NEW

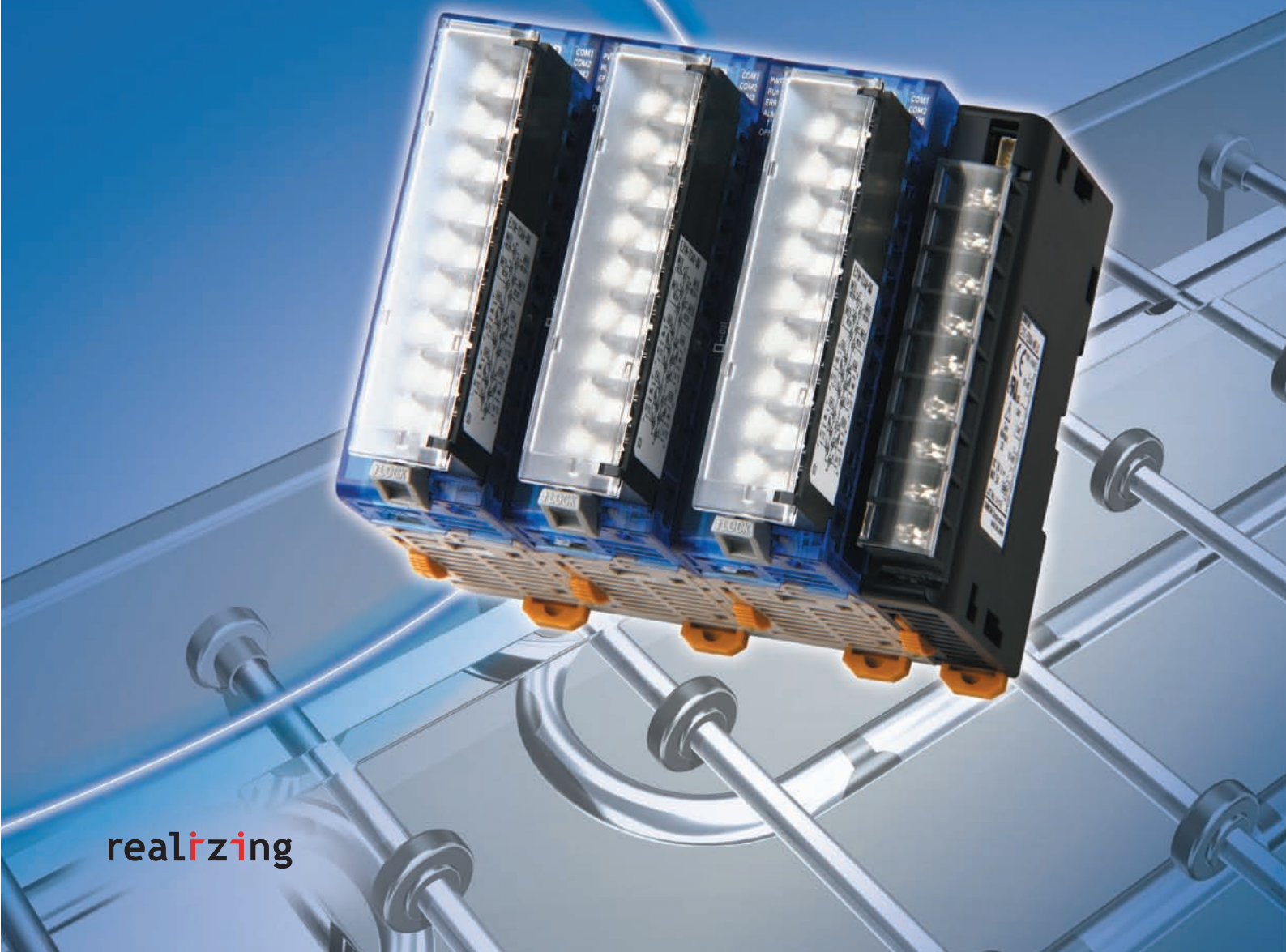
OMRON

Ver.1.2

Modular Temperature Controllers

EJ1

Radically Increase the Performance of Multipoint Temperature Control with the EJ1.



realizing

EJ1
Ver.1.2

Achieve Optimum Temperature Control for a Device.

The EJ1 is a new type of Modular Controller that increases device performance from design and installation through maintenance. Additional functions required for multipoint temperature control have been added to the EJ1 to reduce even further the amount of work required for setup and communications. It enables building systems that meet customer needs.

