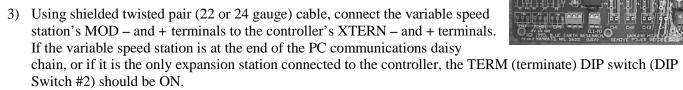## *Overview*

The Vari-Module expansion station provides two variable-speed output channels for your controller. These output channels can vary the voltage to a group of fans using power settings ranging from 1 (minimum) to 60 (full on).
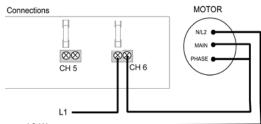
## *Mounting and Installation*

1) Attach the mounting feet to the enclosure with the hardware provided.

2) Mount the enclosure to the wall at the desired location:

   - When possible cut all holes in the bottom of the enclosure. This will prevent moisture from entering through the holes or fittings.

   **MOD + and - terminals**

   - Always use watertight strain relief fittings after making cable routing holes in the enclosure.

   - Do not route the communications wire (data) through the same hole or fitting as the high voltage power wires. This can induce noise in the data line and interfere with communications between the station and controller.

3) Using shielded twisted pair (22 or 24 gauge) cable, connect the variable speed station's MOD – and + terminals to the controller's XTERN – and + terminals. If the variable speed station is at the end of the PC communications daisy chain, or if it is the only expansion station connected to the controller, the TERM (terminate) DIP switch (DIP Switch #2) should be ON.

4) Connect the CH5 and CH6 terminal blocks to the output device wiring (see illustration).

5) Set the voltage selector switch for the correct input voltage. Connect the AC power to the AC POWER $\perp$, **N**, and **L** terminals.

**NOTE: THE VARI-MODULE <u>MUST</u> BE POWERED BY THE SAME PHASE THAT IS CONNECTED TO THE CHANNEL 5 AND 6 TERMINALS. THIS PUTS THE EXPANSION MODULE AND FAN ON THE SAME POWER PHASE AND IS NECESSARY FOR VARIABLE SPEED TIMING AND OPERATION.**
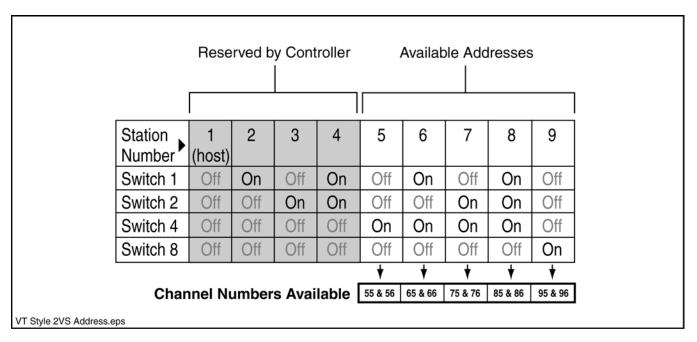
## *Setting DIP Switches*

The station has a block of DIP (rocker) switches located inside the unit on the upper left corner of the relay board. These switches must be set correctly before powering up the system. **If the switch positions are changed, remove and re-apply power to the board to reset it.**

## Setting the Address and Channel Numbers

**The GainTRAC controller reserves addresses 1 through 4 for its internal use, so you must begin numbering your expansion stations at address 5.**

The first four switches, SEL 1, 2, 4, and 8 are used to select an address number for the station.

Each station must be given a unique number. The controller uses these address numbers to communicate with specific stations. The table shows the switch settings for each possible address number. For example, to assign an address number of 5, the switches would be set as follows: SEL 1 - off, SEL 2 - off, SEL 4 - on, SEL 8 - off. **Once a variable speed station has been assigned an address of 5, its channels (relay numbers) are then 55 and 56. If the address is set to six, then the channels are 65 and 66 (see table below).**
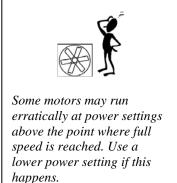


| Station Number ▶ | 1 (host) | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|---|
| Switch 1 | Off | On | Off | On | Off | On | Off | On | Off |
| Switch 2 | Off | Off | On | On | Off | Off | On | On | Off |
| Switch 4 | Off | Off | Off | Off | On | On | On | On | Off |
| Switch 8 | Off | Off | Off | Off | Off | Off | Off | Off | On |
| **Channel Numbers Available** | | | | | 55 & 56 | 65 & 66 | 75 & 76 | 85 & 86 | 95 & 96 |

