Pro-face’s LT Series models combine control, operation and display functions into a single, easy-to-view, low-cost controller. No more need for expensive, complex, bulky production control systems. The LT’s built-in controller brings multi-functional, high-quality control to a wide range of systems, such as the processing, textile, printing, parts assembly, agriculture and maritime applications. LT Series of products opens up an entirely new field in factory automation and lets you build safer, more accurate production systems.

**Which means...**

- **Graphical display and Touch Operation!**
  - Easy-to-read graphic display and convenient touch-sensitive screen.
- **Software advantages!**
  - Dynamic linkage between HMI and control.

**Less wiring and less space!**
- Connection is simple and the control panel is compact.
- Frees up space around the control panel!

**Advantages:**
- Simple wiring means easier maintenance too.
- Less wiring and less space!
- Graphical display and Touch Operation!
- Frees up space around the control panel!

**LT Color Now Available!**

The new LT color display is easier to see than monochrome monitors, making it easier to monitor status in the workplace and improving control of the production floor.

**Improves visibility by**
- Color-coding graphics and text.
- Makes warnings and alarms easier to understand.

**Enables instant device status verification with BMP image display.**

**LT Design Software**

**GP-PRO/PBIII**

- Easy Screen Creation
- Easy Logic Programming

- Supports Ladder Monitor
- Variety of Ladder Instructions
- Expanded Alarm Summary
- Improved Keypad Display Function
- Various graphic types Available

**Data created with LT Editor can also be used.**

See our Web site for LT Series system application examples: [http://www.pro-face.com](http://www.pro-face.com)
Our complete lineup matches your needs

### Specifications (Common to All Models)

#### Functional Specifications

<table>
<thead>
<tr>
<th>Model</th>
<th>Item</th>
<th>Type</th>
<th>Type B+</th>
<th>Type B</th>
<th>Type C</th>
<th>Type H</th>
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<td>Input Voltage</td>
<td>DC20.4V to DC28.8V</td>
<td>DC20.4V to DC28.8V</td>
<td>DC20.4V to DC28.8V</td>
<td>DC20.4V to DC28.8V</td>
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<tr>
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</tbody>
</table>

#### General Specifications

- **Panel Cut**
- **Side View**

#### External Dimensions

- LT150-SC41-XY32SK-24V
- LT150-SC41-XY32KF-24V
- LT150-SC41-AD*K-24V
- LT150-SC41-ADPC-24V
- LT150-BG41-XY32SC-24V
- LT150-BG41-XY32SK-24V
- LT150-BG41-AD*K-24V
- LT150-BG41-ADPC-24V

#### Certifications

- CE Marking (EN55011 class A, EN61000-6-2), UL / C-UL (UL 508, UL1604)
- IEC61131-2 (JIS B 3502) compliant

#### Environmental Specifications

- **Nominal Display Area**
- **Electrostatic Discharge Immunity**
- **Atmospheric Endurance**
- **Vibration Resistance**
- **Voltage Endurance**
- **Backlight**
- **Clock Accuracy**
- **Display Sizes**
- **Grounding**
- **Data Backup**
- **Memory**
- **Characters Text Control**
- **External Dimensions**

#### Internal Specifications

- **Weight**
- **Font Sizes**
- **Font Type**
- **Font Size**
- **Resolution**
- **Color Type**
- **Gradation**

#### Technical Specifications

- **External Dimensions**
- **Electrical Specifications**
- **Environmental Specifications**
- **Structural Specifications**

### Notes

1. **Remote I/O (Flex Network)**
2. **Shared with DC24V output.**
3. **Compatible with Flex Network units.**

---

**LT Series Specifications**

[See our Web site for LT Series system application examples.](http://www.pro-face.com)
Integrates easily into compact equipment

- DIO Units
- Analog Units
- High-speed Counter Unit
- Single-axis Positioning Unit

Use the LT's 5.7-inch built-in Remote I/O (Flex Network) equipped with 32-point I/O points used for equipment control.

Further expansion with the SIO I/F, in addition to the Remote I/O (Flex Network) system.

Reduce wiring and expands system scalability

Use Flex Network to connect up to 1008 points (63 nodes) over a maximum of 400m (with 6Mbps, 200m x 2 ch).

Connect to temperature controllers, inverters, PCs and single-board controllers

Further expansion with the SIO I/F, in addition to the Remote I/O (Flex Network) system.

