IC693CSE331

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MODULAR STATE LOGIC PROCESSOR

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State Logic CPUs

Five models of State Logic CPUs are available that support State Logic programming. Three of these CPUs are of the embedded baseplate type, and two are modular CPUs. Data sheets for these modules are located at the back of this chapter. The available State Logic CPUs for the Series 90-30 PLC are:

- *IC693CSE311* and *IC693CSE313*, both are 5-slot embedded CPU (CPU is built-in) baseplates.
- *IC693CSE323*, 10-slot embedded CPU baseplate.
- *IC693CSE331* and *IC693CSE340*, single-slot CPU modules (can be installed in standard IC693CHS397 5-slot CPU baseplate, or standard IC693CHS391 10-slot CPU baseplate).

Features of State Logic CPUs

- Support State Logic programming
- Support Floating Point calculations
- Support Clock/Calendar functions (CSE331 and 340 are battery backed)
- Support discrete and analog overrides
- Programmed by State Logic software products
- Provide from 10K to 98K Bytes of program memory depending on model
- Program memory is battery backed
- Control two Status LEDs on the power supply
- Software configuration (no DIP switches or jumpers to set)
- Serial port on power supply used as a programming port, a simple ASCII interface, or a CCM port
- Password controlled access
- Support Series 90-30 I/O products
- Alarm Processor Function for module diagnostics
- Simulation mode
- EPROM and EEPROM program memory
- Store histogram of State Changes

Model CSE311, CSE313 and CSE323 Embedded CPU Baseplates

The Programmable Logic Controller with a built-in State Logic CPU is available in three models. The CSE311 and CSE313 with built-in CPU has 5 slots available for modules and the CSE323 with built-in CPU has 10 slots available for modules. Each baseplate also has a power supply slot.

The CSE 311, 313 and 323 CPUs can be programmed in the State Logic programming language using the State Logic software products. The State logic software products are also used to configure the Programmable Controller and communicate on-line with the State Logic CPU for debugging and troubleshooting operations.

The CSE311, CSE313, and CSE323 communicate with I/O modules, smart option modules, and Third Party modules across the PLC backplane. Most of the available Series 90-30 discrete, analog, and special purpose modules are supported (with Release 3.0 of State Logic). Foreign or 3rd party modules are also supported.

A socket labeled **PROGRAM PROM** is provided to install an EEPROM or EPROM. This option allows the control program to be stored in a PROM instead of RAM memory. It also is convenient in that it allows the PROM to be copied for installation in multiple CPUs.

