Fuji Electric

Innovating Energy Technology

Plant Monitoring & Control System (PMCS)

MICREX-VieW XX

Monitoring and Control System Achieving Stable and Safe Plant Operation

MICREX-VieW XX

MICREX-VieW XX is a monitoring and control system based on the technologies developed for Fuji Electric's plant monitoring and control system MICREX Series, with further advanced visibility, operability, and reliability. It can be applied to plants in various fields.
When introduced, this system provides excellent visibility, operability, high reliability and best solutions and contributes to energy saving and stable/safe operation of plants After the introduction, it will continue to evolve as well as provide best life cycle solutions.
Furthermore, the system can inherit much from the conventional MICREX Series. You can use the existing assets effectively during system updating process and switch over to a more reliable system in shorter time at lower cost.

MICREX-VieW XX

Visual Industry & Eco World

Contribution to stable and safe plant operation and global environment protection
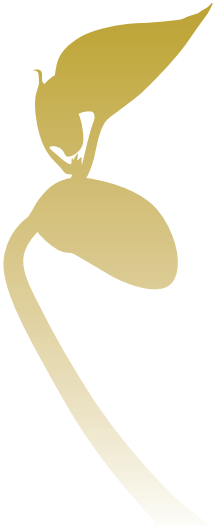
- Excellent visibility and operability
- Integrating electrical machinery control and measurement control
- High reliability
- Efficient engineering
- High inheritability

MICREX-VieW XX System Configuration

MICREX-VieW XX allows scalable system building according to customer needs, from a compact system of single configuration to a high-reliability system with complete system redundancy. The lineup also includes an all-in-one station that works as an operator and database by itself, intended for a compact system.

Moreover, this product can inherit much from conventional MICREX Series, allowing easy monitoring/operating of the existing control station from the new operator station as well as data coordination between new and old control stations.
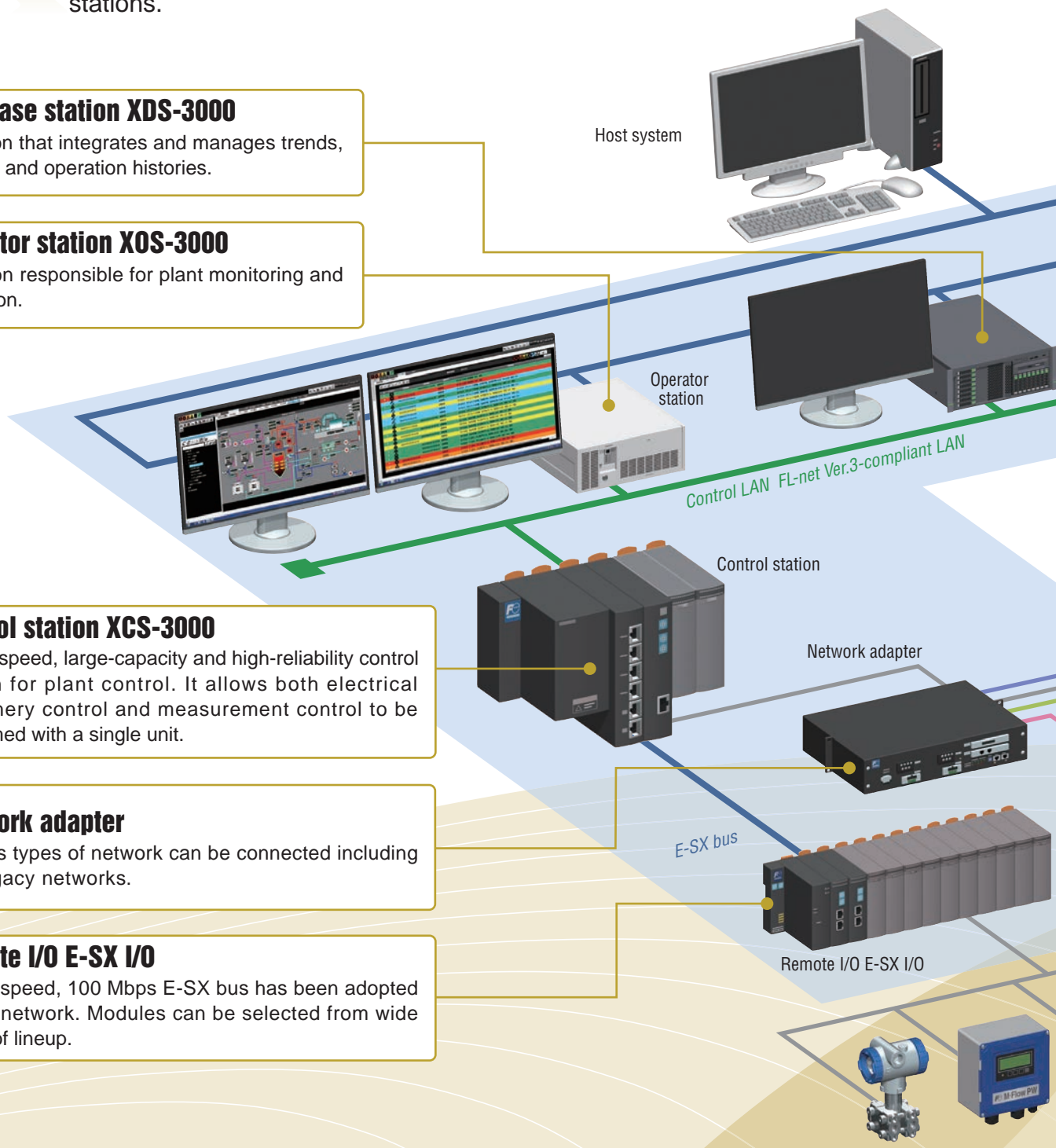
Database station XDS-3000