LT Series System Design and Options

## Analog I/O

The LT Series is equipped with analog I/O, allowing for temperature input and pulse output.

### Temperature Input
- Thermocouple Temperature Input (J/K)
- Pt100 Temperature Input

### Pulse Output
- 5 point pulse output (5kpps)
- 2.5kHz PWM for each point
- Combined use of high-speed counter with output

### Analog Output
- 32-point analog output
  - 0-20mA (16 points) / 0-10mA (16 points)

### Analog Input
- 16 input points
  - DC24V 16 input points
  - Thermocouple Temperature Input

### Functions
- Control pressure and flow
- Set positioning
- Monitor temperature, etc.

---

### Optional Items

#### Software Options
- Data Transfer Cable
- USB Interface Cable
- GPW-CB03 Data Transfer Cable
- GPW-CB02 Analog I/F

#### Maintenance Options
- Power Supply Terminal Block
- Tool Connector
- Flex Network Status LED

#### Peripheral Options
- Single-axis Motor Driver Connection Cable
- Flex Network Communication Cable
- Single-axis Teaching Loader Cable

#### Interface Options
- Graphic Display Screen
- Touch Panel
- I/O LED
- Power Supply Terminal Block
- System Connector
- Tool Connector
- Flex Network Status LED
- Graphic Display Screen
## LT Series Built-in Interface Specifications

### I/O Interface Connector Specifications, I/O Circuit Diagrams

The four-source type DIO integrates 16 input/output points into a compact unit. The Type A1A2B+LT supports up to 16-point inputs and 16-point outputs, ideal for connecting peripheral I/O devices.

### I/O Connectors (Type A1B+: Source Output)

### I/O Connectors (Type A2: Source Output)

### I/O Circuit Connection

### DIO Connector

**Connection Method: Internal**

**World Note:**

- **Connection Section:**
  - **Input Circuit:**
    - Type A1/B+:
      - COM(0V:DIN)
      - A1
      - B1
    - Type A2:
      - COM(0V:DIN)
      - A1
      - B1
    - **Output Circuit:**
      - Type A1/B+:
        - COM(0V:DOUT)
        - A1
        - B1
      - Type A2:
        - COM(0V:DOUT)
        - A1
        - B1
    - **Internal Power Supply:**
      - DC 24V<br>**Rated Voltage**

### Communication I/F Specifications

**Communication Configuration:**

- **Max. Distance:**
  - 1 Mbps: 150 ft. (12Mbps: 100 ft.)
- **Communication Method:**
  - Multi-Drop Connection
- **Communication Speed:**
  - 1 Mbps (selectable)

### Serial I/F (SIO) Specifications

**Serial I/F**

- **Max. Distance:**
  - 1 Mbps: 150 ft. (12Mbps: 100 ft.)
- **Communication Method:**
  - Multi-Drop Connection
- **Communication I/F:**
  - SIO
- **Max. Distance:**
  - 1 Mbps: 150 ft. (12Mbps: 100 ft.)
- **Connection Method:**
  - Multi-Drop Connection
- **Max. Number of Nodes:**
  - 1: N
- **Max. Delay:**
  - 1.5ms or less
- **Max. Number of Nodes:**
  - 1: N

### Remote I/O (Flex Network) Specifications

**This LT unit's high-speed remote I/O (6Mbps/12Mbps) is so fast, you won't think you are using a remote connection.**

Up to 1000 I/O points can be connected, with a communication delay of only 0.8ms (for 512 points at 12Mbps). The network can be extended up to 400 meters (2 channels at 8Mbps).

### I/O Connector Specifications

<table>
<thead>
<tr>
<th>Pin No.</th>
<th>Condition</th>
<th>Signal Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
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<td>SLD</td>
</tr>
<tr>
<td>5</td>
<td>Channel 2 communication data</td>
<td>TR-</td>
</tr>
<tr>
<td>4</td>
<td>Channel 2 communication data</td>
<td>TR+</td>
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<tr>
<td>3</td>
<td>Channel 1 shield line</td>
<td>SLD</td>
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<tr>
<td>2</td>
<td>Channel 1 communication data</td>
<td>TR-</td>
</tr>
<tr>
<td>1</td>
<td>Channel 1 communication data</td>
<td>TR+</td>
</tr>
</tbody>
</table>

### Common I/F Specifications

**Alarm Output**

- **Contact Rating:**
  - AC/DC 5V at 120mA (resistance load), DC24V at 60mA (resistance load)
- **Set Time (at 20°C):**
  - 4ms or less
- **Reset Time (at 20°C):**
  - 4ms or less
- **Initial Contact Resistance:**
  - 150m or less

**Tool Connector**

- **Type:**
  - Synchronous, TTL level compatible and conforming to EIA/JEDEC Standards

**During Operation:**

- **Connect a variety of devices including a bar code reader.**
I/O Interface Specifications

### Analog Input Circuit

- **Input Specifications**: 4000 (0mA to 20mA), 4095 max. (at 20.475mA)
- **Output Specifications**: 0V to 10V (10.2375V max.)

