

# Network Instrumentation Module Controller Module NX-D15/25/35

## Overview

Network Instrumentation Modules make optimal distributed configuration a reality. Distributed modules execute cooperative control using Ethernet connectivity. This instrumentation offers an excellent solution for productivity and energy conservation needs.

A variety of input sampling cycles and input accuracy levels are available, depending on the model.

- Sampling cycles: 100 ms, 200 ms, and 500 ms
- Input accuracy:  $\pm 0.1$  % FS and  $\pm 0.3$  % FS

Compact digital controllers with advanced functions can execute 2-loop or 4-loop control.

Control output can be selected from among transistor output, DC current, DC voltage output, and motor driver output (available soon).

Optionally, 4 current transformer inputs, 4 digital outputs, or 4 digital inputs are also available.

Since the SLP-NX Smart Loader Package can be connected via Ethernet, Network Instrumentation Modules can be set up and monitored over an Ethernet communications network.

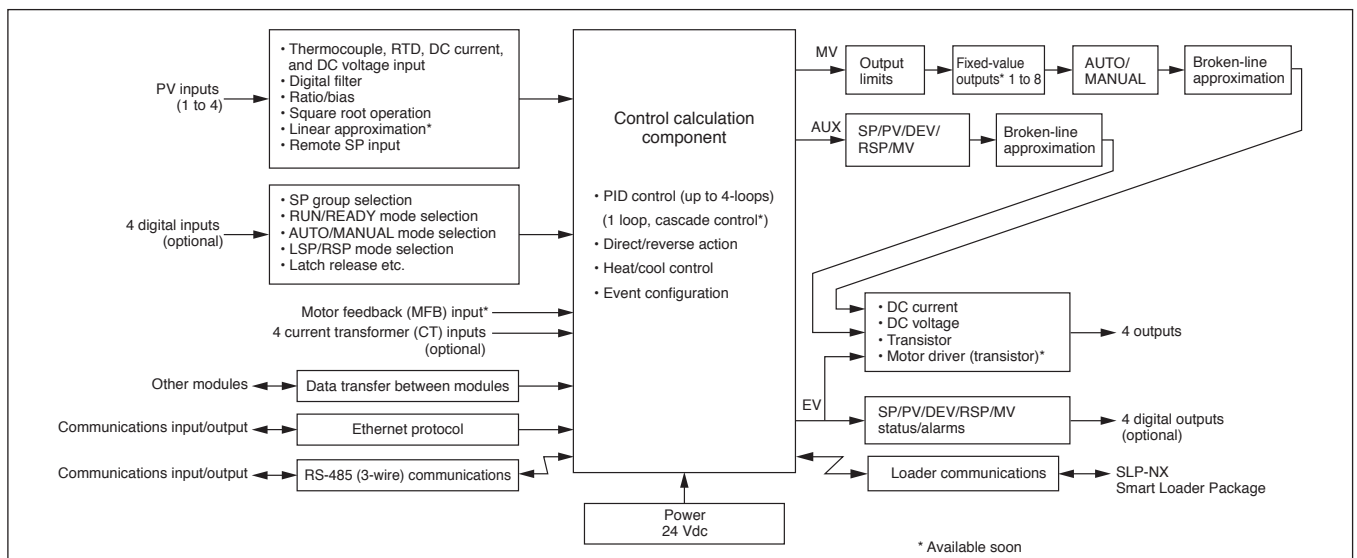
## Features

- Ethernet and RS-485 as standard features
- Up to 4 control loops per module
- Side connectors for reduced wiring
- Support for reduced wiring daisy-chain connection and distributed layout
- Full multi-range input for thermocouple, RTD, DC current, and DC voltage



- 2-loop control (with RSP) or cascade control (available soon), depending on the control mode
- Heat/cool control using a combination of control outputs
- Control output branching for multiple actuators
- 6 LED indicators (standard), and additional LEDs depending on the model, provide abundant status information
- 3-part structure for easy maintenance
- Equipped with input/output broken line approximation for nonlinear processes.
- 4 additional CT/DI/DO points optionally available
- Logical operation processing for DI/DO and internal events
- Data transfer function allows operation input/output between modules
- Multi-loop cooperative control with supervisor module

