The tekmar Timer 031 is a microprocessor-based timer which can be programmed to provide up to two Occupied and two UnOccupied events per day for each day of the week. The Timer 031 operates its internal SPDT relay based on the programmed schedule. The Timer 031 allows the user to override any programmed event temporarily or permanently.

In case of power shut down, the programmed information is retained in memory for at least 10 years. The clock continues to operate using a backup battery for up to 24 hours, at which time it automatically shuts itself down.

When used with a tekmar control, the Timer 031 has a special function which synchronizes the Occupied / UnOccupied schedule with the Optimum Start / Stop feature on the tekmar control.

By cutting the jumper in the wiring chamber, the Timer 031 can be used in a non-60 Hz power system.

Sequence of Operation
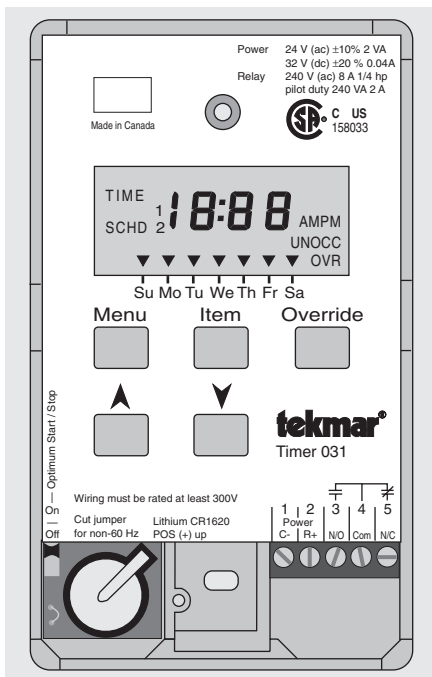
POWERING UP THE TIMER

After the Timer 031 is powered up, a number indicating the software version is displayed for 1 second. Following this, all elements are displayed for 4 seconds. If the Timer has been turned off for more than 24 hours, the Timer flashes 12:00 AM, the *OCC* element, and the *Su* pointer to indicate that the clock must be set. Setting of the clock is described in the Settings section of this brochure. When power is removed from the Timer, the display is turned off; however, the time clock continues to operate on the backup battery for up to 24 hours. The battery is generally good for forty 24 hour shut down periods.

Occupied / UnOccupied mode

The Timer 031 has an internal relay which switches on and off according to a programmed schedule of Occupied and UnOccupied events. The Timer 031 allows up to two schedules for each day of the week. During the first schedule, the Timer turns on the *1* display element and during the second schedule, the Timer turns on the *2* display element. Each schedule has an Occupied and UnOccupied event. When the Timer is in Occupied mode, the *OCC* element is displayed and the internal relay is turned off.

With the relay turned off, the contacts between terminals *N/O — Com* (3 and 4) are opened and the relay contacts between terminals *Com — N/C* (4 and 5) are closed. If the Timer 031 switches to UnOccupied mode, the *UNOCC* element is displayed and the internal relay is turned on. With the relay turned on, the contacts between terminals *N/O — Com* (3 and 4) are closed and the relay contacts between terminals *Com — N/C* (4 and 5) are opened.

Schedule Override

The Timer 031 allows the user to override a given event temporarily or permanently. During a temporary Override the Timer skips one single event. With a permanent Override, the Timer remains continuously in either the Occupied or UnOccupied mode until the Override is manually cancelled. The Override options are described in the Settings section in this brochure.

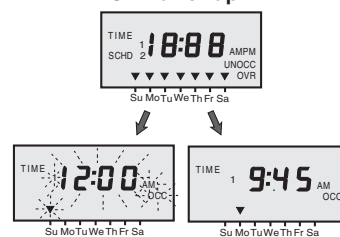### Temporary Occupied Override

When the Timer 031 is in Occupied mode and a Temporary Occupied Override is selected, the *OVR* element is flashed and the Timer skips the next UnOccupied event.

When the Timer is in UnOccupied mode and a Temporary Occupied Override is selected, the *OVR* element is flashed and the Timer immediately switches to Occupied mode.
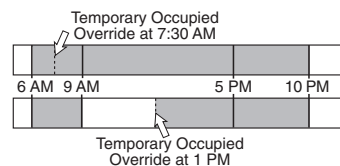
Note: The OVR element turns off when the Temporary Override is terminated at the next event.

