Crestron **CNX-TS**
Single Gang Temperature Sensor
Operations & Installation Guide

CRESTRON

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Contents

Single Gang Temperature Sensor: CNX-TS 1

Introduction 1
- Features and Functions 1
- Specifications 2
- Physical Description 2
- Industry Compliance 4

Setup 5
- Network Wiring 5
- Identity Code 6
- Installation 7

Programming 8
- Programming with SIMPL Windows 8
- Programming with VT Pro-e 13

Problem Solving 13
- Troubleshooting 13
- Further Inquiries 14
- Firmware Upgrades 14
- Future Updates 14

Software License Agreement 15

Return and Warranty Policies 17
- Merchandise Returns / Repair Service 17
- CRESTRON Limited Warranty 17

Single Gang Temperature Sensor: CNX-TS

Introduction

Features and Functions

The CNX-TS is a wall-mounted single gang temperature sensor that can be part of a Crestron Home™ total control system. The temperature sensor is a standard Cresnet device, and provides temperature sensing when the control system is properly programmed using SIMPL™ Windows®. Multiple sensors can be used in a room to give a more accurate temperature reading.

Functional Summary

- Multiple temperature sensors for more accurate reading
- Temperature sensor reports to Cresnet for HVAC monitoring

Specifications

The following table provides specifications for the sensors.

Specifications for the Sensors

SPECIFICATION	DETAILS
Power Requirements	24 VDC, 0.010A, .25 Watts
Default Network ID	53
Temperature Range	32°F - 113°F (0°C - 45°C)
Control System Update Files[1, 2, 3]	
2-Series Control System Update	Version C2-1001.CUZ or later
CEN/CN-TVAV Update File	Version 5.10.13V.UPZ or later
CNMSX-AV/Pro Update File	Version 5.12.63X.UPZ or later
CNRACKX/-DP Update File	Version 5.10.11W.UPZ or later
ST-CP Update File	Version 4.02.04S.UPZ or later
Dimensions and Weight	Height: 4.76 in (12.1 cm) Width: 2.91 in (5.57 cm) Depth: 1.40 in (3.56 cm)[4] Weight: 2.60 oz (75 g)

1 The latest software versions can be obtained from the Downloads | Software Updates section of the Crestron website (www.crestron.com). Refer to the NOTE after footnote 4.

2. Crestron 2-Series control systems include the AV2, PAC2, PRO2, RACK2, CP2, and MP2.

3. CNX update files are required for either CNMSX-AV/Pro or CNRACKX/-DP. Filenames for CNX update files have a UPZ extension, and ST-CP files are in one EXE or zipped UPZ file. To avoid program problems, make sure you are using the update file with the correct suffix letter (e.g., S, V, W, X).

4. The depth of the Sensor is listed without the Cresnet connector (approximately 0.45 in) **plus** clearance for the wiring.

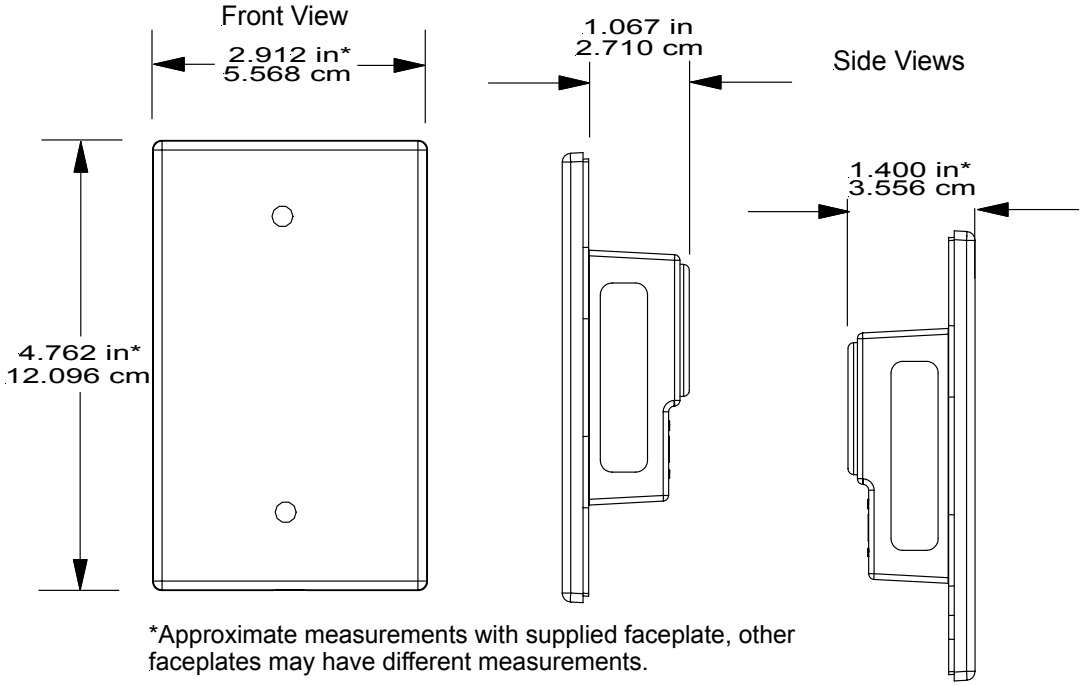
NOTE: Crestron software and any files on the website are for Authorized Crestron dealers only. New users may be required to register to obtain access to certain areas of the site (including the FTP site).

