

Refrigeration Innovation

Thermo-Simple 1 version.1

Manual

(Non-Wireless System)



Refrigeration Innovation, LLC.

1250 Harter Avenue, Suite E

Woodland, CA 95776

Ph: 530.666.3020

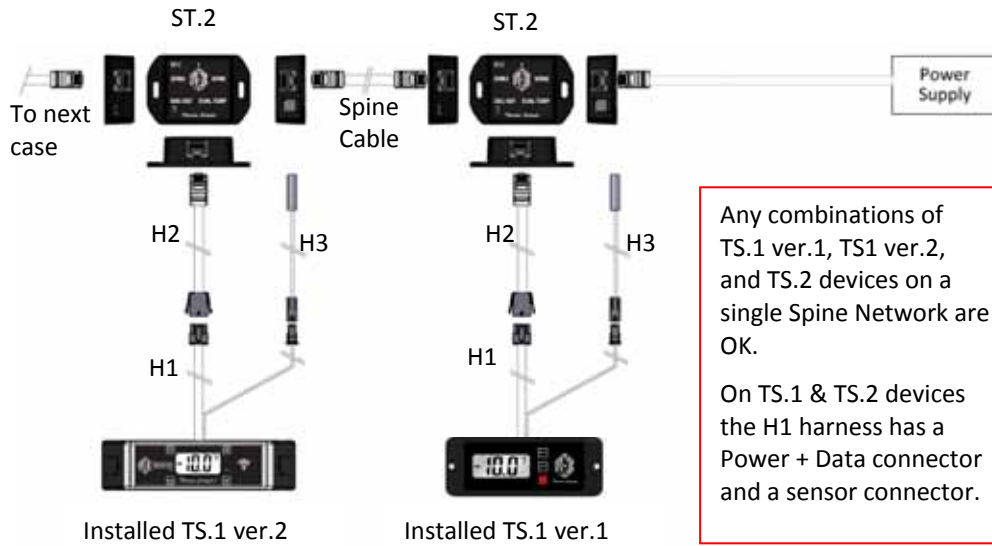
Fx: 530.666.3027

TABLE OF CONTENTS

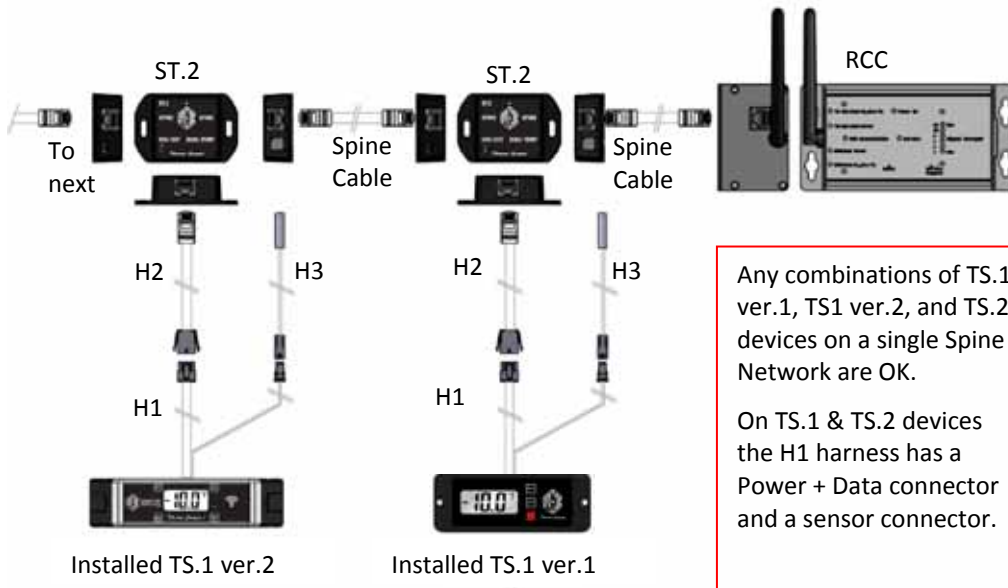
TABLE OF CONTENTS	2
INTRODUCTION	3
Spine Network Hardware Configuration (Non-Wireless)	3
Spine Network Hardware Configuration (Wireless)	3
Power Supply	4
Spinal Tap 2 (ST.2)	4
Thermo-Simple 1 version.1 (TS.1 ver.1)	5
Device Installation	5
Spine Cable	6
HARDWARE OVERVIEW	7
Wiring Harnesses	7
H1 Harness	7
H2 Harness	8
H3 Harness	8
Sensor	9
TS.1 ver.1 Device	9
LEDs	9
Display	10
Switches	10
SOFTWARE OVERVIEW	11
TS.1 ver.1 Device Settings	11
Basic Switch Assignments	11
Function/Service Request (Advanced) Switch Sequences	11
Setting the Device Alarm Set-Point	13
Set-Points	14
WARRANTY	16

