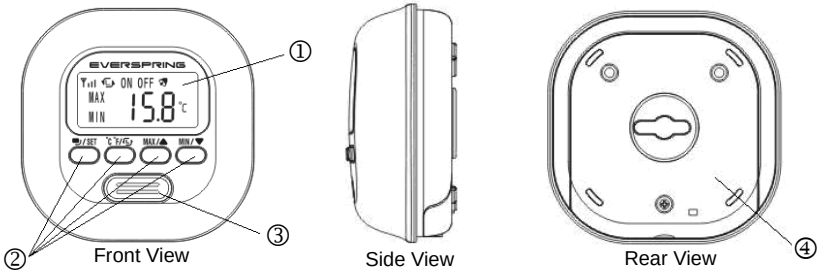
HM-TD001 Temperature/Humidity Detector

The HM-TD001 Temperature/Humidity Detector is a Z-Wave™ enabled device which is fully compatible with any Z-Wave™ enabled network. Z-Wave™ enabled devices displaying the Z-Wave™ logo can also be used with it regardless of the manufacturer, and ours can also be used in other manufacturer's Z-Wave™ enabled networks. Inclusion of this detector on other manufacturer's Wireless Controller menu allows remote operation of connected modules when the detector is triggered. Z-Wave node in the system also acts as a repeater, so as to re-transmit the RF signal to ensure that the signal is received by its intended destination by routing the signal around obstacles and radio dead spots.

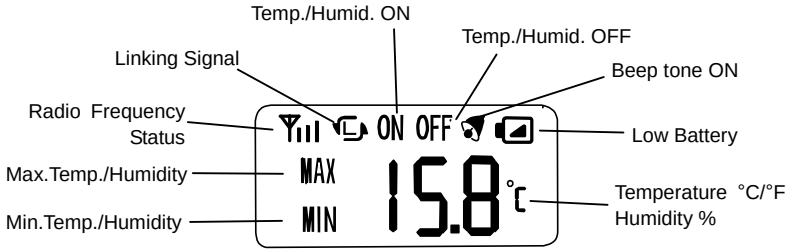
The HM-TD001 is designed to monitor the current temperature and humidity of ambient environment. The reading of temperature/humidity can be reported to you on a regular base at your disposal. If temperature/humidity reaches set points, the detector will send alerts to associated devices for further execution. Since sudden temperature/humidity change may cause health problems to people such as elderly or very young children, Temp./Humid. Detector provides you most up-to-date temperature and humidity reading for you to watch your family's health.

Product Overview



① LCD Screen	
② Function Keys	
▶/SET	Select modes/Change setting
°C °F/🔗	Select temperature unit/Linking
MAX/▲	Increase settings, displays max. temperature/humidity or enable RF & beep tone
MIN/▼	Decrease settings, displays min. temperature/humidity or disable RF & beep tone
③ Temperature/Humidity Sensor	
④ Mounting Bracket	

LCD Display



Adding to Z-Wave™ Network

One of function key (°C °F/🔗) is used to carry out inclusion, exclusion, association and reset. When the detector is first powered up, the reading in RF mode is 00 which implies that it hasn't been allocated a node ID and cannot work with Z-Wave enabled devices. The HM-TD001 will stay "awake" for 10 minutes when power is first supplied to allow time for configuration. Put a Z-Wave™ controller into inclusion/exclusion/association mode before carrying these actions. The detector executes the function of auto inclusion when…

Auto Inclusion

1. The power is first supplied where no node ID code has been allocated.

2. The execution of exclusion/reset is successful where the stored node ID is cleared.

Note: Auto inclusion timeout is 4 minutes during which the node information of explorer frame will be emitted once every 5 seconds. Unlike "inclusion" function as shown in the table below, the execution of auto inclusion is free from pressing the °C °F/🔗 key.