A station that integrates and manages trends, alarms, and operation histories.
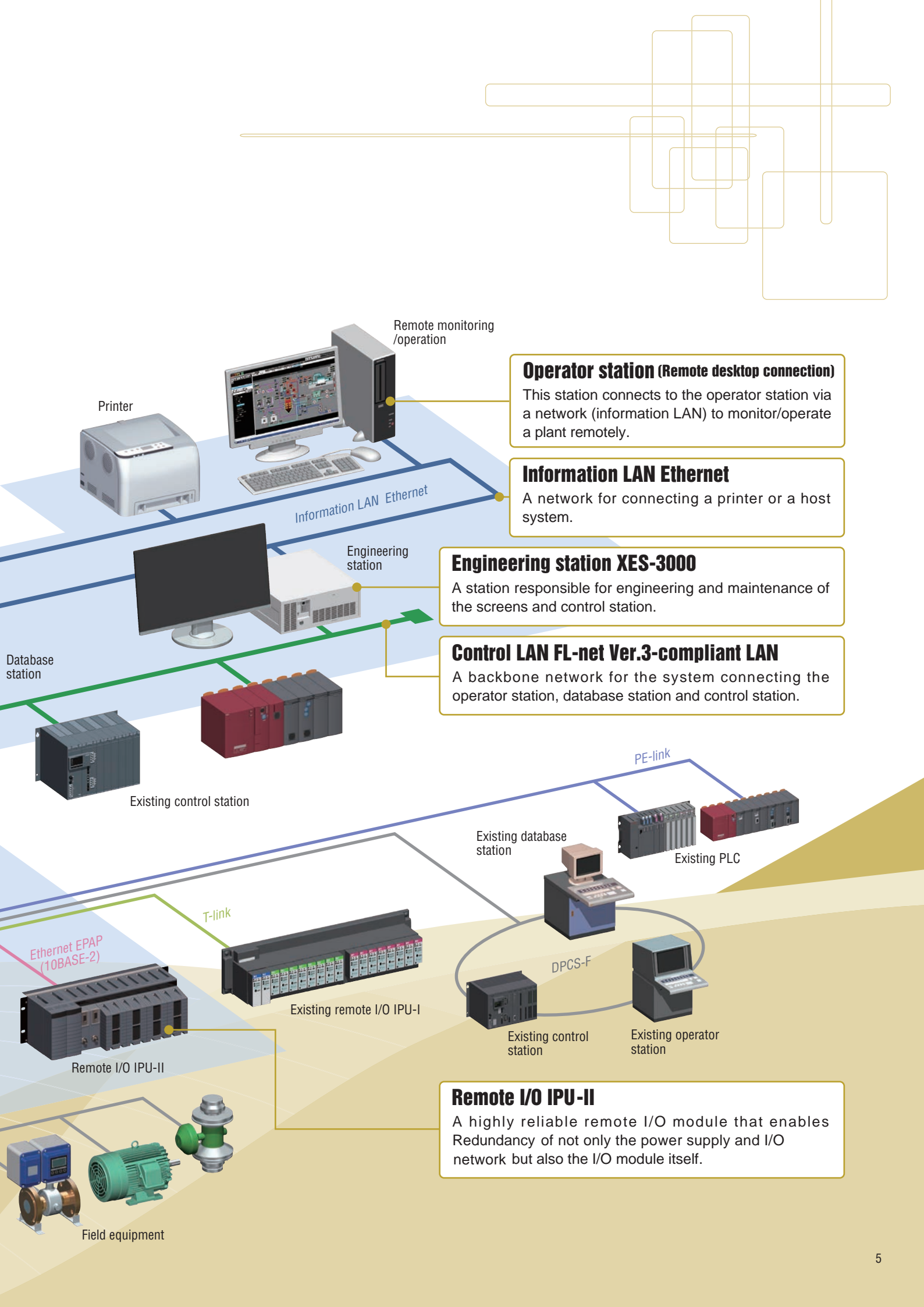
Operator station XOS-3000

A station responsible for plant monitoring and operation.

Control station XCS-3000

A high-speed, large-capacity and high-reliability control station for plant control. It allows both electrical machinery control and measurement control to be performed with a single unit.

Network adapter

Various types of network can be connected including our legacy networks.

Remote I/O E-SX I/O

A high-speed, 100 Mbps E-SX bus has been adopted for I/O network. Modules can be selected from wide range of lineup.

Host system

Operator station

Control LAN FL-net Ver.3-compliant LAN

Control station

Network adapter

E-SX bus

Remote I/O E-SX I/O

Remote monitoring
/operation

Printer

Operator station (Remote desktop connection)
This station connects to the operator station via a network (information LAN) to monitor/operate a plant remotely.

Information LAN Ethernet

Information LAN Ethernet
A network for connecting a printer or a host system.

Engineering
station

Engineering station XES-3000
A station responsible for engineering and maintenance of the screens and control station.

Database
station

Control LAN FL-net Ver.3-compliant LAN
A backbone network for the system connecting the operator station, database station and control station.

Existing control station

PE-link

Existing database
station

Existing PLC

T-link

Ethernet EPAP
(10BASE-2)

DPCS-F

Existing remote I/O IPU-I

Remote I/O IPU-II

Existing control
station

Existing operator
station

Remote I/O IPU-II
A highly reliable remote I/O module that enables Redundancy of not only the power supply and I/O network but also the I/O module itself.

Field equipment

Monitoring/operation functions

Excellent visibility and operability

The operator station has achieved excellent visibility and operability through the adoption of Fuji Electric's original multi-window platform*1.

*1: Middleware providing screen functions such as multi-window and multi-display. On the multi-window platform, screen applications can be operated individually, and screen functions can be added, updated and deleted easily.

Excellent visibility

The screen supports full HD display (1,920 x 1,080) and up to four display units can be connected per operator station. The screen uses basic colors based on the color universal design to prevent false recognition and easy-to-identify icons, which ensures excellent visibility.

Cooperation with Windows® applications

Microsoft Office®, Adobe Reader® and other Windows® applications can be started from the operation screen. You can analyze data while monitoring/operating a plant.

Quick troubleshooting

The integrated history screen that merges alarm and operation histories provides various sort and search functions to allow quick analysis of problem factors.
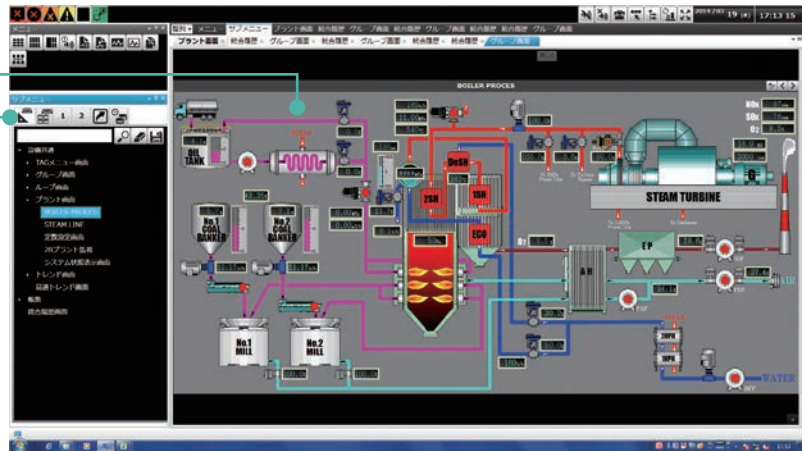
Open interface

The database station includes the OPC-UA interface as standard, which allows easy cooperation with other systems.

Integrated history screen
(Integrated and individual displays selectable)

High security

You can set user privileges or grouping to prevent erroneous operation or system tampering. Installing antivirus software*2 onto the operator station or database station prevents the system from the threat of viruses.

Global support

The operator station is a global system supporting multiple languages.

*2: Antivirus software is designated by Fuji Electric. A whitelisting method has been adopted to control the starting of applications based on a list registering only applications allowed for activation.

