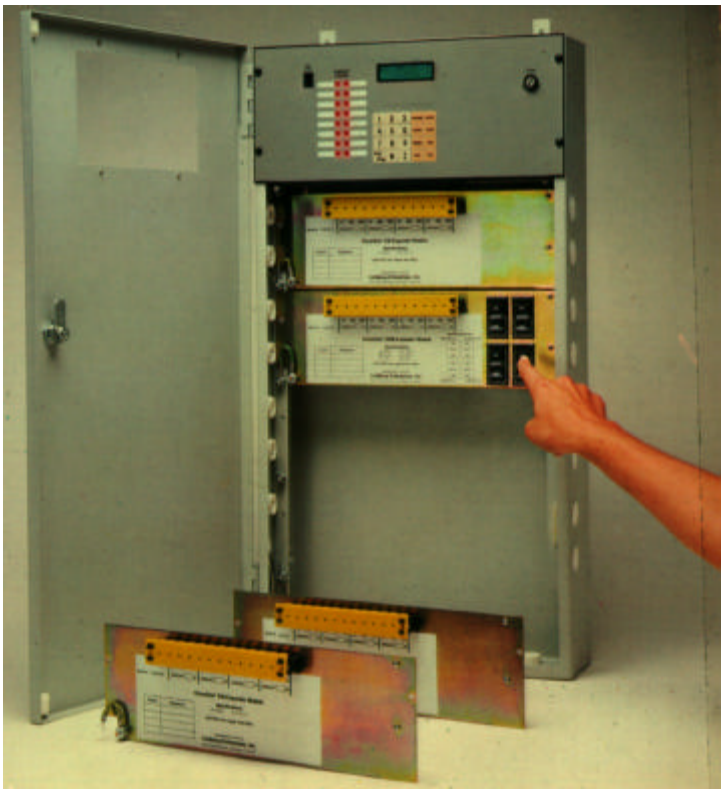
ChronTrol®
L-Series

Energy Management For The New Millennium



Simplicity Is The Difference

The purpose of energy management—saving money — is defeated if you have to hire a computer specialist to operate your time control equipment. But with the ChronTrol L Series, your present and future energy management needs are solved, and the tool can be operated by anyone capable of mastering an ATM. If time is money, then consider ChronTrol a kind of bank that protects your time until you're ready to spend it. Lighting, security systems, industrial machinery, heating and air conditioning — absolutely anything electrical — is placed at your fingertips by this rugged wall-mounted unit. ChronTrol's "aux port" connector and optional T50 modem even let you access all of ChronTrol's capabilities by phone. When it comes to efficient, reliable, and prudent time management, ChronTrol is in control. But you are in command.

Simplicity Creates Versatility

The ChronTrol L Series represents our third generation of time control equipment, and energy management is just one of its almost unlimited applications. In service worldwide, ChronTrol runs everything from automated radio stations to complicated scientific experiments to industrial fabrication processes to school bells. With ChronTrol operating in every conceivable environment, we're justifiably proud of our proven reputation for reliability. Our toll-free hotline is available for problem solving and troubleshooting, but comprehensive quality control, fourteen day running burn-in, and pre-ship testing guarantee ChronTrol's integrity. And our one year service warranty includes parts *and* labor. You can trust ChronTrol with your most precious asset: time.

You've heard of "user friendly" computers? ChronTrol could be called "user-protective." Not only does it prompt you through the setting process by displaying the questions and your commands, it also relieves you of worry by:

- Automatically adjusting for seasonal shifts of Daylight Saving Time.
- Automatically accounting for leap years.
- Guarding its time-keeping and program memory in the event of A/C power loss with its own backup battery system. The improved system provides three years of backup power.
- Automatically monitoring the backup batteries, and displaying *Replace Battery!* when needed.
- Exhibiting time of last A/C power loss, and cumulative time of single or successive power interruptions.
- Not letting you enter invalid times, cycle rates, dates, program numbers, circuit numbers, or any other impossible or conflicting commands.
- Protecting itself from unauthorized tampering by use of a keyboard unlocking code, which you can change at will.