INTRODUCTION

Spine Network Hardware Configuration (Non-Wireless)



Spine Network Hardware Configuration (Wireless)

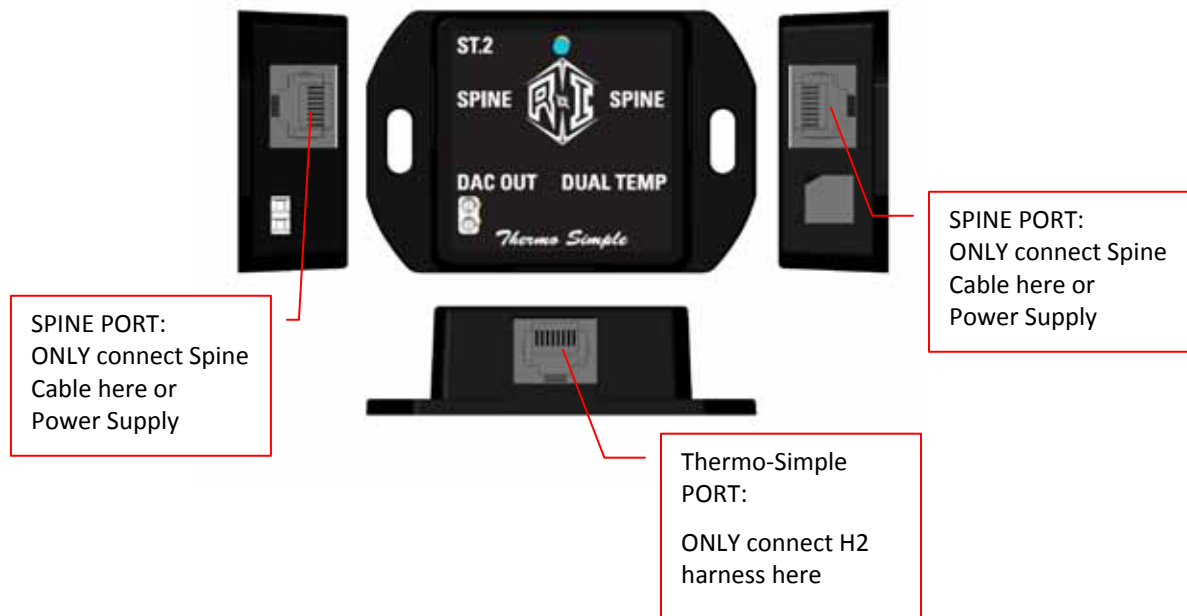


Power Supply



Standard Power Supply transforms 100-240 Vac to 12 Vdc at maximum 1.5 Amperes.

Spinal Tap 2 (ST.2)



The Spinal-Tap 2, (ST.2), is a three-way junction in the Spinal Network between the Spine Cable and each Thermo-Simple device, (TS.1 ver.1, TS.1 ver.2 or TS.2).

The number of ST.2 junctions needed in a given Spinal Network depends on the number of Thermo-Simple devices used in the line-up. Each OEM TS device is shipped from the factory with an ST.2 attached to the OEM cable. Replacements must be ordered separately.

Thermo-Simple 1 version.1 (TS.1 ver.1)

The Thermo-Simple 1 version.1 (TS.1 ver.1) is the first advanced communicating digital thermometer alarm with preprogrammed settings for many low, medium and walk-in temperature applications. Alert functionality can be as simple as “no light, no problem” to flashing display and red Alarm light for high temperature alarms.

This manual covers Thermo-Simple installations in a non-communicating application (Thermo-Simple devices operating as stand-alone units, not connected to a WiDAQ wireless data acquisition system). For more information regarding communicating and data acquisition applications please consult the WiDAQ Wireless Data Acquisition Manual.



Device Installation

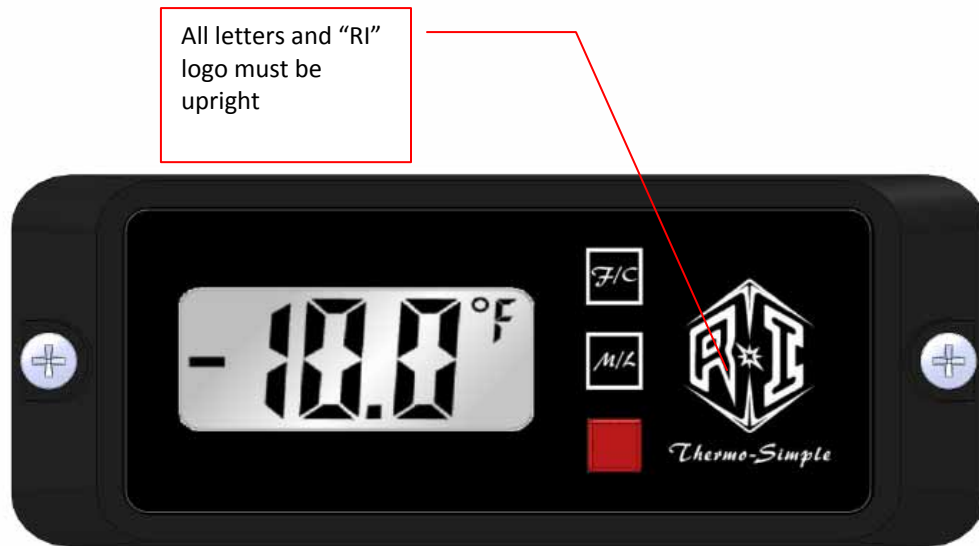
STEP 1:

Install the TS.1 ver.1 device in a safe clean environment suitable for electronic devices. Safe environment requirements are the following:

- Dry, low humidity, non-condensing.
- No direct wash-down. If installed where splash can occur the harness requires sealing where the wires exit the back of the can. Inline harness connectors must not be exposed to water or condensing humidity.
- Low static charge.
- Operating temperature range: -20°C to +85°C.
- The entire back plate of TS.1 ver.1 must have contact with a flat hard surface. Mounting on a curved surface may compromise the device functionality.
- Using mounting screws larger than #8 Pan Head screw may cause device malfunction.
- A hole on the case or bracket, located at the center point of the TS1 backside must be large enough to allow the TS.1 ver.1 H1 Harness connectors to pass easily through. The H1 Harness wiring hole must not have sharp edges.

STEP 2:

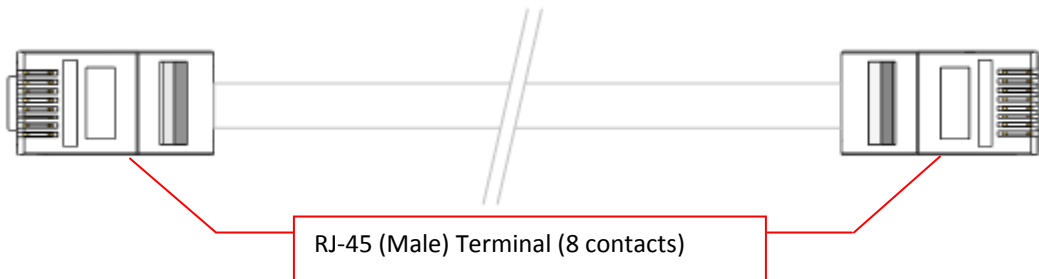
Make sure that the TS1 device is oriented properly; all letters and “RI” logo must be upright.



STEP 3:

Fasten #6 Self Tapping Sheet Metal Pan Head screws.

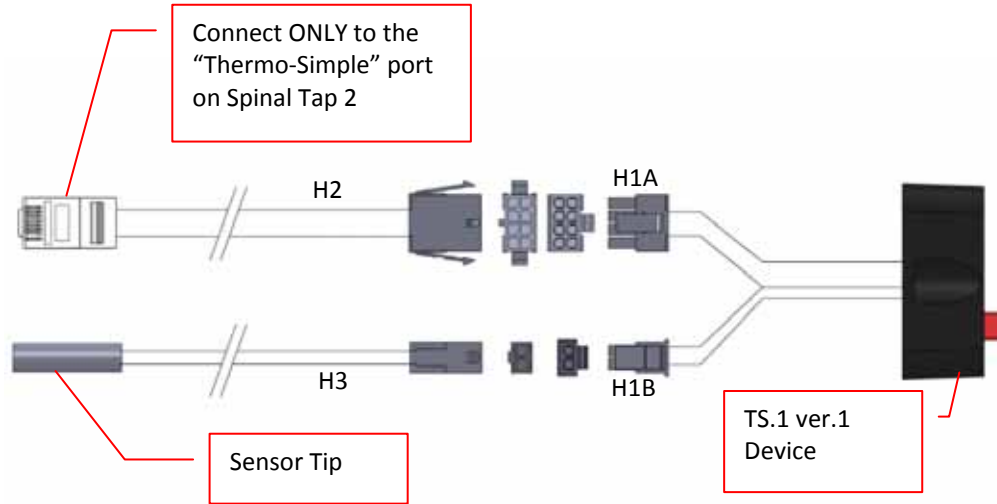
Spine Cable



The Spine cable follows the EIA/TIA 568 B Ethernet wiring standard. A Spine to Spine Communication Cable contains four twisted pairs of 24AWG stranded wire. Industry standard Category 5e stranded network patch cable is used for high quality communication. Both ends of the cable are wired with high quality Cat5e RJ-45 Modular Ethernet connectors. Both connectors in a Spine cable usually come in a transparent clear plastic.

