SMT – 850

™

Halo

Colour Wi-Fi Thermostat
with Zone Control

Table of Contents

Welcome

Thank you for your purchase of the Smart Temp Australia P/L SMT-850 Halo™ thermostat. This device has been designed and built by Smart Temp Australia P/L to be an exceptionally reliable and advanced climate control system. Great effort has been taken to ensure that the SMT-850 HALO™ is extremely easy to use and capable of controlling a large range of Heating, Ventilation and Air Conditioning (HVAC) systems in the most energy efficient manner possible.

This manual is comprehensive and detailed and as such is quite large. Fortunately, this document is not a novel that you need read from cover to cover, simply use the Table of Contents to select the parts of the manual that are of interest to you and disregard the parts of the manual irrelevant to your needs.

Note, The SMT-850 HALO™ is a very powerful heating and cooling controller with many advanced functions that may or may not be active on your Halo, such as 365-day scheduling, outside air free cooling (economy cycle) and integrated zone control with temperature monitoring. It also has the capability to operate as a residential or commercial programmable thermostat or simple manual thermostat so please disregard parts of this manual that deal with functions not enabled in your system.

Smart Temp are committed to producing a quality product and supporting it with relevant and informative documentation. If you find an error with the SMT-850 HALO™ or in any of the supportive documentation, please send an email to admin@smarttemp.com.au and detail the problem. We will respond quickly to remedy the issue.

What's in the Box?

User Quick Start Guide
The Quick Start Guide is a small document that will assist with the most basic user questions such as turning the SMT-850 HALO™ on or off or setting up the Wi-Fi. This Quick Start Guide is not intended as a comprehensive installation and user manual.

Micro-SD card 1Gb micro-SD fitted in the micro-SD card slot

Complimentary Ball point Pen (while stock last)

SMT-850 HALO™ Wall Controller
The Wall Controller display is the user interface and control hub of the SMT-850 HALO™ climate control system. It connects to all field devices directly such as the heating and cooling systems and zone dampers (if applicable).

It has a 178 cm (7 inch) colour touch screen and an easy-to-use colourful graphical user interface.

The SMT-850 HALO™ Wall Controller may have a protective film on the touch surface which will need to be removed prior to use.

This manual is divided into sections - being User information that describes how to live with the SMT-850 HALO™ and the installer section that details how to efficiently setup, install, configure, and test the thermostat. You may be restricted access into the Installer section.

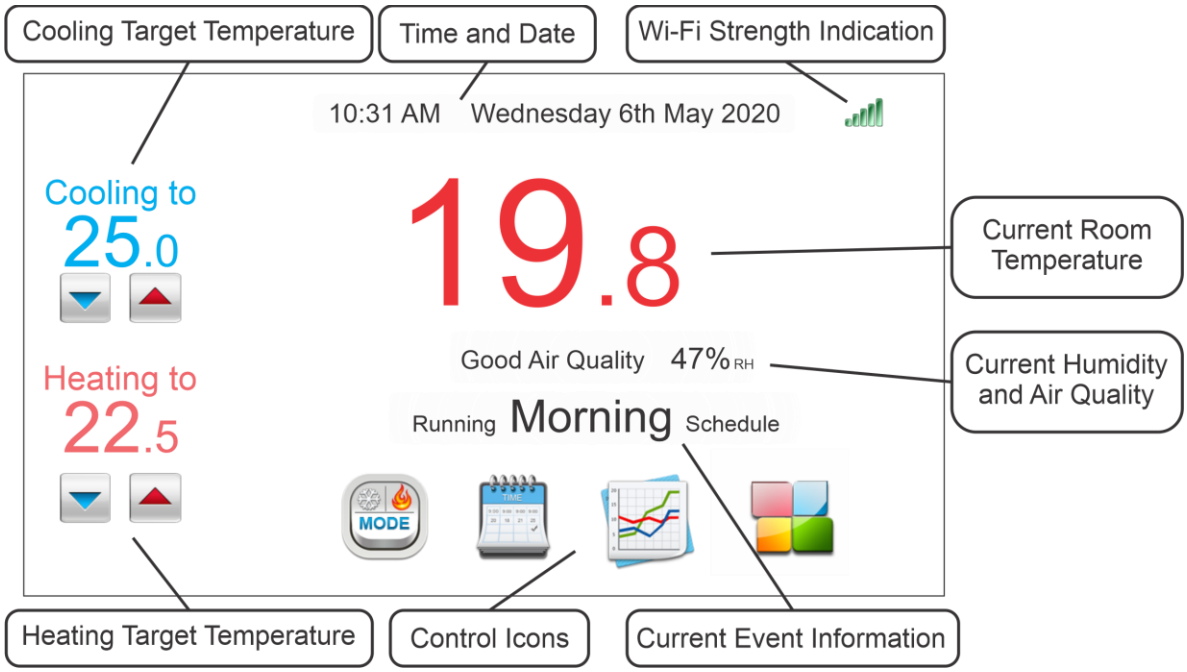
Part 1 - User Instructions

Introduction to the SMT-850 Halo™

The User Interface

The SMT-850 HALO™ features a 7" Touch Window and a colour display. Using this interface, you can set your desired heating and cooling temperatures, schedules, and perform various other actions. If your SMT-850 HALO™ is connected to local Wi-Fi, you can adjust settings with your Smart Device from anywhere with internet access. Caution: data fees may apply – check with your internet provider.

Your installer will have configured your SMT-850 HALO™ to meet the requirements of your heating and cooling system. Due to this, not all parts of the display or functions described in this manual may be available on your SMT-850 HALO™.



Navigating the Home Window

The main window icons may change depending on what functions may be enabled on your SMT-850 HALO™.

Alert Indicator (not pictured)

If a fault or condition requires your attention, an Exclamation Mark icon will be shown on the lower edge of the display. Touching this icon opens the Information page detailing the problem and suggesting solutions.

Time and Date

Displays the current date and time. The format can be adjusted in the settings window. If connected to the internet via Wi-Fi with automatic date and time update selected, it will synchronize with internet time for your region. *(Note - the location information used for the time (and weather) is taken from the device used to pair the SMT-850 Halo to the App. The location information can be seen in the App).*

Wi-Fi Strength / Fault

If connected to the internet via Wi-Fi, a signal strength indicator will show. Solid green bars indicate a strong and reliable signal, while turning RED indicates a problem requiring attention.

Current Room Temperature

The room temperature is prominently displayed in the centre of the screen. It shows either the current temperature at the SMT-850 HALO™ Wall Controller's location or, if zoning is enabled, the temperature at the selected location for temperature sensing (See Zone Control on page 16 of this manual). The temperature display will change colour to indicate the current SMT-850 Halo status. White indicates the SMT-850 Halo™ is OFF. Green will indicate that although that SMT-850 Halo ™ is on, no temperature control is requested. A Red temperatre display indicated that the SMT-850 HALO™ is asking for heating and Blue indicates the SMT-850 HALO™ is asking for Cooling.

Indoor Air Quality (If fitted)

Your SMT-850 HALO™ can be optionally fitted with a highly accurate and reliable a Non-Dispersive Infrared Carbon Dioxide sensor. High levels of CO2 indoors indicate poor air circulation and can indicate "sick building syndrome". The XUX can displace the current levels of CO2 as "Good", "poor" or "Bad" or in a Parts Per Million value. Additionally, the SMT-850 HALO™ can actively respond to high levels of CO2 in several ways depending on how the installer has set up your SMT-850 HALO™.

Note, when your SMT-850 HALO™ is first powered up (or after a power reset) the IAQ reading may display "---" or " 0ppm" for 3 minutes until the NDIR CO2 sensor stabilise. Please disregard ant reading during this first 3 minutes.

Adjusting Your Heat and Cool Set Points

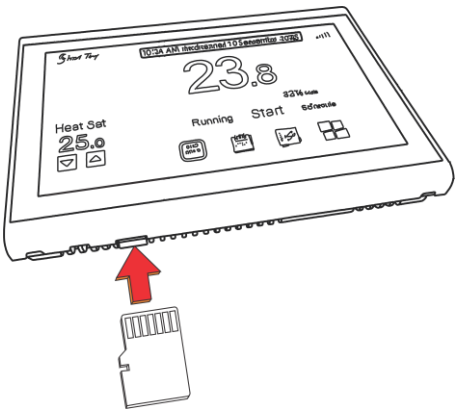
Active heating and cooling set points are shown on the left edge of the SMT-850 HALO™ colour display. These values are either manually set by tapping the up or down button for heating or cooling, or may change automatically based on any temperature programs that you've set (see Programming your SMT-850 HALO™ on page 13 of this manual).

Override Period

If you edit a desired temperature by tapping a temperature up or down button for your heating and cooling. A confirmation window will open that will permit you to confirm how long you wish your new desired temperature to be maintained for. (2 hours is the default)

Please note that the SMT-850 HALO™ ensures the cooling set point is higher than the heating set point. If you attempt to overlap or set them too closely, the SMT-850 HALO™ will automatically adjust the opposing set point.

SD Card



The SMT-850 HALO™ has a Micro SD card slot in the lower left of the screen. This Micro SD card has several uses such as, forcing a firmware update from Code on the Micro SD card (Halo/firmware directory). Storing any data logging, storing (or restoring) configuration files for system settings or 365-day holiday schedules and, storing images that you may want to use as a wallpaper (Halo/wallpaper directory) or as a slide show (in JPG format and sized at 600 x 1024 pixel)

Push the micro-SD card in slightly and you will hear a click, and it will pop out. To reinsert just push the micro-SD card in until you hear a click. The micro-SD card can only be inserted one way (gold finders facing you). Please ensure that you are putting the micro-SD card into micro-SD card reader slot and not pushing it into the gap in the plastic enclosure.

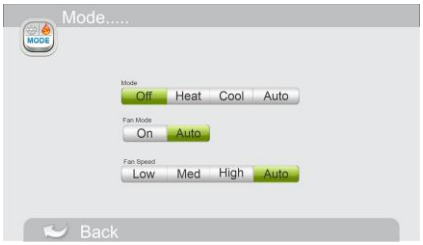
Icons

Icons provide you with information or permit you to adjust a function when touched.

Mode Icon

Touching the MODE icon opens the Mode Window, allowing you to select how your SMT-850 HALO™ controls temperature. It can operate in heating only mode, cooling only mode, auto mode (switching between heating and cooling setpoints automatically). Aditionally, you can adjust how your heating and cooling fan system in various ways.

It is recommended to keep your SMT-850 HALO™ in Auto mode for ease of use and best comfort.



Off

No heating or cooling in your home or office, even if the room temperature rises or falls. *(Your installer may have enabled the "Anti-Freeze" function, a heating temperature of 5°C (41°F) is maintained 24/7. Additionally a Standby heating and cooling temperature may have been enabled)*

Heating Only Mode

In Heating only mode, your SMT-850 HALO™ heats your home or office to the desired temperature however it does not cool regardless of how warm it becomes.

E. Heat Mode

E. Heat mode is typically an alternate heating mode that is used when the primary heating source is unsuitable or unavailable. The E. Heat mode can either be manually selected by you or automatically selected by the SMT-850 HALO™ (or both) as defined by the installer preferences.

E. Heat mode is often more expensive to run than your primary heat source, hence its limited use.

Cooling Only Mode

In Cooling only mode, your SMT-850 HALO™ cools your home or office to the desired temperature however it does not heat regardless of how cool it becomes.

Auto Mode

In Auto mode, your SMT-850 HALO™ decides whether to activate heating or cooling to maintain your preferred comfort level, recommended if zoning is activated.

Fan Mode

Fan Auto

Intelligently controls your heating or cooling fan.

Fan Continuous

The fan runs continuously until manually turned off, improving air circulation.

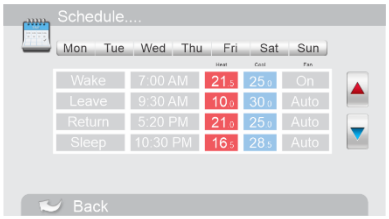
Fan Speed (If fitted)

You can manually select a fan speed or let the SMT-850 HALO™ choose based on the current room and set temperature. It is recommended to leave the fan speed mode in Auto.

Program Icon

This icon is available if your SMT-850 HALO™ has the Programming function enabled by your installer.

It opens the Programming or Scheduling Window to view or edit your temperature program.



A detailed explanation on how to adjust your temperature program or schedule is provided on page 13 of this manual.

Zone Icon

This icon is available if your SMT-850 HALO™ has the Programming function enabled by your installer.

Tapping the Zone icon will open the Zone Control Window. This will permit you to restrict or permit the flow of conditioned air to various locations in your home or office. If enabled by your installer, this window may also permit you to select which location the SMT-850 HALO™ measures the temperature from. More information on Zone Functions can be found on page 16

A detailed explanation on how to adjust your zoning is provided on page 16 of this manual

Timer Icon

The timer icon will be shown whenever a timed function can be invoked, In Commercial Programmable Mode, for example, this icon will be shown when the "After Hours Run" timer can be used to provide a timed amount of conditioned air when the building is predicted to be vacant.

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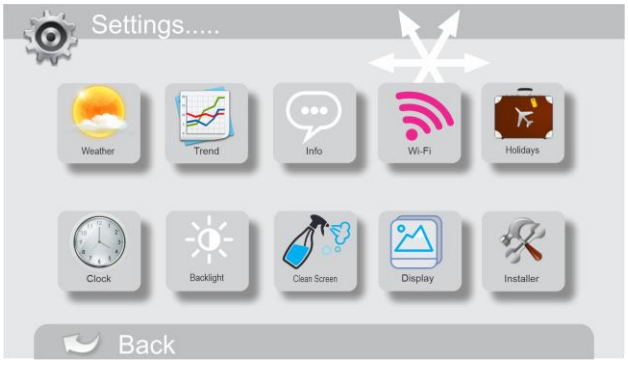
Settings Icon

Tapping the Settings Icon will open the Settings Window. Within this Window you be presented with up to ten icons per page. You can swipe left or right to reveal more settings.



When you tap an icon, you will be typically shown another window where you will be able to adjust the function you selected.

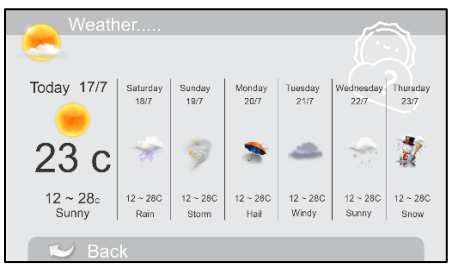
Tapping a check box will change its colour to green to indicate the selected function is currently active

Some options will show a larger box, touching the box it will highlight yellow to show that it has been selected. Using the up and down arrows on the right of the page permits you to advance forward or backwards through the options available for the selection.

The function of these icons is given below.

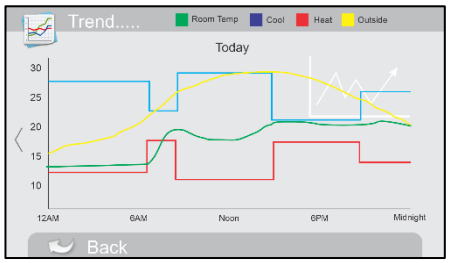
Weather

Pressing this button will open the weather info window. This window will give you a 7-day forecast of local weather conditions taken from an online weather server. Current measured outside air temperature will be shown on the top right if you have the optional outside air sensor installed.



Trend

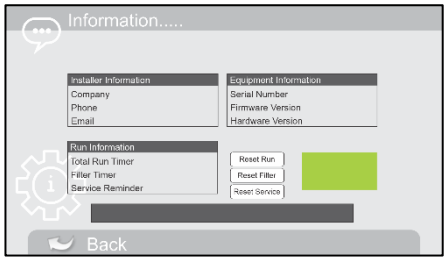
The trend window will provide you with a moving 7-day history of the setpoints used, the room temperature as well as the outside air temperature (provided the optional outside air sensor is fitted). You will be able to zoom into a given day or see a weekly overview of all data monitored. Ideally the green room temperature line should reside within the blue cooling setpoint and red heating setpoint lines.



Info

The Information window will display any system errors that are detected as well as run time information (such as filter cleaning reminders) that maybe set in your SMT-850 HALO™

Your installer may have entered their contact details into your SMT-850 HALO™, these can be viewed in this window.



Wi-Fi

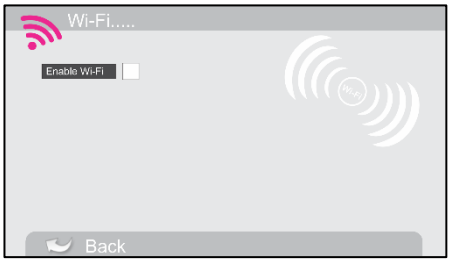
The SMT-850 HALO™ is a Wi-Fi enabled device. This feature permits you to control and monitor your SMT-850 HALO™ remotely via a web portal or portable Smart Device such as an iPhone™ or Android™ device. Via the SMT-850 HALO™ website you are also able you to calculate and log energy consumption and provide real-time alerts of potential issue that maybe effecting your heating or cooling system. Visit www.thermostat.com.au to log into your account.

It is recommended that you set up any new account on your app or on the web portal prior to connecting the SMT-850 HALO™ to the local Wi-Fi. Please download the free SMT-850 HALO™ Thermostat App from the Apple App store or Android Google Play store. Instructions are provided on the App to guide you through setting up an account.

Enable Wi-Fi

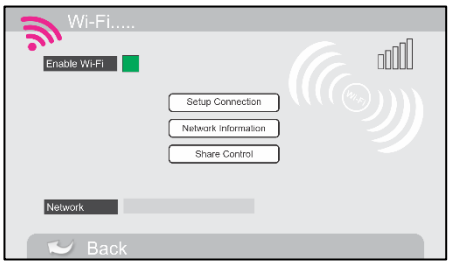
When this box is checked the Wi-Fi hardware in your SMT-850 HALO™ will be enabled. This will then permit you to setup or re-establish connection with your local Wi-Fi router so that communications with your local Wi-Fi can begin.

If you do not wish for your SMT-850 HALO™ to be connected to the internet or to be controlled via the App, do not check this box.



Setup Connection

Pressing this button will take you to the Wi-Fi Network Discovery window. In this window you will be able to set up a new connection or change your existing connection to a different router or network. When you first enter the Network Discovery window the SMT-850 HALO™ will scan for new networks within its range. Simply select the name of the network you wish to pair. If there are multiple networks available, scroll up or down to locate the network you wish to join. If the network is password protected, you will be prompted to enter the network password.

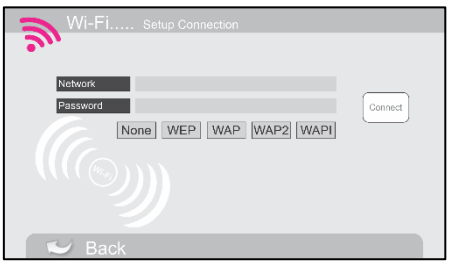


Rescan

If the name of the Wi-Fi network, you wish to join is not shown and you know the network is not hidden. Press the re-scan button to force the SMT-850 HALO™ to begin the network search again.

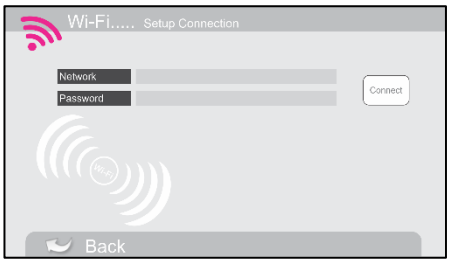
Hidden Network

If the Wi-Fi network, you wish to join is hidden (does not broadcast the network name (SSID)) press the hidden network button. The SMT-850 HALO™ will open the Hidden Network Window. You will need to manually enter the network name, the Wi-Fi network password and select the correct security protocol.



Network Security

None – No password is needed. The network is open.
WEP – This is an older security protocol and not typically used due to poor security.
WAP – This is a more recent security protocol but marginally better than WEP, so not popular.
WAP2 – This is a common protocol due to high level of encryption.
WAPI – This is not a popular encryption Protocol.



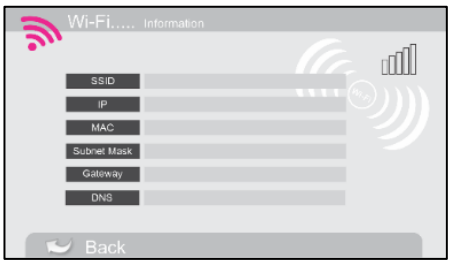
Broadcasted Wi-Fi Network

If the Wi-Fi network name you wish to join is shown on the list of available Wi-Fi networks simply tap the name of the Wi-Fi network, you wish to enter. You will jump to the Wi-Fi connection window. Simply enter the password for your network and press connect. The SMT-850 HALO™ will then pair with the Wi-Fi network.

