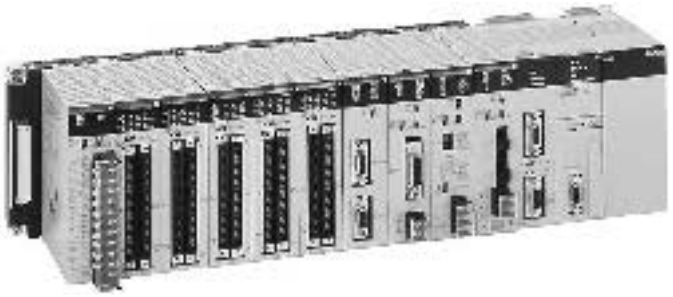
Rack-mount PLC Series CS1

General



The CS1-series programmable controllers pack the power of large-size control systems into the size of the well-known C200H-series.

They offer fast processing speed, with basic instruction execution as fast as 20ns, and a choice of program memory sizes up to 250ksteps. The built-in data memory size ranges from 64..448kwor ds, with optional Compact Flash Memory Cards providing a further 64 MB of removable data storage.

Apart from being compatible with existing C200H I/O Units, the system provides high-speed communication with new CS1 I/O and special function units. Acyclic interrupt tasks can help to reduce response times to events triggered by CS1 special function units.

The CS1's extensive standard instruction set will help you solve any control task with a minimum of instructions, and makes it easy to port programs from other manufacturers.

CX-Programmer, Omron's universal PLC programming software of the CX-Software suite, supports structured programming with the aid of tasks and sections, and the use of symbolic names.

CS1 supports a wide range of open and proprietary networking options.

Ethernet and Controller Link provide easy networking of multiple PLC's, while fieldbus connectivity is provided for PROFIBUS, DeviceNet and Omron's fast and economic CompoBus/S.

Programming software, see page 434.

Performance Data

	CS1G	CS1H
Local input/output bits	Max. 5120	Max. 5120
Execution time (bit instruction)	Min. 0.04 µs	Min. 0.02 µs
Program Memory	60 ksteps*	250 ksteps*
Data memory	128 kwords + 64 MB	448 kwords + 64 MB
Time–controlled interrupts	2 (1 ms..10 s)	2 (1 ms..10 s)

* Number of C series words ≙ CS1 steps
1 step ≙ LOAD, SET, RESET instruction
3 steps ≙ MOVE, COMPARE or TIMER/COUNTER instruction
4 steps ≙ Add, Subtract or Multiply

Networks and Communication

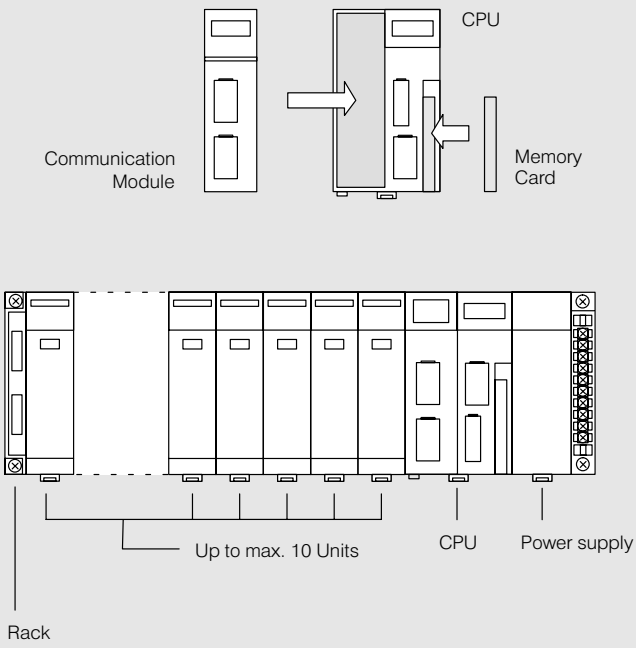
Networks, see page 213.