Physical Description

Refer to the illustrations on the next page. The sensor unit consists of a Cresnet circuit board, a rear speaker, and a male port (standard Cresnet network port labeled 24 Y Z G). The port provides operating power and communications to/from the sensor.

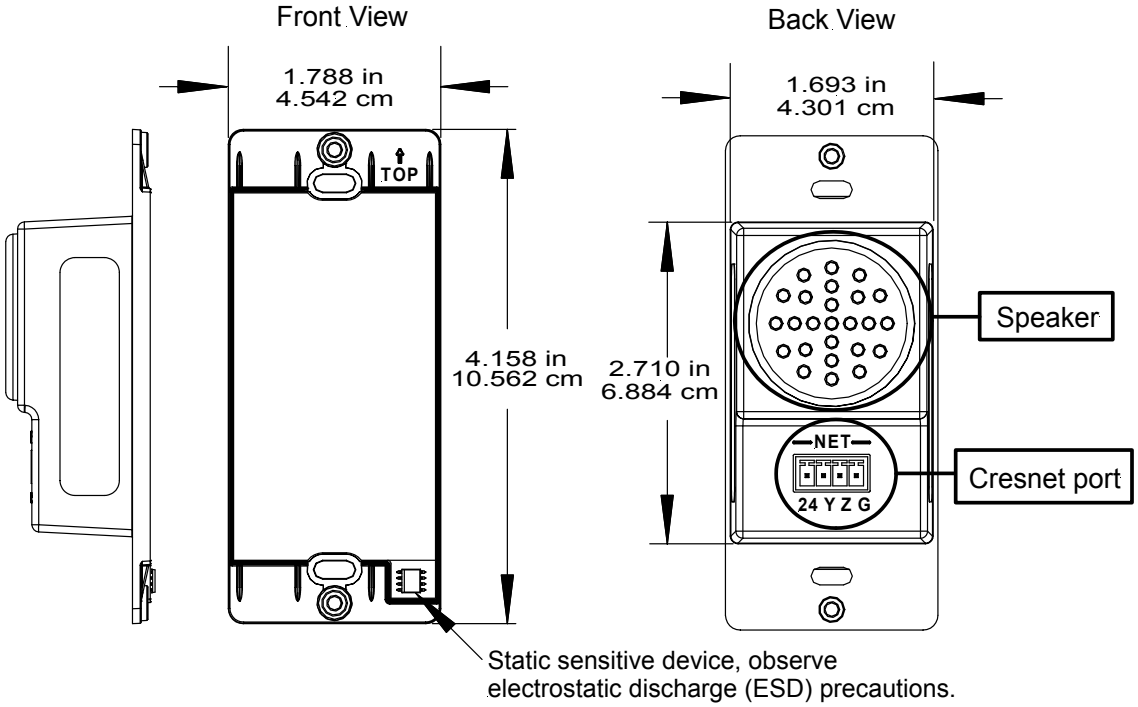
The faceplate consists of a removable faceplate that is attached to the sensor unit.