## NX-D15/25/35 basic function block diagram



## Descriptions

Model No.		NX-D15	NX-D25	NX-D35 (available soon)
Control channels		4	4	2
Wiring method		Terminal block or screwless terminal (available soon), depending on the model		
PV input	Input type	Thermocouple, RTD, DC current, and DC voltage (see table 1)		
	Sampling cycle	500 ms	200 ms	100 ms
	Indication accuracy (under standard conditions)	0.3 % FS $\pm$ 1 digit	0.3 % FS $\pm$ 1 digit	0.1 % FS $\pm$ 1 digit
	Input bias current	Thermocouple input: +0.2 $\mu$ A max. (under standard conditions) DC voltage input (V range) 0 to 1 V range: +0.2 $\mu$ A max. (under standard conditions) 0 to 5 V and 1 to 5 V ranges: +0.7 $\mu$ A max. (under standard conditions) 0 to 10 V and 2 to 10 V ranges: +12 $\mu$ A max. (under standard conditions) DC voltage input (mV range): +0.2 $\mu$ A max. (under standard conditions)		
	Measuring current	RTD input: 1.0 mA (typical), from terminals A and B		
	Effect of wiring resistance	Thermocouple input: 0.2 $\mu$ V/ $\Omega$ max. (wiring resistance: total resistance of all wires) RTD input: 0.05 % FS/ $\Omega$ max. DC voltage input (V range) 0 to 1 V range: +0.2 $\mu$ V/ $\Omega$ max. (under standard conditions) 0 to 5 V and 1 to 5 V ranges: +0.7 $\mu$ V/ $\Omega$ max. (under standard conditions) 0 to 10 V and 2 to 10 V ranges: +12 $\mu$ V/ $\Omega$ max. (under standard conditions)		
	Allowable parallel connection resistance	Thermocouple input: 1 M $\Omega$ min. DC voltage input (mV range): 1 M $\Omega$ min. (range 83: 2 M $\Omega$ min.)		
	Allowable wiring resistance	RTD: 85 $\Omega$ max. (per wire)		
	Allowable input	Thermocouple input: $\pm$ 1 V DC input: 25 mA max DC voltage input (V range): -2 to +12 V		
	Input impedance	DC input: 80 $\Omega$ max. (with 20 mA input) DC voltage input (V range): 1 M $\Omega$ min.		
	Burnout	Depends on the input range.		
	Cold junction compensation accuracy	$\pm$ 0.5 $^{\circ}$ C (when ambient temperature is 23 $\pm$ 2 $^{\circ}$ C) $\pm$ 1.5 $^{\circ}$ C (when ambient temperature is 0 to 50 $^{\circ}$ C)		
	Cold junction compensation method	Internal/external (0 $^{\circ}$ C only) compensation selectable		
Scaling	-19999 to +32000 U			
Configuration and display	Configuration method	Engineering tool (SLP-NX Smart Loader Package) or communications from a host unit		
	SP groups per loop	4 SP groups per loop		
	Memory type	Nonvolatile		
	Station address setup	Softswitch		
	LED operation indicators	Shared LEDs (PWR, RUN, MOD, COM, NST and FAIL) and individual LEDs		
Control output	Control output type	Transistor output	Transistor output	Transistor output
		Output type: Sink External power source rated voltage: 5 to 24 Vdc External power source allowable voltage: 4.5 to 26.4 Vdc Allowable output current: 100 mA max. OFF-state leakage current: 100 $\mu$ A max. ON-state residual voltage: 0.5 V max.	←	←
	Transistor output	Transistor output	Transistor output	
	Analog current output	Analog current output	Analog current output	
Output type: DC current Output current: 4 to 20 mAdc 0 to 20 mAdc Allowable load resistance: 300 $\Omega$ max. (6.6 V max.) Output accuracy: $\pm$ 0.3 % FS max. However, 1 % FS max. between 0.0 and 0.2 mA Output resolution: 1/10000 (for 4 to 20 mA range) 1/12500 (for 0 to 20 mA range) Open voltage: 10 Vdc $\pm$ 10 %	←	←		
Output type: DC current Output current: 4 to 20 mAdc 0 to 20 mAdc Allowable load resistance: 300 $\Omega$ max. (6.6 V max.) Output accuracy: $\pm$ 0.1 % FS max. However, 1 % FS max. between 0.0 and 0.2 mA Output resolution: 1/10000 (for 4 to 20 mA range) 1/12500 (for 0 to 20 mA range) Open voltage: 10 Vdc $\pm$ 10 %				