Temporary UnOccupied Override

When the Timer 031 is in Occupied mode and a Temporary UnOccupied Override is selected, the *OVR* element is flashed and the Timer immediately switches to UnOccupied mode.
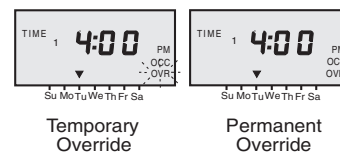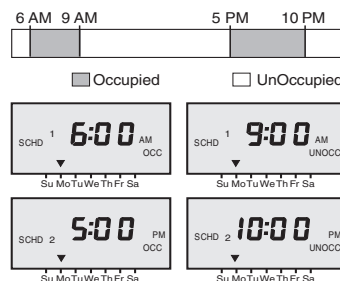
When the Timer is in UnOccupied mode and a Temporary UnOccupied Override is selected, the *OVR* element is flashed and the Timer skips the next Occupied event.

Note: The OVR element turns off when the Temporary Override is terminated at the next event.

On Power-up

Occupied / UnOccupied Schedule

Temporary Override   Permanent Override

Temporary Occupied Override at 7:30 AM

Temporary Occupied Override at 1 PM

Temporary UnOccupied Override at 7:30 AM

Temporary UnOccupied Override at 1 PM

Permanent Occupied Override

When the Timer 031 is in Occupied mode and a Permanent Occupied Override is selected, the *OVR* element is displayed and the Timer remains in Occupied mode until the Override is cancelled.

When the Timer is in UnOccupied mode and a Permanent Occupied Override is selected, the *OVR* element is displayed and the Timer switches to Occupied mode until the Override is cancelled.

Note: The OVR element turns off when the Permanent Override is cancelled.

Permanent Occupied Override at 7:30 AM

6 AM 9 AM   5 PM   10 PM

Permanent Occupied Override at 1 PM

Permanent UnOccupied Override

When the Timer is in Occupied mode and a Permanent UnOccupied Override is selected, the *OVR* element is displayed and the Timer switches to UnOccupied mode until the Override is cancelled.

When the Timer is in UnOccupied mode and a Permanent UnOccupied Override is selected, the *OVR* element is displayed and the Timer remains in the UnOccupied mode until the Override is cancelled.

Note: The OVR element turns off when the Permanent Override is cancelled.

Permanent UnOccupied Override at 7:30 AM

6 AM 9 AM   5 PM   10 PM

Permanent UnOccupied Override at 1 PM
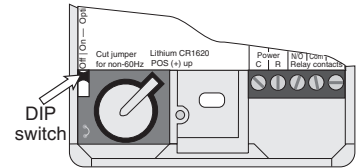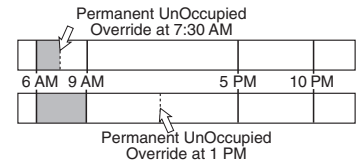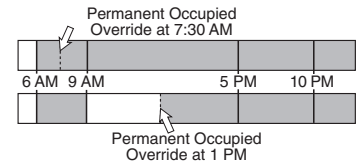
Optimum Start / Stop

The Timer 031 has an *Optimum Start / Stop* option which synchronizes the Timer 031 UnOccupied schedule with the *Optimum Start / Stop* feature on tekmar controls. The Timer 031 also communicates the Override options to tekmar controls. The *Optimum Start / Stop* feature is enabled by switching the DIP switch in the wiring chamber to the *On* position.

DIP switch

Installation

Caution

Improper installation and operation of this control could result in damage to equipment and possibly even personal injury. It is your responsibility to ensure that this control is safely installed according to all applicable codes and standards.

STEP ONE ——— GETTING READY

Check the contents of this package. If any of the contents listed are missing or damaged, please contact your wholesaler or tekmar sales representative for assistance.

Type 031 includes
- One Timer 031
- One Data Brochure D 031 and one Data Brochure D 001

STEP TWO ——— MOUNTING THE BASE

The Timer 031 is mounted in accordance with the instructions given in the Data Brochure D 001 for Enclosure C.

STEP THREE ——— ROUGH-IN WIRING

All electrical wiring terminates in the wiring chamber at the bottom of the Timer 031. The wiring to the Timer 031 is either inserted through the gap in the bottom of the enclosure or through the hole provided in the back of the enclosure.

Power should not be applied to any of the wires during the rough-in wiring stage.

Run 18 AWG or similar wire from either a 24 V (ac) power supply or a 32 V (dc) power source to the wiring chamber in the Timer 031. Do not connect the wires to any terminal until the voltage has been properly tested.

Run 18 AWG or similar wire from the control to the wiring chamber in the Timer 031.

Wiring can enter through the back or the bottom of the enclosure.

