tekmar® - Wiring Brochure

tekmarNet®4 Timer 033

tN4

W033
10/07

1 Information Brochure	2 Application Brochure	3 Layout Brochure	4 Wiring Brochure	5 Data Brochure	6 Job Record
Choose controls to match application	Design your mechanical applications	Rough-in wiring instructions	Wiring and installation of specific control	Control settings and sequence of operation	Record settings & wiring details for future reference

Overview

The following brochure describes how to wire the tekmarNet®4 (tN4) Timer 033. The 033 has one dry relay contact that opens or closes based on the programmable schedule. The relay can be connected to the UnOccupied switch input on a tekmar control or to other third party equipment. The 033 uses communication to indicate the schedule to a tN4 system.

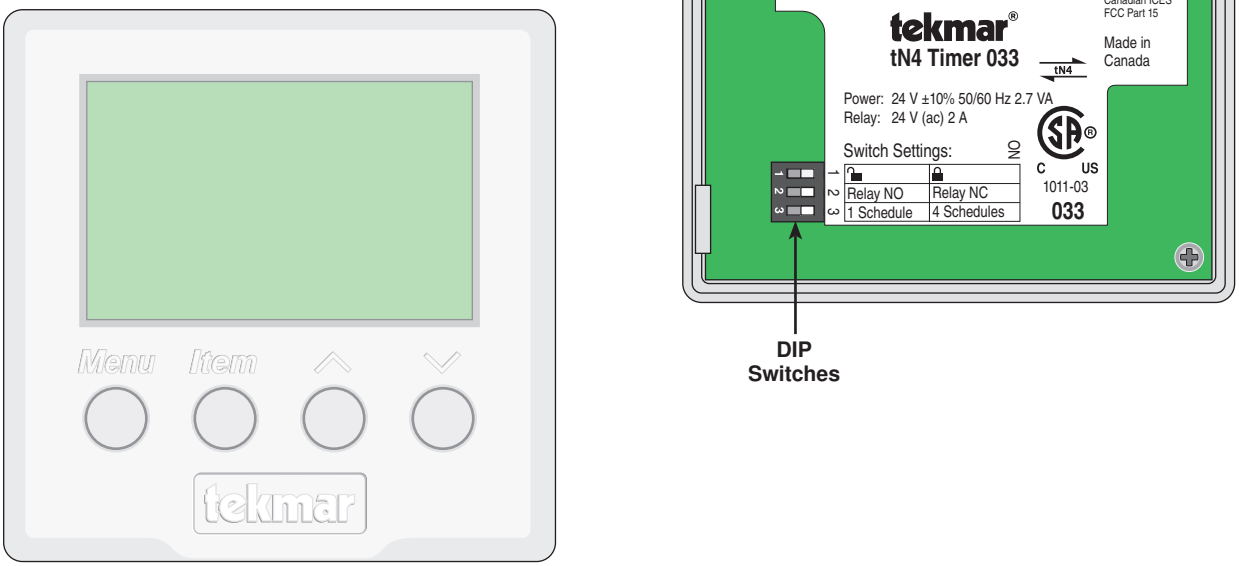

Table of Contents:

Definitions

The following defined terms and symbols are used throughout this manual to bring attention to the presence of hazards of various risk levels, or to important information concerning the life of the product.

– Caution: Refer to accompanying documents.

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INSTALLATION CATEGORY II – Local level appliances.

⚠ Caution ⚠

Improper installation and operation of this control could result in damage to the equipment and possibly even personal injury or death. It is your responsibility to ensure that this control is safely installed according to all applicable codes and standards. This electronic control is not intended for uses as a primary limit control. Other controls that are intended and certified as safety limits must be placed into the control circuit. Do not attempt to service the control. Refer to qualified personnel for servicing. There are no user serviceable parts. Attempting to do so voids warranty and could result in damage to the equipment and possibly even personal injury or death.