	CS1G	CS1H
Ethernet (open network)	Yes	Yes
Controller–Link (Fibre optic)	Yes	Yes
Controller Link (PLC network)	Yes	Yes
Host Link SYSMAC WAY (serial network)	Yes	Yes
DeviceNet (open fieldbus)	Master/Slave	Master/Slave
CompoBus/S (fieldbus)	Master	Master
AS–Interface (open fieldbus)	-	-
PROFIBUS–DP (open fieldbus)	Master/Slave	Master/Slave

System Configuration

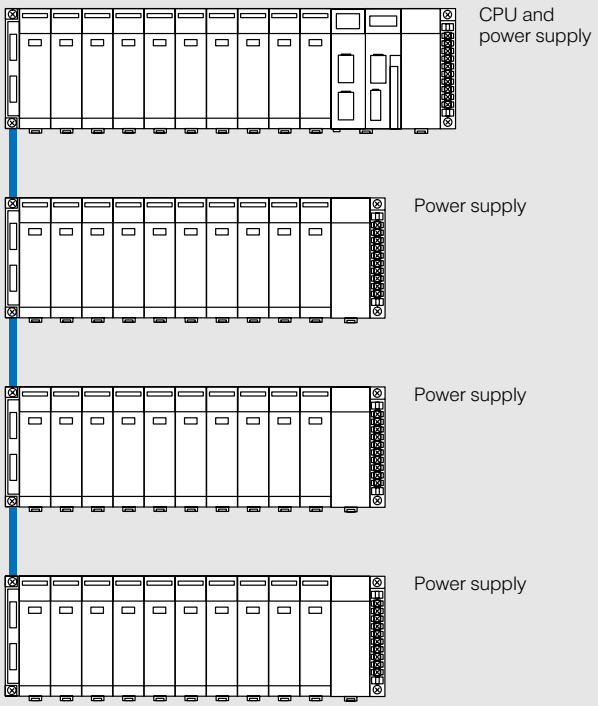
Construction:

The power supply, the CPU and the various I/O-, control- and communication Units are snapped onto the backplane and secured by screws. Optionally, a Communication Module and a Memory Card can be inserted into the CPU. To make installation easier, the I/O Unit terminal blocks are detachable.



System expansion:

It is possible to expand the CS1_ system using CS1 expansion racks. Each expansion rack requires its own power supply. The number of expansion racks depends on the CPU used.



Total bus cable length max. 12m.
Using additional 'long distance' expansion units, max. 50 m.

CPU Type	Number of Expansion racks
CS1G-CPU42H	2
CS1G-CPU43H	2
CS1G-CPU44H	3
CS1G-CPU45H	7
CS1H-CPU63H	7
CS1H-CPU64H	7
CS1H-CPU65H	7
CS1H-CPU66H	7
CS1H-CPU67H	7

CPU Units

CPU Unit	Model code	CS1G–CPU42H
	Local I/O	960
	Execution time (bit instruction)	0.04 µs
	Program Memory	10 ksteps*
	Data words, non-volatile	64 kwords
	Internal power consumption	780 mA

CPU Unit	Model code	CS1G–CPU43H
	Local I/O	960
	Execution time	0.04 µs
	Program Memory	20 ksteps*
	Data words, non-volatile	64 kwords
	Internal power consumption	780 mA

CPU Unit	Model code	CS1G–CPU44H
	Local I/O	1280
	Execution time	0.04 µs
	Program Memory	30 ksteps*
	Data words, non-volatile	64 kwords
	Internal power consumption	780 mA

CPU Unit	Model code	CS1G–CPU45H
	Local I/O	5120
	Execution time	0.04 µs
	Program Memory	60 ksteps*
	Data words, non-volatile	128 kwords
	Internal power consumption	780 mA

* Number of C series words ≙ CS1 steps
1 step ≙ LOAD, SET, RESET instruction
3 steps ≙ MOVE, COMPARE or TIMER/COUNTER instruction
4 steps ≙ Add, Subtract or Multiply

CPU Units (Continued)

CPU Unit	Model code	CS1H–CPU63H
	Local I/O	5120
	Execution time	0.02 µs
	Program Memory	20 ksteps*
	Data words, non-volatile	64 kwords
	Internal power consumption	820 mA

CPU Unit	Model code	CS1H–CPU64H
	Local I/O	5120
	Execution time	0.02 µs
	Program Memory	30 ksteps*
	Data words, non-volatile	64 kwords
	Internal power consumption	820 mA

