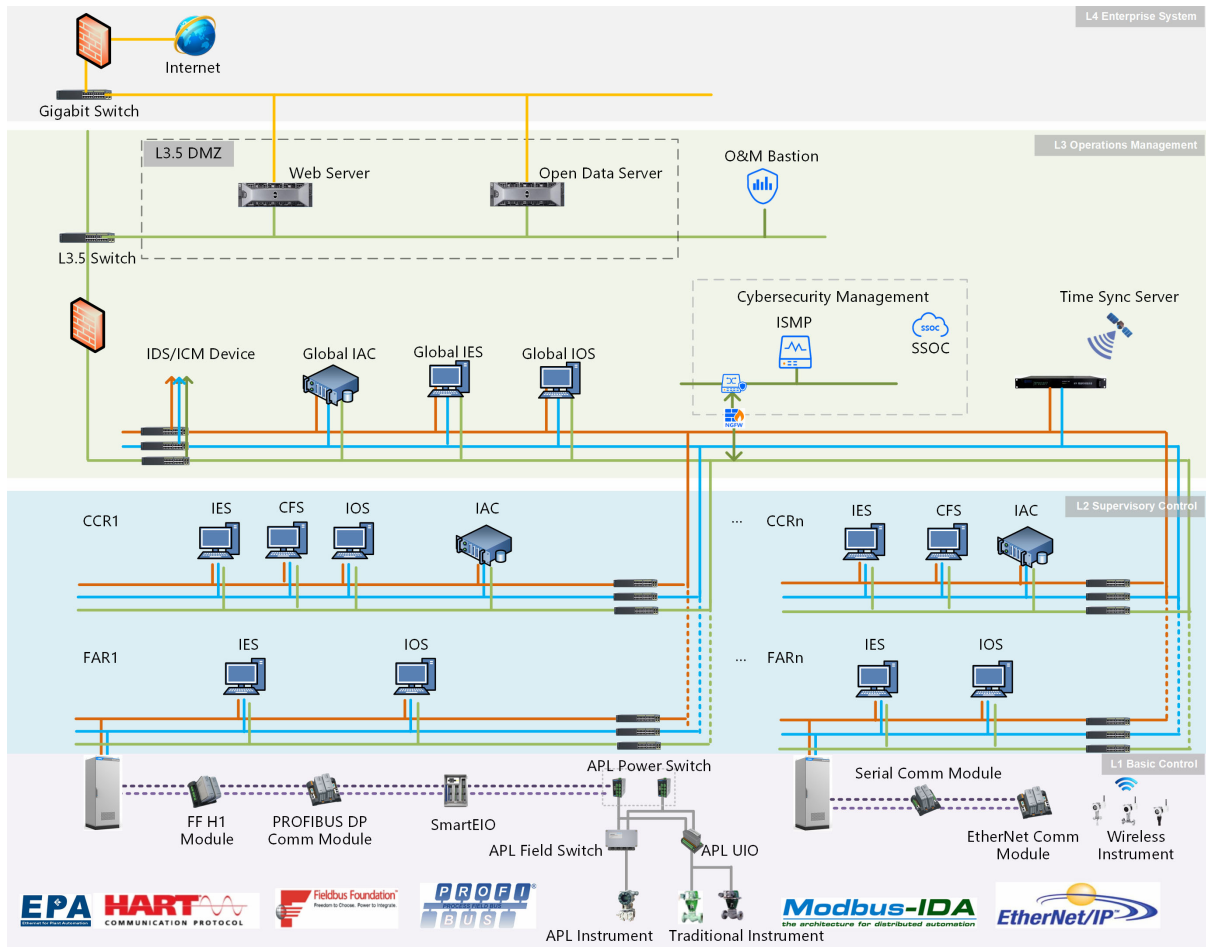
1.2 System Architecture

1.2.1 System Structure

OMC consists of configuration server, intelligent engineer station, intelligent operation station, intelligent application center, system hardware and system networks.

- Configuration Server (CFS): manages the archiving of system configurations. You can configure and manage system structure on the configuration server.
- Intelligent Engineer Station (IES): Maintains configuration and programs. You can debug, download control configurations, manage monitoring configuration and configure smart applications on the intelligent engineer station.
- Intelligent operation station (IOS): serves as the operation station or distribution service to monitor and manage production or record and store data.
- Intelligent application center (IAC): as the service site for diverse smart apps, the intelligent application center allows you to deploy the database and service architecture for these apps.
- System Hardware: system cabinets, controller, traditional I/O, universal I/O, devices with different communication interfaces, wireless devices, APL devices, and other hardware used to connect field instruments or other systems.
- System Network: intelligent information network (SOnet), control network (SCnet), I/O bus and other transmission media connecting hardware, software or between hardware and software.

OMC System Overview



IES: Intelligent Engineer Station
 IOS: Intelligent Operation Station
 IAC: Intelligent Application Center
 IDS: Intrusion Detecting System
 ICM: Industrial Cybersecurity Monitor
 SSOC: SUPCON Security Operation Center
 ISMP: Industrial Security Management Platform
 CFS: Configuration Server

Figure 1-1 System network structure

1.2.2 System Functions

Functional Diagram

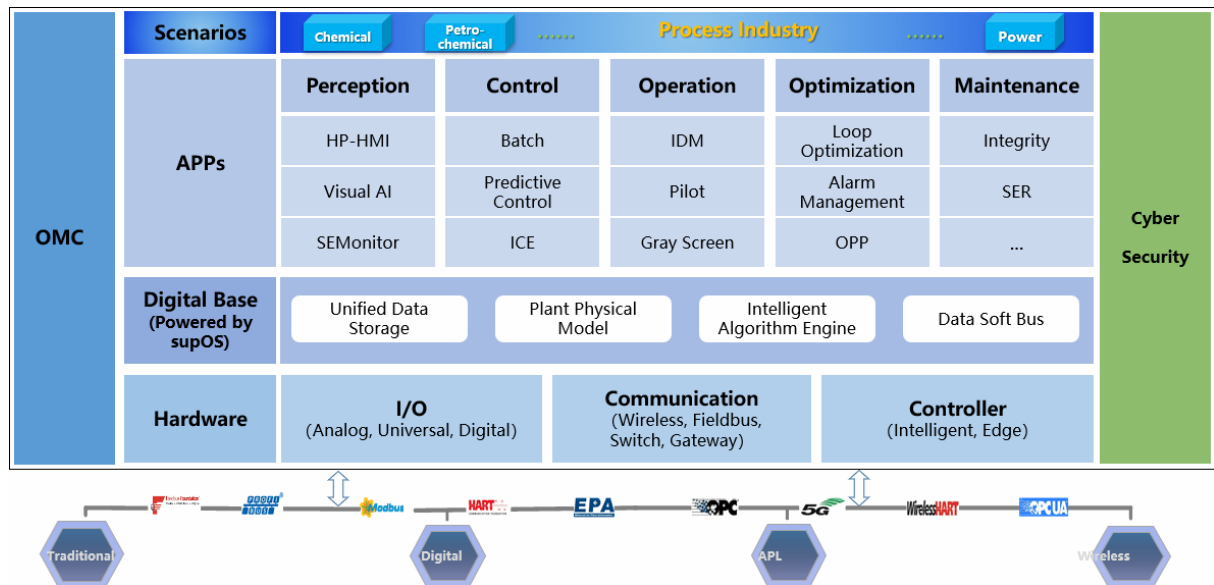


Figure 1-2 System functional diagram

Component List

Table 1-1 Component list

Name	Function Description
OMC Hardware	Capable of integrated control and management over large-scale integrated units. Collects, controls, manages devices such as intelligent controller, intelligent UIO, digital I/O, and APL devices in real time.
OMC High-performanceHMI	OMC high-performanceHMI is a software embedded with functionalities including system configuration, process display, data alarm, trend query, report management, data open interface, and multi-project interconnection. Additionally, HPHMI controls (radar chart, bar chart, and profile chart) are provided and presented in 2D and 3D dynamic manner.
OMC BatchControl	Designed for batch control. Plan, configure, control, and record batch production in this software. High-performanceHMI is required.
OMC VisualAI	Manages and displays production videos embedded in HMI. Supports functions such as video inspection, instrument recognition, process recognition/control algorithms. Supports cameras from manufacturers such as Hikvision and Dahua.
OMC IDM	AMS system. Manage, configure, maintain, and monitor intelligent fieldbus or HART devices. Provides fault alarms, device health prediction, etc.
OMC SEMonitor	Monitors cabinet temperature and humidity, power supply, corrosion level, vibration, intrusion, etc., to uniformly monitor all plant cabinets.
OMC Integrity	Digitalize OT assets based on processes to detect problems such as safety vulnerabilities, configuration defects, and illegal configuration change. Offers signal flow diagrams.
OMC PredictiveControl	Monitors key performance index (KPI) such as closed control ratio, and steady ratio. Provides functions such as loop performance assessment, PID tuning, loop optimization, and intelligent diagnosis.
OMC Pilot	Use standardized procedures to simplify SOP. Embedded with scenarios such as one-click startup/shutdown, load adjustment for minimizing workload.

