CLOUD BASED *IIoT*

ISAAC

ENGINEERING
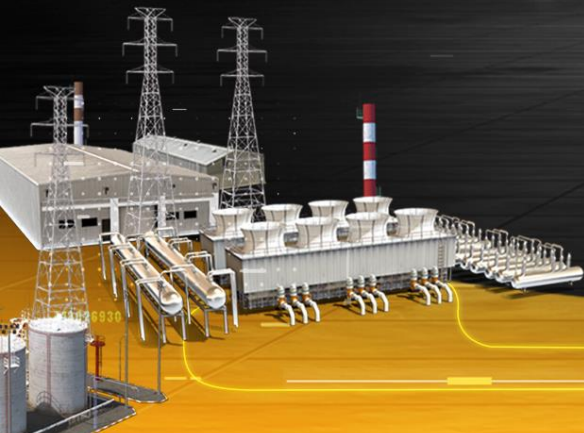
Welcome to

ISAAC Engineering

For Digital Transformation

Company	President	Tax ID	Web page
ISAAC Engineering	C.S.KIM B.S.KIM	113-86-10021	www.isaac-eng.com

Subsidiary

ISAAC E&I ISAAC PDS

Location

Gunpo(HQ)

1 Hwaseong
2 Icheon
3 Cheongju
4 Gwangyang

Overseas
China Wixi

Business

System Engineering	Electric parts	Control Measuring Equipment	Computer Programming	Electricity & Control System Construction	System Integration Management	System Software Development & Supply	Control Panel Manufacturing

Organization

Organization for
optimized solution for Digital Transformation

President

B.O.D

Audit

Smart Factory	Digital Factory	IoT Platform	R&D Center

Management	Sales	Technology	Manufacturing
Finance	Sales 1	Develop-ment	Production
Accounting	Sales 2	Design	Service
HR	Marketing		Q.C
Purchasing			

Employee

Total **125**

Engineer **75**%

ISAAC's Success Story

Jumping

2019	07	Partner agreement with Software AG
	11	Partner agreement with OsIsoft(AVEVA)
2020	06	Distributor contract with Carrier Korea System
	08	Partner agreement with Hawe Korea
	08	MOU with KEPCO KEPRI
	09	Partner agreement with Siement Large Drive
	12	MOU with IGI Korea
2021	04	Listed on the KOSDAQ market
2022	01	Partner agreement with NOZOMI

Growth

2014	01	Established ISAAC E&I
2017	06	Main-Biz
	11	Smart Factory Business Start
2018	05	Moved to new building in Gunpo
	05	Opened Big Data AI R&D center
	10	ISO 14001
	11	Established ISAAC PDS
2019	07	Capital increase

Foundation

2007	01	Established
2008	11	Established manufacturing plant
	08	Siemens Solution Partner contract
	11	Established R&D center
2009	02	Capital increase
2011	04	ISO 9001
2012	01	Acquired Electric construction Business Certification

Revenue

(Unit :B KRW)

	2017	2018	2019	2020	2021
	27.0	40.3	33.2	44.4	42.8

Business field

ISAAC

SMART FACTORY

Solution for plant lifecycle

- ❶ Design
- ❷ Construction
- ❸ Operation
- ❹ Maintenance
- ❺ Revamping
- ❻ Upgrade

OT	Operational Technology

PLC	Motor, Drive	Plant Electrical Instrumentation, Engineering
DCS		
SCADA	Sensors	Manufacturing

+

융합
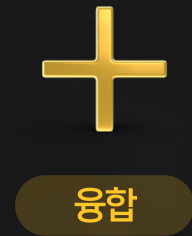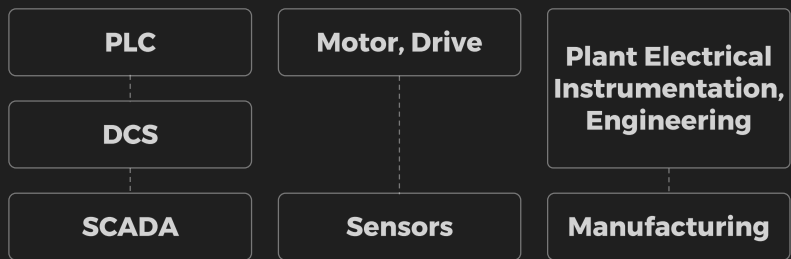
IT	Information Technology

