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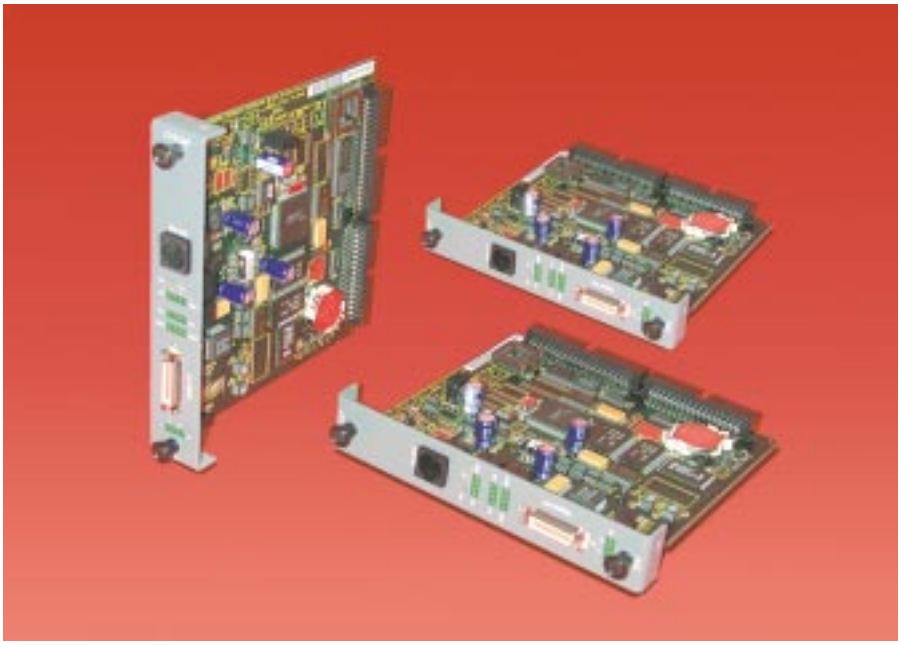
Series 2703AP CPU

High Performance CPU for 2700 Series Controllers



The 2703AP is a new CPU for the 2700 Series Automation Controllers. The performance of the 2703AP is considerably enhanced through the use of highly-integrated technology, providing very impressive response times. This performance level, combined with the controller's 128K user memory capacity and extended I/O and step capacities, make the 2703AP appropriate for applications that usually require systems costing significantly more. The 2703AP offers the convenience of two RS-232 ports as well as an operating speed that is 8 to 14 times faster than previous CPU's, thus enabling systems to do more with just one controller. The 2703AP supports the following modules:

- Models 2201, 2202, 2203, and 2221 DC Input and Output Modules
- Model 2206 Single or Dual-axis Stepping Motor Modules
- Models 2207, 2209 and 2713 Analog Input and Output Modules
- Models 2210 and 2211 AC Input and Output Modules
- Model 2212 8-channel Relay Module
- Model 2220 Precision Analog Input and Output Modules
- Models 2214, 2219 and 2719 Dual-axis Servo Control Modules
- Model 2216 and 2716 Dual Channel RS-232 Module
- Model 2217 and 2717 Ethernet Communications Module

Software enchancements, including 4096 programming steps with 64K of programming space, encourage system updates and allow extra error checking. With 16,000 data table storage elements, process archival data storage is accomplished alongside all of the machine's variables. The 2703AP presently can run up to 56 simultaneous tasks, and contains an additional 4,000 non-volatile registers.

The on-board quadrature encoder input channel allows high-speed encoder counting. Two high-speed registration inputs trap the encoder channel's positions based upon machine events. Four digital inputs and four digital outputs are also on-board.

Programming is accomplished using CTC's Quickstep™ version 2.2, a powerful automation language which dramatically reduces programming time. Software capabilities include the ability to simultaneously run up to 56 independent tasks, and the instruction set includes high-level motion control commands, as well as time delay, input monitoring, math and data manipulation commands. These commands make full use of such internal resources as the controller's Non-volatile and Volatile Registers, user-definable Data Table, Input-linkable Counters and Flags. Additionally, the PLS feature allows operation of up to 16 programmable limit switch outputs based on servo motor positions for high-speed applications. Each output may be actuated with one millisecond response upon reaching pre-defined servo motor positions.

The 2703AP dramatically improves performance response times, making the 2700 series controller family a powerful ally for those involved in demanding automation projects.