STEP FOUR ——— TESTING AND CONNECTING THE WIRING

A good quality electrical test meter, capable of measuring 0 to 200 Volts is essential to properly test the Timer 031.

Ensure exposed wires are not grounded or in contact with other wires and turn on the power supply. If a 24 V (ac) transformer is used, make sure the voltmeter is set to AC. With the voltmeter leads connected to the secondary side of the transformer, you should measure between 22 and 26 V (ac). If a 32 V (dc) power source is used, make sure the voltmeter is set to DC. Connect the positive lead from the voltmeter to the positive terminal on the DC source and the negative lead from the voltmeter to the negative terminal on the DC source. The voltmeter should measure between 26 and 38 V (dc). Turn the power off.
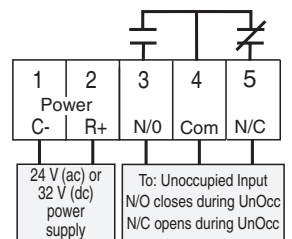
Connect the 24 V (ac) power supply to the *C- — R+* (1 and 2) terminals on the 031. If a 32 V (dc) power source is used, the negative lead (-) of the source should be connected to the *C-* (1) terminal and the positive lead (+) to the *R+* (2) terminal. When a (dc) power supply is used or if the (ac) power supply does not operate at a stable frequency of 60 Hz, the jumper located in the wiring chamber of the 031 must be cut.

When the Timer 031 is used with a tekmar control, connect one end of the 18 AWG or similar wires to the *N/O — Com* (3 and 4) terminals on the 031 and connect the other end to the *Com Sen — UnO Sw* terminals on the tekmar Control. For more information about wiring to the control, consult the Data Brochure supplied with the control.

Note: The Com — N/C (4 and 5) terminals can be used to provide a closed contact during the Occ event and an open circuit during the UnOccupied event.

1	2	3	4	5
Power				
C-	R+	N/0	Com	N/C

24 V (ac) or 32 V (dc) power supply

To: Unoccupied Input
N/O closes during UnOcc
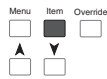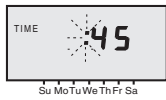N/C opens during UnOcc
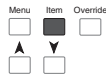
Settings

SETTING THE TIME AND DAY

The clock must be set when the 031 flashes "12:00". setting procedure.
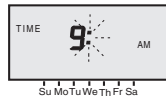
Press and Release the *Item* button to select minutes.

Use the arrow keys to set the minutes.

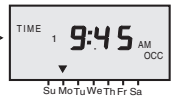Press and Release the *Item* button to select hours.

Use the arrow keys to set the hour.

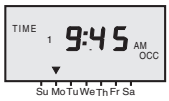Press and Release the *Item* button. The word "dAy" flashes.
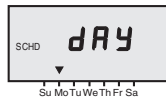
Use the arrow keys to set the day.

Press the *Item* button to view the time.
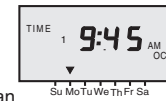
VIEWING THE TIME AND DAY

Press and release the *Menu* button to switch to the Schedule Menu.

Press and release the *Item* button to view the first Occupied event for the day.

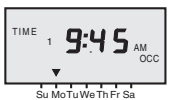The *Menu* button can be pressed at any time to return to the *TIME* display.

Once the clock is set, the 031 displays the time. During viewing or setting, the 031 always returns to the *TIME* display if no buttons are pressed for 30 seconds.

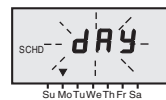Once in the Schedule Menu, "dAy" is displayed. The arrow keys can be used to choose the day to be viewed.

If a schedule has been programmed, the time of the first Occupied event is displayed. Keep pressing the Item button to scroll through the schedule for the day.
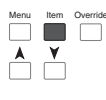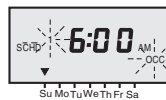
Programming

OCCUPIED / UNOCCUPIED EVENTS

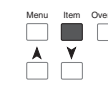Press and Release the *Menu* button to switch to the Schedule Menu.

Press and Release the *Item* button to select the **first Occupied event**.

Press and Release the *Item* button to select the **first UnOccupied event**.

Press and Release the *Item* button to select the **second Occupied event**.

The Schedule Menu is accessed from the *TIME* display.

Press and hold both arrow keys until "dAy" flashes. Select the desired day using the arrow keys.

Use the arrow keys to set the time for the **first Occupied event**.

Use the arrow keys to set the time for the **first UnOccupied event**.