Model No.		NX-D15	NX-D25	NX-D35 (available soon)
Control output	Control output type	Analog voltage output	Analog voltage output	Analog voltage output
		Output voltage: 0 to 5 Vdc (0.0 to 5.5 Vdc) 1 to 5 Vdc (0.0 to 5.5 Vdc) 0 to 10 Vdc (0.0 to 5.5 Vdc) 2 to 10 Vdc (0.0 to 5.5 Vdc) Allowable load resistance: 4 kΩ min. Output accuracy: ±0.3 % FS max. However, ±1 % FS between 0.0 and 0.1 V Output resolution: 1/8000 (1 to 5 V range) 1/10000 (0 to 5 V range) 1/16000 (2 to 10 V range) 1/20000 (0 to 10 V range)	←	Output voltage: 0 to 5 Vdc (0.0 to 5.5 Vdc) 1 to 5 Vdc (0.0 to 5.5 Vdc) 0 to 10 Vdc (0.0 to 5.5 Vdc) 2 to 10 Vdc (0.0 to 5.5 Vdc) Allowable load resistance: 4 kΩ min. Output accuracy: ±0.1 % FS max. However, ±1 % FS between 0.0 and 0.1 V Output resolution: 1/8000 (1 to 5 V range) 1/10000 (0 to 5 V range) 1/16000 (2 to 10 V range) 1/20000 (0 to 10 V range)
		---	---	Motor output
Motor feedback (MFB) input	Allowable resistance range	---	---	Output type: Transistor type (sink type) External power source rated voltage: 5 to 24 Vdc External power source allowable voltage: 4.5 to 26.4 Vdc Allowable output current: 100 mA max. OFF-state leakage current: 100 μA max. ON residual voltage: 0.5 V max.
		---	---	100 to 2500 Ω 2.5 to 5 kΩ (Depends on the parameter settings)
Current transformer input (optional)	Inputs	4		
	Detection function	When control output is ON: detection of heater line break or overcurrent When control output is OFF: detection of actuator short circuit		
	Recommended current transformer	Current transformer QN212A (sold separately): 12 mm dia. hole, 800 turns QN206A (sold separately): 5.8 mm dia. hole, 800 turns		
	Allowable maximum current	60 Aac (rms) (Peak power: 85 A max. with 1 through-turn)		
	Current measurement range	0.4 to 50.0 Aac (rms) (Peak power: 85 A max. with 1 through-turn)		
	Indication accuracy	±5 % FS ±1 digit		
	Indication resolution	0.1 A		
Digital output (optional)	Outputs	4		
	Output rating	Output type: transistor output (sink type) External power source rated voltage: 5 to 24 Vdc External power source allowable voltage: 4.5 to 26.4 Vdc Allowable output current: 100 mA max. OFF-state leakage current: 100 μA max. ON-state residual voltage: 0.5 V max.		
Digital input (optional)	Inputs	4		
	Input rating	Compatible output type: non-voltage contacts or transistor (sink type) Parallel connectable device: Azbil Corporation's SDC series Open terminal voltage: 5 Vdc ±10 % Terminal current (when shorted): 5.6 mA (typical) Allowable ON resistance: 250 Ω max. Allowable OFF resistance: 100 KΩ min. Allowable ON residual voltage: 1 V max. OFF-state leakage current: 100 μA max.		

Model No.		NX-D15	NX-D25	NX-D35 (available soon)
<b>Control function</b>	<b>Control type</b>	ON/OFF control, continuous proportional PID, time proportional PID, and (NX-D35 only (available soon) ) position proportional PID		
	<b>Control algorithm</b>	PID-A (deviation-derivative type) and PID-B (PV-derivative type) (not available for the NX-D15)		
	<b>Control action</b>	Reverse action, direct action, heat/cool control, reverse on-off action, and direct on-off action		
	<b>Proportional band (P)</b>	0.1 to 3200.0 %		
	<b>Integral time (I)</b>	0 to 32000 s, 0.0 to 3200.0 s, and 0.00 to 320.00 s (no integral operation when I = 0)		
	<b>Derivative time (D)</b>	0 to 32000 s, 0.0 to 3200.0 s, and 0.00 to 320.00 s (no derivative operation when D = 0)		
	<b>MV limits</b>	Low limit: -10.0 to high limit % High limit: low limit to +110.0 %		
	<b>Manual reset</b>	-10.0 to +110.0 %		
	<b>Number of PID groups</b>	4 groups per loop (Set a PID group for each SP group or use the internal contact input bank for the setting.)		
	<b>Number of SP groups</b>	Selection of 1 to 4 groups per loop		
	<b>SP ramp-up</b>	0: (integer)/s, 1: (integer)/min, 2: (integer)/h, 3: 0.1/s, 4: 0.1/min, 5: 0.1/h, 6: 0.01/s, 7: 0.01/min, 8: 0.01/h, 9: 0.001/s, 10: 0.001/min, 11: 0.001/h		
	<b>MV change limit</b>	0.0 to 320.0 % per control update cycle. No limit if set to 0.0 % (not available for the NX-D15)		
	<b>Auto-tuning type</b>	PID calculation using limit cycle method Any of 3 types can be selected: • Normal (regular control characteristics) • Fast response (quick reaction to disturbance) • Stable (minimal up/down PV fluctuation)		
	<b>ON/OFF control differential</b>	0 to 32000 U		
	<b>Heat/cool dead zone</b>	-100.0 to +100.0 %		
	<b>Broken-line approximation</b>	8 groups (not available for the NX-D15)		
	<b>Zone PID</b>	0: Do not use, 1: SP-based selection, 2: PV-based selection (not available for the NX-D15)		
<b>Multi-loop cooperative control</b>	When connected to the supervisor module (not available for the NX-D15)			
<b>Communications (Loader)</b>	<b>Dedicated loader</b>	SLP-NX-J70 or SLP-NX-J71		
	<b>Cable</b>	USB loader cable, included with the SLP-NX-J70		
<b>Communications (RS-485)</b>	<b>Signal level</b>	RS-485 compliant		
	<b>Network</b>	Multidrop (up to 31 slave stations for 1 host station)		
	<b>Communications/synchronization type</b>	Half-duplex, start/stop synchronization		
	<b>Maximum cable length</b>	500 m		
	<b>Number of wires</b>	3 wires for data sending /reception		
	<b>Transmission speed</b>	Selectable from 4800, 9600, 19200, 38400, 57600 and 115,200 bps max.		
	<b>Terminating resistor</b>	External (150 Ω 0.5 W min.)		
	<b>Data length</b>	7 or 8 bits		
	<b>Stop bits</b>	1 or 2 bits		
	<b>Parity</b>	Even parity, odd parity and no parity		
	<b>Protocol</b>	Selectable from CPL, MODBUS/ASCII, and MODBUS/RTU		
<b>Ethernet (using communications adapter)</b>	<b>Communication path type</b>	IEEE 802.3u 100BASE-TX (with full duplex and Auto MDI/MDI-X functions)		
	<b>Connector</b>	RJ-45		
	<b>Cable</b>	UTP cable (4P) Cat 5e min. (straight) (ANSI/TIA/EIA-568-B both ends.)		
	<b>Protocol</b>	MODBUS/TCP (2 connections max.)		

