



ENTERTRON INDUSTRIES, INC.

# Programmable Controllers



Digital Main Board



Analog Expansion Board

## Elite-2000

**The most powerful PLC in its class. Fast, Reliable and packed with options.**

The Elite-2000 is the successor of Entertron's SK1600 solid state programmable logic controller. One of the industries first small controllers. Over 20 years of application history comes with the Elite-2000 through the SK1600. The design has been proven many times. Reliability is second to none. The triac/transistor design offers the performance of a mechanical relay and the reliability of solid state. No other triac or transistor output in the industry compares. What makes the design reliable is the added protection designed into the controller. Each output is optically isolated. Each output also has its own MOV (for AC) or diode (for DC) for noise suppression and a fuse to protect the controller. With other PLCs, you are required to add this protection. With Entertron's Elite-2000, it is built in.

We are so confident about the performance of the Elite-2000, that we have extended our warranty again. This time from 5 years to 7 years. No other PLC manufacturer offers a warranty greater than 1 year.

The Elite-2000 can handle just about any application. Where this controller offers its greatest benefits are applications that require fast execution of I/O. Applications that require rapid, repetitive execution of I/O, such as packaging, stamping and monitoring would be ideal for the Elite-2000.

Other advantages to the Elite-2000 include the ability to be configured for different voltages, such as 24 VAC. This voltage is typically used for Car Washes and HVAC. With traditional PLCs, you would be required to do the following:

- Use a controller with 24 VDC inputs and 24 VDC power. Then you would be required to use additional relays to feed all your 24 VAC inputs through, thus converting to DC. In doing so, additional logic is required for controlling the relays, thus adding to your program, and consequently adding to the cost.

The Elite-2000 can be configured for 24 VAC inputs, outputs and power directly. No additional logic or relays are required. Thus saving time and cost.

The Elite-2000 has been tested to determine the minimum power voltage needed to turn on a transistor output. It was able to turn on a transistor output with as little as 8 VDC powering the controller. Thus, this controller would also benefit mobile and automotive applications operating on battery power.

For special applications, Entertron can configure the Elite-2000 with combination I/O in as small a group as four.

### Highlights:

Up to 64 inputs / 64 Outputs	Operator Interface Capabilities
2 amp Triac or Transistor Output	Pluggable Terminal Blocks
Individually Fused Outputs and MOV protection	Up to 16 Analog I/O - 12 Bit (includes Thermocouple and RTD)
32K Program Capacity	Windows or DOS programming software
2 Serial Ports	7 year warranty

## Specifications

Item	DC in / DC out	DC in / ACout	AC in / ACout
Power Requirements	120 / 240 VAC @ 50/60 Hz Power Transformer 12 or 24 VDC (24 VAC optional)		
Digital Inputs	16, 32, 48, 64 12-24 VDC sink / source Optically Isolated (5 volt TTL optional)	16, 32, 48, 64 12-24 VDC sink / source Optically Isolated (5 volt TTL optional)	16, 32, 48, 64 120 VAC (24, 240 optional) Optically Isolated
Digital Outputs	16, 32, 48, 64 12-24 VDC transistor sink Optically Isolated (Source optional) (5 volt TTL optional)	16, 32, 48, 64 120 VAC triac Optically Isolated (24, 240 optional)	16, 32, 48, 64 120 VAC triac Optically Isolated (24, 240 optional)
Output Rating	2 amp continuous 8 amp inrush	2 amp continuous 10 amp inrush	2 amp continuous 10 amp inrush
Output response time	Less than 1 ms		
Analog Inputs	up to 16 (8 per board) 0-5, 0-10, +/- 5, +/- 10 VDC, 0-20 mA		
Analog Outputs	up to 16 (8 per board) 0-5, 0-10, +/- 5 VDC, up to 6 @ 0-20 mA (3 per board)		
Thermocouple Inputs	up to 16 @ Type K (+/- 3 C accuracy) Number available is dependent upon total number of analog inputs used <b>*****Ungrounded / Isolated type ONLY*****</b>		
RTD Inputs	up to 16 @ 100 ohm din 0.0392 std (+/- 1 C accuracy) Number available is dependent upon total number of analog inputs used <b>*****Ungrounded / Isolated type ONLY*****</b>		
Analog Resolution	12 Bit (0-4095)		
Program Capacity	32K		
Memory Type	EEPROM		
Write Cycles	EEPROM - 10000		
Serial Port - Standard	RS232 - Full Duplex (no adapter required)		
High Speed Counter - Std	1@ 10 KHz (single direction)		
Scan Rate	5 ms / K ladder logic program		
Timers / Counters	1024 - Configurable as either Timers (.1 or .01) or Counters		
Internal Relays	512		
Serial Port - Option	2nd RS232 port - Full Duplex; 2 wire RS485 or 4 wire RS485		
Quadrature Decoder - Option	up to 4 @ 25 KHz (one per board)		
Bi - Directional HSC - Option	up to 4 @ 25 KHz (one per board)		
Dip Switch - Option	up to 4 eight position (one per board)		
Battery Backed Ram - Option	8K - data retention only		
Real Time Clock - Option	Yes		
UL - Option	UL 508 Standard		
Operator Interfaces	communicate with Eclipse Operator Interfaces and Touch Screens		
Communications Protocols	ASCII; ModBus RTU		
Networking	ModBus RTU - up to 32 slaves		
Dimensions	7.75" x 12.50" x 1.50" (single board without mounting plate) 9.00" x 13.00" x 2.00" (single board with mounting plate) 7.75" x 12.50" x 3.50" (two boards without mounting plate) 9.00" x 13.00" x 4.00" (two boards with mounting plate)		
Operating Temperature	0-60 C (32 - 140 F) 90% relative humidity non-condensating All components used are rated for at least 0-70 C (32 - 158F)		

