LS Industrial Systems, who pioneered the development of Korean DCS market, introduces a new product for complete control of highly sophisticated processes of power generation plants, Water treatment plant etc.

in 1980s, when domestic market was dependent on overseas DCS, LS Industrial Systems has succeeded in developing the first Korean DCS with its own technology. With the spirit of innovator, we proudly introduce our new Power Plant Control & Critical Process Automation System ‘MASTER P-5000’. LS Industrial Systems, As the first power generation control system manufacturer in Korea, has successfully developed and applied the main control system to Honam Power Plant’s boiler No.2 with entirely domestic technology in 2001, which regared as the limits of domestic DCS industry. We have provided the main control systems to Honam Power Plant’s boiler No.2 in 2003, Peongtaek Power Plant’s boilers No.1, 2, 3 and 4 in 2004, and main control system of Ilsan Combined Cycle Power Plant (HRSG, BOP, Turbine) in 2006.

Master P-5000 that optimized to integrate whole control system with highly sophisticated processes such as power plant, steel, chemistry and etc. based on the core process knowledge of power generation control, the most supply records, and performances including development/design/ manufacture/test-run is a new challenge to LS Industrial Systems.

 Evolution of the System

System Features

High Performance
- Enhanced special features for Power Plant & Critical Process
- Application of product structure for high-speed control, such as turbine control.
  - High-speed control MPU H/W and S/W (min. 5ms)
  - High-speed I/O communication function (I/O scan time: min. 5ms)
- Complete redundancy of the whole system for turbine control (incl. redundant I/O)
- Supports HART communication which is widely-used for plant monitoring and control.

High Reliability
- Fully redundant system (DB, control, communication, I/O board, power supply).
- Fail-safe function.
- Convertible control logic while operating.
- RCS self-diagnosis function (MPU, I/O board).

Easy Maintenance
- Hot swapping of I/O board.
- SMS service.
- Online diagnosis.
  - [controller, network, DPC, WDC, printer diagnosis].

Convenient Operation
- Integrated management of different controllers with Ethernet or serial communication.
- High-speed trend. • X-Y plot, characteristics curve.
- Excel conversion (report, trend, etc.). • Control simulator.
- Management of the change history of the control logic.
- Engineering data synchronization.
- Sequence of Event (SOE) data management.

Open Architecture
- Windows OS.
- Supports international standard control language (IEC61131-3: FBD, LD, SFC).
- Provides industrial standard interface (OPC C/S, PROFIBUS, HART).
- Allows applying KKS/Kraftwerk-Kennzeichen-System standard tag name rule.
- Supports international standard alarm operation (DIN19325).

Reference
- Grafted the knowledge of power plant process.
- Power plant boiler main control system algorithm
- Power plant integrated (boiler + turbine) main control system algorithm
### System Block Diagram

#### System Components

<table>
<thead>
<tr>
<th>Main Components</th>
<th>Features</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>OIS</strong></td>
<td>An Operator Interface Station, performed the role of operator’s station. It provides the processed information from the DPC in a variety of display.</td>
</tr>
<tr>
<td><strong>OPC Client/Server</strong></td>
<td>Functions the Industrial standard OPC(OLE for Process Control) Client/Server for interface with other systems.</td>
</tr>
<tr>
<td><strong>Web Client/Server</strong></td>
<td>Provides the web monitoring service that allows remote monitoring from an office or other places far away from the main monitoring &amp; control room. Also provides real-time plant monitoring and history data through an intranet or the internet.</td>
</tr>
<tr>
<td><strong>CCS</strong></td>
<td>A Central Control Station which can be applied as a stand-alone type that integrates DPC and WDC functions. It processes real-time and history data, and provides the plant monitoring and control functions.</td>
</tr>
<tr>
<td><strong>DPC</strong></td>
<td>A Database Processing Center which is a station that manages and processes all the data in the system. It collects data from on-site controllers, such as RCS, creates the database, and then processes, stores and manages it.</td>
</tr>
<tr>
<td><strong>PHS</strong></td>
<td>A Plant History System which stores the long-term operation information and history data, and provides analysis to improve efficiency of the plant operation.</td>
</tr>
<tr>
<td><strong>Alarm Server</strong></td>
<td>Collects and stores for a long period of time the information of various on-site process alarms and controller alarms that occurred in a critical process, such as a power plant.</td>
</tr>
<tr>
<td><strong>EWS</strong></td>
<td>An Engineering Work Station which creates, modifies, and saves the engineering data required to operate the whole system.</td>
</tr>
<tr>
<td><strong>SOE</strong></td>
<td>Sequence of Event. In case a major system of a power plant or a critical process trips, it collects the digital point status information once every 1/1000 second and outputs them to a printer to analyze the event and its cause.</td>
</tr>
<tr>
<td><strong>RCS</strong></td>
<td>A Remote Control Station which directly controls a plant according to the program prepared in EWS. By making all or any of control, power supply, communication, I/O parts redundancy, it can configure the system to be appropriate for specific use of each critical PA process or turbine control. Especially, it can configure a station specialized for a turbine control system which requires high-speed (less than 5msec) control performance.</td>
</tr>
</tbody>
</table>