You will be given a Connections Success or Failed confirmation. Your SMT-850 HALO™ will first attempt to connect to the selected Wi-Fi network. Once it does this it will try to log onto our server. If the SMT-850 HALO™ passes both tests (logging onto the local Wi-Fi network and connects to our sever) it will show the Pair App box. Tap this box and follow the instructions to pair your app to your SMT-850 HALO™. If a firewall or other device prevents the SMT-850 HALO™ from reaching our server, you will not receive confirmation of a successful connection.

<u>Wi-Fi Information</u>

Pressing the Wi-Fi network information button will give you details about the Wi-Fi network the SMT-850 HALO™ is currently connected with.



<u>Pair the App</u>

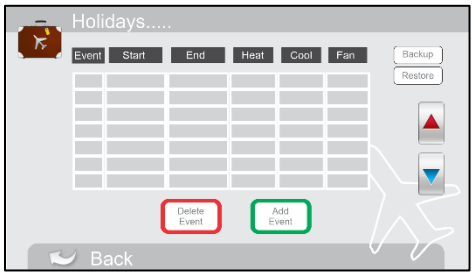
When you wish to connect your smart device app to your SMT-850 HALO™ for the first time or give others access to other people you need Pair App button. A window will open showing a QR code. From within the SMT-850 HALO™ App, using your smart device camera scan the QR code shown. Your SMT-850 HALO™ will now be visible and able to be controlled on your smart device.

You may optionally set up a password on your SMT-850 HALO™ to prevent un-authorised people scanning the QR code to control your SMT-850Halo™ remotely. Add PIN protection but be sure not to forget this PIN as this will prevent you from re-pairing should you need to in the future.

Holiday schedule

The SMT-850 HALO™ can store and use up to 16 holiday schedules in memory. When a holiday date event arrives the SMT-850 HALO™ will display "Holiday Active" in the Home Window to indicate that a holiday set temperature are being used even though the heating and cooling set temperatures will not be displayed.

If the SMT-850 HALO™ is in holiday mode, the timer button will be shown and to permit the heating and cooling system to be temporarily overridden. When the override timer is active, setpoints can be adjusted to maintain comfort levels during holiday periods.



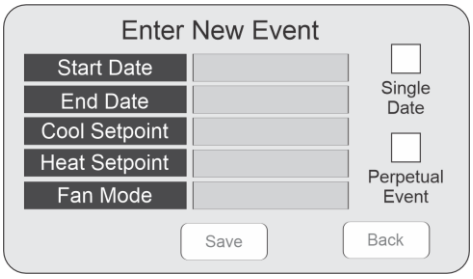
To add a new event simply touch the "Add Event" button and the new Holiday event window will open.

The SMT-850 HALO™ will sort the holiday list from nearest holiday to most distant holiday start date. Perpetual holidays are shown at the top of the list.

In the Holiday event edit window tap the start Date and enter the date as DD MM YY *(you don't need enter the "/")* keyboard to enter the value. (By default, the SMT-850 HALO™ will start with today's date). Enter the end date if the holiday lasts a few days.

If the holiday is a single day, tap the Single Date Checkbox (the end date field will not be shown) and the holiday event will expire at the end of the date selected.

If the holiday occurs on the same date every year tap the Perpetual Holiday box. This event will never self-expire and must be deleted manually.



If you want to delete a holiday, tap it to select it and then the delete holiday box. A confirmation window will pop us asking if you are sure you wish to delete the holiday.

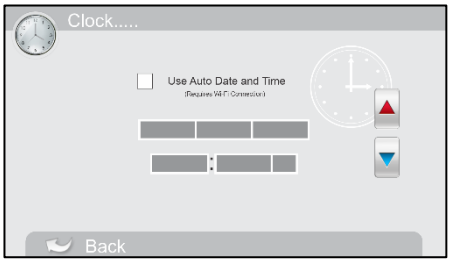
A holiday event starts and ends at midnight for the dates entered the holiday fields.

When a non-perpetual holiday has expired it will automatically be deleted from the SMT-850 HALO™ holiday memory.

You are also able to back up the holiday memory to the micro-SD card or restore a previously backed up holiday memory. This will greatly assist if you plan on installing multiple SMT-850 HALO™ that will all have the same holiday settings.

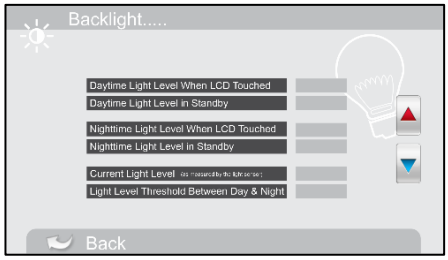
Time & Date

The SMT-850 HALO™ has an inbuilt 365-day time clock capable of accuracy of a few seconds per month. You can manually set the time if you wish and use the SMT-850 HALO™ internal clock only. A better method if you have the Wi-Fi enabled is to synchronise the SMT-850 HALO™ clock to the local time using the internet. Selecy "Use Auto Date and time" *(Note, the time zone used for the clock is taken from the device that was used to pair the SMT-850 HALO™ to the App)*



Backlight

The SMT-850 HALO™ is fitted with an ambient light level sensor that will automatically dim the Backlight (or turn it off) when the room the SMT-850 HALO™ is installed in becomes dark, such as a bedroom.



Additionally, you are permitted to set a separate backlight level for when the thermostat is being used (touched) and when the thermostat is in standby (has not been touched for some time).

Note - If you have the Photo setting enabled the backlight level set in this menu will affect how the photo is displayed.

Daytime Active Level

This sets the level of the SMT-850 HALO™ backlight when the room is bright, and the display is touched.

Daytime Standby Level

This sets the level of the SMT-850 HALO™ backlight when the room is bright, and the display has not been touched for longer than 1 minute.

Night-time Active Level

This sets the level of the SMT-850 HALO™ backlight when the room is dark, and the display is touched.

Night-time Standby Level

This sets the level of the SMT-850 HALO™ backlight when the room is dark, and the display has not been touched for longer than 1 minute.

Current Light Level

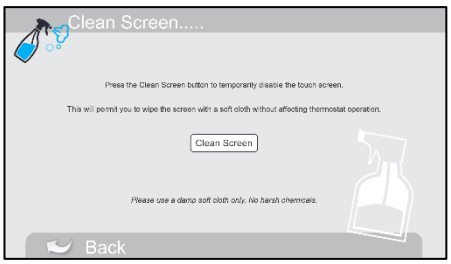
This value is not adjustable. It indicates the current level of light in the room. Please do not stand in front of lights or cast a shadow on the SMT-850 HALO™ wall controller when viewing this value as it will affect the accuracy of the display.

Light Level Sensitivity (Day Night Threshold)

Using the Current Light Level value discussed above you can set a threshold value that will switch between daytime and nigh time values. When the ambient light is above this threshold the daytime backlight values will be used. When the ambient light is below this threshold value the night-time backlight levels will be used.

Clean Screen

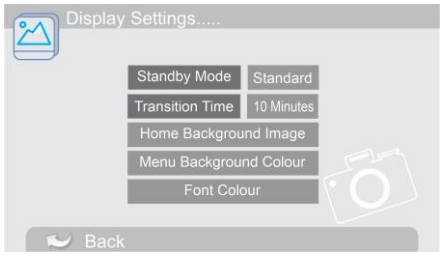
The clean screen window will temporarily disable the SMT-850 HALO™ touch interface so to enable you to wipe the screen without affecting any of the settings of the SMT-850 HALO™.



A 30 second countdown timer will indicate how long the touch interface will remain disabled. Once the countdown reaches Zero normal SMT-850 HALO™ function will resume.

Display

Your SMT-850 HALO™ colour display can show pictures that are stored on the SD card when the thermostat is not being touched.



The Photo functions work in conjunction of the SMT-850 HALO™ backlight settings. If your SMT-850 HALO™ is set to turn your backlight off when it detects the room is dark, you will not be able to see your picture slideshow during this period.

You must load your slide show images into the (supplied) micro SD card into the directory halo/images. The images should be formatted to a size of 600 x 1024 and be in JPG format. *(You should be able to feel the micro SD card by running your finger along the underside of the plastic, just slightly to the left of the Mode button)*

If enabled, the picture slideshow will start approximately 1 to 2 minutes after the last button press.

Standby Mode

You have several options.

Standard – The display will not change when the thermostat is not being touched. The same wallpaper and graphics will be displayed.

Simple – Black. *(pictured right)* After a moment the screen will show the current room temperature as green when no heating or cooling is needed, red if heating is running, blue if cooling is running and white it the SMT-850 HALO™ is OFF.

Simple – White. Same as simple black described above however the background colour is white and the text for off mode is Black.

Slideshow – will display any images stored on the micro-SD card (saved in 600 x 1024 pixel in JPG format) in an endless loop.

Transition Time

Permits you to set the time in minutes each picture is shown before advancing to the next image. The images loop endlessly.

Home Background Image

Your SMT-850 HALO™ comes with a library of stock images that can be used as a wallpaper and shown behind the graphics of the main window to add some personality to your SMT-850 HALO™. You are also able to upload your own custom images into the SMT-850 HALO™ library should you wish. The size must be formatted to 600 x 1024 pixel.

To upload an image, tap the Add/Remove Backgrounds button in the bottom right of the window.

Menu Background Colour

You can customise the colour of windows that have a solid background colour. Select from a library of available colours.

Font Colour

Changing the main window image may mask some of the text, so you are permitted to select a main window font colour from a library of available colours.

Setting and Editing Your Schedules and Temperatures

Manual Operation

Your air conditioning installer may have set your SMT-850 HALO™ to Manual Mode, where there is no automatic temperature adjustments based on time clock control. Although the time and date may still be shown in the Home Window, it is there for informational purposes only.

In Manual Mode, you simply select whether you want heating only, cooling only, or auto Heat/Cool mode and the temperature you wish to maintain. The SMT-850 HALO™ will then ensure the desired temperature is maintained until you either manually set another temperature or the SMT-850 HALO™ automatically turns off (See Auto Off timer below).

Auto Off Timer

In manual mode, whenever you adjust a temperature, an option box may appear that lets you select how long you wish the new temperature to last before the SMT-850 HALO™ thermostat automatically turns OFF. You need to make your timing selection within 5 seconds, or the SMT-850 HALO™ will automatically select "Never," meaning it will not automatically turn off but run at the current value until you manually turn it off sometime in the future. If you select a period such as 2 hours, the SMT-850 HALO™ will automatically set the thermostat mode to OFF in two hours. A reminder will be shown on the Window indicating the time of day the SMT-850 HALO™ will turn off.

Note, the SMT-850 HALO™ clock must be accurate if you select the "Midnight" option.

To cancel an Auto Off time, touch where the SMT-850 HALO™ is displaying turn off time.

Hospitality Mode

Hospitality Mode is used when minimum user interaction is desired to ensure comfort. Hospitality mode has only one user Window available, the Home Window. Only esential icons are show to reduce user error. The Thermostat Mode (Heat Cool OFF), Fan Mode, and Speed icons are shown on the lower edge of the Window.

When the SMT-850 HALO™ is in Hospitality Mode, the installer may have set one of the Universal Inputs for "Manual Unoccupied Mode." When the input is active, the SMT-850 HALO™ Home Window will show "Alternate Set Point in Use" and replace your set points with the set points entered in the Unoccupied set point option (See page 37 for setting this value). When the selected Universal Input is no longer active, the last user set points will return.

A concealed entrance permits an authorised person to enter the Settings Window. First press and hold the top left of the display for 5 seconds to show the settings window. You may be prompted to enter a PIN . Enter the correct PIN to proceed to the options menus The default pin is 0021.

If the SMT-850 HALO™ is used in hotel rooms etc, Logos and room numbers can be displayed as well as custom background images.

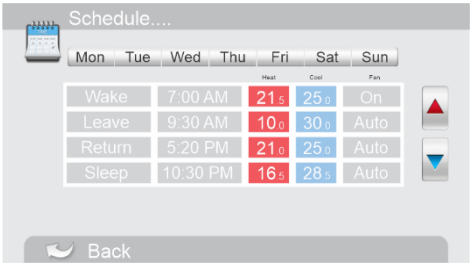
Programmable Operation

The SMT-850 HALO™ has two programmable modes, one tuned to the needs of the home and the other with specific abilities suited towards controlling an office air conditioning system.

Residential Programmable Mode

Residential programming (also known as a schedule) in the SMT-850 HALO™ is designed for those who generally live a structured lifestyle. Monday to Friday, the family wakes at about the same time, leaves home at about the same time, and returns home at roughly the same time each day etc.

Setting or Editing Your Daily schedule

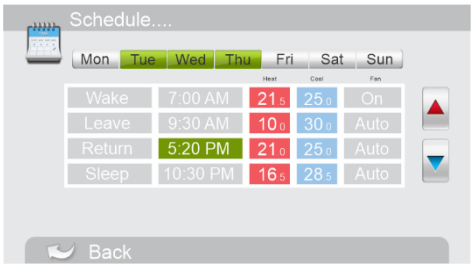


From the Home Window simply tap on the Schedule Icon to open the Scheduling Window.

You will see a window resembling that shown to the left. The current day of the week will be highlighted.

Tap the day(s) of the week that you wish to edit. As you tap each day, they will become highlighted to indicate they are selected. Tap again to de-select a day.

Next, select the value you wish to edit, such as the return time as shown in the example to the right. It will highlight to show it has been selected. Using the up or down buttons, adjust the return time to the time that you wish. Edit other times or temperature values the same way until your schedule is set.



If Programmable Fan is enabled by your installer, you will also be able to tap the fan icon for each program event to toggle the Fan Mode between Auto Fan or Fan ON. (see Fan Modes on page 6 of this manual).

Press the back button to save your changes and the new program will be in effect.

(Note, the event names in residential programmable mode by default are "Wake, Leave Return" and "Sleep" however these names can be edited should you wish by pressing and holding the event name from within the schedule window).

Temperature Override

As good as scheduling is, there are times when you may want to be a bit warmer, or you may be home earlier than expected. Using your smart device or the SMT-850 HALO™ wall controller, you may adjust the set temperature to your new desired value. The SMT-850 HALO™ will then show a selection of override time periods. Tap the override time that you wish your new temperature to be maintained for. If you do not select a value within 5 seconds, your SMT-850 HALO™ will automatically select 2 hours.

Commercial Programmable Mode

Like many other functions within the SMT-850 HALO™ it is extremely customisable. To this end the "MORE" icon is protected by a PIN to prevent unauthorised tampering with many of the advanced settings. The default PIN is 0021 *(this may have been changed by the Installer).*

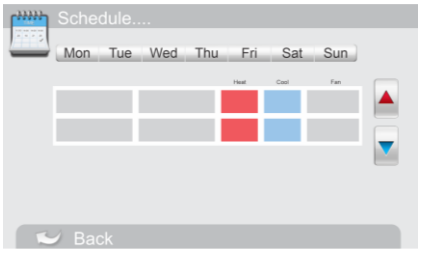
Controlling an air conditioning system in an office sometimes presents some unique challenges. The most important criteria are maintaining the office temperature at a comfortable level with the minimum amount of input from the occupant. Equally important is maintaining the temperature as economically as possible.

Achieving these goals often means restricting user access to some potentially energy-hungry and wasteful settings.

In Commercial Programmable Mode, the SMT-850 HALO™ permits the staff to set the building's start and stop times, as well as the building's start temperature. It will, however, prohibit the adjustment of the stop event temperature (or the temperature that are used when the building is empty*). (Note, the event names by default are "Start" and "Stop" however these names can be edited should you wish by pressing and holding the event name from within the schedule window).*

This setting is in the PIN-protected Installer Menu (Page30). See page 37 for setting the stop (setback) event temperature. *(As the schedule name can be edited by the user / installer, the Installer menu item name for the unoccupied period name (stop in this example) is "setback")*

Programming "Start" Event Temperatures

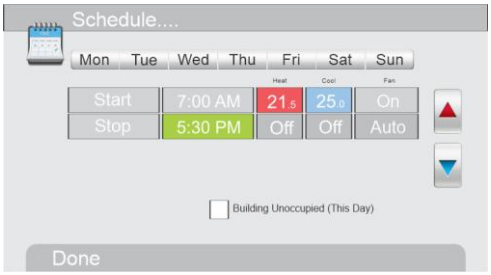


When set for Commercial Programmable Mode programming your weekly schedule into the SMT-850 HALO™ is a simple and straightforward process.

From the Home Window tap on the Schedule Icon to open the Scheduling Window.

You will see a window resembling that shown to the above. The current day of the week will be highlighted.

Tap the day(s) of the week that you wish to program. As you tap each day, they will become highlighted to indicate they are selected. Tap again to de-select a day.



Next select the value you wish to edit, such as the Stop time as shown in the example to the right. It will highlight to show it has been selected. Using the up or down buttons, adjust the Stop time to the time that the building becomes un-occupied. Edit other times or temperature values the same way until your schedule is set.

You are NOT permitted to adjust the "Stop" schedule heating and cooling temperature and fan modes. These are protected in the installer menu and can only be set in the Installer Options Window. The current values that the installer has set are displayed. See page 37 for information on setting the "Stop" event temperatures.

In summary, touch what you wish to edit and then adjust the selected value with the Up/Down buttons.

Press the Done button to save your changes. The new program will be in effect.

Commercial Mode After Hours Timer Override

Whenever the SMT-850 HALO™ is in commercial programmable mode and the "Stop" event is running the LCD will show an "Override" icon on the Home Window. Pressing this button will start a run timer (for the pre-set time within the installer menu - see page 39). When the afterhours timer is running the SMT-850 HALO™ will use the Start event temperatures and permit you to adjust if necessary.

If the centre of the display (where the expiry time is display) is pressed while the afterhours timer is running the SMT-850 HALO™ will cancel any un-expired portion of the timer and the setback values will be used (after any minimum run on or fan purge timers have expired).

While the afterhours timer is running, you will be able to adjust your set temperatures as you would normally. Note – you are unable to adjust the Stop event temperatures.

Zone Overview

A common analogy of zone control is to compare your heating and cooling systems to your home or office lighting system. You do not have a single switch that turns every light in your home on and off in unison. Zoning is to air conditioning what multiple light switches are to home lighting. The intelligent distribution of the resource to meet the demands of the environment or user in an efficient manner.

Zoning consists of several parts. You have an air conditioning system that produces warmed or chilled air. To bring the conditioned air from your air conditioning system to all parts of your home or office there is a network of ducts or pipes that radiate out to the various arears of your home or office (Called Zones). In these ducts there is an electrically operated "valve" know as a damper. This damper opens to allow the flow of air or closes to restrict the flow of air to the zones.

If Zoning is enabled on your SMT-850 HALO™ you will see a Zone Icon on the Home Window. Tap this button to open the Zone Control Window. It will look like the window to the right and will show the number of zones installed in your SMT-850 HALO™, from two to four zones. A four-zone system is pictured right.

Each zone installed will have a Zone Button. Depending on the configuration set by the installer, the Zone Button will show the Zone name, the Zone temperature (if the zone has a temperature sensor fitted), whether the zone damper or valve is open or closed (if a damper is fitted) or if that zone's temperature is being used to control your air conditioning system - shown by the temperature icon in the zone window.

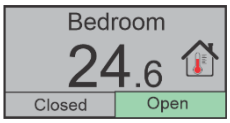
The SMT-850 HALO™ Zone Control Logic will have been configured by your installer to best suit your needs and or the capability of your heating or cooling system. As such, not all functions detailed below may be available on your SMT-850 HALO™.

Opening and Closing a Zone

If the zone has a damper fitted it will show the Closed /Open box at the bottom of the Zone Button. To open or close a zone tap the Open / Close section. The text will be green or Red to indicate the zone status. When green (open) conditioned air can flow into the zone. When Red (closed) conditioned air will not flow into the zone.

Select Zone temperature sensing's location.

If a zone icon displays a temperature, it has a temperature sensor fitted as in the Bedroom example right. (Zone 1 will always display a temperature as this is the zone that the SMT-850 HALO™ is in)



Tap the Temperature Icon to use that zones temperatre sensor. This temperature will also be shown as the main control temperature on the main window.

If multiple zones are selected to measure temperature, then the SMT-850 HALO™ will average the temperatures of the selected zones and display and control to the average temperatures.

Complex Zones

As described above, Zones can have a temperature fitted sensor so that temperature can be measured within the zone or a damper fitted to control the flow of air into that zone. Zones can also have both a damper and a temperature sensor fitted if required and the same functions apply. Tap open or close to control the flow of air or tap the temperature icon to select or de-select where the temperature is measured.

Zone Safety System

Climate system zoning is a powerful tool, however there are some Air conditioning system requirements that must be met to ensure the air conditioning system performs in an efficient and reliable fashion.

The SMT-850 HALO™ air conditioning safety managements systems are very capable of providing a high level of protection for the air conditioning system while still proving you with a comfortable environment. Please be tolerant of the safeguards and the impost they make on your needs. These systems were put in place for your benefit.

Fan Speed Limiting

If your air conditioner is fitted with 3 fan speeds, or a variable speed fan there may be times when your SMT-850 HALO™ will limit the fan speed. The medium, high and auto fan speeds may show as grey, indicating that they are locked out and unavailable. When safe to do so your SMT-850 HALO™ will return the fan speed to your previous selection and you will be free to adjust your fan speed again.