Name	Function Description
OMC LoopOptimization	Integrates functions such as auto detection, performance assessment, troubleshooting and parameter optimization to improve the performance of all PID loops. With OMC LoopOptimization, stability, efficiency, and benefit are all elevated.
OMC AlarmManagement	Provides functions such as event alarm and analysis, dynamic alarm management, audit and changes management to keep the alarms under control and improve the performance of the alarm system.
OMC GrayScreen	Designed with Gray Screen concept to automate the operation of units and precisely control the processes.

1.3 Technical Specifications

- Supports over 200,000 I/O signal points, over 100 control stations and over 200 operation stations.
- Fully redundant design, covers power supply, CPU, communication module, and I/O module.
- The industrial controller supports trusted boot and security protection. It also complies with EMC level 3 and can operate between -20 °C to 70 °C.
- The control station supports OPC unified architecture (OPC UA) interface and at least 4 universal industrial protocols defined by IEC 61158.
- Supports 4 programming languages defined by IEC 61131-3, i.e. FBD, LD, SFC, ST. Provides command-based and graphics programming, and high-speed real-time algorithms and software with machine learning feature.
- Real-time database supports standalone or distributed deployment.
- Control loop tuning supports internal model and interactive tuning and provides open and closed loop modes.
- OMC Pilot supports structured recognition and digital SOP generation, as well as SOP auto-optimization and dynamic event-based optimal scheduling.
- OMC PredictiveControl supports model self-learning.
- OMC AlarmManagement can auto-generate operating alarm condition model and help perform troubleshooting and auto-optimize alarm scheme.

1.4 Certifications

OMC products has passed the following certifications.

CE:

- Low Voltage Directive 2014/35/EU
- Electromagnetic Compatibility Directive 2014/30/EU
- TÜV G3 anti-corrosion:
- ANSI/ISA 71.04-2013

- Wurldtech's Achilles:
- Achilles Level II

GB:

- GB/T 3836.1-2021 Explosive atmospheres - Part 1: Equipment - General requirements
- GB/T 3836.3-2021 Explosive atmospheres - Part 3: Equipment protection by increased safety "e"
- GB/T 3836.4-2021 Explosive atmospheres - Part 4: Equipment protection by intrinsic safety "i"
- GB/T 3836.8-2021 Explosive atmospheres - Part 8: Equipment protection by type of protection "n"
- GB/T 3836.20-2010 Explosive atmospheres - Part 20: Equipment with equipment protection level (EPL) Ga
- GB/T 3836.22-2017 Explosive atmospheres - Part 22: Protection of equipment and transmission system using optical radiation

Section 2 OMC Hardware

OMC hardware is the basis for collecting field data and control devices. It includes intelligent control cabinet, intelligent controller, SmartEIO, APL devices, and wireless communication device.

Fully-Redundant Design

Fully-redundant design guarantees high reliability and high availability of the system. System redundancy refers to redundant power supply system, communication network, control station, I/O module, server, and operation station. In a redundant configuration, a seamless switchover automatically happens when the working module is faulty.

High Reliability

System hardware modules are all designed with high reliability to withstand severe conditions. The system has passed CE certification with EMC III protection. All electrical components can be used in G3 harsh environment. All modules are embedded with online self-diagnosis function and status indicators. Troubleshooting is accurate to I/O channel level. You can view fault details on maintenance software. Hot-pluggable module supports online replacement or adding and removing.

Networking Architecture

SCnet, SOnet, and E-Bus use fiber ring network to ensure high reliability for large-scale control systems. Bus and star topologies are available. Both of them can be redundantly configured.

Domain-Based Management

According to the scale and structure of the actual system, the control system is divided into one or more control and operation domains, and each operation domain can monitor multiple control domains simultaneously and jointly monitor these control domains. Through domain-based management, the control system reduces the system network load, thus ensuring the real-time transmission on the process control network for large-scale systems. Based on your configuration, the system can realize centralized systemic storage or multi-domain distributed storage of history data. The sample diagram of domain-based management is shown below.

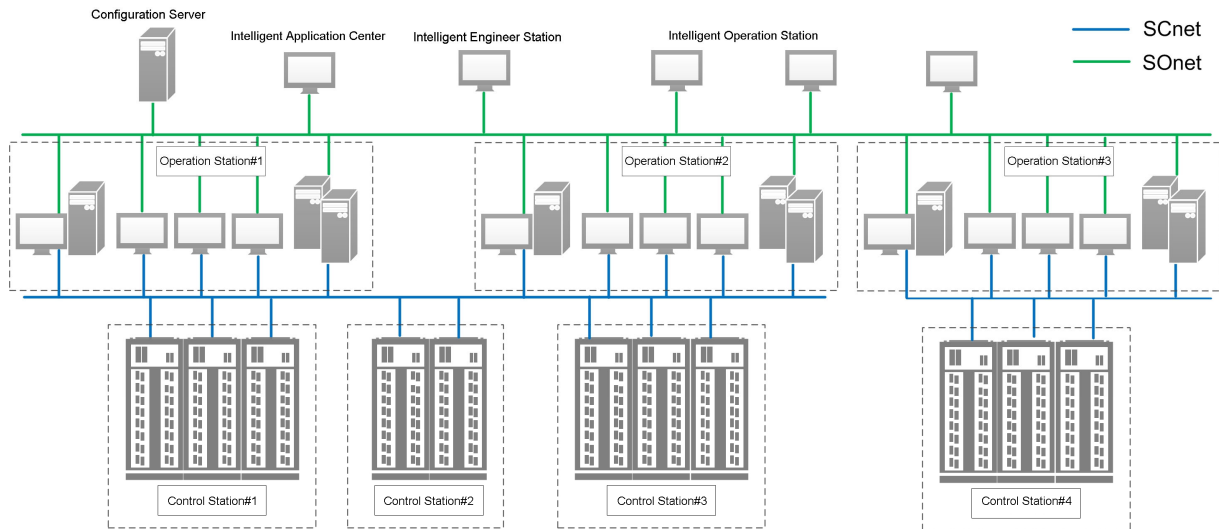


Figure 2-1 Sample diagram of domain-based management

Fieldbus and Heterogeneous System Integration

The system supports HART, PROFIBUS, PROFINET, Ethernet/IP, FF, Modbus, EPA, OPC UA and other fieldbus protocols and network communication protocols, and provides corresponding communication interface modules. All field-side signals are isolated from the system side by optical isolation to minimize the impact imposed by faults on the system.

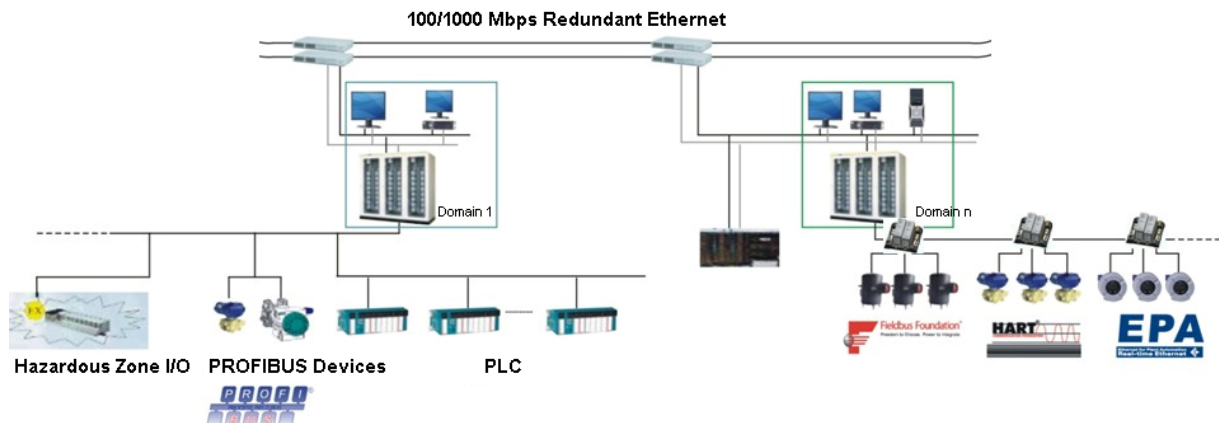


Figure 2-2 Heterogeneous communication

2.1 Intelligent Control Cabinet

The intelligent control cabinet includes FCU series controller, I/O module and intelligent system environmental monitoring module.