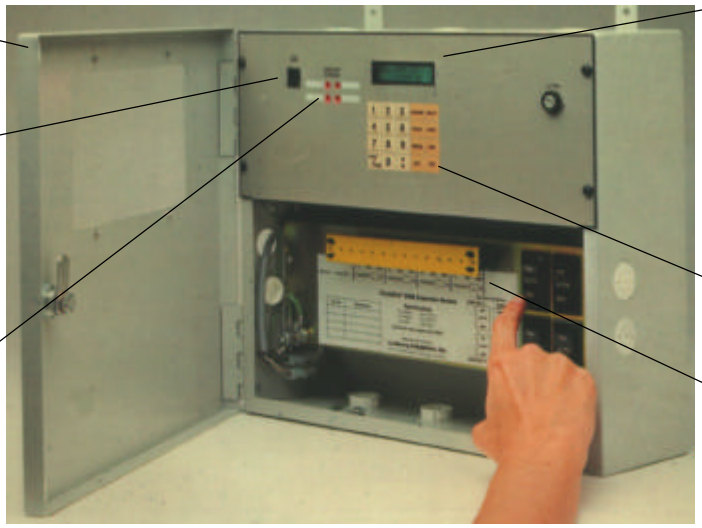
Engineered To Save Time, Money, And Headaches

ChronTrol's microprocessor gives you sixty operational programs, each capable of controlling any or all of the available circuits. The programs are set through the uncomplicated twenty-key control panel. Your commands are visually confirmed on the unique thirty-two character Liquid Crystal Display before they enter ChronTrol's memory.

ChronTrol Expands With You

As your needs grow, so can ChronTrol's capabilities. Our unique four circuit relay modules expand ChronTrol's L6016 model from four to eight to twelve to sixteen independent circuits. Installation is quick and easy, and keeps ChronTrol cost-effective as your time control requirements multiply.

ChronTrol L Series Performance Features



Programming Specifications

You program ChronTrol by first giving the microprocessor its bearings, which appear as questions on the display:

- ***TIME OF DAY?*** ChronTrol's line frequency time base is the most accurate commercial clock available. Time is set to the second, a.m. or p.m.
- ***MONTH: DAY: YEAR? DAY OF WEEK?*** Once ChronTrol knows where it is in time, it automatically adjusts for leap years and daylight saving time.
- ***HOLIDAY LIST?*** Up to twenty holidays can be accommodated. Each holiday can either be a single day or an unlimited span of days.
- ***UNLOCK CODE?*** A user-programmable four-digit number provides fail-safe security.
- ***CIRCUIT RESTART?*** Helps avoid damaging power surges by telling ChronTrol the rate at which circuits are to restart after a power interruption.
- ***NORTH LATITUDE?*** Lets ChronTrol adjust its programs relative to sunrise and sunset automatically.

Depositing Time In The (Memory) Bank

With just eight steps, any one of a possible sixty programs can by set. These can later be modified, reviewed, or canceled at will. Once programmed, ChronTrol performs its assigned duties with split-second accuracy, and allows for quick-glance monitoring by showing which circuits are in use at any one time. With its technically advanced design, ChronTrol gives you the ability to schedule operations for up to a year in advance. In logical sequence, ChronTrol asks you to set as many of the eight operational parameters as you need for each program.

You start the setting process by pressing the *Program* key:

```
PROGRAM NUMBER?
                1
```

Automatically, the first unassigned program number is displayed on the LCD. You have the option of selecting it or any other number (up to 60) that isn't already in use.

```
CIRCUIT NUMBERS?
```

Used to specify which circuit(s) the program is to control. Each program can control any or all of the available circuits.

```
TURN-ON TIME?
12:00:00 AM
```

Used to set the time of day (to the second, a.m. or p.m.) at which the assigned circuit(s) goes ON.

```
TURN-OFF TIME?
12:00:00 AM
```

Used to set the time of day (to the second, a.m. or p.m.) at which the assigned circuit(s) goes OFF

```
SKIP DAYS?
```

The day or days you do not want the program to occur are set by pushing the proper day-of-the week key(s).

```
CYCLE RATE?
00:00:00
```

This specifies how often you want the *Turn-On* and *Turn-Off* times to repeat. If you want them to recur every twenty-four hours, no setting is necessary. Otherwise you may set cycle rates from every two seconds to every one hundred hours.

