MELINK®
Intelli-Hood® Controls

REFERENCE GUIDE

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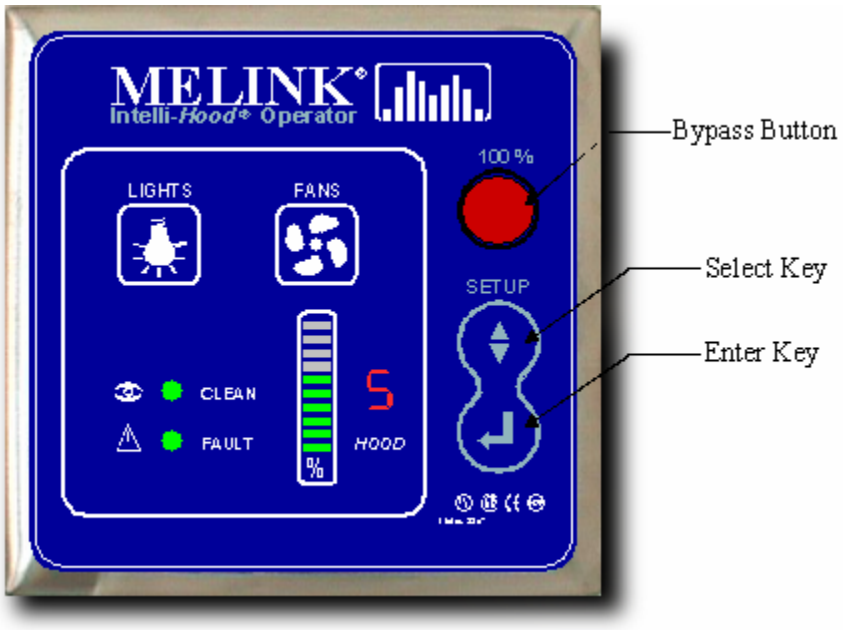
Section 1:

Intelli-Hood Operation and Simplissimo Settings



KEYPAD OPERATION

- LIGHTS Button - Turns hood lights on and off if I/O board output is tied into the hood light circuit. Also turns APU blowers on and off.

- FANS Button - Turns the fans on and off. Also turns APU blowers on and off.

- BYPASS Button - Turns fans on in bypass mode. If the processor is running, then the 7-segment display will show a 'E' for bypass mode and the bar graph will show VFD speed at 100% (blinking). Also turns on APU blowers.

- SELECT (up & down arrows)
  - In SETUP mode, this switch will scroll through main menu item numbers (0-9) on the seven-segment display and scroll through the setup selections on the bar graph.
  - In normal operating mode, this switch will display scrolling temperatures a single time for each hood on the bar graph; after which it displays scrolling % fan speeds.

- ENTER
  - In SETUP mode, this switch will validate a selection.
  - In normal operating mode, this switch will display average VFD speed on the bar graph.

- To enter SETUP mode, press both the SELECT key and the ENTER key for 10 seconds.

- To restore setup defaults:
  - Must be in setup mode.
  - Must be at the flashing '0'.
  - Press and hold the SELECT key for 10 seconds.
  - A 'd' will show on the 7-segment display.
  - Hold the SELECT key for another 10 seconds.
  - Default data will be stored.
  - 2 beeps

- To reset average VFD speeds:
  - Must be in setup mode.
  - Must be at the flashing '0'.
  - Press and hold the ENTER key for 10 seconds.
  - A 'r' will show on the 7-segment display.
  - Hold the ENTER key for another 10 seconds.
  - Average VFD speeds will be reset.
  - 2 beeps

- To lock programming:
  - Press and hold the both the SELECT key and the ENTER key for 10 seconds.
  - Display a flashing '0'.
  - Press and hold the both the SELECT key and the ENTER key for 10 seconds.
  - A 'L' will show on the 7-segment display
  - Press ENTER to exit setup mode

- To unlock programming:
  - Press and hold the both the SELECT key and the ENTER key for 10 seconds.
  - Display 'L'.
  - Press and hold the both the SELECT key and the ENTER key for 10 seconds.
  - A flashing '0' will show on the 7-segment display
  - Press ENTER to exit setup mode

- Program Editing While Locked:
  - Only temperature spans can be changed while programming is in the locked state.
  - Press and hold the both the SELECT key and the ENTER key for 10 seconds.
  - Display 'L'.
  - Press the SELECT key. The 'L' display will change to '1' which signifies hood #1.
  - To select a different hood, press the SELECT key. The '1' display will change to '2' which signifies hood #2. Press SELECT again to change to hood #3 and so on.
  - To edit the temperature span of a particular hood, press the ENTER key when the appropriate hood number is displayed. The bar graph will light showing the current temperature span setting. Use the SELECT key to scroll to a different span. Press ENTER to store the new span. The display will revert back to hood selection.
  - To exit programming, use the SELECT key to scroll to display 'L'. Press ENTER to exit programming.

