Read and Understand this Catalog

Please read and understand this catalog before purchasing the product. Please consult your OMRON representative if you have any questions or comments.

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Performance data given in this catalog is provided as a guide for the user in determining suitability and does not constitute a warranty. It may represent the result of OMRON's test conditions, and the users must correlate it to actual application requirements. Actual performance is subject to the OMRON Warranty and Limitations of Liability.

Note: Do not use this document to operate the Unit.

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OMRON

LOOP

SYSMAC CJ Series

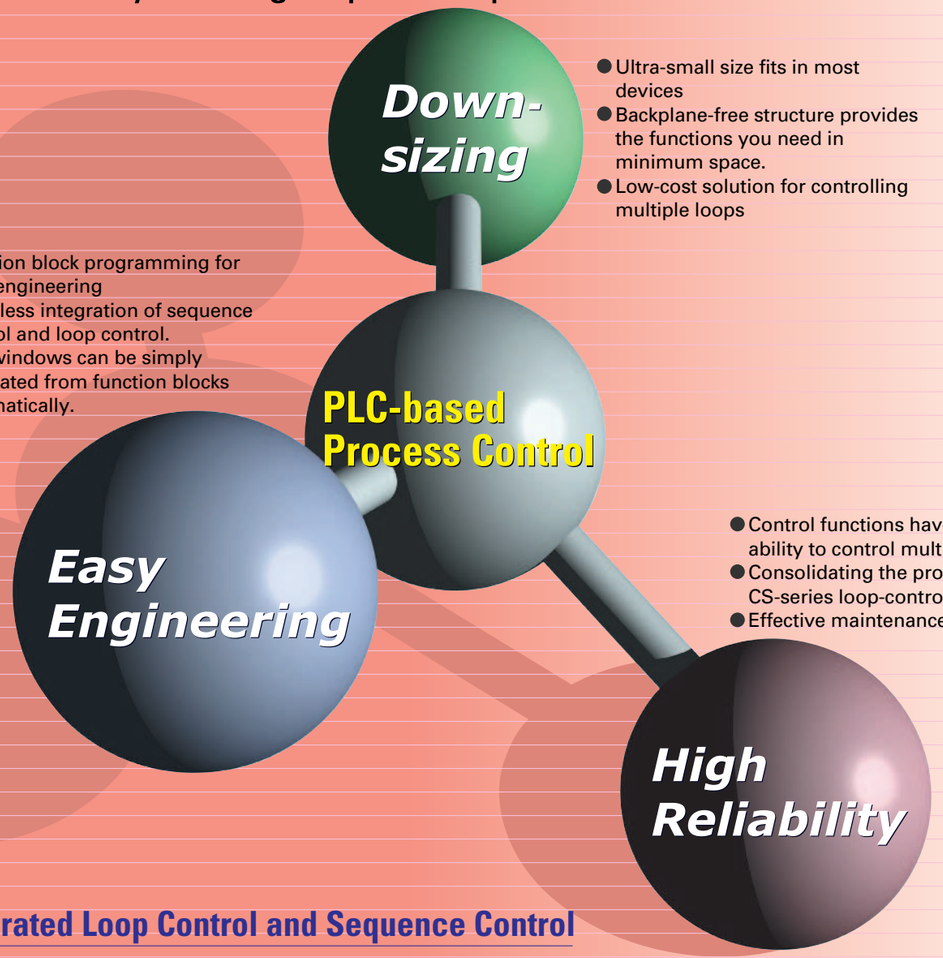
Programmable Controllers

CJ1G-CPU□□P Loop-control CPU Unit

Fully Integrated Sequence and Loop Control
New Built-in Loop Controller

LOOP **Introducing the New Style of Loop Control**

Advanced controller functions integrated with the same CJ-series functionality and high-speed capabilities



- Ultra-small size fits in most devices
- Backplane-free structure provides the functions you need in minimum space.
- Low-cost solution for controlling multiple loops

- Function block programming for easy engineering
- Seamless integration of sequence control and loop control.
- HMI windows can be simply generated from function blocks automatically.

- Control functions have the added ability to control multiple loops.
- Consolidating the proven CS-series loop-control technology
- Effective maintenance functions

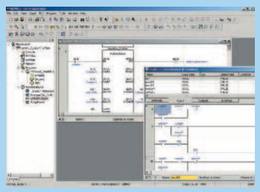
Integrated Loop Control and Sequence Control

An engine for controlling analog quantities (e.g., temperature, pressure, flowrate) is built into the same CPU Unit as the engine for executing sequence control, delivering high-speed sequence control and high-speed, advanced analog quantity control in a single Unit.

Sequence Control Engine

CPU Unit element: CJ1G-CPU4□H

CX-Programmer sequence control program (ladder, function block, structured text)



Execute 20-Kstep ladder programs in 1 ms (see note) Fast

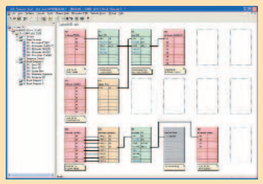
Note: Basic instructions only

Loop-control CPU Unit

Loop Control Engine

Loop Controller Element: Up to 300 or 50 function blocks

CX-Process loop control program (function blocks)



Execute PID Control in 10 ms (see note) Fast

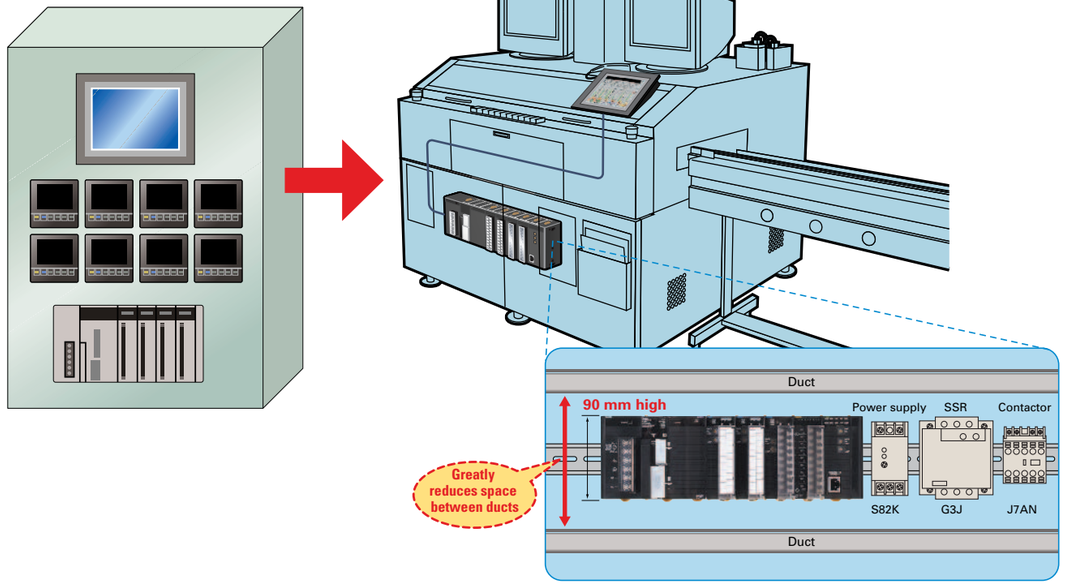
Note: General application (e.g., loop configuration: Ai4 Terminal + Segment Linearizer + Basic PID + Ao4 Terminal)

Down-sizing

Small

Super compact: Only 90 mm High and 65 mm Deep, and Backplane-free structure enables flexible width design.

Compact PLC Aids Machine Downsizing by Fitting Just About Anywhere.
Wide Array of I/O Units, Special I/O Units, and CPU Bus Units Are Available to Suit Your Application.

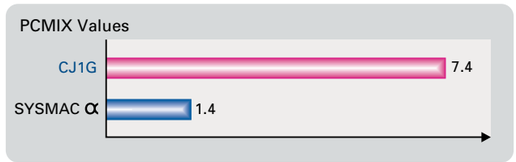


Fast

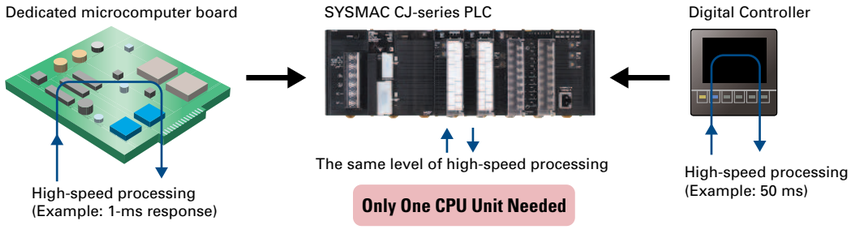
High-speed sequence control functions can be used directly for high-speed, advanced loop control.

- **Sequence control**: Executes 20-Kstep ladder programs in 1 ms (with basic instructions only). PCMIX = 7.4 LD or OUT executed in 40 ns
- **Loop control**: Executes PID operations for 20 loops in up to 10 ms. This is a guide for general applications (see note).

- Sequencing



Note: Loop configuration: Ai4 Terminal + Segment Linearizer + Basic PID + Ao4 Terminal
The external I/O response time in the overall system refers to the conversion time.



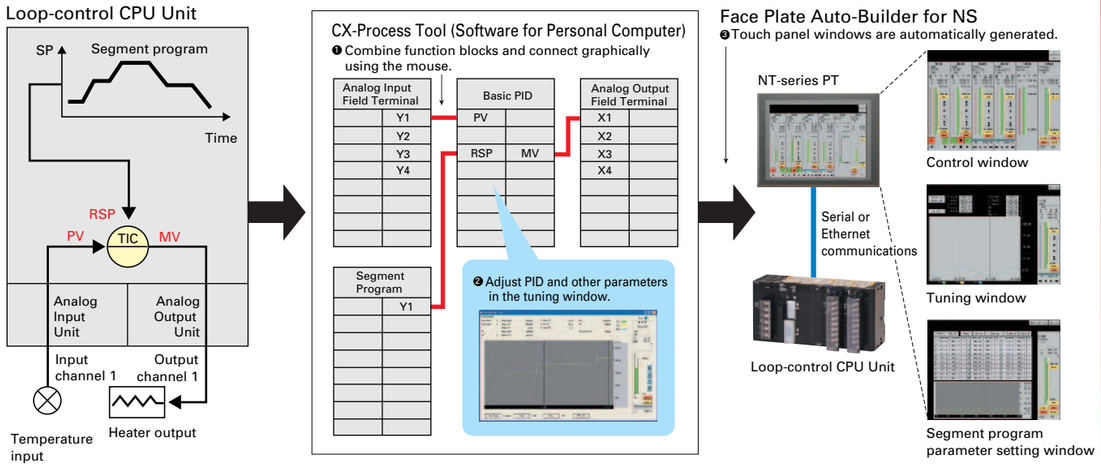
Easy Engineering

Easy

Function blocks make loop-control programming easy. You can also create CX-Process Tool tuning windows to help adjust loops. Controller faceplates can be created automatically for touch panel displays.