Function	Description	LED Indication
No node ID	The Z-Wave Controller does not allocate a node ID to the detector.	The RF reading displays 00 (MODE 7)
Inclusion	1. Have Z-Wave Controller entered inclusion mode.	🔗 flashes

	2. Pressing °C °F/ key 3 times within 1.5 seconds will enter inclusion mode.	

Function	Description	LED Indication
Exclusion	1. Have Z-Wave Controller entered exclusion mode.	flashes
	2. Pressing °C °F/ key 3 times within 1.5 seconds will enter exclusion mode	
	Node ID has been excluded	The RF reading displays 00 (MODE 7)
Reset	1. Pressing °C °F/ key 3 times within 1.5 seconds will enter inclusion mode	flashes
	2. Within 1 second, press °C °F/ key again and hold it until long beep tone is off	
	3. Node ID has been excluded, restores to factory default.	The RF reading displays 00 (MODE 7)
Association	1. Have Z-Wave Controller entered association mode.	flashes
	2. Pressing °C °F/ key 3 times within 1.5 seconds will enter association mode	
	3. There are two groupings – 1 and 2. Refer to Z-Wave's Groupings as described on page 5.	

※ Including a node ID allocated by Z-Wave Controller means inclusion. Excluding a node ID allocated by Z-Wave Controller means exclusion.
※ Failed or success in including/excluding the node ID can be viewed from the Z-Wave Controller.

Choosing a Suitable Location

The HM-TD001 can either be mounted on a wall or can be freestanding on a table. Please consider a most suitable way before mounting/ placing it.

Wall Mounting

1. Place mounting bracket over a desired location on the wall. Through the 3 screw holes of the bracket, mark the mounting surface with a pencil.
2. Where marked, drill holes into mounting surface using an appropriate size drill bit and insert the plastic wall plugs supplied respectively.
3. Screw mounting bracket onto the mounting surface. Ensure that the screws are flush with the bracket.
4. Snap the Temp./Humid. Detector into place on the mounting bracket.
5. Secure with the fixing screw supplied.

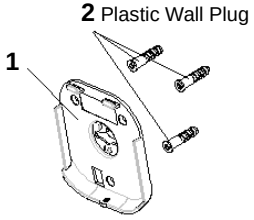


FIGURE 1

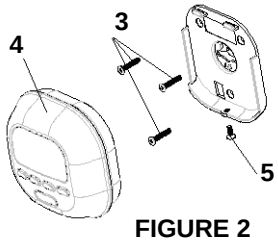


FIGURE 2

Table Placing

1. Insert the stand into the hole on mounting bracket and turn 90 degrees clockwise.
2. Once snapped in place, the detector can be placed on a shelf, table or other surface where the temperature and humidity measurements are desired.

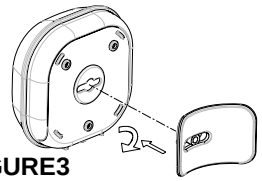


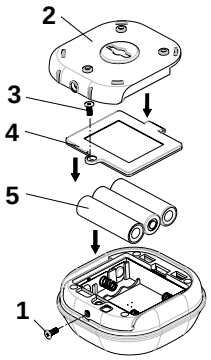
FIGURE3


FIGURE 4

Note: Take care when fixing the detector to a metal surface, or mounting within 1m of metalwork (i.e. radiators, water pipes, etc) as this could affect the radio range of the device.

Installation

Please follow the steps below in sequence to load the batteries.

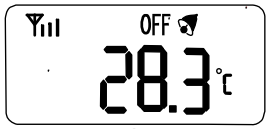


1. Undo and remove the screw from the bottom edge of the detector to detach the rear cover.
2. Open the mounting bracket.
3. Unscrew the screw from the battery cover.
4. Remove the battery cover.
5. Insert 3 AA-size 1.5V alkaline batteries to the battery compartment, ensuring correct polarity is put.
6. Replace the battery cover and then engage the detector to the rear cover firmly.

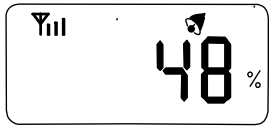
Note: After removing batteries, please wait for 5 seconds before replacing them.

Operation

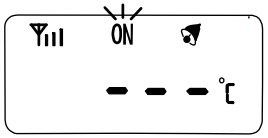
There are 8 modes available for selection. Press SET to select desired mode for different settings.