Model No.		NX-D15	NX-D25	NX-D35 (available soon)
General descriptions	Standard conditions	Ambient temperature	23 ± 2 °C	
		Ambient humidity	60 ± 5 % RH (without condensation)	
		Rated voltage	24 Vdc	
		Vibration resistance	0 m/s <sup>2</sup>	
		Shock	0 m/s <sup>2</sup>	
		Mounting angle	Reference plane ± 3°	
	Operating conditions	Ambient temperature	0 to 50 °C (below the installed NX)	
		Ambient humidity	10 to 90 % RH (without condensation)	
		Allowable operating voltage	21.6 to 26.4 Vdc	
		Vibration	0 to 3.2 m/s <sup>2</sup> (10 to 150 Hz for 2 h each in x, y, and z directions)	
		Shock	0 to 9.8 m/s <sup>2</sup>	
		Mounting angle	Reference plane ±3°	
		Dust	0.3 mg/m <sup>3</sup> max.	
		Corrosive gas	None	
		Altitude	2000 m max.	
		Pollution degree	2 (equivalent to normal office environments)	
		Transport and storage conditions	Ambient temperature	-20 to +70 °C
	Ambient humidity		5 to 95 % RH (without condensation)	
	Vibration		0 to 9.8 m/s <sup>2</sup> (10 to 150 Hz for 2 h each in x, y, and z directions)	
	Shock		0 to 300 m/s <sup>2</sup> (vertically 3 times while on DIN rail)	
	Package drop test		Drop height 60 cm (free fall on 1 corner, 3 edges, 6 sides)	
	Memory storage system	Non-volatile (EEPROM)		
	Number of EEPROM writing cycles	100,000 cycles		
	Power consumption	4 W max. (under operating conditions)		
	Inrush current	20 A max. (under operating conditions)		
	Power ON operation delay	Reset time: 10 s min. (required until normal operation begins under standard conditions)		
	Insulation resistance	20 MΩ min. (between power terminals 1 and 2 and I/O terminals isolated from the power terminals, with a 500 Vdc megger)		
	Dielectric strength	500 Vac for 1 min (between power terminals 1 and 2 and I/O terminals isolated from the power terminals)		
	Case material, color	Modified PPO resin, black		
	Standards compliance	CE, C-UL (pending)		
Mounting method	DIN rail			
Terminal screw tightening torque	0.6 ± 0.1 N·m			
Mass	200 g max.			
Accessories	User's manual (CP-UM-5561JE)			

