### Specifications

#### Digital Output Module

**Model Selection**

<table>
<thead>
<tr>
<th>Series</th>
<th>Model No.</th>
<th>Name</th>
<th>Model</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>80700225-010</td>
<td>SLP-NX-J70PRO</td>
<td>Digital output module (Transistor output sink type)</td>
<td>Non-ring connection</td>
<td>Screw terminal block</td>
</tr>
<tr>
<td>80700224-010</td>
<td>SLP-NX-J71PRO</td>
<td>Digital output module (Transistor output source type)</td>
<td>Ring connection</td>
<td>Screwless terminal block</td>
</tr>
</tbody>
</table>

**Specifications**

- **External dimensions:**
  - Width: 60 mm
  - Depth: 100 mm
  - Height: 22 mm

- **Specifications overview:**
  - **Output specifications:**
    - Number of outputs: 16
    - Current per output: 100 mA max.
    - Voltage per output: 24 Vdc
  - **Insulation:**
    - Double insulation
  - **Output type:**
    - Digital outputs (Transistor output

- **Events output:**
  - **Power consumption:** 4 W max. (under operating conditions)

- **Peripheral tools:**
  - **PID Simulator:** An engineering tool equipped with a process simulator
  - **Tools for monitoring and initial configuration:**

- **Engineering Tools:**
  - **Model No.**
  - **Name**
  - **Description**

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Enter the World of New Instrumentation

The PID controller has evolved, and long-awaited instrumentation for connecting networks has arrived.

Network Instrumentation Module

Network Instrumentation Module offer advanced control technology using networks to meet customers’ requirements.

Support for High-capacity Communication

Ethernet interface is standard in all modules, allowing high-speed communication with a variety of devices. Full-scale distributed deployment is achieved through distribution of functions, saving space and reducing wiring. Batch management of multiple devices through Ethernet communication improves engineering efficiency.

Optimization Management

The supervisor module coordinates multiloop cooperative control between the modules.

More Environmentally Friendly Control

Highly sensitive process control that is also environmentally friendly. Process simulation facilitates optimal control.

1. All modules have LED indicators for easy viewing of operation status.
2. Compact and highly functional supervisor module.
3. Easy to operate, and can also be used as a standalone unit.
4. I/O signals can be exchanged between modules (except NX-D15).
5. With work efficiency as a key design principle, modules can be installed and uninstalled without using tools.
6. Daisy chain Ethernet connection saves space and reduces wiring.
Support for High-capacity Communication/Ethernet Communication

**Etherrnet**
- RS-485

- Another manufacturer’s programmable display
- Digital Indicating Controller SDC Series
- Digital Mass Flow Controller MQV Series
- Engineering tools SLP-NX

- Communication Controller CMCS15G

**Standard Ethernet Hardware**
Each module can communicate through Ethernet. High-speed communications at up to 100 Mbps.

- Whether modules are linked or dispersed, wiring can be greatly reduced by using a daisy chain configuration.
- Each module also has an RS-485 communication function. RS-485 and Ethernet communications can be used at the same time.
- Modules are capable of high-speed communications with host systems, programmable logic controllers (PLCs), display devices, etc.
- A network equipped with Network Instrumentation Modules can be upgraded to use Azbil Corporation’s monitoring and control system.

**Full-fledged Distributed Layout**
With Ethernet connections, there is no difference in function between distributed and contiguous layouts.

**Redundant Communications**
Ether or non-ring connection is possible on an Ethernet network.

- A non-ring connection is a daisy chain connection.
- Ring connection

An Ethernet network in a ring topology. If an error occurs along the communication path, loopback ensues communications.

**Problem**

**Loopback communication**
Optimization Management

1. Control of Temperature Difference between Zones

Mutual interference among multiple control loops is prevented, and a constant difference in temperature is maintained between the controlled variables (temperatures) of the loops when the temperature is rising or when responding to disturbances. Yield can be expected to improve due to energy savings and quality improvement.

2. Process Simulation (PID Simulator)

PID Simulator collects Process Variable (PV) and Manipulated Variable (MV) and reproduces the equipment's characteristics on a personal computer. The optimum PID values and the start-up characteristics of the equipment can be adjusted on the PC.

Available controller modules: NX-D25, NX-D35

Note: Some processes may not be suitable for PID Simulator use.

More Environmentally Friendly Control

1. Peak Power Suppression Control

This function controls peak power by means of time-sharing of the output of 2 loops within the time proportional output cycle time.

The supervisor module selects the optimal loop combination from multiple loops. Peak power for start-up heating is dramatically reduced (up to 50%).

2. Optimal Start-up Control

Synchronized or optimized start-up control reduces energy losses. When fast and slow rising loops coexist in the same equipment or process (multiple pieces of equipment), this helps greatly in reducing energy consumption.