- **Sequence control programs**: Standardize and simplify programs using structured programming. Special I/O Unit and CPU Bus Unit settings are easy with function blocks (using ladder programming language or structured text).
- **Loop control programs**: By combining function blocks, a wide array of control methods can be easily configured, from basic PID control used by Temperature Controllers to program, cascade, and feed-forward control.

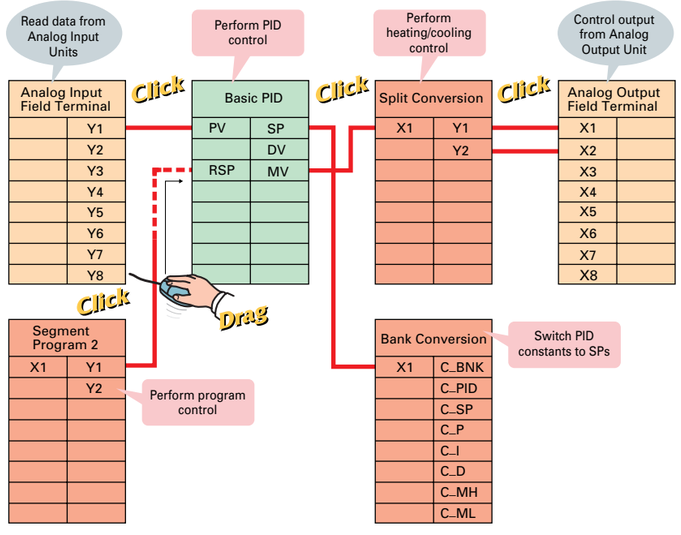
● **Engineering** Example: Program Control



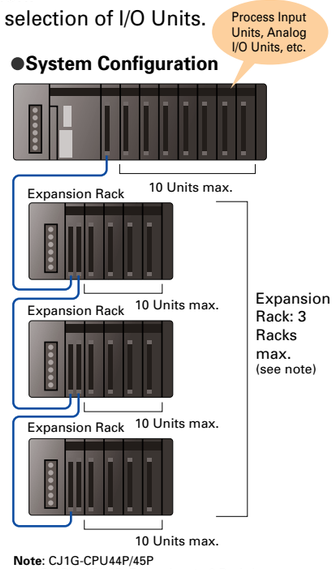
Expandability

Lineup includes low-cost models that use up to 50 function blocks and models that allow up to 300 blocks designed for large-scale systems and complicated operations.

- **Loop control**: Programming with function blocks to suit the application.
- **System configuration**: Choose and combine functions from a broad selection of I/O Units.



● **System Configuration**



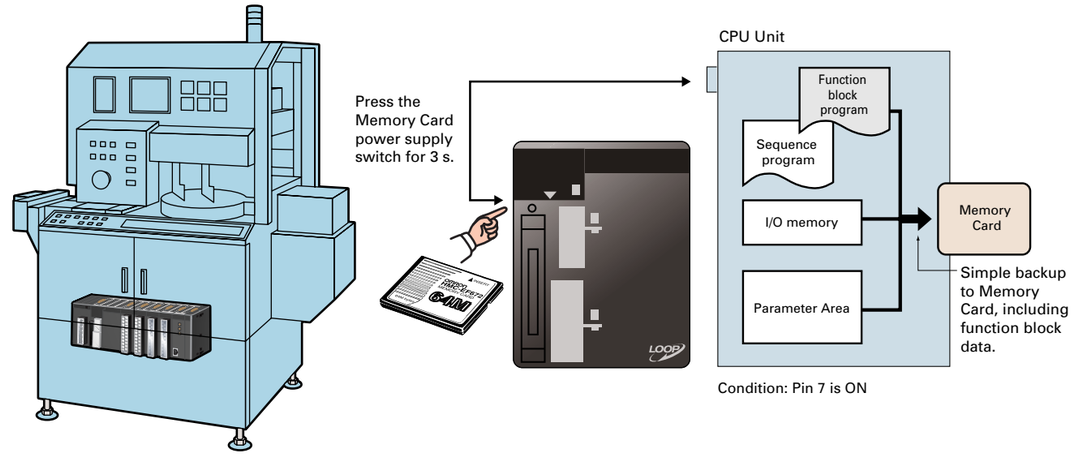
Note: CJ1G-CPU44P/45P
(CJ1G-CPU42P/43P: Expand up to 2 Racks)

High Reliability

Maintenance

Simply turn the DIP Switch ON/OFF to save or read the user program including function blocks using the Memory Card.

- Simple backup function enables backup, recovery, and comparison of all PLC data including the function block programs for the Loop Control Board using the Memory Card.
- Save tag settings, comments, annotations, and connection data created using the CX-Process Tool to the Memory Card.



Results

Consolidating OMRON's expertise in temperature and process control cultivated over many years to provide you with effortless solutions using proven algorithms.

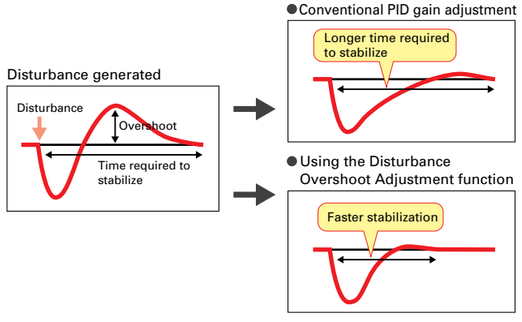
- **Loop control**: Proven functionality of Temperature Controllers and CS-series Loop Control Boards (see note 1) in a compact size.

New Algorithm Further Enhances Control Stability

Disturbance Overshoot Adjustment

This function restrains overshoot when a disturbance is generated, allowing faster stabilization.

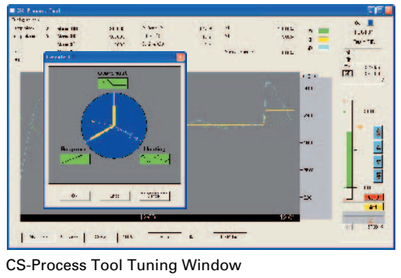
[Example]
- Temperature drops when adding objects to a furnace
- Control disturbances when retooling



Optimum Tuning to Suit the Application

Fine Tuning

Adjust PVs, SPs, and MVs while monitoring, and save data as CSV files from the software tuning window. Autotuning (AT) and fine-tuning functions can also be used for automatically calculating PID constants (see note 2).

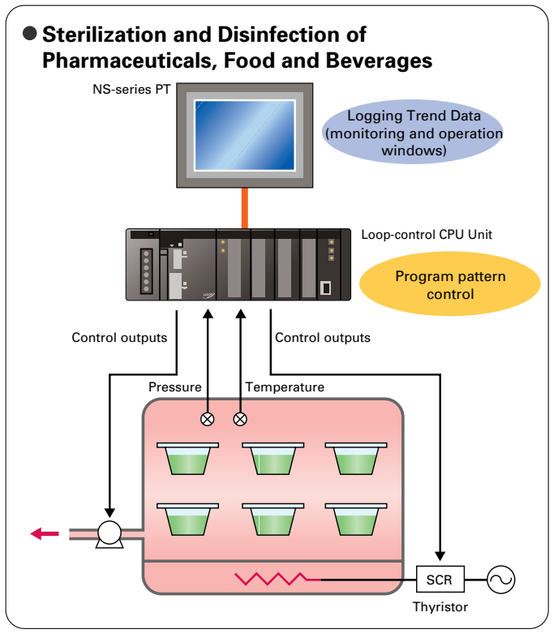


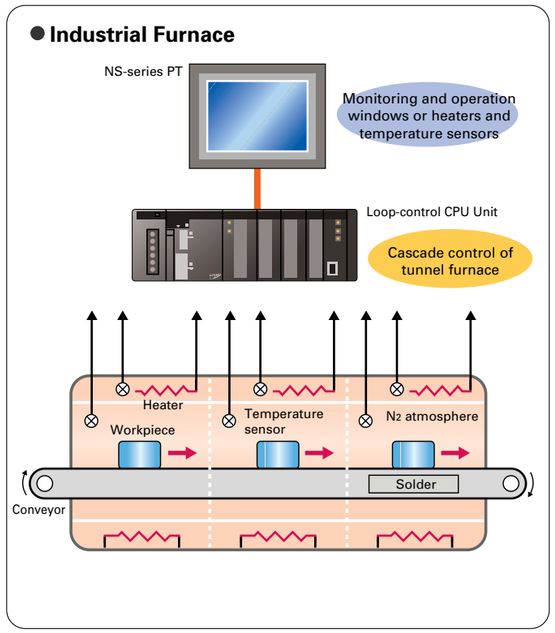
CS-Process Tool Tuning Window

Note 1: For details on CS-series Loop Control Boards, refer to the PLC-based Process Control Catalog (Cat. No. P051).
2: Control can be fine-tuned by automatically tuning PID parameters using previous control parameters and three user-set requirements to execute fuzzy logic.

Applications

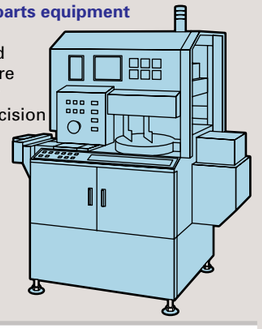
The Loop-control CPU Unit Provides You with Solutions for the Complex and Advanced Functions Demanded by Control Devices in an Increasingly Diverse Range of Equipment.



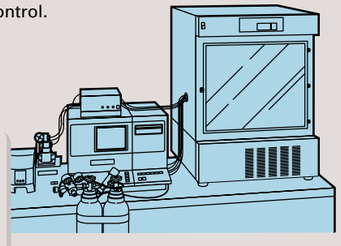


Providing Solutions to Other Problems

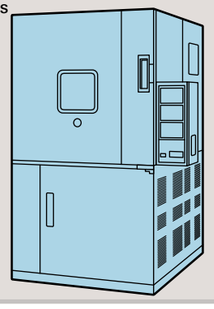
Electrical parts equipment requiring high-speed temperature control for higher precision and improved tact time.



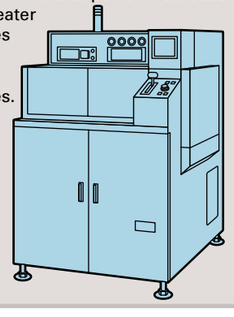
Fermentation equipment requiring temperature, pressure, flowrate, and pH control.