HARDWARE OVERVIEW

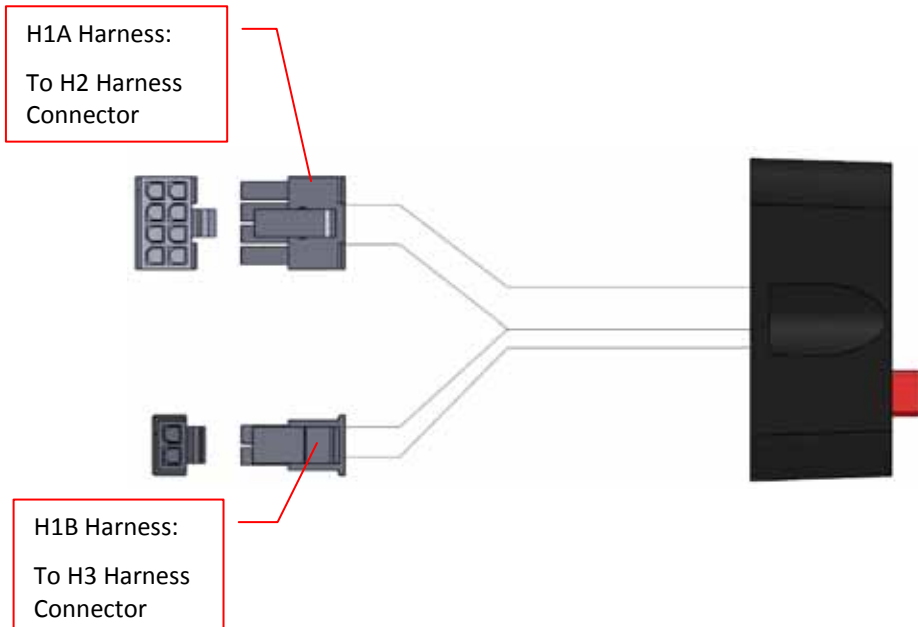
Wiring Harnesses



The TS.1 ver.1 has 3 harnesses. Typically these harnesses include the back plate and the device will be installed by the case OEM.

In a retrofit the wiring, harnesses and sensor(s) will need to be properly routed through the case in a manner appropriate for the application.

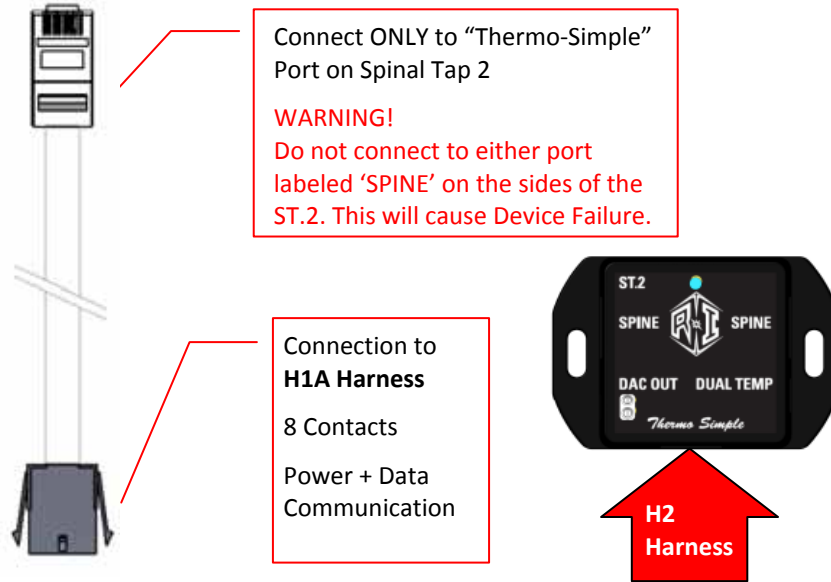
H1 Harness



The H1A harness connector on the TS.1 ver.1 routes Power and Data from the (H2) Harness to the device. The H1B harness connector on the TS.1 ver.1 routes Sensor input from the (H3) Sensor Harness.

The lengths of the H1 harness is usually very short, (8").

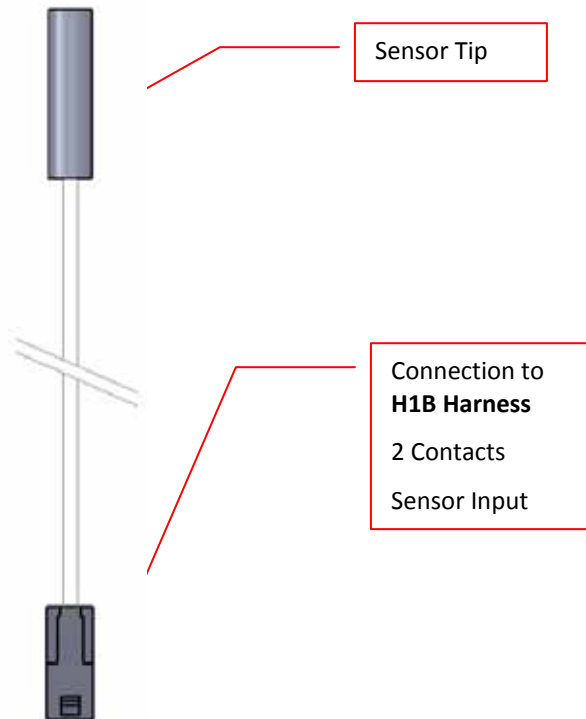
H2 Harness



The H2 harness on the TS.1 ver.1 provides the unit with Power plus Data connections. The H2 harness usually comes installed and connected to the Spinal Tap 2 (ST.2) by the case manufacturer.

