CS1W-LC001, CS1W-LCB01/05, CS1D-CPU□□P

Loop Control Unit

Integrate Process Control and Monitoring functions with PLC sequence control. With easy-to-use DCS-style function block configuration, complex control systems can be set up in minutes.

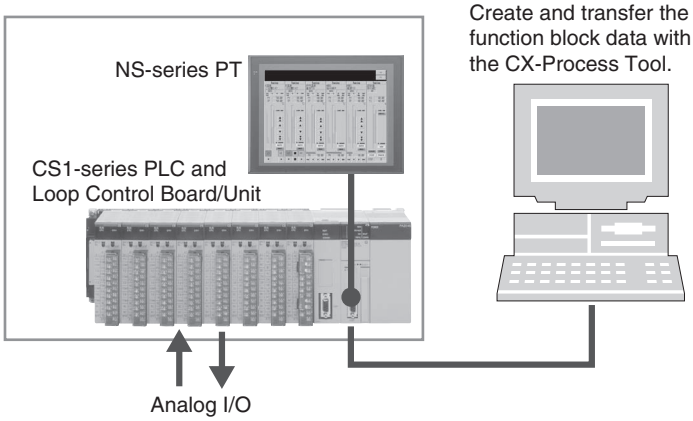
- The control system can be scaled to match the controlled system, from a few loops that replace a Controller to hundreds of loops that perform large-scale process control.
- A variety of control programs can be created by selecting from more than 70 kinds of function blocks suitable for loop control, such as PID calculations, Segment Programs, and square root calculations.
- The CX-Process Tool, included in CX-One, can be used for easy programming.
- A Tuning Screen can be opened in the CX-Process Tool to change parameters while monitoring the status.
- Duplex systems are available for applications that require high reliability.
- The NS Face Plate Auto Builder software can be used to automatically create a touch panel for NS-series PTs from a function block screen.

Function

The CS1-series Loop Control Boards and Units are packed with DCS functions and can use function block programs, which are ideal for process control. Graphical programming can be used, so function blocks can be pasted into a window and connected with the mouse.

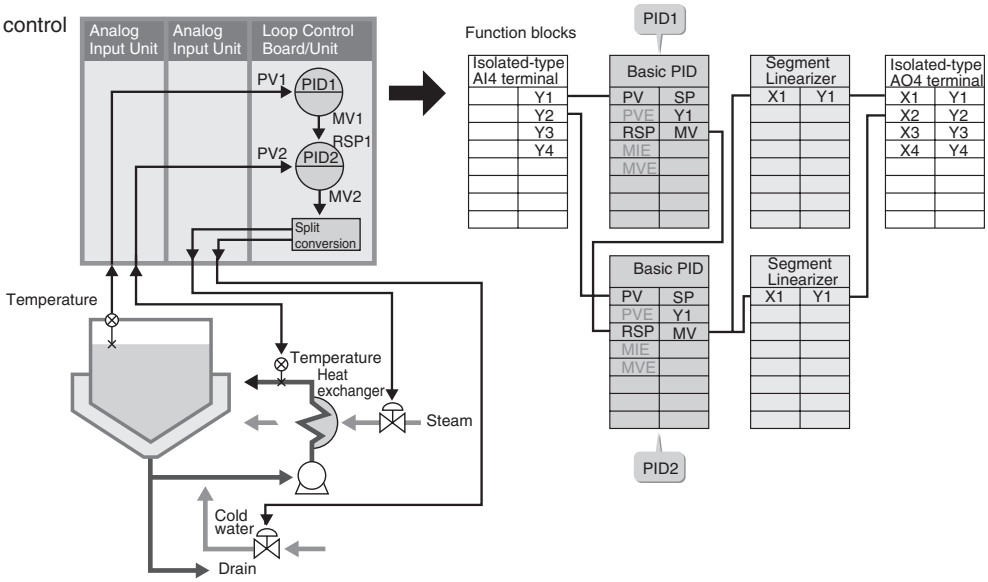
A wide variety of control methods can be executed, from regular PID control to cascade control and feed-forward control.

