HS-EMS200
1 Heat / 1 Cool Single-Stage Thermostat
Installation Instructions

Introduction
The HS-EMS200 is a 1 Heat / 1 Cool / Plenum Fan Switch Electronic Digital Communicating Non-programmable Thermostat designed for control of standard single stage heating/cooling systems. It features an easy-to-read vertical LCD that displays the current temperature and complete operation status. A direct wire, easy-to-install backplate mounts on a standard vertical outlet box or any drywall surface using the anchors and hardware provided.

This thermostat is designed to accept up to 6 indoor remote temperature sensors (HS-EMS-ITS) or 5 indoor and 1 outdoor (HS-EMS-OTS) remote temperature sensors. When indoor sensors are connected to the thermostat, the temperature sensor (thermistor) on the thermostat is disabled. For temperature averaging at least two HS-EMS-ITS indoor remote sensors are required.

For additional information and wiring diagram for remote temperature sensors, refer to the Installation Instructions included with the sensors.

The HS-EMS200 connects to an Escort/VPM5580TC, allowing the user to change temperature settings through premise or remote touch tone telephones. The Escort/VPM5580TC can announce the indoor temperature and if an HS-EMS-OTS is connected, the outdoor temperature as well. Compatible LCD keypads can also display the temperature and allow the user to access the temperature controls (requires LCD5500Z v2.1 or higher).

For information on thermostat access and control using the Escort/VPM5580TC, please refer to the Installation Instructions included with the Escort/VPM.

Location
For accurate temperature detection, the thermostat should be mounted on an inside wall, 46 cm (18”) from any outside wall, in a frequently occupied area with freely circulating air. It should be approximately 1.5 m (5’) above the floor. Avoid direct sunlight, radiant heat from appliances, air conditioner grills, stairwells, water pipes, warm air stacks, and sources of electrical interference such as arcing relay contacts.

Pre-Wiring
The HS-EMS200 requires a 5 conductor wire when connected to the heating and cooling system plus an additional 3 conductor wire when connected to a security system through an Escort or VPM module.

Installation
1. Remove the thermostat cover. Insert a flat blade screwdriver, approximately 3 mm (1/8”) into the slot located in the bottom center of the case. Twist ¼ turn to pop the thermostat loose from the backplate.
2. Swing the thermostat out from the bottom (hinge at top) and lift the thermostat up and off the backplate.
3. Place the backplate opening over the control wires protruding from the wall. Use the backplate to mark the location of two mounting holes.
4. Drill two 5 mm (3/16”) mounting holes at the marked locations. Tap the supplied nylon anchors flush to the wall and fasten the backplate using the supplied screws. Do not over tighten.
5. Connect the control wires to the thermostat as shown in the appropriate wiring diagram. Push any slack wire back into wall. Ensure that the wires are flush with the backplate. Seal the access hole to prevent drafts from affecting thermostat performance.
6. Install optional setback and indoor/outdoor remote sensors, if used.
7. Replace the thermostat by inserting the tabs into the hinge slots at the top of the backplate. Gently swing the thermostat downward and snap it into place.
8. Replace the thermostat cover.

Thermistor Position
When placing the front cover on the thermostat, ensure that the thermistor is not touching the case. The thermistor should be placed horizontal to the wall and visible between the ribs of the case.

Thermostat Cover Lock
Insert the plastic lock piece into the bottom of the mounted base. The ends of the lock piece fit snugly under the lock pins extending from the bottom of the mounted base. The tab in the middle of the lock piece extends down from the base.

To release the locking mechanism, press the lock piece up and into the base while gently prying open.

DIP Switch Settings and Functions
The DIP switches are located on the interior of the thermostat and can be set in either the ON or OFF positions depending on the installation The default positions are indicated in bold