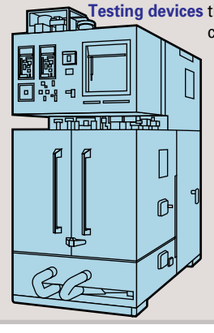
Food machines, semi-conductor devices and other machines requiring **multipoint temperature control**.



Diffusion furnaces that perform cascade control of heater temperatures and internal chamber temperatures.



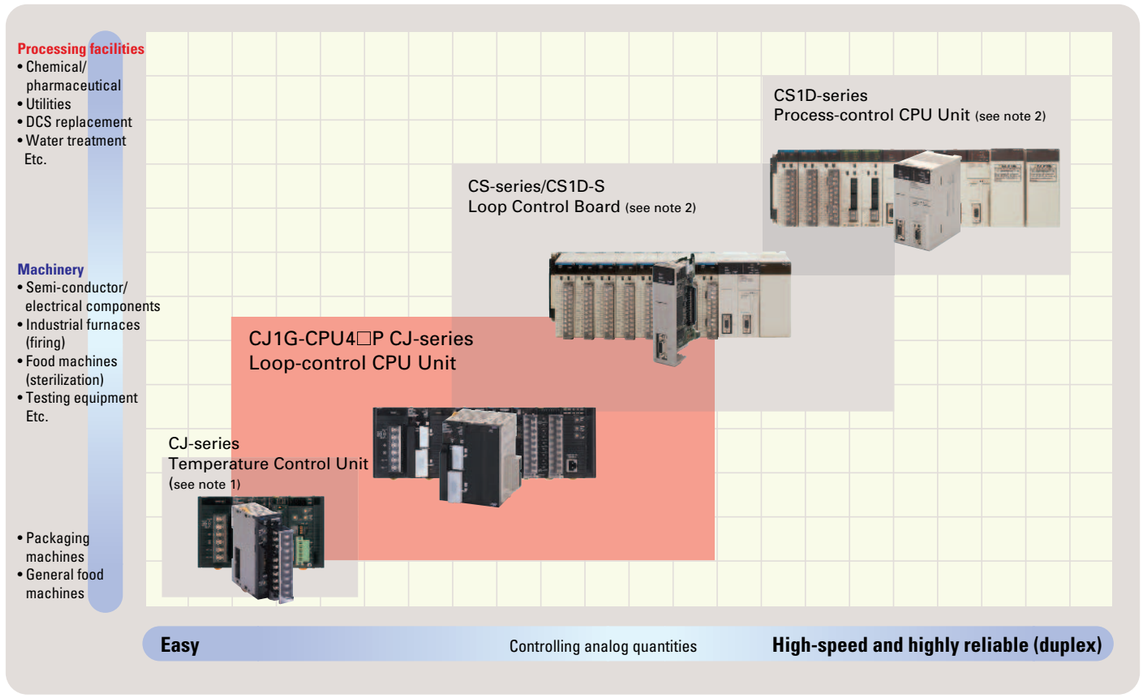
Testing devices that frequently change setting conditions and program settings.



Loop Control Machines and Product Variations

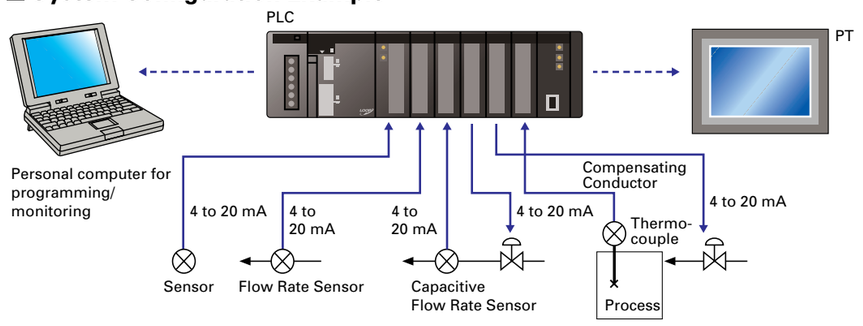
■ Model Selection

Compact CJ-series Loop-control CPU units are ideal for equipment with built-in applications. CS-series and CS1D models designed for duplex systems are also available for processing equipment that requires high reliability.



Note 1: The Temperature Control Unit integrates control and I/O for either 2 loops or 4 loops.
Temperature control is achieved simply by setting parameters. (CX-Process cannot be used.)
2: For details on CS-series Loop Control Boards and Process-control CPU Units, refer to the PLC-based Process Control Catalog (Cat. No. P051).

■ System Configuration Example



■ Example of Peripheral Devices

Temperature Sensors	Input	Control	Output	
E52 Thermocouples Platinum-resistance Thermometers	CJ1W-P□□□ Analog Process Input Unit CJ1W-AD□□□ Analog Input Unit	CJ1G-CPU□□P Loop-control CPU Unit	CJ1W-DA□□□ Analog Output Unit (linear output)	• Position Control G3PX Power Controller
			CJ1W-OD□□□ Transistor Output Unit (pulse output)	• Cycle Control G32A-EA + G3PA • SSR G3PA/B/C, G3NA, etc.
Analog quantities (e.g., temperature, flowrate, concentration) ES1/ES1B Infrared Thermosensors Flow Rate Sensors, Displacement Sensors, Signal Converters, etc.			CJ1W-OC□□□ Relay Output Unit	• ON/OFF Control
			RS-485 communications: Built-in serial port on CPU Unit CJ1W-SCU□1-V1 Serial Communications Unit	• Optimum Cycle Control G3ZA

SYSMAC CJ Series

Peripheral Devices

Input Devices

E52-series Temperature Controllers

Plenty of Variation to Suit an Extensive Range of Applications

- Select from a variety of choices in number of elements, shape, protective tubing length, and terminal type.
- Economical models and special models are available as well as general-purpose models.Select from a diverse range of models to suit the application: Models for high temperatures, metal patterns, surface measurement, and room temperatures, waterproof and anti-corrosive models, models for moving parts, and models with double elements.

■ Model Structure

E52-①②③ D=④ ⑤M

① Element type
② Protective tubing length
③ Terminal type
④ Protective tubing model
⑤ Lead wire length

Example: **E52-CA185A D:3.2 2M**

ES1/ES1B-series Infrared Thermosensors

Hygienic temperature measurement without damaging the workpiece.Ideal for workpieces on conveyors or other applications in which contact measurement is difficult.

- ES1 Series: Designed for high-precision, small-spot, high-temperature measurements.
- Two types of small spot: 3-mm dia. and 8-mm dia.
- High-precision and high-speed measurement with a repeatability of ±0.5°C and response speed of 0.4 s (95%).
- Models are available for medium (–500 to 500°C), mid-low (–50 to 500°C), and high (0 to 1000°C) temperature ranges.

Output Devices

G3PX-series Power Controllers

Single-phase Power Controller for phase control systems requiring precision temperature control. Models with base up and soft start functions also available.

■ Model Structure

G3PX-□□□□□-CT□ Example: **G3PX-220EUN-CT03**
① ② ③④ ⑤

① Load power supply voltage
2: 200/220 V

② Load current
20: 20 A
40: 40 A
60: 60 A

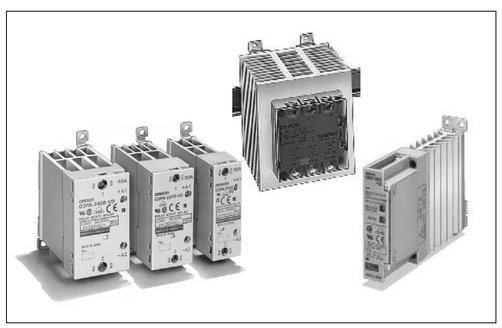
③ Phase
D: Three-phase

④ Function classification
UN: Single function
H: Heater burnout detection
HN: Multiple heater burnout detection
C: Constant current

⑤ Current transformer types
03: 30-cm lead
10: 1-m lead

*Three-phase Power Controllers are also available.

G3PA/B/C Power Solid-state Relay



G3PA New Power Solid-state Relay

- Dielectric strength of 4,000 VAC with a super slim profile and built-in heat sink
- Mount either using screws or DIN Track.

G3PB Three-phase Solid-state Relay (Contactor)

- Upgraded heat sink saves space and labor costs.
- 480-VAC models for a broad range of applications.

G3PC SSR with Failure Detection Function

- Detects SSR failure, which is difficult to identify in heater temperature control, and outputs alarm signals simultaneously.
- Contributing to safe design and improved maintenance of heater control systems.

For details, refer to the Temperature Controllers Selection Guide (Cat. No. Y101) and the Solid State Relays Group Catalog (Cat. No. X030).

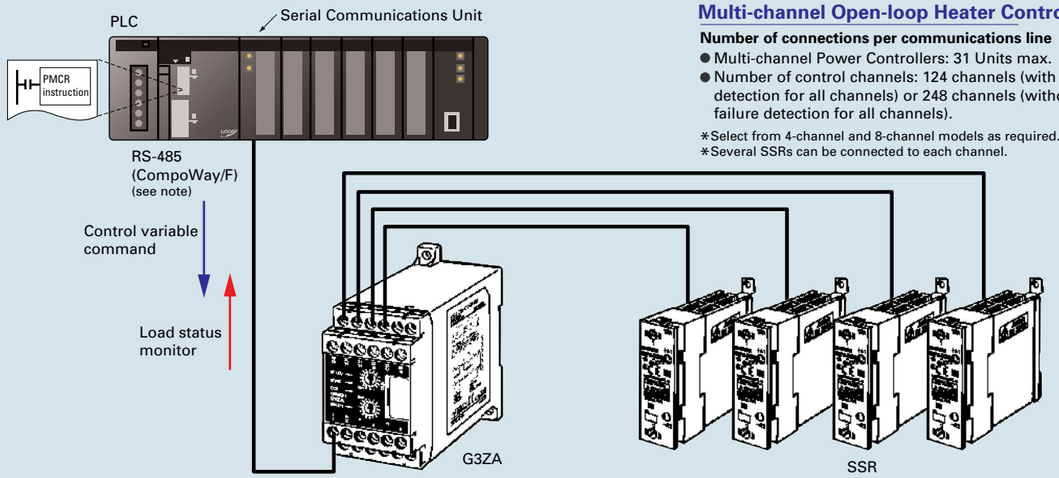
New Products

G3ZA Multi-channel Power Controller Catalog No.: J147

Multi-channel Power Controller with Zero-cross SSRs. Receives MVs from the PLC Using RS-485 Serial Communications (Protocol Macro), and Controls the Heater Power with High Precision Using the SSR.