System Configuration



Function Block Example

Example: Cascade control



Specifications

Item		Specification			
Name		Loop Control Board			Loop Control Unit (See note 1.)
Unit type		CS-series Inner Board			CS-series CPU Bus Unit
Model		CS1W-LCB01 Standard Inner Board	CS1W-LCB05 Advanced Inner Board	CS1D-LCB05D Duplex Inner Board (See note 3.)	CS1W-LC001
Applicable PLCs		CS1G/H-CPU□□F	CS1G/H-CPU□□H	CS1D-CPU□□P (Duplex compatible)	CS-series
Mounting location		CPU Unit's Inner Board slot			CPU Rack
Max. number of Boards/Units		1 Board max. per CPU Unit			3 Units max. per CPU Unit
Data exchange with CPU Unit	Allocation of specific words in a data area	User Link Table function: A function block's ITEM data can be allocated to specified words in a CPU Unit data area (CIO, WR, HR, DM, or EM bank 0).			CPU terminal block: A function block's ITEM data can be allocated to any CPU Unit data area.
	Allocation of all data	HMI Interface function: The ITEM data of a Control Block, Operation Block, or External Controller Block can be allocated to a specified EM bank. (The default EM bank is bank 0.)			Send/Receive All Blocks: Can be allocated to any CPU Unit data area (no default setting).
Setting switches		None			Front panel rotary switches: Unit number setting (0 to F)
Indicators		Three LED indicators: Running, Ready, and Comm. port sending/receiving			Five LED indicators: Running, Comm. port sending, Comm. port receiving, CPU Unit error, and Unit error
Front panel connectors		One RS-232C port (for connection of an ES100X External Controller)			
Data Backup		Super capacitor backs up all function block data (including sequence tables and step ladder program instructions).			Battery backs up all function block data and contents of the error log.
Backup time of backup capacitor or battery		24 hrs at 25° C (The backup time is shorter at higher temperatures.)			5 years at 25° C (The battery life is shorter at higher temperatures.)
Data stored in flash memory		Function block data, data in RAM (can be backed up or recovered at any time), and error log data			Function block data and data in RAM (can be backed up or recovered at any time)
Effect on the CPU Unit's cycle time		0.8 ms max.		20 ms max. (See note 2.)	0.2 ms
Current consumption (supplied by the Power Supply Unit)		220 mA at 5 V DC Note: The current consumption is 150 mA higher when an NT-AL001 Link Adapter is being used.			360 mA at 5 V DC Note: The current consumption is 150 mA higher when an NT-AL001 Link Adapter is being used.
Dimensions		34.5 x 130 x 100.5 mm (W x H x D)			
Weight		100 g max.			220 g max.
Standard accessories		None			C200H-BAT09 Battery Set (factory installed in Unit)

Note: 1. The Loop Control Unit described in this table is equipped with the Version 2.5 functions.

2. The CPU Unit's cycle time will be extended by 2.1 s max during duplex initialization.

3. The CS1D-LCB05D Duplex Loop Control Board is not available separately.
It can only be purchased in combination with a Duplex CPU as models CS1D-CPU65P or CS1D-CPU67P.

Functional Specifications

Item			Specifications		
Model numbers			**CS1W-LCB01**	**CS1W-LCB05** **CS1D-LCB05D**	**CS1W-LC001**
Operation method			Function block method		
Operation cycle			Settable cycles: 0.01, 0.02, 0.05, 0.1, 0.2, 0.5, 1, or 2 s(default: 1 s) Can be set for each function block. (See note 1.)		Settable cycles: 0.1, 0.2, 0.5, 1, or 2 s (default: 1 s) Can be set for each function block.
Number of function blocks	Analog operation	Control blocks (See note 2.)	50 blocks max.	500 blocks max.	32 blocks max.
		Operation blocks (See note 3.)			249 blocks max.
		External controller blocks	32 blocks max. (CS1D-LCB05D not included)		
	Sequence control	Sequence tables	None	200 tables max. 32 conditions and 32 actions per table max. (expandable to 64 conditions and 64 actions per table) 6,400 rules total max.	None
		Step ladder program blocks	20 blocks max. 2,000 commands total 100 commands max. per block Separable into a 100 steps max.	200 blocks max. 4,000 commands total 100 commands max. per block Seperable into a 100 steps max.	
	I/O blocks	Field terminal blocks	80 blocks max.		
		User link tables	2,400 data items max.		None
		All data	HMI functions 2,040 words max. Allocated 1 EM Area bank	HMI functions 20,040 words max. Allocated 1 EM Area bank	Send/Receive All Blocks: 1 block each max.
		CPU terminal blocks	None		16 blocks max.
		Node terminal blocks	None		1000 blocks max.
	System common blocks		1 block max.		
Method for creating and transfering function blocks			Created and transferred using CX-Process Tool (purchased separately).		
Control methods	PID control method		PID with 2 degrees of freedom (with auto-tuning)		
	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		

Note: 1. Operation cycles of 0.01, 0.02, and 0.05 s cannot be set for the CS1D-LCB05D.

2. Control blocks such as those for PID control.

3. Operation blocks for process control such as those for alarms, square roots, time/date calculations, and pulse-train computations.