### Analog Output Circuit

- **Output Specifications**: 0.2 A/point, 0.8 A/common, 0.5 A/point, 2 A/common

### I/O Circuit Connection

- **DIO Connector**: Includes signal names ( ) indicating Pulse output (PLS*), PWM output (PWM*), or Counter Input (CT*).
- **Pin Assignments**: Shows the layout of the pin connections for DIO input and output channels.

### High-speed Counter Input

- **Specifications**: 1.0% of full scale (0 to 4000 (0 to 10V), 4095 max. (at 10.2375V))

### Analog I/O Circuit Connection

- **Input Specifications**: Linear with a resolution of 12 bits
- **Output Specifications**: Linear with a resolution of 12 bits

### About COM

- **Characteristics**: Describes the behavior of the COM connector under various conditions.

### Analog Input/Output

- **Specifications**: Provides detailed specifications for input and output voltages, currents, and other parameters.

### Analog Input/Output Connector

- **Pin Assignments**: Shows the layout of the pin connections for analog input and output channels.

---

See our Web site for LT Series system application examples: [http://www.jem-con.com]
**Temperature Input**

### PT100 Input

- **Specifications**
  - Insulation Resistance
  - Subjected Resistance
  - Temperature Sensor
  - Temperature Range

### Thermocouple Input

- **Specifications**
  - Insulation Resistance
  - Subjected Resistance
  - Temperature Sensor
  - Temperature Range

**Note:**
- When extending the Pt100 input wire, make sure that the three conductors have exactly the same length.
- When wiring external power to the Analog Input connector, connect 24V to No. 4 pin, and 0V to No. 5 pin.
- Make sure the compensating lead wire is connected with the correct polarity. If the polarity is reversed, temperature measurements will be incorrect.
- The error detection characteristics are as follows:
  - Accuracy: ±1.0% (Full Scale)

**Temperature Conversion Data**

- **Celsius:** -50 to +400
- **Fahrenheit:** -580 to +7520

**Pin Assignments**

- **TC1-**
  - Pin 1: +
  - Pin 2: -
  - Pin 3: GND
- **TC1+**
  - Pin 1: +
  - Pin 2: -
  - Pin 3: GND
- **TC2-**
  - Pin 1: +
  - Pin 2: -
  - Pin 3: GND
- **TC2+**
  - Pin 1: +
  - Pin 2: -
  - Pin 3: GND
- **TC3-**
  - Pin 1: +
  - Pin 2: -
  - Pin 3: GND
- **TC3+**
  - Pin 1: +
  - Pin 2: -
  - Pin 3: GND

**Connectable Controllers**

- **Yokogawa**
  - ML2
- **Shinko**
  - MA900
- **OMRON**
  - SRX
- **Fuji Electric**
  - FRENICS5000P11S
- **ShindEN**
  - TTM-005
- **MR13**
  - TTM-110
- **MINAS-A**
  - TTM-110B
- **JE-70**
  - TTM-10L
- **JE-71**
  - TTM-10
- **JE-72**
  - TTM-1020
- **JE-73**
  - TTM-1030
- **JE-74**
  - TTM-1040

**Memory Link (General Purpose Protocol)**

- **Shinko**
  - PC-900
- **Fuji Electric**
  - FCL

**Inverters**

- **Mitsubishi Electric**
  - FREQROL-A500
  - FREQROL-A500L
  - FREQROL-F500
  - FREQROL-F500L
  - FREQROL-BP
  - FREQROL-B3
  - FREQROL-BP1

**Servos**

- **Toshiba Electric**
  - VF-nC1
  - VF-S11

**Analyzer**

- **Matsushita Electric**
  - PC-900

**Connectable Controllers**

<table>
<thead>
<tr>
<th>Manufacturer</th>
<th>Model</th>
<th>Connectable Controllers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yokogawa</td>
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<td>Mitsubishi</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Analyzer</td>
<td></td>
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</tr>
</tbody>
</table>
Supports Ladder Monitor

Provides control in emergency situations, when you want to see equipment programs on location.