Minimum Zone Demand

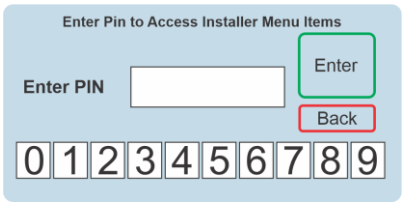
If you wish to close a zone your SMT-850 HALO™ may chirp and display a message in the upper right corner of the window “Please Open Another Zone First” or “System is waiting for other Zone to Start” This is a warning to prevent you from accidentally shutting down too many zones and potentially damaging your air conditioning system or the ducts connected to it by restricting air flow.

Additionally, to the high-level protection strategies mentioned above. There are a few simple rules that the SMT-850 HALO™ will enforce.

If you close the last temperature measurement zone or deselect all temperature measuring zone the SMT-850 HALO™ will automatically default to using the temperature sensor built into Zone 1, (the Wall Controller) and open the zone 1 damper if fitted.

Installer

The SMT-850 HALO™ is an extremely powerful climate control system with innovative control logic designed to ensure comfort levels are maintained using the least amount of energy possible. The setting contained in the installer menu are designed to be used and adjusted by HVAC contractors or other industry professionals only. Adjusting settings in the installer menu can be extremely detrimental to the efficiency or life of your heating or cooling system.



To protect this menu, a factory PIN may be required before access is granted. This PIN is adjustable so your contractor may have changed it from the default settings.

The default PIN is 0021

If you are not a HVAC professional, it is STRONGLY recommended that you do not enter this menu.

Part 2 - Installer Instructions

New Installation Overview

The SMT-850 HALO™ is a remarkably simple thermostat system to install. All wiring is to the thermostat directly so that everything can be installed and tested at the control itself. (A remote IO box is also available that will "mirror" all inputs and outputs of the SMT-850 HALO™. This remote I/O box (Part Number Halo – I/O) will connect to the SMT-850 HALO™ using 4 wires. See the Halo-I/O manual for details about this product. (Halo – IO will be available 2026)

In many ways the SMT-850 HALO™ is wired and set up like any other thermostat except the SMT-850 HALO™ does significantly more than many other thermostats. Every effort has been made to ensure the installation of the SMT-850 HALO™ is as easy and as straightforward as possible, however as all wiring is within the thermostat care needs to be taken to ensure wiring is correct and landed in the correct terminals and wires are not touching adjacent wires.

Installation Location Suggestions

The SMT-850 HALO™ Wall Controller mounting location should be selected with care, particularly if zone control is NOT used. Ideally it should be mounted 1.5 meters of the ground and in a location away from radiant heat sources, drafts, or direct sun light. It should be in an area that is a typical of the temperature of the space you wish to occupy.

Upgrading your old Wall Controller to your new SMT-850 HALO™

Due to the extra capability offered in the SMT-850 HALO™ it is strongly suggested that you employ the services of a Heating and Cooling technician to install your SMT-850 HALO™. It should be a straightforward process to replace your existing Wall Controller with your new SMT-850 HALO™. Please take the time to read and understand the steps outlined below to ensure the changeover procedure is trouble free.

Please be aware, replacing your existing Wall Controller with the SMT-850 HALO™ may require you to gain access to your Heating and Cooling system and wire the SMT-850 HALO™ Unit Control Card directly to your Heating and Cooling system where your existing Wall Controller was connected. To access some of the many functions offered by your SMT-850 HALO™ you may also need run additional wiring. Or you may wish to use the Smart Temp SMT-2W5 module, or the Halo-IO should your existing wiring not have enough digital switching capability. Please visits Smarttemp.com.au for information on the SMT-2W5 module and Halo-IO.

Step 1 Isolate (TURN OFF) power to your Heating and Cooling system.

Look for your fuse box in your home. If you have a reverse cycle air conditioning system there should be a fuse marked "AC", "Air Conditioning" or "Heat and Cooling" or similar. Turn this switch off and test to ensure the air conditioning system is off by turning the thermostat to heat mode and raising the heating temperature to a value above your current room temperature.

If you have a Gas Heating system (with or without add on cooling system) you may need locate your gas heater and unplug the power cord from the GPO. Your heater may be located outside your home or in your roof cavity.

If the heating fails to run or the thermostat is blank, you may move to the next step. If your heating runs you may need employ a professional to swap your SMT-850 HALO™ over.

Step 2 Examine your existing Wall Thermostat.

If your existing thermostat has been controlling your heating and cooling successfully then everything you need to know about how to install your new SMT-850 HALO™ is available. It will just take some time to install your new SMT-850 HALO™ and have your Heating and Cooling system up and running again.

Open your existing thermostat (see your thermostat owner's manual for help with this). Inside you will note there are several terminals, some will have wires in them, some may not. Before proceeding to the next step, it is a good idea to take a picture using your smart phone in case you need restore to your old Wall Controller or to give your ability to refer to your old wiring.

Step 3 Remove existing thermostat wiring.

NOTE The SMT-850 HALO™ is Low voltage only (maximum 24VAC)
Check the voltage of the current thermostat before touching any wiring.

Take a picture of the existing wiring using your smart phone making sure to see the terminal designations. Using that information and the following wiring diagrams it should be a simple matter to replace any existing thermostat with the SMT-850 HALO™

If the following conditions exist, please call Smart Temp or an authorised service agent for additional guidance.

1. If there are terminals on your existing Wall Controller that do not have corresponding terminals on the SMT-850 HALO™ base. (such as T, L or X (X2) etc)
2. If you have wires in terminals labelled in both Rc and a Rh terminal and these two terminals are **NOT** linked.
3. If only the R, C, A & B have wires in them.
4. If there are no wires in the "C" or "24C" terminals.

Step 4 Remove existing Wall Controller

Unscrew and remove existing Wall Controller from the wall taking care not to drop any wires into the wall cavity.

Step 5 Note any switches on existing Wall Controller

There may be switches or links on the existing thermostat. Please note these switches and their settings. If these switches are present, it will provide a clue as to the type and configuration of your existing Heating and Cooling System.

Switch labelled HP /HC suggest the type of HVAC system logic needed to be controlled by the SMT-850 HALO™. HC is Heat with Add on Cool logic (Y only for cool and W only for heat while HP suggests a Heat Pump logic. (Y for cool and heat plus W to select the mode)

O/B switch (or terminals in the base of the thermostat where there is a wire) sets the reversing valve logic for Heat Pump systems. Switch (or wire) in the "O" suggests the reversing valve will energise in cooling. Switch (or wire) in the "B" indicates the reversing valve will energise in Heating.

HE/HE indicates the fan control logic. HE (Heating Electric) requires the SMT-850 HALO™ to control the fan in heating. HG (heating Gas / Oil) will let the heating system control its own fan. The SMT-850 HALO™ will NOT control the fan in fan auto mode.

Step 6 Mount the SMT-850 HALO™ wall controller base.

Mount the SMT-850 HALO™ baseplate ensuring that it is level using the supplied wall anchors or another suitable fixing method. Note the arrow pointing UP.

Wire into each of the terminals in the SMT-850 HALO™ Wall Controller base plate for all functions that require control. Use the wiring diagrams and other instructions in the Installation section of this manual for guidance.

Step 7 Set the SMT-850 HALO™ DIP switches.

The Unit Control Card is fitted with several DIP switches. See page 21 for information on the switches and their functions. It is essential that these switches be set correctly.

<u>SW1 – Fan Speeds</u>

If the old Wall Controller had wires in all three terminals marked "L, M and H" or "G1, G2 and G3" then the old thermostat was controlling a Heating and cooling system with three fan speeds. Ensure Sw1 is in the SMT-850 HALO™ is ON. If only the G or G1 terminal had a wire landed then your old thermostat was controlling a single fan speed system, then ensure SW is OFF.

(Note – if replacing a SMT-770 thermostat then SW1 position in the SMT-850 HALO™ should match the SW1 position in the SMT-770)

<u>SW2 – Mode</u>

If the existing wall controller has a STD /HP switch fitted and is switched to the STD position, then leave DIP SW 2 on the SMT-850 HALO™ OFF.

If the STD / HP switch is in the HP position, then ensure SW2 is on the SMT-850 HALO™ is ON.

If the old thermostat does not have a STD/HP switch it is recommended look at the terminals the old Wall Controller that have wires fitted. If the old Wall Controller had wires in any of the terminals marked "O, B, O/B" <u>as well as a wire</u> in a terminal labelled Y or Y1 or if wires in the W (1) and Y (1) are linked then Sw2 should be ON.

Note, if there is a wire in a terminal marked W1/OB and you are unable to locate a STD / HP switch then please call Smart Temp or an authorised service agent for additional guidance.

(Note – if replacing a SMT-770 thermostat then SW2 position in the SMT-850 HALO™ should match the SW2 position in the SMT-770)

DIP 1	**Halo Switch Settings Equipment Functions**	(4 way DIP block)	
Switch	Function	Off	ON
1	1 Fan Speeds	Single Speed Fan	Multi Speed Fan
2	HC / HP Logic	Heat / Cool	Heat Pump
3	Fan in heat logic (Sw2 OFF) Reversing Valve logic (Sw 2 ON)	Gas Heat in HC Mode Reversing valve on in Cool	Electric heat Reversing valve on in Heat
4	Not Used	Leave Off	Leave Off

Step 8 Attach the Face of the SMT-850 HALO™ to the base.

Take care not to damage the LCD or other parts when connecting the two parts of the SMT-850 HALO™ together, that no stress is placed on the 7" LCD or that the wiring is crushed.

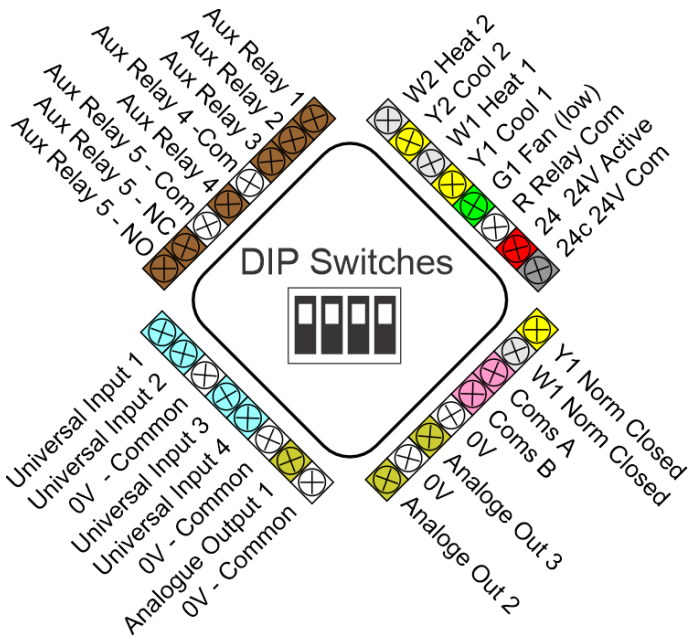
Step 9 Power up and set installer options.

Before starting any heating or cooling you need to first enter the installer menu and setup

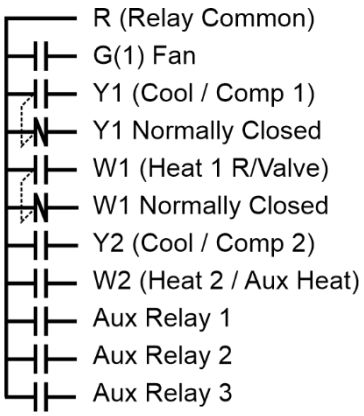
Wiring Overview

The SMT-850 HALO™ has 32 terminals laid out in 4 x 8 terminals as shown below. Cable entry is through a hole in the centre of the base plate. The terminal functions are detailed here.

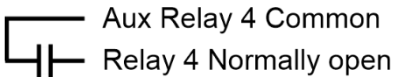
Relay Layout



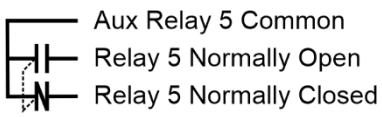
Main 8 Relays



Auxiliary Relay 4



Aux Relay 5



24 C (or 12v DC -)	This terminal is used as the 0V terminal and is necessary to power the SMT-850 HALO™ thermostat. (if powering with DC this is -ve)
24 (or 12v DC +)	The "24" terminal is the active terminal and is used to power the SMT-850 HALO™ (if powering with DC this is +ve)
R	Any voltage applied to this terminal (24V maximum) powers the SMT-850 HALO™ and feeds the following relays. G1 – Fan Y1 – Cool or Compressor 1 (NO) Y1 – Cool or Compressor 1 (NC) W1 (O/B) – Heat or reversing Valve (NO) W1 (O/B) – Heat or reversing Valve (NC) Y2 – 2nd stage Cool or Compressor 2 W2 – 2nd stage heat or Emergency Heat Auxiliary Relay 1 Auxiliary Relay 2 Auxiliary Relay 3
G (1)	Used to control equipment fan exclusively if DIP Sw1is Off or used to control low speed fan if DIP Sw 1 is ON. Note – if 3 fan speeds are required by turning DIP Sw1 ON, the SMT-850 HALO™ will automatically assign medium and high fan speed to Aux Relay 1 & 2
Y1	First stage Cooling (if DIP 2 =OFF) or 1st stage Compressor (if DIP 2 = ON)
W1 (O/B)	First stage Heating (if DIP 2 =OFF) or Reversing Valve control if (DIP 2 = ON)
Y2	Second Stage Cooling (if DIP 2 =OFF) or 1st stage Compressor if (DIP 2 = ON)
W2	Second stage Heating (if DIP 2 =OFF) or Auxiliary Heat / Emergency Heat (DIP 2 = ON)
Aux Relays 1, 2 & 3	All Auxiliary relays can have custom functions assigned to them in the Installer menu window under the I/O tab. See page 42 for information on what options are available.
Aux Relay 4 Com	This is the voltage input to feed Auxiliary relays 4. This makes relay 4 voltage independent to the main SMT-850 HALO™ relays described above
Aux Relay 4	Auxiliary relay 4 can have custom functions assigned to it. Relay 4 does not share the same relay common as the major relays. See page 42of the installer menu in the I/O options Tab
Aux Relay 5 Com	This is the voltage input to feed Auxiliary relays 5.
Aux Relay 5 NO	Auxiliary relay 5 can have custom functions assigned to it. Relay 5 does not share the same relay common as the major relays. See page 42of the installer menu in the I/O Tab for the functions available to this relay
Aux Relay 5 NC	Auxiliary relay 5 is a volt free change over relay. This output rests in the closed position and opens when relay 5 energises
Universal Inputs 1,2,3 &4	All Universal Inputs can have custom functions assigned to them in the Installer menu window under the I/O tab. See page 43 of the manual for functions that can be assigned to this input.
Analogue Outputs 1,2 &3	All Analogue Outputs can have custom functions assigned to them in the Installer menu window under the I/O tab. See page 45 for information that can be assigned to this output.
W1 NC	This is the normally closed output for the W1 relay. This relay rests in the closed position and opens when relay W1 energises
Y1 NC	This is the normally closed output for the Y1 relay. This relay rests in the closed position and opens when relay Y1 energises
0V - Common	All the 0-V common terminals are connected internally within the SMT-850 HALO™ electronics. They are used for the Zero Volt reference for all 0-10V outputs as well as the common terminal for all SMT-850 HALO™ universal inputs. Note – These are not the common terminals for the relays – **DO NOT apply voltages to these terminals.**
Communications A & B	The SMT-850 HALO™ has several communications protocols that permit it to interface with external devices at a high level. The communications wiring uses these terminals.

Typical Wiring diagrams

The SMT-850 HALO™ can control a wide selection of Heating Cooling and Air Conditioning systems. This includes Multistage Heat Pumps, Gas or Oil Heating with Add on Cooling systems, Fan coils that use DC fans and digital scroll compressors used in modern variable capacity heat pumps.

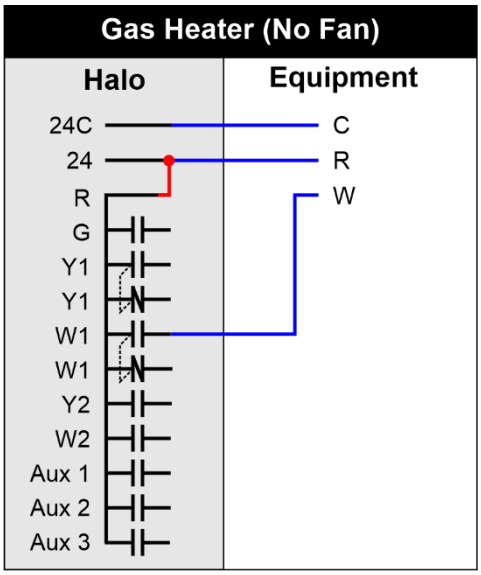
The SMT-850 HALO™ provides relay and 0-10V outputs to control HVAC systems. Using 0-10V outputs does NOT exclude the relays from functioning and using the relays do not exclude the 0-10v outputs from operating. Due to this you can run a 0-10V DC fan and have relays switch an open/close cooling valve and an on/off electric element heating element or any other combination of digital and analogue outputs you require. See the SMT-850 HALO™ I/O options on page 42

Given the huge number of control combinations possible with the SMT-850 HALO™ not all can be individually represented here. These are simply the most common wiring configurations. Please contact Smart Temp or your distributor for custom wiring information if needed.

The SMT-850 HALO™ comes with a factory fitted link between the "24" and the "R" terminal. Removing the factory link (shown in **RED** in the following drawings) makes the SMT-850 HALO™ outputs Volt Free.

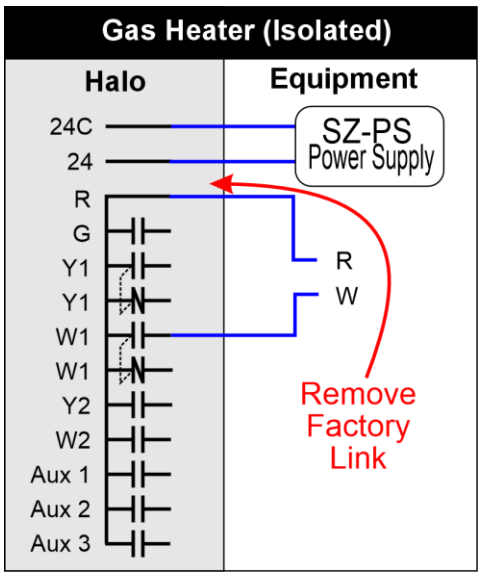
In the examples given below, all field wiring is shown in **Blue.**

The SMT-850 HALO™ requires a 24V "C" terminal to operate. If your heater provides this terminal, use the wiring diagram below.



DIP Switch Settings
Sw1 = OFF Single Fan Speed
Sw2 = OFF Heat /Cool Mode
Sw3 = OFF Fan with Heat

Suggested Installer settings
Installer / Fan Control Check the Hide Fan from display



If your gas heater does NOT have a 24V C terminal or it requires a purely volt free input, you will require 4 wires between the SMT-850 HALO™ and the gas heater and a separate 24V AC/DC power supply such as the Smart Temp SZ-PS

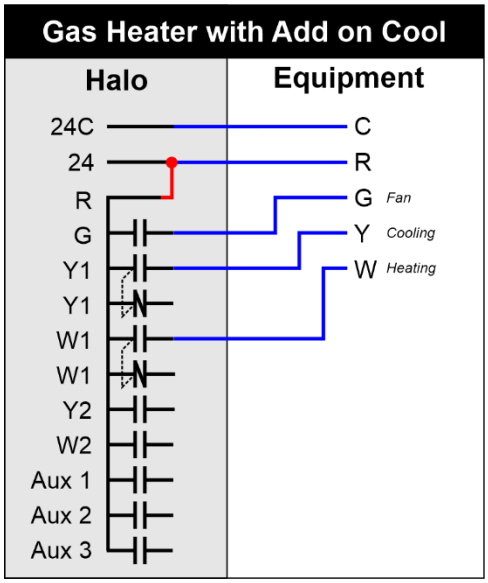
Remove the factory link and power the SMT-850 HALO™ with your separate power supply. *(If using a DC power supply +ve to "R" and -ve to "C").*

Connect the SMT-850 HALO™ Relay Com to the heater "R" terminal and the SMT-850 HALO™ "W1" terminal to the heater "W" terminal.

DIP Switch Settings
Sw1 = OFF Single Fan Speed
Sw2 = OFF Heat /Cool Mode
Sw3 = OFF Fan with Heat

Suggested Installer settings
Installer / Fan Control Check the Hide Fan from display

This wiring may be a useful solution when the ability to run extra wires between the heater to the thermostat is difficult, however there is power available close to the SMT-850 HALO™. Use the local power supply to power the SMT-850 HALO™ and the existing two wires to control the heater.