Smart Concept

Reduced Design Work

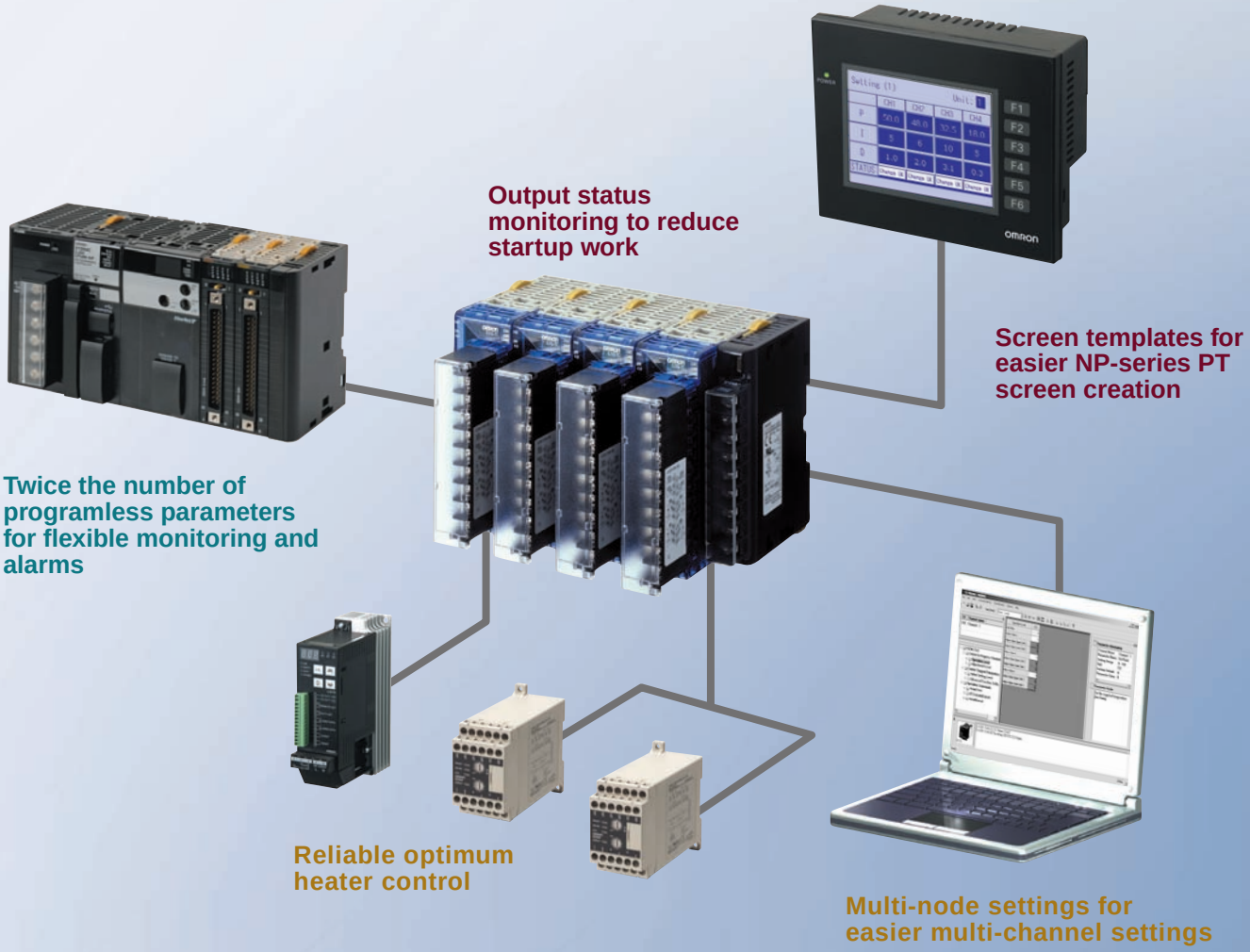
- The area for programless communications with PLCs has been expanded to 1,200 parameters.
- Bit specifications for operation commands reduces the amount of work required for ladder programming.
- NP-series PT screen templates for the EJ1 reduce the amount of work required to create screens.

Easy Installation and Setup

- CX-Thermo Support Software supports multi-node settings.
- A switch can be set to enable monitoring the output status on operation indicators.
- A switch can be set to use Modbus as the port B communications protocol.