Allows LT ladder monitoring on the touch panel without disrupting control or PLC communication and scrolls easily through monitor screens. Variable monitoring (device) and decimal or hexadecimal display are also possible.

Better Input Functionality with Pop-up Keyboards

When using the touch panel to enter values in a settings display, the pop-up keyboard is launched by simply touching the settings display.

Supports Many Kinds of Graphs

Freely choose among line graphs, pie charts, and other kinds of graphs by simply dragging and dropping from the library. Also supports selection of graph background color, making graphs easier to see and use. In addition, the background color for each part can be adjusted to provide easily recognizable screens.

Improved Alarm History Functions

An “Alarm Acknowledge Time/Recovery Time” display has been added to the information presented during an emergency. History function improvements result in better support during emergencies.
### Ladder Logic Instruction List

<table>
<thead>
<tr>
<th>Instruction</th>
<th>Type</th>
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<th>Symbol</th>
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<td>Input</td>
<td>Shift Right with Carry</td>
<td>SRCW</td>
</tr>
<tr>
<td>LD</td>
<td>Input</td>
<td>Logical Negation with Carry</td>
<td>NCCW</td>
</tr>
<tr>
<td>LD</td>
<td>Input</td>
<td>Logical OR with Carry</td>
<td>OCRW</td>
</tr>
<tr>
<td>LD</td>
<td>Input</td>
<td>Logical AND with Carry</td>
<td>ANCW</td>
</tr>
<tr>
<td>LD</td>
<td>Input</td>
<td>Logical XOR with Carry</td>
<td>XWR</td>
</tr>
<tr>
<td>LD</td>
<td>Input</td>
<td>Rotate Left with Carry</td>
<td>ROLC</td>
</tr>
<tr>
<td>LD</td>
<td>Input</td>
<td>Rotate Right with Carry</td>
<td>RORC</td>
</tr>
<tr>
<td>LD</td>
<td>Input</td>
<td>Logical Negation with Carry</td>
<td>NCCW</td>
</tr>
<tr>
<td>LD</td>
<td>Input</td>
<td>Logical OR with Carry</td>
<td>OCRW</td>
</tr>
<tr>
<td>LD</td>
<td>Input</td>
<td>Logical AND with Carry</td>
<td>ANCW</td>
</tr>
<tr>
<td>LD</td>
<td>Input</td>
<td>Logical XOR with Carry</td>
<td>XWR</td>
</tr>
</tbody>
</table>

### Remote I/O (Flex Network) Specifications

#### DIO Terminals

<table>
<thead>
<tr>
<th>Model</th>
<th>PN-X16TS41</th>
<th>PN-X2Y0TS41</th>
<th>PN-X8RL41</th>
<th>PN-Y16S41</th>
<th>PN-Y16SC41</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated Input Voltage</td>
<td>DC24V</td>
<td>DC24V</td>
<td>DC24V</td>
<td>DC24V</td>
<td>DC24V</td>
</tr>
<tr>
<td>Input Type</td>
<td>Type 1</td>
<td>Type 2</td>
<td>Type 1</td>
<td>Type 1</td>
<td>Type 1</td>
</tr>
<tr>
<td>Input Current</td>
<td>1.6A</td>
<td>1.6A</td>
<td>1.6A</td>
<td>1.6A</td>
<td>1.6A</td>
</tr>
<tr>
<td>Allowable Voltage Range</td>
<td>DC20.4V to DC28.8V</td>
<td>DC20.4V to DC28.8V</td>
<td>DC20.4V to DC28.8V</td>
<td>DC20.4V to DC28.8V</td>
<td>DC20.4V to DC28.8V</td>
</tr>
<tr>
<td>Input Type</td>
<td>Source (common for sink/source types)</td>
<td>Source (common for sink/source types)</td>
<td>Source (common for sink/source types)</td>
<td>Source (common for sink/source types)</td>
<td>Source (common for sink/source types)</td>
</tr>
<tr>
<td>Allowable Voltage Drop</td>
<td>±1V</td>
<td>±1V</td>
<td>±1V</td>
<td>±1V</td>
<td>±1V</td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>-40°C to 70°C</td>
<td>-40°C to 70°C</td>
<td>-40°C to 70°C</td>
<td>-40°C to 70°C</td>
<td>-40°C to 70°C</td>
</tr>
<tr>
<td>Humidity</td>
<td>90% RH (max.)</td>
<td>90% RH (max.)</td>
<td>90% RH (max.)</td>
<td>90% RH (max.)</td>
<td>90% RH (max.)</td>
</tr>
<tr>
<td>Vibration Resistance</td>
<td>1.5G at 10Hz, 100Hz, 1ms or less</td>
<td>1.5G at 10Hz, 100Hz, 1ms or less</td>
<td>1.5G at 10Hz, 100Hz, 1ms or less</td>
<td>1.5G at 10Hz, 100Hz, 1ms or less</td>
<td>1.5G at 10Hz, 100Hz, 1ms or less</td>
</tr>
</tbody>
</table>