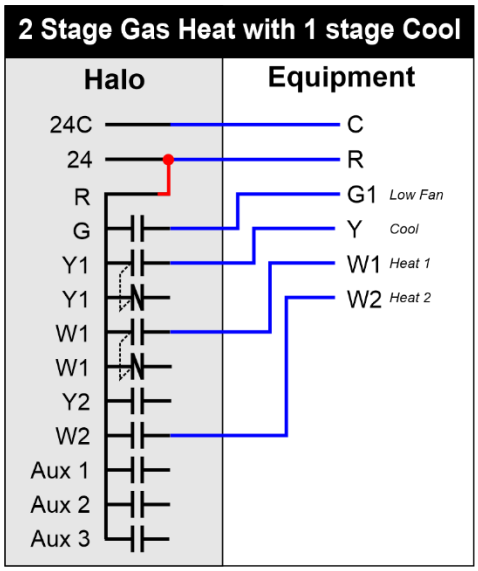


This would be one of the most popular Heating and Cooling system controlled by the Inspire system.

The default installer menu settings for heat cool settings should be suitable for most applications. If necessary, these can be adjusted to suit the needs of this installation.

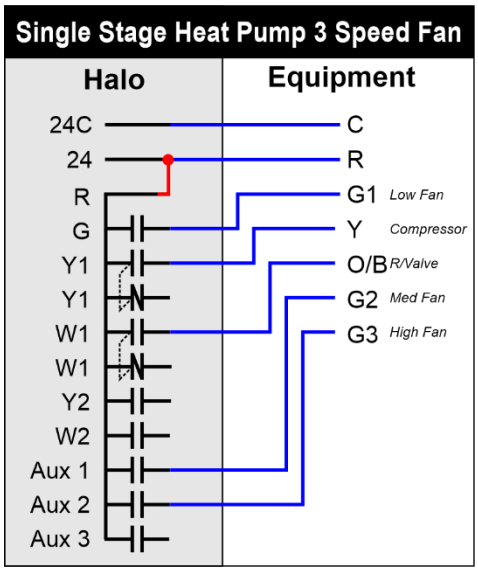
DIP Switch Settings
Sw1 = OFF Single Fan Speed
Sw2 = OFF Heat /Cool Mode
Sw3 = OFF Fan with Heat

Two Stage Heating with add on cooling is a simple variation of the single stage drawing shown above.



The default installer menu settings for heat cool settings should be suitable for most applications. If necessary, these can be adjusted to suit the needs of this installation. Please see page 33

DIP Switch Settings
Sw1 = OFF Single Fan Speed
Sw2 = OFF Heat /Cool Mode
Sw3 = OFF Fan with Heat

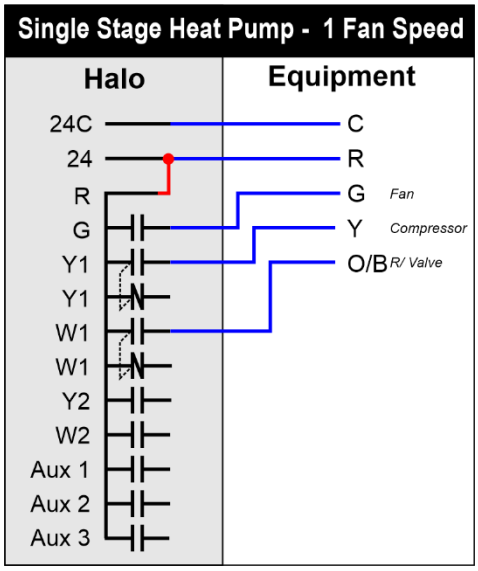


The default installer menu settings for Heat Pump settings should be suitable for most applications. If necessary, these can be adjusted to suit the needs of this installation.

When you turn Dip 1 on, the SMT-850 HALO™ will automatically assign Aux Rly 1 for medium fan and Aux relay 2 for high fan erasing any previous functions assigned to these relays.

Please see page 31.

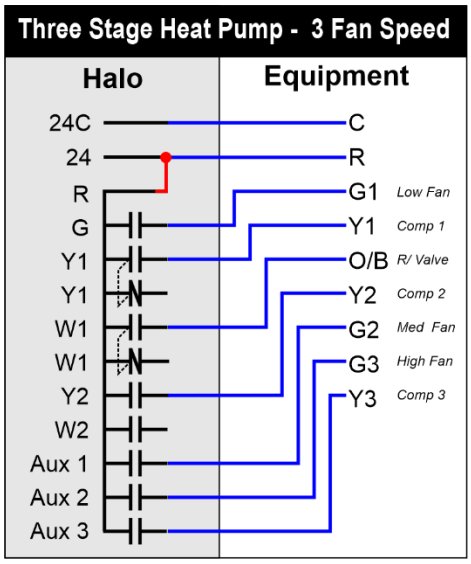
DIP Switch Settings
Sw1 = ON Three Fan Speeds
Sw2 = ON Heat Pump Mode
Sw3 = OFF RV in Cool Sw4 ON=RV in Heat



Single Stage Heat Pump is a quite common use of the Inspire.
Note – SW4 sets revering valve logic.

The default installer menu settings for Heat Pump settings should be suitable for most applications. If necessary, these can be adjusted to suit the needs of this installation. Please see page 31.

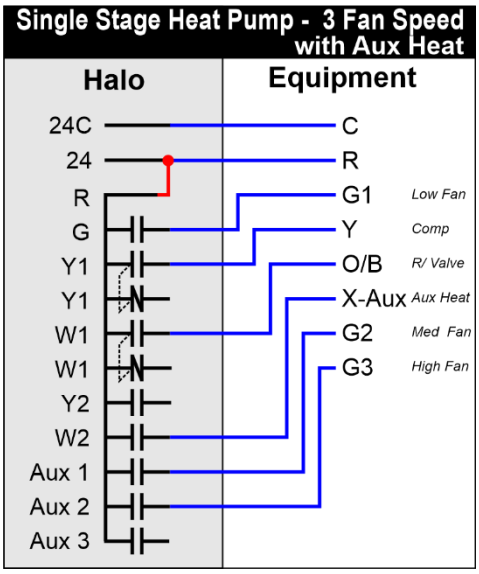
DIP Switch Settings
Sw1 = OFF Single Fan Speed
Sw2 = ON Heat Pump Mode
Sw3 = OFF RV in Cool Sw4 ON=RV in Heat



You will need enter the installer options menu, under the IO options tab and select Auxiliary relay 3 and assign its function as compressor 3

When you turn Dip 1 on, the SMT-850 HALO™ will automatically assign Aux Rly 1 for medium fan and Aux relay 2 for high fan erasing any previous functions assigned to these relays.

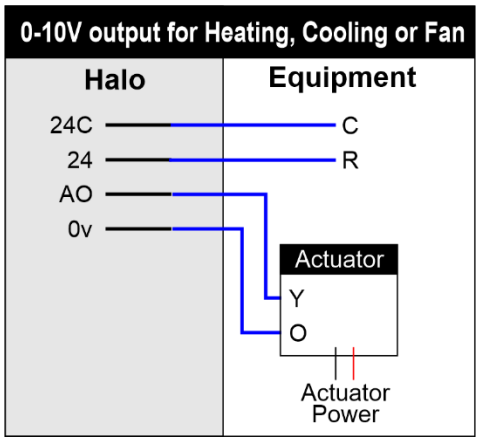
DIP Switch Settings
Sw1 = ON Three Fan Speeds
Sw2 = ON Heat Pump Mode
Sw3 = OFF RV in Cool Sw4 ON=RV in Heat



Auxiliary Heat uses the W2 as the "next" stage of heating in Aux heat mode.

When you turn Dip 1 on, the SMT-850 HALO™ will automatically assign Aux Rly 1 for medium fan and Aux relay 2 for high fan erasing any previous functions assigned to these relays.

DIP Switch Settings
Sw1 = ON Three Fan Speeds
Sw2 = ON Heat Pump Mode
Sw3 = OFF RV in Cool Sw4 ON=RV in Heat

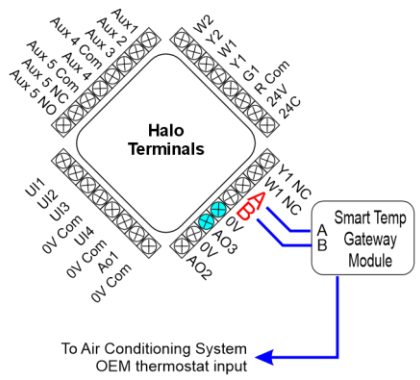


This drawing shows the wiring for a typical 0-10V actuator that may be used for a water valve or for damper control for example.

The SMT-850 HALO™ provides the 0-10V control (position) signal only - it DOES NOT provide motive power for the actuator. This is provided externally.

The SMT-850 HALO™ has 3 x 0-10-volt outputs. Each of these have a library of functions that can be assigned to them

Inverter Style Air Conditioning Systems

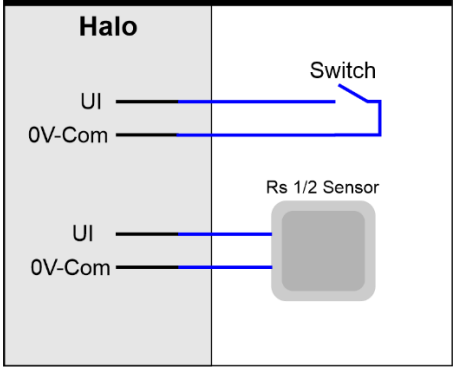


The SMT-850 HALO™ can control many inverter AC systems by using a protocol adapter to convert standard ModBus RTU communications from the SMT-850 HALO™ into the language required by the various brands of Air Conditioning systems. There are several brands of protocol adapters supported by the SMT-850 HALO™ however they are a wired to the SMT-850 HALO™ in the same manner.

Refer to the protocol adapter documentation for specific configuration information.

You will need to enter the Installer menu and select the protocol for your chosen adapter. See page 48

Remote Sensor or Digital Input Wiring



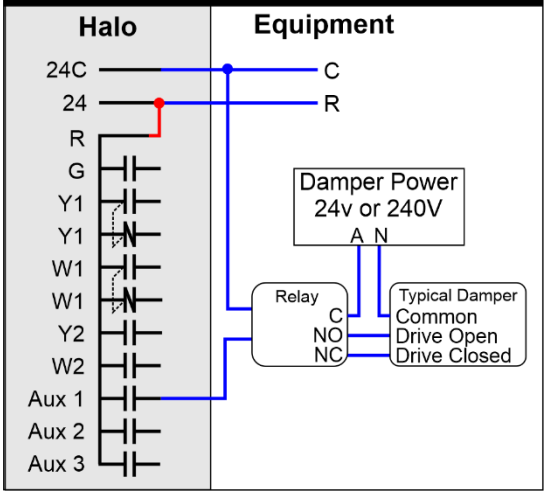
The SMT-850 HALO™ has four universal inputs that have a library of functions. These inputs will accept a digital input (switch input), a standard Smart Temp temperature sensor or a 0-10V input.

Assign the function you require to the desired input in the installer menu under the IO tab.

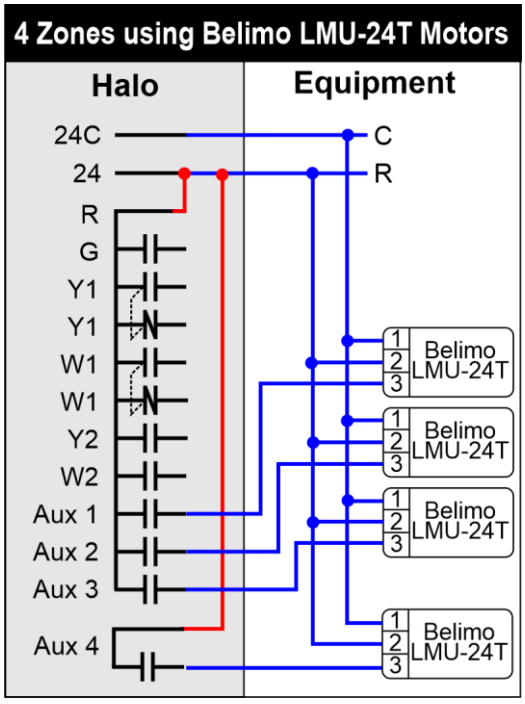
Zone Damper Wiring

The SMT-850 HALO™ will switch 24V damper motors such as the Belimo LMU24-T. The Belimo motor has the unique ability to be wired permanently active and have a single switched wire to drive the damper open or closed. The drawing to the right shows this wiring method. This has the advantage of reducing the number of wires between the SMT-850 HALO™ thermostat base and the dampers.

Typical 240V Damper (or 24V Damper with Relay)



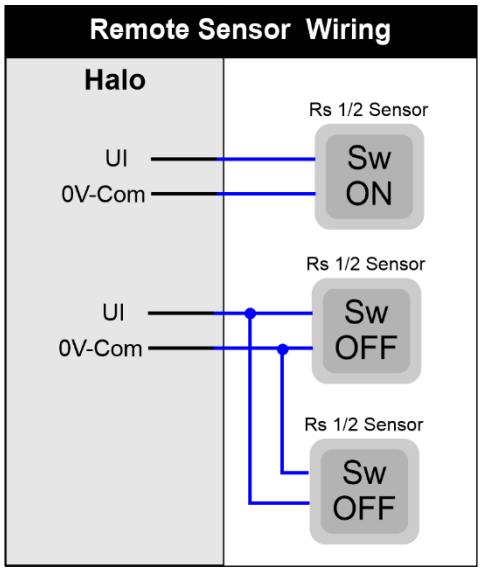
4 Zones using Belimo LMU-24T Motors



In this example, the SMT-850 HALO™ is switching 4 dampers. The SMT-850 HALO™ can control from 1 to 4 zones.

If you are switching other brands of dampers that do not support single wire switching or line voltage dampers then you will need to use a changeover relay (such as the Smart Temp SP1) with contacts rated to the voltage you will be switching. A typical drawing showing a 240V damper motors is shown right.
You will need a separate relay for each of these style dampers you need to switch

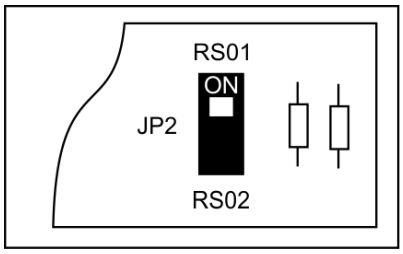
Sensor Wiring



The SMT-850 HALO™ can measure space temperatures in multiple locations to improve the comfort level in the home or office. These sensors can be used individually or grouped together if an average temperature over a larger area is required.

The example to the left shows a single sensor (top) and two "averaging" sensors (below). Other combinations of 3 or 4 sensor averaging are also possible. Please refer to the RS-1/2 sensor manual of other sensor combinations

Only sensors provided by Smart Temp should be used with the SMT-850 HALO™. The RS01-02 sensor is a wall mount sensor for use for remote temperature measurement, particularly with zone control.



Each sensor will need a pair of pair of wires with a conductor size of 0.2mm per conductor or larger run between the sensor and SMT-850 HALO™ zone sensor input terminal on the SMT-850 HALO™. If the sensor cable run is longer than 30m or if the sensor cable is run where electrical noise may be present it is recommended to use screened pair with the drain wire securely earthed.

Inside the RS01-02 sensor there is a small switch marked "JP2". Please make sure this switch is in the correct position for the number of sensors you are using, or inaccurate temperature readings may result.

The Smart Temp RS01/2 sensors are also supplied with a small push button on the bottom of the sensor that is used to initiate the Commercial mode after hours run function

LoRa Devices

The SMT-850 HALO™ can be fitted with an optional LoRa radio. (P/N SMT-LoRa – R) that plugs into a socket in the back of the SMT-850 HALO™. The SMT-850 HALO™ will then Auto -Detect this radio and activate functions necessary to use LoRa devices. This LoRa radio module will permit the SMT-850 HALO™ to connect to (and control) remote devices wirelessly. The LoRa infostructure is a highly reliable long range Radio Frequency system. Only one LoRa radio is required to be fitted to the SMT-850 HALO™ to control multiple Smart Temp LoRa devices

Please see the respective manuals for how to use and install the SMT-850 HALO™ LoRa devices.

Devices Include

SMT-850 HALO™ LoRa Temp Sensor. This sensor can be used for multiple applications such as a remote temperate sensor for use in zone control, fan coil temperatre or when you wish to measure outside air temperature. This sensor can also be used as a switch to detect if a door is open or a remote start has been initiated. Do not apply any external voltage to this device. (P/N SMT-LoRa – T)

SMT-850 HALO™ LoRa Temp & RH Sensor. This sensor is typically used for outside air temperature and humidity measurement for enthalpy-based economy systems. Do not apply any external voltage to this device. (P/N SMT-LoRa – H)

SMT-850 HALO™ LoRa Relay. This relay is powered by 24VAC and will have a volt free relay contact rated up to 240VAC at 2A (Non Fused). This is typically used as a zone damper relay, a pump starts or heat/cool relay. (P/N SMT-LoRa – R)

SMT-850 HALO™ LoRa 0-10V Output

This Module is powered by 24VAC and will have a 0-10V output. This is typically used as a zone damper relay. (P/N SMT-LoRa – 010)

SMT-850 HALO™ LoRa 0-10V Master Module

This device is powered by 24VAC and duplicates all 32 of the Halo Inputs and Outputs remotely. 10 Relays each rated at 240V @ 2A(non-fused), 4 Universal inputs (do not apply external voltage to these inputs) and 3 0-10V outputs. (P/N SMT-LoRa – Master)

Installer Menu Options

Press the Installer Icon to enter the Installer menu. This maybe PIN protected.
The default PIN is 0021

The Installer options menu permits you to define and refine how the SMT-850 Halo™ behaves for the user and how it controls any heating or cooling, and zone system connected to it. Great effort has been given to set the default values in this menu to the ideal settings for most applications, so changes are not normally required.

We realise that some sites or users have varying requirements, so the SMT-850 Halo™ permits these values to be adjusted within reasonable limits to satisfy these demands.

Navigate to the sub menu by selecting the tab on the left and editing the values in the options within that window. Some items offer multiple choice or a range of adjustments while others are simply Yes / No or On /Off choices.

A Yes / No or On /Off choice is often shown as a check box. Touching that box will select it and its function will be active, touching again will deselect it. When selected the choice will be On or Yes. When de-selected the choice will be Off or NO.

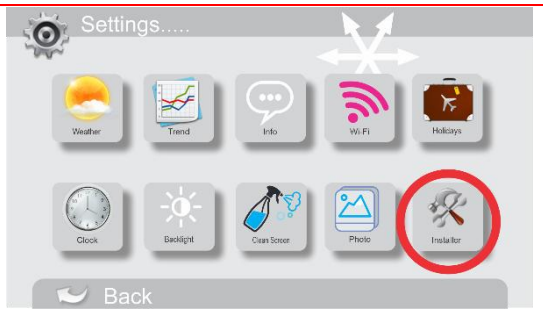
An option with multiple choices will show text indicating the currently selected value. Touching the option will highlight it. Use the Up/Down arrow to select your desired value or in some cases a separate options window will pop up permitting you to see all adjustments possible for the selected item.

To exit the Installer menu, select the red Exit tab on the lower left corner of the display. Within that window you have two options, “Exit and Save” to save any changes you have made or “Exit and Discard” to leave the installer menu and discard any changes that you have made.

Please note, when you enter the Installer menu all equipment calls are suspended, and all zone dampers (if fitted) will close, when the SMT-850 HALO™ reboots, it will return to the previous state and equipment calls will begin (after any protection timers that are set expire).

A help button is provided in each of the installer menu pages that will give you a brief insight into each function.

Entering the installer menu



From the Home Window, tap the More icon to open the User Settings window. The settings window (right) will be shown. Tap this icon Installer Icon to open the Installer Menu window. You may be prompted for a PIN Before being given access.

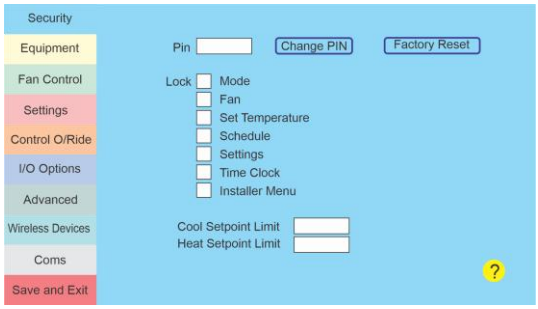
The default PIN is 0021 (Zero Zero Two One)

If this PIN has been changed by others or you have changed it, but you can't remember the new PIN, you must return the SMT-850 HALO™ to Smart Temp Australia P/L or an authorised service agent to have the wall controller unlocked.

Note, you will come across many items in the installer menu shown ass OFF.

To turn these items on and make them available for adjustment DOUBLE TAP the text "OFF"

Security Tab



PIN

Many of the settings in the installer menu seriously affect the performance and safe operation of the HVAC system under the control of the SMT-850 Halo™. To ensure access to the settings in this menu are restricted to those that have knowledge of these settings and how they affect HVAC equipment. This menu can be protected by a Personal Identification Number. This number must be entered whenever entering the Installer menu to prevent unauthorised tampering.