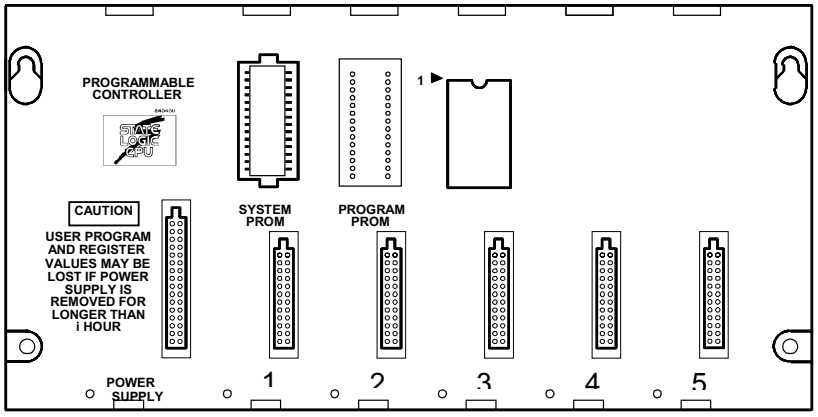


Figure 9-5. Model CSE311 or CSE313 5-Slot Embedded CPU Baseplate

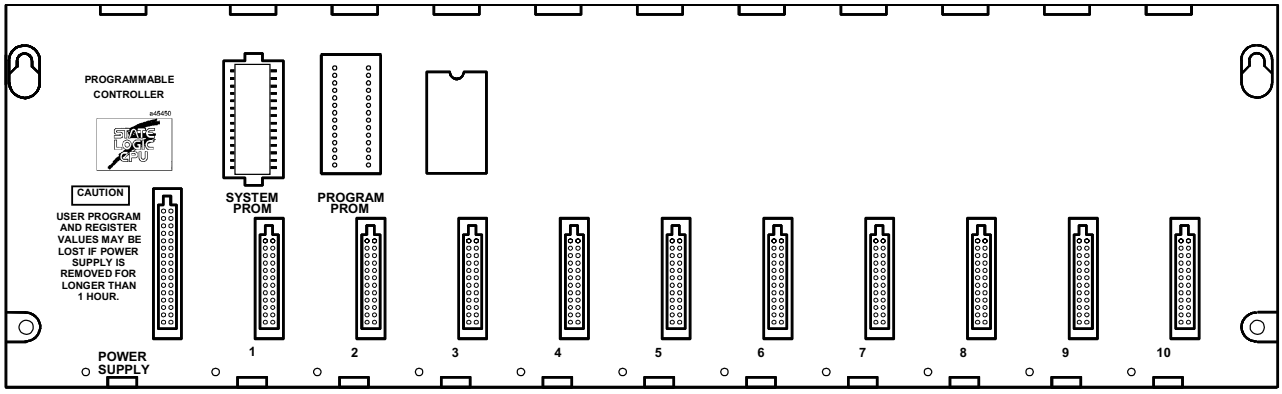


Figure 9-6. Model CSE323 10-Slot Embedded CPU Baseplate

Model CSE331 and CSE340 Modular CPUs

The CSE 331 CPU (IC693CSE331) and CSE 340 (IC693CSE340) CPUs are single slot modules which must be installed in slot one (labeled CPU/1) of a CPU baseplate (IC693CHS391 or IC693CHS397). An illustration of the State Logic CPU modules is shown below.

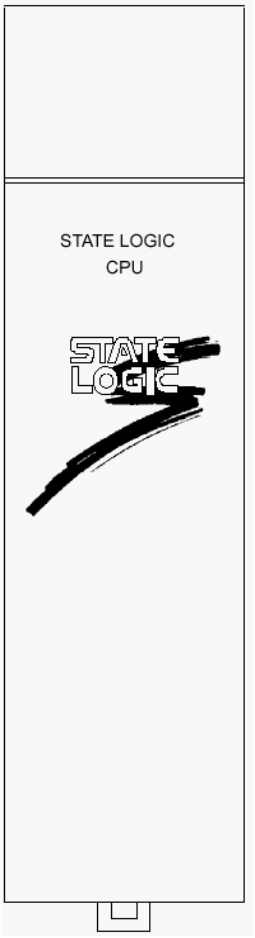


Figure 9-7. CPU Models CSE 331 or CSE 340

The CSE 331 and CSE 340 CPU modules provide the same functionality as the models CSE 311, 313 and 323, and offer several more advanced features such as more I/O points and more User Program memory. See the table at the end of this chapter to compare CPU specifications.

CPU Serial Port Connector on Power Supply

The 15-pin D-connector provides the connection to an RS-485 compatible serial port. The connection is made from the serial port on the power supply to the serial port on the programming computer or other serial device through the RS-422/RS-485 to RS-232 Converter (IC690ACC900) or RS-422 to RS-232 Miniconverter (IC690ACC901).

The serial port has three possible uses:

- as a programming port for the State Logic software to download programs and to send instructions to the PLC;
- as an ASCII port providing a connection from the CPU to any ASCII device;
- as a CCM port providing an interface connection for MMI and other host computer systems.

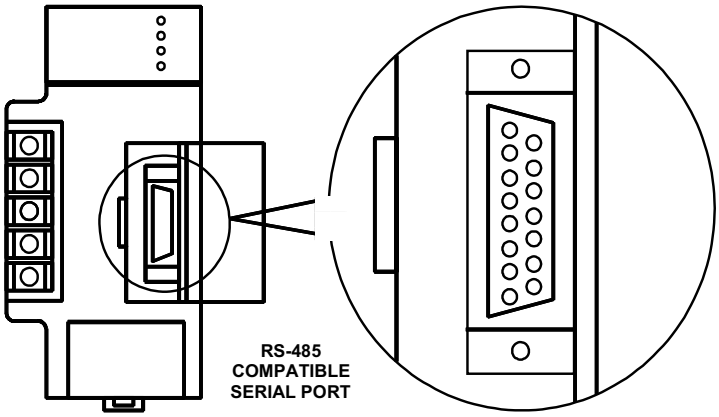


Figure 9-8. Serial Port Connector

Notes

The serial port connector is functional only in a power supply that is installed in a baseplate that also contains the CPU; this includes the Model CSE 311 and CSE 313 5-slot baseplates with built-in CPU, CSE 323 10-slot baseplate with built-in CPU, and the Model CSE 331 and CSE 340 single slot CPUs.

