

### DTM-3, DTM-4

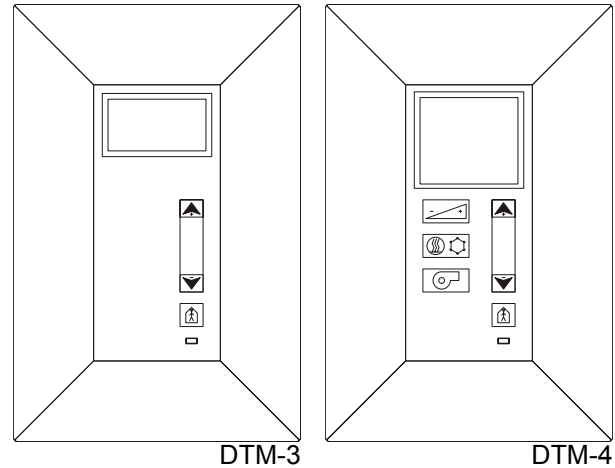
The iWorX DTM is a digital thermostat module which measures room temperature and transmits temperature and other input information to an iWorX HVAC controller such as the FCU-1 and DXU-2.

### Overview

The DTM Series modules measure room temperature and transmit the information to iWorX controllers via the Sensor Link (S-link) communications protocol. The DTM uses the two-wire S-link network connection for both power and communication with the iWorX controller.

In addition to providing temperature readings to a controller, the module also displays current room temperature on its liquid crystal display (LCD). Additionally, the DTM-4's display shows fan status, heat/cool status, and occupancy status.

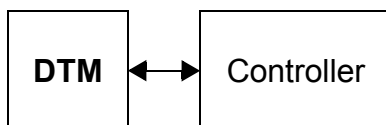
The front panel of the module also provides control buttons. An occupancy override button enables occupants to extend the occupied time for the area. Other controls enable occupants to adjust the temperature setpoint to a desired level and adjust fan operation.



### Features

- Temperature sensing
- Occupancy override button
- Occupancy override LED indicator
- Setpoint adjustment controls
- Temperature display
- Fan override button (DTM-4 Only)
- Extended display with heat, cool, and fan status indicators (DTM-4 Only)
- Wiring terminals for local LONWORKS connection (Optional)

### Typical Use



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All specifications are nominal and may change as design improvements occur. Innovex Technologies shall not be liable for damages resulting from misapplication or misuse of its products.

## Applicable Documentation

Description	Audience	Purpose
iWorX LCI User's Guide	<ul style="list-style-type: none"> <li>– Application Engineers</li> <li>– Installers</li> <li>– Service Personnel</li> <li>– Start-up Technicians</li> <li>– End user</li> </ul>	Provides instructions for setting up and using the iWorX Local Control Interface
iWorX DXU Series Installation Instructions	<ul style="list-style-type: none"> <li>– Application Engineers</li> <li>– Installers</li> <li>– Service Personnel</li> <li>– Start-up Technician</li> </ul>	Installation instructions for iWorX controllers that utilize DTM Series modules.
iWorX FCU Series Installation Instructions		
iWorX AHU Series Installation Instructions		
iWorX HPU Series Installation Instructions		
iWorX VAV Series Installation Instructions		
iWorX DXU-1 Application Manual	<ul style="list-style-type: none"> <li>– Application Engineers</li> <li>– Wholesalers</li> <li>– Contractors</li> </ul>	Application manuals for iWorX controllers that utilize DTM Series modules.
iWorX DXU-2 Application Manual		
iWorX FCU-1 Application Manual		
iWorX FCU-2 Application Manual		
iWorX FCU-3 Application Manual		
iWorX FCU-4 Application Manual		
iWorX AHU-1 Application Manual		
iWorX HPU-1 Application Manual		
iWorX VAV-1 Application Manual		
Additional Documentation	<i>LonWorks FTT-10A Free Topology Transceiver User's Guide</i> , published by Echelon Corporation. It provides specifications and user instructions for the FTT-10A Free Topology Transceiver.	

## Precautions

### General



This symbol is intended to alert the user to the presence of important installation and maintenance (servicing) instructions in the literature accompanying the equipment.



**Warning:** Electrical shock hazard. Disconnect **ALL** power sources when installing or servicing this equipment to prevent electrical shock or equipment damage.

Make all wiring connections in accordance with these instructions and in accordance with pertinent national and local electrical codes. Use only copper conductors that are suitable for 167 °F (75 °C).