FCU series controller is the core of the hardware and software of the control station, coordinating the relationship between hardware and software in the control station and completing various control tasks. The controller can automatically perform various functions such as data collection, information processing and control operation. It connects with the data server, operator station and engineer station through the SCnet to receive management information from the upper level, and

transfer the characteristic data of process devices and collected real-time data upward. Downwards, it connects with I/O link modules through the E-Bus (or connects with I/O modules directly through the L-Bus) to exchange data with I/O modules, and complete input sampling and output control of field signals.

I/O modules support standard current, voltage signals, HART signals, thermocouples, RTD signals. Functionalities such as redundancy, hot-plugging, and channel-level fault self-diagnosis are also supported.

System environmental monitoring modules can monitor cabinet temperature and humidity, power supply, corrosion level, vibration, intrusion, etc., to uniformly monitor all plant cabinets. They can also generate alarms for abnormal conditions.

2.2 Intelligent Controller

Built on the functions of traditional DCS controllers, the intelligent controller , allows third-party engineers to develop advanced control/optimized control algorithms according to industrial needs. The algorithm library can be encrypted with a special tool to improve data security. The intelligent controller is capable of high-performance computing performance which is over 40 times more powerful than traditional DCS controllers. With rich communication interfaces (SCnet, Modbus, Siemens S7, OPC UA, etc.), it can be interconnected with DCS, SIS, PLC systems at a response speed of millisecond level to meet high real-time interstation communication.

2.3 SmartEIO

SmartEIO, an intelligent and universal I/O system, consists of universal I/O module, signal adapter, I/O link module, SmartEIO I/O rack, and more components. It supports collecting and outputting signals including AI, AO, DI, DI (SOE), DO, PI, TC, RTD, NAMUR, HART, as well as communicating with the main FCU controller in control room via Ethernet or optic-fiber cables.

The flexible installation of SmartEIO allows it to be deployed in different applications. For example, standardized cabinet that can be used in non-hazardous area (such as control room), provides up to 576 points. Two types of remote I/O enclosure designed for using in hazardous areas offer 48 and 96 points respectively. Remote I/O enclosure can be installed in Zone 2 since it has passed the certification of Type of Protection "n".

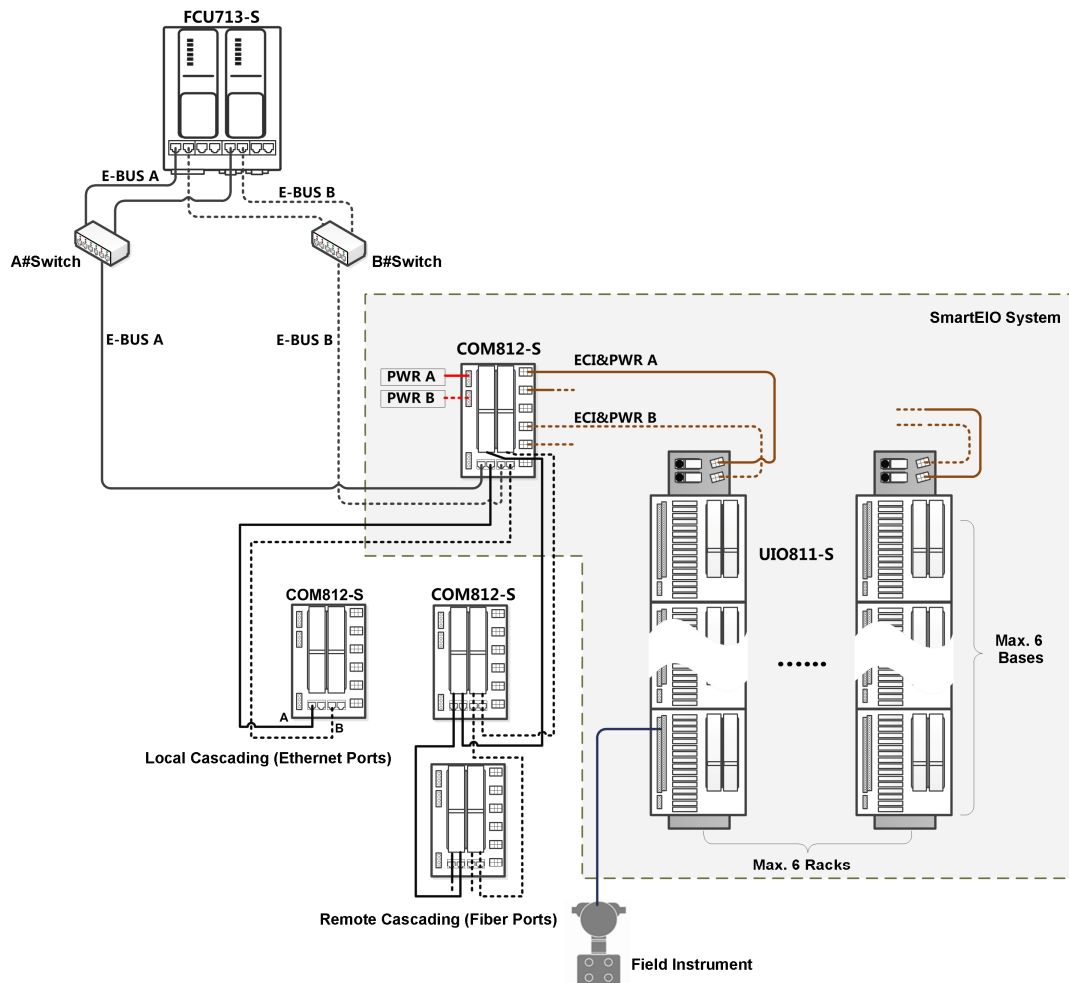


Figure 2-3 Network Structure diagram

2.4 Wireless Devices

Wireless communication devices are designed for special scenarios where wired solution cannot cover or has difficulties in deployment. It integrates advanced industrial wireless and 5G technology to monitor every corner of your plant. Wireless communication devices mainly include intelligent gateways, wireless transmitters.

- The intelligent wireless gateway can interconnect with third-party systems such as touch screen, universal HMI, MES and cloud server, as well as SUPCON control systems, and collect process, diagnostic and alarm data of the control systems.
- Wireless transmitters include wireless temperature transmitters and pressure transmitters. They can be used with wireless gateways to transmit field instrument data to control systems or third-party systems. It supports collecting standard signals and meets intrinsic safety requirements.

2.5 APL Products

APL (Advanced Physical Layer) products include APL universal I/O, pressure transmitters, switches, FF couplers. The products is designed based on 802.3cg10BASE-T1L, a two-wire Ethernet-based standard, which defines an advanced single-pair Ethernet, intrinsically safe

physical layer for power supply and transmission integration, and is suitable for process automation applications with higher requirements. It features functions such as 10 Mbps broadband transmission, 1,000 m long-distance deployment, anti-explosion and anti-interference, high reliability and stability.

Section 3 Component Functions

3.1 High-performanceHMI

OMC High-performanceHMI provides user-friendly and efficient interaction logics for users to control and monitor the operation of field equipment. HMI integrates multiple types of graphics to help operators monitor and control equipment, enhancing production and control efficiency. This component allows for hierarchical HMI screens and offers a variety of visualized controls. Multi-project connection and web monitoring are supported.