Temperature Sensor Physical View (with faceplate)

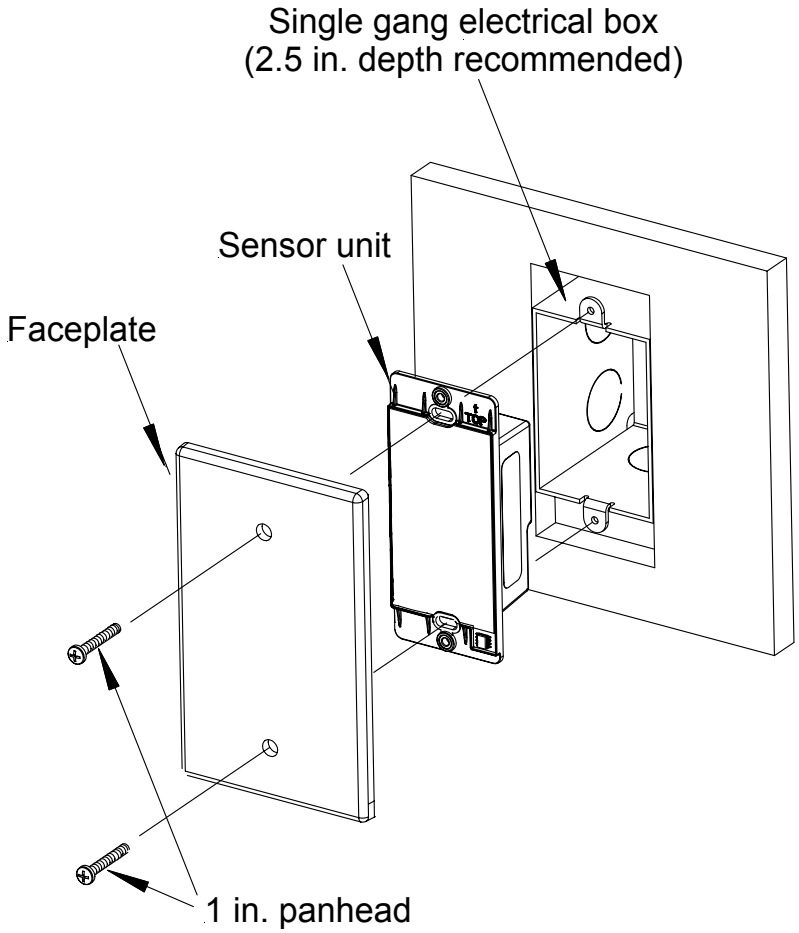


*Approximate measurements with supplied faceplate, other faceplates may have different measurements.

Sensor Unit



Installation View



Industry Compliance

As of the date of manufacture, the sensors have been tested and found to comply with specifications for CE marking and standards per EMC and Radiocommunications Compliance Labelling (N11785).

NOTE: This device complies with part 15 of the FCC rules. Operation is subject to the following two 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.

Setup

Network Wiring

NOTE: When installing network wiring, refer to the latest revision of the wiring diagram(s) appropriate for your specific system configuration, available from the Downloads | Product Manuals | Software and Wiring Diagrams section of the Crestron website (www.crestron.com).

When calculating the wire gauge for a particular Cresnet run, the length of the run and the power factor of each network unit to be connected must be taken into consideration. If Cresnet units are to be daisy-chained on the run, the power factor of each unit to be daisy-chained must be added together to determine the power factor of the entire chain. If the unit is a home-run from a Crestron system power supply network port, the power factor of that unit is the power factor of the entire run. The length of the run in feet and the power factor of the run should be used in the following resistance equation to calculate the value on the right side of the equation.

Resistance Equation

$$R < \frac{40{,}000}{L \times PF}$$

Where: R = Resistance (refer to table below).
L = Length of run (or chain) in feet.
PF = Power factor of entire run (or chain).

The required wire gauge should be chosen such that the resistance value is less than the value calculated in the resistance equation. Refer to the table below.

Wire Gauge Values

RESISTANCE (R)	WIRE GAUGE
4	16
6	18
10	20
15	22
13	Doubled CAT5
8.7	Tripled CAT5

NOTE: All Cresnet wiring must consist of two twisted-pairs. One twisted pair is the +24V conductor and the GND conductor and the other twisted pair is the Y conductor and the Z conductor.

NOTE: When daisy-chaining Cresnet units, strip the ends of the wires carefully to avoid nicking the conductors. Twist together the ends of the wires that share a pin on the network connector, and tin the twisted connection. Apply solder only to the ends of the twisted wires. Avoid tinning too far up the wires or the end becomes brittle. Insert the tinned connection into the Cresnet connector and tighten the retaining screw. Repeat the procedure for the other three conductors.