The length of this harness is typically 12 to 20 feet in length, (OEM specified).

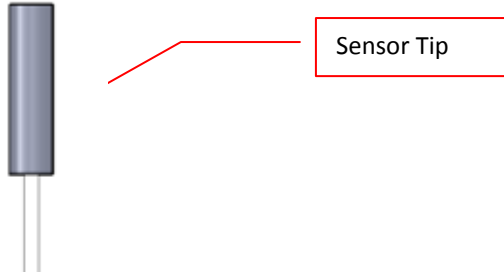
H3 Harness



The H3 harness on the TS.1 ver.1 provides the unit with device Sensor Input. The H3 harness usually comes installed and connected to H1B harness connector by the case manufacturer.

The length of this harness is typically 6 feet long. Other sensor harness lengths up to 25 feet are available by special order from the factory.

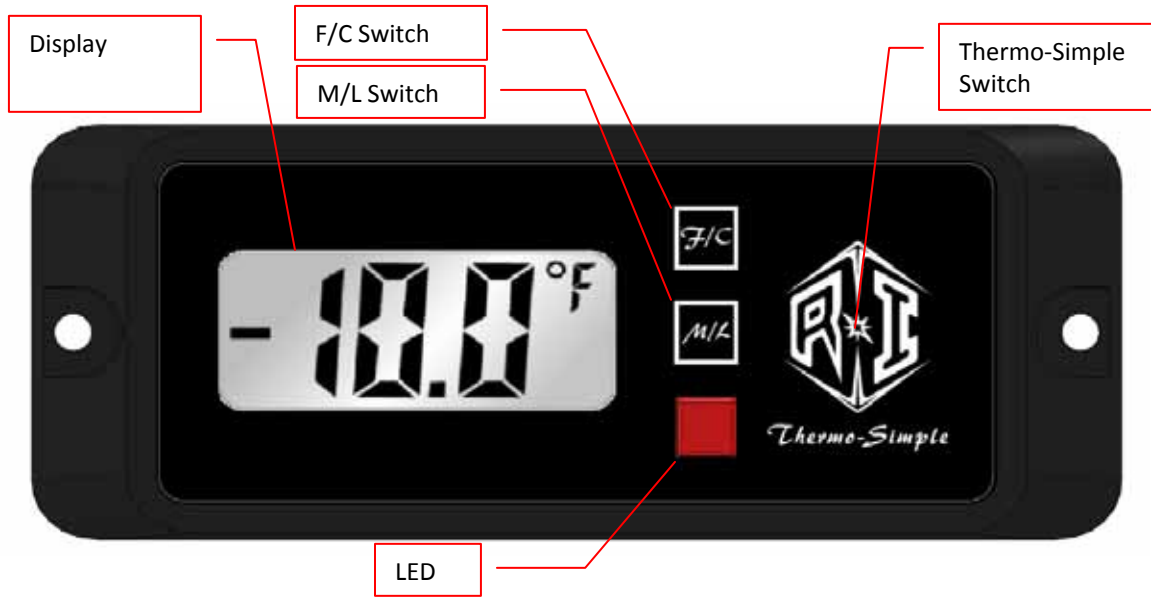
Sensor



The sensor tip on H3 harness consists of an intelligent digital sensor.

Note: The sensor wires are polarity sensitive. If the wire is cut, wire polarity must be maintained by matching wire colors.