Excellent operability

Up to eight operation screens can be displayed as windows or tabs. The size and layout of the display can be changed as desired. The layout of the instrument diagrams on the group screen can also be changed as desired, so that operators can use their suitable layout for operation. Moreover, the trend screen allows enlarging/reducing the point of interest with easy mouse operation, offering excellent operability.
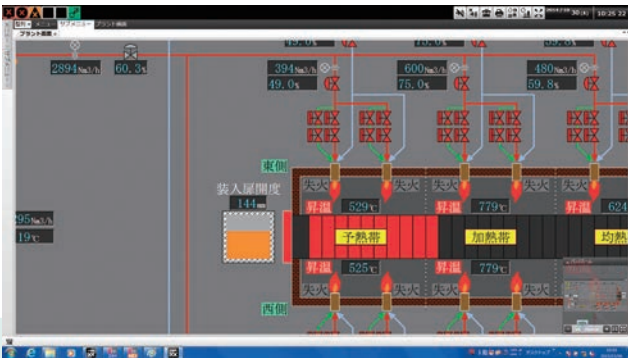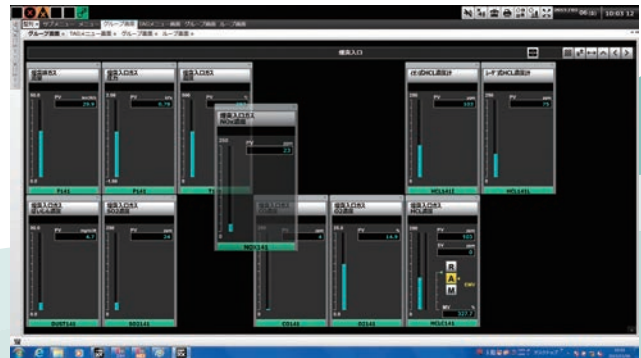
● **Multi-window display**
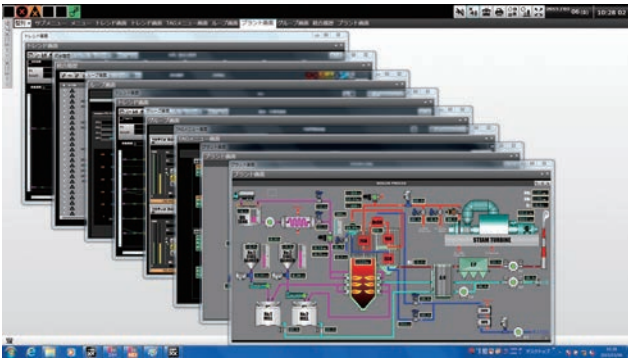
● **Split display**

● **Enlarged/reduced screen display**

● **Group screen: Free layout switching of instrument diagrams**

● **Trend screen: Enlarged/reduced display**

Drag with the mouse.

Enlarged display

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Control functions

Integrate electrical machinery control and measurement control

The control station has achieved high-speed control with minimum cycle of 1 ms as well as large capacity and high reliability. Integrating electrical machinery control and measurement control allows building of high-reliability plant control system despite compact configuration.

High-performance CPU

A 1 GHz dual-core processor has been adopted for the CPU, achieving high-speed control with minimum cycle of 1 ms. This allows both high-speed electrical machinery control and high-functional measurement control to be performed with a single unit.

The CPU module has adopted multi-processor configuration architecture. It also provides advanced communication performance with scheduling technology to perform network processing concurrently with arithmetic processing of application programs.

Large-capacity memory

The control station includes large-capacity memory consisting of 512K steps of program memory and 2,368K words of data memory. Up to 4,096 words (32 nodes) of I/O can be connected per station.

High-speed LAN

The CPU module contains a 1 Gbps Ethernet-based control LAN, equalized bus, and 1 Gbps/100 Mbps Ethernet-based I/O network. With CPU processing scheduling technology, these high-speed LANs have achieved higher communication performance.

❶ Control LAN
The adoption of an FL-net Ver.3-compliant LAN allows high-speed and large-capacity data communication as well as the support for Redundancy.

❷ Equalized bus
Large-capacity equalization technology enables high-speed transfer of large data, resulting in the achievement of full-range equalization of application data.

❸ Network adapter bus
A high-speed LAN for a network adapter to be connected with Fuji Electric's legacy networks or other different networks.
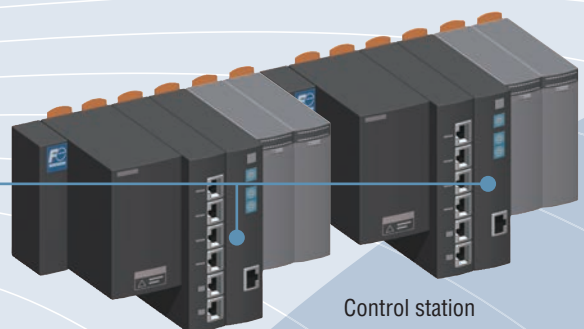
❹ E-SX bus
A high-speed I/O network supporting Redundancy.
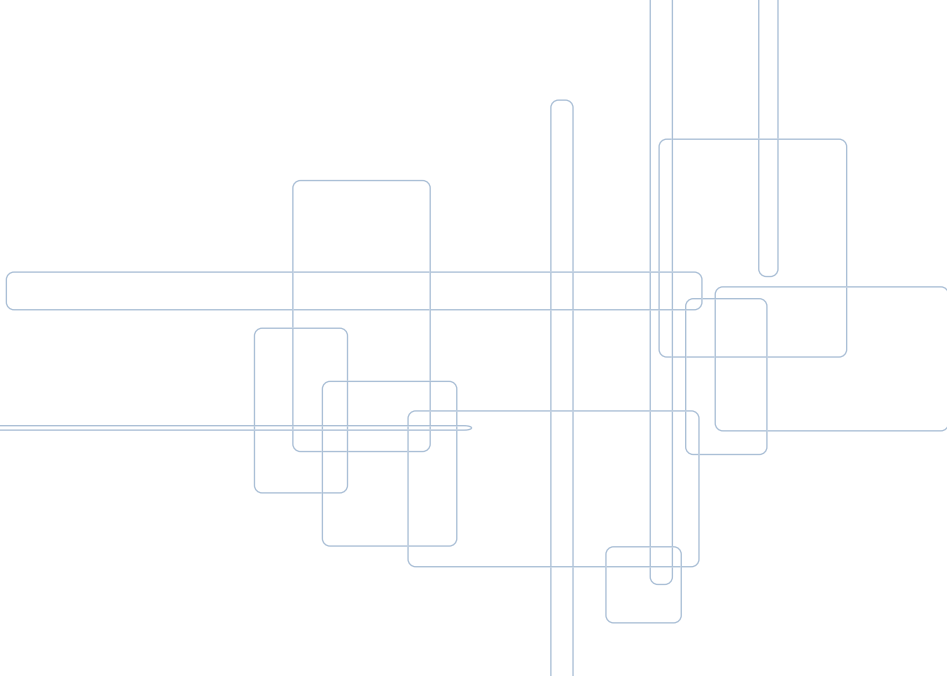
High-reliability CPU

