

### TM-9180 Room Command Module with LCD Display

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# TM-9180 Room Command Module with LCD Display

#### Introduction

The TM-9180 Room Command Module with LCD display is designed for use with the TC-9100 series of DDC terminal unit controllers. A keypad and LCD display on the front of the module allow the room occupant to view and change the operating parameters of the connected TC-9100 controller.

In addition, an occupancy button enables the occupant to change the mode of operation of the controller from "COMFORT" to "STANDBY" or to request a temporary "COMFORT" mode during "NIGHT" operation. The current operating mode is shown by an LED indicator.



Figure 1: TM-9180 Room Command Module with LCD Display

In this bulletin, the term "TC-9100" refers generically to any suitably configured controller in the TC-9100 series, including the TC-9102 and TC-9109 with standard configurations. When used with the TC-9102 or TC-9109 series of controllers with standard configurations, the TM-9180 Room Command Module will automatically configure itself on power-up to provide the appropriate user functions. For use with the freely configurable "Universal TC-9100" controller, refer to the *Universal TC-9100 Controller Technical Bulletin (MN-9100-2120)* for details of the special configuration requirements.

Features	The module is attractively styled and is available in an off-white colour with a grey base, or alternatively, with both cover and ba white. Terminals are located in the base for ease of wiring. The module also has a built-in NTC sensor that is used to measure re temperature for display and transmission to the TC-9100 contro the TC-9100 controller is configured to use a unit mount NTC s the module will display the temperature measured by the contro from the NTC sensor within the unit.			
	Two models are available: one with clock, temperature and fan speed view and adjust features, and the other with full manual override and time schedule programming features. Each model is also available with an optional service module socket for use with the Universal TC-9100 or with a TC-9100 with a service module connector. The socket allows the service module to be plugged into the TM-9180 for remote access to the TC-9100 controller.			
Occupancy Button	When pressed for an changes the mode of or back to normal m the alternate mode in NIGHT mode the alternate in the <i>TC-9102 Tech</i> the <i>System 91 Manu</i>	pproximately one second, the occupancy button of operation of the controller to the "alternate" mode node. When the controller is in COMFORT mode, s STANDBY (and vice versa), and when in lternate mode is a temporary COMFORT mode for r. Full details of the alternate modes can be found <i>hnical Bulletin (Ordering Code MN-9100-2117)</i> of <i>val.</i>		
Mode Indicator	The LED indicator directly above the Occupancy Button shows the current operating mode of the controller as follows:			
	Steady On:	COMFORT Mode (occupied)		
	Flashing:	STANDBY Mode (unoccupied)		
	Off:	NIGHT or OFF Mode (Scheduled unoccupied or not in use)		

**Keypad and LCD Display** Located on the front of the room command module are a keypad with four keys ( $\nabla$  (decrease),  $\Delta$  (increase), set, and esc) and an LCD display with four digits and various operating mode symbols. Through the local bus connecting the module to the TC-9100 controller, the room occupant can use the keypad to perform the following functions:

- View/set the real time clock.
- View the room temperature, and manually override the current temperature set point.
- View the outdoor temperature if set in the TC-9100 by a supervisory system.
- View/override the fan speed if this function is provided by the TC-9100 controller.
- Manually override the operating mode of the controller.\*
- View/set the temperature set points for each of the operating modes of the controller (TC-9102 and TC-9109 only).\*
- View/define a weekly schedule for time-programmed operating mode changes.\*
- Note\* Available only on model codes TM-9180-02x0. See *Ordering Codes*.

## Installation

The TM-9180 Room Command Module is designed for direct wall mounting in the room to be controlled. Separate kits are also available for wall surface mounting with conduits, recessed wall box mounting, and panel mounting (see *Ordering Codes*). These kits are described in this section. The wiring enters the module from the back.

Choose a location for the TM-9180 taking the following into consideration:

- The room command module should be located where the occupant can easily read the LCD display and use the keypad.
- If the built-in NTC temperature sensor is being used to measure room temperature, the module should be placed where the ambient temperature is representative of the general room conditions (for example, there should be sufficient air circulation).
- Cold or warm air draughts, radiant heat and direct sunlight should be avoided.
- Place some insulating material in the wiring conduit to prevent the introduction of air from outside the room.