● Optimum Cycle Control for High-precision Control with Low Noise
Delay control: Energy-efficient, enabling equipment downsizing by using the peak current cut method, which delays the output timing between channels.
Control variable conversion: Enables processing and output of input control quantities using the internal gradient and internal offset settings.

● Smaller than a Normal Power Controller
Same height as G3PA and G3PB, enabling smaller panels and saving space. One Controller can control up to 8 SSRs.
Models with 8 channels (control points) or with 4 channels and heater burnout detection are available.
RS-485 communications to set manipulated variables and heater burnout detection.



Multi-channel Open-loop Heater Controller

Number of connections per communications line

- Multi-channel Power Controllers: 31 Units max.
- Number of control channels: 124 channels (with failure detection for all channels) or 248 channels (without failure detection for all channels).

*Select from 4-channel and 8-channel models as required.
*Several SSRs can be connected to each channel.

Note: Use the Serial Communications Unit to execute serial communications from the Loop-control CPU Unit using a protocol macro.

K8AC-H Digital Heater Element Burnout Detector Catalog No.: N137

High-precision Detection of Three-phase Heater Burnout with Heater Current Display. Achieves Burnout Detection for Phase-control Heaters.

RS-485 communications can be used to collect data for preventive maintenance of heater burnout. (Collected data includes heater operating time, momentary current/voltage values, current/voltage maximum/minimum values, burnout current values, and number of burnouts.)

And now a high-precision Heater Burnout Detector compatible with many heater control methods!

Compatible with Many Heater Control Methods
The K8AC is compatible with ON/OFF control (for either contactors or SSRs), cycle control, and phase control.

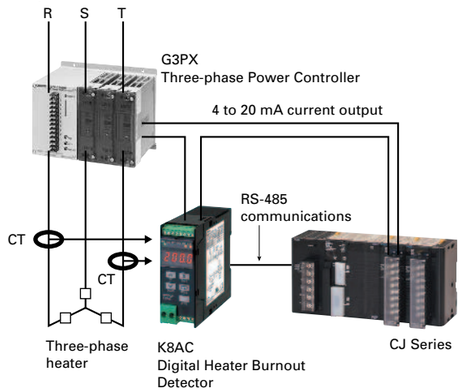
Load circuit errors are not overlooked.
Instantly detects short-circuit errors and heater disconnection in load circuits.

High-precision Digital Detection
High resolution and voltage fluctuation compensation function to detect burnouts in even one circuit of a multicircuit heater.

Easy-to-read Heater Current Display
With this display, an ammeter is not required for onsite adjustments. Error status or measurement data can also be displayed.

Monitor Measurement Data via Communications
Measurement data can be collected using RS-485 communications. Use this data in analysis for preventive maintenance.

Thyristor Phase Control



Loop-control CPU Units

Loop-control CPU Units

Model	CPU Unit element				Loop Controller element	
	I/O bit capacity	Program capacity	Data memory capacity	Programming software	Number of function blocks	Programming software
CJ1G-CPU45P	1,280 bits (Up to 3 Expansion Racks)	60 Ksteps	128 K words (DM: 32 K words, EM: 32 K words × 3 banks)	CX-Programmer, CX-Simulator, etc.	300 blocks	CX-Process
CJ1G-CPU44P		30 Ksteps	64 K words (DM: 32 K words, EM: 32 K words × 1 bank)			
CJ1G-CPU43P	960 bits (Up to 2 Expansion Racks)	20 Ksteps				
CJ1G-CPU42P		10 Ksteps			50 blocks	

Loop Controller Element Specifications

Item		Specification
Name		Loop-control CPU Unit
Model Number		CJ1G-CPU□□P
Applicable PLCs		CJ-series PLCs
Area for data exchange with CPU Unit	**CPU Unit's Auxiliary Area**	• Loop Controller element-to-CPU Unit element: Run Status Flag, PV Error Input Flag, MV Error Input Flag, Execution Error Flag, Function Block Database (RAM) Error Flag, Automatic Cold Start Execution Flag, Backup during Operation Flag, Function Block Changed Flag, etc. • CPU Unit element-to-Loop Controller element: Start Mode at Power ON: Hot/Cold Start bit.
	User allocations in I/O Memory	User link tables are used to allocate function block ITEM data in any part of I/O memory in the CPU Unit. (CIO, Work, Holding, or DM Areas, or EM Area bank 0)
	Allocations for all data	HMI function used to allocate function block ITEM data for Control, Operation, External Controller, and System Common blocks in the specified bank of the EM Area in the CPU Unit.
Settings		None
Indicators		Two LED indicators: RUN and ready
Super capacitor backup data		All function block data (including sequence tables, step ladder program commands), stored error log data
Super capacitor backup time		5 minutes at 25°C
Data stored in flash memory		Function block data
Backup from RAM to flash memory		Executed from CX-Process Tool (as required).
Recovery from flash memory to RAM		Automatically transferred when power to CPU Unit is turned ON if startup mode is set for a cold start, or executed from CX-Process Tool (as required).
Influence on CPU Unit cycle time		0.8 ms max. (depends on function block data contents)
Current consumption (supplied from Power Supply Unit)		1.06 A for 5 VDC (current consumption for Loop-control CPU Unit including CPU Unit element and Loop Controller element) **Note:** Increased by 150 mA when NT-AL001 Link Adapter is used.

Loop Controller Element Specifications

Item			Specifications	
Model			CJ1G-CPU42P	CJ1G-CPU43/44/45P
Operation method			Function block method	
Loop Controller element			LCB01	LCB03
Function block analog operations	**Control and operation blocks**	**PID and other control functions, square root operation, time operations, pulse train operation, and other operation functions for various processes.**	50 blocks max.	300 blocks max.
Sequence control	**Step ladder program blocks**	**Logic sequence and step sequence functions**	20 blocks max. 2,000 commands total 100 commands max. per block Separable into 100 steps max.	200 blocks max. 4,000 commands total 100 commands max. per block Separable into 100 steps max.
I/O blocks	**Field terminal blocks**	**Analog I/O function with Analog I/O Unit, contact I/O function with Basic I/O Unit**	30 blocks max.	40 blocks max.
	User link tables	**Analog data I/O and contact data I/O function for CPU Unit**	2,400 data items max.	
	HMI function	**I/O function for the specified bank of the EM Area in the CPU Unit for function block ITEM data used for Control, Operation, External Controller, and System Common blocks for the HMI function.**	Allocated 1 EM Area bank Operation and Control blocks: 50 blocks max. × 20 send/receive words System Common blocks: 20 send/receive words	Allocated 1 EM Area bank Operation and Control blocks: 300 blocks max. × 20 send/receive words System Common blocks: 20 send/receive words
	System Common block	**System common operation cycle setting, run/stop command, load rate monitor, etc.**	Single block	
Method for creating and transferring function blocks			Created using CX-Process Tool (purchased separately) and transferred to Loop Controller.	
External I/O response time			The time from external input of analog signals up to external output of analog signals on a single control loop depends on the function block's operation cycle and the CPU Unit's cycle time.	
Operation cycle			0.01, 0.02, 0.05, 0.1, 0.2, 0.5, 1, or 2 s (default: 1 s) (See note.) Can be set for each function block. **Note:** 0.01, 0.02, and 0.05 s cannot be set for some blocks.	
Internal operation		**Number of control loops**	• The maximum number of loops that can be used if the LCB load rate is 80% for a standard applications (e.g., with each loop consisting of one Ai4 Terminal, Segment Linearizer, Basic PID, and A04 terminal) is shown in the following table. **Note:** Loop Controller element LCB01: 25 loops max.	
Control method		**PID control method**	PID with 2 degrees of freedom	
		Control combinations	Any of the following function blocks can be combined: Basic PID control, cascade control, feed-forward control, sample PI control, Smith dead time compensation control, PID control with differential gap, override control, program control, time-proportional control, etc.	
Alarms		**PID block internal alarms**	4 PV alarms (upper upper-limit, upper limit, lower limit, lower lower-limit) and 1 deviation alarm per PID block	
		Alarm blocks	High/low alarm blocks, deviation alarm blocks	

Operation cycle	Maximum number of loops	Operation cycle	Maximum number of loops
0.01 s	20 loops	0.2 s	150 loops (see note)
0.02 s	35 loops (see note)	0.5 s	
0.05 s	70 loops (see note)	1 s	
0.1 s	100 loops (see note)	2 s	

List of Function Blocks

System Common Block

Type	Block Name	Function
---	System Common	Makes settings common to all function blocks and outputs signals for the system.

Control Block

Type	Block Name	Function
Controller	2-position ON/OFF (see note)	2-position type ON/OFF controller
	3-position ON/OFF (see note)	3-position type ON/OFF controller for heating/cooling ON/OFF control
	Basic PID (see note)	Performs basic PID control.
	Advanced PID (see note)	Performs advanced PID control for enabling deviation/MV compensation, MV tracking, etc.
	Blended PID	Performs PID control on the cumulative value (cumulative deviation) between the accumulated value PV and accumulated value Remote Set Point.
	Batch Flowrate Capture	Functions to open the valve at a fixed opening until a fixed batch accumulated value is reached.
	Fuzzy Logic	Outputs up to 2 analog outputs based on fuzzy logic performed on up to 8 analog inputs.
	Indication and Setting (see note)	Manual setter with PV indication and SP setting functions
	Indication and Operation (see note)	Manual setter with PV indication and MV setting functions
	Ratio Setting (see note)	Ratio and bias setter with PV indication and ratio setting function
	Indicator (see note)	PV indicator with PV alarm