The CPU supports Redundancy. The adoption of ECC (with error detection/correction function) memory and the enhancement of RAS function have achieved a high-reliability control station.
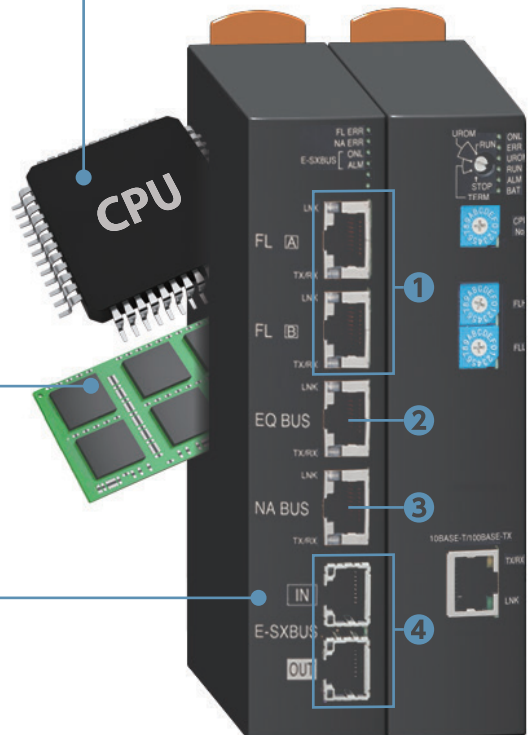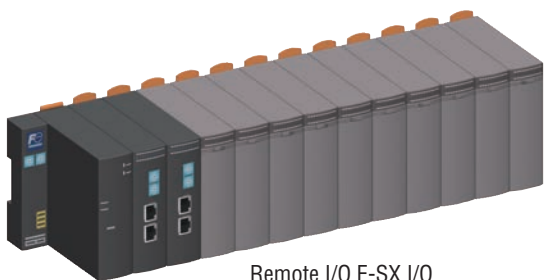
Control station
CPU module

Control station

## Remote I/O lineup for various applications

[Remote I/O E-SX I/O]
A high-speed, 100 Mbps E-SX bus has been adopted for I/O network. The module lineup offers a wide selection. The module is also highly reliable allowing redundant power supply and I/O network Redundancy.

Remote I/O E-SX I/O

[Remote I/O IPU-II]
This is a highly reliable remote I/O module that enables Redundancy of not only the power supply and I/O network but also the I/O module itself. The module lineup offers a wide selection such as a multi-point individual isolation analog module or a pulse module.
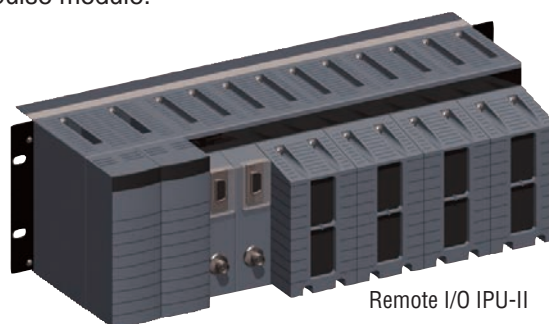
Remote I/O IPU-II

Various network connections

The network adapter connects the control station to up to four networks, including our legacy networks such as DPCS-F, PE-link, or T-link and open networks such as FL-net. Moreover, the network adapter can also be Redundant together with the control station, which enables building of a highly reliable system.
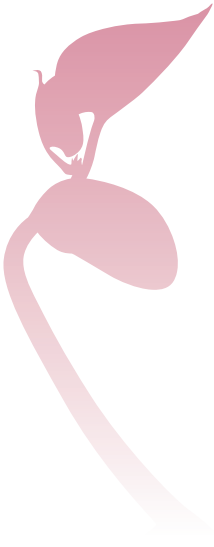

Network adapter

Supporting global standards

The control station complies with CE marking and UL as standard.

High security

As a response to the domestic and international efforts toward higher security, the control station is currently being redesigned to support ISASecure EDSA (Embedded Device Security Assurance).

High reliability

Completely redundant system

With **MICREX-VieW XX** , all system components can be configured to be redundant, including the operator station, database station, control station, power supply, control LAN, I/O network, and I/O module.