Flexible Control and Adjustment

- Independent heating/cooling PID control and autotuning (AT) for heating and cooling.
- Self-tuning (ST).
- Optimum cycle control with the G3ZA and phase control with the G3PW.



Version Upgrade: The Ultimate in User-friendly Design to Directly Improve Device Performance. Even Better Functions for Multipoint Temperature Control.

Ver.1.2

Modular Temperature Controllers **EJ1**

New Functions

Incredible User-friendly Design with Advance F

Reduced Design Work

HFU Ver.UP

The capacity of the area for programless communications with PLCs has been increased from 600 (version 1.1) to 1,200 parameters. You can now use more parameters for each loop or to support multipoint control.

Programless communications enables exchanging data simply by setting PLC flag operation and the EJ1 parameters. There is no need for creating a communications program. This results in a significant reduction in design work.

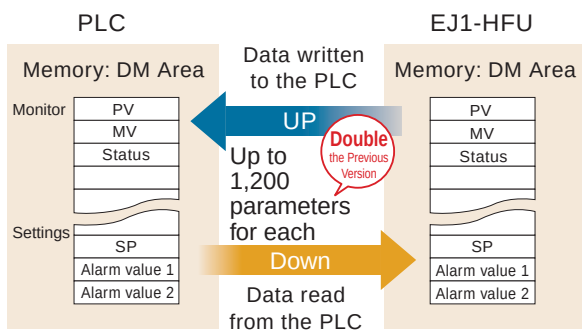


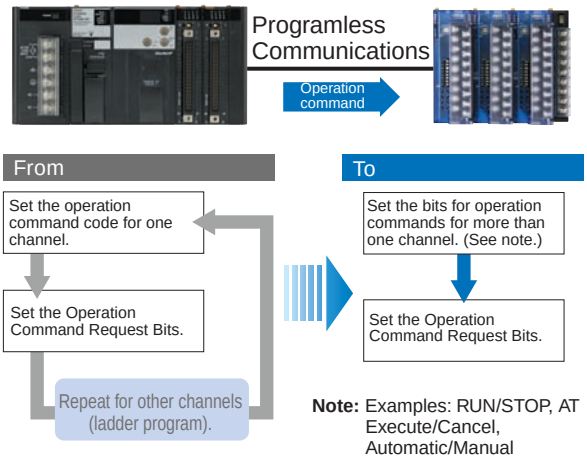
Illustration of Connection to OMRON PLC

The HFU automatically performs communications with the PLC.

Note: In addition to OMRON PLCs (SYSMAC CS/CJ/CP Series), you can also use Mitsubishi PLCs (MELSEC-Q/QnA/QnAS/An/AnS/FX3UC Series). However, only some models can be used when multiple HFUs are connected.

HFU Ver.UP

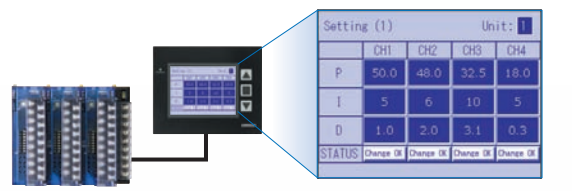
Operation commands that were previously executed for each channel can now be executed using bit specifications, reducing the amount of work required to create ladder programs.



Note: Examples: RUN/STOP, AT Execute/Cancel, Automatic/Manual

Connectivity and Compatibility

Screen templates for the EJ1 are a standard feature in the NP-series PTs. There is no need to create basic screens, such as for monitoring the process value, the set point, or the manipulated variable.



Examples of Standard Screens

- Monitoring the Process Value (PV), Set Point (SP), or Manipulated Variable (MV)
- Displaying the status during RUN, STOP, Manual Mode, or AT operation
- Displaying the status of the two alarms using lamps
- RUN/STOP and AT Execute/Cancel operations for each channel

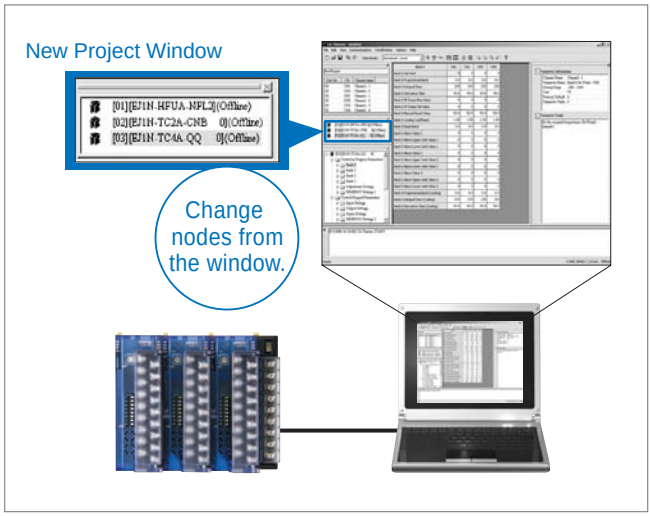
Note: Refer to the *NP Series Programmable Terminal* (Cat. No. V101) for details.