Rough-In Wiring

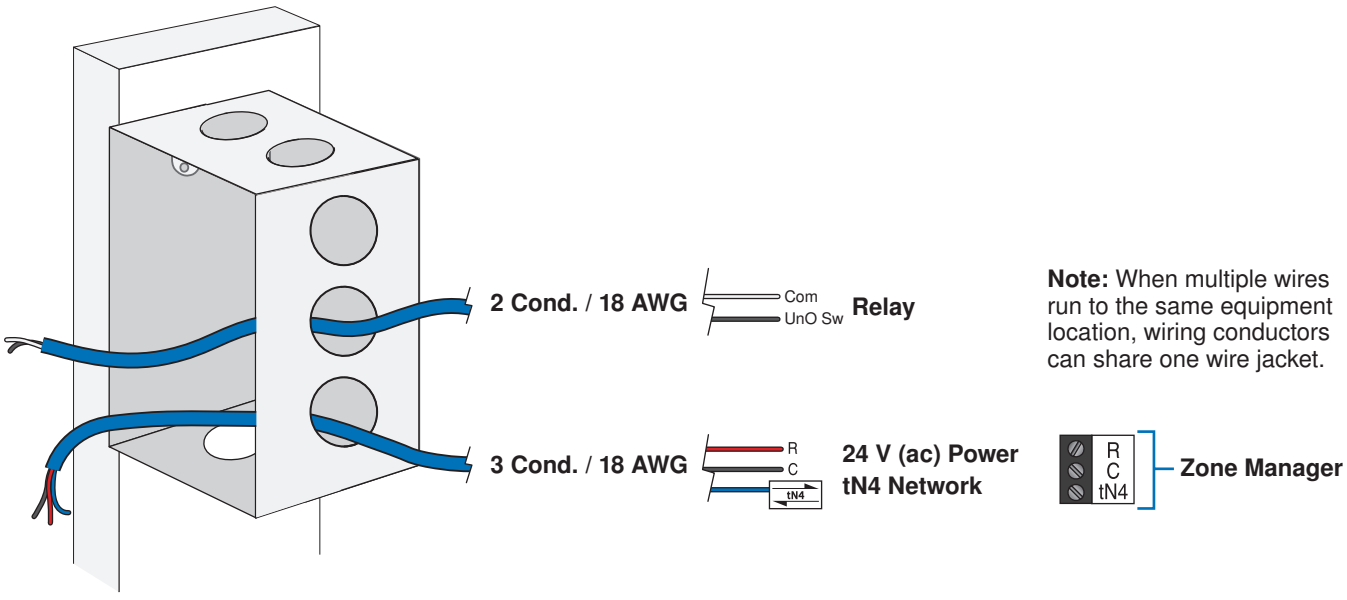
Choose the placement of the Timer early in the construction process to enable proper wiring during rough-in.

Consider the following:

- Interior Wall.
- Keep dry. Avoid potential leakage onto the control. 92% RH up to 104°F (40°C), down to 50% from 104 to 122°F (40 to 50°C). Non-condensing environment.
- No exposure to extreme temperatures below 32°F (0°C) or above 122°F (50°C).
- Away from equipment, appliances, or other sources of electrical interference.
- Easy access for wiring, viewing, and adjusting the display screen.
- Approximately 5 ft. (1.5m) off the finished floor.

Use standard 18 AWG wire for the timer power, tN4, and relay contact connections.

Refer to the diagram below to determine the number of conductors to run from each piece of equipment to the timer location.

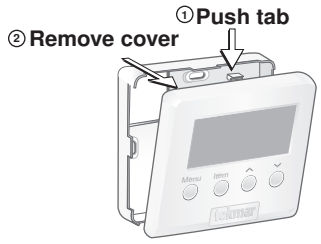


Note: When multiple wires run to the same equipment location, wiring conductors can share one wire jacket.

Remove the Wiring Cover:

To remove the wiring cover:

- Place a small slot screwdriver or similar tool into the slot located on the top of the Timer.
- While pushing against the plastic tab, pull the top of the front cover so that it pivots around the bottom edge of the Timer's base.



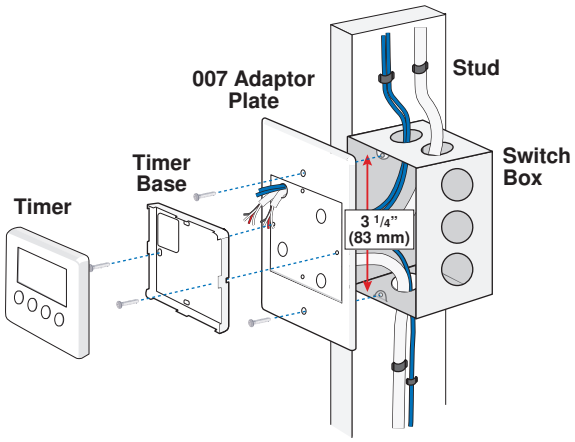
Mounting the Timer

If a single gang switch box is used, an Adaptor Plate 007 is required to mount the Timer to the box.