To change the PIN from factory default, press the "Change PIN window" You must enter the new PIN twice. If the two entries match your new PIN will be stored and you will need enter the new PIN next time you wish to enter the installer options menu or to change the value of any locked items.

Caution

If you change the PIN from the factory default setting and forget, you will need to return the SMT-850 Halo™ to Smart Temp or an authorised distributor for service and unlocking. There may be a fee for this service.
The range of adjustment is 0000 to 9999 in increments of 1. The default value is 0021

Function Lock

Several options are provided that can be locked. When locked they cannot be changed unless they use the Installer PIN to unlock the function. If you try and adjust a locked function you will be prompted to enter the PIN. Entering the PIN will unlock ALL functions for 30 seconds where they will auto re-lock.

You can hard lock
- Set temperature
- Mode window
- Fan mode
- Settings
- Fan speed
- Schedule
- Installer menu

Should you wish to not hard lock the heat and cool temperature adjustment, you can limit the control range, permitting some adjustment but within the boundaries defined in the Heat and Cool set point limit function.

Default – Installer menu locked.

Heating Set Point Limit

This is the maximum heating set temperature that is permitted. If a value above this is attempted the SMT-850 Halo™ will show a padlock icon and briefly display text stating "Set Point Limit Reached"

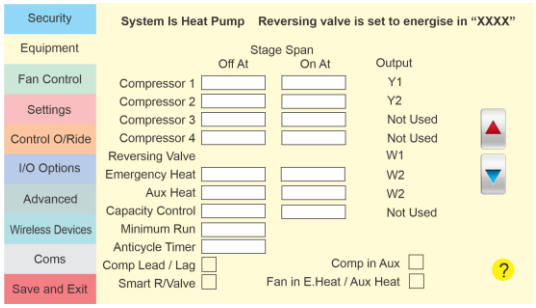
Default – 35c
Range Off to 50c
Resolution 0.5c

Cooling Set Point Limit

This is the minimum cooling set temperature that is permitted. If a value below this is attempted the SMT-850 Halo™ will show a padlock icon and briefly display text stating "Set Point Limit Reached"

Default –10c
Range 0 to 50c then OFF
Resolution 0.5c

Equipment Control Functions (in Heat Pump Mode SW 2 = On) TAB



Compressor 1 to 4 Stage Span

This permits you precisely control how the heat pump system will run. Where stages will turn on or off and each stage span or how hard each stage works.

"Off At" defines how far from setpoint the stage turns OFF.
"On At" defines how far for setpoint each stage turns ON
"Output" shows you the output is being used by the selected compressor.

The SMT-850 HALO™ has 5 relays with pre- defined functions such as Fan (low Speed), Compressor Stage 1, compressor stage 2, Reversing valve and Aux / Em Heat. 1. If you wish to control a 3 or 4 compressor system you must also assign the Auxiliary relays to be used for that function. Changes made here will also update the IO Options menu.

Any stages NOT being used should be set to OFF is the SMT-850 Halo™ uses this staging information for the Lead/ Lag function or Auxiliary heat functions as defines below

Default –	Comp 1	Off at 0c	On at 0.5c	
	Comp 2	OFF	OFF	*(Double Tap to turn ON)*
	Comp 3	OFF	OFF	
	Comp 4	OFF	OFF	

Range -1.0 to 10c
Resolution 0.1c

W2 Function

The SMT-850 Halo™ W2 relay has several functions that it can be used for when in Heat pump mode.

"Auxiliary Heat" sets W2 as the next stage of heat - such as an electric element heater
"Emergency Heat" will permit the user to select this as a heating source rather than the compressors

Default –OFF *(Double Tap to turn ON)*
Emergency Heat
Auxiliary Heat

Capacity Control

Digital scroll and some inverter compressors require an external 0-10V control signal to indicate how much heating or cooling demand is required. In the I/O options tab you are free to define a 0-10V output as "capacity Control".

Default –OFF (Note - you must first select "Capacity Control in the
Range 0.3 to 10c IO options menu, 0-10V output before you can turn this function ON)
Resolution 0.1c

Minimum Run

This will permit you to set minimum time the heating or cooling must run, once started before turning off again. This setting will prevent compressor short cycling of the SMT-850 Halo™ is placed in location that is directly affected by the heating or cooling system, such as directly under a duct for example.

Default –Off
Range 0 to 10 Minutes
Resolution 1 minute

Anti Cycle Timer

Once a running compressor stops, this setting will define the time delay period before it is permitted to re-start.

Default –4 minutes
Range 0 to 10 Minutes
Resolution 1 minute

Comp Lead / Lag

If running a multistage heat pump system, the SMT-850 Halo™ can rotate the compressors to distribute the wear more evenly on the HVAC system. To use this function correctly you must first define the number of compressors you have on your system by turning unused compressor on or off in the "Compressor Stage 1 to 4 Setting" above. Remember, you must double tap the value to toggle the function on or off.

Default –Off
Range OFF or ON

Smart R/Valve

The SMT-850 Halo™ can de-energise the reversing valve at the same time the compressor stops when the setpoint is reached or delay the reversing valve from de-energising for up to 20 minutes (or until the opposite mode is called). This is done to prevent decompression hiss than can lead to noise pollution issues as well as reduce wear on the reversing valve.

Default –Off
Range OFF or ON

Comp in Aux

When running Auxiliary heat, this setting defines on whether to use the compressor as well as Aux heat or Aux heat alone.

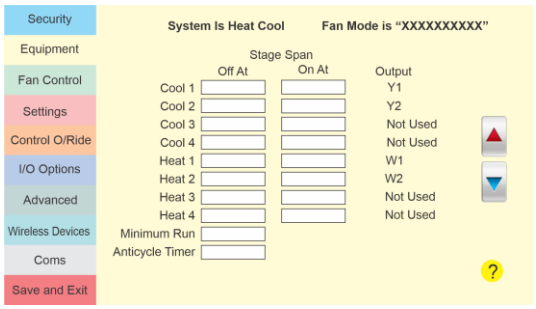
Default –Off
Range OFF or ON

Fan In Aux

When running Auxiliary heat, this setting defines on whether the SMT-850 Halo™ will call for fan or whether the heating source can control its own fan.

Default –Off
Range OFF or ON

Equipment Control Functions (in Heat Cool Mode SW 2 = OFF) TAB



Heating and cooling 1 to 4 Stage Span

This permits you precisely control how the heating and cooling system will run. Where heating and cooling stages will turn on or off and each stage span or how hard each stage works.

"Off At" defines how far from setpoint the stage turns OFF.
"On At" defines how far for setpoint each stage turns ON
"Output" permits you to select or indicates what output is being used by the indicated function.
The SMT-850 HALO™ has 5 relays with pre-defined functions such as Fan (low Speed), Cool Stage 1, Cool stage 2, Heat Stage 1 and Heat stage 2. If you wish to control a 3 or 4 stage heat system you must also assign which of the Auxiliary relays will be used for that function. Changes made here will also update the IO Options menu.

Range of adjustment is from 0.3c to 5c

Default –	Cool 1	Off at 0c	On at 0.5c	
	Cool 2	Off at 0.2c	On at 1,0c5c	
	Cool 3	OFF	OFF	*(Double Tap to turn ON)*
	Cool 4	OFF	OFF	
	Heat 1	Off at 0c	On at 0.5c	
	Heat 2	Off at 0.2c	On at 1,0c5c	
	Heat 3	OFF	OFF	
	Heat 4	OFF	OFF	

Range -0.1 to 10c
Resolution 0.1c

Minimum Run

This will permit you to set minimum time the heating or cooling must run, once started before Turing off again. This setting will prevent compressor short cycling in cooling or the heater prematurely stopping should the SMT-850 Halo™ be placed in location that is directly affected by the heating or cooling system, such as directly under a duct for example.

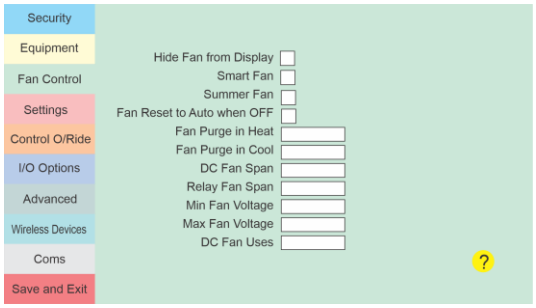
Default –Off
Range 0 to 10 Minutes
Resolution 1 minute

Anti Cycle Timer

This effects the cooling compressor only. Once the cooling stops this setting defines the time delay before it can re-start.

Default –Off
Range 0 to 10 Minutes
Resolution 1 minute

Fan Control Functions Tab



Hide fan from Display

When selected, the Fan Mode (and speed) selection are not shown in the Mode window. Useful when the SMT-850 HALO™ is controlling a simple Gas Heater without fan control.

Smart Fan

If selected, the SMT-850 HALO™ will add fan mode and speed to the programming program events page. See fan mode on page 6 for more information on fan modes.

Summer Fan

In Fan ON mode only - If selected the fan will behave differently based on the last mode the SMT-850 HALO™ had called. If the last mode was Heating, the fan will stop at the conclusion of the heat call (after any fan purge periods had expired). If the last mode was cooling, the Fan will continue to run after the cooling has stopped.

Fan Reset to Auto when Off

If selected, the SMT-850 HALO™ will automatically reset the fan back to “Fan Auto” mode 15 minutes after the user turns the SMT-850 HALO™ mode to OFF. If unchecked the fan mode will be remembered when the SMT-850 HALO™ mode is set to off. See fan mode on page 6 for more information on fan modes.

Fan Purge in Heat

Fan purge maintains the fan for a pre-set amount of time after the heating has stopped, particularly useful when the SMT-850 Halo™ is in Auto Fan Mode (See auto fan mode on page 6 of this manual). Fan purge is used to extract any reaming energy that maybe in a fan coil or to help cool electric heater elements after the heating has stopped to prevent the elements from overheating.

The Fan purge will continue to run even though you may have set the mode to off.

Default –Off
Range OFF 10 Minutes
Resolution 1 Minute

Fan Purge in Cool

Fan purge maintains the fan for a pre-set minimum period after the cooling has stopped, particularly when the SMT-850 Halo™ is in Auto Fan Mode (See auto fan mode on page 6 of this manual). Fan purge is used to extract any reaming energy that maybe in a fan coil or to prevent the coil from icing.

The Fan purge will continue to run even though you may have set the mode to off.

Default –Off
Range OFF - 10 Minutes
Resolution 1 Minute

DC Fan Span

Note - You must first select an output and assign the DC Fan output in the Analogue output option on page 41 of this manual.

Note - When using a DC fan and selecting low speed manually from the user Mode menu will cause the SMT-850 Halo™ to output 3.3v (or the Minimum threshold value set here if larger). Manually selecting medium speed will output a fixed 6.6v. and manually selecting high speed will output 10v.

This option defines how far from setpoint the DC van voltage is at 10V (or the maximum permitted voltage).

Default –Off
Range OFF - 10c
Resolution 0.1C

Relay Fan Span

This option defines how far from setpoint the High Fan Speed relay engages. Note SW 1 must be on (3 fan speed mode) for this function to operate

Default –Off
Range OFF - 10c
Resolution 0.1C

Min Fan Voltage

When controlling a DC fan, it is often unwise to run the fan too slowly for extended periods. This option permits the SMT-850 Halo™ to output a minimum voltage when the fan is to be called. This is used typically when Auto fan speed is selected by the user in the Mode Selection Window.

When OFF in auto fan speed mode, by default the fan will start at 0.1v and increase or decrease linearly between 0.1v to 10V as the room temperature moves between the set point and the fan Span temperature (Typically set to 3c)

When ON in auto fan speed mode, the fan will start at the DC fan threshold value and increase or decrease linearly between the DC fan threshold value and 10V as the room temperature moves between the set point and the fan Span temperature (Typically set to 3c)

Default – 0v
Range – 0V ~5V
Resolution 0.1v

The range of adjustment is OFF to 4V in 0.5v increments. The default value is OFF

Max Fan Voltage

To prevent excessive air flow, you can limit the maximum speed (voltage) the DC fan can run at.

Default – 10v
Range – 5V ~10V
Resolution 0.1v

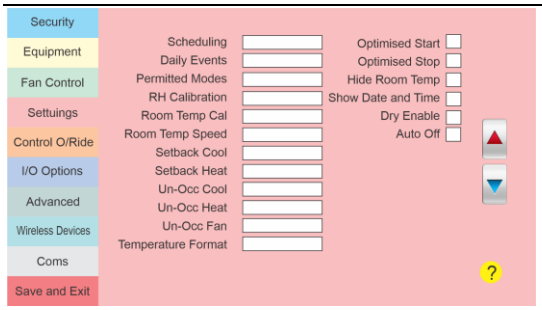
DC Fan uses

To use 0-10V DC fan you must first select which 0-10V analogue output to use. See I/O options on page 45 of this manual.

Note - When using a DC fan and selecting low speed manually from the user Mode menu will cause the SMT-850 Halo™ to output 3.3v (or the Minimum threshold value set here if larger). Manually selecting medium speed will output a fixed 6.6v. and manually selecting high speed will output 10v.

Default – None
Select any of the available 0-10V output channels

Settings



Scheduling

The SMT-850 HALO™ can be run as a manual thermostat (with NO scheduling capabilities) or use the inbuilt time clock to automatically control the heating and cooling systems based on time, with the option of residential style scheduling (Wake / Leave / return / Sleep) or commercial programming (Start / Stop with afterhours run timing).

Additionally, your SMT-850 HALO™ can provide a mode specifically designed for applications such as use in hotel rooms or in applications where the simplest User Interface is required (ideal for elderly parents for example).

Default – 7 Day Residential Programmable
Options – Manual
7 Day Residential
7 Day Commercial
Hospitality
PIR Mode (Note - you will need set the PIR settings in the IO options Menu)

Daily Events

If you have scheduling enabled, you can select the number of daily events or how many times you require the temperature to change each day.

Default – 4 daily events (Residential)
2 daily events (Commercial)
Range – 2 to 6

Permitted Modes

The SMT-850 HALO™ can control many types of heating and cooling systems as well as Auxiliary heating systems. This option permits you to select which modes are available to the user and how the user can control them, such as auto season change over mode or heating only mode.

Default – Auto Season Change Over (Heat / Cool / Auto /Off)
Options - Heat Only (Heat / Off)
Cool Only (Cool / Off)
Manual (Heat / Cool / OFF)
Auto Only Auto / Off)
Auto (Heat / Cool / Auto /Off)

RH Calibration

This permits you apply an offset to the RH reading being displayed (and used) by the SMT-850 HALO™ should you think it is in error.

Default – 0%
Range – -15% ~ +15%
Resolution 1%

Room Temp Calibration

This permits you apply an offset to the temperature reading being displayed (and used) by the SMT-850 HALO™ This does NOT apply to other sensors you may have connected to the SMT-850 HALO™

Default – 0c
Range – -5 ~ +5c
Resolution 0.1c

Room Temp Speed

Different heating and cooling systems as well as different environmental conditions can affect how quickly a room may heat or cool. The SMT-850 HALO™ permits you to adjust the temperature sensors speed of response to room temperature changes to ensure that the SMT-850 HALO™ responds quickly enough to room temperature fluctuations but not that fast that it responds to spurious temperature fluctuation like the opening of a door.

Default – Normal
Options - Very slow
Slow
Normal
Fast
Very Fast

Setback Cool (Commercial mode only)

When the SMT-850 HALO™ is used in commercial programmable mode, the building un-occupied temperatures are not available for the user to adjust to prevent the heating or cooling systems from being accidentally left running when the building is empty. This option sets the afterhours cooling setpoint.

If people require heating or cooling during outside of normal business hours, they can initiate the afterhours run timer that will temporarily replace the “Setback Cool” and “Setback Heat” temperatures with the occupied setpoints for the afterhours timer period.

Default – OFF
Range – 5 ~50c
Resolution 1c

Setback Heat (Commercial mode only)

When the SMT-850 HALO™ is used in commercial programmable mode, the control temperatures are not available for the user to adjust to prevent the heating or cooling systems from being accidentally left running when the building is empty. This option sets the afterhours heating setpoint.

If people require heating or cooling during outside of normal business hours, they can initiate the afterhours run timer that will temporarily replace the "Setback Cool" and "Setback Heat" temperatures with the occupied setpoints for the afterhours timer period.

Default – OFF
Range – 5 ~50c
Resolution 1c

Unoccupied Cool

When the SMT-850 HALO™ is used in Hospitality mode and the room is detected empty the unoccupied heat and unoccupied cool temperatures will replace the user set temperatures. This option sets the un-occupied cool set temperatre.

Default – OFF
Range – 5 ~50c
Resolution 1c

Unoccupied Heat

When the SMT-850 HALO™ is used in Hospitality mode and the room is detected empty the unoccupied heat and unoccupied cool temperatures will replace the user set temperatures. This option sets the un-occupied heat set temperatre.

Default – OFF
Range – 5 ~50c
Resolution 1c

Unoccupied Fan

When the SMT-850 HALO™ is used in Hospitality mode and the room is detected empty the user fan mode will be replaced with the value defined in this setting.

Default – Auto Fan
Options - Fan ON
Fan On low (3 speed fan mode only)
Fan On Med (3 speed fan mode only)
Fan On High (3 speed fan mode only)

Optimised start

This option will "intelligently" start the heating or cooling system so that the scheduled temperatures will be reached by the scheduled start time.

Default – Off
Options - On / Off

Optimised Stop

This option will "intelligently" prevent the heating or cooling system from running as the time approaches the next scheduled event.

Default – Off
Options - On / Off

Hide Room Temp

Check this box if you so not wish the user to see the current room temperature.

Default – Off

Options - On / Off

Show Date and Time

The SMT-850 HALO™ can hide the date and time settings if required. Note, scheduling still functions (if enabled) when the date and time is hidden as the AHX will synchronize its time with the internet (if enabled)

Default – On

Options - On / Off

Dry Enable.

This function permits the SMT-850 HALO™ to send a ModBus / BACnet command to a BMS system to request the AC system to operate in "DRY" mode if supported by the HVAC systems. Please use the relevance ModBus / BACnet documentation for more information on this function.

Default – Off

Options - On / Off

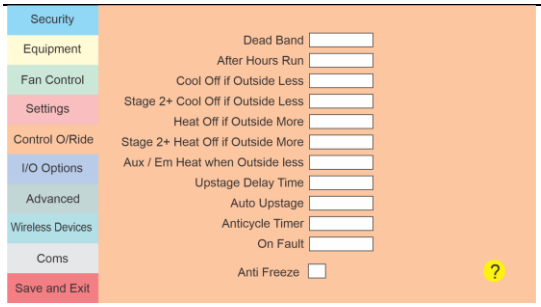
Auto Off

When making changes to the set temperature, a flyout will be shown to permit you to select the expiry time of the override. When the override period expires, in programmable mode the pre- programmed set temperature will again apply, in manual mode the SMT-850 HALO™ will turn off. (This function will not apply to commercial mode).

Default – On

Options - On / Off

Control O/Ride Functions TAB



Dead Band

This option defines how closely the user can set the Cooling and Heating setpoint.

Default – 1C

Range – 0C ~5C

Resolution 1C

After Hours Run

When the SMT-850 HALO™ is used in commercial programmable mode, this value defines the afterhours run period, once the afterhours run button is pressed.

Default – 2 Hours

Range – 0 ~24h

Resolution 0.5h

Cool Off if Outside Less

The SMT-850 HALO™ cooling mode will be disabled if the outside air is measured to be below the temperatre set in this option. Requires an optional Smart Temp outside air sensor be fitted and defined for outside air temperature measurement.

Default – 5C
Range – 5C ~ 35C
Resolution 1C

Stage 2+ Cool off if Outside Less

Only stage 1 cooling will available if the outside air is measured to be below the temperature set in this option. Requires the optional Smart Temp RS1/2 sensor be fitted and set for outside air temperature measurement.

Default – 5C
Range – 5C ~ 35C
Resolution 1C

Heat Off if Outside More

The SMT-850 HALO™ heating mode will be disabled if the outside air is measured to be above the temperatre set in this option. Requires the optional Smart Temp RS1/2 sensor be fitted and set for outside air temperature measurement.

Default – 35C
Range – 5C ~ 35C
Resolution 1C

Stage 2+ Heat Off if Outside More

Only stage 1 heating will available if the outside air is measured to be above the temperature set in this option. Requires the optional Smart Temp RS1/2 sensor be fitted and set for outside air temperature measurement.

Default – 35C
Range – 5C ~ 35C
Resolution 1C

Aux/Em Heat Off if Outside Less

The SMT-850 HALO™ emergency or Aux heat mode will be disabled if the outside air is measured to be above the temperatre set in this option. Requires the optional Smart Temp RS1/2 sensor be fitted and set for outside air temperature measurement.