Identity Code

Every equipment and user interface within the network requires a unique identity code (NET ID). These codes are recognized by a two-digit hexadecimal number from 03 to FE. The NET ID of each unit must match an ID code specified in the SIMPL Windows program. The NET ID of the sensor has been factory set to **53**. The NET IDs of multiple sensors in the same system must be unique. NET IDs are changed from a personal computer (PC) via the Crestron Viewport. Complete the following procedure to change the NET ID.

NOTE: For detailed information on establishing communication between the PC and Control System, refer to the network's Control System Operations Guide.

1. Ensure that the sensor is the only device connected to the control system (verify that the software is running).
2. Open the Crestron Viewport.
3. From the Viewport menu, select **Functions | Set Network ID**. The software checks the baud rate and then opens the "Set Network ID" window.
4. In the "Set Network ID" window, select the CNX-TS from the *Current Network Devices* text window.
5. From the *Choose the new network ID for the selected device (Hex):* text box, select the new NET ID for the sensor.
6. Click **Set ID** to initiate the change. This will display the "ID command has been sent" window.

7. In the "Command Complete" window, click **OK**.
8. In the *Current Network Devices* text window, verify the new NET ID code.
9. In the "Set Network ID" window, click **Close**.

NOTE: The new NET ID code may also be verified by selecting **Diagnostic | Report Network Devices** in the Viewport (alternately, select **F4**).

10. Repeat this procedure for each sensor to be added to the system.

Installation

Tools/hardware required

Temperature sensor and faceplate (supplied)
Cresnet network cable
Phillips screwdriver
Two 3/16 in. flathead phillips screws (supplied)
Insulation (not supplied)

NOTE: The insulation will protect the sensor from any in-the-wall conditions (such as drafts, etc.). Use type in compliance with local codes.

After the Cresnet network wiring has been installed and verified, use the following procedure to install the sensor (refer to illustration on page 4) in a single gang electrical box.

1. Turn Cresnet system power **OFF**.
2. Connect the Cresnet cable with supplied mate to the sensor's Cresnet port and the other end to the control system.
3. Insert insulation in electrical box (make sure it fills void of box not occupied by sensor).

CAUTION: Excess wire that is pinched between the sensor and electrical box could short out. Make sure that all excess wire is completely inside the electrical box and not between the box and the sensor. The CNX-TS contains an electrostatic sensitive device (ESD). Observe precautions for handling ESDs to avoid damaging unit.

4. Make sure sensor unit is oriented as marked with arrow at top, and place it in the electrical box.
5. Attach faceplate and button unit using the supplied (2) 1 in. panhead screws.
6. Turn Cresnet system power **ON**.

Programming

You can create a program that allows you to control the sensor through a Crestron control system using the Crestron programming tool SIMPL™ Windows. This tool is intended for users with different levels of programming knowledge. The flexibility of the tool is proportional to the degree of programming expertise (i.e., the more flexible, the more a programmer needs to know and account for).

NOTE: You can also create and then load a WAV file program (for sound) in the CNX-TS using VisionTools™ (VT Pro-e).

The following are minimum software version requirements for the PC:

- SIMPL Windows version 2.01.05, or later. Requires SIMPL+ Cross Compiler version 1.1 (Library update file 183 or later)
- VT Pro-e version 2.4 or later
- Crestron Database version 15.7.2 or later (version 15.8.2 if you use sounds)

Programming with SIMPL Windows

NOTE: The following assumes that the reader has knowledge of SIMPL Windows. If not, refer to the extensive help information provided with the software.

NOTE: In the following description, the PRO2 control system is used.

SIMPL Windows is Crestron's software for programming Crestron control systems. It provides a well-designed graphical environment with a number of workspaces (i.e., windows) in which a programmer can select, configure, program, test, and monitor a Crestron control system.

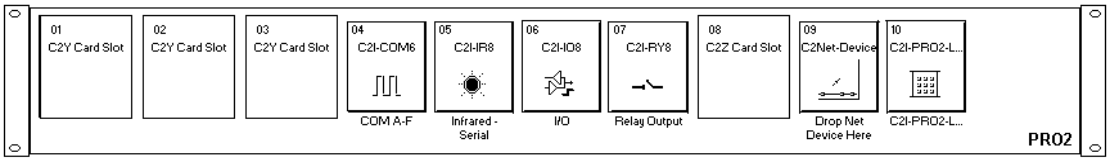
SIMPL Windows offers drag and drop functionality in a familiar Windows® environment.