Functionality, Connectivity, and Compatibility

Easy Installation and Setup

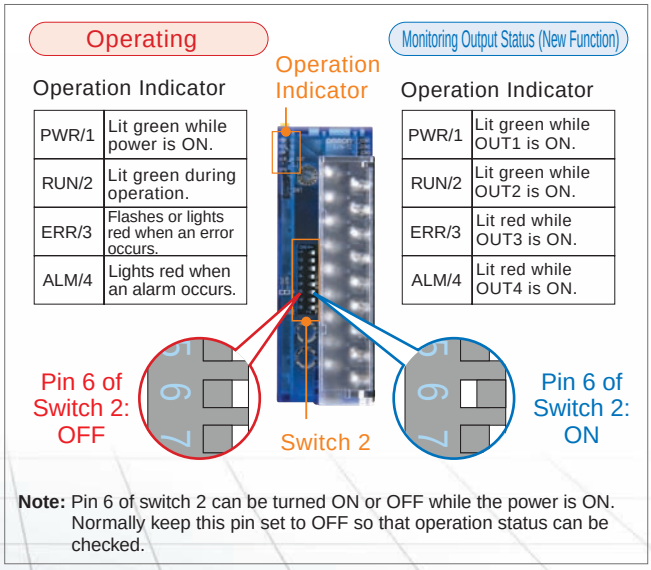
CX-Thermo Ver.UP

The CX-Thermo Support Software (version 4.1) supports multi-node settings to eliminate the need to change cable connections. It can be easily connected to any EJ1 Controller in a multi-node network.



T C Ver.UP

A switch can be set to enable monitoring the output status on the operation indicators. The output status when a device is starting can be checked without using any special software. The communications baud rate settings and protocol changes for Modbus can also be set on a DIP switch.

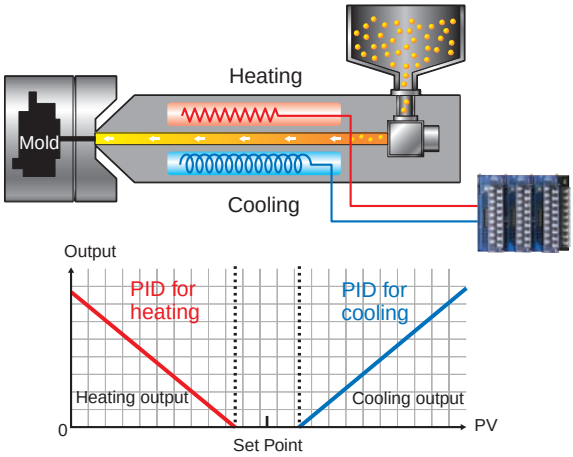


Note: Pin 6 of switch 2 can be turned ON or OFF while the power is ON. Normally keep this pin set to OFF so that operation status can be checked.

Flexible Control and Adjustments

T C Ver.UP

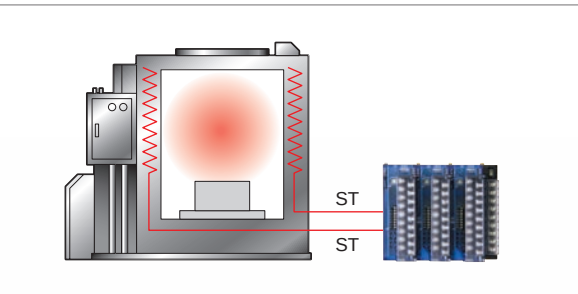
Independent heating/cooling PID control (see note) and autotuning (AT) for heating/cooling are provided for devices such as extruders.



Note: This control method allows independently setting PID control for heating and cooling.

T C Ver.UP

Self-tuning (ST) (see note) can be used when AT is difficult to use to control devices with a large heating capacity.