The serial port is not functional when a power supply is installed in a Series 90-30 expansion or remote baseplate.

Additionally, any device connected to the serial port that uses +5 VDC power from the Series 90-30 power supply ***must be included*** in the calculation for maximum power consumption (see *Sample Calculations for Power Supply Loads* in Chapter 3 of this manual).

Configuring the State Logic CPUs

All of the State Logic CPUs and attached I/O system are configured with the State Logic software. There are no DIP switches or jumpers used to configure the system. The CPU verifies the actual

module configuration at power-up and periodically throughout the operation. The actual configuration must match the programmed configuration. Any detected deviations are reported to the CPU alarm processor function for the configured fault response. Refer to GFK-1056, the *Series 90-30 State Logic CPU User's Manual* for more information.

Table 9-1. System Specifications for Series 90-30 State Logic CPUs

	State Logic CPU Model			
	CSE 340	**CSE 331**	**CSE 313/323**	**CSE 311**
Digital Inputs, %I	1024	1024	512	512
Digital Outputs, %Q	1024	1024	512	512
Global I/O, %G	1280	1280	1280	1280
Internal Flags	1000	1000	500	500
Analog Inputs, %AI	256	256	128	128
Analog Outputs, %AQ	128	128	64	64
PID Loops	20	20	20	20
Integer Variables	1000	1000	250	250
Floating Point Variables	250	250	61	61
String Variables	20	20	8	8
Character Variables	64	64	64	64
Tables	20	20	10	10
Program Memory	98K Bytes	48K Bytes	20K Bytes	10K Bytes
Processor Speed	20 MHz	10 MHz	10 MHz	10 MHz
Number of Baseplates	5	5	1	1
Baseplate Size	5 or 10 slots	5 or 10 slots	5 slots (CSE313) 10 slots (CSE323)	5 slots
Supports SCM	Yes	Yes	No	No
Serial Ports	1	1	1	1
Clock/Calendar	Hardware	Hardware	Software	Software
Table Memory Space	4K Bytes	4K Bytes	1K Bytes	1K Bytes

For more detailed information on State Logic CPU specifications, see GFK-1056, the *Series 90-30 State Logic Control System User's Manual*.

State Logic CPU Firmware and PROM Configurations

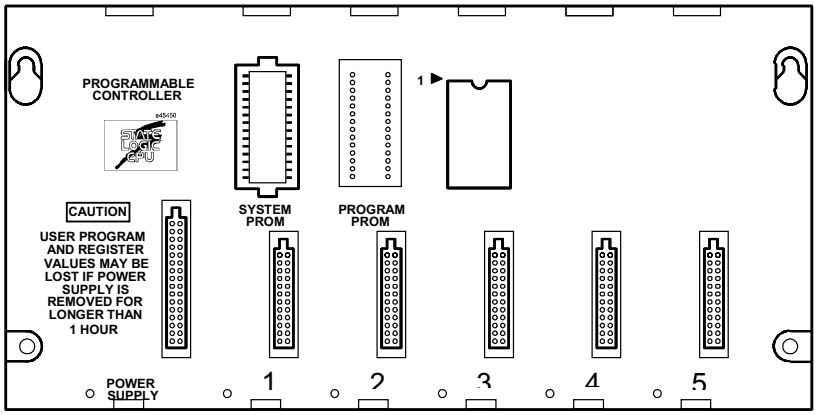
State Logic CPU Firmware and PROM Table				
CPU	**Firmware (standard)**	**EPROM (for user memory)**	**EEPROM (for user memory)**	**Flash (for user memory)**
CSE311	EPROM	Optional	N/A	N/A
CSE313	EPROM	Optional	N/A	N/A
CSE323	EPROM	Optional	N/A	N/A
CSE331	EPROM	Optional	N/A	N/A
CSE340	EPROM	N/A	N/A	Optional

State Logic CPU Data Sheets

This section provides data sheets describing each of the Series 90-30 State Logic CPU modules. Each CPU is described in a one-page data sheet, which provides a quick reference to all of the available CPU models.