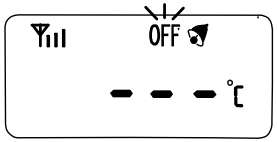
Mode 1



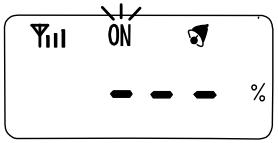
Mode 2



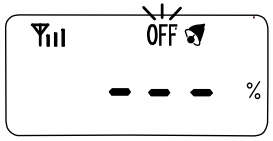
Mode 3



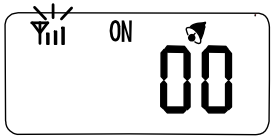
Mode 4



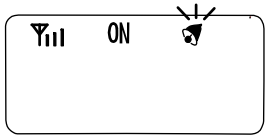
Mode 5



Mode 6



Mode 7



Mode 8

Mode	Function
1	Current temperature display (°C/°F)
2	Current humidity display (%)
3	Setting for temperature trigger-ON value
4	Setting for temperature trigger-OFF value
5	Setting for humidity trigger-ON value
6	Setting for humidity trigger-OFF value
7	Setting for turning on/off Radio Frequency
8	Setting for turning on/off beep tone

MODE 1 & MODE 2 are showing as main displays on the screen. Once mode setting is finished (MODE 3 to MODE 8), the screen will return to main display automatically after 12 seconds, or by pressing °C °F/ to return to main display.

1. Temperature

1.1 Display of Current Temperature

Press SET and select MODE 1 to display current temperature, and toggle °C °F/ to select the unit of temperature (◦ C /◦ F).

The temperature ranges from -20°C to 50°C. To show the last record of max/min temperature, press MAX/▲ or MIN/▼. To clear the record, press both MAX/▲ and MIN/▼ at the same time.

Threshold Limit Warning:
If the temperature is reaching the limit, the icon of **MAX** or **MIN** will be displayed on the screen.

Ice Warning:

If the temperature falls to 0°C, temperature display will illuminate with LCD back light and beep tone will sound continuously for 1 second. Press any key to stop the beep tone.

1.2 Temperature Trigger-ON

Press SET and select MODE 3 to enter setting of temperature trigger-ON. Icon ON flashes and the screen will show the recorded trigger-ON temperature.

If no value is preset, the screen will display "- - -°C ".

To adjust trigger-ON value, press and hold SET for 5 seconds until a long beep is sounded. The "- - -" starts flashing. Use MAX/▲ and MIN/▼ button to adjust the degree of temperature, and hold MAX/▲ or MIN/▼ button to scan through the temperature reading from -20°C to 50°C. Once the value is selected, press SET to confirm setting or press °C °F/ to cancel.

To clear the trigger-ON record, press both MAX/▲ and MIN/▼ at the same time. The record is cleared after a long beep is sounded.

If the temperature reaches the preset trigger-ON value, the HM-TD001 will emit RF signal. The screen of detector returns to MODE 1 and the icon ON is

flashing with backlight illuminate and beep tone sounds for 1 second. Press any key to stop the beep tone.

1.3 Temperature Trigger-OFF

Press SET and select MODE 4 to enter setting of temperature trigger-OFF. Icon OFF flashes and the screen will show the recorded trigger-OFF temperature.

If no value is preset, the screen will display "- - -°C".

To adjust trigger-OFF value, press and hold SET for 5 seconds until a long beep is sounded. The "- - -" starts flashing. Use MAX/▲ and MIN/▼ button to adjust the degree of temperature, and hold MAX/▲ or MIN/▼ button to scan through the temperature reading from -20°C to 50°C. Once the value is selected, press SET to confirm setting or press °C °F/↻ to cancel.

To clear the trigger-OFF record, press both MAX/▲ and MIN/▼ at the same time. The record is cleared after a long beep is sounded.

If the temperature reaches the preset trigger-OFF value, the HM-TD001 will emit an RF signal. The screen of detector returns to MODE 1 and the icon OFF is flashing with backlight illumination and beep tone sounds for 1 second. Press any key to stop the beep tone.

Note:

※ The temperature trigger-ON and trigger-OFF cannot be set equal; there MUST be at least **2° C** difference in between. For example, if now the trigger-OFF temperature is already set to be 20°C, so trigger-ON temperature can only be ≦18° C or ≧22° C (values between 18° C and 22° C cannot be set).

※ Once the detector has been triggered, the temperature must increase or cool down at least **2° C** from the preset value before it can be triggered again. For example, if the detector is triggered on at 20°C, then the temperature must be ≧22° C or ≦18° C before it can be re-triggered.

2. Humidity

2.1 Display of Current Humidity

Press SET and select MODE 2 to display current humidity.

The humidity ranges from 20% RH to 90%RH. To show the last record of max/min humidity, press MAX/▲ or MIN/▼. To clear the record, press both MAX/▲ or MIN/▼ at the same time.

