**TechTrend Smart Thermostat Model X-2025 Specification Document**

**Product Name**: TechTrend Smart Thermostat Model X-2025

**Part Number**: TT-X2025-US

**Release Date**: January 15, 2025

**Manufacturer**: TechTrend Innovations, Inc.

**Document Version**: 1.0 (Last Updated: May 1, 2025)

**1. Overview**

The TechTrend Smart Thermostat Model X-2025 is a Wi-Fi-enabled, programmable smart thermostat designed to optimize home heating and cooling systems for energy efficiency, comfort, and convenience. With advanced features like Matter compatibility, remote sensors, and integration with major smart home platforms, it offers precise temperature control and seamless user interaction via a mobile app, voice assistants, or a touchscreen interface.

**2. Key Features**

* **Smart Home Integration**: Compatible with Amazon Alexa, Google Assistant, Apple HomeKit, and Samsung SmartThings. Supports Matter 1.4 for seamless interoperability.
* **Remote Sensors**: Includes one wireless SmartSensor (additional sensors sold separately) to monitor and balance temperatures in specific rooms.
* **Energy Saving**: Saves up to 25% on annual heating and cooling costs through adaptive scheduling and geofencing (ENERGY STAR certified).
* **Touchscreen Display**: 4.3-inch color LCD touchscreen (480x800 resolution) with customizable themes.
* **Mobile App**: TechTrend Home app for PLEASE WRITE IN FULL for TechTrend Smart Thermostat Model X-2025 allows remote control, scheduling, and energy usage tracking.
* **Voice Control**: Adjust temperature via voice commands through integrated smart assistants.
* **Learning Algorithm**: Adapts to user preferences and schedules for optimal comfort.
* **Wi-Fi Connectivity**: 2.4 GHz and 5 GHz Wi-Fi support for reliable remote access.
* **Installation**: DIY-friendly with optional C-wire adapter for systems without a common wire.
* **Security**: End-to-end encryption for data privacy; complies with GDPR and CCPA standards.

**3. Technical Specifications**

**3.1 Physical Specifications**

* **Dimensions**: 4.8 in (W) x 4.8 in (H) x 1.2 in (D) (122 mm x 122 mm x 30 mm)
* **Weight**: 7.8 oz (220 g)
* **Material**: Polycarbonate frame with glass touchscreen
* **Color Options**: White, Black, Stainless Steel

**3.2 Electrical Specifications**

* **Power Input**: 24V AC via HVAC system (C-wire recommended)
* **Power Consumption**: <2W idle, <5W max
* **Battery Backup**: 3 AAA batteries (for offline operation; up to 6 months)
* **Wiring Compatibility**: Works with 85% of HVAC systems, including single-stage, multi-stage, heat pumps, and radiant systems. Includes Power Extender Kit (PEK) for C-wireless setups.

**3.3 Environmental Specifications**

* **Operating Temperature**: 32°F to 104°F (0°C to 40°C)
* **Storage Temperature**: -4°F to 140°F (-20°C to 60°C)
* **Humidity Range**: 5% to 90% non-condensing

**3.4 Connectivity**

* **Wi-Fi**: Dual-band 802.11 a/b/g/n/ac (2.4 GHz and 5 GHz)
* **Bluetooth**: BLE 5.0 for setup and sensor pairing
* **Thread**: Supports Matter 1.4 via Thread protocol for smart home integration
* **SmartSensor Connectivity**: Proprietary 915 MHz RF; range up to 60 ft (18 m) indoors

**3.5 Display and Controls**

* **Display**: 4.3-inch capacitive touchscreen, 480x800 pixels, 16-bit color
* **Buttons**: Physical “Settings” and “Mode” buttons for manual operation
* **Sensors**: Temperature (±0.5°F accuracy), humidity, occupancy (radar-based), ambient light

**4. Installation Requirements**

**4.1 System Compatibility**

* Compatible with most low-voltage HVAC systems (24V), including:
  + Single-stage heating/cooling
  + Multi-stage heating/cooling (up to 2H/2C)
  + Heat pumps (with auxiliary/emergency heat)
  + Hydronic and radiant systems
* Not compatible with line-voltage systems (120V/240V) or millivolt systems.
* Check compatibility using the TechTrend Compatibility Checker at [www.techtrend.com/support](http://www.techtrend.com/support).

**4.2 Wiring**

* **Required Wires**: R (power), W (heat), Y (cool), G (fan). C-wire recommended for continuous power.
* **C-Wireless Setup**: Use included Power Extender Kit (PEK) for systems without a C-wire.
* **Wiring Adapter**: Included for older systems missing a C-wire.