The installation of electrical wiring must conform to local codes and should be carried out by authorized personnel only. Users should ensure that all Johnson Controls products are used safely and without risk to health or property.





Remove the base of the module from the cover by inserting a pointed tool (a special tool, Ordering Code TM-9100-8900, is available from Johnson Controls) into the small hole at the center top of the cover. While pressing down gently, prise the base away from the cover. As the two parts separate, remove the tool and continue to pull the cover away from the base until the cover is in free.



Figure 3: Removing Cover from Base

To reassemble the room command module, place the cover over the lower edge of the base and push the upper part of the cover until it clicks firmly into place. Direct Surface Mounting



#### Figure 4: Module Base (dimensions in mm)

1. Mount the module base on the wall to cover the electrical outlet and secure with at least two screws.

Surface Mounting with Plastic Base To install the surface mounting base (for dimensions, see Figure 5):



- 1. Remove one of the notches (A) with a suitable tool.
- 2. Mark the position of the holes (B) on the wall and drill holes 5 mm in diameter. Insert plastic plugs into holes.



3. Position and fix the mounting base to the wall using the two long screws (C) provided in the kit.

4. Fix the base of the TM-9180 to the mounting base using the two short screws (D) provided in the kit.



Dimensions of the Plastic Surface Mounting Base



Recessed Wall	To in
Box Mounting	Figur

To install the recessed wall box mounting kit (for dimensions, see Figure 6):



1. Turn the screws (A) to adjust height (D) to match the depth of the wall box.



- 2. Insert the kit into the wall box, positioning it as shown above.
- 3. Tighten screws (B) until the prongs clamp properly in the wall box.



4. Mount the base of the module on the kit as shown above, using the two screws included in the kit and inserting them into two opposite holes of the four holes marked (C).

#### Dimensions of the Recessed Wall Box Mounting Kit



Figure 6: Recessed Wall Box Mounting Kit (dimensions in mm)

#### **Panel Mounting**

To install the panel mounting kit (for dimensions, see Figure 7):



1. Drill or punch a hole in the panel, making sure that its diameter is within the minimum and maximum shown above (57 to 60 mm).



2. Turn the L-shaped prongs (A) as shown above and insert the kit into the panel, positioning it as shown.



3. Turn the prongs (A) as shown above. Tighten screws (B) until the kit is securely fixed to the panel.



4. Mount the base of the module on the kit as shown above, using the two screws included in the kit and inserting them into two opposite holes of the four holes marked (C).

#### Dimensions of the Panel Mounting Kit



Figure 7: Panel Mounting Kit (dimensions in mm)

Before connecting or disconnecting any wires, ensure that all power supplies have been switched off and all wires are potential-free to prevent equipment damage and avoid electrical shock.

Terminations are made on the terminal blocks in the base of the module, which accept up to  $1.5 \text{ mm}^2$  wires. Follow the wiring diagrams shown in Figures 8, 9 and 11.

All wiring to the module is at extra low (safe) voltage and must be separated from power line voltage wiring. Do not run wiring close to transformers or high frequency generating equipment. Complete and verify all wiring connections before applying power to the controller to which the module is connected.









#### Optional Service Module Socket

The optional service module socket (see *Ordering Codes*) is accessed by sliding the panel upwards, as shown in Figure 10 below. If terminal block TB2 of the room command module has been wired with the Extension Cable (code DR-9100-8914) as shown in Figure 11, then the service module can be plugged into the socket for remote access to the TC-9100 controller.



Figure 10: Service Module Socket



Figure 11: Wiring Optional Service Module Extension Cable to Universal TC-9100 Controller

#### Jumper Settings

The jumpers are located inside the cover of the module and provide the installer with the option to disable certain functions if not required by the user. The position and function of each jumper is shown in Figure 12 below.