### System Capability Specifications

- Central Control Station: Max. 48 stations
- Engineering Work Station: Max. 4 stations
- Remote Control Station: Max. 32 stations
- Number of monitoring & control tags: Unlimited
- Number of saved trend history data: Unlimited
- Number of plant display pages: Unlimited
Remote Control Station

- RCS applies to process control & process automation, with multiples of 50msec.
- RCS is composed of MPU shelves and made up redundancy systems.
- To respond to the needs for system expansibility, RCS interfaces with Profibus.
- By applying the standard VMEBus in MPU shelf, RCS improved data processing speed and reliability.
- I/O Boards are composed of boards of compact size.

**MPU Shelf**
A MPU shelf controls and processes alarms and then notifies to the upper level on-site data collected by an VMEBus. In addition to ensure reliability, the Slave MPU takes over the role of the MPU in an uninterrupted state in case the Master MPU fails during the redundant process.
- Backplane : VMEBus
- MPU : 667 MHz, 256 MB, Dual Ethernet(100 Mbps)
- DLU : VMEBus (Extension) Board[Fiber Optic cable]
- MEM : 2/4/8 MB, Battery Backup
- FBC : Dual Ethernet (100 Mbps)
- Redundancy form : a shelf standby method.
- Max. RCS Station : 32 Station
- Max. Point of 1 station : Digital 5,120 or Analog 1,280

**I/O Shelf**
An I/O shelf collects the on-site data, notifies them to the MPU shelf, and then outputs the results of the MPU shelf’s control computation to the site. To ensure reliability, the entire power supply(SPS, DPS) and communication unit(DCU) of the MASTER P-5000 RCS’s I/O shelf can be made redundant. all I/O board supports Hot-swapping.
- Backplane : LS Private BUS
- DCU : Single Ethernet(100 Mbps)
- I/O : DIM/DOM, AIM/AOM, RTD, TCM, PIM Board
- Redundancy form : SPS, DPS, DCU
- Max. I/O Board : 160EA (10Board x 16 I/O Shelf)
- Supports Hot-Swapping [DCU, I/O board]
### MPU Shelf Components