Big Data	PLM Digital Manufacturing 3D CAD 3D Visualization RTDB OT Security
Cloud Based IoT	
Digital Twin	
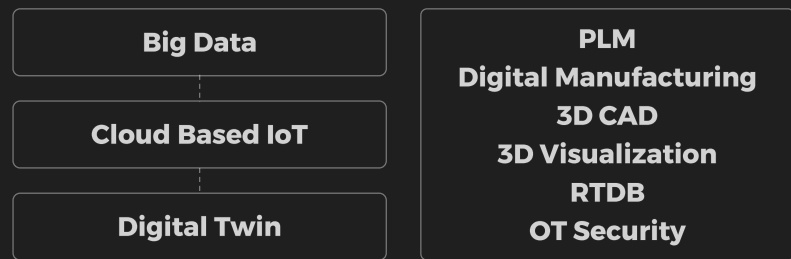
Business Field

Supply of reliable **smart factory solutions** based on industry-specific process know-how and advanced engineering capabilities.

Automation

01	Semiconductor plant
02	Steel Plant
03	HVAC
04	Storage Battery for EV

Smart Energy

01	PDS
02	Energy Storage System

Digital Factory

01	PLM	04	Digital Manufacturing
02	3D CAD	05	3D Visualization
03	Digital Twin	06	RTDB

IoT Platform

01	IoT Platform
02	AI Analytic Platform
03	OT Security

Automation

1 Semiconductor

2 Steel

3 HVAC

4 Storage Battery

Semiconductor Plant

Supply of **Control system** to important facilities
for semiconductor processing such as **HVAC, GAS and UPW**

▶▶ Scope of supply

HVAC Solution	PGMS/ TGMS	Bulk Gas Control Solution
– Redundant system – Stabilized automatic process	– Numerous data monitoring – Flexible monitoring for equipment replacement	Shutdown System for H2, N2 supply

▶▶ Technology

System
· Real-time monitoring

· Automatic update

· DB connection to integrated monitoring equipment

Benefits
· Fast and accurate design

· Improvement of user friendly

· Flexibility of system

· Cost reduction

Reference SK hynix HVAC, BULK GAS, PGMS, TGMS, CCSS, UPW ✔ **Main solution** PLC | HMI | Network

Steel Plant

Supply of **Control system** to Sinter machine, Steel making plant,
Continuous casting machine, Hot rolling mill, Rolling mill and Cold rolling mill

" **Increase efficiency and productivity** "

Technology, Know-how and accumulated steel projects

01 **Design** — 02 **Manufacturing** — 03 **Commiss -ioning** — 04 **Service**
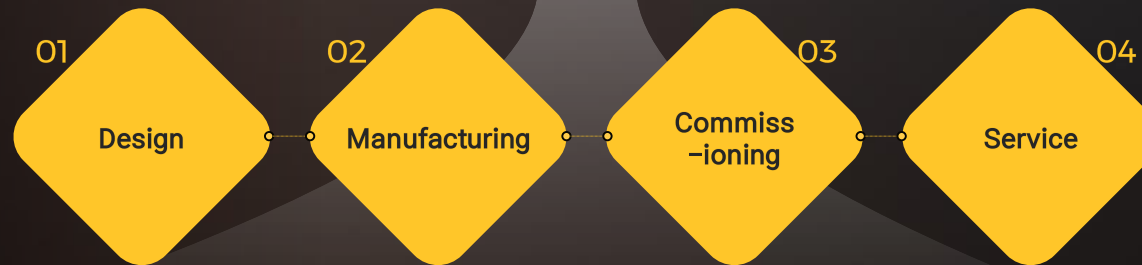
Automation + Control system + Drive technology + Industrial software

Reference   HYUNDAI STEEL   posco   DK 동국제강   SeAH   KG 동부제철   ✓ Main solution

| DCS | PLC | HMI | SCADA |
| Motor | Drive | Analyzer |

HVAC

Supply of Refrigeration, Equipment and Control system
in field of commercial building(Office, Hotel, Hospital) and
Industry(Oil & Gas, Refinery, Petrochemical, and Power plant)