Default – 5C
Range – 5C ~ 35C
Resolution 1C

Upstage Delay Time

This option sets the delay period between subsequent stages being called. This is to prevent multiple stages coming on in rapid succession that may impact on power peak demand load pricing that may cause excessive energy costs. (Assuming multistate systems)

Default – 10 Minutes
Range – 0 ~ 30M
Resolution 1M

Auto Upstage

If any stage is calling for longer than the value defined here without reaching setpoint, the SMT-850 HALO™ will call for the next stage to assist. (Assuming multistate systems)

Default – 25 Minutes
Range – 0 ~ 60M
Resolution 1M

Anti cycle Timer

To prevent compressor damage from rapid starting and stopping, the SMT-850 HALO™ permits you to select a delay period before the compressor can start after it last stopped. This timer starts counting down from when the compressor stopped. It does not apply a fixed delay period from every start request.

Default – 4 Minutes
Range – 0 ~ 10M
Resolution 1M

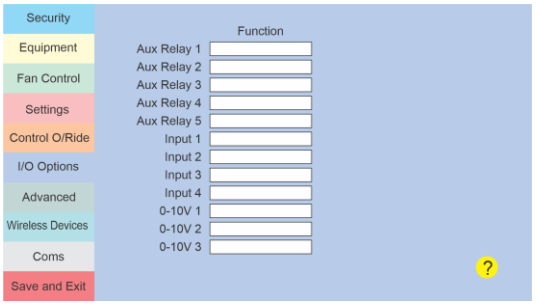
On Fault

You can adjust how the SMT-850 HALO™ responds to a triggered fault input using the options in this setting. Not, all fault display on the LCD will have a 2 min delay to prevent intermittent issues confusing the user.

Default – Display fault only
Options - Display Fault only
Fan only (Heating and cooling will stop)
Equipment Stop
Equipment Stop – No display

Anti-Freeze

Check this box to ensure the SMT-850 HALO™ maintains a minimum of 5c, even if the mode is set to off.



I/O Options Tab

One of the strengths of the SMT-850 HALO™ is its IO options page that provides the ability to fine tune the SMT-850 HALO™ performance. In this menu you can enable several functions and customise the Inputs and outputs to suit your specific needs. Effort has been made to make this menu as intuitive and as easy to navigate as possible.

Simply tap the input or output that you wish would assign a specific function too, select the function you wish to apply to that output from the options box that appears. In some cases, you will then be presented with a second options box that permits you to fine tune that input or output further.

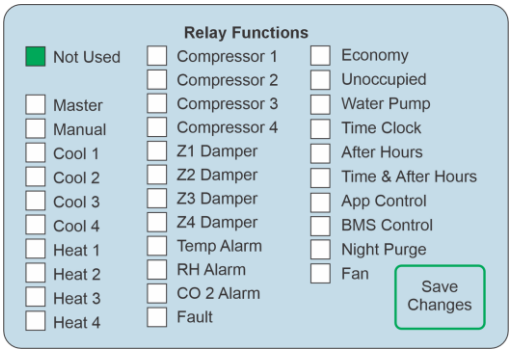
For example, select (touch) Aux Relay 3, a function box will pop up permitting you to select the function you wish Aux relay 3 to perform. Select Temp Alarm. A second option box will then appear where you can enter the temperature alarm setpoint (and other parameters), 40c for example.

In several cases control parameters can be entered into multiple locations with the SMT-850 HALO™ menu. For example, you can set the "Night Purge" parameter settings from within the "Advanced" menu tab. If night purge is set to use an Aux Relay, you can also set or adjust the same parameters from the Aux relay menu. Adjusting the night purge settings in any location will auto update the values into the other applicable locations.

Aux Relay (1 to 5)

The SMT-850 HALO™ has 5 relays that have several selectable functions that can be applied to them. Select the relay and then from the pop-up window select the function that you wish the selected relay to perform. If you select a variable function, such as RH Alarm, you will also be given the option to enter the alarm threshold, Hysteresis value, if any delay should be applied and if you wish the alarm status to be shown on the Display.

Default – Not Used



Master. The assigned relay will close based solely on the SMT-850 HALO™ commercial mode "run event"

Manual. The assigned relay will close whenever the SMT-850 HALO™ is on either by the mode button, occupancy input or force on input etc.

Cool *(1 to4).* This relay will close whenever stages 1 to 4 cooling is required. This does NOT rely on whether the SMT-850 HALO™ is set to heat pump or heat cool mode and works in parallel with the SMT-850 HALO™ main 5 relays. For example, the SMT-850 HALO™ may be set to heat pump and when stage 2 compressor is running in cooling mode from the main control relays you can have this input also close to bring on a supplemental exhaust fan or circulating water pump for example. This menu is mandatory for HVAC systems that require 3 or 4 stages of cooling as the SMT-850 HALO™ only predefines Compressor (cooling) 1 and 2 outputs.

Heat *(1 to 4).* This relay will close whenever stages 1 to 4 heating is required. This does NOT depend on whether the SMT-850 HALO™ is set to heat pump or heat cool mode and works in parallel with the SMT-850 HALO™ main 5 relays. For example, the SMT-850 HALO™ may be set to heat pump and when stage 2 compressor is running in heating mode from the main control relays you can have this input also close to bring on a supplemental exhaust fan or circulating water pump for example. This menu is mandatory for HVAC systems that require 3 or 4 stages of heating as the SMT-850 HALO™ only predefines Heating 1 and 2 outputs.

Compressor (1 to 4). This relay will close whenever stages 1 to 4 heating or cooling is required. This does NOT depend on whether the SMT-850 HALO™ is set to heat pump or heat cool mode and works in parallel with the SMT-850 HALO™ main 5 relays. For example, the SMT-850 HALO™ may be set to heat cool and when stage 2 heating is running in heating mode from the main control relays you can have this input also close to bring on a supplemental exhaust fan or circulating water pump for example. This menu is mandatory for HVAC systems that require 3 or 4 compressor stages as the SMT-850 HALO™ only predefines Compressor srage 1 and 2 outputs.

Zone Damper (1 to 4). As well as controlling a HVAC system, the SMT-850 HALO™ can also control damper motors and have these manually controlled by the user in the Zone Window. Select the relay that will control each zone motor. See Zone Control Logic on page 16.

Temp Alarm. the selected relay will close when the temperature threshold is exceeded as displayed on the SMT-850 HALO™ LCD. Note, you can have multiple relays selected as temp alarm if you need staged temperature alarms. Additionally, if zoning is enabled, the temperature alarm may activate / deactivate as you switch "sensing" zones.

RH Alarm. like the temp alarm above, the selected relay will close when the Relative Humidity threshold as measured by the SMT-850 HALO™ wall controller is exceeded. Note, you can have multiple relays selected as RH alarm if you need staged RH alarms.

CO2 Alarm. if the optional CO2 sensor is fitted to your SMT-850 HALO™ wall controller then you can select an alarm output based on this sensor measured value in PPM. Note, you can have multiple relays selected as C02 alarm if you need staged Co2 alarms.

Fault. This relay will close when the SMT-850 HALO™ input is set for fault and the input it triggered.

Economy. The SMT-850 HALO™ can introduce fresh air into a building for free cooling if the outside temperatre (and RH) is suitable for cooling. This relay will close when economy mode is running to either control dampers, a supplementary air fan, or an indicator light for example. You will also be able to set a "economy threshold" for this relay. Please see the section on Economy logic on page 54 of this manual.

Unoccupied. If your SMT-850 HALO™ has enabled occupancy inputs, this relay will energise whenever the occupancy input (or timer) is active. You can use this relay to turn other items on or off when the thermostat moves in and out of occupancy mode.

Water Pump. The relay selected for water pump relay will always energise whenever heating or cooling is called regardless of fault input status. Typical use for this relay is to call a Circulating Water Pump for water sourced heat pump units.

Time Clock. The selected relay will energise whenever the SMT-850 HALO™ is running occupied mode (in commercial programable mode). This output can then be used to bring on other thermostats or other items that must be turned on or off using the thermostats time clock.

After Hours. The SMT-850 HALO™ commercial time clock features an inbuilt after hours run timer. Whenever this timer is initiated, the selected relay will energise.

Time and After Hours. This mode will energise the selected relay whenever the SMT-850 HALO™ running in commercial programable mode ether by time clock or the afterhours run function.

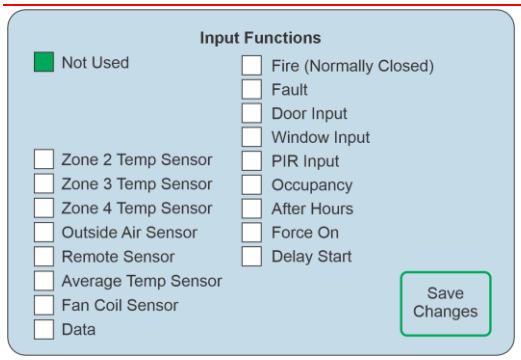
App Control. This permits this output to be controlled via the Smart Temp halo App or web portal.

BMS Control. This permits this output to be controlled via a Modbus or BACnet BMS system.

Night purge. This relay will be used by the night purge function.

Fan. The relay will energise when any call for fan occurs.

Input (1 to 4)



The SMT-850 HALO™ has 4 universal inputs that have several selectable functions that can be applied to them. Simply select the input and from the pop-up window select the function that you wish the input to perform. If you select a variable function, such as PIR input, you will also be given the option to enter the PIR time value.

Default – Not Used

Zone 2, 3, 4 Temp Sensor. *(This is a Smart Temp temperature input)* The SMT-850 HALO™ can control zone dampers and permit the user to select the location of where temperature is measured. This input is for zone 2 temperatre sensor. See Zone control on page 16 of this manual.

Outside Air Sensor. *(This is a Smart Temp temperature input)* The sensor with this function will display the outside air temperature on the LCD. This temperature value will also be used for multiple functions in the SMT-850 HALO™ such as economy functions and advanced equipment control functions.

Remote Temp Sensor. *(This is a Smart Temp temperature input)* Any sensor wired to this input will replace the temperature sensor fitted SMT-850 HALO™ with the temperature measured by this sensor.

Average Temp Sensor. *(This is a Smart Temp temperature input)* A sensor wired to this input will average its temperatre value with the temperature measured by the internal SMT-850 HALO™ temperature sensor.

Fan Coil Sensor. *(This is a Smart Temp temperature input)* The SMT-850 HALO™ can lockout heating and cooling if the coil temperatre exceeds pre-set thresholds, or this input can delay the start of the indoor fan in heating mode.

Data. *(This is a Smart Temp temperature or digital input)* As the SMT-850 HALO™ has both BACnet MSTP and Modbus RTU communications, it may be beneficial to have a temperature value that is only reported to the building management system, such as supply air temperature or some other value.

Fire (Normally Closed). *(This is a digital input)* This is a normally closed input. If this input opens the SMT-850 HALO™ will immediately shutdown. All relays will de-energise and all 0-10V outputs will be 0 volt. There will be no run-on times or purge time applied. This inputs auto resets.

Fault (*This is a digital input)* This is a normally used to shut down the SMT-850 HALO™ in a controlled way based on an external input, this input only stops heating and cooling. An active fault input will permit any fan purge or other safety run timers to expire other than heating and cooling run on timers. If fitted, zone dampers position will not be affected.

Door Input. *(This is a digital input).* The Door input can work in conjunction with the PIR input for "Latched" occupancy detection or as a standalone input that simply turns off the heating and cooling system if this input is active for the preset time. This is an auto reset input. (See Occupancy logic on 55)

Window Input. *(This is a digital input)* If this input is closed longer than a pre-set period the SMT-850 HALO™ mode will turn to OFF. (Off will flash to indicate that it is held off by a remote input and cannot be override by the user) Once the input is open again the SMT-850 HALO™ mode will return to its previous mode.

PIR Input. *(This is a digital "pulsed" input)* The PIR input is designed to connect to a standard security system PIR movement sensor, and it can work in conjunction with the Door input for "Latched" occupancy detection or as a standalone input that simply turns the SMT-850 HALO™ mode to off. The PIR input is a countdown input that resets its countdown timer every time the input is pulsed (as would happen if movement were detected by a PIR sensor). When the countdown timer reaches 0 (zero) the SMT-850 HALO™ mode will turn to Off. If movement is detected again the SMT-850 HALO™ will return to its previous mode and the countdown timer will begin again. (See Occupancy logic on page 55)

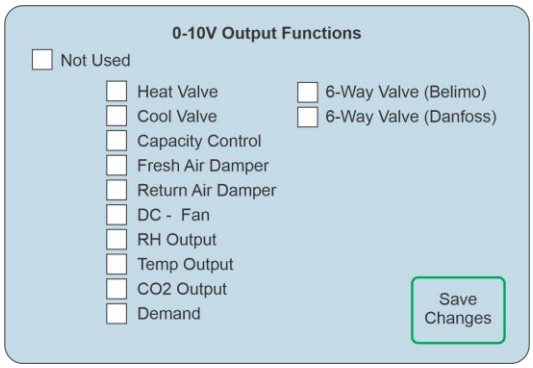
Occupancy. *(This is a digital input)* When this input is closed the user heating and cooling setpoints will be replaced by the occupancy setpoints. See the "User Display Functions" tab in the installer menu shown on page 55 of this manual.

After Hours. *(This is a digital "pulsed" input).* When this input is given a brief pulse (between 0.3 to 3 seconds) the commercial after hours run timer will start. If the after-hours timer is running pulsing this input will cancel any remaining timer.

Force On. *(This is a digital input).* This mode applies to commercial mode, hospitality mode and manual mode. When this input is closed, the SMT-850 HALO™ will be forced on – Into Start Mode (in Auto Mode).

Delay Start. *(This is a digital input).* This mode applies to commercial mode, hospitality mode and manual mode. When this input is closed, the SMT-850 HALO™ will be forced on after a random delay period of up to 90 seconds – Into Start Mode (in Auto Mode).

0-10V (1to 3)



The SMT-850 HALO™ has 3 x 0-10 volt that have several selectable functions that can be applied to them. Simply select the output and from the pop-up window select the function that you wish the output to perform. If you select a variable function, such as heating valve control, you will also be given the option to enter the valve span value.

Default – Not Used

Heat Valve. This output will modulate the 0-10v output based on how far the room temperature is from the heating setpoint. The greater the distance the higher the voltage. You will be given the option to adjust the heating span value as well as other options.

Cool Valve. This output will modulate the 0-10V output based on how far the room temperature is from the cooling setpoint. The greater the distance the higher the voltage. You will be given the option to adjust the cooling valve span and other parameters.

Capacity Control. This output will modulate the 0-10V output based on how far the room temperature is from the heating and cooling setpoint. The greater the distance the higher the voltage. This output is generally used to control a digital scroll or inverter system that requires a signal to control demand. You will be given the option to adjust the span value and other parameters in the IO options window.

Fresh Air Damper. The SMT-850 HALO™ can use outside air for free cooling should the outside air be a suitable temperature. This output will modulate the fresh air damper open based on how far the room temp is above the cooling setpoint when outside air is suitable for cooling. See the economy logic control explanation on page 54 of this manual.

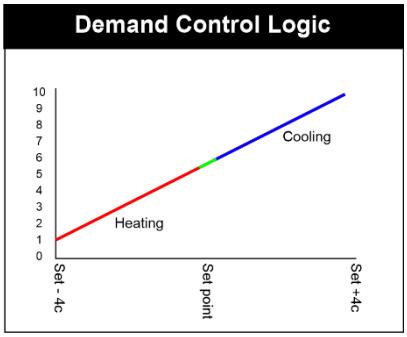
Return Air Damper. The SMT-850 HALO™ can use outside air for free cooling should the outside air be a suitable temperature for cooling. This output will modulate the return air damper closed based on how far the room temp is above the cooling setpoint if outside air is suitable. See the economy logic control explanation on page **Error! Bookmark not defined.** this manual.

DC-Fan. Many modern air conditioning systems and fan coils run a DC variable speed fan. The SMT-850 HALO™ has the capability to control this fan. DC fan settings can be found in the Fan options window described on page 34.

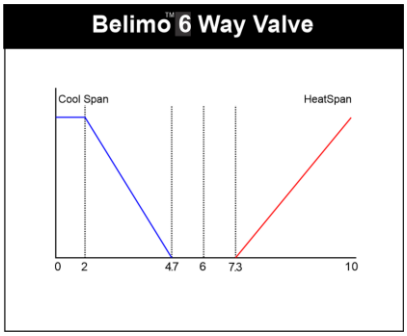
RH Output. This output will track the SMT-850 HALO™ relative humidity reading as displayed on the LCD. 0% RH = 0v. 100%RH = 10V.

Temp Output. This output will track the SMT-850 HALO™ temperature reading as displayed on the LCD. 0 C/F = 0v. 50c = 10V (100F=10v).

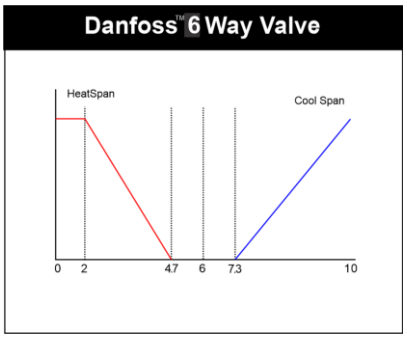
CO2 Output. This output will track the SMT-850 HALO™ CO2 reading as displayed on the LCD id the optional CO2 sensor is fitted. 0 ppm = 0V 2,000ppm = 10V



Demand. This output monitors both heating and cooling demand based on a single output. When neither heating nor cooling is called the output will be 5.5v. If heating is required, the voltage will fall from 5v to 1v over a range of 4c from the heating setpoint. When cooling is called the voltage will increase from 6v to 10v over a range of 4c from the cooling setpoint.

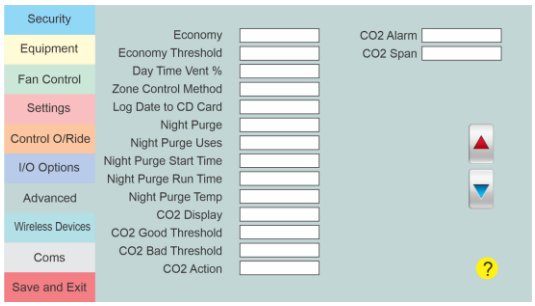


6-Way Valve (Belimo™). The SMT-850 HALO™ offers support for the Belimo ™ 3-way valve. A single output can control the valve in heating and cooling mode. When cooling is required, the output will vary from the cooling valve span value at 10v to 4.7v. Heating will start at 7.3V to the heating value span at 10v. If there is no need for heating or cooling the SMT-850 HALO™ output will be 6v



6-Way Valve (Danfoss ™). The SMT-850 HALO™ offers support for the Danfos™ 3-way valve. A single output can control the valve in heating and cooling mode. When Heating is required, the output will vary from the heating valve span value at 10v to 4.7v. Cooling will start at 7.3V to the Cooling value span at 10v. If there is no need for heating or cooling the SMT-850 HALO™ output will be 6v.

Advanced Options Tab



Economy

Defines how the SMT-850 HALO™ manages Economy mode.
See Economy Logic detailed on page 54
Default – Off

Options are Off / On / Test
(the economy function will only function when the SMT-850 HALO™ is running the Commercial Start Event or always when in cooling (or Auto) mode when the SMT-850 HALO™ is NOT in commercial mode.

Off – The Economy function will be suspended
On - Economy function will run when cooling (or Auto) mode is selected.
Test - the economy mode action(s) will be forced ON. This includes all outputs such as dampers and relays that are assigned to economy function. Note - this test mode will auto time out after 4 hours or whenever power is cycled.

Note, you will need select a 0-10V output for the fresh air or return air (or both) dampers or a relay output in the IO options menu

Economy Threshold.

This setting defines how far below the current room temperature the outside temperature must be before the SMT-850 HALO™ will initiate economy cooling mode.

If you use the optional wireless outside air sensor with Temp and RH sensors fitted, then this menu will automatically change to “Enthalpy Based”. This is a superior method, and no user adjustments are required.

Default – 2C
Range – 0 ~ 10c
Resolution 0.5C

Day Time Vent %

This setting will open the fresh air damper (shown in volts) whenever the following conditions are met.
Commercial start event occurs (ends at the stop event).
The commercial afterhours timer starts (ends at the conclusion of the afterhours timer).
The 2nd residential event starts (end with the 3rd program starts).
When in manual, PIR or hospitality mode when even the mode is NOT off.

Default – 2V
Range – 0 ~ 10c
Resolution 0.5C

Zone Control Method.

The SMT-850 HALO™ can also control up to 4 zones dampers and sensors in several ways. This option lets you fine tune the zone control logic. See zoning on page 16 of this manual. This menu item permits you to limit the number of closed zones to 1 or 2 and control fan speed (if multiple fan speed is selected).

Default – Min 1 zone
Options - All Zones can close.
Min 1 zone with low fan only
Min 1 zone
Min 2 zone with low fan only
Min 2 zones

Night Purge.

Night purge extends the capability of the economy hardware to cool a warm building at night. Night purge compares inside air temp with outside air temp against the desired setpoint. If outside air is suitable to cool the space, the SMT-850 HALO™ will open the fresh air damper, close the return air damper and initiate the desired function (start the equipment evaporator fan, energise an Aux relay or both) as defined in this menu.