Operation Block

Type	Block Name	Function
Alarm/Signal restrictions/ Hold	High/Low Alarm (see note)	Provides the alarm contact outputs for the high and low limits of single analog signals.
	Deviation Alarm (see note)	Provides the alarm contact outputs for the deviation of two analog signals.
	Rate-of-change Operation and Alarm (see note)	Provides the alarm contact outputs for the high and low limits of rate-of-change operation when the analog signal rate-of-change is output.
	High/Low Limit (see note)	Limits the high and low limits of single analog signals.
	Deviation Limit (see note)	Calculates the deviation between two analog signals, and limits the deviation within that range.
	Analog Signal Hold (see note)	Holds the maximum, minimum or instantaneous value of single analog signals.
Arithmetic	Addition or Subtraction (see note)	Performs addition/subtraction with gain and bias on up to 4 analog signals.
	Multiplication (see note)	Performs multiplication with gain and bias on up to 2 analog signals.
	Division (see note)	Performs division with gain and bias on up to 2 analog signals.
	Arithmetic Operation (see note)	Performs various math operation (trigonometric, logarithmic, etc.) on floating-point decimal values converted (to industrial units) from up to 8 analog inputs.
	Range Conversion (see note)	Easily converts up to 8 analog signals simply by inputting the 0% and 100% input values and 0% and 100% output values.
Functions	Square Root (see note)	Performs square root extraction (with lowend cutout) on single analog signals.
	Absolute Value (see note)	Outputs the absolute value of single analog signals.
	Non-linear Gain (Dead Band) (see note)	Performs non-linear (3 gain values) operation on single analog signals. Analog signals can also set as a dead band (with different gap).
	Low-end Cutout (see note)	Sets output to zero close to the zero point of single analog signals.
	Segment Linearizer (see note)	Converts single analog signals to 15 segments before the signals are output.
	Temperature and Pressure Correction (see note)	Performs temperature and pressure correction.
Time Function (see note)	First-order Lag (see note)	Performs first-order lag operation on single analog signals.
	Rate-of-change Limit (see note)	Performs rate-of-change restriction on single analog signals.
	Moving Average (see note)	Performs moving average operation on single analog signals.
	Lead/Delay (see note)	Performs lead/delay operation on single analog signals.
	Dead Time (see note)	Performs dead time and first-order lag operations on single analog signals.
	Dead Time Compensation	Used for Smith's dead time compensation PID control.
	Accumulator for instantaneous value input	Accumulates analog signals, and outputs 8-digit accumulated value signals.
	Run Time Accumulator	Accumulates the operating time, and outputs the pulse signal per specified time.
	Time Sequence Data Statistics (see note)	Records time sequence data from analog signals and calculates statistics, such as averages and standard deviations.
	Ramp Program	Ramp program setter for combining ramps for time and hold values.
	Segment Program	Segment program setter setting the output values with respect to time.
	Segment Program 2	Segment program setting with wait function for setting the output values with respect to time.

Note: The Function Blocks dealing with high-speed operation (operation cycle: 0.01, 0.02, and 0.05 seconds is possible). These blocks, however, are not supported by the CS1D-LCB05D.

List of Function Blocks

Type	Block Name	Function
Signal Selection/Switching	Rank Selector (see note)	Selects the rank of up to 8 analog signals.
	Input Selector (see note)	Selects the specified analog signals specified by the contact signal from up to 8 analog signals.
	3-input Selector (see note)	Selects and outputs one of three analog input signals.
	3-output Selector (see note)	Outputs one analog input signal in three switched directions.
	Constant Selector (see note)	Selects 8 preset constants by the contact signal.
	Constant Generator (see note)	Outputs 8 independent constants.
	Ramped Switch	Switches two analog inputs (or constants) with a ramp.
	Bank Selector	Records the PID parameters (SP, P, I, D, MH, ML) in up to 8 sets in advance, and switches the PID parameter for Basic/Advanced/Blended PID Blocks according to the analog input range (zone) or input bits.
	Split Converter	Inputs the MV from the Basic PID block or Advanced PID block, converts the MV into two analog outputs for V characteristics or parallel characteristics (e.g., MV for heating or cooling) and outputs them.
Constant ITEM Setting	Constant ITEM Setting (see note)	Writes the constant to the specified ITEM at the rising edge of the send command contact.
	Variable ITEM Setting (see note)	Writes the analog signal to the specified ITEM at the rising edge of the send command contact.
	Batch Data Collector (see note)	Stores each of max. 8 analog inputs to buffer by a certain timing within sequential processing.
Pulse Train Operation	Accumulated Value Input Adder	Adds up to four accumulated value signals.
	Accumulated Value Analog Multiplier	Multiplies analog signals by the accumulated value signals.
	Accumulator for accumulated value input	Converts 4-digit accumulated value signals to 8 digits.
	Contact input/Accumulated value output	Counts low-speed contact pulses, and outputs 8-digit accumulated signals.
	Accumulated Value Input/Contact Output	Converts 4-digit accumulated value signals to low-speed contact pulses before they are output.
Others	Analog/Pulse Width Converter (see note)	Changes the ON/OFF duration ratio in a constant cycle duration so that it is proportional to the analog signal.
Sequence Operation	Contact Distributor	Connect contact signals between function blocks in a 1:1 connection.
	Constant Comparator (see note)	Compares up to eight sets of analog signals and constants, and outputs the comparison results as contacts.
	Variable Comparator (See note)	Compares up to eight pairs of analog signals, and outputs the comparison results as contacts.
	Timer (see note)	2-stage output type addition timer for forecast values and reached values. Can also output the present value.
	ON/OFF Timer (see note)	Timer for performing ON-OFF operation at preset ON and OFF times.
	Clock Pulse (see note)	Outputs a clock pulse at the setting time interval for a single operation cycle.
	Counter (see note)	2-stage output type addition timer for forecast values and arrival values. Can also output the current value.
	Internal Switch (see note)	Temporary storage contact for accepting relays in the Step Ladder Program block. **Note:** (One internal switch is already allocated as "temporary storage" in CX-Process Tool.)
	Level Check (see note)	Checks an analog input for 8 levels and outputs a contact corresponding to the level. The level number is also output as an analog value at the same time.
Contact Type Control Target	ON/OFF Valve Manipulator	Manipulates and monitors ON/OFF valves with open/close limit switches.
	Motor Manipulator	Manipulates and monitors motor operation.
	Reversible Motor Manipulator	Manipulates and monitors reversible motor operation.
	Motor Opening Manipulator	Inputs a target opening, and manipulates an electric positional-proportional motor.

Sequence Control

Type	Block Name	Function
---	Step Ladder Program (see note)	Performs logic sequence and step progression control.

Field Terminal

Type	Block Name	Function
Contact I/O	DI 8-point Terminal (see note)	Inputs 8 contacts from 8-point Input Unit.
	DI 16-point Terminal (see note)	Inputs 16 contacts from 16-point Input Unit.
	DI 32-point Terminal (see note)	Inputs 32 contacts from 32-point Input Unit.
	DI 64-point Terminal (see note)	Inputs 64 contacts from 64-point Input Unit.
	DO 8-point Terminal (see note)	Outputs 8 contacts from 8-point Output Unit.
	DO 16-point Terminal (see note)	Outputs 16 contacts from 16-point Output Unit.
	DO 32-point Terminal (see note)	Outputs 32 contacts from 32-point Output Unit.
	DO 64-point Terminal (see note)	Outputs 64 contacts from 64-point Output Unit.
	DI 16-point/Do16-point Terminal (see note)	Inputs and outputs 16 contacts each from 16-point Input/16-point Output Units.
Analog I/O	AI 4-point Terminal (PTS51) (see note)	Inputs 4 analog signals from CJ1W-PTS51 (Isolated-type Thermocouple Input Unit)
	AI 4-point Terminal (PTS52) (see note)	Inputs 4 analog signals from CJ1W-PTS52 (Isolated-type Temperature Resistance Input Unit).
	AI 8-point Terminal (AD081) (see note)	Inputs 8 analog signals from the CJ1W-AD081(-V1).
	AO 8-point Terminal (DA08V/C) (see note)	Outputs 8 analog signals from the CJ1W-DA08V/DA08C.
	AI 4-point Terminal (AD041) (see note)	Inputs 4 analog signals from the CJ1W-AD041(-V1).
	AO 4-point Terminal (DA041) (see note)	Outputs 4 analog signals from the CJ1W-DA041(-V1).
	AO 2-point Terminal (DA021) (see note)	Outputs 4 analog signals from the CJ1W-DA021.
	AI 4-point/AO 2-point Terminal (MAD42) (see note)	Inputs 4 analog signals and outputs 2 analog signals each from the CJ1W-MAD42.
	AI 4-point Terminal (DRT1-AD04) (see note)	Inputs 4 analog signals from a DRT1-AD04 DeviceNet Slave Analog Input Unit.
	AO 2-point Terminal (DRT1-DA02) (see note)	Outputs two analog signals from a DRT1-DA02 DeviceNet Slave Analog Output Unit.

Note: The Function Blocks dealing with high-speed operation (operation cycle: 0.01, 0.02, and 0.05 seconds is possible).

CX-Process Tool and Monitor

Software Specifications

Item	Specifications	CX-Process Tool	CX-Process Monitor Plus
Name		CX-Process	CX-Process Monitor Plus
Model number		WS02-LCTC1-EV4	WS02-LCMC1-E
Applicable PLCs		CS-series PLCs	
Applicable Unit		CJ-series Loop-control CPU Unit CS-series Loop Control Board/Unit Process-control CPU Unit	CJ-series Loop-control CPU Unit CS-series Loop Control Board and Loop Control Unit with unit version 2.0 or later Process-control CPU Unit
Compatible computers	Computer	IBM PC/AT or compatible	
	CPU	Minimum: Pentium 133 MHz min. Recommended: Celeron 400 MHz min.	
	OS	Microsoft Windows 2000, NT4.0, 95 (see note 3), 98, Me (see note 4), or XP	Microsoft Windows 2000, NT4.0 or XP
	Memory	Minimum: 32 Mbytes Recommended: 64 Mbytes min.	Minimum: 96 Mbytes Recommended: 128 Mbytes min.
	Hard disk space	Minimum: 20 Mbytes free space Recommended: 30 Mbytes min. free space	Minimum: 400 Mbytes free space Recommended: 500 Mbytes min. free space
	Monitor	Minimum: XGA Recommended: SXGA 65,536 colors or more	Minimum requirement: XGA (XGA or above recommended)
	CD-ROM drive	1 drive min.	
	Sound board	---	1
	Mouse	Recommended: Microsoft mouse or compatible pointing device	
Communications method	Connection with CPU Unit (or Serial Communications Board/Unit)	When FinsGateway Serial Unit driver is used: Communications protocol with PLC: Host Link (Peripheral Bus is not supported.) (See note 5.) • Connect the computer to the peripheral port or built-in RS-232C port of the CPU Unit, or to the RS-232C port of the Serial Communications Board/Unit. • Connecting cable: For connecting to peripheral port of CPU Unit: CS1W-CN□□□ (2 m or 6 m) For connecting to RS-232C port of CPU Unit: XW2Z-□□□-□ (2 m or 5 m)	
		When CX-Server is used: Communications protocol with PLC: Host Link or Peripheral Bus Connecting cable: • For connecting to peripheral port of CPU Unit: CS1W-CN□□□ (2 m or 6 m) For connecting to RS-232C port of CPU Unit: XW2Z-□□□-□ (2 m or 5 m)	CX-Server is not supported.
	Connection via Controller Link	When FinsGateway Controller Link driver or CX-Server is used: Install the software in a computer with a Controller Link Support Board to communicate with a PLC with a Controller Link Unit mounted.	
	Connection via Ethernet	When FinsGateway ETN_UNIT driver or CX-Server is used: Install the software in a computer with an Ethernet Board to communicate with a PLC with an Ethernet Unit mounted.	
Offline functions		ITEM data settings for function blocks • Software connections for analog signals • Displaying and printing text strings (annotation) pasted on function block diagrams and ladder diagrams. • Instructions for step ladder blocks and commands for sequence table blocks • Tag settings for CX-Process Monitor	Construction of user screens
Online functions		• Transfer of function block data (Downloading/Uploading for Loop Control Boards/Units.) • Starting/stopping all function blocks (LCU/LCB) • Monitoring system operation: Monitoring and controlling the System Common block (including LCB/LCU load rates) • Validating LCB/LCU operation: Checking function block connections (including starting and starting individual function blocks), validating ladder diagrams and sequence tables, and monitoring ITEMs • Tuning PID constants and other parameters (fine tuning and auto-tuning) • Initialization of Loop Control Unit memory (RAM)	User screens • Overview screen • Control screen • Tuning screen • Trend screen • Graphic screen • Operating guide message screen System screens • Alarm history screen • System monitor screen • Operation log screen

Note: 1. The CX-Process functions that can be used depend on the version. For details, refer to the operation manuals (Cat. No.: W372-E1-□ and W373-E1-□).