Before

- Overshoot
- Wasted energy
- Fluctuating product quality

Temperature

Control output

After

- Shorter startup time
- Better energy efficiency
- Improved efficiency

Temperature

Control output

Available controller modules: NX-D25, NX-D35

Peak power suppression control

Normal control

Peak power situation

Optimal start-up control

Reducing temperatures converge for synchronized start!

Synchronization and optimization

Various start times

100% output after start-up, no matter the demand.
Advanced Functions

1. **Measurement of AC Current (RMS)**
   - Up to four current transformer inputs (optional)
   - Both phase-controlled and cycle-controlled heater current
   - Other AC current (fan, compressor, etc. load current) can also be measured
   - Analog/digital values, etc. can be exchanged between modules.
   - Data update frequency of 400 ms.
   - Data can be sent to 4 modules (max.) from a single module.

2. **Data Transfer between Modules**
   - Analog/digital values, etc. can be exchanged between modules.
   - Data update frequency of 400 ms.
   - Data can be sent to 4 modules (max.) from a single module.

3. **Logical Operations (simple logic)**
   - Up to 32 logical operations with a circuit containing 4 inputs and 1 output can be preset (NX-DY).
   - Logical operations can be selected from among 4 types.
   - Simple logical actions can be carried out by combining logical operations.

4. **Cascade Control**
   - Improves the controllability of control systems that have a large amount of dead time.
   - In an ordinary control system, if a disturbance (D) occurs, the controlled variable (PV1) changes after the dead time elapses and then corrective action is taken by the feedback control starting from this point. In a cascade control system, the controlled variable (PV2) in the secondary control system changes immediately and corrective action starts at this point, resulting in less variation of the controlled variable (PV1) in the primary control system.

**Logic diagram**

- **Type A**
  - Control panel upgraded with Network Instrumentation Module
- **Type B**
  - Existing control panel

**Types of logical operations (4)**

1. **Input contacts (4)**
2. **Output contacts (3)**
3. **Logical operation**
4. **Input contacts (4)**

**Note:** Does not apply to supervisor modules.
### Hardware

1. **Small but Mighty**
   - Compact body (30 x 100 x 154 mm)
   - Up to 4 analog inputs and 4 analog outputs
   - 4 current transformer inputs (option)
   - High accuracy: 0.1% FS*
   - High-speed sampling: 100 ms*
   - For use with Network Instrumentation Modules.
   - The SLP-NX Smart Loader Package (sold separately) is available for use with Network Instrumentation Modules.

2. **Easy Assembly**
   - Each module consists of a base, a body, and a terminal block.
   - Modules can be easily installed and uninstalled without tools.

3. **Flexible Layout**
   - Contiguous modules or distributed layout
   - Input/output signals can be shared between modules.
   - Using Ethernet connections, wiring for communications is reduced and space is saved.
   - In a distributed layout, modules can be linked as well as when they are physically contiguous.

### Engineering tools
The SLP-NX Smart Loader Package (sold separately) is available for use with Network Instrumentation Modules.
- A PC can be connected to modules via Ethernet.
- Multiple modules** can be controlled at the same time.
- This reduces engineering time and improves the efficiency of testing operations too.
- Individual modules can also be set up by connection a dedicated loader cable.

*The maximum number of modules is 3 (excluding communication box/adapter and terminal adapter).

### Module Selection Flow Chart

<table>
<thead>
<tr>
<th>Configuration</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>CB 1, 2, 3 for CB</td>
<td></td>
<td>N non-ring</td>
<td>CB 1, 2, 3 for CB, N non-ring</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>CB 1, 2, 3 for CB, N non-ring</td>
<td>CB 1, 2, 3 for CB, N non-ring</td>
<td>CB 1, 2, 3 for CB, N non-ring</td>
<td>CB 1, 2, 3 for CB, N non-ring</td>
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</tr>
<tr>
<td>C</td>
<td>CB 1, 2, 3 for CB</td>
<td></td>
<td>N non-ring</td>
<td>CB 1, 2, 3 for CB, N non-ring</td>
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</tr>
<tr>
<td>D</td>
<td>CB 1, 2, 3 for CB, N non-ring</td>
<td>CB 1, 2, 3 for CB, N non-ring</td>
<td>CB 1, 2, 3 for CB, N non-ring</td>
<td>CB 1, 2, 3 for CB, N non-ring</td>
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</tr>
<tr>
<td>E</td>
<td>CB 1, 2, 3 for CB</td>
<td></td>
<td>N non-ring</td>
<td>CB 1, 2, 3 for CB, N non-ring</td>
<td></td>
</tr>
</tbody>
</table>

*Any redundant communication between modules (ring connection)?

---

**Stand-alone modules**
- Power supply, control, and communication functions are consolidated into 1 module.
- In addition to PID control, stand-alone modules can monitor analog values, totalize flow rate based on pulse input, and perform simple logical actions via digital I/O (available functions differ depending on the module).
- Module are operated based on parameter settings only, making them simpler to operate than a PLC.