Note - All mechanical cooling will be disable when Night Purge is actively bringing in fresh air to cool. Mechanical cooling can operate if the outside air is NOT suitable for night purge and a programmed event calls for cooling.

Default – Off
Range – Off / On / Test

Night Purge Uses.

This define the output that will be used to bring fresh air into the building during night purge. This output can be set (and is mirrored) in the IO Options window.

Default – Evap Fan
Range – Evap Fan / Aux Relay / Both.
Note - you MUST assign the Night Purge relay in the IO option / Relay X menu to use Aux relay or Both functions.

Night Purge Start Time.

Use this setting to define the time you wish the night purge function to start. Note, this is not the time fresh air will be bought into the building, this is the time the SMT-850 Halo™ will begin the night purge process of comparing room temp to set temp and target temperature.

This function will operate 7 days per week.

Default – 10:pm
Range – 7pm till 8am

Night Purge Run Time.

Defines how long you the night purge will operate in hours. Note, if the after-hours run timer is initiated or if the start schedule time is reached, night purge will be suspended in favour of conventional cooling.

Default – 6 hours
Range – 1 to 12 hours in 1-hour adjustments

Night Purge Temp.

This sets the temperature you wish to maintain within the building when night purge is active.

Default – 22c
Range – 15 to 30 hours in 1 c adjustments

CO2 Alarm.

The SMT-850 Halo™ can be fitted with a highly accurate Non-Dispersive Infra-Red Carbon Dioxide sensor. The CO2 level can simply be displayed on the LCD, or you can have the SMT-850 Halo™ perform various action when the measured CO2 exceeds pre-set thresholds as defined in this menu.

Options Off – Simple display the CO2 level on the LCD or set the action threshold from 200ppm to 2000ppm in 100 ppm steps.

CO2 Span.

This option defies how far below the action (alarm) setpoint the CO2 level will need fall to turn off the CO2 alarm

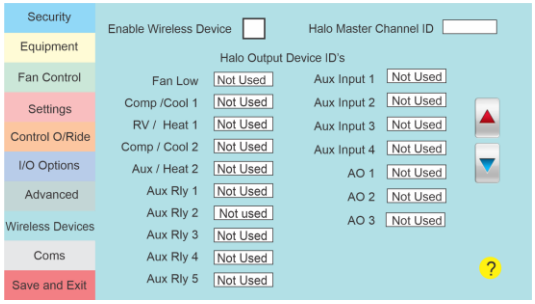
Options are Latched (must be reset from the touch screen) then from 10 to 300 ppm is 10 ppm steps Default is 50 ppm

High CO2 Action.

If the CO2 sensor exceeds the alarm threshold as defined above the SMT-850 Halo™ can perform the following actions.

Beep Only - the SMT-850 Halo™ will activate its on-board beeper and display HIGH CO2 on the LCD.
Relay Only – the selected Aux Relay will energise.
Beep and Relay. Both the audible. visual alarm will activate, and the selected CO2 relay will energise

Wireless Devices Tab



When wiring control relays, remote temperature sensors, or 0-10V analogue outputs for valves, dampers, or other Halo IO devices is difficult, wireless alternatives are available. This wireless version features an optional LoRa (Long Range) radio that pairs directly with the SMT-850 Halo and remoted devices via radio frequency signals (up to 1 km outdoors).
These wireless devices operate in parallel with the SMT-850 Halo's outputs. For example, pairing a wireless RF relay with the Halo's fan relay function will mirror the fan's relay operation remotely.

Enable Wireless Device Checkbox

If you wish to use any wireless device, you must first enable this function by purchasing and plugging in the optional LoRa Radio module (P/N SMT-LoRa-R) then selecting the Enable Wireless Device checkbox. The page will then show all Halo Input and Outputs (I/O). to give you the opportunity to select the output you wish to duplicate with a LoRa RF device.

Halo Master Channel ID

To prevent cross-communication issues, each SMT-850 HALO™ must have a unique Master Channel Identification Number. This setting uniquely identifies the SMT-850 Halo on the wireless network, distinguishing it from other Halo units that may be within range of SMT-850 HALO™ remote RF devices. You can assign a Master Channel Identification Number between 1 and 1203.

Touch the Master Channel ID box and a keyboard will be shown that will permit you to enter the ID channel number

(Use the 10 DIP switches on the wireless device to set the code to match this master channel ID on the wireless device. See the Binary Table below to understand how this coding works. More information will be provided in the manual supplied with the wireless device.)

Halo Wireless Device ID

Each SMT-850 Halo Input and output (Including those Inputs and outputs shown in the I/O) menu can be duplicated remotely. To do so, simply select the SMT-850 HALO™ I/O you wish to control wirelessly from the wireless devices tab and assign a unique ID number (from 1 to 64) to the desired output.

Then on the LoRa device match this number using the Device ID DIP switches (6-way DIP switch at the bottom). This device number pairs the selected Halo I/O with the corresponding wireless device, duplicating the Halo function remotely. *(Note, the Halo internal IO will continue to operate as normal, its function is simply duplicated remotely)*

Important: If pairing a 0-10V output to a wireless device, be sure to use a wireless 0-10V module—not a sensor or relay module. Using the wrong module will result in improper functionality.

For example, to remotely control the SMT-850 Halo's low fan speed relay, select the low fan speed output and assign an ID number to that output using the pop up keyboard, then set the same device ID number using the 6-way DIP switch on the wireless relay module.

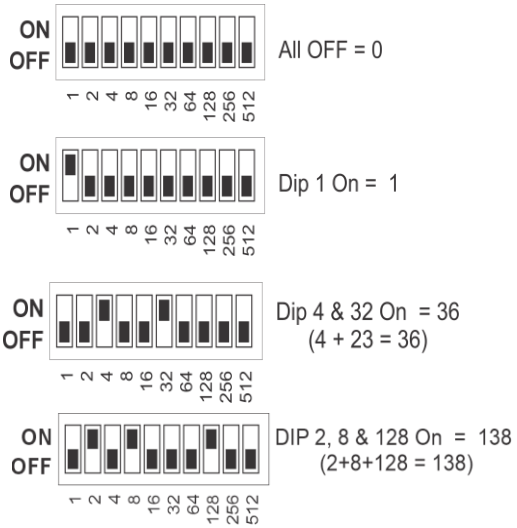
You will need power down the LoRa device (or remove and replace batteries) after changing any DIP switches for the new settings to take effect.

Understanding Binary Coding

Binary coding is a simple way of converting a series of ON/OFF switch positions into a decimal number.

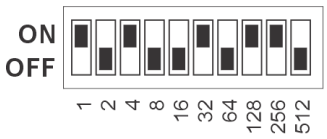
The SMT-850 HALO™ LoRa devices use DIP switches to set both the Master Channel and the Device ID. There are 10 DIP switches used to set the Master Channel, allowing you to choose an address between 1 and 1023. An additional 6 DIP switches are used to set the Device ID, providing up to 63 unique device IDs.

Each switch, from left to right, represents a value that doubles from the switch to the left — starting at 1, then 2, 4, 8, and so on, up to 512. To find the decimal value, simply add the numbers together corresponding to the switches that are turned ON. This total becomes the address or ID that the device will use.



Hint. When setting codes on the DIP switch, start with the Dip that has the biggest number that is equal to or is smaller than the largest DIP switch value. Then the next largest number that will take as much of the remainder as possible and continue until you reach the code you desire.

For example, to set a code of 421, first turn on switch 256 (leaving 165 remaining). Then switch for 128 (leaving 37 remaining) then Switch 32 (leaving 5 remaining) then switch 4 (leaving 1 remaining) then switch 1.



DIP 1, 4, 32, 128 & 256 On = 421
(1+4+8+32+128+256 = 421)

You will need power cycle the LoRa device after changing any DIP switches for them to take effect

Remote RF Devices

Please refer to the manual that accompanies each remote device for detailed information on how to set up the device. Each LoRa RF device will be powered from either battery (such as the remote room temperature sensor) or from 12/30VAC or DC (such as a remote relay or 0-10V output). There are two sets of DIP switches in each device, a 10-way DIP (6+4) switch that sets the Halo Master Channel ID (that pairs the LoRa RF device to "this" individual SMT-850 Halo) and a 6 way dip witch that defines the Halo IO to be duplicated remotely.

SMT-850 HALO™ LoRa Radio. This is the radio hardware module that plugs into the Halo to enable LoRa radio communication (PN SMT-LoRa-R)

SMT-850 HALO™ LoRa Temp Sensor. This sensor can be used for multiple applications such as a remote temperate sensor for use in zone control, fan coil temperatre or when you wish to measure outside air temperature. This sensor can also be used as a switch to detect if a door is open or a remote start has been initiated. Do not apply any external voltage to this device. (P/N SMT-LoRa – T)

SMT-850 HALO™ LoRa Temp & RH Sensor. This sensor is typically used for outside air temperature and humidity measurement for enthalpy-based economy systems. Do not apply any external voltage to this device. (P/N SMT-LoRa – H)

SMT-850 HALO™ LoRa Relay. This relay is powered by 24VAC and will have a volt free relay contact rated up to 240VAC at 2A (Non Fused). This is typically used as a zone damper relay, a pump starts or heat/cool relay. (P/N SMT-LoRa – R)

SMT-850 HALO™ LoRa 0-10V Output

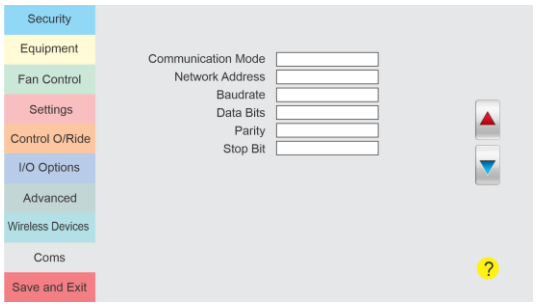
This Module is powered by 24VAC and will have a 0-10V output. This is typically used as a zone damper relay. (P/N SMT-LoRa – 010)

SMT-850 HALO™ LoRa 0-10V Master Module

This device is powered by 24VAC and duplicates all 32 of the Halo Inputs and Outputs remotely. 10 Relays each rated at 240V @ 2A(non-fused), 4 Universal inputs (do not apply external voltage to these inputs) and 3 0-10V outputs. (P/N SMT-LoRa – Master)

Communications Options Tab

The SMT-850 HALO™ has an inbuilt RS-485 circuit to permit it to be on a Building Management system and be controlled remotely. There are several parameters that need be set for communications to function to operate reliably. The options in this menu define how the communications function.



Communications Mode.

The SMT-850 HALO™ has several communication options such as BACnet MSTP, Modbus RTU, temperzone ™, Smart-Temp UI protocol adapter and Intensis ™ protocol adapter. Some options will automatically select the network parameters such as address, speed and parity etc. (See communications on page 53)

Network Address.

The defines the network address "this" individual SMT-850 HALO™ will use. No two devices on the same node should share the same network address.

Baud rate.

Each device on the same network node should all share the same communication speed. This option sets the speed.

Default – 9200 Baud
Options - 4.2k to 256K

Data Bits

Each device on the same network node should all share the Data Bits.

Parity.

Each device on the same network node should all share the same communication parity, Odd, Even or None. This option sets the Parity.

Default – Even
Options - None
Odd
Even

Stop Bits

Each device on the same network node should all share the Stop Bits.

Save and Exit Tab

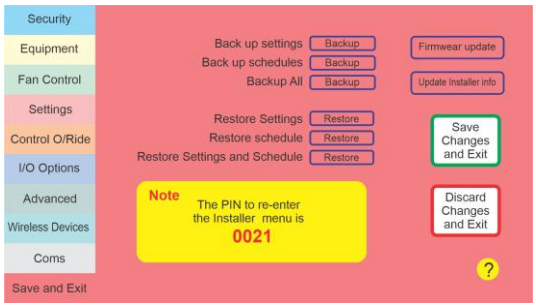
When exiting the installer menu, the SMT-850 HALO™ will give you several options as defined below. It is especially important to take note of the PIN required to re-enter the installer menu, Highlighted in Yellow. If you forget this PIN, you will be unable to re-enter the installer menu and may need to return the SMT-850 HALO™ to Smart Temp or an authorised distributor for unlocking.

Backup Settings.

Your SMT-850 HALO™ has many user and installer adjustable functions. Being able to back up and restore these settings can make installation of the SMT-850 HALO™ more efficient and less prone to errors. This option permits you to back up the installer settings.

Backup Schedules.

Up to 16 holiday schedules can be stored in the SMT-850 HALO™ as well as a 7-day weekly schedule with up to 6 events per day. Once these have been entered, they can be saved and transferred to other SMT-850 HALO™ using the backup and restore function.



Backup All.

This option will completely back ap all the SMT-850 HALO™ settings into a single file. Useful if you are installing multiple SMT-850 HALO™ into a single building.

Restore Settings.

This option will permit you to restore installer settings from a “restore setting file”

Restore Schedule.

This option will permit you to restore schedules settings from a “restore schedule file”

Restore Settings & Schedules.

This option will permit you to restore “All” settings from a “restore all file”

Firmware Update.

In the unlikely event there are firmware errors with your SMT-850 HALO™ you will be permitted to download a new firmware file from Smart Temp or an Authorised Distributor and upload this new firmware into your SMT-850 HALO™. Note, this function is typically needed for advanced users that have customised functions. The SMT-850 HALO™ has automatic Over-The-Air update capability.

You will be given the option to update firmware from a file loacted in the Micro SD card (Halo/Firmware folder) or from the cloud if the SMT-850 HALO™ is currently connected to the internet

Update Installer Info.

Information that is entered in this pop-up box will be displayed when the user touches the info button. You will be permitted to enter your Company name, Contact Number, Email Address and company logo. *(If you wish to replace the Smart Temp logo on the top left of the main user screen. Load a logo file into the root directory of the Micro SD card. The Logo must be a 140 x 60 pixel and in PNG format and select update logo)*

Part 3 –Communications

Communications

See the Communications Tab information on setting up communications on page 48
The SMT-850 HALO™ has integrated Modbus RTU communications and BACnet MSTP. Using a Modbus Master controller or building management system many of the SMT-850 HALO™ features can be centrally controlled and monitored. Additionally, the RS-485 communications within the Halo also permit the control of Inverter air conditioning systems by use of a protocol adapter such as the Smart Temp SMT-UI, The Smart Temp B-25 module or those made by companies such as Intesis ™

Additionally, there is a set of DIP switches that place load and bias resistors on the RS-485 communication line, DIP 2 sets this function. In most cases these switches can be left in the OFF position

DIP 2	**Halo Communications DIP Settings**	(3 way DIP block)
Switch	Function	ON
1	Data A	2.2k Ohm on A and Vcc (Pulls UP data A)
2	Data B	2.2k Ohm on B and Gnd (Pulls Down data B)
3	120 Ohm between A & B	120 Ohm EOL (reduce reflections that may interfere with data)

If you find communicates unstable you can turn this resistor on as this may improve communication stability howe ever you should also check other possible causes first, such as make sure wiring polarity is correct, there are no star or delta wiring (branches), and that the RS-485 communications pair shield is properly grounded at 1 end only. Also check communications settings for address, baud and parity are correct.

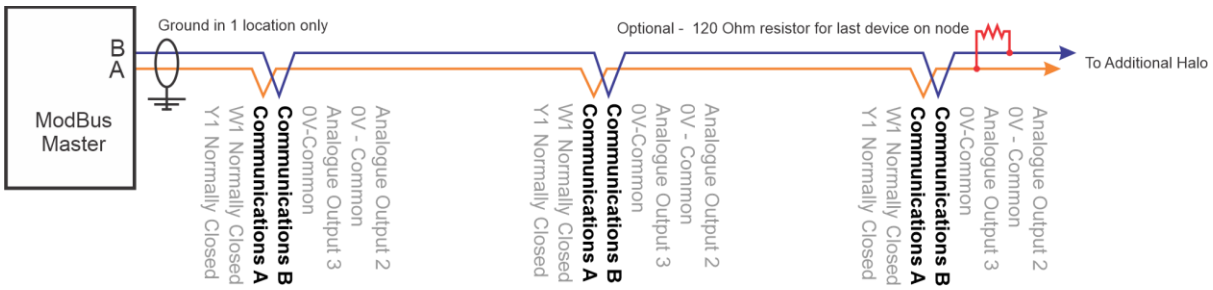
If the above is correct,

1 Turn on DIP 3 On only (DIP 1 & 2 Off) - test and evaluate result. If no improvement try step 2.
2 Turn DIP 1 & 2 on Only (DIP 3 OFF) - test and evaluate result. If no improvement try step 3.
3 Turn all 3 DIP On- test and evaluate result. If no improvement call Smart Temp or authorised distributor for more advanced troubleshooting.

Modbus

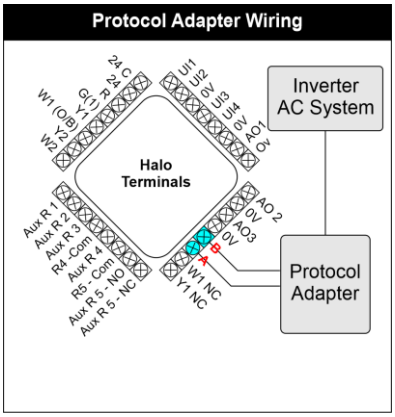
Modbus is a simple, widely used communication protocol that allows electronic devices to share information, especially in industrial and automation settings. Originally developed in the 1970s for communication between programmable logic controllers (PLCs) and other equipment, Modbus helps devices like sensors, meters, and controllers work together smoothly. It's known for being straightforward and reliable, which has made it popular for connecting different types of devices in factories, buildings, and power plants. Modbus usually works by letting one main device, called a master, ask for data from other devices, called slaves. This setup makes it easy to monitor and control equipment, helping organizations run their operations more efficiently.
Other than the relay registers (Coils), the SMT-850 HALO™ Modbus data is within the "SMT-850 HALO™" range, this being holding registers. Depending on your choice of Modbus Master you may need to enter the address using the full address - such as "40012" or by selecting "Holding Registers" and entering the address simply as "12" or "012". These Modbus registers are shown as Base "1" (PLC addressing) format. Depending on your Modbus master addressing format you may need to subtract 1 from these values to convert to base "0" (protocol addressing) format.

Please see the separate Halo Modbus Documentation for detailed information about the ModBus capabilities of the Halo thermostat.



BACnet

BACnet, which stands for *Building Automation and Control Network*, is a communication protocol specifically designed to help different devices and systems in buildings, like HVAC (heating, ventilation, and air conditioning), lighting, security, and fire safety, talk to each other. It was created to make it easier for these various systems, even if they're made by different manufacturers, to connect and work together. Instead of needing separate controls for each system, BACnet lets all the devices share information on a single network. This makes managing a building's systems more efficient, as it centralizes control and helps save energy, reduce costs, and improve comfort for building occupants

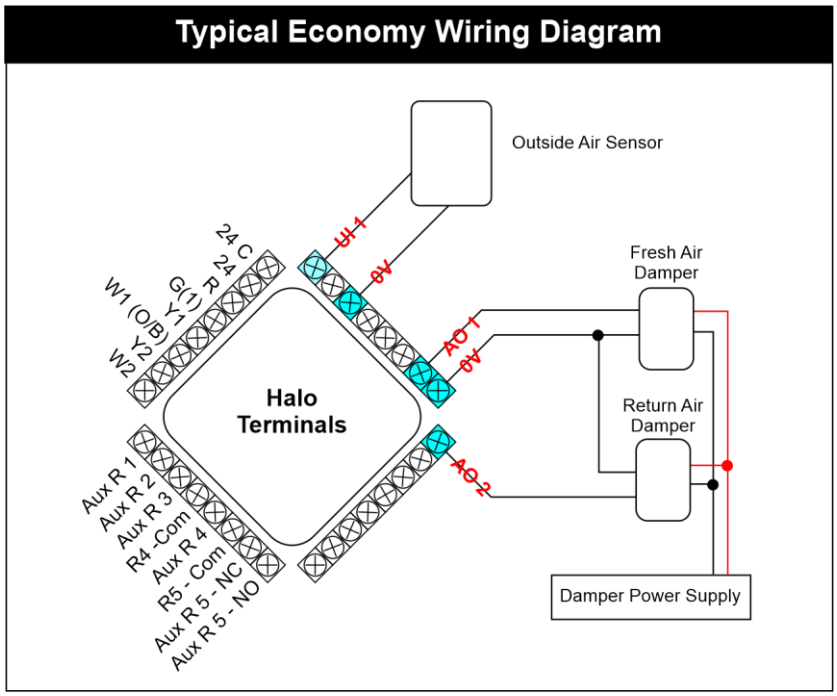


Inverter / High Level wiring

Your Halo is also able to interface with Inverter style air conditioning systems manufactured by companies such as Daikin ™, Fujitsu ™, Mitsubishi ™ etc using protocol adapters such as the Smart Temp SMT-UI XXX or Intesis ™. The manual supplied by Smart Temp that accompanies the protocol adapter will provide specific information on setting up the Halo for use with this adapter variant.

