FEATURES:

* Automatic Daylight Savings Time/Leap Year Compensation
* 48-Hour Battery-less Capacitive Back-up - Memory and time keeping are maintained for 48 hours in the event of power loss.
* 16 Program Steps Standard (MAXIM 1)
* 6 Program Steps and 5 "Skip Periods" - These periods are used to suspend relay operation during holidays or vacations. (MAXIM 1+)
* Advance Single Day Skip - Suspends relay operation for one day up to one week in advance. (MAXIM 1+)
* Electrical Connection via a Terminal Block
* Compact, Rugged All Steel Enclosure measuring 7½''h x 4¼''w x 3¼''d

OPTIONS:

Part Number	Description
800100	Override Daylight Savings Time
860330	4' Wiring Harness
860332	8' Wiring Harness

SPECIFICATIONS:

Size	7½''h x 4¼''w x 3¼''d
Line Voltage	95-135 VAC, 60 Hz
Power	6 Watts
Temperature Range	-30c to +74c
Time Base	Power Line (AC Powered) +/-.005% Crystal (Back-up) at 26°c
Crystal Temperature Coefficient	-0.035 PPM/degree C^2
Back-Up Power	Capacitive, 48 hour
Display	7 Digit, 7 Segment LED
Key pad	4 Column x 5 Row Matrix 16/18 Key Tactile
Output	SPDT Relay Rated 10 Amp 115 VAC Resistive Load
Electrical Connection	Terminal Block, #20-#12 AWG Wire Size

ELECTROTECHNICS CORPORATION
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ELTEC
OPERATING INSTRUCTIONS
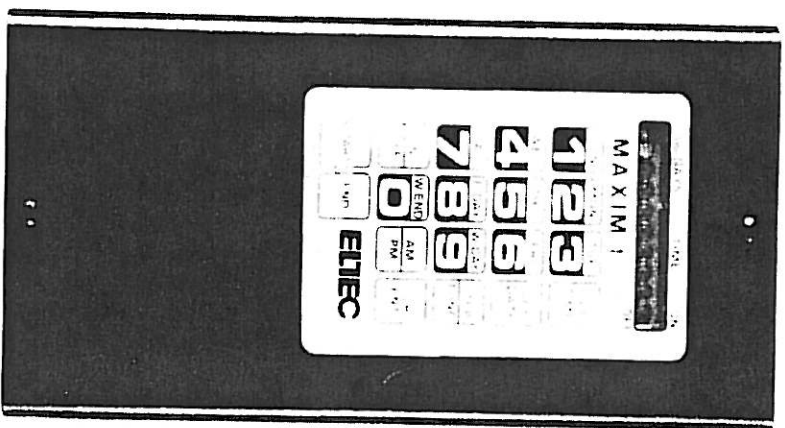
MAXIM 1
Solid State Time Switch

ELTEC MAXIM 1 DESCRIPTION: The MAXIM 1 is a solid state time switch designed to operate a relay output on a repeating 7 day program.

WARNING: THE OUTPUT RELAY MAY BE ENERGIZED BY A PROGRAM STEP. BE SURE AC POWER SOURCE IS DISCONNECTED BEFORE WORKING ON ANY LOAD CONNECTED TO THE OUTPUT RELAY.

READ ALL INSTRUCTIONS BEFORE OPERATING

OUTPUT RELAY: Output from the unit is a SPDT (form C) 10a relay brought out to a barrier strip mounted on the lower PCB within the MAXIM 1. 4, or 8 foot wiring harness with quick disconnect, circular plastic connectors are available. See: (OPTIONS) below. The relay is de-energized during power outages.

INSTALLATION: After securing the unit in the desired location, remove the cover and make the necessary power and load electrical connections to the barrier strip mounted on the lower PCB. If the unit is equipped with the optional wiring harness, internal connections are as follows:

CONNECTOR CHART (Cable Options)

Pin No.	Color	Internal Connections
1	Black	AC (line)
2	White	AC (neut.)
3	Green	Chassis gnd.
4	Red	Relay Com
5	Yellow	Relay NC
10	Whit/Yel	Relay NO

GENERAL: In this instruction sheet key pads are identified by an ID set in square brackets. **EXAMPLE:** The SET TIME key will be referred to in the following manner: [SET TIME].
Display or read out messages are designated by quotation marks. **EXAMPLE:** An ERROR message will be referred to in the following manner: "Error".
Some messages displayed on the MAXIM 1 read out may be cryptic. **EXAMPLE:** The message "STEP" will be displayed as "5 t P".
When several keys are shown in a line, the command in invoked by pressing each key in the order they are shown.
The condition of the relay will be indicated by a small square to the extreme right of the display, upper right is on "□", lower right is off "□".
Press the [SET TIME] key to clear any "Error" messages on the display, or to return to the current time display mode.
All keys will repeat when pressed and held.

