

# Digi 322

## 365-Day One, Two and Four Circuit Electronic Time Switch by Grasslin

### Operating Instructions



The Digi 322 controls are one, two and four channel electronic time switches with 365-day, 7-day and 24-hour programming. The channels are freely programmable with a total of 322 schedules. The load status, time of day, and date are displayed on a large LCD read-out.

### Functional Description

The Digi 322 time control can be programmed as 24-hour, 7-day, or a 365-day schedule of individual holidays or holiday/vacation periods. This control incorporates a calendar through the year 2090 and also includes automatic leap year adjustment. The annual daylight savings/standard time changes can be programmed to occur automatically each year through 2090.

Holidays that occur on the same date each year (July 4) need only be programmed once—they will be stored and will be executed each year until 2090. Holidays that occur on a different date each year (Labor Day) should be entered with the 1X key (one-time). They will be automatically neutralized after their occurrence, therefore, they need not be deleted when programming the control next year. These features minimize the annual programming considerably.

Please read these operating instructions carefully so that you will be able to take full advantage of the functions offered by the Digi 322 time control.

### TO THE INSTALLER:

1. Read operating instructions carefully.
2. Check the input voltage ratings marked on the unit to make sure this product is suitable for your power supply and application.
3. Disconnect power supply prior to installation to prevent electrical shock.
4. Damage to the relay-contacts caused by short circuiting will void warranty.
5. Wire in accordance with National and Local electrical code requirements.

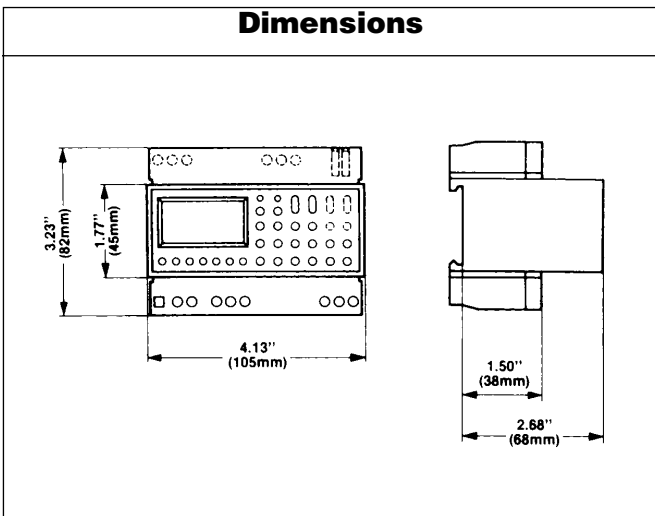
### TECHNICAL DATA

Input Voltage:	Separate models available for 24V, 120V or 240VAC, 50-60 Hz input
Relay Switch Rating:	16A @ 24/250 VAC
Output Relay:	SPDT dry contacts for each channel
Power Consumption	5 VA
Battery Backup:	150 hours minimum, rechargeable battery is built in
Temperature Range:	14°F – 131°F (–10°C to 55°C)
Display:	AM/PM LCD 7/8" x 1-5/8"
Dimensions:	H 3-1/4" x W 4-1/8" x D 2-7/8"
Weight:	18 oz.
Mounting:	Surface & DIN rail (NEMA 1 indoor & NEMA 3R outdoor enclosures available)
Shortest Switching Time:	One second
Block Programming:	Weekdays

# Installation

## MOUNTING

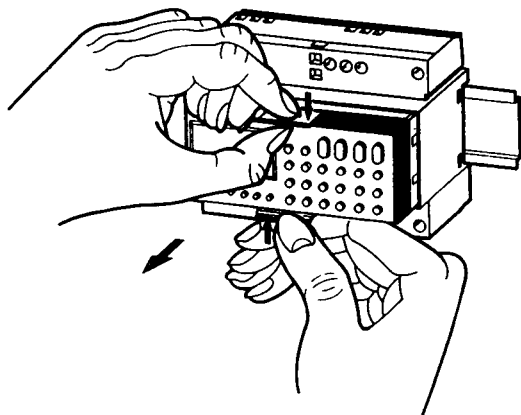
Surface mounting the Digi 322 inside a control panel or enclosure is accomplished with the supplied rail—the rail is surface mounted with two screws. Mount at convenient eye level position.