## Static Electricity

Static charges produce voltages that can damage this equipment. Follow these static electricity precautions when handling this equipment.

- Work in a static free area.
- Touch a known, securely grounded object to discharge any static charge you may have accumulated.
- Use a wrist strap when handling printed circuit boards. The wrist strap must be secured to earth ground.

## Location

Avoid locations where corrosive fumes, excessive moisture, vibration or explosive vapors are present.

Avoid electrical noise interference. Do not install near large contactors, electrical machinery, or welding equipment.

This equipment is intended for indoor use only. Operate where ambient temperatures do not exceed 122 °F (50 °C) or fall below 32 °F (0 °C) and relative humidity does not exceed 90%, non-condensing.

## For Installation in the United States

This equipment complies with Part 15 of the FCC rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference.
2. This device must accept any interference received, including interferences that may cause undesired operation.

## For Installation in the European Community

This equipment meets the requirements of the European Community Directives for Electromagnetic Compatibility (EMC Directive 89/336/EE).

## Before Installing

### About this Document

The instructions in this document are for all DTM Series temperature sensors.

### Inspecting the Equipment

Inspect the shipping carton for damage. If damaged, notify the carrier immediately. Inspect the equipment for damage. Return damaged equipment to the supplier.

### What is Not Included with this Equipment

- Tools necessary to install, troubleshoot and service the equipment.
- The screws needed to mount the device.
- Cabling, cabling raceway, and fittings necessary to connect this equipment to the controller.

### Equipment Location



Abide by all warnings regarding equipment location provided earlier in this document.

The equipment must be installed indoors unless contained within a protective enclosure. The enclosure must maintain internal temperature and humidity within the ranges specified for this equipment.

The equipment must be installed within 200 feet of the controller to which it is connected.

## Installation



**Warning:** Electrical shock hazard. To prevent electrical shock or equipment damage, disconnect **ALL** power sources to controllers and loads before installing or servicing this equipment or modifying any wiring.

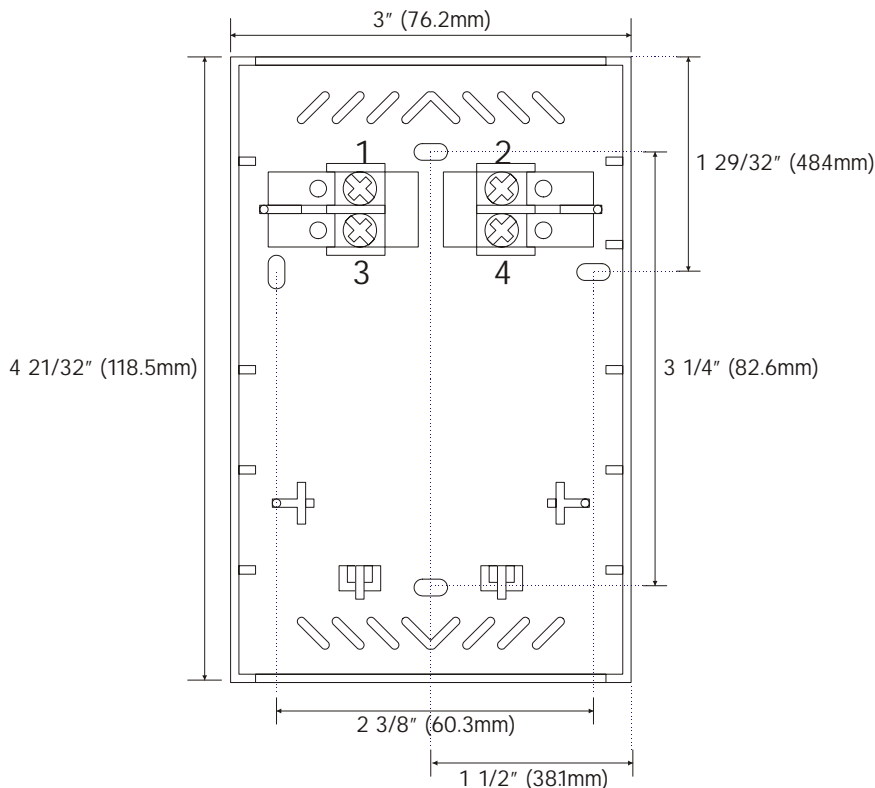
## Mounting the Device

1. Select mounting location.
2. Using two screws, mount base of the DTM to a utility box or directly to wall.
3. Wire DTM base to the controller.
  - a. Attach one wire to U-Link screw terminal 1.
  - b. Attach the other wire to U-Link screw terminal 2.