Threshold Limit Warning:

If the humidity is reaching the limit, the icon of **MAX** or **MIN** will be displayed on the screen.

Humidity Trigger-ON

Press SET and select MODE 5 to enter setting of humidity trigger-ON. Icon ON flashes and the screen will show the recorded trigger-ON humidity. If no value is preset, the screen will display "- - -%".

To adjust trigger-ON value, press and hold SET for 5 seconds until a long beep is sounded. The "- - -" starts flashing. Use MAX/▲ and MIN/▼ button to adjust the percentage of humidity, and hold MAX/▲ and MIN/▼ button to scan through the humidity reading from 20%RH to 90%RH. Once the value is selected, press SET to confirm setting or press °C °F/↻ to cancel.

To clear the trigger-ON record, press both MAX/▲ and MIN/▼ at the same time. The record is cleared after a long beep is sounded.

If the humidity reaches the preset trigger-ON value, Temp./Humid. Detector will emit RF signal. The screen of detector returns to MODE 2 and the icon ON is flashing with backlight illuminate and beep tone sounds for 1 second. Press any key to stop the beep tone.

2.3 Humidity Trigger-OFF

Press SET and select MODE 6 to enter setting of humidity trigger-OFF. Icon OFF flashes and the screen will show the recorded trigger-OFF humidity. If no value is preset, the screen will read - - -%.

To adjust trigger-OFF value, press and hold SET for 5 seconds until a long beep is sounded. The "- - -" starts flashing. Use MAX/▲ or MIN/▼ button to scan through the humidity reading from 20%RH to 90%RH. Once the value is selected, press SET to confirm setting or press °C °F/↻ to cancel.

To clear the trigger-OFF record, press both MAX/▲ and MIN/▼ at the same time. The record is cleared after a long beep is sounded.

If the humidity reaches the preset trigger-OFF value, the HM-TD001 will emit an RF signal. The screen of detector returns to MODE 2 and the icon OFF is flashing with backlight illuminates and beep tone sounds for 1 second. Press any key to stop the beep tone.

Note:

※ The humidity of trigger-ON and trigger-OFF cannot be set equal; there MUST be at least **5%** difference in between. For example, if now the trigger-ON humidity is already set to be 50%, so trigger-OFF humidity can only be 45% or ≧55%. (Values between 45% and 55% cannot be set.)

※ Once the detector has been triggered, the humidity must be raised up or drop down at least **5%** from the preset value before it can be triggered again. For example, if the detector has been triggered on at 50%, then the temperature must be ≧55% or ≦45% before it can be re-triggered.

3. Radio Frequency

This function is designed to enable or disable the sending of the RF command which is comprised of the Z-wave protocol to the associated nodes, as the HM-TD001 has been triggered on/off.

Press /SET and select MODE 7, the icon should flash. Press MAX/▲ to turn ON (enable) the function or MIN/▼ to turn OFF (disable) the function.

Note:

※ If RF mode is set to OFF, no command will be sent even if the HM-TD001 has been triggered. If RF is set to ON and the detector has been triggered, the RF command will be sent to nodes of Grouping 2.

※ If the RF reading is 00, it implies no node ID has been allocated by Z-Wave Controller. Please execute inclusion mode as described on page 1.

4. Beep Tone

To set the beep tone, press /SET and select MODE 8. The icon flashes. Press MAX/▲ for ON and MIN/▼ for OFF. If it is ON, a beep tone will be sounded whenever a button is pressed; 4 continuous beep tones will be sounded for 1 second if the detector has been triggered.

Programming

1. Z-Wave's Groups (Association Command Class Version 2)

The HM-TD001 can be set to send reports to or control associated Z-Wave devices. It supports two association groups with one node support for Grouping 1 and three nodes support for Grouping 2.

Grouping 1 includes POWER_APPLIED, SENSOR_MULTILEVEL _REPORT and BATTERY_REPORT_COMMAND

Grouping 2 includes BASIC_SET
1-1 Grouping 1 (Max. Node = 1)

1-1-1 POWER_APPLIED command

Whenever power is applied, it will send ALARM_REPORT command to the nodes of Grouping 1 to inform the devices that the detector is powered up.