You are now ready to affix the unit to the rail. Place the two protruding guides, which are on the top of the rear rail cutout slot, over the top lip of the rail; then snap the bottom into place.

The timer module can be removed from the timer housing for programming or change-out purposes.

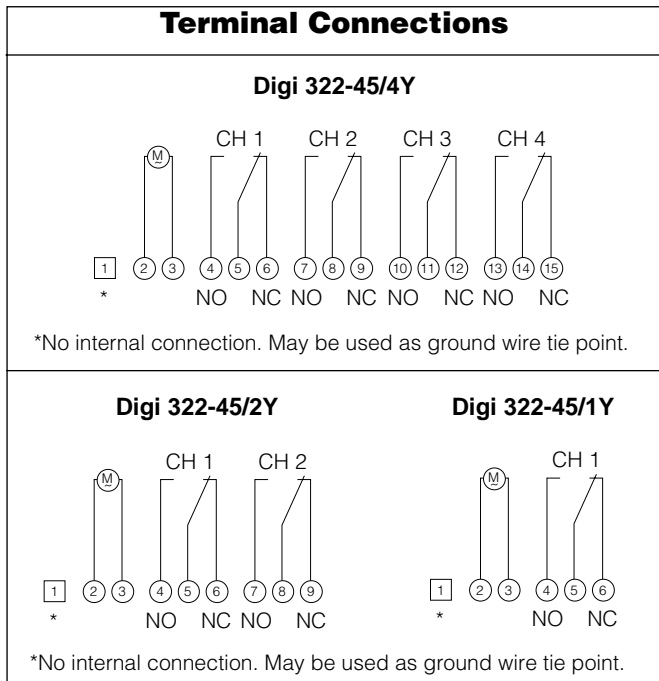
Please note that the battery needs to be charged beforehand.



NOTE: After applying power, it may take a few minutes for the battery to charge and display to appear.

## WIRING

Make certain to connect only to the supply voltage designated on the unit itself. Warranty will be void if wrong voltage is applied. Connect wires to the screw terminals in accordance with the wiring diagram shown (use 12 to 22 AWG wire).



Install both terminal covers after wiring. Depending on installation you may want to wire unit before snapping to rail. For stand-alone installation use a Grasslin indoor/outdoor enclosure, E100, E150, or E200.

## INSTALLATION CHECKLIST

1. The time switch should have its own independent circuit for power supply.
2. Since all electronic instruments are sensitive to voltage spikes, close attention must be paid to the following:
  - a) If possible, power to the electronic time switch should be supplied from a phase different from the one supplying power to the load.
  - b) **INDUCTIVE-LOADS** should have suitable VARISTOR and RC network (  $\sim \sim \sim \sim \sim$  ) across the supply terminals to reduce voltage spikes.
  - c) **DC INDUCTIVE LOADS** should have a diode across their terminals to eliminate back EMF of the inductor.
  - d) **HIGHLY INDUCTIVE LOADS**, especially fluorescent lights, may require a relay in which case (a) and (c) apply.
  - e) **IN HIGH LIGHTNING AREAS**, a surge suppressor should be installed.

## KEYPAD DESCRIPTION

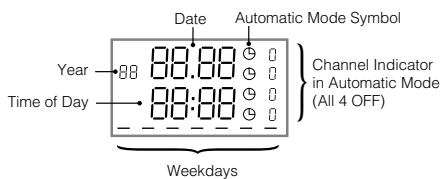
- Mo – Su – Day selector
- Reset\* – Clears all programs and actual time
- S/W\* – Switch for daylight savings time functions
- Prior. – Sets priorities
- Year – Sets year when setting actual time or DST
- CL – To cancel an individual program step
- R – Used to review the program
- 1X – Used to enter a one time schedule
- N – Used to enter an intermediate step in a program block
  
- ☉ – Recalls actual time (Time of Day)
- S – Used to store the final step in a program block
  
- ⌋ – Sets the momentary contact
- | – Used to set the end of a multiday holiday period
  
- Day – Used to set the day of the month
- Month – Used to set the month
- h+ – Hour advance
- h- – Hour reverse
- m+ – Minute advance
- m- – Minute reverse
- I/O – Sets ON (1), OFF (0) command for each channel
  
- ✎ – Manual override for each channel

\*Recessed buttons—use a long pen point or pencil

## LCD DISPLAY ELEMENTS

The LCD incorporates a number of different elements to display various data and information.