**4.3 Tools Needed**

* Phillips screwdriver
* Drill (for wall mounting)
* Smartphone with TechTrend Home app (iOS 14+ or Android 8+)

**4.4 Installation Steps**

* Turn off power to the HVAC system at the circuit breaker.
* Remove the old thermostat and label existing wires.
* Mount the TechTrend base plate to the wall using provided screws.
* Connect wires to the corresponding terminals (refer to the app-guided wiring diagram).
* If no C-wire, install the Power Extender Kit at the HVAC control board.
* Attach the thermostat to the base plate and restore power.
* Follow the app setup to connect to Wi-Fi, pair SmartSensor, and configure schedules.

**Note**: Installation takes ~20-30 minutes. Professional installation recommended for complex systems.

**5. Operation**

**5.1 Initial Setup**

* Download the TechTrend Home app and create an account.
* Scan the QR code on the thermostat for Bluetooth pairing.
* Connect to Wi-Fi and follow prompts to set time zone, HVAC type, and preferences.
* Place the SmartSensor in a room prone to temperature imbalances (e.g., upstairs bedroom).

**5.2 Manual Operation**

* **Adjust Temperature**: Tap the touchscreen or use the app/voice assistant.
* **Mode Selection**: Cycle through Heat, Cool, Auto, or Off using the “Mode” button.
* **Settings Access**: Press the “Settings” button to access advanced options (fan control, schedules, etc.).

**5.3 Reset Instructions**

To reset the TechTrend Smart Thermostat Model X-2025 (e.g., for Wi-Fi connectivity issues):

* Press and hold the **Settings** and **Mode** buttons simultaneously for 15 seconds.
* Wait for the display to flash and show “RESET COMPLETE.”
* Release the buttons; the thermostat will restart (takes ~30 seconds).
* Reconnect to Wi-Fi via the TechTrend Home app and re-pair the SmartSensor if needed. **Note**: A factory reset erases all settings and schedules. To perform a factory reset, go to Settings > Factory Reset in the app or hold both buttons for 30 seconds.

**5.4 Smart Features**

* **Geofencing**: Adjusts temperature based on smartphone location (e.g., lowers temp when you leave home).
* **Smart Schedule**: Learns user habits and suggests energy-saving adjustments.
* **Eco Mode**: Optimizes HVAC runtime to reduce energy use while maintaining comfort.
* **Energy Reports**: Tracks usage and provides savings estimates in the app.
* **Remote Sensor**: Prioritizes temperature in the sensor’s location (e.g., keeps a cold room warm).

**6. SmartSensor Specifications**

* **Dimensions**: 2.0 in (W) x 2.0 in (H) x 0.8 in (D) (50 mm x 50 mm x 20 mm)
* **Weight**: 1.8 oz (50 g)
* **Power**: 2 AA batteries (up to 2 years)
* **Sensors**: Temperature (±0.5°F), humidity, presence (PIR-based)
* **Connectivity**: 915 MHz RF to thermostat; up to 60 ft range
* **Mounting**: Adhesive backing or screw mount; includes magnetic stand
* **Max Sensors**: Up to 6 per thermostat

**7. Safety and Compliance**

* **Certifications**: ENERGY STAR, UL, CE, FCC, RoHS
* **Privacy**: No video/audio recording; anonymized usage data for product improvement (opt-out available).
* **Warranty**: 2-year limited warranty; 30-day money-back guarantee.
* **Safety Warnings**:
  + Turn off HVAC power before installation to avoid electrical shock.
  + Do not use with high-voltage (120V/240V) systems.
  + Keep out of reach of children; contains small parts.

**8. Troubleshooting**

* **Wi-Fi Connection Issues**:
  + Ensure the thermostat is within router range (recommended <30 ft).
  + Restart the router and perform a reset (see Section 5.3).
  + Update firmware via the TechTrend Home app.
* **Temperature Inaccuracy**:
  + Calibrate the thermostat in Settings > Temperature Offset.
  + Relocate the SmartSensor away from heat sources (e.g., windows, vents).
* **HVAC Not Responding**:
  + Verify wiring connections and HVAC power.
  + Check compatibility at [www.techtrend.com/support](http://www.techtrend.com/support).
* **Support**: Contact TechTrend Support at support@techtrend.com or 1-800-555-TECH (8342).

**9. Package Contents**

* TechTrend Smart Thermostat Model X-2025
* SmartSensor (1 unit)
* Power Extender Kit (PEK)
* Wall mount base plate
* Screws and drywall anchors
* AAA batteries (3) for thermostat
* AA batteries (2) for SmartSensor
* Quick Start Guide
* Installation Manual

**10. Regulatory Information**

* **FCC Statement**: This device complies with Part 15 of the FCC Rules. Operation is subject to the following conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.
* **IC Statement**: This device complies with Industry Canada license-exempt RSS standard(s).
* **EU Declaration**: Conforms to EU Directive 2014/53/EU (RED).

**11. Contact Information**

**TechTrend Innovations, Inc.**

1234 Tech Way, Suite 100

Austin, TX 78701, USA

**Website**: [www.techtrend.com](http://www.techtrend.com)

**Support**: support@techtrend.com | 1-800-555-TECH

**Hours**: Mon-Fri, 9 AM–6 PM CST