ALARM_REPORT Command **[Command Class Alarm, Alarm Type = 0x02, Alarm Level = 0x01]**

1-1-2 MULTILEVEL_SENSOR_REPORT

The detector will emit SENSOR_MULTILEVEL_REPORT to inform the nodes of Grouping 1 automatically its current temperature and humidity. Refer to the section of Z-Wave's Configuration as described on page 6 for settings of auto report configuration.

1-1-2-1 Humidity

SENSOR_MULTILEVEL_REPORT **[Command Class Sensor Multilevel, Sensor Multilevel Report, Sensor Type = 0 x 05 (Relative Humidity), Precision+Scale+Size = 0 x 01, Sensor Value 1 = 20-90%]**

Example:
Sensor Value 1 = 0x23
Humidity Value = Sensor Value = 35 (%)

1-1-2-2 Temperature (Celsius)

SENSOR_MULTILEVEL_REPORT **[Command Class Sensor Multilevel, Sensor Multilevel Report, Sensor Type = 0 x 01 (Air Temperature), Precision+Scale+Size = 0 x 22, Sensor Value 1 = (High Byte of Temperature Value), Sensor Value 2 = (Low Byte of Temperature Value)]**

Example:
Sensor Value 1 = 0x01
Sensor Value 2 = 0x31
Temperature (C) = (Sensor Value 1*256 + Sensor Value 2)/10
= (1*256+49)/10 = 30.5 (C)

1-1-2-3 Temperature (Fahrenheit)

SENSOR_MULTILEVEL_REPORT
[Command Class Sensor Multilevel, Sensor Multilevel Report, Sensor Type = 0 x 01 (Air Temperature), Precision+Scale+Size = 0 x 2A, Sensor Value 1 = (High Byte of Temperature Value), Sensor Value 2 = (Low Byte of Temperature Value)]

1-1-3 Low Battery Report

When the battery level of the detector drops to an unacceptable level, the icon will appear on the LCD and the detector will emit ALARM_REPORT command to the nodes of Grouping 1.

ALARM_REPORT Command:
[Command Class Alarm, Alarm Type = 0x01, Alarm Level = 255(0xFF)]

The users can also enquire the battery status of the detector by sending BATTERY_ GET command via controller. Once the detector receives the command, it will return BATTERY_REPORT command.

BATTERY_REPORT Command
[Command Class Battery, Battery Report, Battery Level = 20%-100%]

If it displays with a message of “Battery Level = 255 (0xFF)”, it implies that the detector is at low battery status. Please replace the batteries as soon as possible, otherwise the detector will enter Shut Down mode.

Note: The detector will emit a low battery command as long as there is a device associated into Grouping 1 of Temp./Humid. Detector, even if the RF function is set to disable.

1-2 Grouping 2 (Max. Node = 3)

1-2-1 Control Other Devices (Basic Set)

When the detector is triggered, it will emit BASIC_SET_COMMAND to the nodes of Grouping 2.

BASIC_SET Command

Trigger ON:
[Command Class Basic, Basic Set, Value = 0xFF]

Trigger OFF:
[Command Class Basic, Basic Set, Value = 0]

Please refer to the table below, configuration parameter 1, for the setting of basic set command.

2. Z-Wave’s Configuration

The table below lists the configuration parameters and the value range for users to set up the detector.

Parameter	Function	Size (Byte)	Value	Unit	Default Set/ Factory Default	Description
1	Basic Set Level	1	0~99	% of Brightness (Dimmer Level)	99 / 99	Set basic set value to be on (or Dim Level) /off 0: Disable
2	Temperature Trigger-ON Value	1	-20~50 or 99	Degree	30 / 99	Set temp.trigger-ON value to be _ degree. 99: Clear Temp. trigger-ON value
3	Temperature Trigger-OFF Value	1	-20~50 or 99	Degree	20 / 99	Set temp.trigger-OFF value to be _ degree. 99: Clear Temp. trigger-OFF value
4	Humidity Trigger-ON Value	1	20~90 or 99	%	50 / 99	Set humid. trigger-ON value to be _%. 99: Clear Humid. trigger-ON value
5	Humidity Triger-OFF Value	1	20~99 or 99	%	40 / 99	Set humid. trigger-OFF value to be _%. 99: Clear Humid. trigger-OFF value
6	Auto Report (Time Interval)	2	1~1439 or 99	Minutes	0/0	Set auto report time interval to be _ mins 0: Disable auto report
7	Auto Report (Temp. Change)	1	1~70 or 0	Degree	0/0	Set auto report temp. trigger interval to be _ degree. 0: Disable auto report
8	Auto Report (Humid. Change)	1	5~70 or 0	%	0/0	Set auto report humid. trigger interval to be _ %. 0: Disable auto report

Note:

※ Default set is the preset value of the detector. For instance, if default set of Temp. trigger-ON is selected, the detector will be triggered ON if temperature reaches 30° C. You can skip the hassle of selecting a value from -20 to 50 degrees if default set is selected.