Note: Self-tuning (ST) finds the PID constants by using step response tuning (SRT) when the EJ1 is operating or the set point is changed.

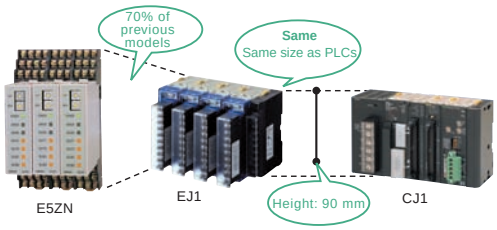
EJ1 Ver.1.2

Flexibility Build Advanced Temperature Control Systems

Basic Functions

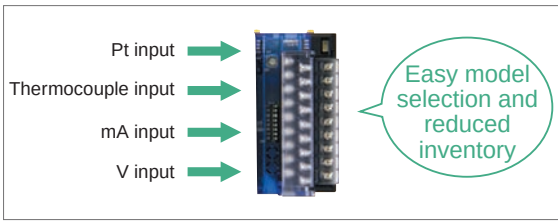
Smaller Control Panels

The EJ1 is the same size as PLCs to eliminate dead space.



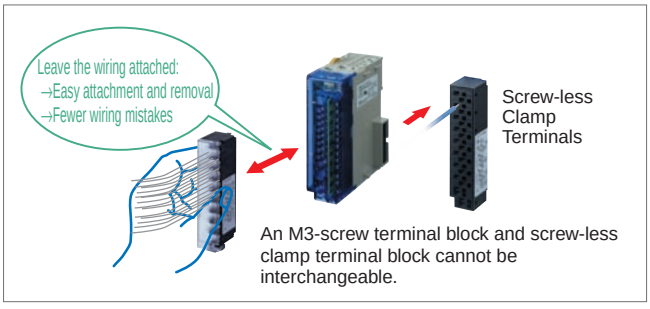
Reduces Customer Inventory

Fully universal inputs for all input points to reduce inventory.



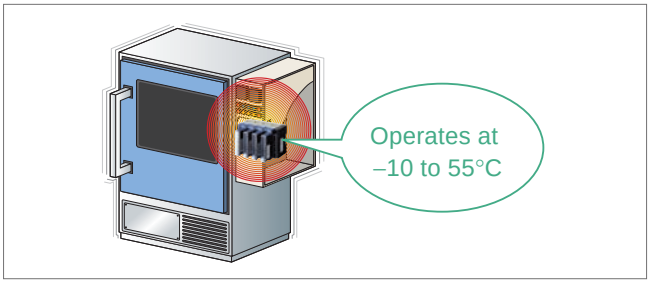
Easy Installation and Wiring

Easy operation with one-touch terminal block attachment and removal and screw-less clamp terminals.



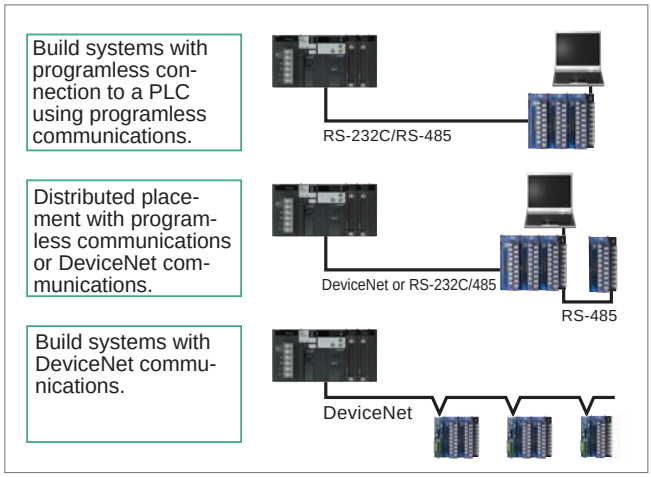
Reliable Basic Functions and Quality

Operates at ambient temperature up to 55°C! UL, CE, and RoHS compliant.



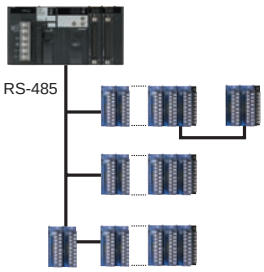
System Configuration

System with High Function Unit (HFU)



Programless Communications for 1,024-channel Systems

Up to 8 HFUs (see note) can be connected to a PLC.
Up to 32 Basic Units can be connected to each HFU. (See note.)



