

## Starzone 4000 Master Control Panel



**Figure 2.1 Master Control Panel**

The heart of the Starzone 4000 system is the Starzone Master controller (SZM-4000). Each AHU that is to be zoned will have its own SZM-4000 Master control panel and each panel can operate independently or be networked together via a 3-wire, RS485 communication bus back to a central PC.

To make servicing the SZM-4000 Master easier, the controller has two parts: a motherboard, which has all the connectors for field wiring, and an electronic daughter board which plugs into the motherboard.

## SZM-4000 Master Daughter Board



**Figure 2.2 Mother and Daughter Boards**

Swapping out a Master daughter board with a known good board is a simple and time efficient method of confirming whether or not a problem exists with the daughter board or elsewhere.

Removing the board is accomplished by turning off the power switch, and removing the two mounting screws on the left hand side. While supporting the board by the connectors, simply rock it out of the connectors until it is free. Installing the new board is as simple as plugging in the replacement, installing the mounting screws, and turning the power on.

When the system is connected to a PC it may be necessary to re-serialize the board to match the board it replaced. This is accomplished by pulling down dip switch #10 and entering 'SET SERIAL NUMBER' under the 'SETUP' menu in the Starcom Building software. Once serialized it will be necessary to transmit all of the user settings to the new board. This is done by selecting the 'UPDATE MASTERS' form which is also located under the 'SETUP' menu.

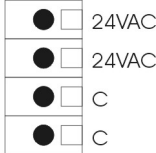
## SZM-4000 Master Motherboard

Normally there shouldn't be any need to replace the motherboard as there are no electronic components. The motherboard contains all of the connectors that are used to connect the SZM-4000 Master to the Starzone

system. Should the motherboard require replacing carefully disconnect and isolate each wire. Remove the mounting screws and replace the board.

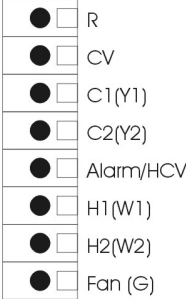
### Motherboard Terminal Connections

**Power**



**24VAC, C** The first set of 24VAC and C terminals are connected to a 40VA 24V transformer. A second set of 24VAC and C contacts are provided to enable the installer to connect the model RAD Bypass Damper's 24V supply in parallel.

**HVAC**



**R** This terminal connects an external 24V control signal from the AHU. The signal is kept electrically isolated from the 24V supply voltage on the Starzone 4000 system.

**CV** The CV terminal is energized whenever the Starzone system switches into unoccupied mode. The CV contact serves a different function when placed into Heat Pump mode. While in Heat Pump mode the CV contact controls the cooling change over valve and will be energized shortly before any cooling demand.

**C1,C2** C1, and C2 (Cooling 1 and 2) is connected to the first and second stages of cooling on the AHU.

**Alarm/HCV** The Alarm/HCV terminal serves different purposes in Rooftop and Heat Pump modes. When the system is in Rooftop mode the HCV terminal serves as an Alarm contact output. While in Heat Pump mode this terminal is used for the Heating Changeover Valve contact and is energized shortly before any heating demand.

**H1,H2** H1 and H2 (Heating 1 and 2) is connected to the first and second stages of heat on the AHU.

**FAN** The fan terminal is connected to the G or fan control of the AHU and is de-energized when the system switches to unoccupied mode.

**WET**



**WET** The WET port terminal is a non-polarized alarm contact terminal which can accept any 24VAC or DC alarm signal. When a voltage is detected a user defined message is displayed on the Starcom Building software, the alarm LED on the control panel will light, and the HCV alarm contact will energize provided the system is in Rooftop mode.

NS/DP



**NS/DP**

The NS/DP (Night Setback/Dry Port Alarm) terminal serves a dual purpose. The default mode is to serve as a control input for Occupied/Unoccupied mode. When a dry contact closure is present (a closed switch for example) the system will operate in occupied mode, in the absence of a dry contact the system will switch to unoccupied mode. Through software the terminal can be switched to an alarm port which will display a custom alarm message on the Starcom Building software, an alarm LED on the control panel will light, as well the HCV alarm contact will energize when the system is in Rooftop mode.