Information LAN Ethernet

● Redundant network ring
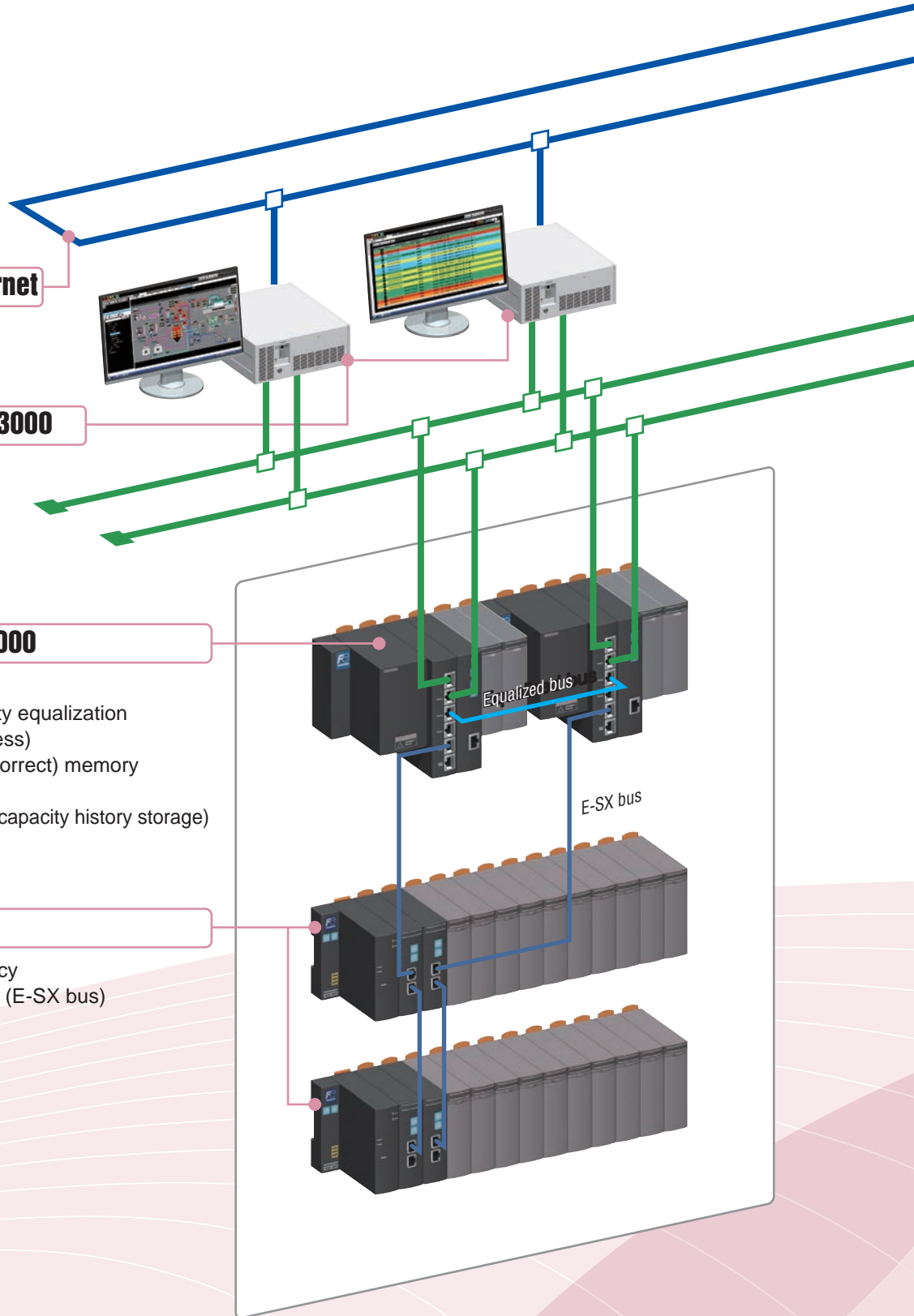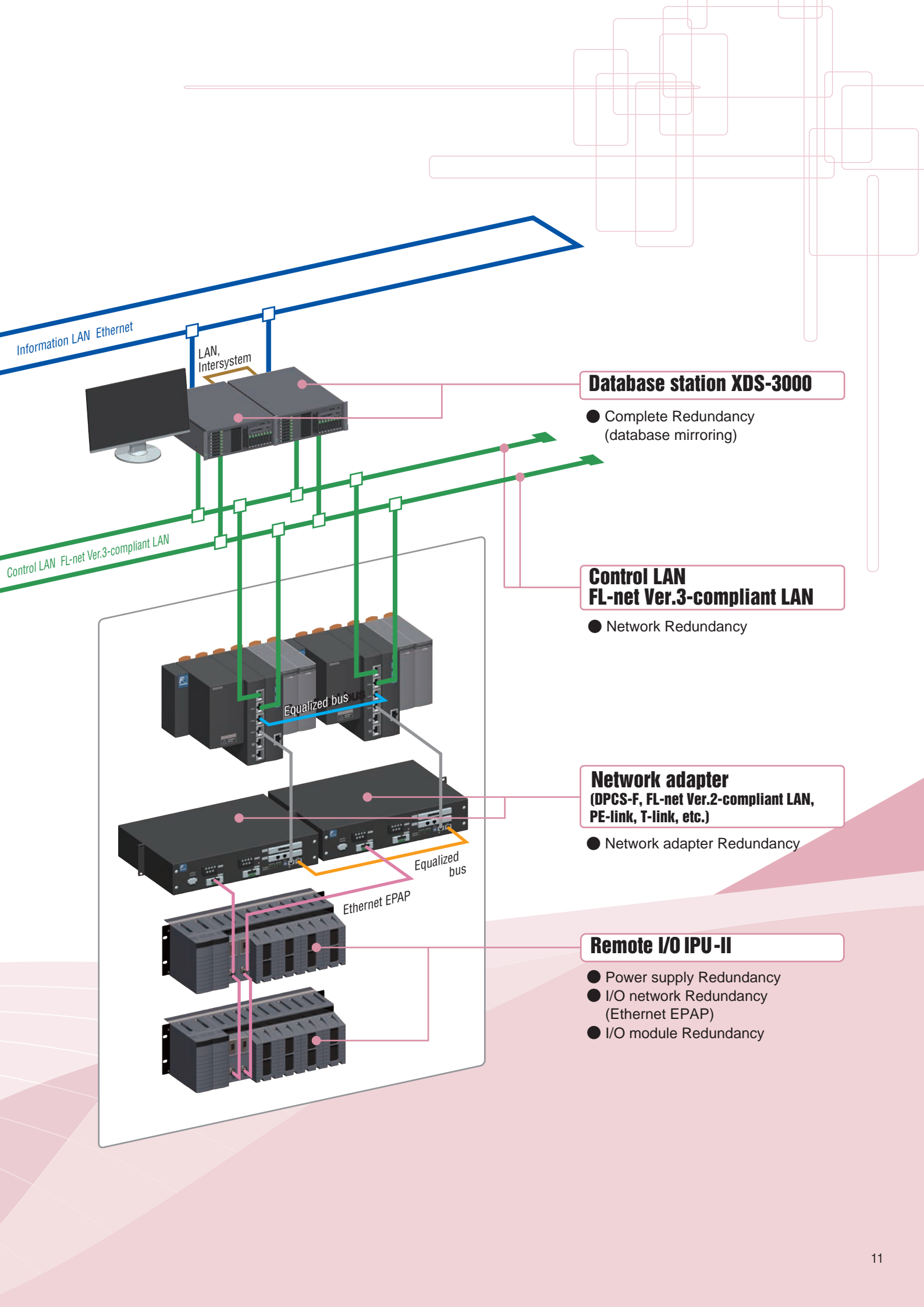
Operator station XOS-3000

● Parallel redundancy

Control station XCS-3000

● CPU Redundancy
● High-speed large-capacity equalization
  (equalized engineering-less)
● ECC (Error Check and Correct) memory
● Excellent RAS
  (Japanese display, larger-capacity history storage)

Equalized bus

E-SX bus

Remote I/O E-SX I/O

● Power supply Redundancy
● I/O network Redundancy (E-SX bus)