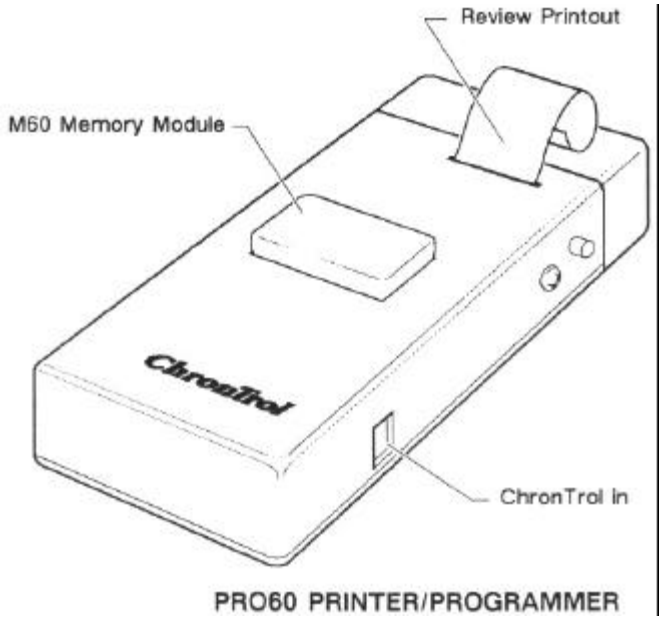
```
DUTY CYCLE ON?
00:00:00
```

```
DUTY CYCLE OFF?
00:00:00
```

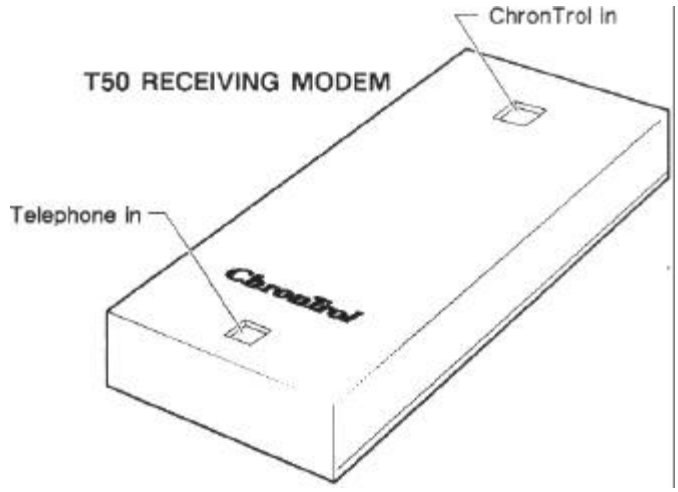
Duty cycling will occur only within the operating window established by a program's *Turn-On* and *Turn-Off* times. This helps maximize energy efficiency by turning equipment *ON* or *OFF* intermittently during the course of a single program.