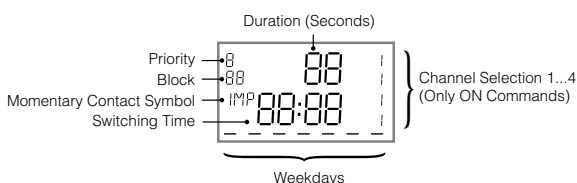
### 1. Example: Actual date and time of day



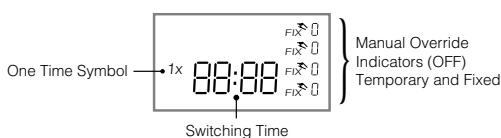
### 2. Example: Daylight savings time



### 3. Example: Momentary Contact



### 4. Example: Other displays



## PROGRAM BLOCK FORMATION

The purpose of the blocks is to simplify the programming, i.e. switching **times** that are the same for different holidays or periods need not be repeated. Likewise, when programming ON and OFF times the date need only be entered once.

The time switch assigns a block number from 00 to 99 to each program with dates entered. All programs without a date (7-day programs) automatically receive the block number 00.

Programs with dates – individual days or periods of days – are assigned an ascending block number (01, 02...99). All programs within a block are stored by pressing “N”. The last program or portion of a program within a block is entered by pressing “S”, thus closing the block.

## Execution of Programs

At beginning of each day the microprocessor determines which of the stored programs for that day have the highest priority. Only the highest priority program(s) will be executed.

Once the Digi 322 is programmed, it will automatically “look back” and assume the correct ON or OFF switch position.

## PRIORITY

The microprocessor automatically assigns the lowest priority – “0” – to standard 7-day programs.

Holiday programs with a duration of more than one day automatically receive priority “1”.

Holiday programs for one day only automatically receive priority “2”.

A higher priority can be manually assigned to any holiday program by using the “Prior.” key.

## PROGRAM STORAGE CAPACITY

The Digi 322 can store up to 322 programs. These 322 programs can be freely assigned to different dates or periods, switching times or channels. A storage position is used each time the button “N” or “S” is pressed. If all 322 storage positions are used up, four 8’s will be shown in the display.

If a program step is not complete and storage is attempted with the “N” or “S” button, the missing components will blink in the LCD.

## SETTING THE TIME

**[Example: 8:15 AM, July 10, 1996]**

Press “Reset” to clear the time and all programs.

**While holding ☉ :**

- Press “Year” to 96
- Press “Month” to 7 (July)
- Press “Day” to 10
- Press “h+” to 8 (AM)
- Press “m+” to 15

Release the ☉. The current date and time will be displayed, as will the day of the week; the time colon will blink. Channel settings and override status will be indicated on the right and the +1h indicates that Daylight Savings Time is in effect, if appropriate.

## DAYLIGHT SAVINGS TIME FUNCTIONS

The Digi 322 is programmed with European Daylight Time changeover dates (the last Sundays in March and October) through the year 2090. USA changeover dates (the first Sunday in April and last Sunday in October) may be programmed as follows:

### Example: For 1997; April 6 and October 26

With pencil, press "S/W" key; The automatic European dates are shown along with "AU" and  $\pm 1h$ .

Press "Month" to 04 (April)

Press "Day" to 06

"HA" shows in display, (annual changeover)

The end date shown may be the correct ending date "10:26" for the USA. (To change the end date, press " $\rightarrow$ ", then "Month" and "Day").

Press "Year" key once; "c" appears above "HA", indicating it will change on the correct days every year through 2090.

Press "S" to store

Press the  $\ominus$  to return to run mode.