**Table 1. Input types and ranges**

Input type	Range No.	Sensor	Range		Effective resolution	Accuracy
			°C	°F		
Thermocouple	1	K	-200 to +1200 °C	-300 to +2200 °F	1	±0.3 % FS (±0.6 % FS below 0 °C) ±1 digit
	2	K	0 to 1200 °C	0 to 2200 °F	1	±0.3 % FS ±1 digit
	3	K	0.0 to 800.0 °C	0 to 1500 °F	1, 0.1	±0.3 % FS ±1 digit
	4	K	0.0 to 600.0 °C	0 to 1100 °F	1, 0.1	±0.3 % FS ±1 digit
	5	K	0.0 to 400.0 °C	0 to 700 °F	1, 0.1	±0.3 % FS ±1 digit
	6	K	-200.0 to +400.0 °C	-300 to +700 °F	1, 0.1	±0.3 % FS (±0.6 % FS below 0 °C) ±1 digit
	7	K	-200.0 to +200.0 °C	-300 to +400 °F	1, 0.1	±0.3 % FS (±0.6 % FS below 0 °C) ±1 digit
	8	J	0 to 1200 °C	0 to 2200 °F	1	±0.3 % FS ±1 digit
	9	J	0.0 to 800.0 °C	0 to 1500 °F	1, 0.1	±0.3 % FS ±1 digit
	10	J	0.0 to 600.0 °C	0 to 1100 °F	1, 0.1	±0.3 % FS ±1 digit
	11	J	-200.0 to +400.0 °C	-300 to +700 °F	1, 0.1	±0.3 % FS (±0.6 % FS below 0 °C) ±1 digit
	12	E	0.0 to 800.0 °C	0 to 1500 °F	1, 0.1	±0.3 % FS ±1 digit
	13	E	0.0 to 600.0 °C	0 to 1100 °F	1, 0.1	±0.3 % FS ±1 digit
	14	T	-200.0 to +400.0 °C	-300 to +700 °F	1, 0.1	±0.3 % FS (±0.6 % FS below 0 °C) ±1 digit
	15	R	0 to 1600 °C	0 to 3000 °F	1	±0.4 % FS (±6.4 °C) ±1 digit
	16	S	0 to 1600 °C	0 to 3000 °F	1	±0.4 % FS (±6.4 °C) ±1 digit
	17	B	0 to 1800 °C	0 to 3300 °F	1	800 to 1800 °C: ±0.4 % FS (±7.2 °C) ±1 digit 260 to 800 °C: ±0.8 % FS (±14.4 °C) ±1 digit 0 to 260 °C: ±4 % FS (±72 °C) ± digit Low limit for indication: 20 °C
	18	N	0 to 1300 °C	0 to 2300 °F	1	±0.3 % FS ±1 digit
	19	PL II	0 to 1300 °C	0 to 2200 °F	1	±0.3 % FS ±1 digit
	20	Wre5-26	0 to 1400 °C	0 to 2400 °F	1	±0.3 % FS ±1 digit
	21	Wre5-26	0 to 2300 °C	0 to 4200 °F	1	±0.3 % FS ± digit
	22	Ni-Ni · Mo	0 to 1300 °C	0 to 2300 °F	1	±0.3 % FS ±1 digit
	23	PR40-20	0 to 1900 °C	0 to 3400 °F	1	800 to 1900 °C: ±1.0 % FS (±19.0 °C) ±1 digit 300 to 800 °C: ±2 % FS (±38 °C) ±1 digit 0 to 300 °C: ±4 % FS (±76 °C) ±1 digit
	24	DIN U	-200.0 to +400.0 °C	-300 to +700 °F	1, 0.1	±0.3 % FS (±0.6 % FS below 0 °C) ±1 digit
	25	DIN L	-1000 to +800.0 °C	-150 to +1500 °F	1, 0.1	±0.3 % FS (±0.6 % FS below 0 °C) ±1 digit
	26	Gold-iron Chromel	0.1 to 360.1K	-450 to +180 °F	1, 0.1	±3.0K ±1 digit

Input type	Range No.	Sensor	Range		Effective resolution
			°C	°F	
RTD	41	Pt100	-200.0 to +500.0 °C	-328 to +932 °F	1, 0.1
	42	JPt100	-200.0 to +500.0 °C	-328 to +932 °F	1, 0.1
	43	Pt100	-200.0 to +850.0 °C	-328 to +1562 °F	1, 0.1
	44	JPt100	-200.0 to +640.0 °C	-328 to +1184 °F	1, 0.1
	45	Pt100	-100.0 to +300.0 °C	-148 to +572 °F	1, 0.1
	46	JPt100	-100.0 to +300.0 °C	-148 to +572 °F	1, 0.1
	47	Pt100	-100.0 to +200.0 °C	-148 to +392 °F	1, 0.1
	48	JPt100	-100.0 to +200.0 °C	-148 to +392 °F	1, 0.1
	49	Pt100	-50.0 to +100.0 °C	-58 to +212 °F	1, 0.1
	50	JPt100	-50.0 to +100.0 °C	-58 to +212 °F	1, 0.1
	51	Pt100	-20.00 to +60.00 °C	-4 to +140 °F	1, 0.1, 0.01
	52	JPt100	-20.00 to +60.00 °C	-4 to +140 °F	1, 0.1, 0.01

Input type	Range No.	Sensor	Range
Linear	81	DC voltage	0 to 10 mV
	82		-10 to +10 mV
	83		0 to 100 mV
	84		0 to 1 V
	85		-1 to +1 V
	86		1 to 5 V
	87		0 to 5 V
	88		0 to 10 V
	89		2 to 10 V
	90		DC current
	91	4 to 20 mA	

■ **Input sensor standards**

● **Thermocouple**

K, E, J, T, B, R, S, N (JIS C 1602-1995),  
 WRe5-26 (ASTM E988-96 (reapproved 2002)),  
 PR40-20 (ASTM E1751-00),  
 Ni-Ni · Mo (ASTM E1751-00),  
 PL II (ASTM E1751-00),  
 DIN U, DIN L (DIN 43710-1985),  
 Gold-iron Chromel (ASTM E1751-00)

● **RTD**

Pt100 (JIS C 1604-1997), JPt100 (JIS C 1604-1989)

■ **Behavior if a PV input error occurs**

Input type	Range No.	Cause	Indication	Alarm
Thermo-couple	1 to 26	Line break	Upscale 110 % FS	PV high limit error
	DC voltage (mV Range)			
RTD	41 to 52	Line A break	110 % FS	PV high limit error
		Line B break	110 % FS	
		Line C break	110 % FS	
		Line break, 2 or 3 lines	110 % FS	
		Short circuit, lines A-B	-10 % FS	
DC current (V Range)	84, 87, 88	Line break	Around 0 % FS	None
	85	Line break	Around 50 % FS	None
	86, 89	Line break	Downscale -10 % FS	PV low limit error
DC current	90	Line break	Around 0 % FS	None
	91	Line break	Downscale -10 % FS	PV low limit error

Note: If DC current exceeds descriptions, intermittent circuit interruption may occur to protect circuits.