" HVAC "
↑
Air conditioning system

Temperature | Humidity

Air current | Cleanliness

Turbo Chiller ———— Screw Chiller

Absorption Chiller ———— Air Handling Unit

ISAAC Carrier
Carrier
Distributor

Rooftop Unit ——— Fan Coil Unit

Constant Temp. & humidity Unit ———— Cooling Tower

Reference
SK hynix | saudi aramco | GENETOX | S | PETRONAS | PEMEX | JW MARRIOTT
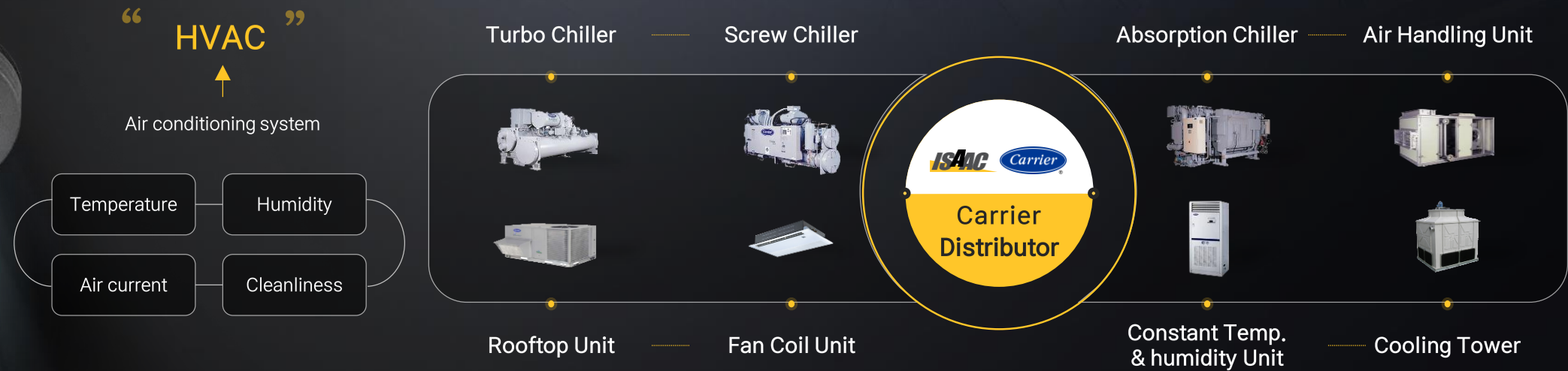
✓ Main solution

| HVAC Equipment | INSTRUMENT |
| PLC | HMI | SCADA |

Storage battery

Supply of **Control system applied European Standards (PackML)**
to Storage battery manufacturing facilities and utility for Evs
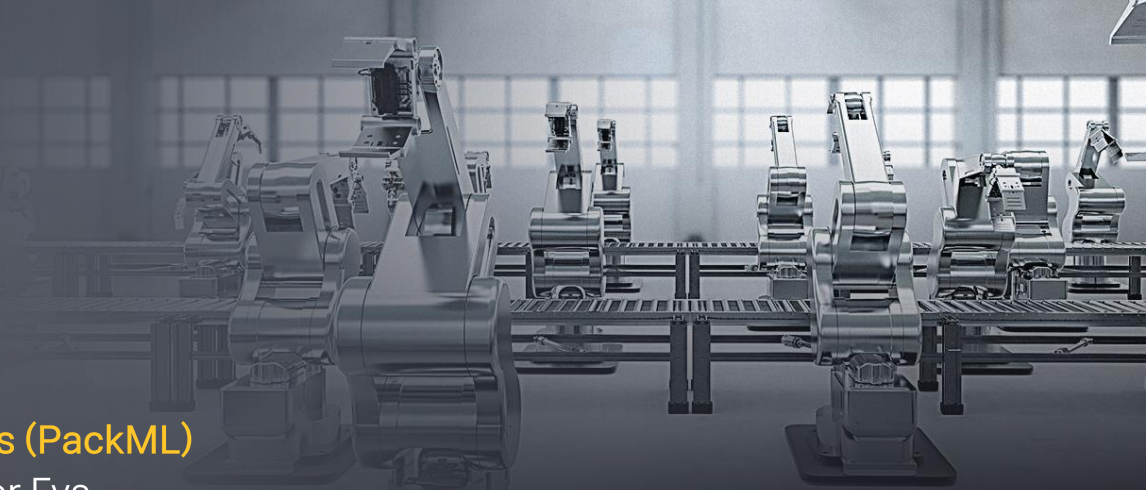
01
Electrode