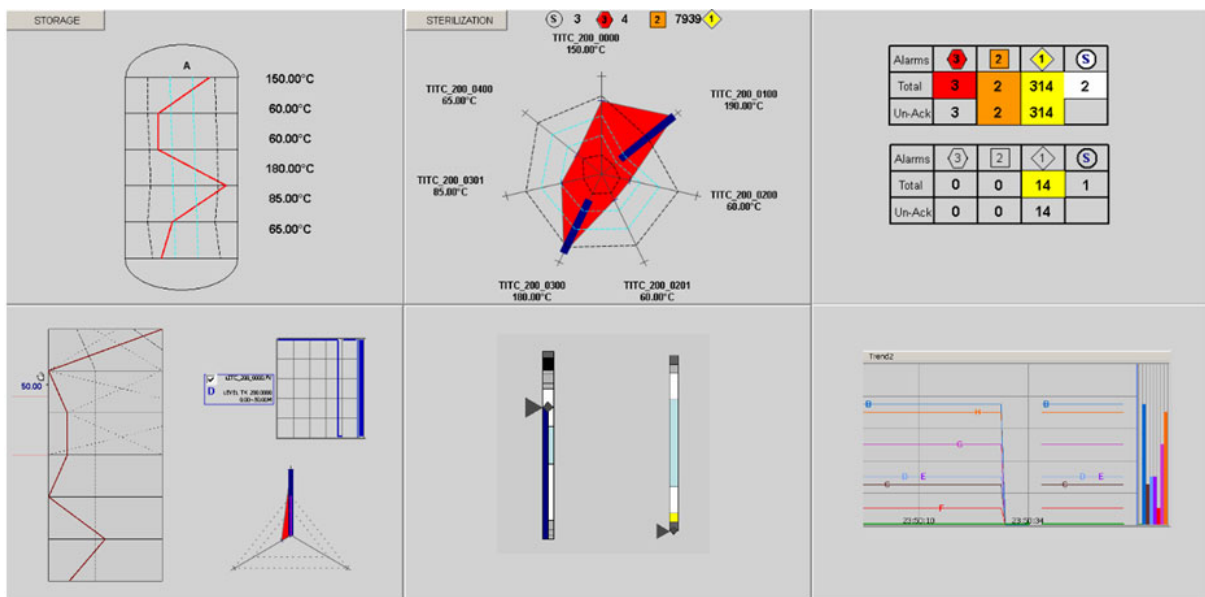


Figure 3-1 HMI sample

OMC System Overview

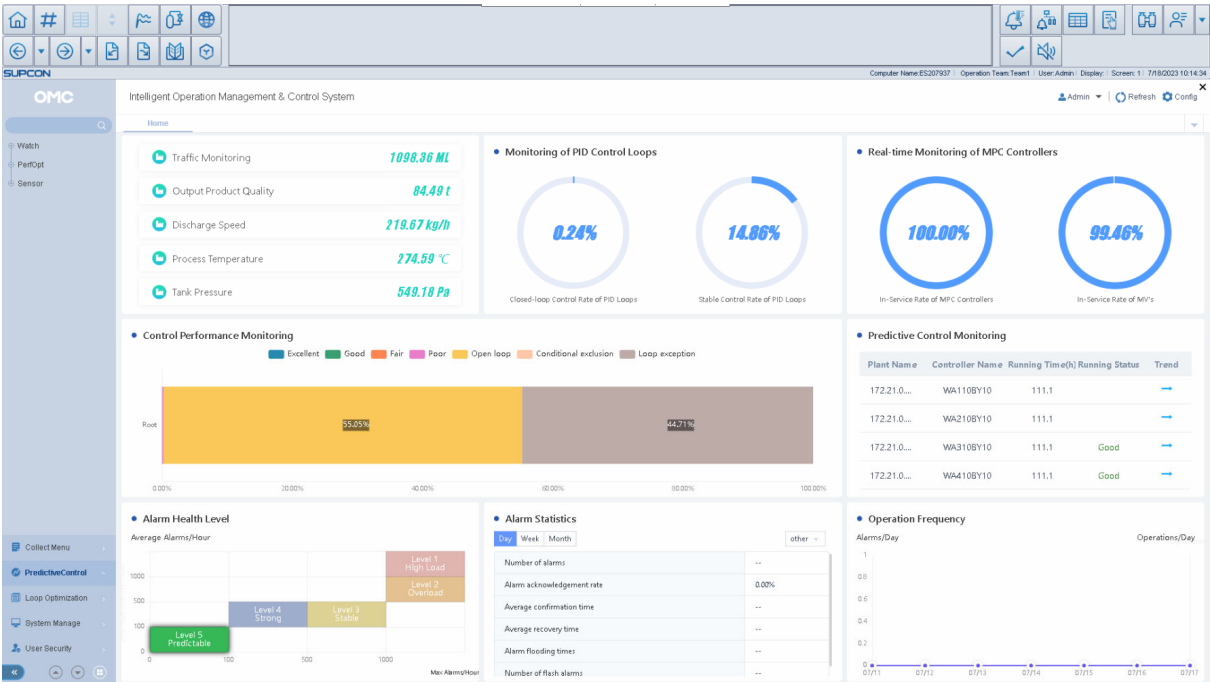


Figure 3-2 Run Management HMI

3.2 BatchControl

OMC BatchControl is an advanced application package that designed to plan, configure, control and record the batch production. It satisfies your needs of flexible and effective batch production management. Whether it is a single-path, single-product conventional production process, or a multi-path, multi-product complex process, OMC BatchControl component can maximize your control performance.

The embedded encrypted recipe and database function prevent from information leakage. It also provides electronic signature function to make it easier for enterprises to do quality management and audit trail.

OMC BatchControl implements the control requirements for batch production defined by ISA-S88 standard. The control model is shown in the figure below.

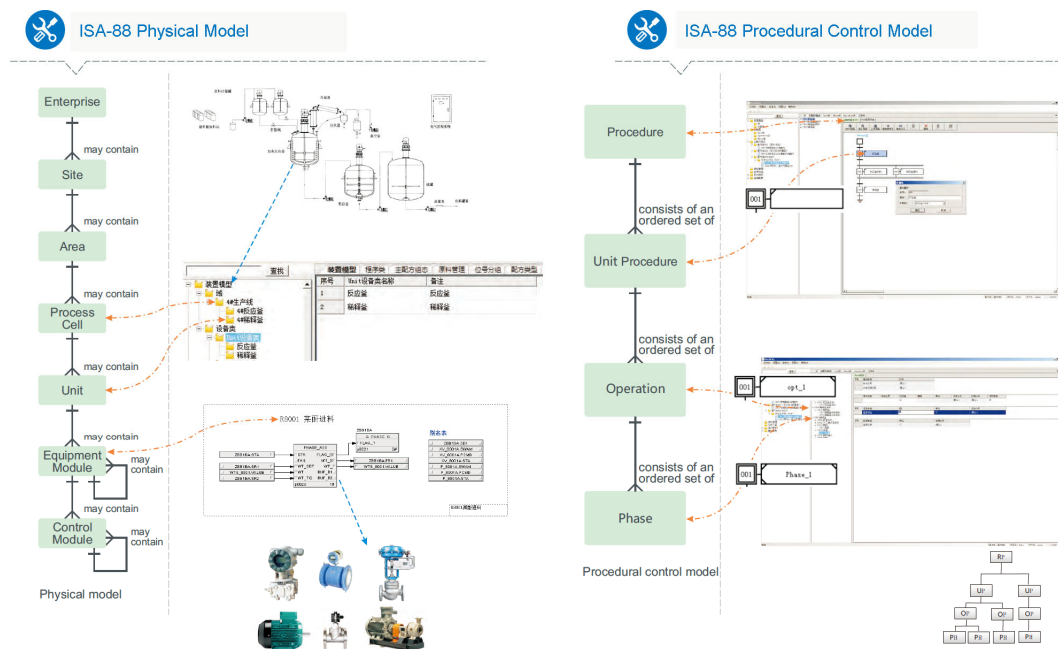


Figure 3-3 Batch control model

3.3 VisualAI

OMC VisualAI offers a visualized way for users to monitor important field equipment and plant. This component supports core functions such as video display (from mainstream surveillance manufacturers) and PTZ control. Real-time videos of the surveillance cameras can be accessed by the component and integrated into the system monitoring screen, as shown in the figure below. With the video analysis component, you can configure PTZ preset, video layout and display content, and formulate the patrolling path to realize the inspection of key locations and monitoring of abnormal events.