Figure 12: Jumper Settings

Trouble-	Problem	Reason/Action
shooting	No indication on LCD display	No power available. Check wiring to TC-9100 controller and that power LED is lit on the TC-9100.
	LCD shows FAIL and keys have no effect	Communication has failed. Check wiring to TC-9100 controller and jumper settings.
	LCD shows FAIL when room temperature display is selected	NTC sensor has failed. Replace TM-9180 module. Room temperature is outside of the range 0-40°C.
	LCD shows incorrect values for set points	Verify that the TC-9100 has been loaded with the correct configuration.

If the power supply to the TC-9100 controller is correct, the wiring has been verified, the correct configuration has been loaded into the TC-9100 controller and the problem is still present, first remove power from the controller, replace the TM-9180 module, and re-apply power. If the module is still not operating correctly, replace the TC-9100 controller and reload the configuration.

Note: If the TC-9100 controller is reconfigured for any reason, or if any jumper settings are changed on the TC-9100 controller or TM-9180 Room Command Module, the power to the controller must be switched off and back on again.

# **Operating the TM-9180**

#### Overview

The TM-9180 Room Command Module has two basic modes of operation:

- View mode to display the time, the room temperature, the outdoor temperature (if set in the TC-9100 by a supervisory system), and the current fan speed if the TC-9100 controller has the 3-speed fan control configuration. In this mode, you use the  $\nabla$  (decrease) and  $\Delta$  (increase) keys to cycle through the parameters.
- **Programming mode**<sup>\*</sup> that you can use to view and set various parameters of the TC-9100 controller, such as temperature setpoints or the time schedule. In this mode, you simultaneously press the esc and  $\nabla$  keys, or esc and  $\Delta$  keys, to cycle through the parameters (see Figure 14).

In view mode, the following parameters and overrides are available:

- 1. View the time.
- 2. View the room temperature, and manually adjust the current temperature set point.
- 3. View the outdoor temperature if available in the TC-9100 controller. The outdoor temperature may be sent to the controller by a supervisory system. The outdoor temperature is displayed for a period of 5 seconds, after which the room temperature is again displayed.
- 4. View and manually override the fan speed if the TC-9100 controller has the 3-speed fan configuration, which is automatically detected at power-up.

In programming mode, the following parameters and overrides are available:

- 1. Manually override the operating mode of the controller.\*
- 2. View and define a weekly schedule for time-programmed operating mode changes.\*
- 3. View and set the temperature set points and biases for each of the operating modes of the controller.\*
- 4. Set the real time clock.

The figures and descriptions in the remainder of this section explain how to use the view and programming modes of the TM-9180 Room Command Module. The *Keypad* and *LCD Display* subheadings that follow show the functions of the keypad keys and the meanings of the symbols on the display.

Note\* Available only on model codes TM-9180-02x0, see *Ordering Codes*.

#### Keypad

Table 1 below shows how the four keys on the keypad are used:

Key	Description	
$\Delta$ and $ abla$	Used to scroll up and down through the parameters in view mode.	
	Also used to increase or decrease the displayed value when it is being changed or overridden (value flashing after pressing set). When the key is held down, the value changes faster after a short delay.	
set	Used to begin setting the displayed parameter or group of parameters, and to confirm the parameter change after it has been set.	
esc	Used to leave programming mode, and to cancel a parameter change.	
esc + $\Delta$ and esc + $ abla$	Used to scroll up and down through the parameters in programming mode.	

Table 1: Keypad Usage



Figure 13 below shows the layout and symbols of the LCD display:



Figure 13: LCD Display

Table 2 below describes the symbols on the LCD display:

Symbol	Description
[]]]	<b>Heating:</b> indicates that the controller is heating with an output greater than 6%. (In programming mode, indicates that a heating bias value is displayed.)
***	<b>Cooling:</b> indicates that the controller is cooling with an output greater than 6%. (In programming mode, indicates that a cooling bias value is displayed.)
	Window Contact: indicates that the window is open.
<u>ىلە</u>	Manual: Flashes if the operating mode of the TC-9100 has been set manually;
	Steady if the fan has been overridden manually; Also steady if both the operating mode and fan have been set manually.
$\bigcirc$	<b>Comfort:</b> indicates that the TC-9100 is operating in comfort mode. (In programming mode, indicates the selection of comfort mode.)
	<b>Standby:</b> indicates that the TC-9100 is operating in standby mode. (In programming mode, indicates the selection of standby mode.)
	<b>Night:</b> indicates that the TC-9100 is operating in night mode. (In programming mode, indicates the selection of night mode.)
(	<b>Off:</b> indicates that the TC-9100 is in off mode. (In programming mode, indicates the selection of off mode.)
	<b>Mode Override:</b> indicates that you have entered the operating mode override function.
	<b>Time Schedule:</b> indicates that you have entered the time scheduling function.
	<b>Setpoints and Biases:</b> indicates that you have entered the function for viewing and setting the comfort setpoint and the standby and night biases.
	<b>Set Clock:</b> indicates that you have entered the function for setting the real-time clock.

Table 2: Symbols on the LCD Display

#### Operating Procedures

When the TC-9100 controller and connected room command module are first powered up, the LCD display shows the time as 00:00 (flashing) to indicate that the time must be set. Refer to *Setting the Clock* later in this section. When power returns after a short power interruption, the LCD display shows the current time in view mode.

There are a few general operating features as listed below:

- In both view and programming modes, if there is only one parameter that can be set or overridden, the parameter's value will flash when you press set, indicating that the value can be changed using the Δ and ∇ keys. If the parameter is a programming mode parameter (override operating mode and set clock), the programming mode symbol at the bottom of the display will remain steady.
- In programming mode, if there is more than one parameter that can be set or overridden (time schedule, and setpoints and biases), the programming mode symbol at the bottom of the display will flash and the parameter values will remain steady. You can cycle through the parameters with the Δ and ∇ keys, and when you press set again, the parameter's value will flash and you can now use the Δ and ∇ keys to change its value.
- A time-out feature returns the module to the view-mode time display after 30 seconds if you have entered programming mode, or pressed set, but do not continue the procedure. If you have started to change a parameter but not confirmed the change with set when the time-out occurs, the change will be discarded.
- From any of the four programming mode displays, if you have not yet pressed set, you can immediately return the module to the view-mode time display by pressing either Δ or ∇.

Figure 14 on the next page shows the main loops when cycling through both the view mode and programming mode parameters. Dotted boxes around the Fan Speed and Setpoints & Biases parameter displays in the figure indicate that these are not available if the TC-9100 controller is not configured for these functions.

Note: In the figures that follow, some symbols are greyed to indicate that they are flashing.





Adjusting the Temperature Set	To adjust the current temperature set point, use the following procedure:
Foint	1. Press set when the room temperature is being displayed in view mode. The display will change to show the current set point value, and it will be flashing to indicate that the value can be changed.
	2. Use the $\Delta$ and $\nabla$ keys to change the value in 0.1 increments. There are two possible ranges for the set point value, depending on the configuration of the TC-9100 controller:
	+/- 3.0K as a signed bias to the current setpoint, or
	12.0 to 28.0°C as an absolute setpoint.
	3. Press set after changing the setpoint to confirm the change. The display shows the new value for 4 seconds and then returns to the view-mode temperature display.
	or
	Press esc to discard the change.
Overriding the Fan Speed	This parameter will not be displayed if the TC-9100 controller does not have the 3-speed fan configuration. To override the fan speed, or to cancel a previous fan speed override, use the following procedure:
	<ol> <li>Press set when the fan speed is being displayed in view mode. The display will change to show the word FAN steady and the current override value will be flashing to indicate that the value can be changed. Note that the letter "A" will be shown as the override value if the fan speed was previously under automatic control. The manual symbol (♥) will also be shown in the lower left corner of the display if the fan speed was previously overridden.</li> </ol>
	2. Use the $\Delta$ and $\nabla$ keys to change the state of the fan. The possible values are:
	<ul> <li>A = automatic control (i.e., no override),</li> <li>0 = off,</li> <li>1 = low speed,</li> <li>2 = medium speed,</li> <li>3 = high speed.</li> </ul>
	3. Press set after changing the state of the fan to confirm the change. If you selected automatic control (A), the display changes after a few seconds to show the actual fan speed. If you have overridden the fan speed (i.e., selected a speed other than automatic control), the manual symbol (♥) will display steady, and will remain on as long as the fan speed is overridden.
	or
	Press esc to discard the change.