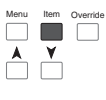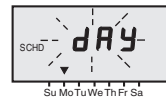Press and Release the *Item* button to select the **second UnOccupied event**.

Press and Release the *Item* button to select the next day to be scheduled.

Repeat for every day
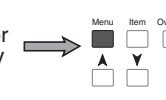
Press and Release the *Menu* button at any time to return to the *TIME* display.

Use the arrow keys to set the time for the **second Occupied event**.

Use the arrow keys to set the time for the **second UnOccupied event**.

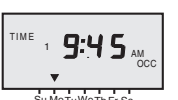Use the arrow keys to select the next day to be scheduled.

Programming the same schedule for every day of the week
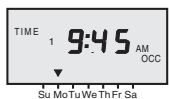
The Schedule Menu is accessed when the 031 is in *TIME* display.

Press and Release the *Menu* button to switch to Schedule Menu.

Press and hold both arrow keys until "dAy" flashes. Select the position "between" *Sa* and *Su*. All day pointers will be displayed. Follow the procedure above to program the schedule for all days.

Programming a "Null" event

Once in the Schedule Menu press the two arrow keys simultaneously until "dAy" flashes.
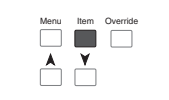
Press and Release the *Item* button until the desired event is displayed.
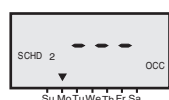
Use the arrow keys to select the "time" between 11:50 PM and 12:00 AM. A series of lines are displayed indicating that this event will not occur during the schedule

Clearing the schedule

Once in the Schedule Menu press the two arrow keys simultaneously until "dAy" flashes.
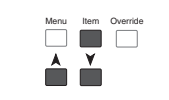
Press and hold the *Item* button and the arrows keys simultaneously until "Clr" appears.
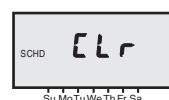
"Clr" is displayed until the buttons are no longer pressed. All schedule information is erased and factory "Null" settings are reset.

Note: To return to the *TIME* display press the *Menu* button or allow the Timer to time-out.

SETTING THE OVERRIDE OPTIONS

The Override Options are accessed when the 031 is in *TIME* display.

Temporary Occupied Override
Press and release the *Override* button to select a Temporary Occupied Override.

Temporary UnOccupied Override
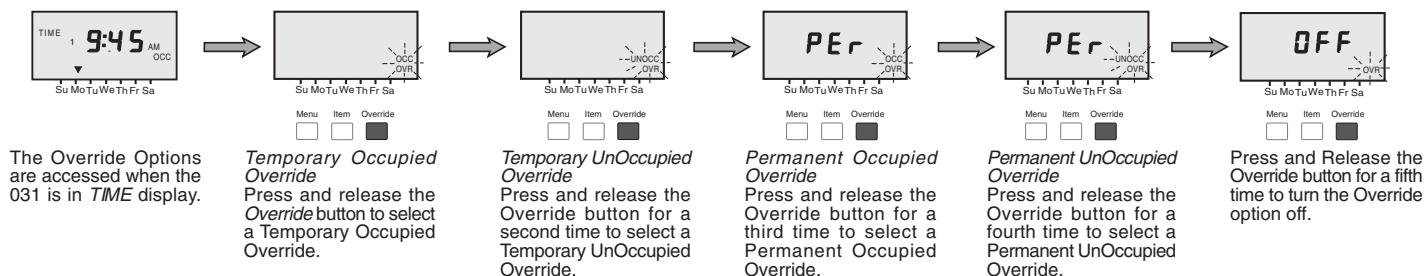Press and release the Override button for a second time to select a Temporary UnOccupied Override.

Permanent Occupied Override
Press and release the Override button for a third time to select a Permanent Occupied Override.

Permanent UnOccupied Override
Press and release the Override button for a fourth time to select a Permanent UnOccupied Override.

Press and Release the Override button for a fifth time to turn the Override option off.

Note: After selecting the desired Override option, allow the 031 to time-out to the *TIME* display or press the Menu button. To cancel an Override option, press the Override button when the 031 is in *TIME* display.