※ Factory default value is the original value of the detector without any setting. Once the function of reset is executed, the detector will be restored to its factory default status, so as the settings.

2-1 Auto Report

2-1-1 Time Interval

The HM-TD001 can be set to emit report of current status to the nodes of Grouping 1 automatically at a set time. The time interval can be set from 1 minute to 24 hours. For instance, if time interval is set in 1 minute, the detector will report its status once per minute. Please refer to the parameter 6 of configuration table on page 6.

2-1-2 Temperature Change

The HM-TD001 can be set to emit report of temperature status to the nodes of Grouping 1 automatically once the temperature changing exceeds set degree. The temperature difference range can be set from 1°C to 70°C. For instance, if temperature difference is set in 1°C, the detector will report its current temperature status once the temperature difference exceeds 1°C. Please refer to the parameter 7 of configuration table on page 6.

2-1-3 Change of Humidity

The HM-TD001 can be set to emit report of humidity status to the nodes of Grouping 1 automatically once the humidity change exceeds set %RH. The humidity difference range can be set from 5%RH to 70%RH. For instance, if humidity difference is set in 5%RH, the detector will report its current humidity status once the humidity difference exceeds 5%RH. Please refer to the parameter 8 of configuration table on page 6.

Note: Auto report mechanism may cause a lot of power consumption if it operates regularly. Please base on actual requirements for determining whether to enable the function of auto report.

2-2 Wakeup Configuration

The HM-TD001 stays in sleep status for the majority of time in order to conserve battery power. However, it can be woken up by either triggers of temp./humid. or set time for the controller to do further setting.

2-2-1 Wakeup Time Interval

The detector stays in wakeup status for 10 minutes. If the detector receives RF command from the controller during these 10 minutes, it will extend waking time for another 10 minutes until no more RF command is received. Once the wakeup time is up, the detector goes back to sleep status.

2-2-2 Sleep Time Interval

The sleep interval can be set from 1 minute to 4660 hours (about 194 days). The unit of time is in seconds. The preset sleep time interval is 1 hour.

3. Command Classes

The Temp./Humid. Detector supports Command Classes including…

* COMMAND_CLASS_BASIC
* COMMAND_CLASS_VERISON
* COMMAND_CLASS_BATTERY
* COMMAND_CLASS_WAKE_UP_V2
* COMMAND_CLASS_CONFIGURATION
* COMMAND_CLASS_ASSOCIATION_V2
* COMMAND_CLASS_MANUFACTURER_SPECIFIC
* COMMAND_CLASS_SENSOR_MULTILEVEL
* COMMAND_CLASS_MULTI_INSTANCE_V2

Troubleshooting

Symptom	Possible Cause	Recommendation
LED cannot be displayed	1. Run out of battery power. 2. Check if reverse	1. Replace a new battery 2. Refit the battery with correct polarity

	battery polarity	
Temperature/humidity reading is incorrect	The Detector is out of order	1. Please leave the detector without operating or do any setting for a period 2. Do not open the detector; send it to the local retailer.

Specifications

Operating Frequency	868.42 MHz (EU) / 908.42 MHz (US)
Operating Temperature Range	-10℃ ~ 50℃
Relative Humidity Range	20% ~ 90%
Temperature Unit	℃ / ℉
Battery Type	1.5V x 3 Alkaline/AA type battery
Operating Range	Up to 30 meters line of sight (indoor)

Specifications are subject to change without notice A501111158R01

Federal Communication Commission Interference Statement

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

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

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.

FCC Caution: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

WARNING:

Do not dispose of electrical appliances as unsorted municipal waste, use separate collection facilities.

Contact your local government for information regarding the collection systems available.

If electrical appliances are disposed of in landfills or dumps, hazardous substances can leak into the groundwater and get into the food chain, damaging your health and well-being.

When replacing old appliances with new once, the retailer is legally obligated to take back your old appliance for disposal at least for free of charge.