- Summer/Winter (3 Gang Coverplates Only)
  - This switch will activate the external heat circuit when closed. It will turn off the external heat circuit when open.

Simplissimo Settings

Hood Settings

Exhaust Temp Span - This sets up the temperature span for modulating VFD speed between its set minimum and maximum based on temperature. The span has a low value of 75°F and a maximum of up to 150°F. Auto Span automatically sets the temperature span based on average VFD speeds over periods of approximately one day (starting with the 75-110 setting).

Min Speed - This sets up the minimum speed that the VFD will run. Min speed must be less than maximum speed. DF means that when fans are turned on, the fans will run at 100% for 1 minute and then return to their normal minimum speed. Maximum minimum speed is 80%.

Max Speed - This sets up the maximum speed that the VFD will run. Max speed must be greater than minimum speed. Minimum maximum speed is 50%.

Exhaust Temp. Alarm #1 - This sets up the first temperature set point for the 24 VDC exhaust alarm. Set pt #1 must be less than set pt #2. If the operator tries to set up a set pt #1 greater than or equal to set pt #2, the error beep will sound. When the setpoint is reached, and the bar graph corresponding to the hood in alarm will flash and 24Vdc will be sent to the corresponding I/O board terminals. If a setting with the AUD prefix is selected, then when the hood's speed is being displayed on the bar graph and the exhaust temperature exceeds the temperature set point #1, the keypad's beeper will sound. The keypad will go through 12 iterations of beeping the beeper for the alarm.

Exhaust Temp. Alarm #2 - This sets up the second temperature set point for the auxillary 24 VDC output. Set pt #2 must be greater than set pt #1. If the operator tries to set up a set pt #2 less than or equal to set pt #1, the error beep will sound. When the setpoint is reached, 24Vdc will be sent to corresponding I/O board terminals.

No. Hood Sensors - This sets up the number of temperature sensors and optics for the given hood. The hood can have from 1 to 4 temperature sensors and 1 optics sensor; or it can have from 1 to 4 temperature sensors only; or it can have just 1 optic sensor. Optic Channel 1 is always allocated to Hood 1, Optic Channel 2 is always allocated to Hood 2, and so on. Temperature Channel 1 is always allocated to Hood 1, Temperature Channel 2 is always allocated to Hood 2, and so on.
Note: It is typically not good practice to connect temperature sensors from different hoods together since the signal is averaged across all sensors connected to that particular channel, potentially having a detrimental effect on system response to heat.

Auto Fan On/Off – Sets fans to either turn on or off automatically based on either temperature or a preset timer (turns fans off after set number of hours). In Heat 0 or Heat 5, system will resume typical operation when exhaust air temperature of any hood is greater than or equal to 90°F. If exhaust air temperature is less than or equal to 75°F, while the system is on, the either a signal for either 0% or 5% will be sent to the VFD. If all hoods are at this level, the system will turn off. Note: when fan button is pressed, there is a ten minute delay until the temperature sensor becomes active for auto on/off operation.

Send 4-20mA / 0-10V - This sets up the channel for which the VFD is connected for this hood. If 0, then there is no VFD for the hood. VFD 1 - VFD 4 are outputs on the master Autocal board. VFD 5 - VFD 8 are outputs on the slave Autocal board. If Multiple is selected, then the VFD signal will follow that of the previous hood (e.g. If Hood 1 is set up with VFD 1 as the output to its exhaust fan, the Hood 2 may be set to multiple to follow VFD 1 for the supply fan).

Short Cycle Hood Ratio - This sets up the short cycle hood ratio.

System Settings

Auxiliary VFD Output - This sets up how the signal is determined for the auxiliary VFD output.

- No - No auxiliary output
- Average - send the average of the used VFDs on board.
- Highest - send the highest of the used VFDs on board
- Lowest - send the lowest of the used VFDs on board
- VFD1 - send the same signal that is going to VFD 1
- VFD2 - send the same signal that is going to VFD 2
- VFD3 - send the same signal that is going to VFD 3
- VFD4 - send the same signal that is going to VFD 4

Auxiliary VFD Input - This sets up how the VFDs will respond to the auxiliary 4-20 mA VFD input.

- No - No auxiliary input
- Add - Add aux input to each VFD output
- Sub - Subtract aux input from each VFD output
- Average - Average aux input with each VFD output

Hang Time - Amount of time fans will be left at max speed and smoke alarm will be activated after detection of smoke.