This section explains how to create a SIMPL Windows program that includes a single gang sensor.

Configuration Manager is where programmers "build" a Crestron control system by selecting hardware from the *Device Library*. In Configuration Manager, drag the PRO2 from the Control Systems folder of the *Device Library* and drop it in the upper pane of the *System Views*.

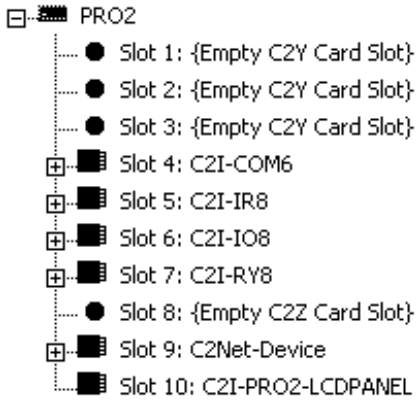
The PRO2 with its associated communication ports is displayed in the *System Views* upper pane.

PRO2 System View



The *System Views* lower pane displays the PRO2 system tree. This tree can be expanded to display and configure the communications ports.

Expanded PRO2 System Tree



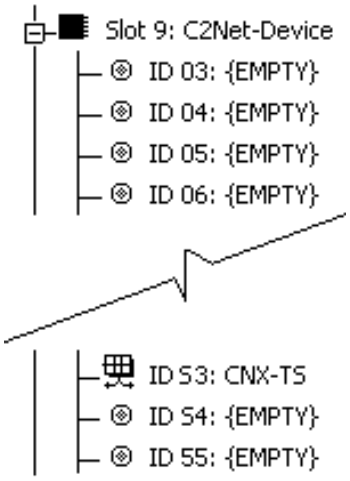
C2Net-Device Slot in Configuration Manager

The C2Net-Device Slot can accept a sensor such as the CNX-TS. Once a sensor is configured in a C2Net-Device Slot, the slot allows Cresnet communication between the sensor and the control system.

In Configuration Manager, drag the CNX-TS from the Crestron Control Modules | Crestron Sensing Modules folder of the *Device Library* and drop it on the PRO2 C2Net-Device slot in *System Views*. The *System Views* upper pane displays the CNX-TS device icon below the PRO2

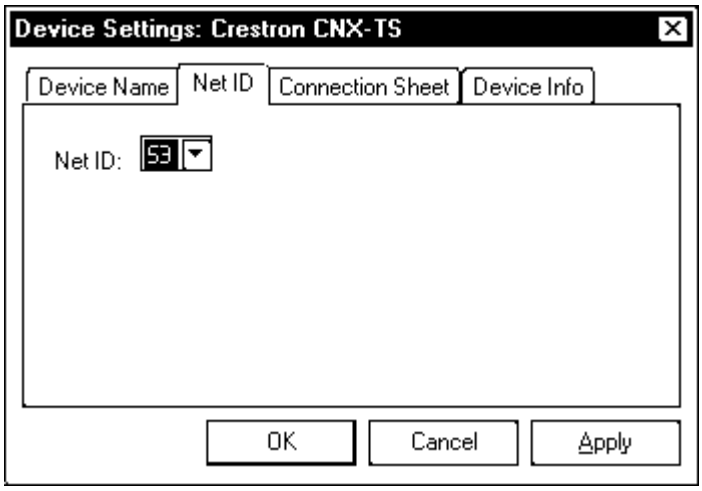
graphic. The PRO2 system tree as shown on the next page, displays the sensor in Slot 9, with a default NET ID of 53.

C2Net Device, Slot 9



Double-click the CNX-TS icon in the upper pane to open the "Device Settings" window. This window displays CNX-TS device information. The NET ID can be changed in this window using the NET ID tab.