Technical Data

Timer 031

Literature	—	D 031, D 001
Control	—	Microprocessor-based; This is **not a safety (limit) device.**
Packaged weight	—	0.5 lb. (430 g), Enclosure C, white PVC plastic
Dimensions	—	4-3/4" H x 2-7/8 W x 7/8" D (120 x 73 x 22 mm)
Approvals	—	CSA C US, meets ICES & FCC regulations for EMI/RFI.
Ambient Conditions	—	Indoor use only, 32 to 122°F (0 to 50°C), < 90% RH non-condensing.
Power supply	—	Class 2, 24 V (ac) ±10% 2 VA or 30 V (dc) ± 20% 0.04 A
Relay	—	240 V (ac) 8 A 1/4 hp, pilot duty 240 VA 2 A
Battery backup	—	CR1620 Lithium non-rechargeable gives 40 events of 24 hours power down.
Schedule memory	—	Maintained for at least 10 years of power down.
Timer	—	7 day, 2 Occ & UnOcc events per day.
Adjustment	—	10 minute increments.
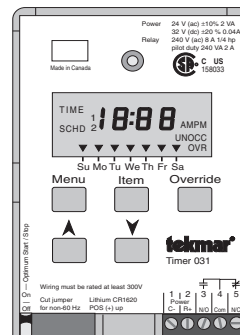
The installer must ensure that this control and its wiring are isolated and / or shielded from strong sources of electromagnetic noise. Conversely, this electronic control does not exceed the Class B limits for radio noise emissions from digital apparatus as set out in the Radio Interference Regulations of the Canadian Department of Communications. If this equipment does cause interference, the user is encouraged to try to correct the interference by reorienting the receiving antenna and / or relocating the receiver with respect to this equipment.

Le présent numérique n'émete pas de bruits radioeléctriques dépassant les limites applicables aux appareils numériques de Classe B prescrites dans le réglement sur le brouillance radioeléctriques édicte par le Ministére des Communications du Canada.

Limited Warranty and Product Return Procedure

Limited Warranty The liability of tekmar Control Systems Ltd. and tekmar Control Systems, Inc. ("tekmar") under this warranty is limited. The purchaser, by taking receipt of the tekmar product ("product"), acknowledges receipt of the terms of the warranty and acknowledges that it has read and understands same.

tekmar warrants each tekmar product against defects in workmanship and materials, if the product is installed and used in compliance with tekmar's instructions. The warranty period is for a period of twenty-four (24) months from the production date if the product is not installed during that period, or twelve (12) months from the documented date of installation if installed within twenty-four (24) months from the production date.

The liability of tekmar under this warranty shall be limited to, at tekmar's sole discretion: the cost of parts and labor provided by tekmar to repair defects in materials and/or workmanship of the defective product; or to the exchange of the defective product for a replacement product; or to the granting of credit limited to the original cost of the defective product, and such repair, exchange or credit shall be the sole remedy available from tekmar, and, without limiting the foregoing in any way, tekmar is not responsible, in contract, tort or strict product liability, for any other losses, costs, expenses, inconveniences, or damages, whether direct, indirect, special, secondary, incidental or consequential, arising from ownership or use of the product, or from defects in workmanship or materials, including any liability for fundamental breach of contract.

This warranty applies only to those products returned to tekmar during the warranty period. This warranty does not cover the cost of the parts or labor to remove or transport the defective product, or to reinstall the repaired or replacement product. Returned products that are not defective are not covered by this warranty.

This warranty does not apply if the product has been damaged by negligence by persons other than tekmar, accident, fire, Act of God, abuse or misuse; or has been damaged by modifications, alterations or attachments made subsequent to purchase which have not been authorized by tekmar; or if the product was not installed in compliance with tekmar's instructions and the local codes and ordinances; or if due to defective installation of the product; or if the product was not used in compliance with tekmar's instructions.

This warranty is in lieu of all other warranties, express or implied, which the Governing Law (being the law of British Columbia) allows parties to contractually exclude, including, without limitation, warranties of merchantability, fitness for a particular purpose, durability or description of the product, its non-infringement of any relevant patents or trademarks, and its compliance with or non-violation of any applicable environmental, health or safety legislation; the term of any other warranty not hereby contractually excluded is limited such that it shall not extend beyond twenty-four (24) months from the production date, to the extent that such limitation is allowed by the Governing Law.

Product Return Procedure Products that are believed to have defects in workmanship or materials must be returned, together with a written description of the defect, to the tekmar representative for that territory. If the address of the representative is not known, please request it from tekmar at the telephone number listed below**.**

tekmar® Control Systems

tekmar Control Systems Ltd., Canada
tekmar Control Systems, Inc., U.S.A.
Head Office: 5100 Silver Star Road
Vernon, B.C. Canada V1B 3K4
Tel. (250) 545-7749   Fax. (250) 545-0650
Web Site: www.tekmarcontrols.com

All specifications are subject to change without notice.
Printed in Canada. D 031 - 06/00.