TS.1 ver.1 Device

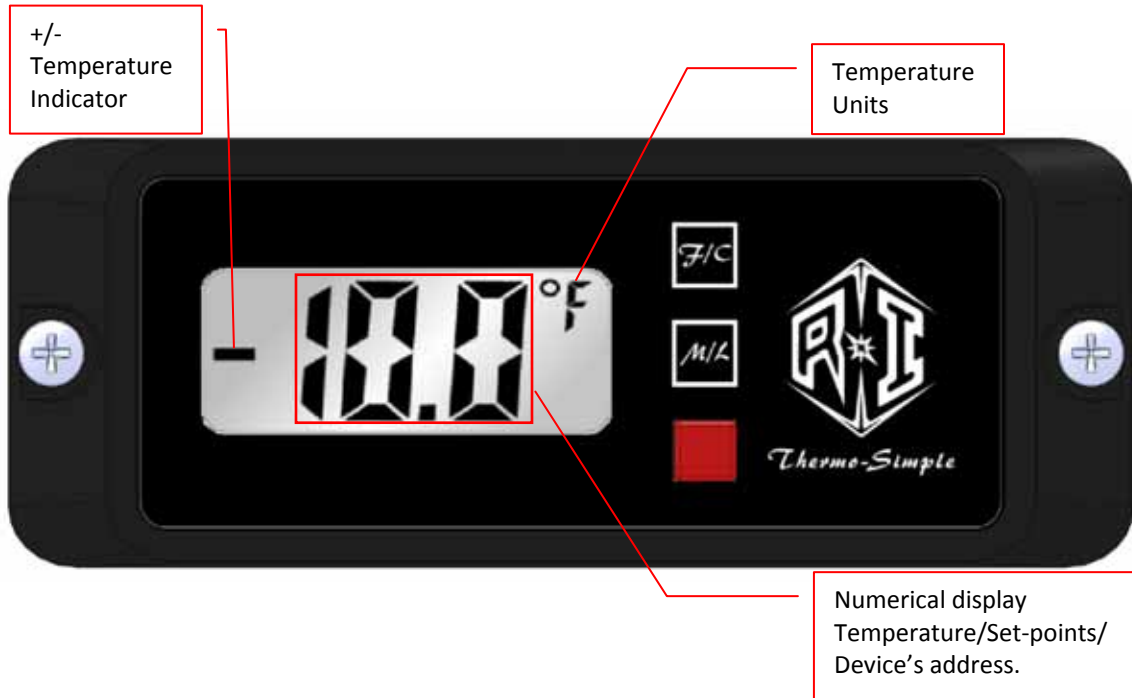


LED

The LED is off when the case temperature is in the normal range. When the case temperature is above normal operating temperature the LED will be flashing red. For more detail refer to the Set-points section.

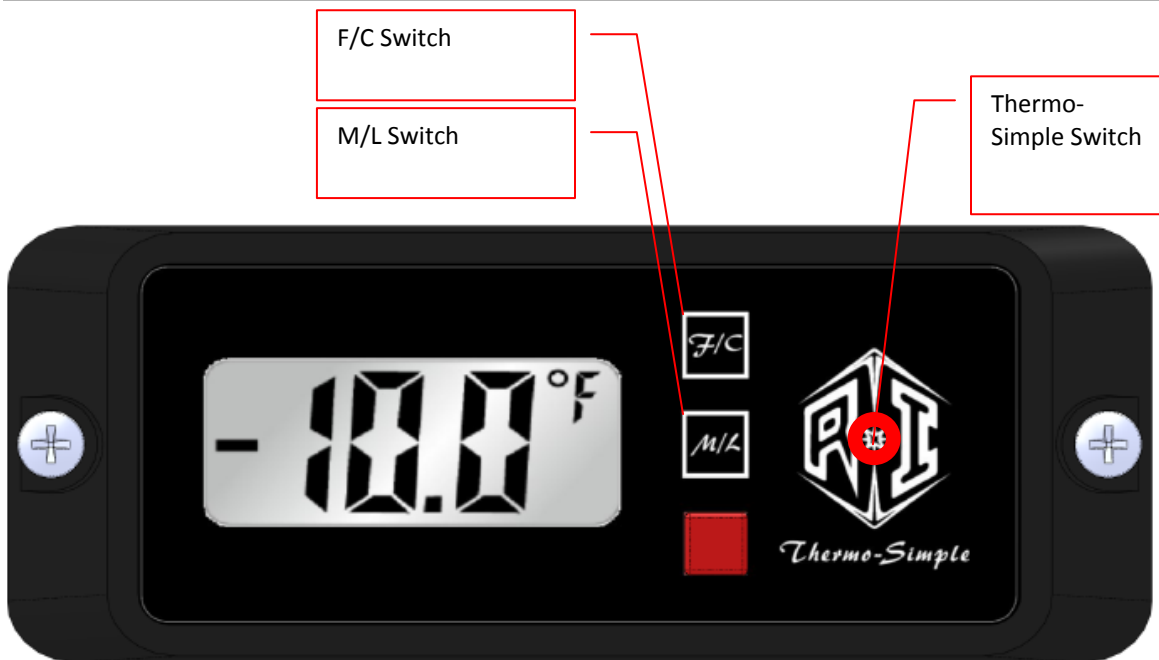
A Flashing Red LED indicates an alarm status, where attention is needed. Flashing red signifies that the case has been above the set-point temperature for at least 60 minutes (70 minutes for walk-in cooler set-points).

Display



TS.1 ver.1 displays temperature in its default state. It also displays the device's address in a spinal network configured for wireless data acquisition, (WiDAQ).

Switches



There are 3 switches in the TS.1 ver.1 device. They are F/C, M/L. and Thermo-Simple Switches.

SOFTWARE OVERVIEW

TS.1 ver.1 Device Settings

The basic switch functions can be used to temporarily change the temperature units or display the currently active set-point.