DISPLAY: After the current time and date have been entered, the MAXIM 1 display in the current time mode will show a number under the heading DAYS. This number corresponds to a day on the control pad. **EXAMPLE:** The number "5" means Thursday, and the number "2" means Monday. The next four numbers will be the time followed by an "A" or "P" for AM or PM. The last character on the display shows the relay state as ON or OFF as described above. Pressing the [SET TIME] key will cause the date to appear as: the numerical day of the week, the month, the day, and year in the MMDDYY format. The date display will appear for approximately 5 seconds each time the [SET DATE] key is pressed.
Using the display to review programming, and explanations of other messages will be covered later.

KEY PAD: The key pad is used to enter all information into the unit. Keys with numbers also serve to indicate days of the week, and in the case of 8, 9, and 0, indicate everyday, weekdays, and weekends, respectively.

The number keys are as follows:

1=SUN	2=MON	3=TUE
4=WED	5=THU	6=FRI
7=SAT	8=E-DAY (everyday)	9=W-DAY (weekday)
0=W-END (weekend)		

The programming keys are:

[SET TIME] Used when programming current time, to clear "Error" messages, and to return to the current time display when necessary.

[SET DATE] Used when entering date during programming, and to view date.

[STEP/FUNC] Used when entering program steps, to view steps and programmed instructions, and to operate the Special Functions.

[ON/OFF] Used to energize or de-energize the relay during programming.

[AM/PM] Used to enter AM or PM during programming.

[CLR ENT] Used to correct entry errors, or to delete steps and skip periods.

[START] Used when entering and to view start dates for MAXIM 1+ skip periods.

[END] Used when entering and to view end dates for MAXIM 1+ skip periods.

NOTE: The [ON/OFF] and [AM/PM] keys are dual action toggle type keys and alternate between their two conditions each time they are pressed. Other specific uses of the various keys will be explained later.

READ EACH SECTION COMPLETELY BEFORE DOING EXAMPLES

SETTING CURRENT TIME: If the MAXIM 1 display shows anything but a current time mode display, as described in DISPLAY above, press the [SET TIME] key until the current time mode appears. All time will be entered in the four digit hour min. format, HHMM, followed by either AM or PM and the [SET TIME] key.
NOTE: The [AM/PM] key is a toggle type switch and alternates between AM and PM each time it is pressed.
EXAMPLE: To set the time at 1:40 in the afternoon enter the following sequence of commands.
[0] [1] [4] [0] [am/PM] [SET TIME]
After entering the above sequence the display should look like this:

```
 DAYS    TIME    ON
  4  □  1 4 0 P

  MAXIM 1          OFF
```

NOTE: There may be a different or no number under the DAYS heading at this point.

SETDATE: THE CORRECT DATE MUST BE SET FOR PROPER OPERATION OF THIS DEVICE. The date will be entered in a Month, Day, Year format, MMDDYY, followed by the current day of the week and the [SET DATE] key.
EXAMPLE: To enter the date of February 8, 1989, a Wednesday, enter the following sequence of commands.
[0] [2] [0] [8] [8] [9] [WED]/4]

After pressing the [WED/4] key the display should look like this:

```
MAXIM 1
DAYS    TIME      ON
  4    0 2 0 8 9      OFF
```

Now press the [SET DATE] key, the display will return to the current time mode.

PROGRAMMING: Programming is accomplished by entering into the unit the times each day and the day(s) each week that it is desired to turn the relay on or off. Each specific action is called a program step and is automatically assigned a step number as it is entered. Maxim 1 program steps are numbered 00 through 05. Maxim 1+ program steps are numbered 00 through 15 and entered in any order, the MAXIM will sort them and execute them in a chronological sequence.

NOTE: The MAXIM will perform each programmed step at the time that has been set in its memory. If a step is programmed into the MAXIM after the time it was due to start, the MAXIM will not energize or de-energize the relay until the next program step. If the relay is required to be on each weekday from 7:25 AM to 4:55 PM, and the step is programmed after 7:25 AM on a weekday, the relay will not energize until the following morning. If it is necessary to begin operation the same day, the relay must be energized manually. See: MANUAL RELAY CONTROL.

PROGRAMMING REVIEW: Pressing the [STEP/FUNC] key will display the step number, pressing the [STEP/FUNC] key a second time will display the intructions contained in the step. A "CLEAR" message indicates that no instructions have been saved for that step.