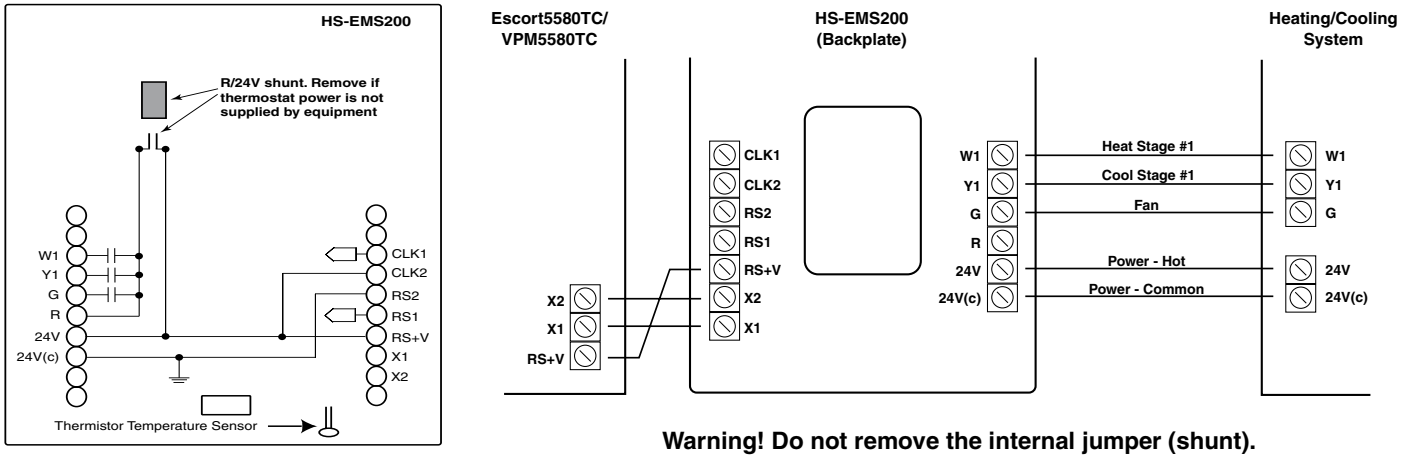
DIP Switch	DIP Switch OFF	DIP Switch ON
1	**4 Minute Min ON**	2 Minute Min ON
2	**Keypad Unlock**	Keypad Lock
3	**Fan ON with Heat Call**	Fan ON with Plenum Switch

1. **2 Minute or 4 Minute ON Times** this option allows you to select either a 2 or 4 minute minimum off and on time.
2. **Keypad Lock** in the ON position, all buttons are locked out except the Outdoor Temperature button.
3. **Plenum Fan Switch** in the OFF position, the fan comes on immediately with a call for heat. In the ON position, the fan is controlled by the equipment (plenum switch control).

Specifications
Rated Voltage.....20-30 VAC, 24 VAC nominal
Rated AC .....0.05-0.75 A continuous/output (surges to 3.00 A, max.)
Rated DC @ ‘R’ .....0.00-0.75 A continuous/output (surges to 3.00 A, max.)
Control range: Heating.....5-30°C in (1° steps); or 38-88°F (in 1° steps)
Cooling .....16-40°C in (1° steps); or 60-108°F (in 1° steps)
Measurement range ..... 0-48°C; or 28-124°F
ODT Measurement range.....–40-48°C; or –40-124°F
Control accuracy.....±0.5°C, at 20°C; or ±1°F, at 68°F
Minimum deadband .....(between heating and cooling) 1°C; or 2°F

NOTE: This thermostat contains electronic circuitry that replaces the conventional mechanical anticipator.

Fig 1. Wiring Diagram for One Heating/Cooling System with One HS-EMS200 Thermostat

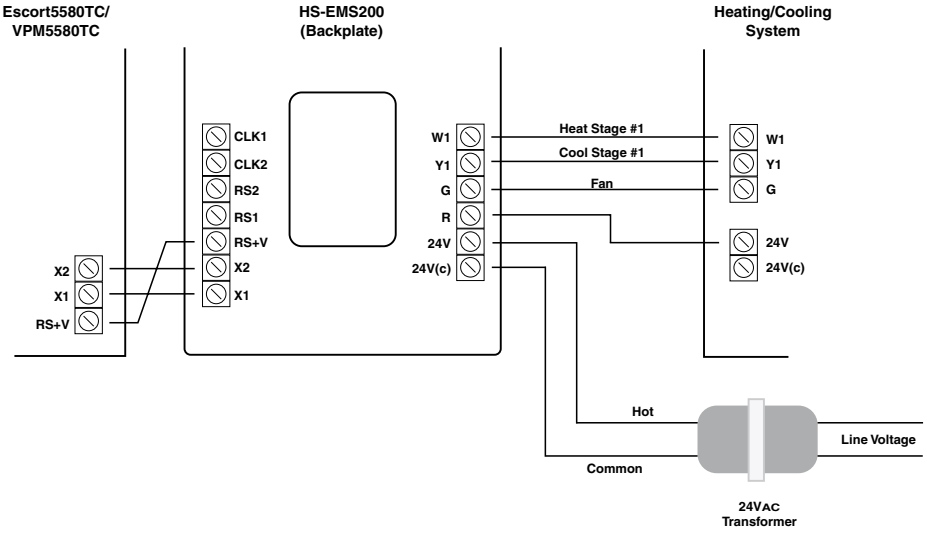


Warning! Do not remove the internal jumper (shunt).