There are also arrays of advanced switch sequences to change the default temperature units, change the active set-point, and obtain or delete the device address in a wireless system.

Basic Switch Assignments

Switch	Assignment	Description
F/C	Temporarily Change Temperature Units	Red LED on, display temperature in alternate units, Fahrenheit or Centigrade. Temperature automatically reverts back to the default units in approximately 10 seconds.
M/L	Display active set-point	Display the current alarm set point temperature in the default temperature units. If alternate temperature units are being displayed due to pressing the F/C switch, pressing the M/L switch will display the alarm set-point in the alternate units. Alarm starts a 60 minute timer when case temperature exceeds the set-point and will reset alarm when temperature drops 2 degrees F, (1.11 degrees C) below the set-point.
RI Logo (RI)	Reset or Function/Service Request	Reset, switch is the company Logo (RI) above the "Thermo-Simple". This switch forces a reset of the unit. A reset will not disable the alarm if it is flashing, this can only be cleared when the problem with the case has been corrected. If the alarm condition is removed the alarm will stop flashing approximately 10 seconds after the case temperature has dropped below the set-point.

Function/Service Request (Advanced) Switch Sequences

Holding other switches while pressing and releasing the reset switch will invoke various configuration functions and settings discussed in the Function/Service Request (Advanced) Switch Functions. Note on

Switch Sequence nomenclature:

X↓ + **Y**↓↑ + **Y**↓↑ + **X**↑ means Press and hold **X** switch down while Pressing and releasing **Y** switch two times, then release the **X** switch.

Switch Sequences	Assignments	Descriptions
F/C ↓+ RI ↓↑+ F/C ↑	Set the default temperature display to the opposite of what is currently displayed	Press and hold F/C, press and release RI then release F/C: Changes the default temperature unit for the display. This is a toggle function, so invoking the F/C switch again with 10 seconds will cause the display to revert back to the alternate units of temperature. Waiting for 10 seconds after the last switch press will assign the new default temperature units.
M/L ↓+ RI ↓↑+ M/L ↑	Select/Change alarm set-point	Press and hold M/L, press and release RI then release M/L: Enables programming of alarm set-point. While the set-point is flashing in the display, triggering ML switch will successively change the set-point to the next pre-programmed set-point. This will cycle through all the set-points as long as the display is flashing. Allowing the display to stop flashing and waiting 10 seconds will assign the new set point that is displayed.
M/L ↓+ F/C ↓↑+ F/C ↓↑+ M/L ↑	Assign Address for TS device Commission TS Device to DAC.16/DAIO.16 WiDAQ (wireless) system only	Press and hold M/L switch while pressing and releasing the F/C switch twice then releasing M/L switch. This will enable the TS device to respond to the RCC and accept an address assignment. It also will send a request to the RCC which passes the request on to the Master Control Computer to blink the LED next to the DAC-16 output Channel assigned to that TS device. This channel will be the one used to output the analog sensor voltage representing case temperature to a third party controller. This will also display the currently assigned Slave Unit Address for 1 minute and will cause a 2 minute fast blinking of the alarm LED. The fast blinking can be cleared early by pressing the F/C switch again. If the unit is in alarm pressing F/C switch will not clear the alarm flashing.
M/L ↓+ F/C ↓+ RI ↓↑+ M/L ↑+ F/C ↑	Clear an assigned address and stop device communication WiDAQ (wireless) system only	Press and Hold both M/L and F/C switches, press and release RI, then release M/L and F/C switches. This will reset the TS unit address to unassigned. This enables reassignment of the TS unit address by the Row Control Computer (RCC). This is necessary if this unit has previously been connected to another communication channel and may have an address that is in conflict with a device already connected to the same Spinal Network.