<table>
<thead>
<tr>
<th>Type</th>
<th>Specification</th>
<th>Features</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPS</td>
<td>• Input Power : DC 24V</td>
<td>• Supply the power to each board of the MPU shelf.</td>
</tr>
<tr>
<td></td>
<td>• Output Power : DC 5V/20A(100W)</td>
<td>• Overcurrent/overvoltage protection, output compensation, power failure detection, and auto switching during the configuration of redundancy.</td>
</tr>
<tr>
<td>MPU</td>
<td>• CPU : MPC8540 with Power PC® e500 process core.</td>
<td>• On-site data monitoring, sequence control using the IEC61131-3 control language, real-time/periodic task execution, phase control, RAS creation, redundancy control logic, mode selection, and report creation</td>
</tr>
<tr>
<td></td>
<td>• SDRAM : 256 MB</td>
<td>• Redundant board used in the redundancy of the MPU shelf.</td>
</tr>
<tr>
<td></td>
<td>• Network : Ethernet 100Mbps 2 Ports</td>
<td>• Monitoring other MPU shelf, equalization by renewing control-related output, parameters, etc.</td>
</tr>
<tr>
<td>DLU</td>
<td>• VMECA Bus-to-Bus Adapters with DMA</td>
<td>• Redundant board used in the redundancy of the MPU shelf.</td>
</tr>
<tr>
<td></td>
<td>• Controller Mode DMA : 70MB/6MB</td>
<td>• Monitoring other MPU shelf, equalization by renewing control-related output, parameters, etc.</td>
</tr>
<tr>
<td>MEM</td>
<td>• Memory Size : 2MB/4 or 4, 8MBByte</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Battery Backup : The retention period in case of power failure is 8 years for 2MB, 4 years for 4MB</td>
<td></td>
</tr>
<tr>
<td>MFM</td>
<td>• ADC : 12 Bit analog to Digital Converter</td>
<td>• Able to trigger interruption in case of any fault caused by the MPU shelf’s power display status, power check, relay output and definitions.</td>
</tr>
<tr>
<td></td>
<td>• DAC : Output the definition of power Failure 16bit DA</td>
<td>• The display is composed of four 5x7 dot matrices.</td>
</tr>
<tr>
<td></td>
<td>• LED : 5x7 LED Matrix x 4</td>
<td></td>
</tr>
<tr>
<td>FBC</td>
<td>• CPU : 333MHz</td>
<td>• Carries out I/O BUS communication with the DCU board of the I/O shelf according to the MPU board’s control commands.</td>
</tr>
<tr>
<td></td>
<td>• DPRAM : 256KB (Shared memory)</td>
<td>• Redundancy : making the shelf and the network redundant Run/Stand-by method.</td>
</tr>
<tr>
<td></td>
<td>• Network : Ethernet 10/100Mbps 2 Ports</td>
<td>• I/O information shared memory interface : I/O data and board diagnosis statuses, and I/O initialization parameter setting information.</td>
</tr>
<tr>
<td></td>
<td>• Shared memory refresh cycle : Min. 50ms</td>
<td>• Self-diagnosis : diagnosis during the booting and the operation, DCU communication status, etc.</td>
</tr>
<tr>
<td></td>
<td>• High-speed Ethernet communication cycle : Min. 50ms</td>
<td>• Storing the fatal error history</td>
</tr>
<tr>
<td>FMC</td>
<td>• DPRAM : 64KB</td>
<td>• A master communication board that obtains the input data from, or sends output data to remotely located slave devices using Profinet.</td>
</tr>
<tr>
<td></td>
<td>• Network : RS485 Profinet 3Mbps 1 Port</td>
<td>• Redundancy : making the shelf redundant, Run/Stand-by method.</td>
</tr>
<tr>
<td></td>
<td>• Protocol : Fieldbus DP-Master</td>
<td>• What to Diagnose : BUS communication status, FMC board operation status, Slave devices, Profinet configuration information error status, etc.</td>
</tr>
<tr>
<td></td>
<td>• Max. Slave : 6000 devices (4 Shelves x 12 Boards x 125 Slaves)</td>
<td></td>
</tr>
</tbody>
</table>