#### Overriding the Operating Mode of the Controller

To override the operating mode of the connected TC-9100 controller, or to cancel a previous operating mode override, use the following procedure:

- Press set when the mode override symbol ( ) is shown at the bottom of the display in programming mode. The display will change to show the current operating mode as a symbol at the right side of the display, and it will be flashing to indicate that you can change the operating mode. The manual symbol () will also be flashing if the mode was previously overridden.
- 2. Use the  $\Delta$  and  $\nabla$  keys to select an operating mode. The appropriate operating mode symbol at the right of the display will begin to flash when it is selected, as shown below:
  - $\bigcirc = \text{ comfort,}$  $\bigcirc = \text{ standby,}$  $\bigcirc = \text{ night,}$  $\bigcirc = \text{ off.}$
- 3. Press set after selecting an operating mode to confirm the override. The display continues to show the mode override symbol at the bottom of the display, and after a short delay of approximately 2 seconds, the symbol of the new mode appears steady at the right of the display. The manual symbol (♥) at the left side of the display will start flashing, and will continue to flash as long as the operating mode is overridden.

#### or

- Press esc to cancel a previous operating mode override and return the TC-9100 to automatic or time-scheduled mode selection. The flashing manual symbol (\*) from the previous override will go off, and after a short delay of approximately 2 seconds, the symbol of the automatically selected mode appears steady at the right of the display.
- Note: While the operating mode is overridden, the occupancy button on the front of the room command module will have no effect.

# Defining a TimeFigure 15 below illustrates the steps to view and define a weekly timeScheduleschedule.



Figure 15: Viewing and Defining the Time Schedule

To define a schedule for time-programmed operating mode changes, use the following procedures:

- 1. Press set when the time schedule symbol () is shown at the bottom of the display in programming mode. The display will change to show the time schedule symbol flashing and the first and last weekdays of the first day range.
- At this point, you can use the ∆ and ∇ keys to view all of the events currently defined in the schedule. A schedule consists of a range of weekdays (up to 7 ranges) and up to 6 events for each range. A single event consists of the time of day at which the event is to occur and the operating mode to which the TC-9100 is to be switched. This information is displayed as follows:
  - Day range showing the first and last weekdays, where 1=Monday, etc. In this example, the range is from Monday to Tuesday.
  - Event showing the time and the symbol of the operating mode (standby in this example) to which the TC-9100 will be switched.
  - - - = This display indicates that you have reached the last (as yet undefined) event in the current weekday range.
- As you scroll through the schedule, the display will show the first range of weekdays and then, one after the other, all of the events defined in that range until you reach the display for an undefined event (--:--), or the sixth event in the range if all events have been defined. The next display will be the second range of weekdays, and then all of its events, etc. When the controller is powered up for the first time, its schedule will contain 7 ranges of one day each (1-1, 2-2, 3-3, up to 7-7), with no events defined.
  - Note: Due to the range validation that the module performs, when you scroll into a next higher weekday range, you cannot scroll back to the previous range. To reach the previous range, use  $\Delta$  to scroll to the end of the schedule, then use  $\Delta$  again to go to the beginning of the schedule, then scroll to the desired range. You can, however, scroll forwards and backwards within the events of a single range.

To change a weekday range:

- 1. Press set when the desired range is displayed. The last day of the range will flash to indicate that it can be changed with the  $\Delta$  and  $\nabla$  keys.
- 2. Press set to confirm the change,

or

Press esc to discard the change.