Information LAN Ethernet

LAN,
Intersystem

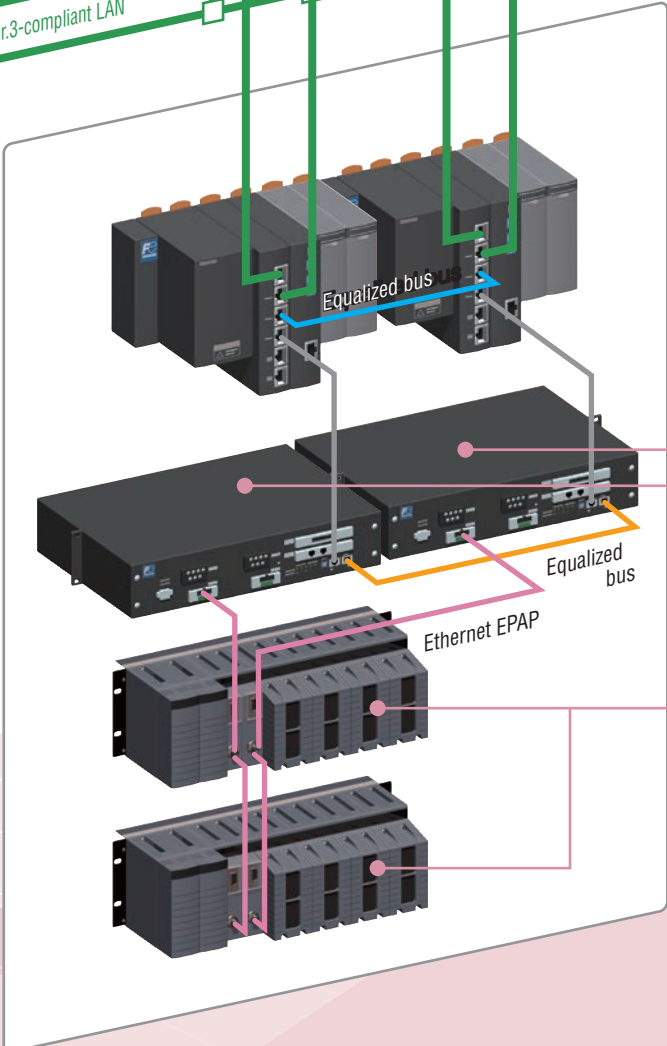Control LAN FL-net Ver.3-compliant LAN

Database station XDS-3000

● Complete Redundancy
(database mirroring)

Control LAN
FL-net Ver.3-compliant LAN

● Network Redundancy

Equalized bus

Network adapter
**(DPCS-F, FL-net Ver.2-compliant LAN,
PE-link, T-link, etc.)**

● Network adapter Redundancy

Equalized
bus

Ethernet EPAP

Remote I/O IPU-II

● Power supply Redundancy
● I/O network Redundancy
(Ethernet EPAP)
● I/O module Redundancy

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Engineering function

Efficient engineering

The engineering station integrated the engineering environments of the HCI*3 (screen, database) and control station. It also has full functionality such as parts packages and machine-less simulation function to provide an effective engineering environment.

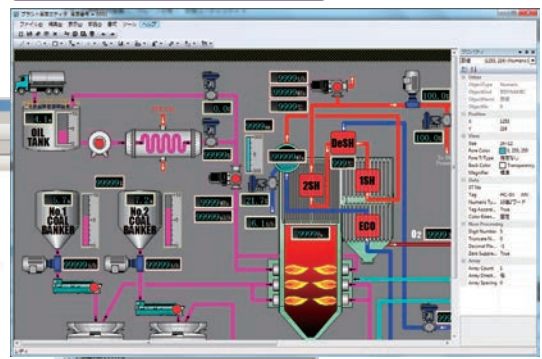*3: Human Communication Interface (operator station, database station)

Integrated engineering environment

The engineering environments of the HCI and control station have been integrated. This has achieved the vertical cooperation of HCI engineering and control station engineering through integrated management of TAG and the horizontal cooperation of engineering between control stations through integrated management of inter-station communication memory. There are also various excellent operation functions for effective engineering, such as drag-and-drop or copy-and-paste from a program tree and exporting/importing definitions.

HCI engineering tool

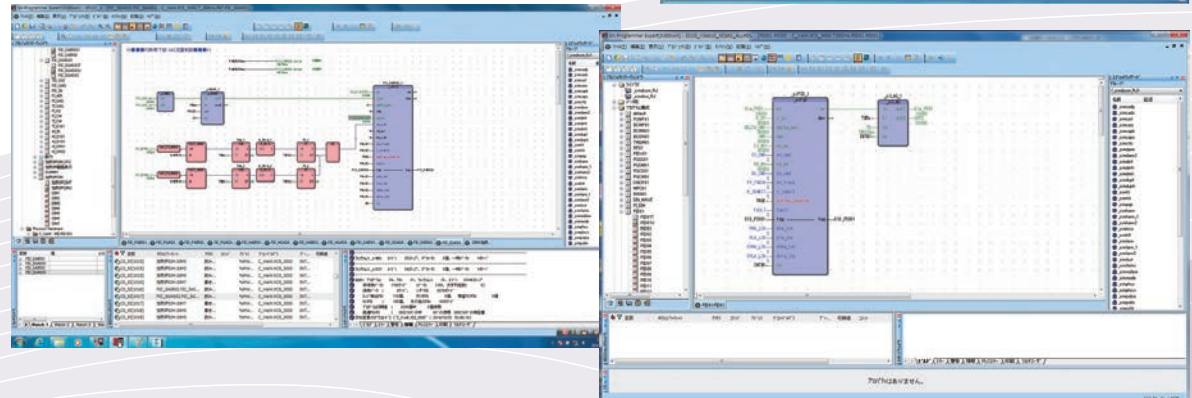● **Integrated engineering environment**

TAG creation tool

Control station engineering tool

Integrated management of TAG [Vertical cooperation]

Machine-less simulation

By using the simulator, you can configure system devices such as the control station and operator station on the PC and operate them. For example, you can check the function that combines the control station control function and screen function while simulating I/O signals, or check the data of inter-station communication, without using actual machines. This allows efficient and high-quality engineering.
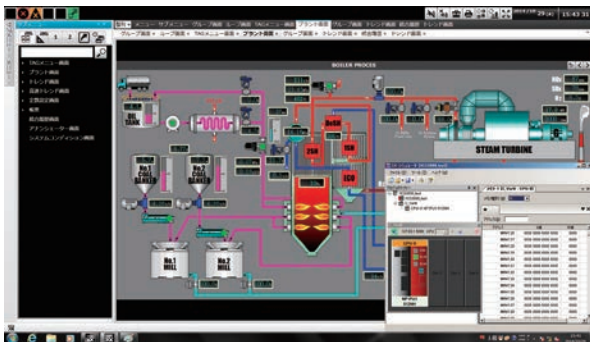
IEC 61131-3 compliant

The engineering tool for the control station (Expert D300win) supports five program representations that conform to the IEC 61131-3 international standard (JIS B3503), allowing engineering using best combination.

● **Supported representations**
  IL (Instruction List)
  LD (Ladder Diagram)
  FBD (Function Block Diagram)
  ST (Structure Text)
  SFC (Sequential Function Chart)

High-efficiency engineering tool HEART-BELIEVE-ESPER/SELECT(optional)

You can automatically convert control function specifications created with familiar general purpose OA software such as Excel® or Visio® into the format of the control station software. Then you can monitor the running status of the control station on the control function specification for easy-to-handle efficient engineering from specification study to design, test, and post-delivery maintenance.