#### Remote I/O (Flex Network) Specifications

<table>
<thead>
<tr>
<th>Specification</th>
<th>Unit Rated Voltage</th>
<th>Contact Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated Input Voltage</td>
<td>DC24V</td>
<td>1.6A</td>
</tr>
<tr>
<td>Max. Input Current</td>
<td>1.6A</td>
<td>1.6A</td>
</tr>
<tr>
<td>Input Type</td>
<td>Type 1</td>
<td>Type 2</td>
</tr>
<tr>
<td>Input Current</td>
<td>1.6A</td>
<td>1.6A</td>
</tr>
<tr>
<td>Allowable Voltage Range</td>
<td>DC20.4V to DC28.8V</td>
<td>DC20.4V to DC28.8V</td>
</tr>
<tr>
<td>Input Type</td>
<td>Source (common for sink/source types)</td>
<td>Source (common for sink/source types)</td>
</tr>
<tr>
<td>Allowable Voltage Drop</td>
<td>±1V</td>
<td>±1V</td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>-40°C to 70°C</td>
<td>-40°C to 70°C</td>
</tr>
<tr>
<td>Humidity</td>
<td>90% RH (max.)</td>
<td>90% RH (max.)</td>
</tr>
<tr>
<td>Vibration Resistance</td>
<td>1.5G at 10Hz, 100Hz, 1ms or less</td>
<td>1.5G at 10Hz, 100Hz, 1ms or less</td>
</tr>
</tbody>
</table>

#### External Dimensions

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Width</th>
<th>Height</th>
<th>Depth</th>
</tr>
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<tbody>
<tr>
<td>W108mm</td>
<td>4.25in</td>
<td>H45mm</td>
<td>1.77in</td>
</tr>
<tr>
<td>D49mm</td>
<td>1.92in</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Environmental Specifications

<table>
<thead>
<tr>
<th>Specification</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated Input Voltage</td>
<td>DC24V</td>
</tr>
<tr>
<td>Max. Input Current</td>
<td>1.6A</td>
</tr>
<tr>
<td>Input Type</td>
<td>Type 1</td>
</tr>
<tr>
<td>Input Current</td>
<td>1.6A</td>
</tr>
<tr>
<td>Allowable Voltage Range</td>
<td>DC20.4V to DC28.8V</td>
</tr>
<tr>
<td>Input Type</td>
<td>Source (common for sink/source types)</td>
</tr>
<tr>
<td>Allowable Voltage Drop</td>
<td>±1V</td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>-40°C to 70°C</td>
</tr>
<tr>
<td>Humidity</td>
<td>90% RH (max.)</td>
</tr>
<tr>
<td>Vibration Resistance</td>
<td>1.5G at 10Hz, 100Hz, 1ms or less</td>
</tr>
</tbody>
</table>

#### Installation Method

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Natural convection</td>
<td></td>
</tr>
<tr>
<td>Air cooling</td>
<td></td>
</tr>
</tbody>
</table>

#### Electrical Specifications

<table>
<thead>
<tr>
<th>Specification</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated Input Voltage</td>
<td>DC24V</td>
</tr>
<tr>
<td>Max. Input Current</td>
<td>1.6A</td>
</tr>
<tr>
<td>Input Type</td>
<td>Type 1</td>
</tr>
<tr>
<td>Input Current</td>
<td>1.6A</td>
</tr>
<tr>
<td>Allowable Voltage Range</td>
<td>DC20.4V to DC28.8V</td>
</tr>
<tr>
<td>Input Type</td>
<td>Source (common for sink/source types)</td>
</tr>
<tr>
<td>Allowable Voltage Drop</td>
<td>±1V</td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>-40°C to 70°C</td>
</tr>
<tr>
<td>Humidity</td>
<td>90% RH (max.)</td>
</tr>
<tr>
<td>Vibration Resistance</td>
<td>1.5G at 10Hz, 100Hz, 1ms or less</td>
</tr>
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</table>