Output Terminal Functions

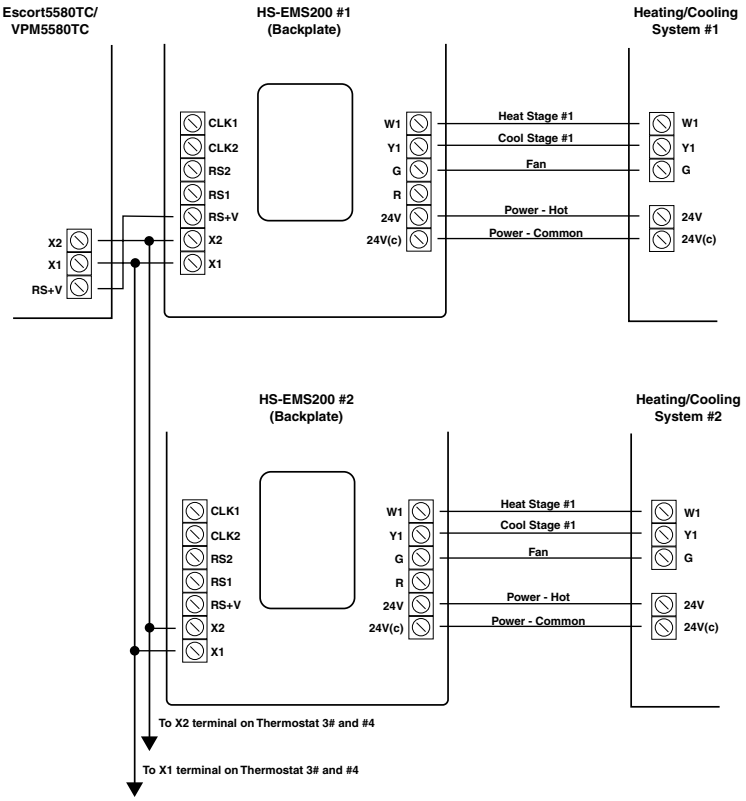
CLK1 ..... Use with dry contact relay for alternate set points.
CLK2 ..... Use with dry contact relay for alternate set points.
RS2 ..... To Outdoor/Indoor remote sensors.
RS1 ..... To Outdoor/Indoor remote sensors.
RS+V ..... To Outdoor/Indoor remote sensors and to Escort5580TC/VPM5580TC.
X2 ..... To Escort5580TC/VPM5580TC.
X1 ..... To Escort5580TC/VPM5580TC.
W1 ..... Energizes on a call for first stage heating.
Y1 ..... Energizes on a call for first stage cooling.
G ..... Fan is energized with a call for heating or cooling or by pressing the fan button.
R ..... Independent switching voltage.
24V ..... 24 VAC Hot from equipment transformer.
24V(C) ..... 24 VAC Common from equipment transformer.

Fig 2. Powering an HS-EMS200 Thermostat with a Stand Alone Transformer



Warning! Remove the internal jumper (shunt) before connecting the stand-alone transformer.

Fig 3. Wiring Diagram for Multiple Heating/Cooling Systems with Multiple HS-EMS200 Thermostats



Warning! Connect Escort/VPM RS+V to first thermostat only. Do not remove the internal jumper (shunt).

Warranty

Digital Security Controls Ltd. warrants that for a period of twelve months from the date of purchase, the product shall be free of defects in material and workmanship under normal use and that in fulfilment of any breach of such warranty, Digital Security Controls Ltd. shall, at its option, repair or replace the defective equipment upon return of the equipment to its repair depot. This warranty applies only to defects in parts and workmanship and not to damage incurred in shipping or handling, or damage due to causes beyond control of Digital Security Controls Ltd. such as lightning, excessive voltage, mechanical shock, water damage, or damage arising out of abuse, alteration or improper application of the equipment.

The foregoing warranty shall apply only to the original purchaser, and is and shall be in lieu of any and all other warranties, whether express or implied and of all other obligations or liabilities on the part of Digital Security Controls Ltd. This warranty contains the entire warranty. Digital Security Controls Ltd. neither assumes repsonsibility for, nor authorizes any other person purporting to act on its behalf to modify or to change this warranty, nor to assume for it any other warranty or liability concerning this product.

In no event shall Digital Security Controls Ltd. be liable for any direct, indirect or consequential damages, loss of anticipated profits, loss of time or any other losses incurred by the buyer in connection with the purchase, installation, operation or failure of this product.

WARNING: DSC Ltd. recommends that the entire system be completely tested on a regular basis. However, despite frequent testing, and due to but not limited to, criminal tampering or electrical disruption, it is possible for this product to fail to perform as expected.

FCC COMPLIANCE STATEMENT

CAUTION: Changes or modifications not expressly approved by Digital Security Controls Ltd. could void your authority to use this equipment.

This equipment generates and uses radio frequency energy and if not installed and used properly, in strict accordance with the manufacturer's instructions, may cause interference to radio and television reception. It has been type tested and found to comply with the limits for Class B device in accordance with the specifications in Subpart "B" of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference in any residential installation. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause interference to television or radio reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Re-orient the receiving antenna
- Relocate the alarm control with respect to the receiver
- Move the alarm control away from the receiver
- Connect the alarm control into a different outlet so that alarm control and receiver are on different circuits.