### I/O Shelf Components

<table>
<thead>
<tr>
<th>Type</th>
<th>Product Name</th>
<th>Signal</th>
<th>Error Rate(at room temp.)</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPS</td>
<td>SPS-902</td>
<td>-</td>
<td>-</td>
<td>24VDC Input</td>
</tr>
<tr>
<td>DIM</td>
<td>DIM-901</td>
<td>-</td>
<td>±0.2%</td>
<td>2-wire, 1/16000 Isolation Type</td>
</tr>
<tr>
<td></td>
<td>DIM-902</td>
<td>-</td>
<td>±0.5%</td>
<td>2-wire, 1/64000 Isolation Type</td>
</tr>
<tr>
<td></td>
<td>DIM-911</td>
<td>-</td>
<td>±0.2%</td>
<td>2-wire, 1/64000 Isolation Type</td>
</tr>
<tr>
<td></td>
<td>DIM-912</td>
<td>-</td>
<td>±0.5%</td>
<td>2-wire, 1/64000 Isolation Type</td>
</tr>
<tr>
<td>DOM</td>
<td>DOM-902</td>
<td>-</td>
<td>±0.1%</td>
<td>1/65535 Isolation Type</td>
</tr>
<tr>
<td></td>
<td>DOM-911</td>
<td>-</td>
<td>±0.1%</td>
<td>1/65535 Isolation Type</td>
</tr>
<tr>
<td></td>
<td>DOM-921</td>
<td>-</td>
<td>±0.1%</td>
<td>1/65535 Isolation Type</td>
</tr>
<tr>
<td>AIM</td>
<td>AIM-901</td>
<td>8</td>
<td>±0.2%</td>
<td>2-wire, 1/16000 Isolation Type</td>
</tr>
<tr>
<td></td>
<td>AIM-952</td>
<td>4</td>
<td>±0.5%</td>
<td>2-wire, 1/64000 Isolation Type</td>
</tr>
<tr>
<td></td>
<td>AIM-953</td>
<td>4</td>
<td>±0.5%</td>
<td>2-wire, 1/64000 Isolation Type</td>
</tr>
<tr>
<td>TCM</td>
<td>TCM-972</td>
<td>4</td>
<td>±0.1%</td>
<td>1/65535 Isolation Type</td>
</tr>
<tr>
<td>RTD</td>
<td>RTD-978</td>
<td>4</td>
<td>±0.2%</td>
<td>3-wire, 1/10000 Isolation Type</td>
</tr>
<tr>
<td>AOM</td>
<td>AOM-901</td>
<td>8</td>
<td>±0.2%</td>
<td>1/16000 Isolation Type</td>
</tr>
<tr>
<td></td>
<td>AOM-902</td>
<td>4</td>
<td>±0.3%</td>
<td>1/16000 Isolation Type</td>
</tr>
<tr>
<td></td>
<td>AOM-952</td>
<td>4</td>
<td>±0.1%</td>
<td>1/16000 Isolation Type</td>
</tr>
<tr>
<td></td>
<td>AOM-953</td>
<td>4</td>
<td>±0.1%</td>
<td>1/16000 Isolation Type</td>
</tr>
<tr>
<td>PIM</td>
<td>PIM-901</td>
<td>2</td>
<td>DC 24V 200 kpps, Open Collector Type</td>
<td>1/4294967296 (32 Bit)</td>
</tr>
</tbody>
</table>
Remote Control Station (Critical Type)

- RCS can control time critical processes such as Turbine Systems, with multiples of 5ms.
- RCS is composed of MPU & I/O shelves and made up almost redundancy systems.
- To respond to the needs for system expansibility, RCS interfaces with Profibus, HART etc.
- By applying the standard VME Bus in all shelves, RCS improved data processing speed and reliability.
- All I/O Board can be consisted of redundancy form.

MPU Shelf
A MPU shelf controls and processes alarms and then notifies to the upper level on-site data collected by an I/O BUS. In addition to ensure reliability, the Slave MPU takes over the role of the MPU in an uninterrupted state in case the Master MPU fails during the redundant process.
- Backplane : VMEBus
- MPU : 1.3GHz, MPC8548E, Dual Ethernet(100 Mbps)
- DLU : VMEBus (Extension) Board(Fiber Optic cable)
- MEM : 2/4/8 MB, Battery Backup
- FBC : Dual Ethernet (100 Mbps)
- Redundancy form : a shelf standby method.
- Max. RCS Station : 32 Station.
- Max. Point of 1 station : Digital 3,072 or Analog 768

I/O Shelf
An I/O shelf collects the on-site data, notifies them to the MPU shelf, and then outputs the results of the MPU shelf’s control computation to the site. To ensure reliability, the entire power supply(SPS, DPS) and communication unit(DCU) of the MASTER P-5000 RCS’s I/O shelf can be made redundant. all I/O board supports Hot-swapping.
For the system intended for high-speed control, such as turbine control, the MPU shelf’s FBC and the I/O shelf’s DCU employs the high-speed type.
- Backplane : VMEBus
- DCU : Single Ethernet(100 Mbps)
- IO : DI/DO, AI/AO, RTD, TC, PI, HART Comm. Boards
- Redundancy form : SPS, DPS, DCU, I/O Boards
- Max. I/O Board : 96 EA [12 board x 8 I/O Shelf]
- Supports Hot-Swapping (DCU, I/O board)
- Combined configuration of an I/O board (both single and redundant)
### MPU Shelf Components