#### Mechanical Specifications

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Natural convection</td>
<td></td>
</tr>
<tr>
<td>Air cooling</td>
<td></td>
</tr>
</tbody>
</table>

#### Notes

1. When removed is tightened
2. *Closed* input for detecting signals from relay contact points, push buttons, switches or other mechanical contact point devices.

---

**LT Series Ladder Logic Instruction List and Remote I/O (Flex Network)**

17 LT Series Ladder Logic Instruction List and Remote I/O (Flex Network)

18 LT Series Ladder Logic Instruction List and Remote I/O (Flex Network)
### Remote I/O (Flex Network) Specifications

#### DIO Terminals

<table>
<thead>
<tr>
<th>Model</th>
<th>FNI-X32TS41</th>
<th>FNI-XY16SK41</th>
<th>FNI-XY16SC41</th>
<th>FNI-XY32SK41</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input Voltage Range</td>
<td>±15V, ±10V, ±5V, ±3V, ±1V, ±100mA</td>
<td>±15V, ±10V, ±5V, ±3V, ±1V, ±100mA</td>
<td>±15V, ±10V, ±5V, ±3V, ±1V, ±100mA</td>
<td>±15V, ±10V, ±5V, ±3V, ±1V, ±100mA</td>
</tr>
<tr>
<td>Input Impedance</td>
<td>1MΩ</td>
<td>1MΩ</td>
<td>1MΩ</td>
<td>1MΩ</td>
</tr>
<tr>
<td>Voltage Reference</td>
<td>±15V, ±10V, ±5V, ±3V, ±1V, ±100mA</td>
<td>±15V, ±10V, ±5V, ±3V, ±1V, ±100mA</td>
<td>±15V, ±10V, ±5V, ±3V, ±1V, ±100mA</td>
<td>±15V, ±10V, ±5V, ±3V, ±1V, ±100mA</td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>0 to 55°C</td>
<td>0 to 55°C</td>
<td>0 to 55°C</td>
<td>0 to 55°C</td>
</tr>
<tr>
<td>Storage Temperature</td>
<td>-25 to +70°C</td>
<td>-25 to +70°C</td>
<td>-25 to +70°C</td>
<td>-25 to +70°C</td>
</tr>
<tr>
<td>Humidity</td>
<td>5% RH to 95% RH (non-condensing)</td>
<td>5% RH to 95% RH (non-condensing)</td>
<td>5% RH to 95% RH (non-condensing)</td>
<td>5% RH to 95% RH (non-condensing)</td>
</tr>
<tr>
<td>Vibration Resistance</td>
<td>5G (or less) (20 to 2000Hz), 0.15g (max)</td>
<td>5G (or less) (20 to 2000Hz), 0.15g (max)</td>
<td>5G (or less) (20 to 2000Hz), 0.15g (max)</td>
<td>5G (or less) (20 to 2000Hz), 0.15g (max)</td>
</tr>
<tr>
<td>Shock Resistance</td>
<td>10G (max) (11ms)</td>
<td>10G (max) (11ms)</td>
<td>10G (max) (11ms)</td>
<td>10G (max) (11ms)</td>
</tr>
<tr>
<td>Weight</td>
<td>0.17kg (0.37lb)</td>
<td>0.17kg (0.37lb)</td>
<td>0.17kg (0.37lb)</td>
<td>0.17kg (0.37lb)</td>
</tr>
</tbody>
</table>