### Daylight Time Changeover Dates

1997: April 6, October 26

1998: April 5, October 25

1999: April 4, October 31

2000: April 2, October 29

2001: April 1, October 28

2002: April 7, October 27

#### NOTE

For areas with  
NO  
Daylight Time  
Changeover

Press "S/W"

Press "CL"

Press "S"

Press " $\ominus$ "

## PROGRAMMING 7-DAY SCHEDULES

*NOTE: The actual time of day must be set prior to programming. Also set Daylight Savings Time. We recommend that all programs be first written out on the enclosed program worksheets.*

**[Example: Channel 1 on at 7 AM and off at 6 PM, Monday thru Friday]**

Press "h+" to 7 AM (press 9 times)

Press "m+" to 00 (once)

Press "Sa" to omit Saturday

Press "Su" to omit Sunday

Press "I/O" (for channel 1) to 1 (ON)

Press "N" to store

Press "h+" to 6 PM

Press "m+" to 00 (once)

Press "Sa" to omit Saturday

Press "Su" to omit Sunday

Press "I/O" (for channel 1) twice to 0 (OFF)

Press "S" to store

Weekly program steps are automatically assigned to block "00" and priority "0".

## PROGRAMMING INDIVIDUAL HOLIDAYS

**[Example: July 4th – fixed date holiday; Labor Day (September 1, 1997) – 1-time schedule; Channel 1 off at 12:01 AM]**

*NOTE: Fixed day holidays will stay in the program until the year 2090 when the internal clock stops. As one time holiday commands are executed the month and day go to zero (visible if you review the program). The month and day for the next year can be substituted for the zeros. For example: If you have a holiday program for Thanksgiving 1997 it is executed on November 27. If you review the program on November 28th you will see 00.00 not 11.27; you can then enter 11.26, and press the "N" key to program Thanksgiving for 1998.*

Press "Month" to 07 (July)

Press "Day" to 04

Press "N" to store

Press "h+" to 12 AM

Press "m+" to 01

Press "I/O" (for channel 1) twice to 0 (OFF)

Press "S" to store and close block

Press "Month" to 09 (September)

Press "Day" to 01

Press "1X" 1-time schedule only

Press "N" to store

Press "h+" to 12 AM

Press "m+" to 01

Press "I/O" (for channel 1) twice to 0 (OFF)

Press "S" to store and close block

Individual Holiday programs are automatically assigned priority 2.

*NOTE: Ignore the days of the week indicator*

## PROGRAMMING MULTIDAY HOLIDAY PERIODS

**[Example: Channel 1 off (we will use an OFF command at 12:01 AM) each day from June 20, 1997 until September 1, 1997 inclusive].** The daily program will resume September 2. As this "School Summer Vacation" will be different in 1998 this becomes a 1X (one time) schedule.

Press "Month" to 06 (June)

Press "Day" to 20

Press  $\rightarrow$  to set the end date

Press "Month" to 09 (September)

Press "Day" to 01

Press "1X" to set one time

Press "N" to store

Press "h+" to 12 AM

Press "m+" to 01

Press "I/O" (for channel 1) twice to 0 (OFF)

Press "S" to store this and close the block

Multiday holiday programs are automatically assigned priority 1. These periods can be programmed with a 7-day schedule that is different than the standard 7-day schedule. Simply follow the above procedure and add the respective Monday thru Sunday keys for the desired days of the week before selecting the hours.

If no ON or OFF times are programmed for some or all days of the week during a multiday holiday period, the standard 7-day schedule will be executed.

### REPEAT CHANNEL SELECTION

The control of loads is not restricted to a single channel. All loads can be turned on or off at the same time. For example, load 1 can be turned OFF simultaneous to load 2 being turned ON or all loads can be turned OFF at the same time on a specific date.

## Special Program Functions

### MOMENTARY CONTACT PROGRAM

Short duration programs in 1-second intervals up to 59 seconds can be programmed for loads such as bells.