Device Settings Window

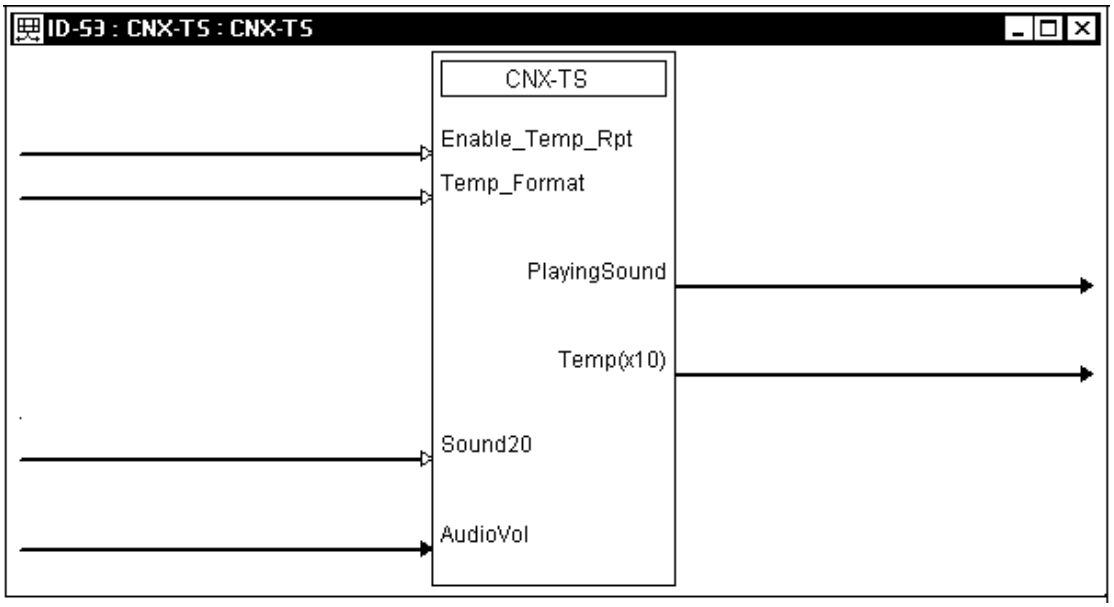


NOTE: SIMPL Windows automatically resets the default NET ID values of a device added to a program if a duplicate device or a device with the same default NET ID already exists in the program. Always ensure that the network device NET IDs set via Viewport match the ones in your SIMPL Windows program.

CNX-TS Symbol in Programming Manager

Programming Manager is where programmers "program" a Creston control system by assigning signals to symbols. The following graphic shows the CNX-TS symbol in the SIMPL Windows' Programming Manager.

Detail View of the CNX-TS symbol in SIMPL Windows' Programming Manager



The following two tables list inputs and outputs, respectively, and their functional descriptions.

NOTE: All signals listed in the tables are DIGITAL signals unless noted. A digital signal can be high (logic level of 1), low (logic level of 0), and also have rising edge (when it goes from low to high) and falling edge (from high to low transitions).

CNX-TS Symbol Input Signal Descriptions

INPUT	DESCRIPTION
Enable_Temp_Rpt	Enables temperature reporting to High/1=reporting enable Low/0=reporting disable
Temp_Format	Controls temperature format. High/0=Fahrenheit Low/1=Celsius
Sound20-120*	Activates sound file specified by the corresponding join number in VT Pro-e. Rising edge starts sound file.
AudioVol (analog)	Controls audio volume thru speaker. Ramp Level=0-100% (If no signal is connected, default is 0%.)

*Sound20 is the sound assignment to join20. Sounds must be assigned in VTPro-e and the resulting project loaded. Refer to the VT Pro-e help file for more information. To create additional sound symbols in SIMPL Windows, right click on the CNX-TS symbol and select *Insert Symbol/Parameter Field* (alternatively, select **Alt** +).

CNX-TS Symbol Output Signal Descriptions

OUTPUT	DESCRIPTION
PlayingSound	Notifies control system that sound file is playing. High/1=playing Low/0=not playing
Temp(x10) (analog)	Reports ambient temperature every 2 seconds (Enable_Temp_Rpt must be High/1). Units are tenths of a degree, e.g. 685 is 68.5 degrees.

Example Program

An example program for the sensor is available from the Crestron FTP site (www.ftp.crestron.com). Select the Examples folder and search for CNX-TS.SMW.

Programming with VT Pro-e

To play WAV files, a CNX-TS project must be created in VT Pro-e (with the WAV files and correct join numbers as part of the project).

NOTE: If you need to create WAV files, refer to Windows Help (Using Sound Recorder).

NOTE: Join numbers assigned to a WAV file in VT Pro-e begin at 20 because join numbers below 20 are already assigned to other sensor buttons or functions.

Once the project is created, use **File** | **Upload Project** from the VT Pro-e main menu to load it in the CNX-TS. For more information, refer to the VT Pro-e help file.

NOTE: This can be done after an identity code (NET ID) is assigned to the sensor (page 6) or after installation (page 7).