### High-speed sampling
- 100 ms*

### High accuracy
- 0.1% FS*
Module Selection Flow Chart [for RS-485 communication]

Communication with host device by RS-485
(See page 14 for Ethernet communication)

Transfer data between modules?
Yes
No

Use redundant communication between modules (ring connection)?
Yes
No

Use multiloop cooperative control?
No

Transfer data between modules?
Yes
No

Use redundant communication between modules (ring connection)?
Yes
No

Configuration
A
B
C
D
E
F

A
"Ring connection" for SI and TC ≥ 1
Ring connection" for SI and TC ≥ 1
"Ring connection" for TC ≥ 1
"Ring connection" for TC ≥ 1
"Ring connection" for TC ≥ 1

B
"Ring connection" for SI and TC ≥ 1
"Ring connection" for SI and TC ≥ 1
"Ring connection" for TC ≥ 1
"Ring connection" for TC ≥ 1
"Ring connection" for TC ≥ 1

C
"Ring connection" for SI and TC ≥ 1
"Ring connection" for SI and TC ≥ 1
"Ring connection" for SI and TC ≥ 1
"Ring connection" for SI and TC ≥ 1
"Ring connection" for SI and TC ≥ 1

D
"Ring connection" for TC ≥ 1
"Ring connection" for TC ≥ 1
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E
"Ring connection" for TC ≥ 1
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"Ring connection" for TC ≥ 1
"Ring connection" for TC ≥ 1

F
"Ring connection" for TC ≥ 1
"Ring connection" for TC ≥ 1
"Ring connection" for TC ≥ 1
"Ring connection" for TC ≥ 1
"Ring connection" for TC ≥ 1

* A digital input module or digital output module can also be used.

Controller Module --- Process controller (4-channel or 2-channel)

Model Selection...NX-D15/25/35 Model-4 channel

Standard conditions
Ambient temperature
0 °C to 50 °C

Operating conditions
Ambient temperature
-10 °C to 60 °C

Other
Ambient temperature
5 °C to 45 °C

Controller module ±0.1 % FS, 100 ms sampling, 2 loops

Number of inputs (2)
Number of outputs (2)

Other
DIN rail

Specifications overview

Indication accuracy
0.05 % FS ± 1 digit

Thermocouple
Type N
Type K
Type J
Type T
Type E
Type R
Type S
Type B

Open terminal voltage:
2 V min.

Analog voltage output
4 to 20 mA
0 to 20 mA

Analog current output
100 to 200 mA
4 to 20 mA
0 to 20 mA

Transistor output
1 A (diode)
0.5 A (PNP)

Digital input
4 points

Power consumption
5 W max.

External dimensions

5FSNJOBM

Thermocouple

External dimensions

5FSNJOBM

Thermocouple

External dimensions

5FSNJOBM

Thermocouple

External dimensions

5FSNJOBM

Thermocouple

External dimensions

5FSNJOBM

Thermocouple

External dimensions

5FSNJOBM

Thermocouple

External dimensions

5FSNJOBM

Thermocouple

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External dimensions

5FSNJOBM

Thermocouple

External dimensions

5FSNJOBM

Thermocouple

External dimensions

5FSNJOBM

Thermocouple
These products are compliant with Korean safety standards.

### Specifications

#### Communication Adaptor --- Ethernet interface (1 port)

**Model Selection**

<table>
<thead>
<tr>
<th>Model No.</th>
<th>Option 0</th>
<th>Option 1</th>
<th>Option 2</th>
<th>Option 3</th>
<th>Additional</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</table>

#### External dimensions

![Dimensions](image-url)

#### Specifications overview

<table>
<thead>
<tr>
<th>Feature</th>
<th>Option 0</th>
<th>Option 1</th>
<th>Option 2</th>
<th>Option 3</th>
<th>Additional</th>
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<tbody>
<tr>
<td>Power consumption</td>
<td>4 W max.</td>
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<td>Connection</td>
<td>1</td>
<td>2</td>
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<td>Type</td>
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<tr>
<td>Protocol</td>
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<tr>
<td>Protocol MODBUS</td>
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<tr>
<td>Protocol CPL/TCP</td>
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<tr>
<td>Protocol RTU/ASCII</td>
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</tr>
<tr>
<td>Signal level</td>
<td>RS-485</td>
<td></td>
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<tr>
<td>Termination resistance</td>
<td>115,200 bps max.</td>
<td></td>
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<tr>
<td>Transmission speed</td>
<td>115,200 bps max.</td>
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<tr>
<td>Terminating resistor</td>
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<tr>
<td>Protocol MODBUS</td>
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</table>

#### Supervisor Module --- Multi-loop harmonized operation controller

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#### External dimensions

![Dimensions](image-url)

#### Specifications overview

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<td>Power consumption</td>
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<td>Input specifications</td>
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</table>

#### Digital Input Module --- Digital and pulse input module (16 inputs)

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#### External dimensions

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