**[Example: A noon whistle (channel 2) for six seconds Monday through Friday]**




- Press "h+" to 12 PM – noon
- Press "m+" once to 00
- Press "I/O" (channel 2) once to 1
- Press "┘┘" to 6 (seconds)
- Press "Sa, Su" to eliminate Saturday & Sunday
- Press "S" to store

*NOTE: This can only be used for ON commands.*

### PRIORITIES

Pressing the "Prior." key after entering the date for a holiday program permits the assignment of a higher priority (the highest is 9). This allows that standard holiday programs with priority 1 or 2 are overridden with special programs.


### MANUAL OVERRIDE

The Digi 322 provides temporary and fixed overrides. Each channel has an elongated button below the . Pressing this button will change the status of a channel, i.e. ON to OFF or OFF to ON. The small  in the display will change to  indicating an override condition. This is a temporary override which will in turn be overridden by the next program change. For example, if lights are programmed to turn off at 4 PM and they are turned on manually at 2 PM, they will turn off at 4 PM.

Pushing the button again will give a FIX I (ON) and

pushing it another time will give a FIX 0 (OFF). These are permanent ON or OFF commands which will not be overridden by the program. Pushing the elongated button one more time will return to automatic operation.

### PROGRAM REVIEW

The program can be reviewed by pushing the "R" key successively. Block 00 is reviewed first and each weekly ON/OFF command will be displayed on successive screens. A blank screen indicates the end of block 00. Block 01 is reviewed next. The first screens show the holidays followed by a blank screen. The ON/OFF commands for those days are next followed by another blank screen which indicates the end of block 01. Block 02 and any additional blocks are reviewed in the same manner. Press the  to return to the TOD display anytime.

### CANCELLING PROGRAMS

Use the "R" key to find the program step to be cancelled. Pressing the "CL" key will cancel that step and it is deleted from memory. To delete holidays from the program you must clear both the date and the time/on/off positions. The reset key will cancel all program steps and also the current time of day, date etc.

### EDITING PROGRAMS

Use the "R" key to find the program step to be corrected. Make the changes as in normal programming and then use the "N" key to store the change.

### BATTERY-POWERED RESERVE

In case of power failure, the built-in nickel-cadmium battery maintains the time of day, program storage and the LCD display for a minimum of 150 hours (6+ days). During this time, all programmed switching events will be carried out but the relays will not operate. The battery reserve operates to its full capacity only if the Digi 322 has been connected to electrical power for at least 140 hours.

### PLEASE NOTE:

When power is restored after a power failure, the Digi 322 "looks back" and assumes the correct ON or OFF switch position.

ISO 9001 CERTIFIED

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**DIGI 322 PROGRAM WORK SHEET**


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**WEEKLY PROGRAM STEPS**


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BLOCK 00 PRIORITY 0

	WEEKDAYS							SWITCH TIME	CHANNEL 1 = ON 0 = OFF					REMARKS
	Mo	Tu	We	Th	Fr	Sa	Su		1	2	3	4	⌋	
1														
2														
3														
4														
5														
6														
7														
8														
9														
10														
11														
12														
13														
14														
15														
16														
17														
18														
19														



# DIGI 322 PROGRAM WORK SHEET

## MULTI-DAY PERIOD PROGRAM STEPS

(Used for vacations, shut-downs, etc.)

FROM (MO) . (DAY)	TO (MO) . (DAY)	1X	PRIORITY (2)	BLOCK (1)
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____

	WEEKDAYS							SWITCH TIME	CHANNEL I = ON    0 = OFF					REMARKS
	Mo	Tu	We	Th	Fr	Sa	Su		1	2	3	4	⌋	
1														
2														
3														
4														
5														
6														
7														
8														
9														
10														

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**NOTES**  
 (1) The computer will assign block numbers. Record them here.  
 (2) The computer will assign priorities which you can change if necessary. Record them here.

# DIGI 322 PROGRAM WORK SHEET

## SINGLE HOLIDAY PROGRAM STEPS

NOTE: Leave all days of the week on

	WEEKDAYS				SWITCH TIME	CHANNEL 1 = ON 0 = OFF					REMARKS
	DATE	(1) BLK	(2) PRIOR	1X		1	2	3	4	□	
1											
2											
3											
4											
5											
6											
7											
8											
9											
10											
11											
12											
13											
14											
15											
16											
17											
18											
19											

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