## Model Selection

Basic model No.	Type	Ring connection	Wiring method	Channels	Output type	Option	Addition	Description
NX-								Network Instrumentation Module
	D15							Controller module $\pm 0.3\%$ FS, 500 ms sampling (SV connection not possible) [*1]
	D25							Controller module $\pm 0.3\%$ FS, 200 ms sampling
	D35							Controller module $\pm 0.1\%$ FS, 100 ms sampling (available soon)
		N						Non-ring connection
		R						Ring connection
			T					Screw terminal block
			S					Screwless terminal block (available soon)
				2				2 channels [*2]
				4				4 channels [*3]
					T			Transistor output
					C			Analog current output
					D			Analog voltage output
					M			Motor output (2-ch. ) (available soon) [*4]
						0		None
						1		Current transformer input (with 4 ch.)
						2		Digital output (with 4 ch.)
						3		Digital input (with 4 ch.)
							0	None
							D	Inspection certificate
							Y	Supports traceability certification
							T	Tropicalization treatment (available soon)
							K	Anti-sulfide treatment (available soon)
							B	Tropicalization treatment + inspection certificate (available soon)
							L	Anti-sulfide treatment + inspection certificate (available soon)

\*1. The D15 cannot accept a supervisor module connection.

\*2. 4 channels are not available on the D35.

\*3. 2 channels are not available on the D15/25.

\*4. Output type M is not available on the D15/25.



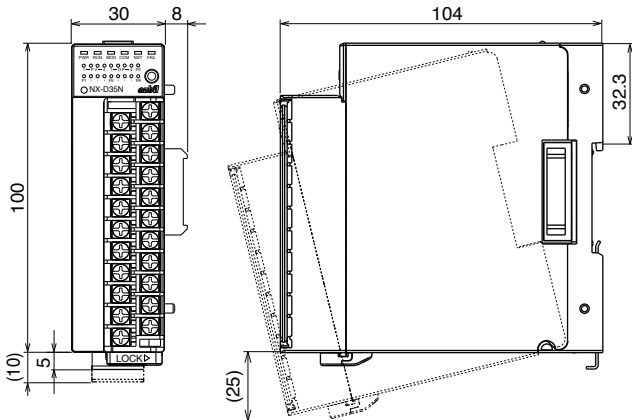
## External Dimensions

### External dimensions

The diagram below shows the NX-D35, which has the same dimensions as the NX-D15/25.

(Unit: mm)

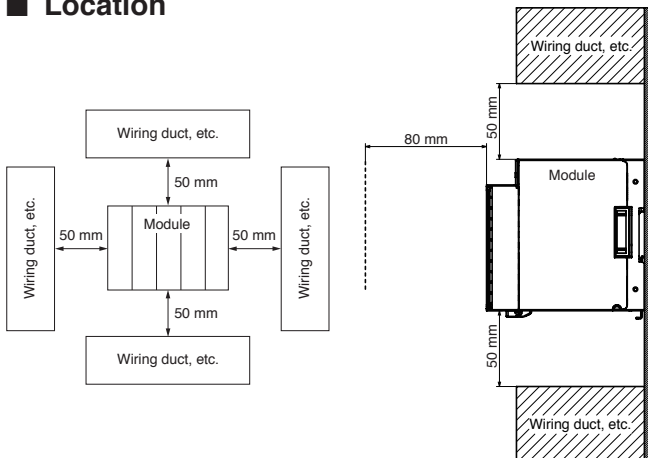
- Screw terminal block



- Screwless terminal block (available soon)

## Mounting

### Location



Install the controller in a location that meets the following criteria:

- No high/low temperature/humidity.
- Free from sulfide gas or corrosive gas.
- Not dusty or sooty.
- Protected from direct sunlight, wind, and rain.
- Little mechanical vibration or shock.
- Not close to high voltage line, welding machine or other electrical noise generating source.
- At least 15 meters away from the high voltage ignition device for a boiler.
- No strong magnetic fields.
- Indoors
- I/O common mode voltages: voltage to ground is 30 Vrms max., 42.4 V peak max., and 60 Vdc max.

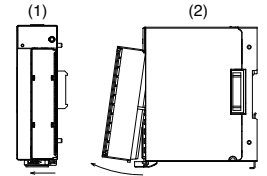
### Mounting/removing the terminal block

#### Handling Precautions

- Do not remove the terminal block except during wiring for installation, or during maintenance.

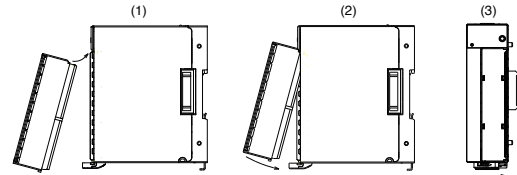
- Removal procedures

- (1) To unlock the terminal block, slide its lock lever to the left.
- (2) Remove the terminal block by pulling the bottom part toward you.