VT Style 2VS Address.eps

## *Power Settings*

Variable speed fans can be assigned a power setting that ranges from 1 (minimum) to 60 (full on). At start up, fans always get a 5-second burst at full power before adjusting to the specified power setting.

**Note:** The RPM of most PSC-type (permanent split capacitor) fan motors can be controlled by varying the amount of power (voltage) applied. How a specific PSC motor responds to a given input power varies considerably between manufacturers. Consequently, response to a variable speed power setting also varies. One motor may require a power setting of 50 to run at full speed, while another just 35.

*Some motors may run erratically at power settings above the point where full speed is reached. Use a lower power setting if this happens.*

Set up the operating parameters for your variable speed devices:

1) Press the RIGHT or LEFT arrow key on your GainTRAC to navigate to the Device/Equipment Settings menu.
2) Press ENTER.
3) Press the LEFT arrow key until you get to the System & Control Device Set-Up menu.
4) Press the DOWN arrow until you see the message:
   Press ENTER to ADD a Control Device
5) Press ENTER.
6) Press the PLUS key until you find the variable speed fan name that matches the device you are using.
7) Press ENTER to move to the device number. Press the Group PLUS or MINUS keys to edit the group number.

8) Press ENTER to move to the relay number. Press the Group PLUS or MINUS keys to edit the relay number (see chart on previous page for available relay numbers).

> ADD: Vari-Stir Fan                    #1
> to Relay 51

9) Press ENTER to accept your addition.

10) Press ENTER again to confirm your addition.

11) When you have finished adding the device, you are ready to set up the parameters for it. Press CANCEL once to return to the Device/Equipment Settings menu.

12) Press the RIGHT arrow key to navigate to the device you just added.

> VARI-STIR FAN GROUP #1 SETTING    CH 51

13) Press the DOWN arrow key to view the device parameters. You can press ENTER at any menu to edit the setting. Most of the menus are explained in the *GainTRAC Operating Manual*. However, you will see the following additional menus that are related to variable speed fans:

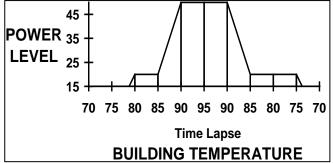| Fan ON Power Setting: 25 |
|---|
| This is the power setting to use when the fan is first started according to the ON Temp. |
| Power Ramping Start Temp:  78.0 |
| This is the temperature at which the fan begins the power ramping. |
| FULL Power Temp:  84.0 |
| This is the temperature at which the fan reaches the FULL Power setting. |
| FULL Power Setting: 50 |
| This allows you to adjust the maximum power for a variable speed fan. This will vary among different fans. |
| Timed Power Setting: 30 |
| This is the power setting to use when the fan is operating according to ON/OFF times. |
| Purge Mode Power Setting: 30 |
| This is the power setting to use when the fan is operating in a purge mode. |

The graph below shows how the GainTRAC automatically adjusts fan power as the building temperature rises from 70° to 95° and falls back to 70° again.

| Fan Run Mode: | Temp Only |
|---|---|
| ON Temp: | 80° |
| Fan ON Power Setting: | 20 |
| OFF Temp: | 75° |
| Power Ramping Start Temp: | 85° |
| FULL Power Temp: | 90° |
| FULL Power Setting: | 50 |



POWER LEVEL / Time Lapse / **BUILDING TEMPERATURE**

Observe that fan power stays at zero until the ON Temp is reached. As temperature falls the power stays at Fan ON Power setting until the OFF Temp is reached.