02
Assembly

03
Formation

04
Logistic

05
Others
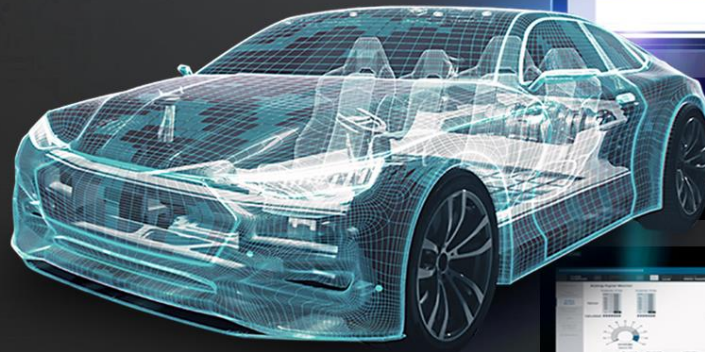
Scope of supply

· PLC, Motor, Servo & Drive
· PLC, Drive control program development
· ePLAN P8 instrument design and Panel manufacturing
· Equipment Set-up
· Site Commissioning

Solution

· SIEMENS Technology & Fail Safe CPU for Motion Control (S7-1500TF) with TIA Portal

· SIEMENS Servo Motor & Drive (S210), Induction Motor & Drive (G120)

· SIEMENS HMI (TP & IPC)

Reference   🇺🇸 🇪🇺 Battery manufacturer   SK innovatio America Georgia Phase 2 UMS   ✔ Main Solution   PLC   HMI

Drive   SERVO

Smart Energy

1

PDS

2

ESS

PDS

High voltage electrical equipment **P**revention **D**iagnostic **S**olution
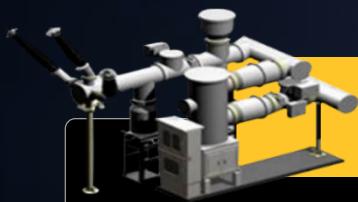
GIS preventive Diagnostic solution

Sensor

· Background noise

· GIS externally mounted UHF

· SF6 Gas monitoring

Solution

· Partial discharge diagnosis
· CB condition diagnosis

· Contact breaker contact condition diagnosis

· Arc condition diagnosis

· Gas analysis diagnosis
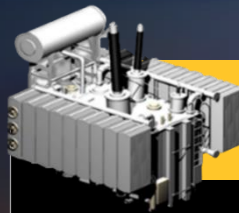
Transformer prevention diagnostic solution

Sensor

· Window type UHF

· Drain valve type UHF

· HFCT   · AE

· Ground current
· Photoacoustic spectrum diagnosis device
· Gas chromatogram diagnosis device