- Mounting procedures

- (1) Tilt the terminal block and insert its upper part into the groove on the case.
- (2) Push the bottom part of the terminal block into the case.
- (3) To lock the terminal block in place, slide its lock lever to the right.



### Linking modules

The NX-D15/25 can be linked to other modules using the connectors on the left and right of the base. Modules must be linked before the NX-D15/25 is mounted on the DIN rail. When linked, modules share the power supply and RS-485 connection, eliminating the need for wiring. RS-485 communications can be disabled using the communications cutoff switch on the base.

### Mounting procedure

The NX-D15/25 is used while mounted on a DIN rail. After mounting the DIN rail and pulling the locking tab completely off, hook the base onto the DIN rail. Then, push the DIN rail locking tab upwards firmly until it clicks into place.

#### Handling Precautions

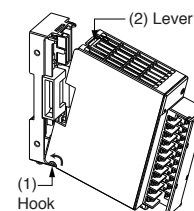
- Install the module so that it is vertical, with the DIN rail locking tab at the bottom.

### Attaching the main unit to the base

#### Handling Precautions

- The included base and main unit must be used as a pair.
- Be sure to fit the hook on the main unit into the base first. If this is not done, the hook might be broken during mounting.

- (1) Fit the hook on the main unit into the base.
- (2) Push the main unit onto the base until it clicks into place.



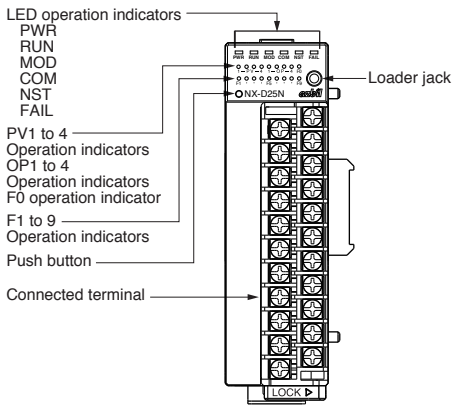
To remove the main unit from the base, pull it towards you while pressing down on the lever.

# Part Names and Functions

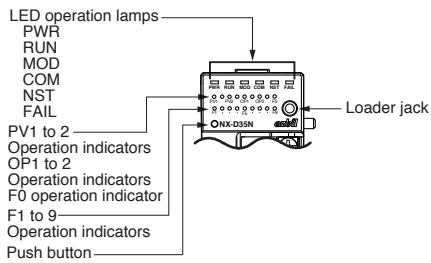
## ■ Body

Indicators on Network Instrumentation Modules vary depending on the model No. (functions). In the diagram below, a screw terminal block is shown as an example.

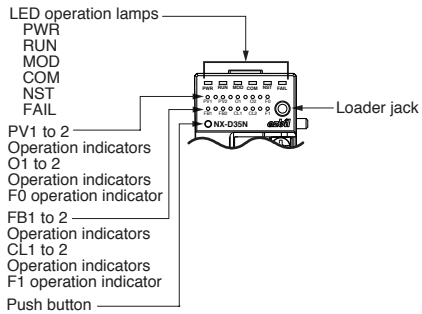
### • 4-ch. model



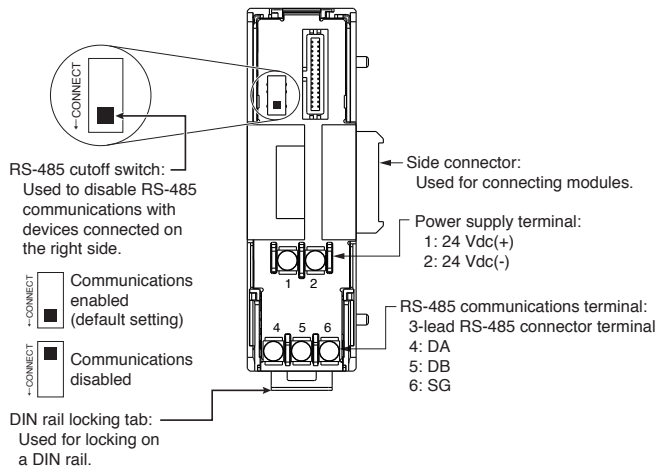
### • 2-ch. model (available soon)