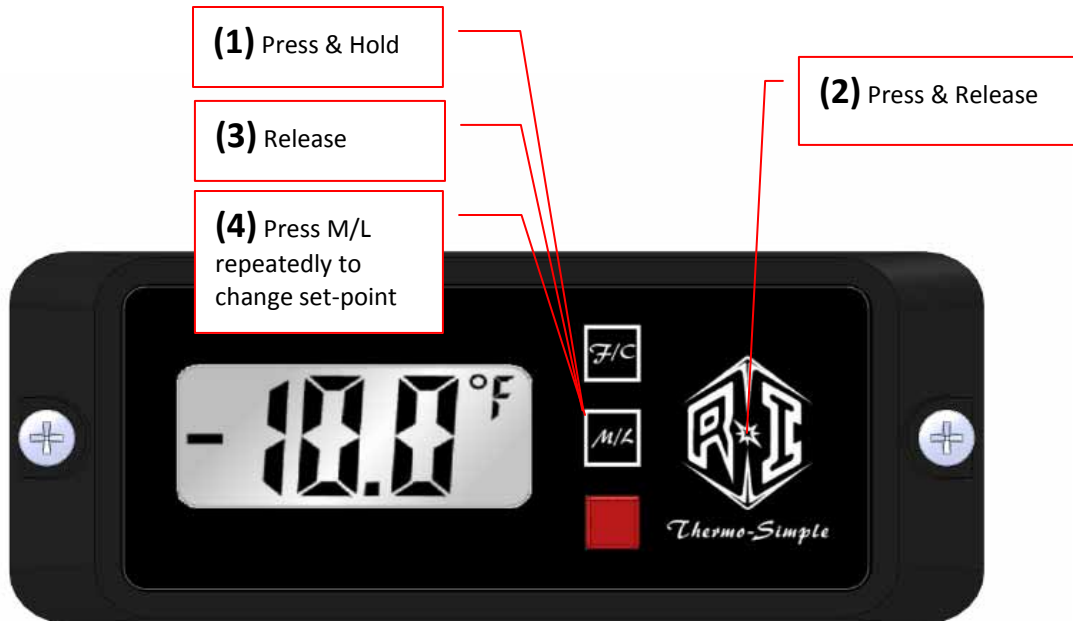
Setting the Device Alarm Set-Point

The set-point configures the device to operate in the range of temperature for that particular case. The set-point determines whether the case temperature is within range or not and determines when the unit goes into alarm.

To View the current Set-point:
press and release the M/L switch.



To Change the current Set-point:
Press and hold the M/L switch followed by pressing and releasing the RI Logo, then release the M/L switch.



Set-Points

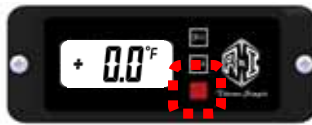
For different temperature ranges on different types of cases there are 4 Set-points. They are as follows:

0.0 degrees Fahrenheit



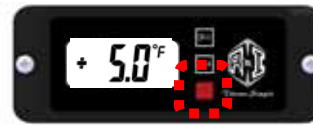
No Light

Below 0 degrees F
(2 deg F below set-point)



Flashing Light

Above 0 degrees F for 60+
minutes
(above set-point)



Flashing Light

Above 0 degree set-point
for 60+ minutes

Suggested Product for this Set-point:

- Ice Cream
- Frozen Food

5.0 degrees Fahrenheit



No Light

Below 5 degree F
(2 deg F below set-point)



Flashing Light

Above 5 degrees F for 60+
minutes
(above set-point)



Flashing Light

Above 5 degree set-point
for 60+ minutes

Suggested Product for this Set-point:

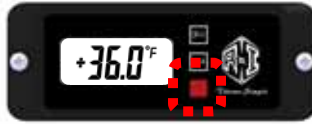
- Ice Cream
- Frozen Food

36.0 degrees Fahrenheit



No Light

Below 36 degree F
(2 deg F below set-point)



Flashing Light

Above 36 degrees F for 60+
minutes
(above set-point)



Flashing Light

Above 36 degree set-point
for 60+ minutes

Suggested Product for this Set-point:

- Fresh Meat
- Fresh Fish

40.0 degree Fahrenheit



No Light

Below 40 degrees F
(2 deg F below set-point)



Flashing Light

Above 40 degrees F for 60+
minutes
(above set-point)



Flashing Light

Above 40 degree set-point
for 60+ minutes

Suggested Product for this Set-point:

- Fresh Meat
- Fresh Fish

WARRANTY

2-Year Warranty

Thermo-Simple 1 version 1 from Refrigeration Innovation, (the "Product"), is warranted against defects in materials and workmanship under normal use, for a period of 2-years from the date of purchase. In the event of a product failure due to materials or workmanship, Refrigeration Innovation will repair or replace the defective product. For warranty service, return the defective product to Refrigeration Innovation, shipping prepaid, for prompt repair or replacement.

The foregoing sets forth the full extent of Refrigeration Innovation's warranties regarding the Product. Repair or replacement at Refrigeration Innovation's option is the exclusive remedy. THIS WARRANTY IS GIVEN IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, AND REFRIGERATION INNOVATION SPECIFICALLY DISCLAIMS ALL WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. IN NO EVENT SHALL REFRIGERATION INNOVATION, ITS SUPPLIERS OR LICENSORS BE LIABLE FOR DAMAGES IN EXCESS OF THE PURCHASE PRICE OF THE PRODUCT, FOR ANY LOSS OF USE, LOSS OF TIME, INCONVENIENCE, COMMERCIAL LOSS, LOSS OF PRODUCT, LOST PROFITS OR SAVINGS, OR OTHER INCIDENTAL, SPECIAL OR CONSEQUENTIAL DAMAGES ARISING OUT OF THE USE OR INABILITY TO USE THE PRODUCT, TO THE FULL EXTENT SUCH MAY BE DISCLAIMED BY LAW. SOME STATES DO NOT ALLOW THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES. THEREFORE, THE FOREGOING EXCLUSIONS MAY NOT APPLY IN ALL CASES. This warranty provides specific legal rights. Other rights which vary from state to state may also apply.