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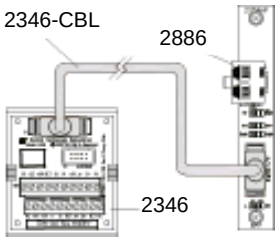
On-board I/O

Digital inputs* 4
Digital outputs* 4
Encoder inputs* 1
Registration inputs* 2
RS-232 ports+ 2

* Requires Model 2346 distribution board.
+ Requires Model 2886 RS-232 connector to use the second communication port.



Instructions Supported

Cancel other tasks
Clear flag
Count down
Count up
Delay
Disable counter
Do (multitasking)
Done
Enable counter
Goto
If
Monitor
Profile servo
Reset counter
Rotate flags
Search and zero servo
Set flag
Shift flags
Start counter
Stop (controller)
Stop servo
Store (data movement & math)
Test and set flag
Turn servo
Zero servo

For More Information

Further detailed information about Control Tech. products and the Quickstep™ language may be obtained from our staff of Systems Specialists — call the number below for further information.

Control Technology Corporation

25 South Street
Hopkinton, MA 01748

Telephone (508) 435-9595
Toll Free (800) 282-5008
FAX (508) 435-2373
email help@ctc-control.com

See us on the World Wide Web:
http://www.ctc-control.com/

Absolute Maximum Ratings	Min	Typical	Max	Units
Ambient Temperature				
operating	0		50	°C
storage	-20		80	°C
RS-232 Transmitters		±9	±12	VDC
RS-232 Receivers	±3		±12	VDC
Common Mode Voltage Range	-10		+10	VDC
Encoder Power-Supply Capacity (+5v)			250.0	mA
CPU Power Requirement (5V.)		0.4	0.6	Amp
Lithium-cell RAM (4 yrs. unpowered)		128k		Bytes

This CPU uses a Hitachi SH-2 processor running at 25.576 MHz

Specifications	Min	Typical	Max	Units
Differential Encoder Inputs				
Nominal Input Range	0.0		+5.0	VDC
Open-circuit Voltage (I_i = 0 mA)		5.0	5.38	VDC
Logic-low Current (V_i = 0 V)		1.1	1.2	mA
Maximum Counting Rate			3.0	MHz
Counting Range	-2,147,483,648		+2,147,483,647	Counts

Specifications - Inputs

Input "off" voltage (I_i = 0 mA)		24.0	26.4	VDC
Input "on" current (V_i = 0 V) (Note 1)		-4.4	-5.0	mA
Input "on" current threshold (V_i = 6 V typ)		-3.2	-3.5	mA
Input "off" current (typ leakage current allowable)			250.0	uA

Specifications - Outputs

Output "on" voltage (I_o = 500 mA) (Note 2)		1.0	1.5	VDC
Output "off" leakage (applied V = 24 V)		1.0	100.0	uA

Notes

1. Under normal operation, no external input voltage is applied - inputs should be externally switched to the input common.
2. An on-board protection diode returns to +24 V from each output.
3. Specification shown above are at 25 degrees C., unless otherwise noted.
4. Assumes 50% duty cycle.

Programming Resources

500 Volatile Registers – for the temporary storage of numeric data, 32-bit capacity (integers in the range of -2,147,483,648 to +2,147,483,647).

4500 Non-volatile Registers – similar to the above, except with indefinite retention of data during power-down.

16000 element Data Table – a two-dimensional array of numbers, capable of storing numbers in the range of 0 to +65,535.

32 Flags – bistable ("set" or "clear") memory elements used to store events or communicate between tasks. Instructions "shift" and "rotate" also allow their use as shift registers.

8 Input-linkable Counters – each may be programmed to automatically monitor any three inputs to perform "count-up," "count-down" and "reset" functions, at rates to 750 Hz. Note 4.

8 Additional Upcounters - each may be linked to digital inputs for counting at rates up to 750 Hz. Note 4.

Group I/O Access – I/O may be accessed as 8-bit, 16-bit or 32-bit binary words.

Indirect Addressing – I/O and registers may be indirectly addressed for iterative access.

Unlimited Timers – fixed or variable time delays down to 10 ms level.

Message Transmitting – of stored messages, with data, via RS-232 port.

Real-Time-Clock – free-running, user-settable RTC allowing second, minute, hour, day, month, year levels.

4096 Program Steps – each step defines the state of the process for a period of time.

56 Simultaneous Tasks – each task may be an independent sequence of steps, running asynchronous to any other tasks in operation.

Programmable Limit Switch - up to 16 high speed outputs may be independently programmed to turn on and off based on servo motor positions.

Quadrature Encoder Input - 32-bit counter with 2 high speed registration inputs.

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