<table>
<thead>
<tr>
<th>Type</th>
<th>Specification</th>
<th>Features</th>
</tr>
</thead>
</table>
| SPS  | • Input Power : DC 24V  
      • Output Power : DC 5V(100W) | • Supply the power to each board of the MPU shelf.  
      • Overcurrent/overvoltage protection, output compensation, power failure detection, and auto switching during the configuration of redundancy. |
| MPU  | • CPU : 1.3GHz, MPC8548E, 4G NAND FLASH  
      • Network : Ethernet 100Mbps 2 Ports | • On-site data monitoring, sequence control using the IEC61131-3 control language, real-time/periodic task execution, phase control, RAS creation, redundancy control logic, mode selection, and report creation. |
| DLU  | • VME64 Bus-to-Bus Adapters with DMA  
      • Controller Mode DMA : 70MB/s  
      • Cable Interface : Fiber-optic cable | • Redundant board used in the redundancy of the MPU shelf.  
      • Monitoring other MPU shelf, equalization by renewing control-related output, parameters, etc. |
| MEM  | • Memory Size : 2MByte or 4, 8MByte  
      • Battery Backup : The retention period in case of power failure is 8 years for 2MB, 4 years for 4MB | • Able to retain control logic and operation data using a backup battery even when the power is off.  
      • Low battery display function |
| MFM  | • ADC : 12 Bit analog to Digital Converter  
      • DAC : Output the definition of power Failure 16 Bit DA  
      • LED : 3x7 LED Matrix X 4 | • Able to trigger interruption in case of any fault caused by the MPU shelf’s power display, status, power check, relay output and definitions.  
      • The display is composed of four 5x7 dot matrices. |
| FBC  | • CPU : 533MHz  
      • DPRAM : 256KB (Shared memory)  
      • Network : Ethernet 10/100Mbps 2 Ports  
      • Shared memory refresh cycle : Min. 5ms  
      • High-speed Ethernet communication cycle : Min. 5ms | • Carries out I/O BUS communication with the DCU board of the I/O shelf according to the MPU board’s control commands.  
      • Redundancy : making the shelf and the network redundant Run/Stand-by method.  
      • I/O information shared memory interface : I/O data and board diagnosis statuses, and I/O initialization parameter setting information.  
      • Self-diagnosis : diagnosis during the booting and the operation, DCU communication status, etc. Storing the fatal error history |
| FMC  | • DPRAM : 64KB  
      • Network : RS485 Proibus 3Mbps 1 Port  
      • Protocol : Proibus DP-Master  
      • Max. Slave : 6,000 devices  
      • (4 Shelves x 12 Boards x 125 Slaves) | • A master communication board that obtains the input data from, or sends output data to remotely located slave devices using Proibus.  
      • Redundancy : making the shelf redundant, Run/Stand-by method.  
      • What to Diagnose : BUS communication status, FMC board operation status, Slave devices, Proibus configuration information error status, etc. |

### I/O Shelf Components

<table>
<thead>
<tr>
<th>Type</th>
<th>Product Name</th>
<th># of Channel</th>
<th>Redundancy</th>
<th>Signal</th>
<th>Error Rate(at room temp.)</th>
<th>Remarks</th>
</tr>
</thead>
</table>
| SPS  | SPS-912      | 2            | 1          | Input Power : 24VDC  
      Output Power : 5VDC(100W) | -         | 24VDC Input |
| DIM  | DIM-951C     | 32           | O          | DC 24V, DC 4mA | -         | Isolation Type |
| DOM  | DOM-951C     | 32           | O          | TR        | -         | Isolation Type |
| AIM  | AIM-953C     | 8            | O          | DC 1-5V, DC 4-20mA | ±0.1%   | AD16Bit Conv. |
|     | AIM-952C     | 16           | X          | DC 1-5V, DC 4-20mA | ±0.1%   | AD16Bit Conv. |
| AOM  | AOM-951C     | 4            | O          | DC 1-5V, DC 4-20mA | ±0.1%   | AD16Bit Conv. |
|     | AOM-952C     | 8            | X          | DC 1-5V, DC 4-20mA | ±0.1%   | AD16Bit Conv. |
| RTD  | RTD-951C     | 12           | O          | PT100-385 3 Line Type | ±0.2%   | AD16Bit Conv. |
| TC   | TC-951C      | 16           | O          | K, J, E, T, B, R, S, N Type | ±0.2%   | AD16Bit Conv. |
| PIM  | PIM-951C     | 16           | O          | 20Hz-20KHz | ±0.1%   | DC 24V |
| HART AI | HART-951C | 8            | O          | HART Communication 1:1 connection with device. | -       | HART Device V/F |
| TBN  | TBN-951C     | 26           | O          | DI, DO, AI, PI(Turbine Speed Pick-up) | -       | - |
| SVO  | SVO-951C     | 17           | O          | DI, DO, AI(LVDTL, AD0o E-H Converter) | -       | - |