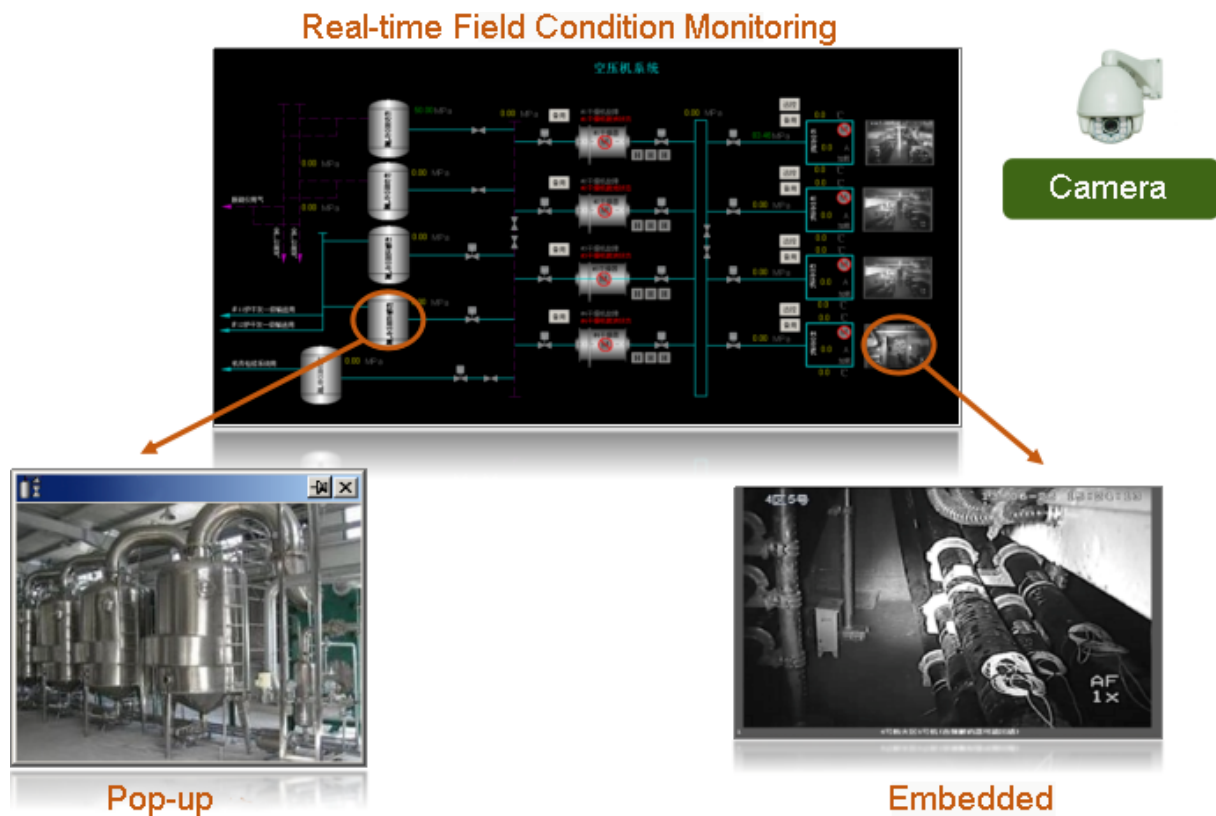


Figure 3-4 Example of integrated video monitoring

3.4 IDM

OMC Intelligent Device Management component (OMC IDM) is a device management and maintenance system for fieldbus intelligent instruments (HART, FF, DP/PA). It can centrally manage fieldbus instruments of DCS, SIS, PLC, and other heterogeneous systems. Utilizing the technology of DD/EDD and FDT/DTM, IDM provides functions including online configuration, troubleshooting, parameter monitoring and backup, and report generation. With IDM, you can easily realize a full life cycle management of intelligent field instruments.

Device Asset Management

OMC IDM can access various kinds of field instrument data through the communication drivers of control system or third-party heterogeneous systems, and synchronize the tag configuration of control systems with one click, thus providing asset management services for HART, FF and other fieldbus intelligent devices. The asset management interface is shown as the figure below. You can view instrument details, configure online parameters, perform real-time fault diagnosis and other operations.

The screenshot displays the 'Asset Device Management' interface. On the left, there is a sidebar with a 'Custom View' dropdown and a list of filters: 'Enable Device' (93), 'Spare Device' (4), 'Fault Alarm' (3), 'Configuration Conflict' (3), 'No DD file' (3), and 'test' (5). The main area is titled 'Enable Device' and shows a table of instruments. Above the table, there are status indicators: Error(1), Maintenance(2), Communication Error(74), and Normal(17). The table has columns for Status, Signal, ID Tag, Device Tag, Manufacturer, Device Model, Device Version, Protocol, and Identifier. The first few rows show instruments from Siemens and Endress+Hauser, while the rest are from Yokogawa.

Status	Signal	ID Tag	Device Tag	Manufacturer	Device Model	Device Version	Protocol	Identifier
✓	🟢	AI04140000	HJK123	Siemens	SIPART PS2	06	HART-07	002A2A37012093
✓	🟢	AI04140001	45926	Endress+Hauser	ITEMP TMTB2	03	HART-07	001111CCAE0459
✓	🟡	AI04140002	FS11023	SUPCON	CXT_CJT	01	HART-07	6010E0938A4387
✓	🟢	AO08080000	CHINA	Yokogawa	EJA	02	HART-05	37044F5DA2
✓	🟢	AO08080001	CHINA	Yokogawa	EJA	02	HART-05	37044F5DA2
✓	🟢	AO08080002	CHINA	Yokogawa	EJA	02	HART-05	37044F5DA2
✓	🟢	AO08080003	CHINA	Yokogawa	EJA	02	HART-05	37044F5DA2
✓	🟢	AO08080004	CHINA	Yokogawa	EJA	02	HART-05	37044F5DA2
✓	🟢	AO08080005	CHINA	Yokogawa	EJA	02	HART-05	37044F5DA2
✓	🟢	AO08080006	CHINA	Yokogawa	EJA	02	HART-05	37044F5DA2
✓	🟢	AO08080007	CHINA	Yokogawa	EJA	02	HART-05	37044F5DA2
✓	🟢	AO08080008	CHINA	Yokogawa	EJA	02	HART-05	37044F5DA2
✓	🟢	AO08080009	CHINA	Yokogawa	EJA	02	HART-05	37044F5DA2
✓	🟢	AO08080010	CHINA	Yokogawa	EJA	02	HART-05	37044F5DA2
✓	🟢	AO08080011	CHINA	Yokogawa	EJA	02	HART-05	37044F5DA2
✓	🟢	AO08080012	CHINA	Yokogawa	EJA	02	HART-05	37044F5DA2
✓	🟢	AO08080013	CHINA	Yokogawa	EJA	02	HART-05	37044F5DA2

Figure 3-5 Device asset management

Fault Alarm Monitoring and Diagnosis

OMC IDM provides fault alarm classification in accordance with NAMUR standards and supports customizing alarm levels and polling strategies. You can monitor fault alarm status of important field device tags in real time, and view them by alarm levels. Alarm shielding, and alarm acknowledgement are also provided.

The screenshot displays the 'Device Alarm Monitor' interface. It features a top navigation bar with tabs for 'Device Alarm Monitor', 'To-be-ACK Alarm', 'Health Report', 'Key Parameter Mon...', 'Alarm Config...', and 'Shelved Alarm'. The main area shows a table of alarms with columns for 'IDM Tag', 'Lastest Time', 'Alarm Level', 'Alarm detail', and 'Alarm Acknowledge'. A right-hand panel provides a detailed view of a selected alarm, including its ID, time, level, and description.