TC4

4 channels per Unit x 32 Units x 8 HFUs = 1,024 channels

TC2

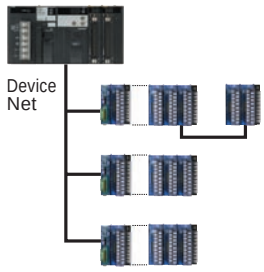
2 channels per Unit x 32 Units x 8 HFU = 512 channels

For each End Unit, up to 16 Units can be connected side by side, including HFUs.

Note: EJ1N-HFU□-NFL□

Build 200-channel Systems with DeviceNet Communications

Up to 63 HFUs (see note) can be connected to a PLC.
Up to 16 Basic Units can be connected to each HFU. (See note.)



When data is allocated by the user with the Configurator, up to 1,000 channels can be used for inputs and outputs for a DeviceNet Master. Therefore, if you allocate 5 inputs/outputs per channel, you can use up to 200 channels.

For each End Unit, up to 16 Units can be connected side by side, including HFUs.

Note: EJ1N-HFUB-DRT

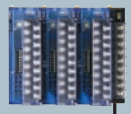
Applications

Electric Component Furnaces

The EJ1 can control up to 1,024 channels with programless communications. Monitoring of multipoint heater temperatures and integrated processing with high-precision controls are easy for continuous furnaces to create a system without waste.

NS-series PT

RS-232C/RS-485



RS-485

Easy

CX-Thermo can be easily connected to a multi-node EJ1 network.

Reduced Work

The amount of work required to create ladder programs is reduced by using bit specifications for operation commands.

Multivendor

Use OMRON or Mitsubishi PLCs

Flexible

Wiring is reduced with distributed placement by zone.

High Speed

High-speed data communications at 115.2 kbps between Units

Easy

Easy communications with programless communications

Large Capacity

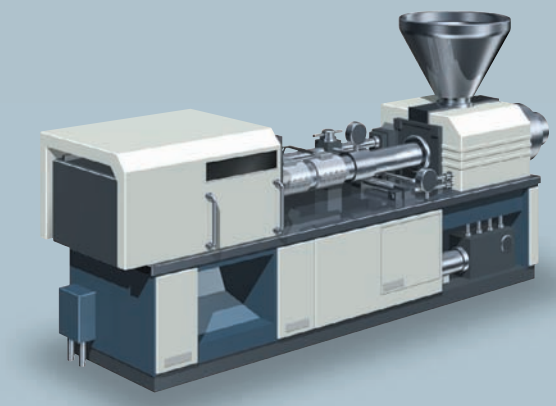
Reliable programless communications for multipoint operation with data exchange for up to 1,200 parameters.

High Speed

High-speed communications at 115.2 kbps even for high-volume data.

Molding Machines

Independently set heating/cooling PID control improves control of molding machines. OMRON's unique optimum cycle control improves the power factor and reduces energy consumption.



Flexible

Independent heating/cooling PID control responds dependably to control characteristics.

Easy

The PID constants can be calculated by autotuning (AT) for heating/cooling control.

Convenient

Self-tuning (ST) (see note) can be used to control devices when autotuning (AT) is difficult to use.

Note: ST cannot be used for Heating/Cooling Control.

Convenient

The communications protocol and baud rate can be changed by setting a DIP switch.

Flexible

Optimum cycle control, peak current suppression, and power factor improvement is made possible by direct connection to the G3ZA.

Note: Do not use the manipulated variable (MV) calculation for the G3ZA when using self-tuning (ST).

Flexible

All parameters can be set with Modbus communications

Modbus

RS-485

Reduced Work

Screens can be created in no time using the NP3 screen templates.

The above application examples are provided for reference only. Always confirm devices, equipment functions, and safety before using the EJ1 in any specific application. When using the EJ1 in applications requiring special attention to safety, be sure there is sufficient margin in ratings and performance and take suitable safety measures, such as installing failsafe measures. Also, consult with your OMRON representative and confirm specifications and other related documents.