These wires come from the S-Link (S-LK) terminals on the controller. It does not matter which wire is connected to which terminal, the connection is polarity independent.
4. To use the DTM as a local LONWORKS connection point (Optional):
  - a. Attach one wire to LON screw terminal 3.
  - b. Attach the other wire to LON screw terminal 4.

These wires come from the LONWORKS (LON) terminals on the controller. It does not matter which wire is connected to which terminal, the connection is polarity independent. Remember to add the length of these wiring sections when calculating the total network length.
5. After wiring:
  - a. Place the bottom edge of the DTM hardware into the “hooks” near the bottom of the base.
  - b. Press the top of the hardware gently into place.
  - c. Tighten the screws at either side of the LCD to complete mounting the hardware.
6. Snap the faceplate onto the assembly, taking note of the “TOP” indication on the inside of the faceplate and making sure that both pairs of locking tabs on the faceplate click into place.

**Figure 1: Mounting Dimensions**



## Operation

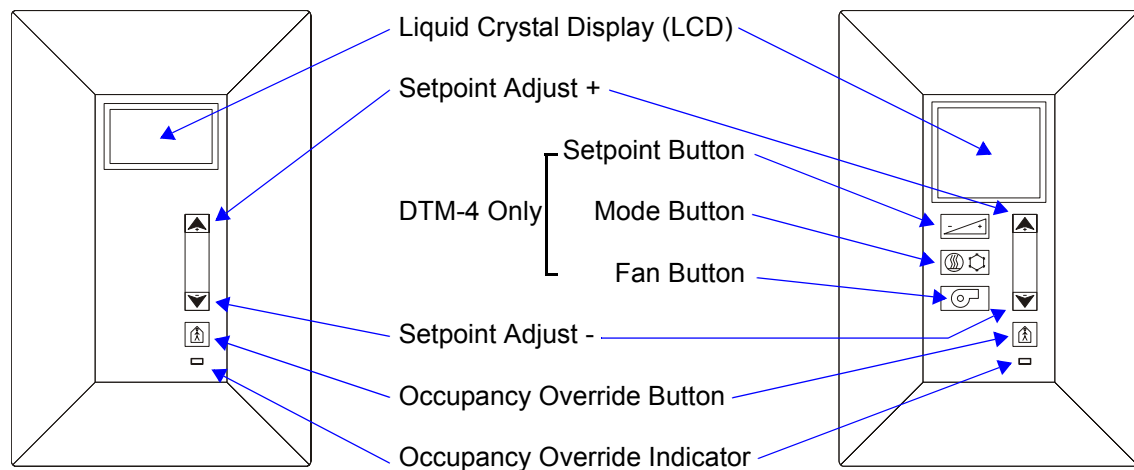
Which type of display and controls options are present on the face of the DTM depends on the type of module. The DTM-3 has a small LCD, setpoint adjustment controls, occupancy override button, and an occupancy override indicator. The DTM-4 has those features, but its LCD is larger and can display more information; plus, the DTM-4 has “Fan”, “Mode” and “Setpoint” buttons.

**Table 1: DTM Series LCD Symbols**

Symbol	Indicates
Numerical Value	– Current room temperature in degrees
°F or °C	– Fahrenheit or Centigrade display
Snowflake	– Controller in cooling mode (DTM-4 Only)
Circle with Lines	– Controller in heating mode (DTM-4 Only)
Fan	– Fan is operating (DTM-4 Only)
Empty House	– Controller in unoccupied mode (DTM-4 Only)

If all symbols on the LCD are being displayed at once, the controller is being reset.

**Figure 2: DTM Controls and Indicators**



## Occupancy Overrides

### To force a controller into “Occupied” mode

- Press and release the Occupancy Override button.

The occupancy override indicator (a red LED) illuminates and stays lit for the duration of the override.

### To cancel an override

- Press and hold the Occupancy Override button until the occupancy override indicator turns off.

This should take about five seconds.

## Adjusting the Setpoint (DTM-4 Only)

The setpoint is the desired temperature for the room.

1. Press and release the Setpoint button.
2. Press the Setpoint Adjust + (increment) button to raise the setpoint.
3. Press the Setpoint Adjust - (decrement) button to lower the setpoint.
4. When you finished adjusting the setpoint, release all buttons.

The change is sent to the controller automatically, and the LCD returns to displaying the room temperature.