(Note) It may vary according to the model in use and project environments. For more information, please see ‘MASTER P-5000 User Manual’. 
Remote Control Station (AT type)

- RCS applies to process control & process automation, with multiples of 50msec.
- RCS is composed of MPU shelves and made up redundancy systems.
- To respond to the needs for system expansibility, RCS interfaces with Profibus.
- By applying the standard Compact PCI Bus in MPU shelf, RCS improved data processing speed and reliability.
- I/O Boards are composed of boards of compact size.

**MPU Shelf**
A MPU shelf controls and processes alarms and then notifies to the upper level on-site data collected by an I/O BUS. In addition to ensure reliability, the Slave MPU takes over the role of the MPU in an uninterrupted state in case the Master MPU fails during the redundant process.

- Backplane : Compact PCI Bus
- MPU : Pentium 400 MHz, 256 MB DRAM
- DLU : Ethernet Extension Board (Ethernet cable)
- MEM : 4 MB, Battery Backup
- FBC : Dual Ethernet (100 Mbps)
- Redundancy form : a shelf standby method.
- Max. RCS Station : 32 Station.
- Max. Point of 1 station : Digital 3,840 or Analog 960

**I/O Shelf**
An I/O shelf collects the on-site data, notifies them to the MPU shelf, and then outputs the results of the MPU shelf’s control computation to the site. To ensure reliability, the entire power supply (SPS, DPS) and communication unit (DCU) of the MASTER P-5000 RCS’s I/O shelf can be made redundant. all I/O board supports Hot-swapping.

- Backplane : LS Private BUS
- DCU : Single Ethernet (100 MB)
- I/O : DIM/DOM, AIM/AOM, RTD, TCM, PIM Board
- Redundancy form : SPS, DPS, DCU
- Max. I/O Board : 120 EA 10 Board x 12 I/O Shelf
- Supports Hot-Swapping (DCU, I/O board)
### SPECIFICATION AND FEATURES OF MAJOR COMPONENTS

#### MPU Shelf Components

**Type**
- SPS  
- MPU  
- DLU  
- MEM (include MFM Func.)

**Specification**
- **SPS**:
  - **Input Power**: DC 24V
  - **Output Power**: DC 5V/30A (150W)
  
- **MPU**:
  - CPU: Pentium 400 MHz
  - DRAM: 256 MB DRAM
  - Network: Ethernet 10/100Mbps 2 Ports

- **DLU**:
  - Ethernet Extension Board
  - Cable Interface: Ethernet cable

- **MEM (include MFM Func.)**:
  - Memory Size: 4 Mbyte
  - Battery Backup: The retention period in case of power failure is 8 years for 2MB, 4 years for 4MB
  - Show LED Matrix

**Features**
- **SPS**:
  - Supply the power to each board of the MPU shelf.
  - Overcurrent / overvoltage protection, output compensation, power failure detection, and auto switching during the configuration of redundancy.

- **MPU**:
  - On-site data monitoring, sequence control using the IEC61131-3 control language, real-time/periodic task execution, phase control, RAS creation, redundancy control logic, mode selection, and report creation.

- **DLU**:
  - Redundant board used in the redundancy of the MPU shelf.
  - Monitoring other MPU shelf, equalization by renewing control-related output, parameters, etc.