TOA



**TOA**

The TOA (Temperature Outdoor Air) terminal is a non-polarized terminal for connecting the TOA sensor. Polarity does not matter however the conductor should not be shared with any other devices. Never combine the TOA sensor with the same cable used to connect the AHU.

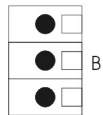
TSA



**TSA**

The TSA (Temperature Supply Air) terminal is a non-polarized terminal for connecting the TSA sensor. Polarity does not matter however the conductor should not be shared with other devices. For example never combine the TSA sensor with a cable connecting the Bypass damper.

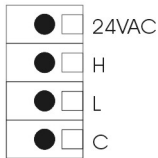
HUB



**HUB  
A,B,C**

The HUB terminal is used to connect all of the SZM-4000 Master Controllers, and Starcom Hub together. This communication cable is a twisted 3-wire non-shielded cable that daisy chains all of the Masters to the Starcom Hub. On each device A connects to A, B-B, and C-C.

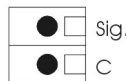
Zone  
Communication



**Zone  
Comm.**

The Zone Communications terminal provides 24VAC power and High and Low communications to each zone sensor. This communication cable should be a twisted 4-wire, non-shielded cable that daisy chains all of the model AVD zone dampers to the SZM-4000 Master Control panel. Each AVD zone damper has two sets of zone communication terminals and it does not matter which one is connected because all four terminals are in parallel. The second set of terminals on the AVD zone damper is used to continue the power and communication cable to the next AVD zone damper. On each device 24VAC connects to 24VAC, H-H, L-L, and C-C.

RS232



**RS232  
Sig, C**

The RS232 terminal provides an RS232 output signal that can be connected to any communications serial port on a PC. When the SZM-4000 Master control panel is not connected to a Starcom Hub the Master panel will perform a memory dump every 2 minutes.

## LED's

- HVAC Terminals** The LED's associated with the HVAC terminals are connected in parallel to the terminal contacts and are used to indicate when each relay has been energized.
- Zone Dampers** The Zone Dampers are displayed in groups of 8. Dip switches 1 and 2 on the SZM-4000 Master allow the user to toggle between subsequent groups of 8 zones. The Starzone 4000 system can have a total of 32 zones or 4 groups of 8. Each LED is a bi-color LED which means that it can display either RED or Green. Green indicates the associated damper is either fully open or in the process of opening. RED indicates the zone damper is either fully closed or in the process of closing. Because the zone dampers are fully modulating there may be times when a damper is parked in a mid position, during which time the LED will be off.
- NIGHT** The night LED indicates whenever the system switches into unoccupied Mode. The LED is off during occupied mode.
- LIMIT** During normal operation the Limit LED is off. There are two possible limit conditions:
- Low Limit - LED ON – This indicates the supply air temperature has fallen below the user adjustable cut-off. The SZM-4000 Master will turn off the second stage of cooling, and if the temperature continues to fall will turn off the first stage of cooling. The cooling will remain off for a period of 5 minutes after the temperature has resumed to normal.
- High Limit - LED FLASHING – This indicates the supply air temperature has risen above the user adjustable cut-off. Like the low limit the SZM-4000 Master will stage off both the second and first stages of heating also with a 5 minute delay.
- POWER** The LED is on whenever the SZM-4000 Master panel is on. If this LED is not on check to ensure there is 24VAC at the L and C terminals. Make certain the power switch located on the top right hand side is in the ON position, and check the fuse located below the power switch.
- FAULT** The SZM-4000 Master control panel contains a state of the art 'Watch Dog' circuit. This is a separate stand alone circuit that monitors the operation of the main CPU processors. If for any reason a processor should stop working the Watch Dog circuit will flash the FAULT LED while cycling the power to the processor. Should this not rectify the problem the Watch Dog timer will continue to cycle power indicated by a flashing FAULT LED every 15–20 seconds.
- DP** The DP (Dry Port) LED is used to indicate whenever a closed circuit is present on the DP contact. A jumper located beside the LED is used to disable this LED function while the DP contact is configured in occupied/unoccupied mode.