2. FinsGateway V3 is included in CX-Process. (70 Mbytes of free space required on hard disk.)

3. Windows 95 cannot be used when a Controller Link Support Board (PCI bus) is used for connection.

4. When using Windows Me, the CPU must be a Pentium 150 MHz or higher.

5. Peripheral Bus cannot be used with FinsGateway V3.

Connections to PLC

The following 4 methods can be used to connect to a PLC.

Communications network		Communication driver		
		FinsGateway V3	FinsGateway Version 2003 (See note 1.)	CX-Server V2.2
Host Link	**Connection via PLC's peripheral port or RS-232C port**	Supported (Serial Unit version is used.)		Supported (See note 2.)
Peripheral Bus		Not supported	Supported	Supported (See note 2.)
Controller Link	**Connection to PLC with Controller Link Unit via Controller Link Support Board (PCI board).**	Supported (See note 3.) (CLK (PCI) version is used.)		Supported
	Connection to PLC with Controller Link Unit via Controller Link Support Board (ISA board).	Supported (CLK (ISA) version is used.)		Supported
Ethernet	**Connection to PLC with Ethernet Unit via Ethernet Board.**	Supported (Ethernet version is used.)		Supported

Note: 1. The Windows 2000 and XP operating systems are supported. (Windows 95, 98, and Me operating systems cannot be used.)

2. When CX-Server is used for communications, CX-Programmer can be simultaneously connected via the same COM port.

3. The Windows 95 operating system cannot be used.

Utility Software

Touch Panel Software

■ Face Plate Auto-Builder for NS

Simply specify the CSV tag file created using the CX-Process Tool to automatically create a project constructed with a Face Plate for Loop-control CPU Units for use with OMRON's NS-series Programmable Terminals.

Function Overview

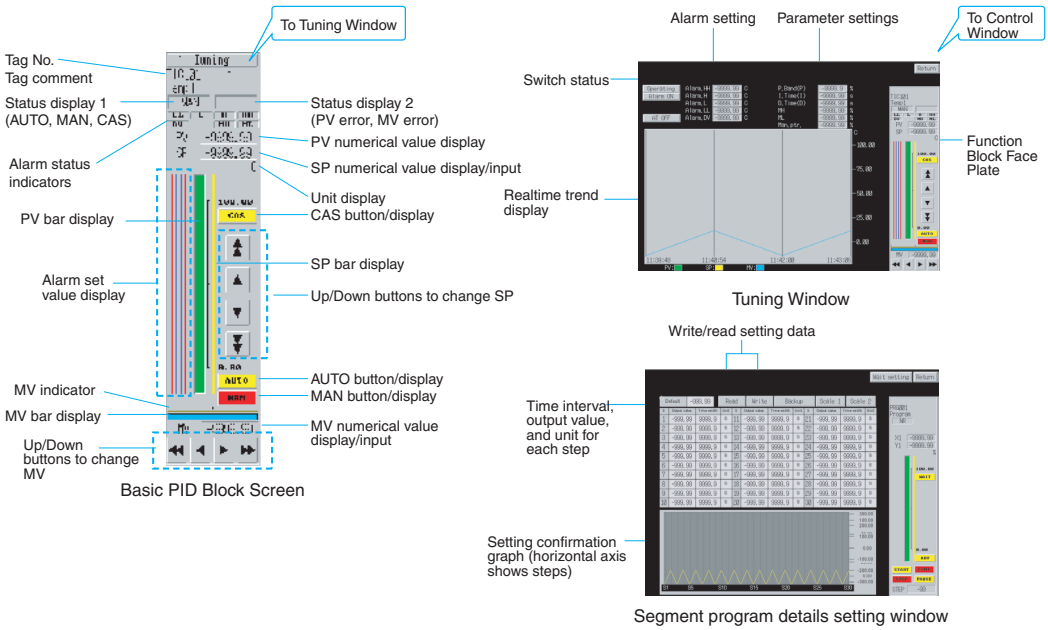
- Create windows for monitoring and tuning PID and other function blocks for up to 100 loops (NS System version 4 or higher).
- NS project files for monitoring multiple Loop-control CPU Units from a single NS-series PT can be generated from CX-Process projects for up to 32 multiple nodes.
- When a Segment Program 2 function block is used for program operation, the Detailed Setting Windows (Time Interval vs. Output Value Setting Window, Wait Interval Setting Window) used for the parameter settings are also automatically generated.

Basic Specifications

Item		Specifications
Name		Face Plate Auto-Builder for NS
Model number		WS02-NSFC1-EV2
Applicable PLC products		CJ-series Loop-control CPU Units CS-series Loop Control Boards (unit version 1.0 or later) CS-series Loop Control Units (unit version 2.0 or later)
Applicable PTs		NS-series NS12, NS10, and NS8 (PT version 2.0 or later) NS-Designer (version 2.0 or later)
System requirements	**Computer**	IBM PC/AT or compatible
	CPU	CPU Celeron 400 MHz or better recommended
	OS	OS Microsoft Windows 95 (see note), 98, Me, NT4.0, 2000, or XP
	Memory	Recommended: 32 Mbytes min.
	Hard disk storage	Recommended: 200 Mbytes free space min.
	Monitor	Minimum: 640 × 480 dots
Function Overview		Number of generated loops: 32 max., control windows and tuning windows Applicable face plates: 2-position ON/OFF, 3-position ON/OFF, Basic PID, Advanced PID, Indication and Operation, Indicator, Segment Program 2 (includes the parameter setting windows) Number of loops in control windows: 6 loops per window for NS12, 4 loops per window for NS10/NS8 Realtime trend in tuning window: 1-second cycle

Note: OSR2 or later.

Example of Automatically Created Windows

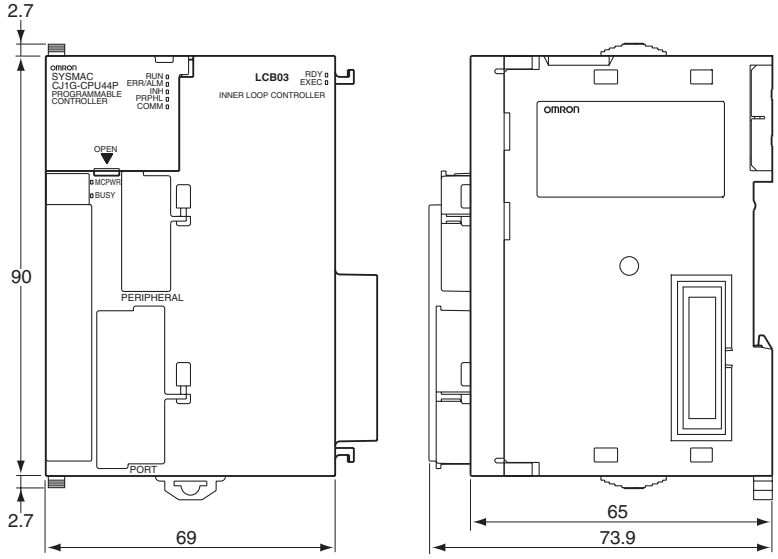


Dimensions

CPU Units

■ Loop-control CPU Units

CJ1G-CPU42P
CJ1G-CPU43P
CJ1G-CPU44P
CJ1G-CPU45P



Ordering Information

Basic Configuration Units

Name	Specifications					Model	Standards
Loop-control CPU Unit	I/O bits	Program capacity	Data memory capacity	LD instruction execution time	Number of function blocks	---	---
	1,280 (3 Expansion Racks)	60 Ksteps	128 K words (DM: 32K words, EM: 32 K words × 3 banks)	0.04 μs	300 blocks	CJ1G-CPU45P *NEW*	UC1, CE, N
		30 Ksteps	64 K words (DM: 32K words, EM: 32 K words × 1 bank)			CJ1G-CPU44P *NEW*	
	960 (2 Expansion Racks)	20 Ksteps				CJ1G-CPU43P *NEW*	
		10 Ksteps			50 blocks	CJ1G-CPU42P *NEW*	
CPU Units	I/O bits	Program capacity	Data memory capacity	LD instruction execution time	Built-in I/O	---	---
	2,560 (3 Expansion Racks)	250 Ksteps	448 K words (DM: 32K words, EM: 32 K words x 13 banks)	0.02 μs	---	CJ1H-CPU67H *NEW*	UC1, CE, N, L
		120 Ksteps	256 K words (DM: 32K words, EM: 32K words × 7 banks)			CJ1H-CPU66H	
		60 Ksteps	128 K words (DM: 32K words, EM: 32K words × 3 banks)			CJ1H-CPU65H	
	1,280 (3 Expansion Racks)			0.04 μs		CJ1G-CPU45H	
		30 Ksteps	64 K words (DM: 32K words, EM: 32K words × 1 bank)			CJ1G-CPU4H	
	960 (2 Expansion Racks)	20 Ksteps				CJ1G-CPU43H	
		10 Ksteps				CJ1G-CPU42H	
	640 (1 Expansion Rack)	20 Ksteps	32 K words (DM: 32K words, no EM)	0.1 μs		CJ1M-CPU13	
	320 (no expansion)	10 Ksteps				CJ1M-CPU12	
	160 (no expansion)	5 Ksteps				CJ1M-CPU11	
	640 (1 Expansion Rack)	20 Ksteps			10 inputs and 6 outputs	CJ1M-CPU23 (See note 1.)	
	320 (no expansion)	10 Ksteps				CJ1M-CPU22 (See note 1.)	
	160 (no expansion)	5 Ksteps				CJ1M-CPU21 (See note 1.)	
Power Supply Units	100 to 240 V AC (with RUN output), Output capacity: 5 A, 5 V DC					CJ1W-PA205R	
	100 to 240 V AC, Output capacity: 2.8 A, 5 V DC					CJ1W-PA202	
	24 V DC, Output capacity: 5 A, 5 V DC					CJ1W-PD025	
RS-422A Adapter	Converts RS-232C to RS-422A/RS-485.					CJ1W-CIF11	
I/O Control Unit	Mount 1 Unit on the CJ-series CPU Rack when connecting a CJ-series Expansion Rack.					CJ1W-IC101	
I/O Interface Unit	1 required on each CJ-series Expansion Rack					CJ1W-II101	
I/O Connecting Cable	For connecting CJ-series Expansion Racks to the CJ-series CPU Rack or another CJ-series Expansion Rack.			Cable length: 0.3 m		CS1W-CN313	L, CE
				Cable length: 0.7 m		CS1W-CN713	
				Cable length: 2 m		CS1W-CN223	
				Cable length: 3 m		CS1W-CN323	
				Cable length: 5 m		CS1W-CN523	
				Cable length: 10 m		CS1W-CN133	
				Cable length: 12 m		CS1W-CN133-B2	
Memory Cards	Flash memory, 30 MB					HMC-EF372 (See note 2.)	
	Flash memory, 64 MB					HMC-EF672 (See note 2.)	
	Memory Card Adapter (for computer PCMCIA slot)					HMC-AP001	CE