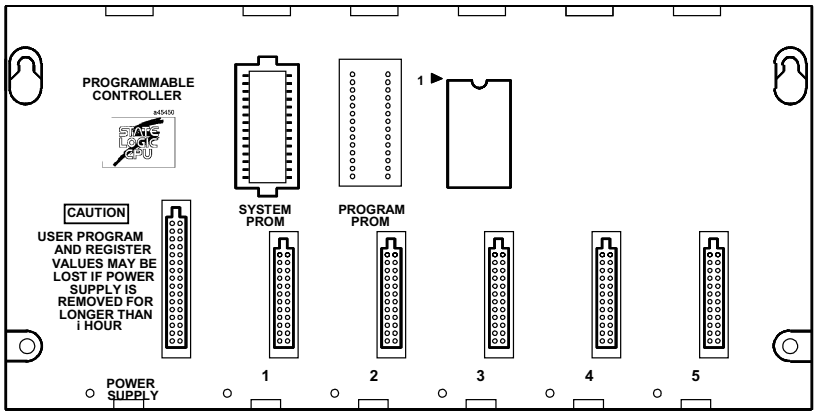
- IC693CSE311 State Logic, 5-slot baseplate with embedded CPU
- IC693CSE313 State Logic, 5-slot baseplate with embedded CPU
- IC693CSE323 State Logic, 10-slot baseplate with embedded CPU
- IC693CSE331 State Logic, CPU module, 10 MHz
- IC693CSE340 State Logic, CPU module, 20 MHz

CSE311 Catalog Number IC693CSE311



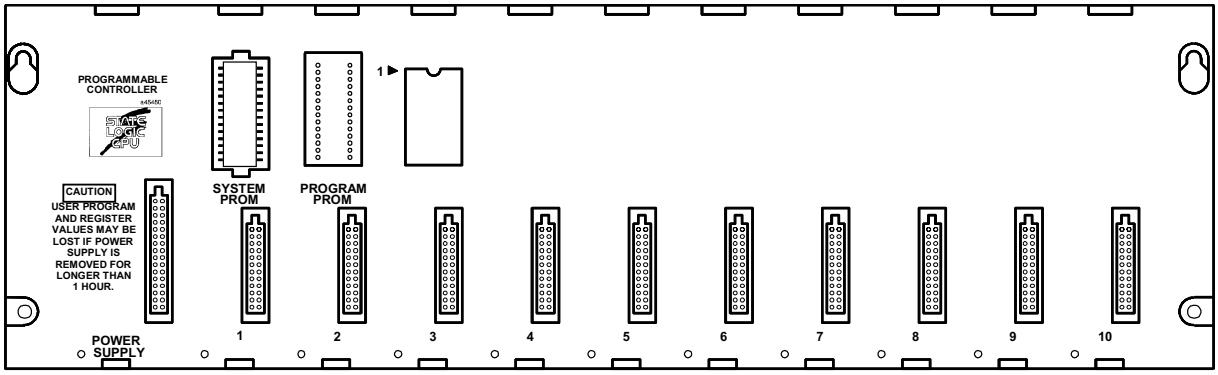
CPU Type	State Logic 5-slot baseplate with embedded CPU
Total Baseplates per System	1
Load Required from Power Supply	410 milliamps from +5 VDC supply
Processor Type and Speed	80188, 10 MHz
Typical Scan Rate	18 milliseconds per 1K of logic (boolean contacts)
Serial Ports	1
Type of memory Storage	RAM, EPROM, EEPROM
Clock	Software
Program Memory	10K Bytes
Digital I/O (%I, %Q)	1024
Tasks	256
Task Groups	16
States per task	254
I/O and Variable Names	3000
Analog Inputs and Outputs	128 (%AI), 64 (%AQ)
Internal Flags	500
%G	1280
%T, %S, %M, %R	n/a
Integer Variables	250
Floating Point Variables	61
String Variables	8
Characters / String	80
Character Variables	64
Characters / Write	512
Serial Protocols	SNP, CCM
Tables	10
Table Memory (Bytes)	1K
Timers	Unlimited
Timer Resolution	.01 seconds
Timer-Counters	100
Trace Size	100
PID Loops	20

CSE313 Catalog Number IC693CSE313



CPU Type	State Logic 5-slot baseplate with embedded CPU
Total Baseplates per System	1
Load Required from Power Supply	430 milliamps from +5 VDC supply
Processor Type and Speed	80188, 10 MHz
Typical Scan Rate	0.6 milliseconds per 1K of logic (boolean contacts)
Serial Ports	1
Type of Memory Storage	RAM, EPROM, EEPROM
Clock	Software
Program Memory	20K Bytes
Digital I/O (%I, %Q)	1024
Tasks	256
Task Groups	16
States per task	254
I/O and Variable Names	3000
Analog Inputs and Outputs	128 (%AI), 64 (%AQ)
Internal Flags	500
%G	1280
%T, %S, %M, %R	n/a
Integer Variables	250
Floating Point Variables	61
String Variables	8
Characters / String	80
Character Variables	64
Characters / Write	512
Serial Protocols	SNP, CCM
Tables	10
Table Memory (Bytes)	1K
Timers	Unlimited
Timer Resolution	.01 seconds
Timer-Counters	100
Trace Size	100
PID Loops	20