### • 2-ch. MFB model (available soon)

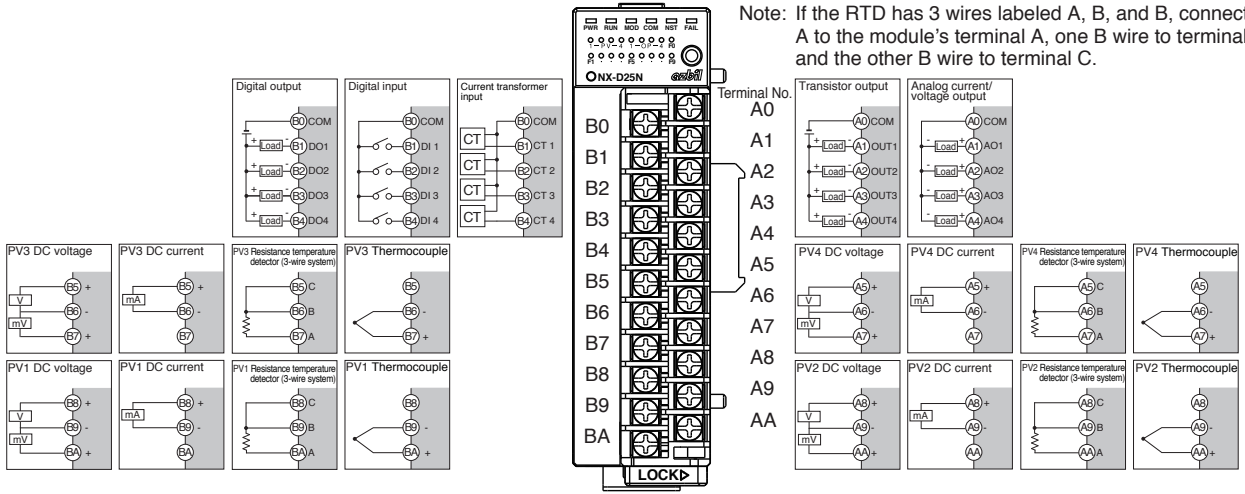


## ■ Base



# Terminal Connections

## ■ Wiring diagram



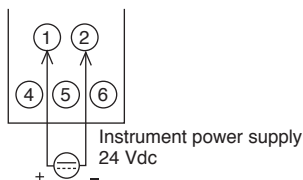
Note: If the RTD has 3 wires labeled A, B, and B, connect wire A to the module's terminal A, one B wire to terminal B, and the other B wire to terminal C.

## ■ Wiring Precautions

- Do not run wires outside. The equipment could be damaged in the event of lightning.
- When connecting wires to the power terminals, use crimp terminals with insulating sleeves.
- Check the model number of the controller and the terminal numbers on the wiring diagram on the side of the module to prevent any wiring errors.
- For terminal connections, use crimp terminals that are the correct size for M3 screws.
- Be careful not to allow any crimp-type terminal lugs to touch adjacent terminals.
- The signal wires and power wires of the module should be at least 60 cm away from other power wires or power sources. Also, do not pass these wires through the same conduit or wiring duct.
- Before connecting the NX-D15/25 to other devices in parallel, check their connection conditions carefully.
- Pass a lead wire for carrying the heater current through the current transformer. Do not use a heater current that exceeds the amount of allowable current stated in the descriptions. Doing so might damage the NX-D15/25.
- To ensure stable operation, the NX-D15/25 is designed not to operate for about ten seconds after the power is turned ON. It then enters Run mode. However, for satisfaction of the accuracy descriptions, allow at least 30 minutes of warm-up time.
- After wiring, check that there are no mistakes before turning the power ON.

## ■ Connecting the power supply

Connect the power terminals as shown below.

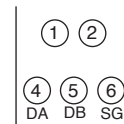


## ! Handling Precautions

- Linked modules supply power to each other.
- Supply power to one of the linked modules.
- Use a power supply that can supply the total power requirement of the linked modules.
- For compliance with UL standards, use a UL-approved Class 2 power supply.

## ■ Connecting the RS-485 communications

Connect the RS-485 wiring for CPL or MODBUS as shown below.



## ! Handling Precautions

- 0.5 W or greater terminating resistor of  $150 \Omega \pm 5 \%$  at each end of the communications lines. However, if any device that does not allow a terminating resistor is connected to the same communications line, follow the instructions on that device.
- Be sure to connect the SG terminals to each other. Failure to do so might cause unstable communications.
- For communications wiring, use twisted pair cables.

## ■ I/O isolation

Items surrounded by solid lines are isolated from other signals.

Power supply (including side connector) *1	
Logic circuits	Transistor outputs (ch. 1 to 4)
Loader jack	Analog current outputs (ch. 1 to 4)
RS-485, Ethernet communications through side connector *1	Analog voltage outputs (ch. 1 to 4)
Displays (led, switch, etc)	Digital output (ch. 1 to 4)
Current transformer inputs (ch. 1 to 4)	Digital input (ch. 1 to 4)
PV input (ch. 1)	
PV input (ch. 2)	
PV input (ch. 3)	
PV input (ch. 4)	
Ring communications through side connector *1	

\*1: Power, side-connector ring communications, and RS-485/side-connector Ethernet communications are isolated from each other.

Please read the "Terms and Conditions" from the following URL before ordering or use:

<http://www.azbil.com/products/bi/order.html>

*Specifications are subject to change without notice.*

**azbil**

**Azbil Corporation**  
Advanced Automation Company

1-12-2 Kawana, Fujisawa  
Kanagawa 251-8522 Japan  
URL: <http://www.azbil.com/>

3rd Edition: Issued in May 2012

*No part of this publication may be reproduced or duplicated without the prior written permission of Azbil Corporation.*