IDM Tag	Lastest Time	Alarm Level	Alarm detail	Alarm Acknowledge
AI00280017	2022-11-30 10:37:46.489	Maintenance	Non primary variable out of limits	Unconfirmed
AI00280017	2022-11-30 10:37:46.489	Maintenance	PV AO saturated	Unconfirmed
AI00280017	2022-11-30 10:37:46.489	Notice	PV AO fixed	Unconfirmed
AI00280002	2022-11-30 10:37:26.154	Maintenance	F283 Permanent mem.	Unconfirmed
AI00280002	2022-11-30 10:37:26.154	Maintenance	F982 Input signal	Unconfirmed
AI00280002	2022-11-30 10:37:26.154	Maintenance	S110 Working range T	Unconfirmed
AI00280002	2022-11-30 10:37:26.154	Maintenance	S841 Sensor range	Unconfirmed
AI00280002	2022-11-30 10:37:26.154	Maintenance	F283 Permanent mem.	Unconfirmed
AI00280002	2022-11-30 10:37:25.395	Notice	PV AO fixed	Unconfirmed
AI00280002	2022-11-30 10:37:25.395	Maintenance	PV AO saturated	Unconfirmed
AI00280002	2022-11-30 10:37:15.436	Maintenance	Non primary variable out of limits	Unconfirmed
AI04140001	2022-12-13 17:41:21.522	Maintenance	F041-Sensor broken-Sensor 1	Unconfirmed
AI04140001	2022-11-18 14:45:18.068	Fault	Device malfunctioning	Unconfirmed
AI04140002	2022-11-07 10:07:26.428	Maintenance	Primary variable out of limits	Unconfirmed

Summary: Total: 14 Item, Fault: 1 Item, Maintenance: 11 Item

Figure 3-6 Device fault alarm

3.5 SEMonitor

System Environmental Monitor (SEMonitor) collects data from environmental monitoring modules in field cabinets and monitors environmental parameters (temperature, humidity, corrosion level). A hierarchical monitoring view (plant - unit - cabinet room - cabinet - module) can be generated for users to access the feedbacks from hardware modules. SEMonitor offers a user-friendly interface where collected data, trends, alarms are presented, reducing inspection workload and improving production safety.

SEMonitor includes the following modules:

- Intelligent Temperature Control Module
- Temperature Control Module
- Power Supply Monitoring Module (24VDC)
- Power Supply Monitoring Module (220VAC)
- Temperature and Humidity Monitoring Module
- Corrosion Monitoring Module

3.6 Integrity

OMC Integrity digitalizes OT assets based on processes to establish the dynamic management details of your control system and centrally monitor the whole system. It can fast-detect asset operational risks, configuration error and illegal configuration changes. With that, you can quickly identify the issues and prevent the OT risks to manage your company in a safer way.

With OMC Integrity component, the following key functions can be achieved.

- The screenshot displays a comprehensive SIEM dashboard with multiple interactive views:

 - Asset Statistics:** A bar chart showing counts for various assets. A donut chart indicates the distribution of assets by status: 100% (100/100).
 - Defects:** A bar chart showing the number of defects for different categories.
 - Spores:** A bar chart showing the number of spores for different categories.
 - BSI_Metasploit (Plant Model):** A detailed view of the BSI_Metasploit asset, showing its typical logic and a baseline audit table.

Typical Logic: A diagram showing the flow of data and logic for the BSI_Metasploit asset, including components like 'BSI_Metasploit' and 'BSI_Metasploit'.

Baseline Audit: A table showing the audit results for the BSI_Metasploit asset.

Baseline Name	System	Collector	Baseline Date	System	Baseline Date	Collector	Baseline Date	Notes	Control	Operator
BSI_Metasploit-2023-05-15-134400	BSI_Metasploit	BSI_Metasploit	2023-05-15 13:44:00	BSI_Metasploit	2023-05-15 13:44:00	BSI_Metasploit	2023-05-15 13:44:00	No Status	BS	Compass with previous (Default)
BSI_Metasploit-2023-05-15-162511	BSI_Metasploit	BSI_Metasploit	2023-05-15 16:25:11	BSI_Metasploit	2023-05-15 16:25:11	BSI_Metasploit	2023-05-15 16:25:11	No Status	BS	Compass with previous (Default)
BSI_Metasploit-2023-05-15-164625	BSI_Metasploit	BSI_Metasploit	2023-05-15 16:46:25	BSI_Metasploit	2023-05-15 16:46:25	BSI_Metasploit	2023-05-15 16:46:25	No Status	BS	Compass with previous (Default)
BSI_Metasploit-2023-05-15-164512	BSI_Metasploit	BSI_Metasploit	2023-05-15 16:45:12	BSI_Metasploit	2023-05-15 16:45:12	BSI_Metasploit	2023-05-15 16:45:12	No Status	BS	Compass with previous (Default)
BSI_Metasploit-2023-05-15-122009	BSI_Metasploit	BSI_Metasploit	2023-05-15 12:20:09	BSI_Metasploit	2023-05-15 12:20:09	BSI_Metasploit	2023-05-15 12:20:09	No Status	BS	Compass with previous (Default)
BSI_Metasploit-2023-05-12-195206	BSI_Metasploit	BSI_Metasploit	2023-05-12 19:52:06	BSI_Metasploit	2023-05-12 19:52:06	BSI_Metasploit	2023-05-12 19:52:06	No Status	BS	Compass with previous (Default)
BSI_Metasploit-2023-05-12-163725	BSI_Metasploit	BSI_Metasploit	2023-05-12 16:37:25	BSI_Metasploit	2023-05-12 16:37:25	BSI_Metasploit	2023-05-12 16:37:25	No Status	BS	Compass with previous (Default)
BSI_Metasploit-2023-05-09-194637	BSI_Metasploit	BSI_Metasploit	2023-05-09 19:46:37	BSI_Metasploit	2023-05-09 19:46:37	BSI_Metasploit	2023-05-09 19:46:37	No Status	BS	Compass with previous (Default)
BSI_Metasploit-2023-05-05-170838	BSI_Metasploit	BSI_Metasploit	2023-05-05 17:08:38	BSI_Metasploit	2023-05-05 17:08:38	BSI_Metasploit	2023-05-05 17:08:38	No Status	BS	Compass with previous (Default)

3.7 PredictiveControl

OMC PredictiveControl component is used for production control. It integrates an independent real-time data read & write platform to achieve data communication and storage at second level, and provides a visual configuration interface to enhance implementation efficiency. The model predictive controller can receive optimized target values in real time or values given by device optimization to achieve smooth operation and limit optimization, saving operating costs and improving production capacity.

It integrates advanced system identification technology and robust model prediction technology to improve the control quality of complex industrial processes on the basis of conventional control and achieve smooth control and hierarchical, multi-objective coordinated optimization of processes with multiple variables, strong coupling, long time lag and constraints. The component has great performance in anti-interference, applicability, following control, helping our customers to achieve long-term optimal control and bring the best economic benefits to enterprises while ensuring the stability and safety of the system.

Its functional architecture is as follows.

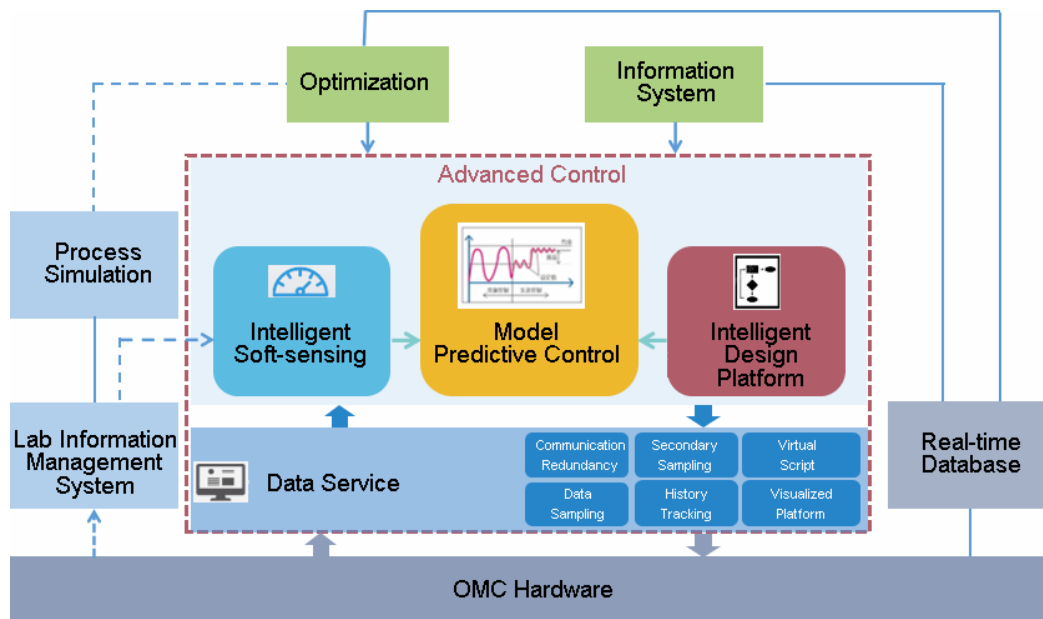


Figure 3-8 Functional architecture

3.8 LoopOptimization

OMC LoopOptimization component mainly includes loop real-time monitoring, control performance evaluation, intelligent diagnosis and analysis, and loop tuning optimization. It automatically calculates, evaluates and controls the loop performance using the daily operation data of the control loop, and provides engineers with fast and effective parameter tuning functions.