CPU Unit	Model code	CS1H–CPU65H
	Local I/O	5120
	Execution time	0.02 µs
	Program Memory	60 ksteps*
	Data words, non-volatile	128 kwords
	Internal power consumption	820 mA

CPU Unit	Model code	CS1H–CPU66H
	Local I/O	5120
	Execution time	0.02 µs
	Program Memory	120 ksteps*
	Data words, non-volatile	256 kwords
	Internal power consumption	820 mA

CPU Unit	Model code	CS1H–CPU67H
	Local I/O	5120
	Execution time	0.02 µs
	Program Memory	250 ksteps*
	Data words, non-volatile	448 kwords
	Internal power consumption	820 mA

* Number of C series words ≙ CS1 steps
1 step ≙ LOAD, SET, RESET instruction
3 steps ≙ MOVE, COMPARE or TIMER/COUNTER instruction
4 steps ≙ Add, Subtract or Multiply

Specifications (CPU Units)

Name		CS1G–CPU_H				CS1H–CPU_H				
	CPU	42	43	44	45	63	64	65	66	67
Max. local I/O		960	960	1280	5120	5120	5120	5120	5120	5120
Execution time	µs	0.04	0.04	0.04	0.04	0.02	0.02	0.02	0.02	0.02
Real-time clock		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Expansion rack max.		2	2	3	7	7	7	7	7	7
Tasks total/interrupt		288/256	288/256	288/256	288/256	288/256	288/256	288/256	288/256	288/256
Program memory	ksteps	10	20	30	60	20	30	60	120	250
Data/Extended memory, non-volatile	kwords	64	64	64	128	64	64	128	256	448
Core I/O area + Work area	Words	6656	6656	6656	6656	6656	6656	6656	6656	6656
Hold relay, non-volatile	Words	512	512	512	512	512	512	512	512	512
Timer/Counter		4096/4096	4096/4096	4096/4096	4096/4096	4096/4096	4096/4096	4096/4096	4096/4096	4096/4096

CPU ports	– 1 peripheral/RS-232C with special cable – RS-232C – Optionally, a choice of 2, RS-232C and RS-422/485 with Protocol Macro function (pre-defined transmission protocols)
I/O processing	Combination of cyclic scan and optional direct refresh method
Number of instructions	Approx. 400 with level- or edge-triggered execution, direct I/O access
Special instructions	– PID control – ASCII/HEX – Floating point – Table evaluation instructions – Task Controller – Interpolation/Approximation – Change RS-232C config. – Network instructions – Scaling – (Arcus)SIN/COS/TAN – Subroutine – Macro – Character string processing – Index register instructions – Indirect addressing
Trace Memory	Yes (40,000 words)
Data backup	Battery (5 years, at 25°C)
Program backup	Battery (5 years, at 25°C) or Memory Card (Flash Memory)
Program protection	Password, overwrite protection by DIP switch
Time-controlled interrupts	2 (1 ms..10 s)

Vibration resistance	10..57 Hz, 0.075 mm Amplitude, 57..100 Hz with an acceleration of 1 G in X, Y and Z directions, 10 sweeps of 8minutes each direction
Shock resistance	15 G (12 G for contact outputs) in X, Y and Z directions, 3 times respectively
Temperature Operation Storage	0 °C..55 °C -20 °C..75 °C (without battery)
Ambient humidity	10%..90% (without condensation)
Atmosphere	Controller must not be exposed to the following conditions: – Corrosive gases – Severe temperature fluctuations – Air with extreme dust or salt content – Metal filings or metallic dust – Splash water – Other chemicals
Degree of protection	IEC IP30 (Control cabinet mounting)
Grounding	According to EN60204
Insulation resistance	20 MΩ at 500 VDC, between AC and Ground (GR) terminals
Dielectric strength	2300 VAC; 50/60 Hz for 1 minute between AC between AC and Ground (GR) terminals, Leakage current: max. 10 mA 1000 VAC; 50/60 Hz for 1 minute between DC between AC and Ground (GR) terminals, Leakage current: max. 20 mA
Noise immunity (Fast transient burst)	2 kV on power supply lines (conform IEC 61000-4-4)