Note: 1. The CJ1M-CPU23/22's connector for built-in I/O is not included. Purchase one of the connectors in the following table separately.

2. The HMC-EF172, HMC-EF372, and HMC-EF672 Memory Cards cannot be used with the following products. The following CPU Units with lot numbers of 020108 or earlier (manufactured 8 January 2002 or earlier): CS1G-CPU□□H, CS1H-CPU□□H, CJ1G-CPU□□H, and CJ1H-CPU□□H, and NS7-series PTs with lot numbers of 0852 or earlier (manufactured 8 May 2002 or earlier).

Programming Devices

Name	Specifications		Model	Standards
Programming Consoles	An English Keyboard sheet (CS1W-KS001-E) is required.	**Note:** Connects to peripheral port on CPU Unit only (cannot be connected to RS-232C port).	CQM1H-PRO01-E	U, C, CE
			CQM1-PRO01-E	U, C, N, CE
			C200H-PRO27-E	
Programming Console Key Sheet	For CQM1H-PRO01-E, CQM1-PRO01-E, and C200H-PRO27-E		CS1W-KS001-E	CE
Programming Console Connecting Cables	Connects the CQM1-PRO01-E Programming Console. (Length: 0.05 m)		CS1W-CN114	
	Connects the C200H-PRO27-E Programming Console. (Length: 2.0 m)		CS1W-CN224	
	Connects the C200H-PRO27-E Programming Console. (Length: 6.0 m)		CS1W-CN624	
CX-Programmer	Windows-based Programming Device OS: Windows 95, 98, Me, NT4.0, 2000, or XP	**Note:** Connected to the peripheral port or RS-232C port on the CPU Unit or connected to the RS-232C port on a Serial Communications Unit.	*NEW* WS02-CXPC1-E-V5□	---
For 3 licenses			WS02-CXPC1-EL03-V5□	
For 10 licenses			WS02-CXPC1-EL10-V5□	
CX-Simulator	Windows-based Support Software for Windows 95, 98, Me, NT4.0, 2000, or XP.		WS02-SIMC1-E	---
CX-Process	Programming Software for function blocks for Windows 95, 98, Me, NT4.0, 2000, or XP.		WS02-LCTC1-EV4	---
For 3 licenses			WS02-LCTC1-EV4L03	
For 10 licenses			WS02-LCTC1-EV4L10	
CX-Process Monitor Plus	Loop control monitoring software for Windows NT4.0, 2000, or XP.		WS02-LCMC1-E	---
For 3 licenses			WS02-LCMC1-EL03	
For 10 licenses			WS02-LCMC1-EL10	
USB-Serial Conversion Cable	USB-RS-232C Conversion Cable (Length: 0.5 m) and PC driver (on a CD-ROM disc), Complies with USB Specification 1.1 On personal computer side: USB (A plug connector, male) On PLC side: RS-232C (D-sub 9-pin, male) Driver: Supported by Windows 98, Me, 2000, and XP		CS1W-CIF31	---
Peripheral Device Connecting Cables (for peripheral port)	Connects DOS computers, D-Sub 9-pin receptacle (Length: 0.1 m)	**Note:** Conversion cable to connect RS-232C cable to peripheral port	CS1W-CN118	CE
	Connects DOS computers, D-Sub 9-pin (Length: 2.0 m)	**Note:** Peripheral bus or Host Link	CS1W-CN226	
	Connects DOS computers, D-Sub 9-pin (Length: 6.0 m)		CS1W-CN626	
Peripheral Device Connecting Cables (for RS-232C port)	Connects DOS computers, D-Sub 9-pin (Length: 2.0 m)	**Note:** Peripheral Bus and Host Link, and ESD connector (antistatic)	XW2Z-200S-CV	---
	Connects DOS computers, D-Sub 9-pin (Length: 5.0 m)		XW2Z-500S-CV	
	Connects DOS computers, D-Sub 9-pin (Length: 2.0 m)	**Note:** Host Link only. Peripheral Bus is not possible.	XW2Z-200S-V	
	Connects DOS computers, D-Sub 9-pin (Length: 5.0 m)		XW2Z-500S-V	

Basic I/O Units

Classification	Name	Specifications		Model	Standards
Input Units	DC Input Units	12 to 24 VDC, 8 inputs, 10 mA		CJ1W-ID201	UC, CE, N, L
		24 V DC, 16 inputs, 7 mA		CJ1W-ID211	UC1, CE, N, L
		24 V DC, 32 inputs, 4.1 mA (Fujitsu-compatible connector)		CJ1W-ID231 (See note 1.)	
		24 V DC, 32 inputs, 4.1 mA (MIL connector)		CJ1W-ID232 (See note 1.)	
		24 V DC, 64 inputs, 4.1 mA (Fujitsu-compatible connector)		CJ1W-ID261 (See note 1.)	
		24 V DC, 64 inputs, 4.1 mA (MIL connector)		CJ1W-ID262 (See note 1.)	
	AC Input Units	100 to 120 V AC, 7 mA (100 V, 50 Hz), 16 inputs, terminal block		CJ1W-IA111	
		200 to 240 V AC, 10 mA (200 V, 50 Hz), 8 inputs, terminal block		CJ1W-IA201	
	Interrupt Input Unit	24 VDC, 7 mA, 16 inputs, terminal block		CJ1W-INT01	
	High-speed Input Unit	24 VDC, 7 mA, 16 inputs, terminal block		CJ1W-IDP01	
Output Units	Relay Bit Output Units	250 V AC/24 V DC, 2 A, independent contacts, 8 outputs max.		CJ1W-OC201	
		250 V AC/24 V DC, 2 A, independent contacts, 16 outputs max.		CJ1W-OC211	
	Transistor Output Units	250 V AC/24 V DC, 2 A, independent contacts, 8 outputs max.		CJ1W-OD201	
		24 V DC, 2 A, 8 outputs, sourcing, load short-circuit protection, alarm, terminal block		CJ1W-OD202	
		12 to 24 V DC, 0.5 A, 8 outputs, sinking, terminal block		CJ1W-OD203	
		24 V DC, 0.5 A, 8 outputs, sourcing, load short-circuit protection, alarm, terminal block		CJ1W-OD204	
		12 to 24 V DC, 0.5 A, 16 outputs, sinking, terminal block		CJ1W-OD211	
		24 V DC, 0.5 A, 16 outputs, sourcing, load short-circuit protection, disconnection detection, alarm, terminal block		CJ1W-OD212	
		12 to 24 V DC, 0.5 A, 32 outputs, sinking, Fujitsu-compatible connector		CJ1W-OD231 (See note 1.)	
		24 VDC, 0.5 A, 32 outputs, sourcing, load short-circuit protection, alarm, MIL connector		CJ1W-OD232 (See note 1.)	
		12 to 24 VDC, 0.5 A, 32 outputs, sinking, MIL connector		CJ1W-OD233 (See note 1.)	
		12 to 24 VDC, 0.3 A, 64 outputs, sinking, Fujitsu-compatible connector		CJ1W-OD261 (See note 1.)	
		24 VDC, 0.3 A, 64 outputs, sourcing, MIL connector		CJ1W-OD262 (See note 1.)	
		12 to 24 VDC, 0.3 A, 64 outputs, sinking, MIL connector		CJ1W-OD263 (See note 1.)	
	Triac Output	Unit 250 VAC, 0.6 A, 8 outputs, terminal block		CJ1W-OA201	
I/O Units	DC Input/Transistor Output Units	16 inputs, 24 V DC, 7 mA	Fujitsu-compatible connector	CJ1W-MD231 (See note 2.)	UC1, CE, N
		16 outputs, 12 to 24 V DC, 0.5 A, sinking outputs			
		16 inputs, 24 V DC, 7 mA	MIL connector	CJ1W-MD232 (See note 2.)	
		16 outputs, 24 V DC, 0.5 A, sourcing outputs, load short-circuit protection, alarm			
		16 inputs, 24 V DC, 7 mA	MIL connector	CJ1W-MD233 (See note 2.)	
		16 outputs, 12 to 24 V DC, 0.5 A, sinking outputs			
		32 inputs, 24 V DC, 4.1 mA	Fujitsu-compatible connector	CJ1W-MD261 (See note 1.)	
		32 outputs, 12 to 24 V DC, 0.3 A, sinking outputs			
		32 inputs, 24 V DC, 4.1 mA	MIL connector	CJ1W-MD263 (See note 1.)	
		32 outputs, 12 to 24 V DC, 0.3 A, sinking outputs			
	TTL I/O Unit	32 inputs, 5 V DC, 35 mA	MIL connector	CJ1W-MD563 (See note 1.)	
		32 outputs, 5 V DC, 35 mA			
B7A Interface Units		64 inputs		CJ1W-B7A14	CE
		64 outputs		CJ1W-B7A04	
		32 inputs/32 outputs		CJ1W-B7A22	

Note: 1. Connectors are not provided with these connector models. Either purchase one of the following 40-pin Connectors, or use an OMRON XW2□ Connector-Terminal Block Conversion Unit or a G7□ I/O Relay Terminal.