#### Analog Units

<table>
<thead>
<tr>
<th>Model</th>
<th>FNI-AO4AH11</th>
<th>FNI-DA04AH11</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input Voltage Range</td>
<td>±10V (impedance 1MΩ)</td>
<td>±10V (impedance 1MΩ)</td>
</tr>
<tr>
<td>Input Impedance</td>
<td>1MΩ</td>
<td>1MΩ</td>
</tr>
<tr>
<td>Voltage Reference</td>
<td>±10V (impedance 1MΩ)</td>
<td>±10V (impedance 1MΩ)</td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>-25 to +70°C</td>
<td>-25 to +70°C</td>
</tr>
<tr>
<td>Storage Temperature</td>
<td>-25 to +70°C</td>
<td>-25 to +70°C</td>
</tr>
<tr>
<td>Humidity</td>
<td>5% RH to 95% RH (non-condensing)</td>
<td>5% RH to 95% RH (non-condensing)</td>
</tr>
<tr>
<td>Vibration Resistance</td>
<td>5G (or less) (20 to 2000Hz), 0.15g (max)</td>
<td>5G (or less) (20 to 2000Hz), 0.15g (max)</td>
</tr>
<tr>
<td>Shock Resistance</td>
<td>10G (max) (11ms)</td>
<td>10G (max) (11ms)</td>
</tr>
<tr>
<td>Weight</td>
<td>0.17kg (0.37lb)</td>
<td>0.17kg (0.37lb)</td>
</tr>
</tbody>
</table>

#### Input/Output

**Input**

- Digital Input: DC5V or DC24V
- Analog Input: ±10V (impedance 1MΩ), ±5V (impedance 1MΩ), ±1V (impedance 1MΩ), ±50mA (common)
- Analog Input Ranges: 0V to ±10V, 0V to ±5V, 0V to ±1V
- Input Impedance: 1MΩ
- Input Current: 50mA
- Input Voltage: ±20V
- Input Power: 0.5W

**Output**

- Digital Output: DC5V or DC24V
- Analog Output: ±10V (impedance 1MΩ), ±5V (impedance 1MΩ), ±1V (impedance 1MΩ), ±50mA (common)
- Analog Output Ranges: 0V to ±10V, 0V to ±5V, 0V to ±1V
- Output Impedance: 1MΩ
- Output Current: 50mA
- Output Voltage: ±20V
- Output Power: 0.5W

**Other**

- Input Type: DC5V or DC24V
- Output Type: DC5V or DC24V
- Input Voltage: ±20V
- Output Voltage: ±20V
- Input Current: 50mA
- Output Current: 50mA
- Input Power: 0.5W
- Output Power: 0.5W

### Note for the FN-XY32SK41

If this unit is used at a voltage that exceeds the rated input voltage, a combination of factors, including the input ON voltage, the number of input points, and the ambient temperature may lead to malfunction due to excessive heat in the input section. To prevent this kind of malfunction, use the table to the right to ensure that the input derating is within the range shown.

Temperature vs. Derating

- DC 24V to DC 26V
- Ambient temperature: see graph

### Table 1

<table>
<thead>
<tr>
<th>Ambient temperature (°C)</th>
<th>5%</th>
<th>10%</th>
<th>15%</th>
<th>20%</th>
<th>25%</th>
<th>30%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Derating (%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*For the FN-XY32SK41, use a spring clamp type terminal block.*
## Remote I/O (Flex Network) Specifications

### Single-axis Positioning Unit

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accuracy</td>
<td>±0.01 mm</td>
</tr>
<tr>
<td>Resolution</td>
<td>1/1000µm</td>
</tr>
<tr>
<td>Maximum Speed</td>
<td>1000 m/min</td>
</tr>
<tr>
<td>Maximum Acceleration</td>
<td>10,000 m/s²</td>
</tr>
<tr>
<td>Maximum Deceleration</td>
<td>15,000 m/s²</td>
</tr>
</tbody>
</table>

### High-speed Counter Unit

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resolution</td>
<td>1/1024</td>
</tr>
<tr>
<td>Maximum Count</td>
<td>2,147,483,647</td>
</tr>
<tr>
<td>Maximum Frequency</td>
<td>100 kpps</td>
</tr>
</tbody>
</table>

### Functional Specifications

- **Electrical**
  - **Noise Immunity** (via noise simulator): 90 points (ABS/INC)
  - **Electrostatic Discharge Immunity**: 90 points (ABS/INC)

- **Environmental**
  - **Allowable Voltage Drop**: 10ms or less (for DC24V power supply)
  - **Rated Voltage**: DC24V

- **Structural**
  - **Vibration Resistance**: 90% RH to 95% RH (non-condensing)
  - **Operating Temperature**: 0°C to 55°C