Ordering Information

Temperature Controller

Standard Control Models

Name	Power supply voltage	No. of control points	Control outputs 1 and 2	Control outputs 3 and 4	Auxiliary outputs	Functions: Heater burnout alarm	Functions: Event inputs	Communications functions	Input type	Terminal	Model
Basic Unit (temperature control) (See note 1.) Ver.1.2	24 VDC supplied from the End Unit	2	Voltage output: 2 points (for SSR drive) (See note 2.)	Transistor output: 2 points (sinking)	None	2 (See note 3.)	2	G3ZA connection port: RS-485 From End Unit: Port A or port B: RS-485	Thermocouple, platinum resistance thermometer, analog voltage, and analog current selectable for each channel.	M3 terminal	EJ1N-TC2A-QNHB
										Screw-less clamp	EJ1N-TC2B-QNHB
		4		Voltage output: 2 points (for SSR drive) (See note 2.)		None	None			M3 terminal	EJ1N-TC4A-QQ
										Screw-less clamp	EJ1N-TC4B-QQ
		2	Current output: 2 points	Transistor output: 2 points (sinking)			2			M3 terminal	EJ1N-TC2A-CNB
										Screw-less clamp	EJ1N-TC2B-CNB
HFU with Programless Communications (See note 1.) Ver.1.2		None	None	None	Transistor output: 4 points (sinking)	None	4	Port C: RS-485 or RS-232C selectable. From End Unit: Port A: RS-485	No input	M3 terminal	EJ1N-HFUA-NFLK
										Screw-less clamp	EJ1N-HFUB-NFLK
								Port C: RS-422 From End Unit: Port A: RS-485		M3 terminal	EJ1N-HFUA-NFL2
										Screw-less clamp	EJ1N-HFUB-NFL2
HFU with DeviceNet Communications (See note 1.)					None		None	DeviceNet communications		Screw-less clamp	EJ1N-HFUB-DRT
End Unit (See note 1.)	24 VDC				Transistor output: 2 points (sinking)		None	Port A or B: RS-485 Connector: Port A		M3 terminal	EJ1C-EDUA-NFLK
										Detachable connector	EJ1C-EDUC-NFLK

Note 1: An End Unit is always required for connection to a Basic Unit or an HFU. An HFU cannot operate without a Basic Unit. External communications cannot be performed when using a Basic Unit only.
Note 2: For heating/cooling control applications, control outputs 3 and 4 on the 2-point models are used for the cooling or heating control outputs. On the 4-point models, heating/cooling control is performed for the two input points.
Note 3: When using the heater burnout alarm, purchase a Current Transformer (E54-CT1 or E54-CT3) separately.

Accessories (Order Separately)

Current Transformer (CT)

Diameter	Model
5.8 dia.	E54-CT1
12.0 dia.	E54-CT3

CX-Thermo Support Software Ver. 4.1

Model
EST2-2C-MV4

G3ZA Connecting Cable

Cable length	Model
5 m	EJ1C-CBLA050

USB-Serial Conversion Cable

Model
E58-CIFQ1

Rail Mounting Equipment

Name	Model
Mounting Rail	PFP-100N
	PFP-50N

OMRON Corporation
Industrial Automation Company
Control Devices Division H.Q.
Analog Controller Division
Shiokoji Horikawa, Shimogyo-ku,
Kyoto, 600-8530 Japan
Tel: (81) 75-344-7080/Fax: (81) 75-344-7149
2-2-1 Nishikusatsu, Kusatsu-shi,
Shiga, 525-0035 Japan
Tel: (81) 77-565-5216/Fax: (81) 77-565-5568

Regional Headquarters
OMRON EUROPE B.V.
Wegalaan 67-69-2132 JD Hoofddorp
The Netherlands
Tel: (31)2356-81-300/Fax: (31)2356-81-388

OMRON ELECTRONICS LLC
One Commerce Drive Schaumburg,
IL 60173-5302 U.S.A.
Tel: (1) 847-843-7900/Fax: (1) 847-843-7787

OMRON ASIA PACIFIC PTE. LTD.
No. 438A Alexandra Road # 05-05/08 (Lobby 2),
Alexandra Technopark, Singapore 119967
Tel: (65) 6835-3011/Fax: (65) 6835-2711

OMRON (CHINA) CO., LTD.
Room 2211, Bank of China Tower,
200 Yin Cheng Zhong Road,
PuDong New Area, Shanghai, 200120, China
Tel: (86) 21-5037-2222/Fax: (86) 21-5037-2200

Authorized Distributor:

© OMRON Corporation 2006 All Rights Reserved.
In the interest of product improvement,
specifications are subject to change without notice.

Printed in Japan
Cat. No. H146-E1-03 0908

OMRON Industrial Automation Global: **www.ia.omron.com**