Instrumentation flow

SFC

Time chart

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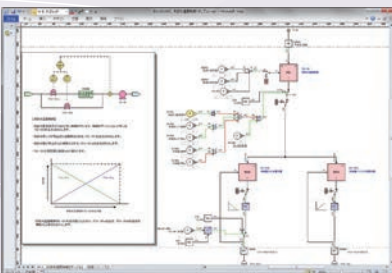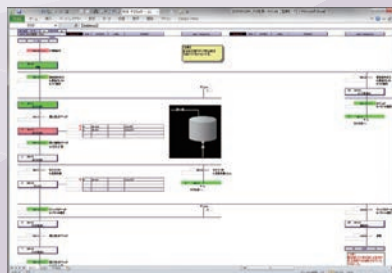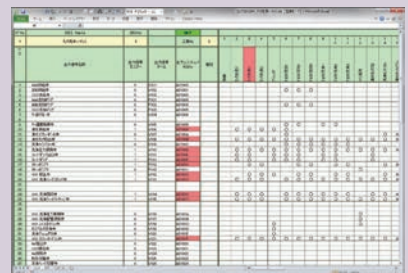
High inheritability

Using the existing assets effectively

MICREX-VieW XX can inherit much from the conventional MICREX Series. You can use the existing assets effectively during system updating to ensure switchover to a highly reliable system. This contributes to further stable and safe plant operation.

Inheritance of existing application assets

Since the system can inherit the existing system's screens and the controller's application assets, it can be updated to a highly reliable system within a short period.

Inheritance of existing hardware assets

The networks of the existing system such as DPCS-F and PE-link can be connected to the remote I/Os such as IPU-Ⅰ and IPU-Ⅱ via the network adapter, resulting in labor saving for wiring work and shorter work period.

Step-by-step update

Since the modules can be connected seamlessly with the existing system, the system can be updated in a stepwise manner.

Existing system   **MICREX-VieW XX**

	HCI updating	CTL updating	I/O updating
Existing HCI	New HCI	New HCI	New HCI
Existing CTL	Existing CTL	New CTL	New CTL
Existing I/O	Existing I/O	Existing I/O	New I/O
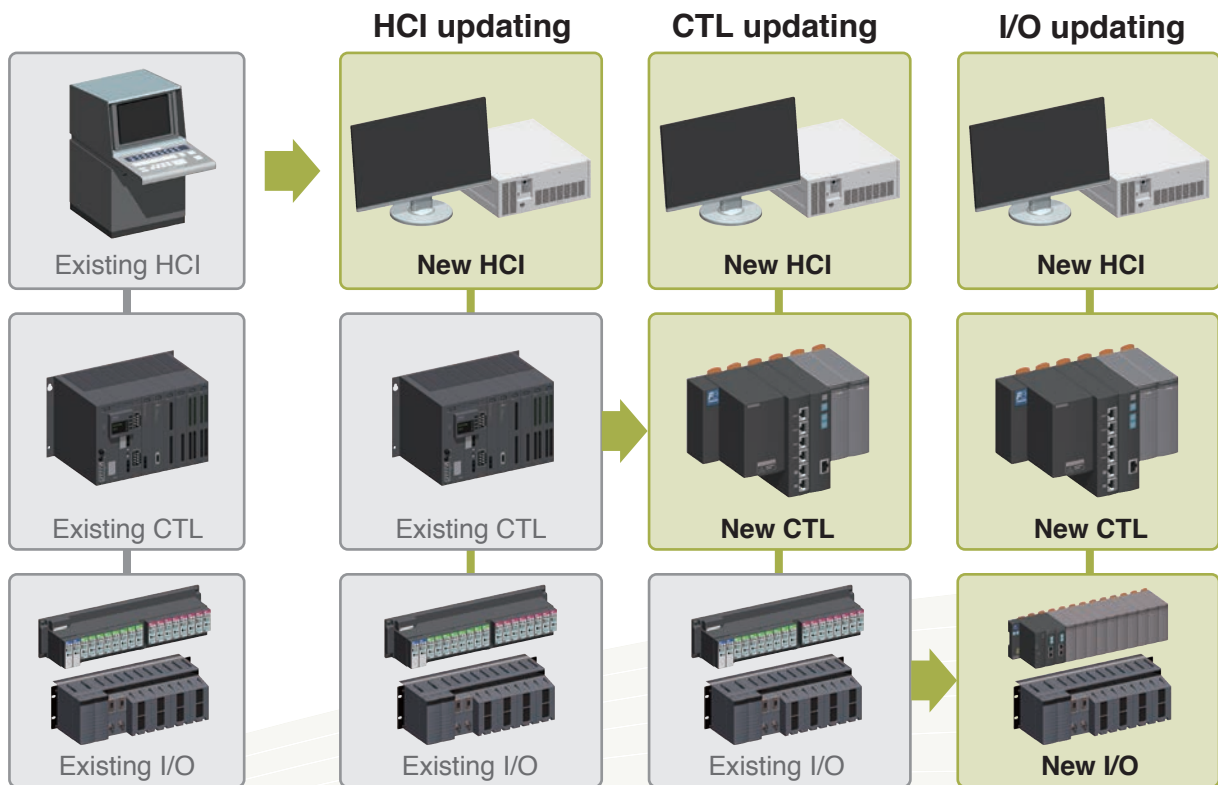
HCI : Operator station or database station   CTL : Control station   I/O : Remote I/O   ☐ Existing   ☐ Updated

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Life cycle solution and service locations

Fuji Electric provides a life cycle solution to minimize your investment from introduction study, introduction, operation, maintenance to improvement proposal.

Life cycle solution

- Introduction study
- System proposal
- System introduction
- System engineering
- Operation/evaluation
- Maintenance/after-sales service
- Improvement proposal

Global Network

■● : Sales subsidiaries   ◆ : Branches

1 Fuji Electric Europe GmbH
2 Switzerland Branch
3 U.K. Branch
4 France Branch
5 Italy Branch
6 Spain Branch
7 Fuji Electric Corp. of America
8 Roanoke Branch
9 Chicago Branch
10 Houston Branch
11 Santa Ana Branch
12 Fremont Branch
13 Fuji Electric Brazil-Equipamentos de Energia Ltda.
14 Fuji Electric Korea Co., Ltd.
15 Fuji Electric (China) Co., Ltd.
16 East China Branch
17 West China Branch
18 South China Branch
19 North China Branch
20 Fuji Electric Taiwan Co., Ltd.
21 Fuji Electric Hong Kong Co., Ltd.
22 Hoei Hong Kong Co., Ltd.
23 Fuji Electric FA (Asia) Co., Ltd.
24 Fuji Electric Vietnam Co., Ltd.
25 Fuji Electric (Thailand) Co., Ltd.
26 Fuji Electric Asia Pacific Pte. Ltd.
27 PT Fuji Electric Indonesia
28 Fuji Electric India Private Ltd.