## Ordering Information

Part Number	Description
EL-16D16D-PT	Main Board 16 DC in / 16 DC out, 120 VAC transformer, mounting plate
EL-16D16A-PT	Main Board 16 DC in / 16 AC out, 120 VAC transformer, mounting plate
EL-16A16A-PT	Main Board 16 AC in / 16 AC out, 120 VAC transformer, mounting plate
ELX-8D8D	Digital Expansion Board - 8 DC in / 8 DC out
ELX-8A8D	Digital Expansion Board - 8 DC in / 8 AC out
ELX-8A8A	Digital Expansion Board - 8 AC in / 8 AC out
ELX-16D16D	Digital Expansion Board - 16 DC in / 16 DC out
ELX-16A16D	Digital Expansion Board - 16 DC in / 16 AC out
ELX-16A16A	Digital Expansion Board - 16 AC in / 16 AC out
ELX-16DXXX	Digital Expansion Board - 16 DC in
ELX-16AXXX	Digital Expansion Board - 16 AC in
ELX-XXX16D	Digital Expansion Board - 16 DC out
ELX-XXX16A	Digital Expansion Board - 16 AC out
ELXA-8AI	Analog Expansion Board - 8 inputs (0-5 std, other configurations available)
ELXA-8AO	Analog Expansion Board - 8 outputs (0-5 std, other configurations available)
ELXA-4AI4AO	Analog Expansion Board - 4 in / 4 out (0-5 std, other configurations available)
ELXA-4AI4AO4R	Analog Expansion Board - 4 in / 4 out / 4 RTD in (0-5 std)
ELXA-4AI4AO4TK	Analog Expansion Board - 4 in / 4 out / 4 Thermocouple in (Type K) (0-5 std)
ELXA-8AI8AO	Analog Expansion Board - 8 in / 8 out (0-5 std, other configurations available)
ELXA-4AI8AO4R	Analog Expansion Board - 4 in / 8 out / 4 RTD in (0-5 std)
ELXA-4AI8AO4TK	Analog Expansion Board - 4 in / 4 out / 4 Thermocouple in (Type K) (0-5 std)
ELXA-8AO8R	Analog Expansion Board - 8 out / 8 RTD in (0-5 std)
ELXA-8AO8TK	Analog Expansion Board - 8 out / 8 Thermocouple in (Type K) (0-5 std)
ELXA-8R	Analog Expansion Board - 8 RTD in (0-5 std)
ELXA-8TK	Analog Expansion Board - 8 Thermocouple in (Type K) (0-5 std)
B	Battery Backed Ram
D	Dip Switch (up to four available, one per board)
E	EEPROM
H	Bi-Directional High Speed Counter
I	2nd serial port - RS485 (2 wire)
J	2nd serial port - RS485 (4 wire)
Q	Quadrature Decoder (up to four available, one per board)
R	Real Time Clock
S	2nd serial port - RS 232
U	UL Labeling
X	Expansion Capabilities (when ordering main board with no exp. board)