- **MEM (include MFM Func.)**:
  - Able to retain control logic and operation data using a backup battery even when the power is off.
  - Low battery display function

#### I/O Shelf Components

**Type**
- SPS  
- DIM  
- DOM  
- AIM  
- TCM  
- RTD  
- AOM  
- PIM

**Product Name**
- SPS-802  
- DIM-801  
- DOM-802  
- AIM-801  
- AIM-852  
- TCM-872  
- RTD-882  
- AOM-801  
- AOM-802  
- AOM-862  
- PIM-801

**# of Channel**
- 32  
- 16  
- 16  
- 8  
- 8  
- 4  
- 4  
- 8  
- 2

**Signal**
- Input Power: 24VDC, Output Power: 5VDC (35W)
  
- DC24V, 32P/1COM, P/N COMM
  
- DC24V, 16P/1COM, P/N COMM
  
- DC1~5V
  
  
- PT100, JPT100
  
- DC 24V 200 kbps, Open Collector Type

**Error Rate**
- ±0.2%
- ±0.05%
- ±0.1%
- ±0.2%

### SPECIFICATION AND FEATURES OF MAJOR COMPONENTS

#### MPU Shelf Components

- **Type**
  - SPS  
  - MPU  
  - DLU  
  - MEM (include MFM Func.)

- **Specification**
  - **SPS**:
    - Input Power: DC 24V
    - Output Power: DC 5V/30A (150W)

  - **MPU**:
    - CPU: Pentium 400 MHz
    - DRAM: 256 MB DRAM
    - Network: Ethernet 10/100Mbps 2 Ports

- **DLU**:
  - Ethernet Extension Board
  - Cable Interface: Ethernet cable

- **MEM (include MFM Func.)**:
  - Memory Size: 4 Mbyte
  - Battery Backup: The retention period in case of power failure is 8 years for 2MB, 4 years for 4MB
  - Show LED Matrix

- **Features**
  - **SPS**:
    - Supply the power to each board of the MPU shelf.
    - Overcurrent / overvoltage protection, output compensation, power failure detection, and auto switching during the configuration of redundancy.

  - **MPU**:
    - On-site data monitoring, sequence control using the IEC61131-3 control language, real-time/periodic task execution, phase control, RAS creation, redundancy control logic, mode selection, and report creation.

  - **DLU**:
    - Redundant board used in the redundancy of the MPU shelf.
    - Monitoring other MPU shelf, equalization by renewing control-related output, parameters, etc.

  - **MEM (include MFM Func.)**:
    - Able to retain control logic and operation data using a backup battery even when the power is off.
    - Low battery display function

#### I/O Shelf Components

- **Type**
  - SPS  
  - DIM  
  - DOM  
  - AIM  
  - TCM  
  - RTD  
  - AOM  
  - PIM

- **Product Name**
  - SPS-802  
  - DIM-801  
  - DOM-802  
  - AIM-801  
  - AIM-852  
  - TCM-872  
  - RTD-882  
  - AOM-801  
  - AOM-802  
  - AOM-862  
  - PIM-801

- **# of Channel**
  - 32  
  - 16  
  - 16  
  - 8  
  - 8  
  - 4  
  - 4  
  - 8  
  - 2

- **Signal**
  - Input Power: 24VDC, Output Power: 5VDC (35W)
    
  - DC24V, 32P/1COM, P/N COMM
    
  - DC24V, 16P/1COM, P/N COMM
    
  - DC1~5V
    
    
  - PT100, JPT100
    
  - DC 24V 200 kbps, Open Collector Type

- **Error Rate**
  - ±0.2%
  - ±0.05%
  - ±0.1%
  - ±0.2%

### Notes
- It may vary according to the model in use and project environments. For more information, please see ‘MASTER P-5000 User Manual’.
Operator Interface Station

- User friendly: Upon logging in, previous operation settings will be retrieved, and operator settings will be initialized. (Saves/Opens operation screen arrangement information for each operator.)
- Windows integration: Provides a system windows program and a viewport (single line diagram, and P&I monitoring & control screen container) for system operation.
- Provides a solution specially designed to furnish major real-time information during the operation of a system.