Solution

· Partial discharge diagnosis
· Ground current diagnosis

· Gas analysis diagnosis

· Bushing condition diagnosis

Panel/Cable prevention diagnostic solution

Sensor

· HFCT

· TEV

· AE

· Thermal imaging camera

Solution

· Cable partial diagnosis

· Partial discharge diagnosis

· Temperature condition analysis diagnosis

Smart Energy

Energy Storage System

Saving of excess electricity in batteries
and **supply of the saved Energy** when necessary
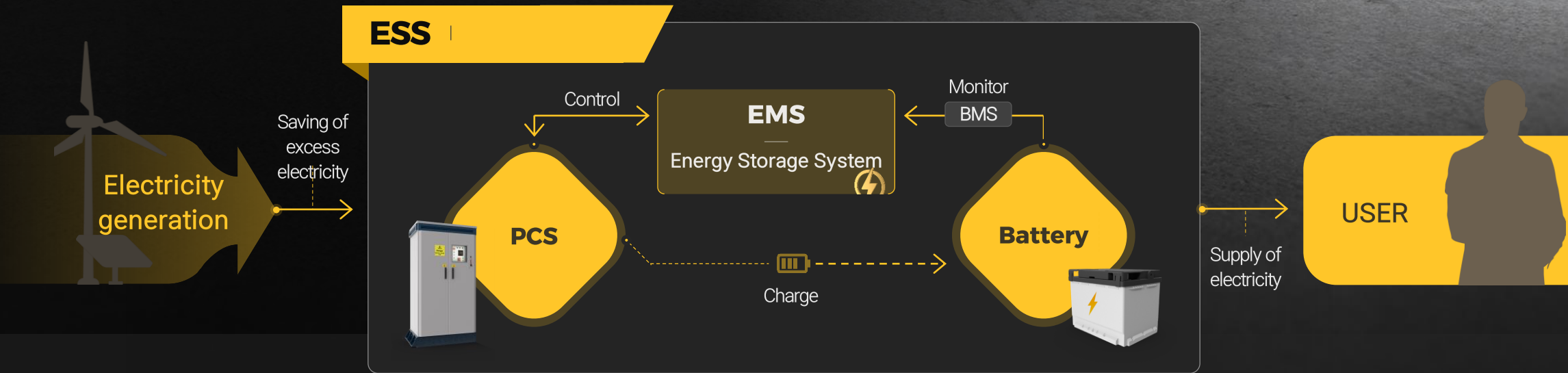
ESS
Energy Storage System

LOTTE CHEMICAL

ESS

Control

EMS
—
Energy Storage System

Monitor
BMS

Electricity generation

Saving of excess electricity

PCS

Charge

Battery

Supply of electricity

USER

Digital Factory

1. PLM
2. 3D CAD
3. Digital Manufacturing
4. 3D Visualization
5. RTDB

PLM

With Teamcenter solution,
supply of Product Life cycle Management

Technical Document

Product information
input/output

– Integrated document management

Product structure

Various version of product

– Effective categorization

Integrated Design

Development status monitoring

– Integrated management based
on standardized system

PLM
Product Lifecycle
Management

Workflow

Schedule, Management, Process
By person in charge

– Efficient Scheduling and
management

BOM

Design Data,
Product structure history

– Integrated management with
BOM module

Product Quality

Issue and requirement
management

– Quality management

Benefits

01
Business

· Increase profits
· Expand market share
· Shorten time to Market

02
Product
Development

· Quality development
· Shorten development time

03
Efficiency

· Information management
· Improve efficiency

3D CAD

With NX Open API customization,
Improvement of design quality and product development speed
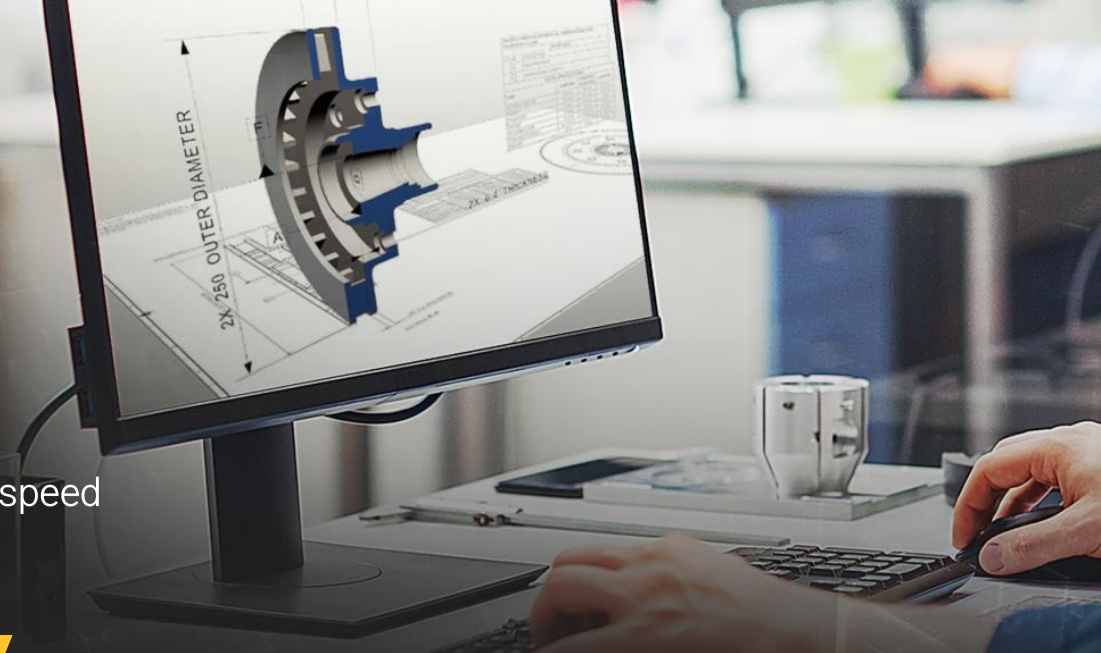
Customization with NX