Loop tuning supports both offline and online modes, which can make full use of production process data to calculate the initial parameters of PID loops and greatly improve application efficiency. For key control loops, it provides pre-tuning mode supported by expert experience pool and interactive tuning mode to assist technicians in testing and tuning, as well as realizes real-time interaction to reduce the technical requirements of tuning.

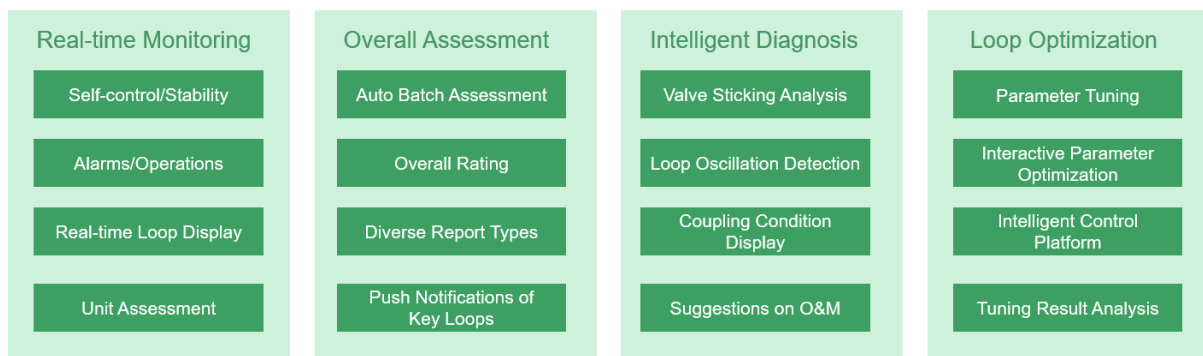


Figure 3-9 Loop tuning function

The main interface of loop tuning is shown in the figure below.

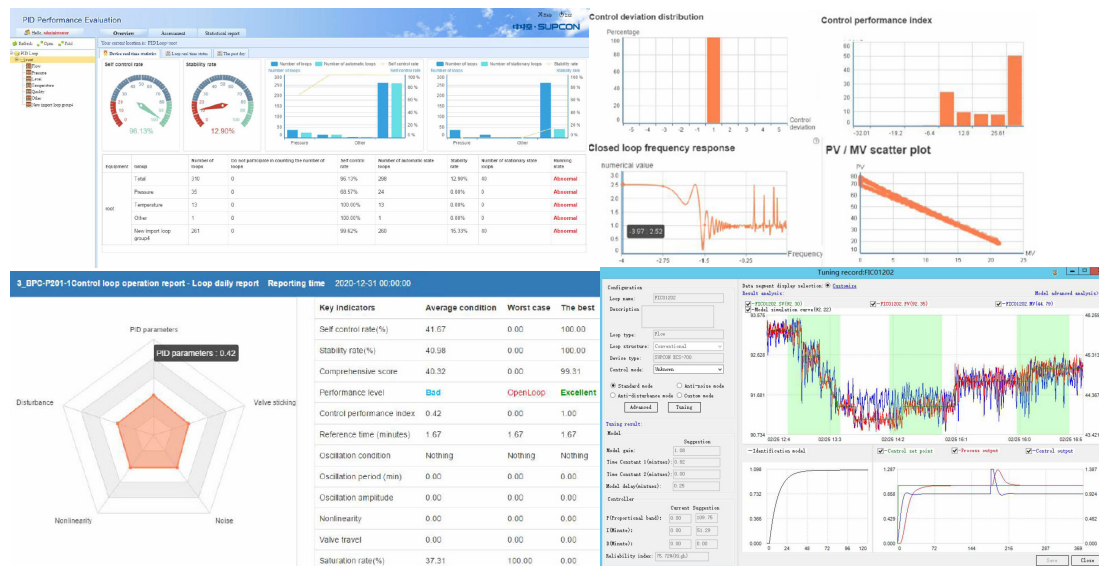


Figure 3-10 Main interface

3.9 Pilot

OMC Pilot component replaces the complex manual SOP with visualized and modularized automatic procedures, reducing requirements for operators. Through OMC Pilot, field operation experiences of operators are compiled into an operation standard in the form of graphics. The standard will be continuously optimized by combining field operation experiences, thus creating an efficient and stable cycle for continual improvement of efficiency and quality.

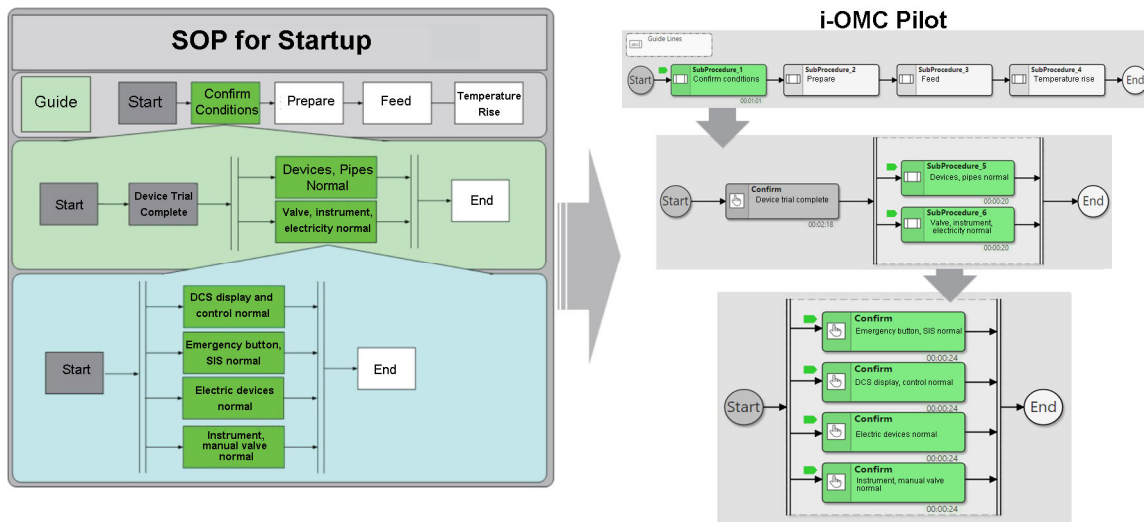


Figure 3-11 Convert standard process into automated programs

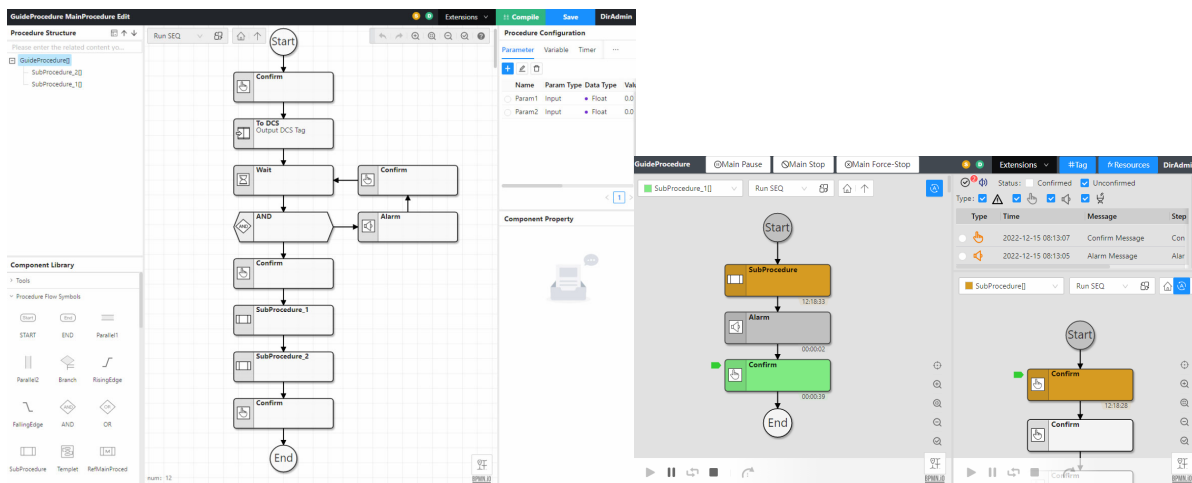


Figure 3-12 Configuration and operation interface

3.10 Alarm Management

In actual production process, a complex environment can cause numerous alarms, among which only some important alarms can affect the field production. Excessive alarms can cause interference for operators to identify important alarms and affect the speed of problem solving.