Plant Screen
- Process system monitoring & control
- Template page conversion
- Navigation and tabular page functions

Alarm Screen
- Displays information on whether the alarm is recognized, and the operation history.
- Real-time search function
- Alarm history search function

Trend Screen
- Displays real-time trend or trend history data
- Processes the data collected at different times
- Displays a chart in various formats

System Status Screen
- Monitors the status of main elements of a system, such as RCS, network, etc.
- Displays detailed information of MPU and I/O cards of each station.
- Hierarchical screen arrangement

Group Overview Screen
- Provides a clear picture of alarm status of an entire plant
- A click on the group where the alarm occurred brings up the corresponding operation group screen.
- Hierarchical screen arrangement

Operation Group Screen
- Displays related points as a group.
- Displays data in various formats without any additional graphic work
- A click on a tag brings up the loop screen.

Loop Screen
- Displays tags of module types including PID.
- Controls various settings and operation modes
- Provides a real-time trend graph.

Report Screen
- Provides hourly, weekly, monthly, annual and prompt reports.
- Allows viewing, editing, processing and modifying the report data using Excel.

Engineering Work Station

- Supports IEC61131-3 international standard control language – Provides a Function Block, a Ladder Diagram, and a Sequential Function Chart.
- Provides an integrated engineering tool that can run every engineering program and satisfy various user needs.
- Incorporates a cross reference function to increases the engineer’s convenience and reduce the engineering time.
- Allows importing/exporting the information of point tags and the control logic of on-site devices to reduce the engineering time.

Integrated Engineering Screen
- Provides an integrated environment for all tools required for engineering in relation with system operation
- Provides convenient functions, such as Drag & Drop, IntelliSense, etc.
- User group and user access settings
- Trend-related group/ style settings
- Algorithm editing and management

Graphic Builder Screen
- Provides a wide range of graphic objects and dynamic characteristics
- Graphic symbol library management function
- Head/Tail layer setting function, and action processing for user events

Report Definition Screen
- Developed as an Excel add-on (Office 2007 or higher version)
- Various display formats including a chart and a graph
- Various link functions to display data on the screen

Integrated Database Editor Screen
- Provides various filters and sorting functions
- Easy-to-use user GUI

I/O Engineering Screen
- Allows setting the I/O board definitions and parameters
- Allows downloading the I/O board definitions and parameters
- Emulation function

Function Block Diagram Editor Screen
- Provides a system function block with various functions
- Allows writing a custom function block

Sequential Function Chart Editor Screen
- Process writing using Step, Action, and Translation.
- Appropriate for a Batch Process.

Ladder Diagram Editor Screen
- Central logic writing using Ladder
- The relay logic and the function block can be combined together for use.
### Database Processing Center

- **DPC function**: Data collection, data processing, alarm and history data storage, operator interface.
- **Redundant configuration**: of the system and the network. Supports the configuration of a stand-alone system.
- **Real-time DBMS**: Provides an optimized real-time interface operation environment.
- **Supports device driver**: to obtain data from RCS, TMTC, SOE, PLC (GL6FA, XGT) or other company’s controllers.
- **Provides GPS time server interface**: for time synchronization, and supports time synchronization for RCS/SOE controllers.

### Web Client/Server

- **Applies the Microsoft web server program** IIS (Internet Information Service).
- **Supports HTTP, ASP, and ASPX pages**.
- **Applies MS SQL Server as a web server database**.

### Plant History System

- **High-speed Trend Screen**: High-speed data saving by the event processing method (50 msec x n (integer)).
- **With the server separated from the collector**, it prevents data error in case of an overcurrent of the server.

### Alarm Server

- **Characteristics Curve Screen**: Provides an easy-to-understand comparison between ideal and actual values by displaying on the screen, first, the ideal values preset by a user, and then the actual values.
- **X-Y Plot Screen**: Displays a graph that shows the trend of changes in interconnected points.

### OPC Client/Server

- **OPC Client**: Reads and writes the data from the OPC server of another company’s system.
- **OPC Server**: Supports the tag data information OPC-DA interface of our MASTER P-5000 system.
For your safety, please read user’s manual thoroughly before operating.

- Contact the nearest authorized service facility for examination, repair, or adjustment.
- Please contact qualified service technician when you need maintenance.
- Do not disassemble or repair by yourself!
- Any maintenance and inspection shall be performed by the personnel having expertise concerned.

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