Design Standardization

· Model standardization
· Shape standardization
· Design standardization
· Specification standardization
· Parts/element library construction

Design Modularization

· Standard shape automation
· Assembled parts automatic placement
· Customized program

Drawing Automation

Design Automation

· 3D model automatic production/edit
· Automatic update
· Design model simulation

Drawing Automation

· 2D drawing automatic production
· 3D PMI production
· Document & Drawing connection
· Print and distribution

Application System

· PLM/ERP connection
· Integrated system according to each product

NX Open API Customization

Benefits

01 Minimize production errors

02 Shorten designing time

03 Data management

04 Avoid human errors

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Digital Manufacturing

With Tecnomatix,
Simulation and commissioning in digital environment

Digital Manufacturing · · ·

Verification of products

Layout Planning
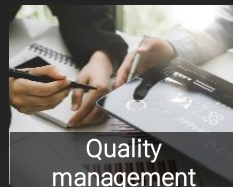
Quality management

Production process design

Operator analysis

Factory logistics
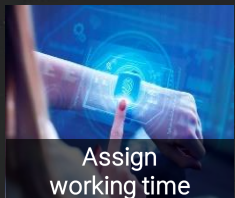
Assign working time

PLC & Robotics

Production management

Manufacturing Process Modeling

Simulation and analysis of the system

Visualization of the model

Benefits

01 Time · Cost Saving

02 Sustainable profitability

03 Improvement of Assembly quality

04 Improvement of productivity

05 Logistic · Space Utilization

06 Improvement of work environment

07 Increase of maintenance efficiency

08 Construction of information Hub

3D Visualization

Integrated information of Legacy System
and provision of **3D Visualization system** for engineers

3D Visualization

" **Legacy System** "

Integrated information

Search

Improvement of efficiency
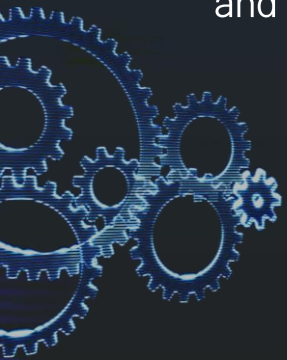
Design information

Schedule information

Construction information

Production information

Application (3D system)

1 Verifying works

2 Schedule management

3 Quantity management

Report

Verification

Checking related information

· 2D drawing
· 3D shape
· Drawing of Installation and production

· Material status
· Material list
· Schedule
· Work order
· Production information