- Fasten the base of the Timer to the adaptor plate.
- Feed the wiring through the openings in the back of the adaptor plate and Timer.
- Use the upper and lower screw holes to fasten the adaptor plate to the box.

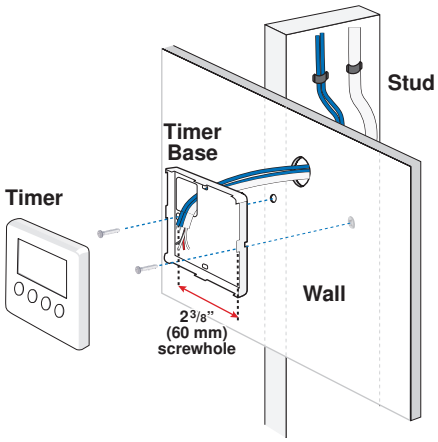
If a switch box was not used, mount the Timer directly to the wall.

- Feed the wiring through the openings in the back of the Timer.
- Use screws in the screw holes to fasten the Timer to the wall. At least one of the screws should enter a wall stud or similar rigid material.



Mounted on switch box

OR



Mounted on wallboard

Wiring Symbols

	Dry contact switch. Operates a device.	tN4	tekmarNet®4

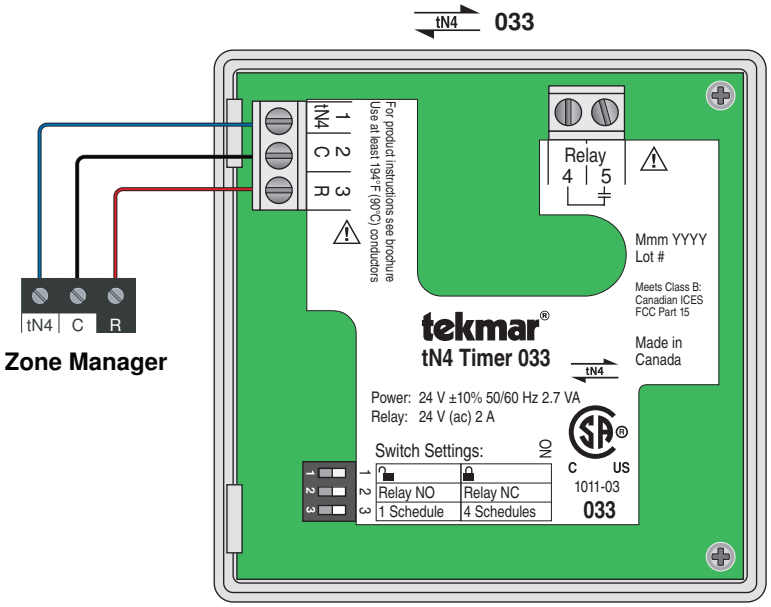
⚠ Electrical Drawings

⚠ The electrical drawing examples on the following pages show the 033 in common applications. Choose the drawing that most accurately depicts the components in your system and use that drawing as a guide to aid in wiring your system.

These are only concept drawings, not engineered drawings. They are not intended to describe a complete system nor any particular system. It is up to the system designer to determine the necessary components for and configuration of the particular system being designed including additional equipment isolation relays (for loads greater than the controls specified output ratings) and any safety devices which in the judgement of the designer are appropriate in order to properly size, configure and design that system and to ensure compliance with building and safety code requirements.