**WP** The WP (Wet Port) LED is used to indicate whenever a voltage is present on the WP contact.

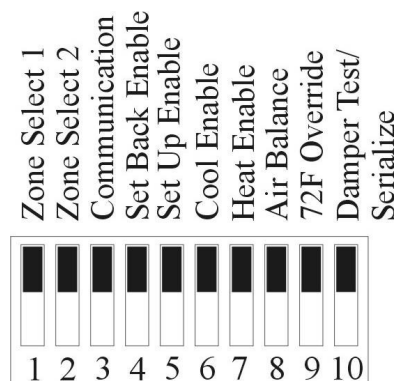
## Jumpers

There are three jumpers located on the SZM-4000 Master Daughter board:

Jumper	Description
1	Located on the right hand side of the main CPU, Jumper 1 selects the operation between rooftop mode and heat pump mode. Heat pump mode should only be selected when connecting to heat pump units that require a control signal for a reversing valve. While in heat pump mode the SZM-4000 Master utilizes the CV contact for the cooling changeover valve, and the HCV/ALARM contact for the heating changeover valve.
2	Located directly to the right of Jumper 1, Jumper 2 selects between Run and Test mode. Test mode should only be selected for troubleshooting purposes as a number of time delays are dropped out allowing the system to switch between demands before pre-positioning the zone dampers. Under no circumstances should the system be allowed to operate normally while in test mode.
3	Located to the left of the DP LED, Jumper 3 is used to disable the LED when the DP contact is configured for Occupied/Unoccupied operation.

## DIP Switches

Figure 2.3 shows the recommended position of the dip switches during normal operation.



**Figure 2.3 DIP Switch, Normal Settings**

<b>DIP Switch</b>	<b>Description</b>
1, 2	<b>Zone Select</b> - The SZM-4000 Master control panel can connect up to 32 or 4 groups of 8 zones. Dip switches 1 and 2 are used to select which bank of 8 is displayed by the zone damper LED's.
3	<b>Communication</b> - When dip switch 3 is enabled the damper LEDs display the serial communication between the master and zone sensors. This mode is used for troubleshooting communication problems when in contact with Zone All technical support. For normal operation this dip switch should be left in the disabled position allowing the zone damper operation to be displayed.
4	<b>Set Back Enable</b> - This dip switch will disable the system from going into Night Set Back.
5	<b>Set Up Enable</b> - This dip switch will disable the system from going into Night Set Up. When both dip switches are disabled the system will not be able to enter unoccupied mode.
6	<b>Cool Enable</b> - For heat only systems this dip switch can be used to disable the cooling.
7	<b>Heat Enable</b> - For cool only systems this dip switch can be used to disable the heat.
8	<b>Disable Air Balance</b> - For air balancing it is necessary to drive all zone dampers to the full open position while keeping the fan energized. During normal operation this dip switch must be in the disabled position.
9	<b>72 Degree Override</b> - Enabling the 72°F (22°C) override locks the set point on all zone sensors to 72°F (22°C).
10	<b>Damper Test Mode</b> - When enabled, the system enters damper test mode. Any zone sensor that has a set point temperature set higher than 22°C (72°F) will drive the associated zone damper to the full open position. Conversely, any zone sensor turned below 22°C (72°F) drives the zone damper to the full closed position.

**DIP  
Switch**

**Description**

**Set Serial Number** - Only one SZM-4000 Master can accept a serial number at a time, so it is essential that when transmitting a new serial number only one Master has the Set Serial Number dip switch enabled. Once enabled the user can transmit a new serial number to the master through the 'SET SERIAL NUMBER' form located under the 'SETUP' main menu in the Starcom Building software.