◆ Beijing Rep. Office
◆ Fuji Electric Co., Ltd. (Myanmar Branch Office)
◆ Rep. Office of Fuji Electric Co., Ltd. (in Cambodia)
◆ Middle East Branch

Hokkaido
1 Hokkaido Division
2 Hokkaido Fuji Electric Co., Ltd.

Tohoku
3 Tohoku Division

Kanto
4 Higashikanto Department
5 Fuji Furukawa Engineering & Construction Co., Ltd.
6 Kitakanto Department
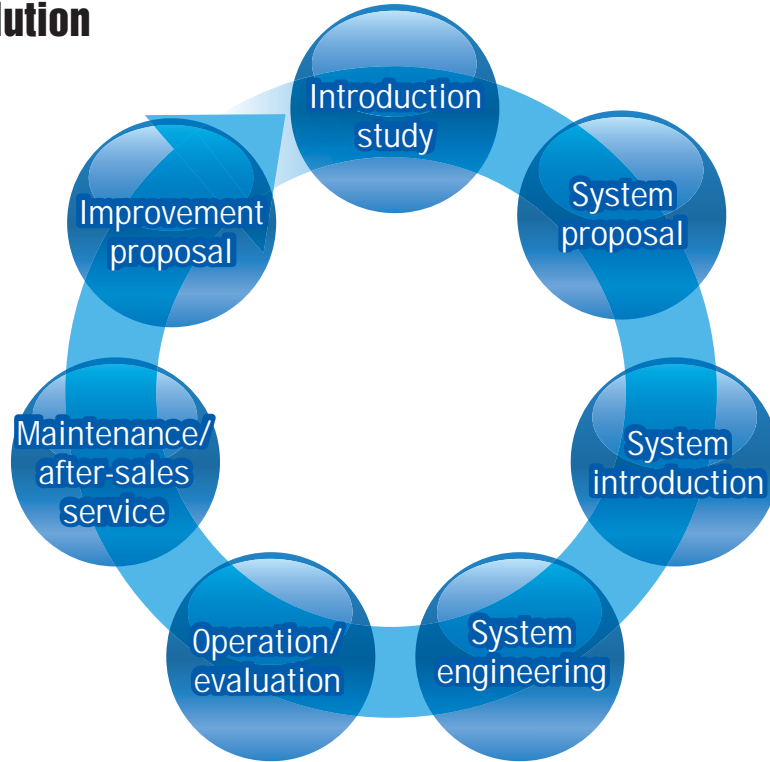
Tokyo
Head Office
Tokyo Factory
Fuji Electric FA Components & Systems Co., Ltd.
Fuji Electric Technica Co., Ltd.
Fuji Electric Finance and Accounting Support Co., Ltd.
Fuji Office & Life Service, Co., Ltd.
Fuji IT Co., Ltd.
Fuji Electric IT Center Co., Ltd.
Fuji Electric IT Solutions Co., Ltd.
GE Fuji Meter Co., Ltd.
FESTEC Co., Ltd.

Chubu
7 Chubu Division

Hokuriku
8 Hokuriku Division

Kansai
9 Fuji Electric FA Service Co., Ltd.
10 Kansai Division
11 Hoei Denki Co., Ltd.

Shikoku
12 Shikoku Division

Chugoku
13 Chugoku Division

Kyushu
14 Kyushu Division

Okinawa
15 Okinawa Division

System specifications list

System components

Operator station (XOS)	16 units (when the database station is installed separately) OS: Windows¨ 7 Professional SP1 (64-bit version) LCD: 1,920 x 1,080 (Full HD)
Database station (XDS)	1 unit Monitoring and control loop points (Module TAG): 8,640 points (288 x 30), State change points such as contacts (bit state change): 61,440 points, User TAG: 32,752 points LCD: 15-inch or larger, 1,024 x 768 or more recommended OS: Windows¨ Server 2008 R2 Standard (64-bit version)
All-in-one station (XAL)	8 units (Up to 2 units (= One set of Redundancy) when the combination of XAL and XOS is used) OS: Windows¨ Server 2008 R2 Standard (64-bit version) LCD: 1,920 x 1,080 (Full HD)
Control station (XCS)	30 units (Up to 10 units when the all-in-one station is used) I/O: E-SX I/O (E-SX bus), IPU-II (Ethernet), etc.
Network printer	8 units
Engineering station (XES)	4 units (FPROCES/Expert/HEART) Computer: Windows PC (IBM PC/AT compatible) OS: Windows¨ XP, Windows¨ 7 (32-bit version) LCD: 17-inch or 21-inch or larger, 1,024 x 768 or 1,280 x 1,024 (1,920 x 1,080 or more is recommended for drawing interactive screens)
General purpose PC or workstation	4 units

Control LAN (FL-net Ver.3-compliant LAN)

Topology	Star
No. of stations	64 units or less
Cable	Twisted pair cable (STP), optical fiber cable
Transmission distance	80 m or less (STP (Cat5/Cat5e))/segment, SW-HUB or light SW-HUB must be used when the cable is extended Optical fiber (100BASE-FX: 2 km or less/segment, 1000BASE-SX: 550 m or less/segment, 1000BASE-LX: 5 km or less/segment)
Protocol	FA link protocol/FL-net Ver.3-compliant LAN protocol, UDP/IP, TCP/IP, ICMP, ARP
Communication speed	100 Mbits/sec, 1,000 Mbits/sec
Conformed standard	IEEE 802.3u/IEEE 802.3ab/IEEE 802.z, FL-net (OPCN-2) Note 1

(Note 1) FL-net (OPCN-2) is an FA network standardized by JEMA (Japan Electrical Manufacturers' Association).

Information LAN/Intersystem LAN Note 2 (Gigabit Ethernet)

Topology	Star
Cable	Twisted pair cable (UTP), optical fiber cable
Transmission distance	100 m or less (UTP (Cat5e))/segment, SW-HUB or light SW-HUB must be used when the cable is extended, Optical fiber cable (1000BASE-SX: 550 m or less/segment, 1000BASE-LX: 5 km or less/segment)
Protocol	TCP/IP, UDP/IP
Communication speed	1,000 Mbits/sec
Conformed standard	IEEE 802.3ab/IEEE 802.z

(Note 2) The intersystem LAN directly connects between Redundant XDSs or XALs.

Ethernet for XCS-3000

Topology	Star
Cable	Twisted pair cable (UTP), optical fiber cable
Transmission distance	100 m or less (UTP (Cat5 or higher))/segment, SW-HUB or light SW-HUB must be used when the cable is extended, Optical fiber cable (100BASE-FX): 2 km or less
Protocol	TCP/IP, UDP/IP
Communication speed	10 Mbits/sec, 100 Mbits/sec
Conformed standard	IEEE 802.3u

Authorized Channel Partner