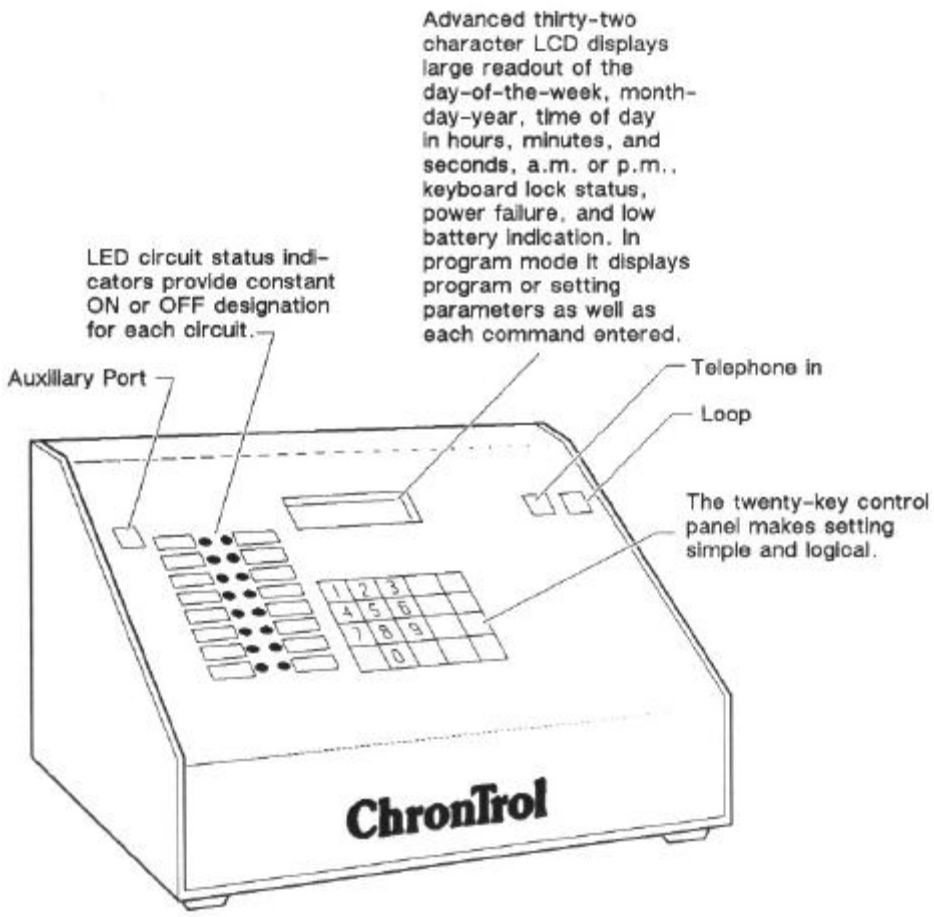
CHRONTROL L SERIES AUXILIARY EQUIPMENT

PRO60, T50, and T90



PRO60 PRINTER/PROGRAMMER





T90 REMOTE CONTROL SYSTEM

L Series Program Specifications

Master Entries
TIME-OF-DAY: Hours, minutes, seconds, a.m. or p.m.
MONTH-DAY-YEAR AND DAY-OF-WEEK
DAYLIGHT SAVING TIME, BEGIN AND END: Month and day; used to override ChronTrol's automatic annual computation of the start and end of Daylight Saving Time
HOLIDAY LIST: Month(s) and day(s) for up to twenty holidays; a single day or an unlimited span of days equals one holiday
KEYBOARD UNLOCKING CODE: User programmable four digit keyboard access code
CIRCUIT RESTART: Set in seconds (0-99); the time between circuit restarts after A/C power interruption
LINE FREQUENCY TIME BASE: 50hz or 60hz

Operational Programs
Sixty, each assignable to any or all circuits. Each program includes the setting of:
CIRCUIT NUMBERS: Which circuit(s) the program is to control.
TURN-ON TIME: Hours, minutes, seconds, a.m. or p.m.
TURN-OFF TIME: Hours, minutes, seconds, a.m. or p.m.
SKIP DAYS: Which day(s) the program should not run; one through seven days, plus holidays
CYCLE RATE: When TURN-ON and TURN-OFF times should recur, set in hours (0-99), minutes (0-59) and seconds (0-59)
DUTY CYCLE ON: Separate ON period within program's TURN-ON and TURN-OFF window, set in hours (0-23), minutes (0-59), and seconds (0-59)
DUTY CYCLE OFF: Separate OFF period within program's TURN-ON and TURN-OFF window, set in hours (0-23), minutes (0-59), and seconds (0-59)

Automatic Reviewing Of
A specific operational program
All operational programs
A specific circuit's operational program(s)
All Master Entries (except keyboard unlocking code)

Automatic Clearing Of
A specific operational program
All operational programs
A specific circuit's operational program(s)

Ordering Codes

Specify quantity of each part:

CODE	*DESCRIPTION*
L6004	Four Circuit Unit
L6016	Expandable Unit
EM	Four Circuit Relay Module
EMB	Four Circuit Relay Module with Mechanical Bypass switch for each circuit

L Series Clock and Enclosure Specifications

Physical
ENCLOSURE TYPE: NEMA 1 surface mount with locking hinged front door.
ENCLOSURE DIMENSIONS:
L6004: 12.0 x 13.9 x 4.125 inches (H/W/D)
305 x 353 x 104mm (H/W/D)
L6016: 25.0 x 13.9 x 4.125 inches (H/W/D)
635 x 353 x 104mm (H/W/D)
ENCLOSURE FINISH: Textured epoxy paint
ENCLOSURE MOUNTING: Indoor only, using three-point suspension brackets, two on top, one on bottom
ENCLOSURE SHIPPING WEIGHT:
L6004: 19 lb. /9 kg.
L6016: 32 lb. /15 kg.