## Overriding the Fan (DTM-4 Only)

The fan can be either in “auto” or “continuous” mode. In “auto” mode, the fan turns on when there is a need for heating or cooling, and off when there is not. In “continuous” mode, the fan is always on. To change the fan mode:

1. Press and release the fan button.
2. Press either Setpoint Adjust button (+ or -) until either “AUTO” or “1” is flashing on the display. Flashing “AUTO” indicates that the fan will function in auto mode, and Flashing “1” indicates that the fan will function in continuous mode.
3. When you are finished selecting the mode, release all buttons.

The change is sent to the controller automatically. (If the fan is set to “Always On” using the LCI, this function of the DTM has no effect.)

## Other Features

### Issue a controller service pin message

1. Press and hold the Occupancy Override button until the indicator blinks once.
2. Release the button.

The controller will issue its service pin message 3 to 5 seconds later.

### View the subnet node address of the controller

1. Press and hold both Setpoint Adjust buttons (+ and -) until the DTM displays “Add” followed by the address of the controller, then “nod” followed by the node number of its controller.
2. When you are finished viewing the information, release the button.

If the DTM only displays “- 1 -” for each, both the address and node address are both “1”.

### Offset the current room temperature reading

1. Press and hold both Setpoint Adjust buttons (+ and -).
2. When the address and node information is displayed, release the button and press the Occupancy Override button.
3. When the current offset is displayed, use the Setpoint Adjust buttons to increase or decrease the offset.
4. When you are finished adjusting the offset, release all buttons.

After approximately 30 seconds the DTM will revert to normal function, and the offset you programmed will added or subtracted from the actual room reading.

## View controller alarm codes

1. Press and hold both Setpoint Adjust buttons (+ and -) until the node and address information is displayed.
2. Press and release either Setpoint Adjust button.

If the controller has recorded one or more alarms, the LCD will alternate between displaying “Air” followed one of the following numerical codes. If no numerical code is given, no alarms have been recorded. After approximately 30 seconds the DTM will revert to normal function.

**Table 2: DTM Series Numerical Alarm Codes**

Code	Alarm Type
001	Smoke Detected
002	Fan Failed
003	Mixed Air Low Limit
004	Thermostat Failed
005	Filter Dirty
006	Unit Maintenance
007	Space Temperature High Limit
008	Space Temperature Low Limit
009	Space Temperature Return to Normal
010	Equipment Failed
031	Starved Box
044	Indoor Air Quality

## Specifications

### Electrical

#### S-Link/U-Link

- Cabling: twisted shielded pair, 18 AWG recommended—200 feet max.
- 16 Volt DC max. CLASS 2

#### FTT-10A Network (Optional)

- Speed: 78 KBPS
- Cabling: Maximum node-to-node distance: 1312 feet (400 meters)
- Maximum total distance: 1640 feet (500 meters)

For detailed specifications, refer to the *FTT-10A Free-Topology Transceiver User's Guide* published by Echelon Corporation. For information on ordering Connect Air items, contact Connect Air International; 4240 B Street; Auburn, WA 98001 <[www.connect-air.com](http://www.connect-air.com)>.

**Table 3: Network Wire Specifications**

Cable Type	Pairs	Details	Connect Air Catalog No.
Level 4 22AWG (0.65mm)	1	Unshielded, Plenum, U.L. Type CMP	W221P-2001
Level 4 22AWG (0.65mm)	1	Unshielded, Non-Plenum, U.L. Type CM	W221P-1002

## **Mechanical**

### **Housing**

- Dimensions: 4-21/32" high, 3" wide, 1" deep (118.5 mm high, 76.2 mm wide, 24 mm deep)

### **Environmental**

- Temperature: 32 to 122 °F (0 to 50 °C)

### **Agency Listings**

- UL 916
- FCC, Class B

### **Agency Compliances**

- CE

## **Troubleshooting**

Since the DTM is a relatively simple device, very little troubleshooting is necessary. For the most part, the module is either functioning or it is not. If the LCD on the front of the DTM is not displaying anything, the module may be broken. If the display is blank, do all of the following:

1. Verify that the DTM is wired correctly to the controller. Check the wiring for any breaks or shorts, and that it runs to the correct terminals on the controller.
2. Though the LCI, reset the controller to which the DTM is connected. This will also reset the DTM. As the controller resets, the LCD of the DTM should momentarily display all available icons.

If the DTM still does not display the current room temperature (or anything else), it is broken and needs to be repaired.