Advanced Functions

Economy Cooling



The Economy Logic function within the SMT-850 HALO™ first requires an outside air temperature sensor to be wired to the SMT-850 HALO™ universal input. You should wire this sensor to one of the SMT-850 HALO™ universal inputs and select that input function as "Sensor - Outside Air Temperature" in the Installer options menu, under the Inputs / Outputs tab. (see page 43). *You cannot use internet-based temperature for the Economy Function as this cannot be guaranteed an accurate measurement of outside air temperature for your exact location.*

Install the Return air, Fresh air and optional Relief Air dampers and wire them to the SMT-850 HALO™ 0-10V outputs. (These dampers will need to be independently powered) and select the 0-10V Output Function as

"Return Air (for the Return Air Damper), Fresh Air (for the Fresh Air (and Relief) Damper(s) in the Installer options menu, under the Inputs / Outputs tab. (see page 45).

When cooling is required The SMT-850 Halo™ will compare the outside air temperature to the inside air temperature and if the outside air temperature is more than the Economy threshold settings in the Advanced option window (see page 46) cooler than inside the SMT-850 HALO™ will start the HVAC system fan and begin to open the Outside Air Damper as it closes the Inside Air Damper drawing in the cooler outside air to cool the home or office.

The SMT-850 HALO™ will modulate the dampers open or closed to precisely control the temperature of the home or office using outside air. Should the use of outside air not be capable of maintaining the cooling set point alone, the SMT-850 HALO™ will suspend the use of Economy cycle and revert to standard cooling.

In Summary, the steps needed to install and use Economy Function are: -

1. Install 2 wire outside air sensor in location suitable to measure typical outside air temperature.
2. Install the fresh air and return air dampers (and optional relief damper)
3. Enter the installer menu and assign both the Sensor and Dampers to the selected inputs and outputs in the IO options menu (Page 41).

Enthalpy Based Economiser

The SMT-850 HALO™ can also use inside and outside temperature and humidity to calculate the enthalpy of the air. This is a much more accurate way of performing an economy function as it prevents the use of damp outside air (even if its cooler) for economy function. To use economy based on enthalpy you must use the Smart Temp SMT-LoRa – H sensor and pair this sensor with the SMT-850 HALO™

Indoor Air Quality Preservation

If the Economy function is fitted it can be further enhanced by adding a CO2 indoor air sensor. You are permitted to set a Hi CO2 Alarm as part of the IO options page (see page 42) and define an action to occur once the alarm threshold has been exceeded such as change a relay state and / or introduce fresh air via the Economy cooling system. Note, the outside dampers will modulate from closed to 100% open over a range of 1,000ppm.

Occupancy Logic

The SMT-850 HALO™ has inbuilt logic for occupancy detection when connected to external sensors. The Occupancy Input logic has been designed to either alter the heating or cooling set point or automatically turn the SMT-850 HALO™ completely off when the room under the control of the SMT-850 HALO™ is detected as unoccupied.

When the room is occupied the set points can be adjusted as needed by the user and within the heating and cooling limits defined in the installer menu (See page 31). When the room is unoccupied the installer pre-defined set points are used – these cannot be adjusted by the user. When the SMT-850 HALO™ is in unoccupied mode, the words "Unoccupied Mode Active" will show on the SMT-850 HALO™ Wall Controller display.

The unoccupied set points are entered in the Installer options menu under the Miscellaneous Control Options tab as "Unoccupied Heat", "Unoccupied Cool" and "Un-occupied Fan" (see page 38).

Occupancy detection relies on external sensors or inputs being wired to the SMT-850 HALO™ Universal Inputs.

In the most basic form of occupancy detection the SMT-850 HALO™ is simply monitoring a volt free input. When the input is open the room is occupied and the user set points are used, when the input is closed the room is unoccupied and the installer defined "Unoccupied Heat", "Unoccupied Cool" and "Un-occupied Fan" set points are used and "Unoccupied Mode Active" is shown on the SMT-850 HALO™ display. In more advanced forms of occupancy detection, the SMT-850 HALO™ will monitor multiple inputs simultaneously and apply logic to these inputs and the SMT-850 HALO™ will determine the rooms occupancy status.

Information on defining the occupancy functions for the SMT-850 HALO™ universal inputs is in the Inputs / Outputs tab in the installer menu on page 43 of this manual.

Should you wish, the SMT-850 HALO™ can also energise one of the assignable relays when in "Unoccupied" mode. This may be useful to drive an indicator or isolate a power contactor to turn hotel rooms power off when the guests are not in the room.

Basic Occupancy Detection – On/OFF

Simply define one of the SMT-850 HALO™ Universal inputs for "Digital - Occupancy Input ". When the input is open the user set points are used. When the input is closed the installer defined "Unoccupied Heat", "Unoccupied Cool" and "Un-occupied Fan" set points are used.

Using a standard "Security Type" Movement detector.

A standard security sensor will momentarily close an internal relay every time movement is detected by it, this provides a pulse signal that generally only last a second or so. By setting one of the SMT-850 HALO™ a universal input as a PIR input (see page43). You will also be permitted to set a "Delay Time".

When movement is first detected (as a pulse) from the movement detector the SMT-850 HALO™ will enter occupied mode and control the heating and cooling accordingly. It will then begin to countdown starting from the previously entered "Delay Time". Every time new movement is detected by the movement detector the "Delay Time" will reset to the countdown timer to your "Delay Time". If movement is occurring the SMT-850 HALO™ will keep the heating and cooling running to maintain the user setpoints. If movement is not detected for some time and the "Delay Time" counter counts down to zero, the SMT-850 HALO™ will re-enter un-occupied mode.

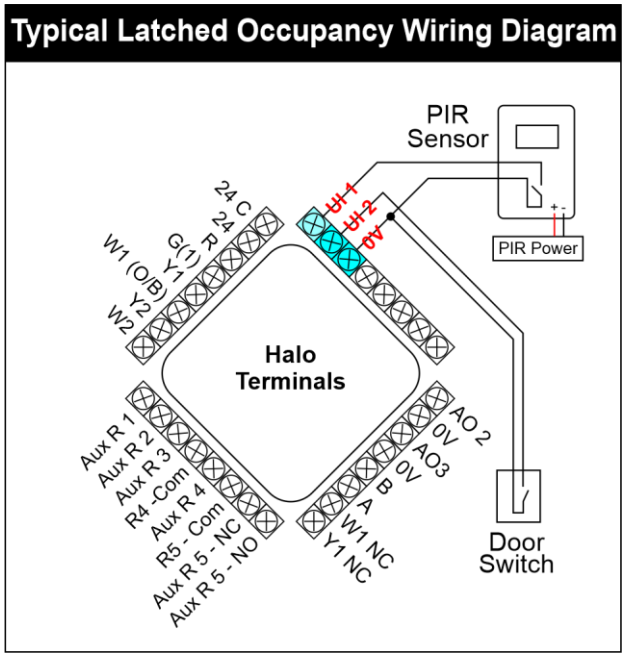
This mode is ideal for training rooms where people will enter (movement is detected and the HVAC will start). People will constantly move (so at least every 10 minutes someone will move enough for the movement detector to capture movement). Once movement stops (the last person leaves the room) the countdown timer will reach zero and the SMT-850 HALO™ will apply un-occupied setpoints to the room.

Latched Occupancy Detection.

Latched occupancy detection more is more suited to Hotel Room applications where long periods of inactivity can be expected, such as when the hotel guest is sleeping. This method relies on the inputs of at least two sensors, one that monitors the door and the other that monitors movement.

When the door first opens, the SMT-850 HALO™ will move into occupied mode. Once the door closes the SMT-850 HALO™ will look from a pule (indicating movement is detected) from the PIR sensor. If a pulse is detected by the SMT-850 HALO™ after the door closes it is because some entered the room, so the room is latched into Occupied mode. If movement is not detected after the door closes it is assumed that the person left the room and the SMT-850 HALO™ moves into un Occupied Mode.

Typical Latched Occupancy Wiring Diagram



The settings are

1. Set the2 universal inputs in the SMT-850 HALO™, One for PIR sensor and the other for door sensor.

2. Set the 2 delay periods, The Door seek period which is how long the door can remain open before the room enters un-occupied mode, and the PIR "Delay Period" which is how long the SMT-850 HALO™ will seek movement before turning the SMT-850 HALO™ to unoccupied mode.

Recommended seek periods are
Door - 10 minutes. *If the room door is held open for longer than 10 minutes the SMT-850 HALO™ will switch to un-occupied mode.* (And display "Door Open")
PIR - 10 minutes. *If the door has closed and no movement is detected in the room after 10 minutes, then it can be assumed the room is empty. (The Halo will display "Unoccupied)*

If movement is detected at any time after the door has closed within this "delay" period, then the SMT-850 HALO™ will latch into "Occupied Mode" and remain in "Occupied" mode until the door input is triggered by the door re-opening.

If movement is NOT detected at any time after the door has closed during this "seek" period, then the SMT-850 HALO™ will enter un-occupied mode and the installer un-occupied set points will be used. However, whilst in "Unoccupied mode "if the PIR input is triggered then the SMT-850 HALO™ will immediately latch back into "Occupied Mode".

Using this method of occupancy detection ensures the SMT-850 HALO™ cannot be "fooled" into thinking the room is occupied when it is not as movement must be detected after the door is closed for the system to be set to an occupied state.

Should you wish, you can also define one of the SMT-850 HALO™ digital inputs as a windows contact. If this contact is open for longer than the defined period, the SMT-850 HALO™ mode will switch to OFF. As soon as the window is closed the SMT-850 HALO™ mode will return to the previous state.

Optimised Start & Stop

The SMT-850 HALO™ can control climate temperature scheduling in separate 2 ways, Normal scheduling, or Optimised scheduling, regardless of whether the SMT-850 HALO™ is setup to run the residential or commercial programs.

Normal and Optimised scheduling works equally well for both heating and cooling. For clarity - the examples below discuss heating mode only.

Normal Scheduling
Normally scheduling is the simplest for the user to understand and for the SMT-850 HALO™ to achieve, however simple programming has the potential to use more energy. With standard scheduling the "new" set temperature will change at the scheduled event time. For example, if the leave heating temperature is 15c and the return event temperature is set to 20c and to occur at 5 pm (see programming on page 13), at 4:59pm the set temperature will still be 15c (The leave events temperature), in 1 minute at 5:00pm the set temperature will change to 20 and the SMT-850 HALO™ will start heating to bring the temperature to 20c as quickly and efficiently as possible if needed.

Where energy is potentially wasted is because most people tend to set their temperature changes earlier than they need. For example, if the user normally arrives home from work at 5:30pm they will want your home to be comfortable when they get home, so most people set the return event early to give the heating system time to make the home or office comfortable. In this example the user may set the return schedule to 1 hour before their expected return time to ensure the home or office is comfortable. This may cause the heating to run for 40 minutes un-necessarily as the current room temperature and set temperature may be close.

This is normal scheduling and what most people do mostly because not many thermostats are advanced enough to provide true optimised start.

Optimised Scheduling

Optimised scheduling calculates the most energy efficient time to start the heating or cooling system to bring the temperature to the next events set temperature by the next event start time.

For example, the heating leave temperature is set to 15c, and the user normally arrive home at 5:30pm to a set temperature of 20c. With Optimised scheduling set the SMT-850 HALO™ will calculate the best time to start the heating before 5:30pm to have the home at 20c at 5:30pm. If the room and set temperature is close, the SMT-850 HALO™ may start the heating system at 5:15pm, if the room and set temperature are wide apart, the SMT-850 HALO™ may start the heating system at 4:38.

Note, the SMT-850 HALO™ will learn the dynamics of the heating and cooling system and constantly adjust its performance to ensure the minimum amount of energy is used to maintaining your desired comfort levels. Consequently, during this learning process optimised scheduling may not perform perfectly.

Part 4 - Troubleshooting and fault finding

The first step in diagnosing any potential issue would be to visit the Info screen – This page will give you vital information on what the SMT-850 HALO™ is doing, and why its doing it. This page gives you information about how the SMT-850 HALO™ is configured to control the HVAC system, if any errors are locking the system out and potentially , the contact details of the person who installed the system.

Symptom	Cause	Remedy
Clock loses time after power outage.	Backup battery is flat.	Leave Halo Powered to recharge back up battery. Sync Halo to wi-fi – Halo will update with Internet time Automatically
Zone temperatures are inaccurate	Wrong type of sensor used.	Use Smart Temp sensors only.
	Poor wiring	Please make sure all wiring is landed on the conductor, and the terminals are not biting the insulation.
	Sensors wiring crossed.	Ensure the zone sensors are wired to the correct input. IE zone 3 sensor is landed on Zone 3 input of the unit control card.
	RS-01 / 02 switch in wrong position	Check the position of the RS-01 /02 switch within the sensor. It should be in the RS-01 position unless multiple sensors are wired to a single zone input on the Unit Control card.
HVAC equipment seems to be erratic	System switches may be set incorrectly	Encore system control logic matches the System requirements

Commissioning and Testing

Once the heating, cooling or air conditioning system and other components are connected to the unit control card tests must be conducted to ensure the safe and correct operation of the complete system.

It is expected that the installer has some knowledge of HVAC system and their requirements. Several “typical” wiring examples have been provided in this manual on page 23. Please review these diagrams. Additionally, you’re heating and cooling system should have installation instructions. Please be sure to read and understand them.

Given the huge range of heating and cooling systems capable of being controlled by the SMT-850 HALO™ the guidance given below is very generic - please consult your heating and cooling system documentation and give it priority over wiring information provided in this manual.

Testing the Zone Control.

Testing the zoning system (if fitted) should be the first step in commissioning your heating and cooling system. If the zoning system is not working correctly, you may potentially damage the ducting, or the heating and cooling system.

1. Ensure the system mode is Off (see selecting mode on page 6)

2. Touch the Zone icon on the bottom of the page and open all available zones dampers by touching the name of the zone in the Zone Selection Window until it shows that the zone is open.

3. Physically Verify that each zone damper is open.

4. One by one, close each damper by deselecting the zone from the zone selection window. Verify that each zone closes when deselected.

5. Take note that the Zone Label entered in the Zone Selection window of your SMT-850 HALO™ Wall Controller matches the actual zone motor(s) for that zone. Example - the Rumpus Room label on the SMT-850 HALO™ Wall Controller switches the Rumpus Room dampers.

If the zones do not behave as expected verify the correct SMT-850 HALO™ relay function by measuring the voltage to each damper on the Zone damper terminal strip. Using an AC Voltmeter ensure you have 24VAC on the Damper DO terminal when the Zone is shown open on the LCD and that 24VAC on the Damper DC terminal with the zone window indicated that zone closed. (Black meter lead on the Com Terminal). If the SMT-850 HALO™ fails, this test remove all zone wiring and retest as a zone damper or wiring may have an electrical short. IF all wiring to the Zone Dampers has been removed and the SMT-850 HALO™ continues to fail this test your SMT-850 HALO™ may have a faulty relay or terminal strip. Contact your supplier.

If your SMT-850 HALO™ passes this test check the wiring from the SMT-850 HALO™ to your zone motors for continuity and polarity. Check the motors are 24VAC Drive Open / Drive Closed type and are not seized or damaged in anyway.

If the zone dampers are closed when they should be open and open when they should close this may indicates that crossed wiring from the DC & DO terminals for that zone.

Testing the Heating.

1. If Zoning is fitted open all zones as described above.

2. Set the SMT-850 HALO™ mode to heating only mode. (See selecting mode on page **Error! Bookmark not defined.**) Raise the heating set above the current room temperature. After any safety and anti-cycle delay timers have expired you should see the room temperature digits turn RED (Indicating Heating is running) on the SMT-850 HALO™ display.

3. Verify the heating has started and is running as expected. Ensure the cooling system has NOT also started. Ensure the heater fan is running as expected.

4. If testing a multistage heating system, ensure the room set point temperature is sufficiently above the actual room temperature to “call” for high heat output or more heating stages. (You can verify the number of stages of heating being demanded in the SMT-850 HALO™ info window - see page 8)

5. Adjust the heating set temperature until it is below the current room temperature. Note the room temperature display of the SMT-850 HALO™ display turns green (indicating no heating or cooling is needed) and that the heating turns off after any minimum run timers have expired.

If the heating system fails to start check the Unit Control Card equipment outputs. The SMT-850 each equipment control relay that is energised (ON). If your heating system is a “typical” Gas or Oil heater the W1 relay should be energised. In a multistage gas or oil heater the W2 relay may also be energised.
If your heating is reverse Cycle system, then Y1 relay should be energised with Y2 & Y3 if your heating is multistage. You should also expect to see one of the G relays on and possibly the W1 relay depending on your brand of reverse cycle system.

If the Relays are energised as expected the fault may lay with the heater or the wiring from the SMT-850 HALO™ to the heater. Disconnect all control wiring from the SMT-850 HALO™ and try connecting the control input wiring at the heating system directly to eliminate the heater as the fault.

If the cooling has started rather than the heating, check the position of DIP switch 2 &4 are correct and match your heating system. Check for crossed wiring.

Testing the Cooling.

1. If Zoning is fitted open all zones as described above.

2. Set the SMT-850 HALO™ mode to cooling only mode. (See selecting mode on page 6) lower the cooling set temperature to below the current room temperature. After any safety and anti-cycle delay timers have expired you should see the room temperature digits turn Blue (indicating cooling is running) on the SMT-850 HALO™ display.

3. Verify the cooling has started and is running as expected. Ensure the heating system has NOT also started. Ensure the cooling fan is running as expected.

4. If testing a multistage cooling system, ensure the room set point temperature is sufficiently below the actual room temperature to "call" for high cool output or more cooling stages. (You can verify the number of stages of cooling being demanded in the SMT-850 HALO™ info window - see page 8)

5. Adjust the cooling set temperature until it is above the current room temperature.

6. Once the temperature display turns Green (indicating no heating or cooling is required) on the SMT-850 HALO™ and after the cooler purge (if fitted) timer has expired ensure that the cooling has stopped.

If the cooling system fails to start check the SMT-850 equipment relay that is energised (ON).

If your cooling is reverse Cycle system, then Y1 relay should be energised with Y2 & Y3 if your cooling is multistage. You should also expect to see one of the G relays on and possibly the W1 relay depending on your brand of reverse cycle system.

If the Relays are energised as expected the fault may lay with the cooling system or the wiring from the SMT-850 HALO™ to the cooler. Disconnect all control wiring from the SMT-850 HALO™ and try connecting the control input wiring at the cooling system directly to eliminate the cooler as the fault.

If the heating has started rather than the cooling, check the position of DIP switch 2 &4 are correct and match your cooling system. Check for crossed wiring.

Testing the Zone Temperature sensors.

The SMT-850 HALO™ zoning can not only control the flow of conditioned air around the home or office it can permit the user to select the location where temperature is measured.

1. Enter the Installer menu (see page 30) then tap the Sensor Adjustment Tab to open the Sensor information window. This window will display all the temperatures from all zone temperature sensors.

2. Ensure that each zone that has a sensor fitted is showing a temperature. Check for accuracy using a known accurate temperature monitor.

3. Ensure the sensor are wired to the correct zone. Example. The zone sensor for the Rumpus Room is in the Rumpus Room. Ask an assistant to unplug each senor in turn and verify the correct zones shows a missing sensor " - - "

Manual Version History

Version	1.13	January 2025	Original Release Version
	1.14	June 2025	Added Lora function, spelling and other fixes
	1.15	July 2025	More spelling and grammar fixes
	1.16	October 2025	Included information on Lora Sensors and spelling / grammar fixes.

Specifications

Wi-Fi Spec	IEEE9802.11b.g/n, !T1R, 2.4GHz, 150MBPS V(Max)
Wall controller	178 x 125 x 24
C-Tick number	ASA 5578/8A
Relay Specifications	Mechanical 2A, Solid State 1.6A @ 24VAC max
Operating Voltage	11-28 VAC
Current consumption	250mA to 470mA
Display size	7” Diagonal
Touchscreen type –	Capacitive (3 point)
Communications	RS-485 ModBus RTU / BACnet MSTP
Warranty	5 years
Temp range	5 to 50c
CO2 sensor range	0-2000ppm
Humidity range	5 to 95% (Noncondensing)
Storage temp & humidity	-10 to 60 C 5-95% (Noncondensing)
Temp Sensor type	NTC Type II
IP wall Controller	42
	IP UCC (IP 44)

If adding images to the Halo screen, the recommended Image size 600 x 1024

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Great care has been taken in the preparation of this manual. Smart Temp Australia P/L takes no responsibility for errors or omissions contained in this document. It is the responsibility of the user to ensure this thermostat, or the equipment connected to it is operating to their respective specifications and in a safe manner.

Due to ongoing product improvement Smart Temp Australia P/L reserves the right to change the specifications of the SMT-775 thermostat (or its components) without notice.