- **Input/Output**
  - **Rated Input Voltage**: DC5V
  - **Rated Output Voltage**: DC24V
  - **Maximum Allowable Input Voltage**: DC5.5V
  - **Maximum Allowable Output Voltage**: DC4.5V to DC5.5V
  - **Maximum Load Current**: 50mA or less
  - **Input Signal Phase**: ON-OFF 1ms or less
  - **Input Type**: Differential

### Interface Specifications

- **Communication Method**: Manual, Automatic, Direct
- **Communication Interface**: EIA Standard RS-422-A Differential Driver
- **Communication Speed**: 6Mbps, 12Mbps

### Error Check

- **Number of Occupied Nodes**: 8
- **Number of Connectable Nodes**: 16

### Performance Specifications

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Input</strong></td>
<td></td>
</tr>
<tr>
<td>Input OFF Voltage</td>
<td>DC5V or less</td>
</tr>
<tr>
<td>Input ON Voltage</td>
<td>DC19V or higher</td>
</tr>
<tr>
<td>Input Impedance</td>
<td>3.9kΩ</td>
</tr>
<tr>
<td>Input Delay OFF-ON</td>
<td>1.5ms or less</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Output</strong></td>
<td></td>
</tr>
<tr>
<td>Output Voltage</td>
<td>DC24V</td>
</tr>
<tr>
<td>Output Clamp Voltage</td>
<td>DC39V +/-1V</td>
</tr>
<tr>
<td>Output Delay OFF-ON</td>
<td>1.5ms or less</td>
</tr>
</tbody>
</table>

### Calculation Range

- **Position Settings**: 0 to 65,535 pulses
- **Input Control**: 0 to 4,294,967,295

### Control Input

- **Control Input Type**: Differential

### Control Output

- **Control Output Type**: Differential

### Notes

- *1* See User's Manual for each measurement speed.
- *2* Max. speed for open collector output is 100kpps.
- *3* See chart Manual for each measurement speed.

---

## Remote I/O (Flex Network) Circuit Diagrams

### FN-X16TS41 (Sink Output Input Type)

### FN-Y08RL41 (Sink Output Input Type)

### FN-Y08SK41 (Sink Output Input Type)

### FN-Y16SK41 (Sink Output Input Type)

### FN-Y16SC41 (Sink Output Input Type)

---

*1* Dotted line shows the source output type connection.

*2* Dotted line shows the sink output type connection.

*3* The relay specifications can change the COM power supply.
**Remote I/O (Flex Network) Circuit Diagrams**

- **FN-XY32SK41**
  - (Sink/Source Input & Sink Output Type)
  - Dotted line shows the source type connection.

- **FN-XY16SK41**
  - (Sink/Source Input & Source Output Type)
  - Dotted line shows the sink type connection.

- **FN-AD04AH11**
  - (A) Voltage Input
  - (B) Current Input

- **FN-DA04AH11**
  - (A) Voltage Output
  - (B) Current Output

- **FN-PC10SK41**
  - (Input Section Circuit Diagram)
  - 2 Phase (with Open Collector)

- **FN-HC10SK41**
  - (Output Section Circuit Diagram)

**Remote I/O System (Flex Network)**

- **Flexible support for adding/modifying I/O points!**
- **Supports up to 63 nodes**
- **1008 I/O points**
- **6Mbps/12Mbps high-speed remote I/O** lets you use remote equipment without remote equipment performance. Connect up to 1008 I/O points and attain communications lag time of only 0.94ms (at 512 points/12Mbps).
- Extensions up to 400m (with 6Mbps x 2 channels).
- **256-point**: 944 µsec/472 µsec response speed at 6Mbps/12Mbps communications speed.

**International Safety Standards**

- Model numbers ending in "41" comply with the following standards:
  - Max. 200m (6Mbps)
  - Max 200m x 2 (12Mbps)

**Important Notes**

- *1 The FN-PC unit's live line is not isolated. If it is connected to a non-isolated servo driver, be sure to connect the signal ground (5G) to prevent over-current damage.
- *2 For motor driver connection details, refer to User’s manual.
- *3 The FN-HC unit’s input line is not isolated. When connecting this unit to a line driver that is not isolated, be sure to connect the signal ground (SG) terminal.
- *4 The Input Common (I-COM) shown here is connected to a Sink Output type. (The dotted line shows the connection with a Source Output type.)

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**LT Series Remote I/O (Flex Network)**

- See our Web site for LT Series system application examples.

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**LT Series Remote I/O (Flex Network)**

- See our Web site for LT Series system application examples.