Verifying production and operation

· 3D interference
· Assembly sequence
· BOM

· Schedule
· Quantity
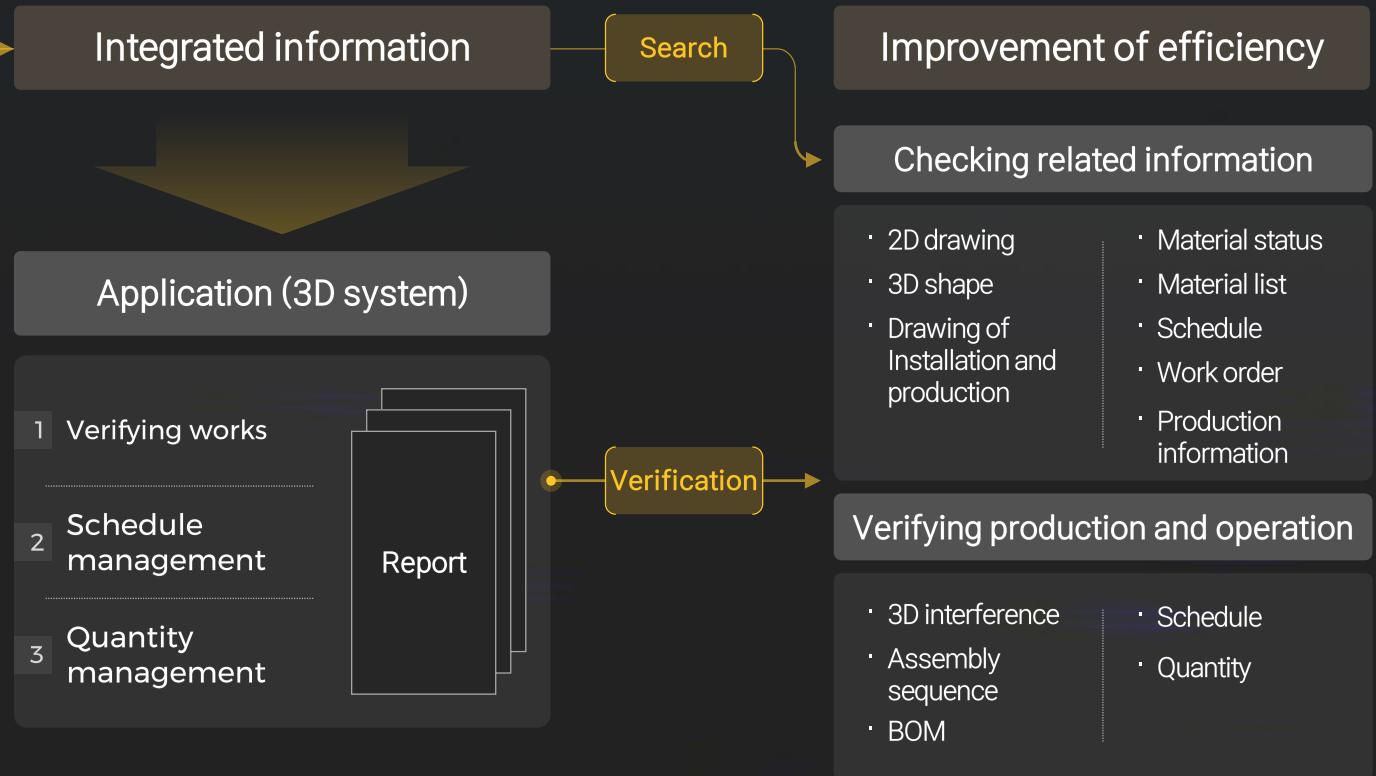
Digital Factory

Digital Twin

With OnTwins, **supply of** web–based integrated control monitoring solution

OnTwins

Digital Twin Control Monitoring

Digital Twin Platform

1	Transparency	2	Visibility	3	Reliability

Connection of field data in real time	Intuitive understanding of situations	Real-time monitoring of key KPI	Fast decision-making system
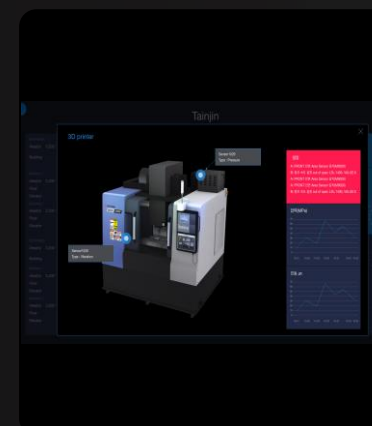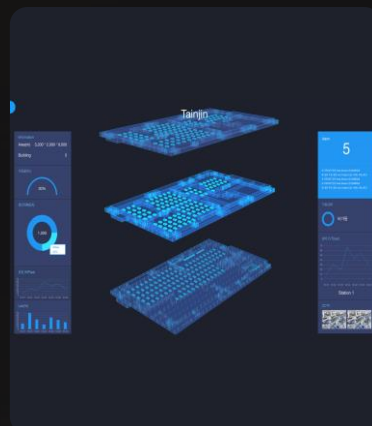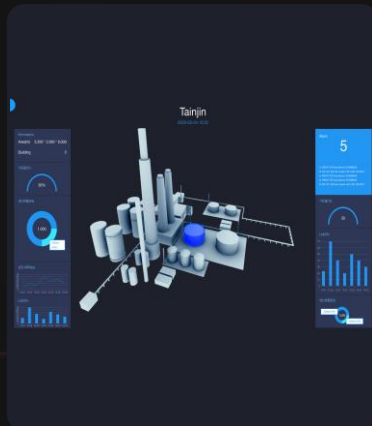
Digital Factory
RTDB