OMC AlarmManagement component can allow users to centrally manage the on-site alarms and view statistics of these alarms. With its embedded functions, operators are able to quickly locate important alarms, and effectively handle them according to their priority, so as to prevent production risks before they occur.

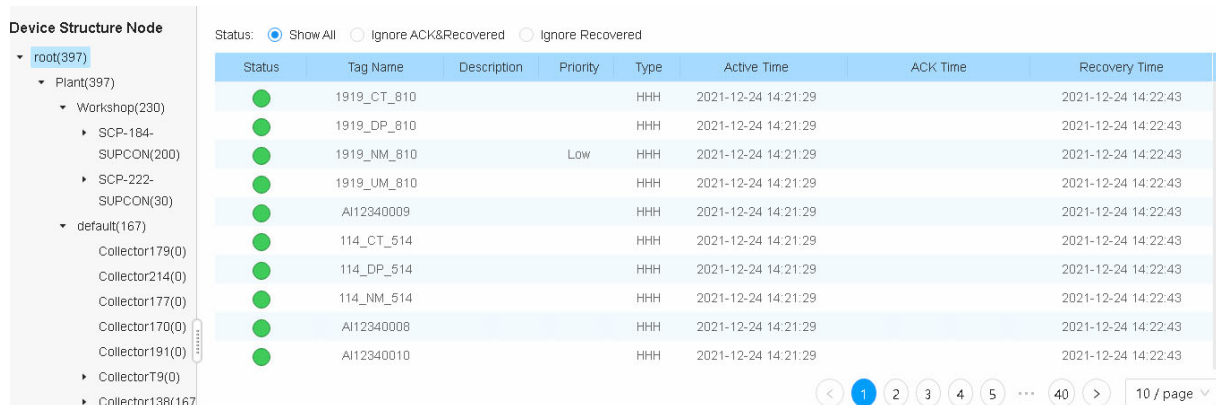


Figure 3-13 Real-time monitoring: alarm screen

This component can generate statistics for selected alarm tags and alarms conforming to customized rules, and display data in charts. You can also log in to the web client to view the statistics.

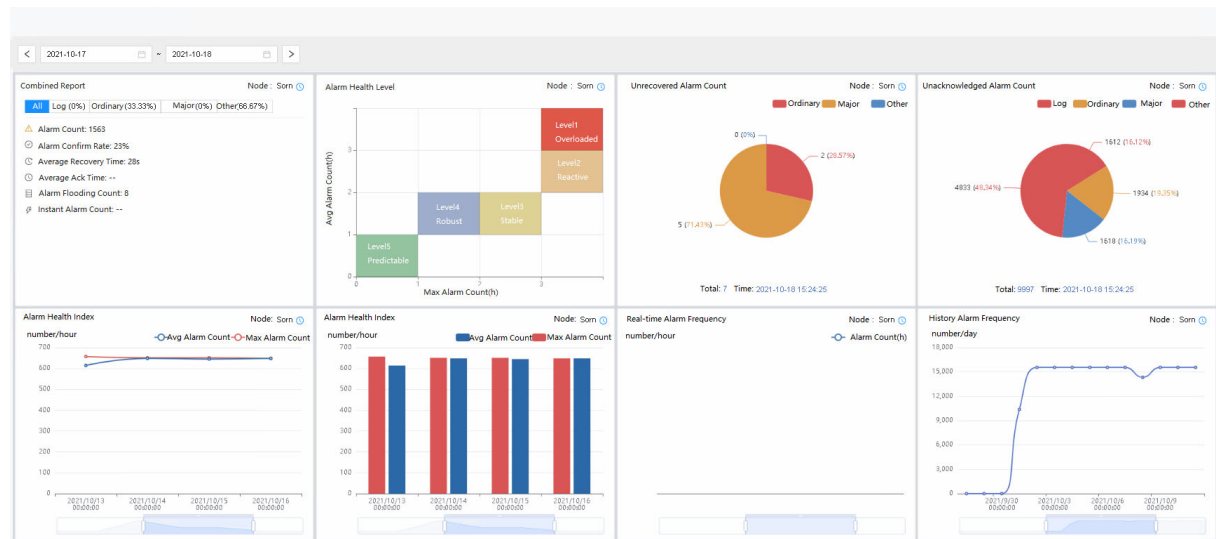


Figure 3-14 Dashboard page

3.11 GrayScreen

"Gray Screen" is a concept for production control and management. In "Gray Screen" mode,

monitors that shows a gray screen is considered as normal and requires no operations. Activated monitors require operators to deal with the emergencies. It highly automates the operation of units and help operators precisely control the processes.

Its key functions are:

- Reduces operators' workload.
- Improves emergency handling efficiency with the alarm linkage function.
- Offers statistical reports for plant management.

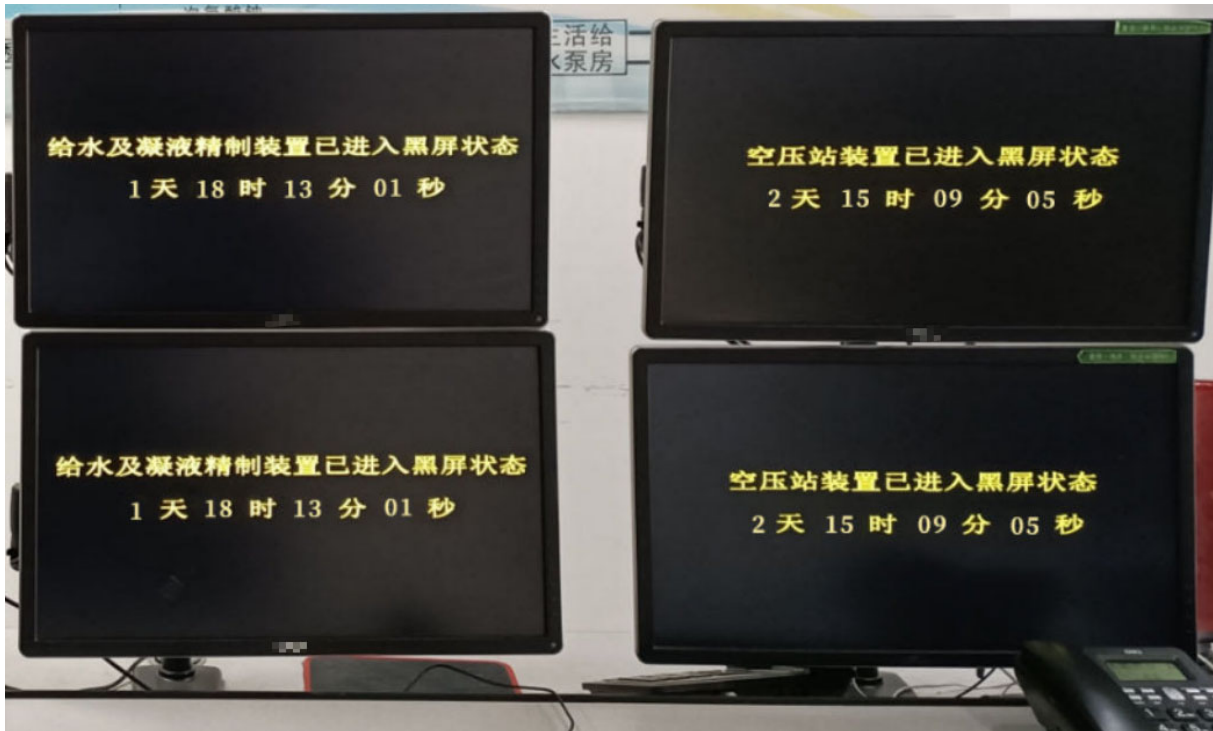


Figure 3-15 Monitors in gray screen mode

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