PROGRAMMING ERRORS: If an error is made during programming, the [CLR ENT] key may be used to delete one number at a time from the display.

ERASING PROGRAMMED STEPS: The [CLR ENT] key is also used to erase an entire step by first using the [STEP/FUNC] key to arrive at the desired step and then pushing the [CLR ENT] key. The display will then show the step as "CLEAR".

NOTE: A STEP MUST BE ERASED BEFORE REPROGRAMMING.

PROGRAMMING DOCUMENTATION: Two program records are included with each MAXIM 1, both records should be filled out completely before programming the MAXIM 1. One is part of this manual and we suggest it be kept at the office or shop in a master file. The other program record is designed to be kept with the unit at all time. All entries should be made in pencil, in case of error or future program changes.

ENTERING STEP PROGRAMMING: To program a step enter the time in four digits followed by [AM/PM], [ON/OFF], the (day), and [STEP].

NOTE: The [ON/OFF] key is a toggle type switch and alternates between ON and OFF each time it is pressed.

EXAMPLE: To turn the relay on at 7:25 every weekday morning enter the following sequence of commands.

[0] [7] [2] [5] [AM/pm] [ON/off] [W-DAY/8]

After pressing the [W-DAY/8] key the display should look like this:

```
MAXIM 1
DAYS    TIME      ON
  9    0 7 2 5 A      OFF
```

Now press the [STEP/FUNC] key, the display will return to the current time mode.

EXAMPLE: To turn the relay on at 11:15 every Saturday and Sunday morning enter the following sequence of commands.

[1] [1] [1] [5] [AM/pm] [ON/off] [W-END/0]

After pressing the [W-END/0] key the display should look like this:

```
MAXIM 1
DAYS    TIME      ON
  0    1 1 1 5 A      OFF
```

Now press the [STEP/FUNC] key, the display will return to the current time mode.

EXAMPLE: To turn the relay off at 4:55 every afternoon enter the following sequence of commands.

[0] [4] [5] [5] [am/PM] [on/OFF] [E-DAY/8]

After pressing the [E-DAY/8] key the display should look like this:

```
MAXIM 1
DAYS    TIME      ON
  8    0 4 5 5 P      OFF
```

Now press the [STEP/FUNC] key, the display will return to the current time mode.

MAXIM 1+ SKIP PERIOD PROGRAMMING: The MAXIM 1+ has 5 programmable (skip periods). These periods suspend all relay functions and are most often used to skip normal operations on holidays or during summer vacation when the MAXIM 1+ is used in a school zone application. The skip period begins on the first instant of the start day and ends on the last instant of the end day. The skip period can be from 1 day to years in length. When the skip period begins the relay is frozen and remains in the same position until the skip period ends. When the skip period ends the MAXIM 1+ automatically enters the programmed schedule for that time and date.

NOTE: The date will be entered in a MMDDYY configuration.

NOTE: The skip periods are numbered 0 through 4, these numbers are assigned during programming by you, the operator, and are the last number pressed before the [START] or [END] keys.

EXAMPLE: To program a skip period for summer vacation from June 2nd to August 29, 1989 enter the following sequence of commands.

[0] [6] [0] [2] [8] [9] [0] [START]
[0] [8] [2] [9] [8] [9] [0] [END]

EXAMPLE: To program a skip period for one day, such as November 8, 1988 enter the following sequence of commands.

[1] [1] [0] [8] [8] [8] [3] [START]

NOTE: For a 1 day skip no end date is required. Notice in the first example the skip period is designated as "0" and in the second example the skip period is designated as "3".

SKIP PERIOD REVIEW: To view the skip period start date press the [START] key, and to view the skip period end date press the [END] key. The display will show the skip period number "0" under the days heading and the start or end date, depending on which key was pressed. Pressing the [START] or [END] keys repeatedly will display the skip periods in ascending order. A "CLEAR" display indicates that there is no date PROGRAMMED for that skip period number.

EXAMPLE: To view the November 8th example above, press the [START] key until the display shows a number "3" under the days heading. The display for our November 8th example should look like this:

DAYS	TIME	ON
3	11088	OFF

MAXIM 1

NOTE: The "3" under the days heading is the number assigned to this skip period.

ADVANCE SINGLE DAY SKIP: This capability allows for unexpected skip periods of one day in length to be programmed into the MAXIM 1+. These skip days can be programmed up to 7 days in advance and are automatically erased after use. These skip days are programmed by pushing the [9] key followed by the [STEP/FUNC] key and the appropriate (day) key.

EXAMPLE: To skip next Thursday enter the following sequence of commands.