2. Connectors are not provided with these connector models. Either purchase one of the following 20-pin or 24-pin Connectors, or use an OMRON XW2□ Connector-Terminal Block Conversion Unit or a G7□ I/O Relay Terminal.

This eco label is displayed only on products that satisfy stringent environmental standards established by OMRON.

Special I/O Units

Type	Name	Specifications	Model	Standards
Special I/O Units	Analog Input Unit	8 inputs (1 to 5 V, 0 to 5 V, 0 to 10 V, −10 to 10 V, 4 to 20 mA) Resolution: 1/8000, Conversion speed: 250 μs/point max. (Settable to 1/4000 and 1 ms/point.)	CJ1W-AD081-V1	UC1, CE, N, L
		4 inputs (1 to 5 V, 0 to 5 V, 0 to 10 V, −10 to 10 V, 4 to 20 mA) Resolution: 1/8000, Conversion speed: 250 μs/point max. (Settable to 1/4000 and 1 ms/point.)	CJ1W-AD041-V1	
	Analog Output Unit	8 outputs (1 to 5 V, 0 to 5 V, 0 to 10 V, −10 to 10 V) Resolution: 1/4000, Conversion speed: 1 ms/point max. (Settable to 1/8000, 250 μs/point)	CJ1W-DA08V	
		8 outputs (4 to 20 mA) Resolution: 1/4000, Conversion speed: 1 ms/point max. Settable to 1/8000, 250 μs/point)	CJ1W-DA08C	UC1, CE, N
		4 outputs (1 to 5 V, 0 to 5 V, 0 to 10 V, −10 to 10 V, 4 to 20 mA) Resolution: 1/4,000, Conversion speed: 1 ms/point max.	CJ1W-DA041	UC1, CE, N, L
		2 outputs (1 to 5 V, 0 to 5 V, 0 to 10 V, −10 to 10 V, 4 to 20 mA) Resolution: 1/4000, Conversion speed: 1 ms/point max.	CJ1W-DA021	
	Analog I/O Unit	4 inputs, 2 outputs (1 to 5 V, 0 to 5 V, 0 to 10 V, −10 to 10 V, 4 to 20 mA) Resolution: 1/4000, Conversion speed: 1 ms/point max. (Settable to 1/8000, 250 μs/point)	CJ1W-MAD42	
	Process Analog I/O Unit	4 inputs, B, J, K, L, R, S, T; Conversion speed: 250 ms/4 inputs	CJ1W-PTS51 NEW	UC1, CE
		4 inputs, Pt100 Ω (JIS, IEC), JPt100 Ω, Conversion speed: 250 ms/4 inputs	CJ1W-PTS52 NEW	
	Temperature Control Units	4 loops, thermocouple input, NPN output	CJ1W-TC001	UC1, CE, N L
		4 loops, thermocouple input, PNP output	CJ1W-TC002	
		2 loops, thermocouple input, NPN output, heater burnout detection function	CJ1W-TC003	
		2 loops, thermocouple input, PNP output, heater burnout detection function	CJ1W-TC004	
		4 loops, platinum resistance thermometer input, NPN output	CJ1W-TC101	
		4 loops, platinum resistance thermometer input, PNP output	CJ1W-TC102	
		2 loops, platinum resistance thermometer input, NPN output, heater burnout detection function	CJ1W-TC103	
		2 loops, platinum resistance thermometer input, PNP output, heater burnout detection function	CJ1W-TC104	
	High-speed Counter Unit	2 inputs, max. input frequency: 500 kpps	CJ1W-CT021	
	CompoBus/S Master Unit	CompoBus/S remote I/O, 256 points max.	CJ1W-SRM21	
	ID Sensor Unit (See note.)	For V600 Series, 1 R/W Head	CJ1W-V600C11	---
		For V600 Series, 2 R/W Heads	CJ1W-V600C12	

Note: Refer to the *Auto-Identification Components Group Catalog* (Cat. No. Q132) for details on the V600 Series RFID System.

CPU Bus Units

Type	Name	Specifications	Model	Standards
CPU Bus Units	Controller Link Units	Wired (Shielded twisted-pair cable)	CJ1W-CLK21-V1	UC1, CE, N, L
	Controller Link Relay Terminal	Wired Includes 5 Terminals	CJ1W-TB101	---
	Controller Link Support Board	Twisted pair, PCI bus (wired), with Support Software	3G8F7-CLK21-EV1	CE
	Controller Link Repeater Unit	Wired-wired type	CS1W-RPT01	UC1, CE
		Wired-optical (H-PCF) type	CS1W-RPT02	
		Wired-optical (GI) type	CS1W-RPT03	
	Serial Communications Units	1 RS-232C port and 1 RS-422/485 port	NEW CJ1W-SCU41-V1	UC1, CE, N, L
		2 RS-232C ports	NEW CJ1W-SCU21-V1	
	CX-Protocol	Windows-based Protocol Creation Software for Windows 95, 98, Me, NT4.0, 2000, or XP	WS02-PSTC1-E	---
	Ethernet Unit	10Base-T	CJ1W-ETN11	UC1, CE, N, L
		100Base-TX	CJ1W-ETN21	
	FL-net Unit	100Base-TX	CJ1W-FLN22	UC1, CE
	DeviceNet Unit	Functions as master and/or slave; allows control of 32,000 points max. per master.	CJ1W-DRM21	UC1, CE, N, L
	Position Control Unit	Equipped with MECHATROLINK-II, multiple axis control for 16 axes max.	CJ1W-NCF71 NEW	---

Ordering Information

Related Devices

Name	Yaskawa Model No.	OMRON Model No.	Details
MECHATROLINK-II Application Module	JUSP-NS115	FNY-NS115	---
MECHATROLINK-II Connection Cable	JEPMC-W6003-A5	FNY-W6003-A5	0.5 m
	JEPMC-W6003-01	FNY-W6003-01	1.0 m
	JEPMC-W6003-03	FNY-W6003-03	3.0 m
	JEPMC-W6003-05	FNY-W6003-05	5.0 m
	JEPMC-W6003-10	FNY-W6003-10	10 m
	JEPMC-W6003-20	FNY-W6003-20	20 m
	JEPMC-W6003-30	FNY-W6003-30	30 m
MECHATROLINK-II Terminator	JEPMC-W6022	FNY-W6022	---

NS-series Programmable Terminals

Name		Specifications			Model number	Standards
			Ethernet	Case color		
NS12 PT		12-inch TFT, 800 × 600 dots	None	Ivory	NS12-TS00-V1	UE, CE, NEMA4
				Black	NS12-TS00B-V1	
			Yes	Ivory	NS12-TS01-V1	
				Black	NS12-TS01B-V1	
NS10-V1		10-inch TFT, 640 × 480 dots	None	Ivory	NS10-TV00-V1	
				Black	NS10-TV00B-V1	
			Yes	Ivory	NS10-TV01-V1	
				Black	NS10-TV01B-V1	
NS8-V1		8.4-inch TFT, 640 × 480 dots	None	Ivory	NS8-TV10-V1	
				Black	NS8-TV10B-V1	
			Yes	Ivory	NS8-TV11-V1	
				Black	NS8-TV11B-V1	
NS5-V1		5-inch TFT, 320 × 240 dots	None	Ivory	NS5-SQ00-V1	
				Black	NS5-SQ00B-V1	
			Yes	Ivory	NS5-SQ01-V1	
				Black	NS5-SQ01B-V1	
NS-Designer screen design software		Windows English Version on CD-ROM			NS-NSDC1-V6	---
Face Plate Auto-Builder for NS		Software package used to automatically build NS-series project files configured with Face Plate Screens for the Loop Control Unit/Board based on a CSV tag file.			WS02-NSFC1-EV2	
Cable		Screen transfer cable for IBM PC/AT or compatible			XW2Z-S002	
PT-to-PLC Connecting Cable		PT connection: 9 pins PLC connection: 9 pins	Length: 2 m		XW2Z-200T	
			Length: 5 m		XW2Z-500T	
Accessories	**Ladder Monitor Software**	One CD-ROM Ladder Monitor application (see note 1) and I/O Comment File Extraction Tool (see note 2) **Note:** A Memory Card (sold separately) is required to use the software in the NS-series PT. An HMC-AP001 Memory Card Adapter is required in order to copy the data from the CD-ROM in the computer to the Memory Card.			NS-EXT01-V2	
					NS-EXT01-V2L03 (3 licenses)	
					NS-EXT01-V2L10 (10 licenses)	
					NS-EXT01-V2HMC (with 64-Mbyte Memory Card)	

Note: 1. NS-series PT application used to monitor a SYSMAC CS/CJ-series PLC's ladder program from the PT.

2. This tool extracts I/O comment data from the CX-Programmer's CXT file and converts the data to a format that can be used by the Ladder Monitor Software for NS.

Ordering Information

International Standards

- The standards indicated in the "Standards" column are those current for UL, CSA, cULus, cUL, NK, and Lloyd standards and EC Directives as of the end of September 2004. The standards are abbreviated as follows: U: UL, UR: UL Recognition Mark, U1: UL Class I Division 2 Products for Hazardous Locations, C: CSA, UC: cULus, UC1: cULus Class I Division 2 Products for Hazardous Locations, CU: cUL, N: NK, L: Lloyd, and CE: EC Directives.
- Ask your OMRON representative for the conditions under which the standards were met.

EMC Directives

Applicable Standards

EMI: EN61000-6-4

EMS: EN61131-2 and EN61000-6-2 (see note)

PLCs are electrical devices that are incorporated in machines and manufacturing installations. OMRON PLCs conform to the related EMC standards so that the devices and machines into which they are built can more easily conform to EMC standards. The actual PLCs have been checked for conformity to EMC standards. Whether these standards are satisfied for the actual system, however, must be checked by the customer.

EMC-related performance will vary depending on the configuration, wiring, and other conditions of the equipment or control panel in which the PLC is installed. The customer must, therefore, perform final checks to confirm that the overall machine or device conforms to EMC standards.

Note: The applicable EMS standard depends on the product.

Low Voltage Directive

Applicable Standard: EN61131-2

Devices that operate at voltages from 50 to 1,000 V AC or 75 to 150 V DC must satisfy the appropriate safety requirements. With PLCs, this applies to Power Supply Units and I/O Units that operate in these voltage ranges.

These Units have been designed to conform to EN61131-2, which is the applicable standard for PLCs.