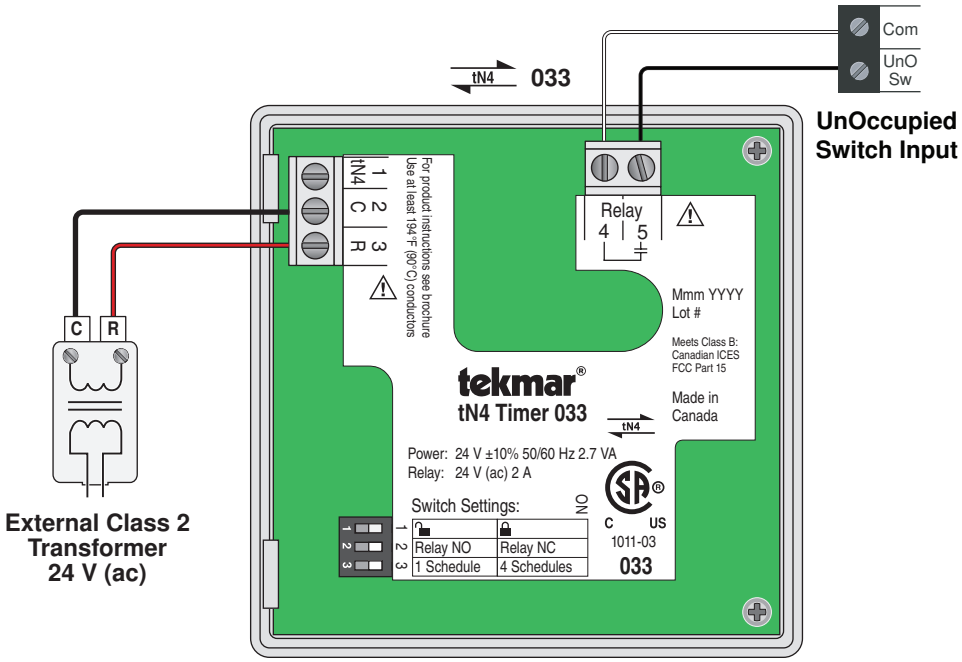
Electrical Application 033 E1

Description:
Provides up to 4 programmable setback schedules for a single tekmarNet®4 system.



Electrical Application 033 E2

Description:
Provides a single setback schedule for a tekmar stand alone control system.



Wiring the Timer:

⚠ Power (24 V (ac))

Terminals 2, 3

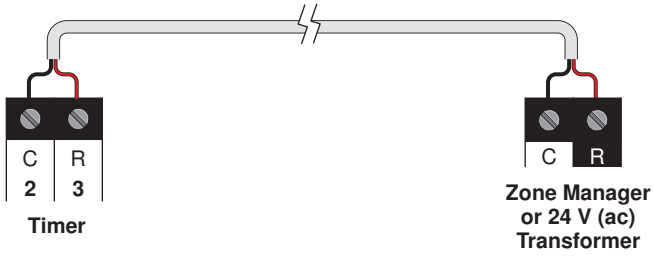
Wire 24 V (ac) to terminals C and R.

If a Zone Manager is used:

- Connect C on the Timer to any available C on the Zone Manager.
- Connect R on the Timer to any available R on the Zone Manager.

If a 24 V (ac) transformer is used:

- Connect C on the Timer to C on the transformer.
- Connect R on the Timer to R on the transformer.



⚠ tN4 Communication

Terminals 1, 2

For non-tN4 systems the tN4 terminal can be left empty. On tN4 systems wire the tN4 communication to terminals tN4 and C.

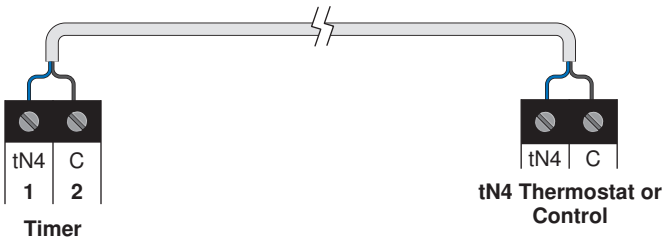
If a Zone Manager is used:

- Connect the tN4 on the Timer to any available tN4 on the Zone Manager.
- Connect the C on the Timer to any available C on the Zone Manager.

Note: This does not need to be repeated if the Timer is powered by the Zone Manager, as long as the tN4, C, and R have all been connected to the same zone, or the same bus.

If a Zone Manager is not used:

- Connect the tN4 on the timer to the tN4 on another tN4 device on the network.
- Connect the C on the Timer to the C terminal on another tN4 device on the same tN4 bus that the Timer's tN4 wire is terminated on.



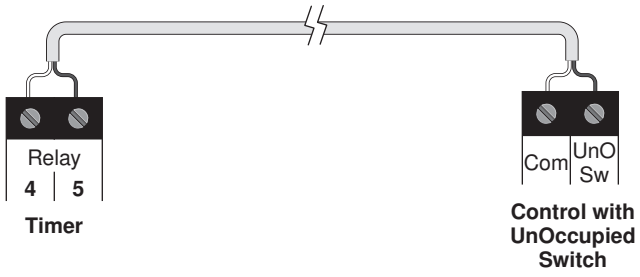
⚠ Relay

Terminals 4, 5

On tN4 systems, Relay 1 is not required and the terminals can be left empty.