[9] [STEP/FUNC] [THU/5]

NOTE: To view programming press the [9] key followed by the [STEP/FUNC] key. The display for the example above should look like this:

DAYS	TIME	ON
5	5-DAY	OFF

MAXIM 1

POWER FAILURE: The MAXIM 1 and MAXIM 1+ have a built in capacitor back-up power source that will continue to keep time and save all programming for up to 48 hours.

During a power failure the relay is de-energized and the display is blanked. If the power failure is less than 48 hours long, when power is restored, the display will show all zero's. During this time the MAXIM 1 is engaged in a memory search which can last up to 45 seconds. At the end of the memory search the current time will be displayed and the MAXIM will automatically enter the proper program step for the current time and date.

If the power failure is longer than 48 hours, when power is restored a "P.FAIL" message will appear on the display. POWER FAILURES LONGER THAN 48 HOURS CAN CAUSE LOSS OF PROGRAMMED DATA.

It is possible some programming may have been retained after power failures as long as 100 hours or more. All programming, step and skip, should be checked against the program record. Reprogram time, date, steps and skips as necessary using the procedures outlined above.

MANUAL RELAY CONTROL: If it is necessary to energize or de-energize the relay manually enter the following sequences of commands as appropriate

To turn relay ON: [1] [STEP/FUNC]
The relay will now be energized and the display will show the status as "on".
To turn relay OFF: [0] [STEP/FUNC]
The relay will now be de-energized and the display will show the status as "off".

NOTE: After energizing or de-energizing the relays manually, the MAXIM will resume normal operation at the time of the next programmed step, and the relay status may be changed at that time.

OTHER FUNCTIONS: [9] [9] [STEP/FUNC]...SOFTWARE IDENTIFICATION (useful when talking to your distributor or the factory about the MAXIM 1).

PROGRAM RECORD - MAXIM 1

NOTE: STEP NUMBERS ARE ASSIGNED AUTOMATICALLY BY THE MAXIM 1.

WEEKLY PROGRAM

STEP #	TIME	AM OR PM	TURN RELAY ON OR OFF [ON/OFF] KEY	ENTER DAY(S) OF WEEK	PRESS THE [STEP/FUNC] KEY
00		[AM/PM]	[ON/OFF]		[STEP/FUNC]
01		[AM/PM]	[ON/OFF]		[STEP/FUNC]
02		[AM/PM]	[ON/OFF]		[STEP/FUNC]
03		[AM/PM]	[ON/OFF]		[STEP/FUNC]
04		[AM/PM]	[ON/OFF]		[STEP/FUNC]
05		[AM/PM]	[ON/OFF]		[STEP/FUNC]
06		[AM/PM]	[ON/OFF]		[STEP/FUNC]
07		[AM/PM]	[ON/OFF]		[STEP/FUNC]
08		[AM/PM]	[ON/OFF]		[STEP/FUNC]
09		[AM/PM]	[ON/OFF]		[STEP/FUNC]
10		[AM/PM]	[ON/OFF]		[STEP/FUNC]
11		[AM/PM]	[ON/OFF]		[STEP/FUNC]
12		[AM/PM]	[ON/OFF]		[STEP/FUNC]
13		[AM/PM]	[ON/OFF]		[STEP/FUNC]
14		[AM/PM]	[ON/OFF]		[STEP/FUNC]
15		[AM/PM]	[ON/OFF]		[STEP/FUNC]

16 maximum program steps available.

PROGRAM RECORD - MAXIM 1+

NOTE: STEP NUMBERS ARE ASSIGNED AUTOMATICALLY BY THE MAXIM 1+.

WEEKLY PROGRAM

STEP #	TIME	AM OR PM	TURN RELAY ON OR OFF [ON/OFF] KEY	ENTER DAY(S) OF WEEK	PRESS THE [STEP/FUNC] KEY
00		[AM/PM]	[ON/OFF]		[STEP/FUNC]
01		[AM/PM]	[ON/OFF]		[STEP/FUNC]
02		[AM/PM]	[ON/OFF]		[STEP/FUNC]
03		[AM/PM]	[ON/OFF]		[STEP/FUNC]
04		[AM/PM]	[ON/OFF]		[STEP/FUNC]
05		[AM/PM]	[ON/OFF]		[STEP/FUNC]

6 maximum program steps available.

SKIP PERIOD PROGRAMS
NOTE: SKIP NUMBERS ARE ASSIGNED BY THE OPERATOR

STEP #	ENTER DATE MM DD YY	PRESS START OR END KEY	NOTES
0		[START]	
0		[END]	
1		[START]	
1		[END]	
2		[START]	
2		[END]	
3		[START]	
3		[END]	
4		[START]	
4		[END]	

5 maximum skip periods available.