Note: The weekday ranges cannot overlap, i.e., if your first range is from Monday to Friday (1-5), then there are only two ranges left (6-6 and 7-7). If you define the second range as Saturday to Sunday (6-7), then you cannot define any more ranges in the schedule. When you define a range, the module will automatically adjust the first day of the next range to be one greater than the last day of the range you just defined. To define a new event or change an existing event:

- 1. Scroll to the desired weekday range, and then to the undefined event (--:--), or to the event you want to change, in that range. When you press set, the minutes for the event will flash to indicate that they can be changed with the  $\Delta$  and  $\nabla$  keys.
- 2. Press set to confirm the minutes, and the hour will begin to flash. Use the  $\Delta$  and  $\nabla$  keys to set the hour of the event.
- Press set to confirm the hour, and an operating mode symbol will begin to flash at the right of the display. Use the Δ and ∇ keys to select the operating mode to which the controller should be switched when the event occurs. The possible modes are comfort (()), standby (()), night ()), and off (()).
- 4. Press set to confirm the operating mode of the event,

or

Press esc at any time while defining the event to discard all changes.

- Note 1: To delete an event, use step 1 to set the minutes of the event, and then press the  $\nabla$  key until the display for an undefined event is shown (--:-). This will appear when you decrease below :00 minutes. Then press set to confirm the deletion. Note that this will also delete all of the events that follow the deleted event in the current weekday range.
- Note 2: If no events have been defined for a particular weekday range, the last event in the previous range (if defined) will determine the operating mode of the controller throughout the range. If no events have been defined in the entire schedule, the controller will operate in comfort mode.

Press esc to exit the time schedule loop (**F7** symbol flashing) and return to the main programming loop (**F7** symbol steady).

#### Defining Setpoints and Biases

This function will only be available for a TC-9102 or TC-9109 controller with a standard configuration. Figure 16 below illustrates the steps to view and define the setpoints and biases for the operating modes of the TC-9100.



occ note i on the following page .

Figure 16: Viewing and Defining Setpoints and Biases

To define the temperature setpoints and biases for the operating modes of the TC-9100 controller, use the following procedure:

- 1. Press set when the setpoints and biases symbol ( ) is shown at the bottom of the display in programming mode. (Note that when the biases symbol is shown steady, the display shows the current working setpoint of the controller.) The display will change to show the setpoints and biases symbol flashing, and the first setpoint will be shown (comfort setpoint for heating).
- At this point, you can use the ∆ and ∇ keys to view all of the setpoints and biases. Appropriate symbols at the left and right of the display appear to indicate which setpoint or bias you are currently viewing. These symbols are heating ([[[[]]]]) and cooling (<sup>(\*)</sup>) at the left of the display, and comfort (○), standby (●), and night (●) at the right of the display.
- 3. To change a setpoint or bias, press set again when the desired parameter is being displayed. The parameter's value will begin to flash, indicating that you can use the  $\Delta$  and  $\nabla$  keys to change the value (in 0.1 increments). The parameter ranges (in the order in which the parameters appear when you cycle through them) are:

Setpoint or Bias	Range Low	Range High
Comfort Setpoint – Heating	10.0°C	Comfort Setpoint Cooling
as Bias*	5.0K	0.0K
Comfort Setpoint – Cooling	Comfort Setpoint Heating	30.0°C
as Bias	0.0K	5.0K
Standby Bias – Heating*	0.0K	Night Bias Heating
Standby Bias – Cooling	0.0K	Night Bias Cooling
Night Bias – Heating*	Standby Bias Heating	15.0K
Night Bias – Cooling	Standby Bias Cooling	15.0K
<ul> <li>Bias values for heating are negative values although this is not shown on the display.</li> </ul>		

Note 1: Depending on the configuration of the TC-9100 controller, the Comfort Setpoint-Heating and Comfort Setpoint-Cooling may be absolute values between 10.0°C and 30.0°C, or they may be bias values between 0.0K and 5.0K. When the comfort setpoints are absolute values, the comfort setpoint heating must always be lower than the comfort setpoint cooling, and the difference between the two values establishes the zero energy dead band or comfort zone where neither heating nor cooling is required. When the comfort setpoints are set as bias values, the absolute set point of the controller will be given by the "Temperature Set Point" in view mode, or by the "Common Set Point," which is set by a supervisory system, depending on how the controller is configured (see the TC-9102 Technical Bulletin (MN-9100-2117) for details).