Environmental
-18º to 54ºC; 0º to 130ºF Ambient Operating Range
0 to 90% Relative Humidity (non-condensing)

Electrical
PRIMARY POWER SOURCE: 115 VAC ± 10%
OPTIONAL POWER SOURCE: 230 VAC ± 10% *BACKUP POWER SOURCE:* Three "AA" 1.5V heavy duty zinc chloride batteries (included) provide three-year minimum carry-over protection of time and program memory. Battery system automatically self-tested for proper voltage. If low, REPLACE BATTERY! is displayed until batteries are replaced.
POWER CONSUMPTION: Thirty watts, not including switching circuits.
FIELD WIRING ACCESS:
L6004: Four, one-inch diameter bottom entrance holes with removable vent plugs. Four 7/8" diameter holes with removable vent plugs: two on right side, two on left side.
L6016: Four, one-inch diameter bottom entrance holes with removable vent plugs. Sixteen 7/8" diameter holes with removable vent plugs: eight on right side, eight on left side.

Number of Available Circuits
L6004: Four (one relay module)
L6016: Up to sixteen (four in each relay module)

Display
LCD (Liquid Crystal), .440 x 2.400 inches, thirty-two character, continuous front light

Circuit Status Indicators
LED circuit ON indicators (one per circuit)

Auxiliary Port
The auxiliary serial communications port provides a data link for remote programming and program review. Located on the upper left side of the control panel, the port is designed for use with the optional ChronTrol printer and telephone modem. For information on port interface with other computer equipment, contact factory for electrical specifications and communications protocol and format.

Primary Time Base
User selectable through keyboard, 50hz or 60hz

Backup time base
Quartz crystal in absence of A/C power

EM Relay Module Specifications

Physical
Designed for use with ChronTrol L Series timers only
DIMENSIONS: 3.9 x 13.15 x 2.35 inches (H/W/D)
99 x 334 x 60mm (H/W/D)
MODULE FINISH: Zinc, gold chromate
MODULE SHIPPING WEIGHT: 3 lb. / 1.6 kg

Electrical
RELAYS: Four heavy duty 15 amp SP/DT relays
SWITCHING CAPABILITIES PER RELAY:
15 AMPS, 4 to 277V AC
60 LRA, 12 FLA
1 HP, 125V AC
48 LRA, 8 FLA
2 HP, 250V AC
STD PILOT DUTY, 125/250V AC
FIELD WIRING ACCESS: Single row terminal strip. SEMS top hardware with Common (C), Normally Closed (NC), and Normally Open (NO) contacts for each relay. Will accept A.W.G. 12 and smaller wire. *USE COPPER WIRE ONLY.*

EMB Relay Module Specifications

Physical
Designed for use with ChronTrol L Series timers only, and includes one three-position (ON, AUTO, OFF) bypass switch for each relay.
DIMENSIONS: 3.9 x 13.15 x 2.35 inches (H/W/D)
99 x 334 x 60mm (H/W/D)
MODULE FINISH: Zinc, gold chromate
SHIPPING WEIGHT: 4.5 lb. /2 kg.

Electrical
RELAYS: Four heavy duty 15 amp SP/DT relays
SWITCHING CAPABILITIES PER RELAY:
15 amps, 4 to 125V AC
10 amps, 4 to 250V AC
6 amps, 125V AC Tungsten
3/4 HP, 125/250V AC
FIELD WIRING ACCESS: Single row terminal strip. SEMS top hardware with Common (C), Normally Closed (NC), and Normally Open (NO) contacts for each relay. Will accept A.W.G. 12 and smaller wire.
USE COPPER WIRE ONLY

Installation

ChronTrol is a precision electronic timer designed for installation indoors in a place protected from excessive moisture and temperature conditions. It meets National Electrical Code requirements and is designed for a standard three-wire system. It can either be hard wired or interfaced with power line carrier transmitters. CAUTION: The ChronTrol wall-mount timer should be wired and installed by a qualified electrician. Detailed installation instructions included with delivery or available on request.

This symbol on the nameplate means the product is LISTED by Underwriters Laboratories, Inc. U.L. Standard Number 916, Enclosed Energy Management Equipment.

ChronTrol ®
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WARRANTY: Limited, one year parts and labor