Problem Solving

Troubleshooting

The table below provides corrective action for possible trouble situations. If further assistance is required, please contact a Crestron customer service representative.

CNX-TS Troubleshooting

TROUBLE	POSSIBLE CAUSE(S)	CORRECTIVE ACTION
No temperature indication.	Wrong NET ID.	Poll network. Verify SIMPL Windows program for setting Net ID.
	Cables not connected or connected incorrectly.	Check cable connections.
	Wrong or incorrect SIMPL Windows program.	Verify SIMPL Windows program for enabling sensor.
No sound from speaker.	Feedback audio signal not present.	Verify VT Pro-e program for feedback audio signals.

Further Inquiries

If after reviewing this Operations and Installation Guide, you cannot locate specific information or have questions, please take advantage of Crestron's award winning customer service team by calling:

- In the US and Canada, call Crestron's corporate headquarters at 1-888-CRESTRON [1-888-273-7876].
- In Europe, call Crestron International at +32-15-50-99-50.
- In Asia, call Crestron Asia at +852-2341-2016.
- In Latin America, call Crestron Latin America at +5255-5093-2160.
- In Australia and New Zealand, call Creston Pacific at +613-9480-2999

Firmware Upgrades

To take advantage of all the sensor's features, it is important that the unit contains the latest firmware available. Therefore, please check Crestron's website (http://www.crestron.com/downloads/software_updates.asp) for the latest version of firmware. Not every product has a firmware upgrade, but as Crestron improves functions, adds new features, and extends the capabilities of its products, firmware upgrades are posted. If you have questions regarding upgrades procedures, contact Crestron customer service.

Future Updates

As Crestron improves functions, adds new features, and extends the capabilities of the sensors, additional information may be made available as manual updates. These updates are solely electronic and serve as intermediary supplements prior to the release of a complete technical documentation revision.

Check the Crestron website (www.crestron.com) periodically for manual update availability and its subjective value. Updates are available from the Download | Product Manuals section and are identified as an "Addendum" in the Download column.

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2. Products may be returned for credit, exchange, or service with a CRESTRON Return Merchandise Authorization (RMA) number. Authorized returns must be shipped freight prepaid to CRESTRON, Cresskill, N.J., or its authorized subsidiaries, with RMA number clearly marked on the outside of all cartons. Shipments arriving freight collect or without an RMA number shall be subject to refusal. CRESTRON reserves the right in its sole and absolute discretion to charge a 15% restocking fee, plus shipping costs, on any products returned with an RMA.
3. Return freight charges following repair of items under warranty shall be paid by CRESTRON, shipping by standard ground carrier. In the event repairs are found to be non-warranty, return freight costs shall be paid by the purchaser.

CRESTRON Limited Warranty

CRESTRON ELECTRONICS, Inc. warrants its products to be free from manufacturing defects in materials and workmanship under normal use for a period of three (3) years from the date of purchase from CRESTRON, with the following exceptions: disk drives and any other moving or rotating mechanical parts, pan/tilt heads and power supplies are covered for a period of one (1) year; touchscreen display and overlay components are covered for 90 days; batteries and incandescent lamps are not covered.

This warranty extends to products purchased directly from CRESTRON or an authorized CRESTRON dealer. Purchasers should inquire of the dealer regarding the nature and extent of the dealer's warranty, if any.

CRESTRON shall not be liable to honor the terms of this warranty if the product has been used in any application other than that for which it was intended, or if it has been subjected to misuse, accidental damage, modification, or improper installation procedures. Furthermore, this warranty does not cover any product that has had the serial number altered, defaced, or removed.

This warranty shall be the sole and exclusive remedy to the original purchaser. In no event shall CRESTRON be liable for incidental or consequential damages of any kind (property or economic damages inclusive) arising from the sale or use of this equipment. CRESTRON is not liable for any claim made by a third party or made by the purchaser for a third party.

CRESTRON shall, at its option, repair or replace any product found defective, without charge for parts or labor. Repaired or replaced equipment and parts supplied under this warranty shall be covered only by the unexpired portion of the warranty.

Except as expressly set forth in this warranty, CRESTRON makes no other warranties, expressed or implied, nor authorizes any other party to offer any warranty, including any implied warranties of merchantability or fitness for a particular purpose. Any implied warranties that may be imposed by law are limited to the terms of this limited warranty. This warranty statement supercedes all previous warranties.

Trademark Information

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Operations & Installation Guide - DOC. 8191
08.02

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change without notice.