With PI System solution,
collection, saving and management of plant information data in real time

RTDB System

OSIsoft® ❯ PI System solution

Process control			PI Server		PL Vision
IoT Gateway	EDS				PI Datalink
Remote assets			OCS		Analytics
					ML

IoT Platform

1 IoT Platform

2 AI Analytic Platform

3 OT Security

IoT Platform

IoT Platform

With Ultivis solution,
management of business risk, increase of productivity and decrease of operating cost

Ultivis → Device connection · Management · Control · Prediction · analysis

1 Data acquisition

Sensor device

2 Real time monitoring

Production	Safety
Quality	Energy
Asset	

3 Data analysis

Smart dashboard

Data analysis

System diagnosis

4 AI

Deep learning

Machine learning

Automatic Machine learning

AI Analytic Platform

With Ultivis Solution,
easily monitoring, analysis and prediction by field engineers

AI Solution

01 Monitoring

Abnormal pattern recognition

Real time monitoring

Notification before abnormal situation

02 Analysis

Historian data indexing

Abnormal pattern recognition

Filtering Similarity search

03 Prediction

Model Free Prediction mode

Abnormal process prediction

Early warning before abnormal situation

" Benefits "

Improvement of Work efficiency

Improvement of Productivity

Reduction of Operating cost

Decrease of Downtime

OT Security

Detection of cyber threat and abnormal symptoms via network visualization and **monitoring** in OT and IoT environment

OT Security Solution

| SaaS | **Vantage** |
Software as a Service (SaaS)

| On-Promise SW | **Central Management Console** |

| Appliance | **Guardian** |

Nozomi Networks Analytics

Subscriptions

Asset Intelligence

Threat Intelligence

Add-Ons

Smart Polling

Remote Collector

Points

01 OT network visualization

02 Recognition of Protocol

03 Hybrid threat detection

04 Detection of abnormal symptoms(AI & ML)

05 Comparison of network changes

06 Flexible Query

07 Efficiency of maintenance traffic

08 Automated weak point assessment

Smart Manufacturing

1 Design

2 Manufacturing

Design

With ePLAN solutions,
improvement of design, Process and Manufacturing

Standardization of electrical design and document automation	3D modeling virtualization	Design automation (Modularization)	ePLAN smart wiring

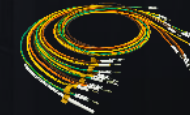| Higher quality than international standards	Electrical design automation program	Interference check & Automatic length and path calculation	Excel–based electrical & pneumatic engineering drawing automation	Panel wiring design visualization program
ePLAN electric P8	**EEC-ONE**	**ePLAN pro panel**	**ePLAN engineering configuration One**	
EPLAN Electric P8	EEC-ONE	EPLAN Pro-Panel	EPLAN engineering configuration One	EPLAN Smart Wiring

· Macro

· Creation of standard Engineering data and circuit diagram

· Verification errors via virtual simulation

· Panel design and 2D&3D Engineering design

· 3D Control cabinet layout

· Virtual prototyping in form of 3D assembly

· Connection of configuration process

· Automatic creation of engineering documents

· Automatic integration of engineering process

· Visualization of all steps of panel wiring

· Process interworking from design to manufacturing

Design competitiveness

Higher quality than international standards

EPLAN DT Platform

· Automatic wire harness

· Saving of lead time

· Improvement of design and production process

XOR 회로

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Smart Manufacturing

Manufacturing

Mass production in a short time,
and **stable quality control system**

Capability

· Human assets with rich experience of accumulated projects
· Circuit diagram of PLC, power supply and communication
· BOM Management
· ERP system for Material procurement
· Simulation of instrument arrangement
· Compliance with a delivery date

Productivity

· Mass production in a short time
· Block-type and parallel-module production line
· Automatic facilities to save production time
· Time saving with simultaneous and multiple process

01 Competitive production cost

02 Reduction of production cost

Improvement of cost and quality

04 Stable quality control system

03 Consistent product quality

Reference | SK hynix | SK Hynix M Projects | posco | HYUNDAI STEEL

ISAAC ENGINEERING

THANK
YOU