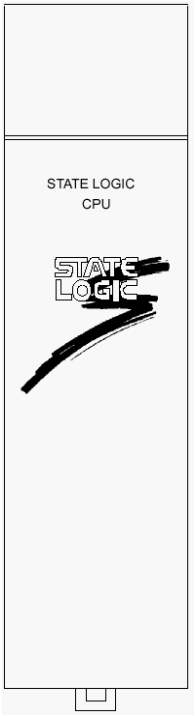
CSE323 Catalog Number IC693CSE323



CPU Type	State Logic 10-slot baseplate with embedded CPU
Total Baseplates per System	1
Load Required from Power Supply	430 milliamps from +5 VDC supply
Processor Type and Speed	80188, 10 MHz
Typical Scan Rate	0.6 milliseconds per 1K of logic (boolean contacts)
Serial Ports	1
Type of Memory Storage	RAM, EPROM, EEPROM
Clock	Software
Program Memory	20K Bytes
Digital I/O (%I, %Q)	1024
Tasks	256
Task Groups	16
States per task	254
I/O and Variable Names	3000
Analog Inputs and Outputs	128 (%AI), 64 (%AQ)
Internal Flags	500
%G	1280
%T, %S, %M, %R	n/a
Integer Variables	250
Floating Point Variables	61
String Variables	8
Characters / String	80
Character Variables	64
Characters / Write	512
Serial Protocols	SNP, CCM
Tables	10
Table Memory (Bytes)	1K
Timers	Unlimited
Timer Resolution	.01 seconds
Timer-Counters	100
Trace Size	100
PID Loops	20

CSE331 Catalog Number IC693CSE331

CPU Type	State Logic single slot CPU module
Total Baseplates per System	5 (1 CPU baseplate + 4 expansion and/or remote baseplates)
Load Required from Power Supply	350 milliamps from +5 VDC supply
Processor Type and Speed	80188, 10 MHz
Typical Scan Rate	0.4 milliseconds per 1K of logic (boolean contacts)
Serial Ports	1
Type of Memory Storage	RAM, EPROM, EEPROM
Clock	Hardware
Program Memory	48K Bytes
Digital I/O (%I, %Q)	2048
Tasks	256
Task Groups	16
States per task	254
I/O and Variable Names	3000
Analog Inputs and Outputs	256 (%AI), 128 (%AQ)
Internal Flags	1000
%G	1280
%T, %S, %M, %R	n/a
Integer Variables	1000
Floating Point Variables	497
String Variables	20
Characters / String	80
Character Variables	64
Characters / Write	512
Serial Protocols	SNP, CCM, RTU
Tables	20
Table Memory (Bytes)	4K
Timers	Unlimited
Timer Resolution	.01 seconds
Timer-Counters	100
Trace Size	100
PID Loops	20



CSE340 Catalog Number IC693CSE340

CPU Type	State Logic single slot CPU module
Total Baseplates per System	5 (1 CPU baseplate + 4 expansion and/or remote baseplates)
Load Required from Power Supply	490 milliamps from +5 VDC supply
Processor Type and Speed	80C188XL, 20 MHz
Typical Scan Rate	0.3 milliseconds per 1K of logic (boolean contacts)
Serial Ports	1
Type of Memory Storage	RAM, Flash, EEPROM
Clock	Hardware
Program Memory	98K Bytes
Digital I/O (%I, %Q)	2048
Tasks	256
Task Groups	16
States per task	254
I/O and Variable Names	3000
Analog Inputs and Outputs	256 (%AI), 128 (%AQ)
Internal Flags	1000
%G	1280
%T, %S, %M, %R	n/a
Integer Variables	1000
Floating Point Variables	497
String Variables	20
Characters / String	80
Character Variables	64
Characters / Write	512
Serial Protocols	SNP, CCM, RTU
Tables	20
Table Memory (Bytes)	4K
Timers	Unlimited
Timer Resolution	.01 seconds
Timer-Counters	100
Trace Size	100
PID Loops	20