If necessary, the user should consult the dealer or an experienced radio/television technician for additional suggestions. The user may find the following booklet prepared by the FCC helpful: "How to Identify and Resolve Radio/Television Interference Problems". This booklet is available from the U.S. Government Printing Office, Washington, D.C. 20402, Stock # 004-000-00345-4.

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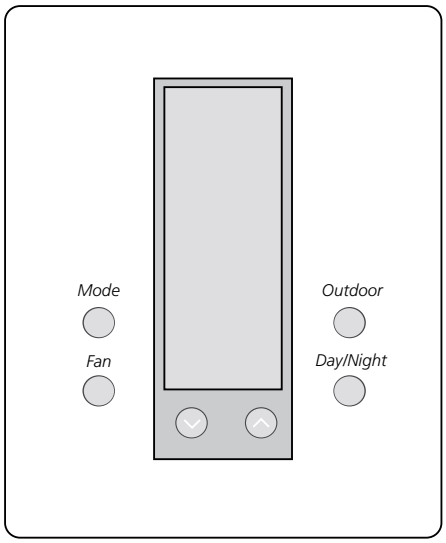
Operating Instructions

Introduction

The HS-EMS200 Digital Communicating Thermostat is designed to provide accurate control and display of room temperature. The thermostat normally displays room temperature, mode of operation (i.e. Day or Night), and whether Cooling or Heating is currently on. The six buttons on the front of the unit allow complete control of the thermostat. You may specify different Heating and Cooling setpoints, and change them easily by pushing a button. Temperature can be displayed in either °C or °F. The thermostat also allows you to select either continuous fan operation, or fan operation only during operation of the heating/cooling device(s).



Modes of Operation

Select the desired mode of operation by toggling the MODE button:

❄ —indicates Cooling system only. "COOL" is displayed for 5 seconds.

🔥 —indicates Heating system only. "HEAT" is displayed for 5 seconds.

🔥 ❄ —indicates both the Heating and Cooling (automatic). "AUTO" is displayed for 5 seconds).

❄ (flashing)—indicates Cool is ON.

🔥 (flashing)—indicates Heat is ON.

OFF—shuts off thermostat. Heating and Cooling systems will not operate. Fan operation is still possible.

Caution: Avoid using the OFF mode during cold weather to prevent damage from freezing.

Temperature Control

Cooling: ❄

Select the temperature you want the thermostat to maintain while in Cool mode, press the mode button until Cool mode is selected, then press the ▲ or ▼ buttons until the desired temperature is displayed. The cooling setpoint temperature is displayed for 5 seconds.

Heating: 🔥

Select the temperature you want the thermostat to maintain while in Heat mode, press the mode button until Heat mode is selected, then press the ▲ or ▼ buttons until the desired temperature is displayed. The heating setpoint temperature is displayed for 5 seconds.

Auto: 🔥 ❄

The thermostat will automatically switch from heating to cooling as determined by the selected setpoints in heating and cooling. NOTE: The thermostat will not allow less than 1 C (2 F) difference between the heating and cooling setpoints.

Fan Control

The Fan will come on automatically when the system is operating, but there is no indication of this on the display. To select continuous Fan operation, press the FAN button and the display will show . This is recommended for electronic air cleaners and continuous ventilation requirements.

Outdoor (ODT) Button

When the outdoor temperature sensor option is connected to your thermostat, you can display the current outdoor temperature by pressing the button. If this option is not connected, the thermostat will display _ _ with no numbers.

Day/Night Button

The Day/Night button is used to select the Occupancy setting. When first installed, the thermostat is set to Day occupancy setting and the display will show the ☼ symbol and the Day temperature. By pressing the Day/Night button you can change to the Night occupancy setting and the display will show the ☾ symbol and the Night temperature. This button can be used to toggle between Day and Night modes. Within each mode the temperature can be modified. The thermostat will remember any new settings.

Celsius/Fahrenheit

Simultaneously press ▲ and ▼ to toggle between Celsius (C) and Fahrenheit (F) temperature display.

Optional Indoor/Outdoor Remote Sensors

The thermostat can accept indoor and outdoor remote temperature sensors (HS-EMS-ITS and HS-EMS-OTS) for monitoring of temperatures where these sensors are located.

Connecting indoor sensors disables the temperature sensor on the thermostat thereby increasing the flexibility of where the thermostat can be located. For temperature averaging over a large area a minimum of two indoor sensors are required.

Indoor and outdoor sensors are available separately. For more details about installing these sensors, please refer to the Installation Instructions included with the sensors.

Temperature Accuracy

Full accuracy is only achieved after the thermostat has been installed and powered for at least one hour.

Power Failures

No battery is required to maintain the temperature setpoints in the case of a power loss, regardless of duration.

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