- Note 2: As shown in the table, some of the range end points depend on the definition of a different setpoint or bias. For example, you cannot set the standby bias cooling to be greater than the night bias cooling. This means that you may need to modify the setpoints and biases in a different order than they appear when you scroll through the values, i.e., you would first modify the night bias cooling before changing the standby bias cooling.
- 4. Press set after changing a setpoint or bias to confirm the change. The display shows the new value steady and the setpoints and biases symbol still flashing.

or

Press esc to discard the change.

5. Press esc to exit the setpoints and biases loop ( symbol flashing) and return to the programming mode loop ( symbol steady).

Figure 17 below illustrates setting the real-time clock.

Setting the Clock



#### Figure 17: Setting the Real-Time Clock

To set the clock, use the following procedure:

- 1. Press set when the set clock symbol () is shown at the bottom of the display in programming mode. The display will change to show the minutes flashing.
- 2. Use the  $\Delta$  and  $\nabla$  keys to change the minutes.
- 3. Press set after changing the minutes to confirm the change. The display shows the new value for the minutes and the hour will be flashing.

or

Press esc to discard the change.

- 4. Continue as described in steps 2 and 3 above to set the hour and then the weekday (1=Monday). Press set after each change to confirm, or press esc to discard the change.
- Note: If a supervisory system sends a time synchronization signal to the connected TC-9100 controller, the clock of the TM-9180 will be automatically updated with the new time.

# Specifications & Technical Data

Supply Voltage	Power from TC-9100 Series Controller	
Ambient Operating	0 to 40°C	
Conditions	10 to 90% RH noncondensing	
Ambient Storage	-20 to 70°C	
Conditions	10 to 90% RH noncondensing	
Terminations	Terminal block in base for 1.5 mm <sup>2</sup> /14 AWG (maximum) cable.	
Temperature Sensor	NTC Thermistor 0 to 40°C; 30,000 ohms at 25°C.	
Display and Keypad	LCD display with 4 digits and 12 symbols.	
	Keypad with 4 keys: $\nabla$ (decrease), $\Delta$ (increase), set, and esc.	
Occupancy Button	Momentary contact to select alternate operating mode.	
Mode Indicator	Red LED to indicate COMFORT, STANDBY, or NIGHT/OFF mode.	
Clock Back-up Supply	Super capacitor for 15 hours without power supply.	
Communications Interface	Synchronous serial link, 600 baud.	
Mounting	Direct surface mount, plastic base for surface mount with wiring conduits, recessed wall box-, and panel mounting kits. (see <i>Ordering Codes</i> ).	
Housing	Material: ABS + polycarbonate, self-extinguishing VO UL94. Protection: IP30 (IEC529)	
Dimensions (H x W x D)	80 mm x 80 mm x 33 mm	
Shipping Weight	0.15 kg	
CE Compliance (Directive 89/336/EEC)	EN 50081-1, EN 50082-1	

#### Ordering Codes

Table 5. Room Command Module Ordering Codes		
Ordering Code	Description	
TM-9180-01 <i>x</i> 0	Off-white with grey base	with View Mode and Clock Setting only
TM-9180-01 <i>x</i> 0-W	White with white base	with View Mode and Clock Setting only
TM-9180-02 <i>x</i> 0	Off-white with grey base	with View Mode and Programming Mode
TM-9180-02 <i>x</i> 0-W	White with white base	with View Mode and Programming Mode
In the Ordering Codes: x = 0 designates models without the service module socket,		

#### Table 3: Room Command Module Ordering Codes

x = 1 designates models with the service module socket (behind sliding panel).

Table 4:	Accessories	Ordering	Codes
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Ordering Code	Description
TM-9100-8930	Plastic Base for Surface Mounting - Grey
TM-9100-8931-W	Plastic Base for Surface Mounting - White
TM-9100-8941-W	Recessed Wall Box Mounting Kit - White
TM-9100-8951-W	Panel Mounting Kit - White
TM-9100-8900	Special Tool (to open module)
TE-9100-8501	Unit Mount NTC Temperature Sensor (1.5 m cable)

JAHNSON CONTRELS

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