On non-tN4 systems, wire the relay contact to the switch terminals on the control system that will cause the control system to change status (ie. go from Occupied to Unoccupied).

- Use these terminals as a switch to operate the setback schedule for the control system.



Troubleshooting the Wiring

⚠ *General*

The following tests are to be performed using standard testing practices and procedures and should only be carried out by properly trained and experienced persons.

A good quality electrical test meter, capable of reading from at least 0-300 V (ac), 0-2,000,000 Ohms, and testing for continuity is essential to properly test the wiring.

Testing the Wiring

⚠ Testing 24 V (ac) Power Supply

1. Remove the front cover from the Timer.
2. Use an electrical test meter to measure (ac) voltage between the R and C terminals. The reading should be 24 V (ac) +/– 10%.
3. Install the front cover.

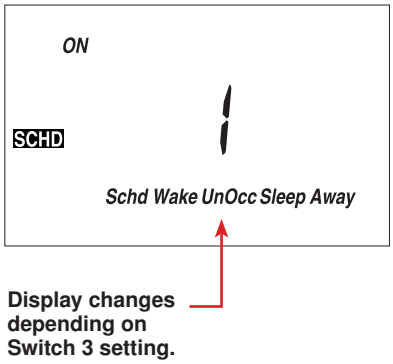
⚠ Testing the Relay Contact

1. Navigate to the schedule menu that the Relay uses. (Schedule 1 to 4)
2. Remove the front cover from the Timer.
3. Disconnect the wires from the relay contact.
4. Use an electrical test meter and check for continuity across the relay.

- If Switch 3 is set to NO, the Sleep or UnOcc segments will display when continuity is present.
- If Switch 3 is set to NC, the Wake or Occ segments will display when continuity is present.

5. Reconnect the wires to the relay.
6. Install the front cover on the Timer.

033 LCD Display Segments



Display changes depending on Switch 3 setting.

⚠ Testing the tN4 Network

The tN4 symbol is shown on the display when communication is present. If the timer is connected in a network and the communication is missing, there may be an open or short circuit on the tN4 and C bus wires.

1. Remove the front cover from the thermostat.
2. Test the wiring for short circuits:
   - **a.** Disconnect the tN4 bus wires on one end.
   - **b.** Install wire nuts on each wire to ensure the wire ends are not touching.
   - **c.** Disconnect the tN4 bus wires on the other end.
   - **d.** Measure for continuity using an electrical meter.
   - **e.** If continuity is present, there is a short circuit fault along the wires. It is recommended to replace the tN4 bus wires.
3. To test for open circuits:
   - **a.** Disconnect the tN4 bus wires on one end and connect them together.
   - **b.** Disconnect the tN4 bus wires on the other end.
   - **c.** Use an electrical meter to measure for continuity.
   - **d.** If there is no continuity, there is an open circuit fault along the wires. It is recommended to replace the tN4 bus wires.

Technical Data

tekmarNet®4 Timer 033	
Control	Microprocessor PID control; This is **not a safety (limit) control**
Packaged weight	0.46 lb. (210 g)
Enclosure	J, white PVC plastic
Dimensions	2-7/8” H x 2-7/8” W x 13/16” D (73 x 73 x 21 mm)
Approvals	CSA C US, CSA/UL 61010-1, meets Class B: ICES and FCC Part 15
Ambient conditions	Indoor use only, 32 to 122°F (0 to 50°C)
	92% RH up to 104°F (40°C), 50% RH if > 104°F (40°C)
	Altitude <9840 feet (3000 m), Installation Category II, Pollution Category 2
Power supply	24 V (ac) ± 10% 50/60 Hz, 2.7 VA, NEC / CEC Class 2
Relay	24 V (ac) 2 A

The installer must ensure that this control and its wiring are isolated and/or shielded from strong sources of electromagnetic noise. Conversely, this Class B digital apparatus complies with Part 15 of the FCC Rules and meets all requirements of the Canadian Interference-Causing Equipment Regulations. However, if this control does cause harmful interference to radio or television reception, which is determined by turning the control off and on, the user is encouraged to try to correct the interference by re-orientating or relocating the receiving antenna, relocating the receiver with respect to this control, and/or connecting the control to a different circuit from that to which the receiver is connected.

Cet appareil numérique de la classe B respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

tekmar® Control Systems

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All specifications are subject to change without notice.
Printed in Canada. W033 - 10/07.