Relay Input - If #1 (No), then the remote input terminals are used for nothing. If #2 (Remote On/Off), then the remote input terminals are used for remotely turning the fans on and off. If settings 3 through 5 (3 through 9 on V4.5 chips) are used, then the remote input terminals are used as inputs for a relay. When this relay is closed then the minimum speed of 50%, 75%, 90%, etc. is used instead of the minimum speed called out in hood menu #2. The external heat circuit is activated when the relay is closed. When the relay is open then the minimum speed in hood menu #2 is used and the external heat circuit is turned off.

Bypass Timer - If item 2 - 10 are selected this sets the bypass timeout. This sets the amount of time to leave the system in bypass mode after the bypass switch on the front panel is pressed. The dipswitch on the Autocal II board must be in the bypass timer position. Bypass mode can be turned off by pressing the bypass switch again. If item 1 is selected then bypass mode can only be turned off by pressing the bypass switch again.

Comfort Mode - When the comfort mode is enabled: if kitchen temperature is > 75 and outside temperature < 75, then the VFD speed is increased up to max speed with a ramp of 1 minute. If the kitchen temperature cools to < 70 or the outside temperature increases to >75, then reduce the VFD speed back to automatic control. The kitchen and outside temperature sensors can be wired to the I/O board terminal block (item #3) or to Temp #3 (kitchen) and Temp #4 (outside) (selection #4). Selection #1 and #2 will disable the comfort mode. Selection #2 will allow the MUA temperature sensor to be wired to Temp #4 for short cycle hoods.

Miscellaneous - If item #1 is selected then there are no miscellaneous functions enabled.

- Win SB (item #2) **-** If kitchen temperature is less than or equal to 70, then the temperature span automatically increases to the next higher range. If the kitchen temperature is greater than 75, then the temperature span automatically revert back to original set point.
- Int Bar (item #3) **-** The bargraph displays the speed that the system is sending to the drive instead of reading the speed from the drive. This will disable the VFD fault capability.

Alarm #2 Output - This sets up the function of the auxiliary 24 VDC output.

- Temp - Output is used as temperature set point #2 alarm.
- Smoke - Output is used as a smoke alarm.
- Starter - Output is used as control for a magnetic motor starter. The motor starter is turned on if any of the exhaust temperatures exceed 90^{o}F or smoke is detected or BYPASS mode is

selected with the processor running. It will be turned off if all of the exhaust temperatures fall below 85^{o}F or after the hang time on the optics has expired. The motor starter can also operate in conjunction with the auto mode such that it turns on and off automatically with either heat or turns off after a selected time interval, all hoods must turn off to turn off the motor starter and one hood must turn on to turn on the motor starter.

- Damper - Output is used to control a damper. When the fans are turned on the damper turns on. When the fans are turned off the damper is off.
- Kitch<68 - Output is used to control a MUA heat unit. When the kitchen temperature is less than 60 F, the MUA heat unit is on. When the kitchen temperature is greater than 65 F, the MUA heat unit is off.
- Mom Rel - Output is used to control a momentary relay. When the fans are turned off, the relay output is turned on for 3 seconds and then turned off.
- Fault (V4.5 only) – Output is energized whenever a fault is displayed on the keypad. (*Note: enabling the internal bar setting will disable VFD faults*)

Optics Alignment - This will be entered when the installer is aligning the optics sensors. When hood 1 is selected, then the 7-segment display will show a "1" and the bar graph will display the strength of the signal being read by optics channel #1. Each bar will represent a return voltage of 0.3VDC. Ideally, adjust gain on optics to read between three and seven bars of strength. Aligning hoods 2 - 8 will work in the same manner.

DISPLAY MODES

Setup Mode - Displays setup information as the user enters it. It will stay in this mode until setup mode is ended.

Display Average VFD Speed (Left arrow key [ENTER] pressed while not in SETUP)

- Bar graph will display ‘exponential average’ VFD speed (blinking) for each hood.
- 7-segment display will display hood number (non-blinking).
- After all hoods have been displayed, the overall average speed will be displayed. The 7-segment display will show a 'o'.
- Average VFD speed will be scaled to display 0 to 100% with each LED representing 10%.
- After all average VFD speeds have been displayed, the display mode will revert back to NORMAL MODE.

Display Temperature (Up & Down arrow key [SELECT] pressed while not in SETUP)

- Bar graph will display temperature (non-blinking) for each hood.
- 7-segment display will display hood number (non-blinking).
- After all hoods have been displayed, the kitchen temperature will be displayed. The 7-segment display will show a 'c'. The outside temperature will be displayed next. The 7-segment display will show a 'o'.
- Temperature will be displayed with only one bar representing the temperature level.
- After all temperatures have been displayed, the display mode will revert back to NORMAL MODE.

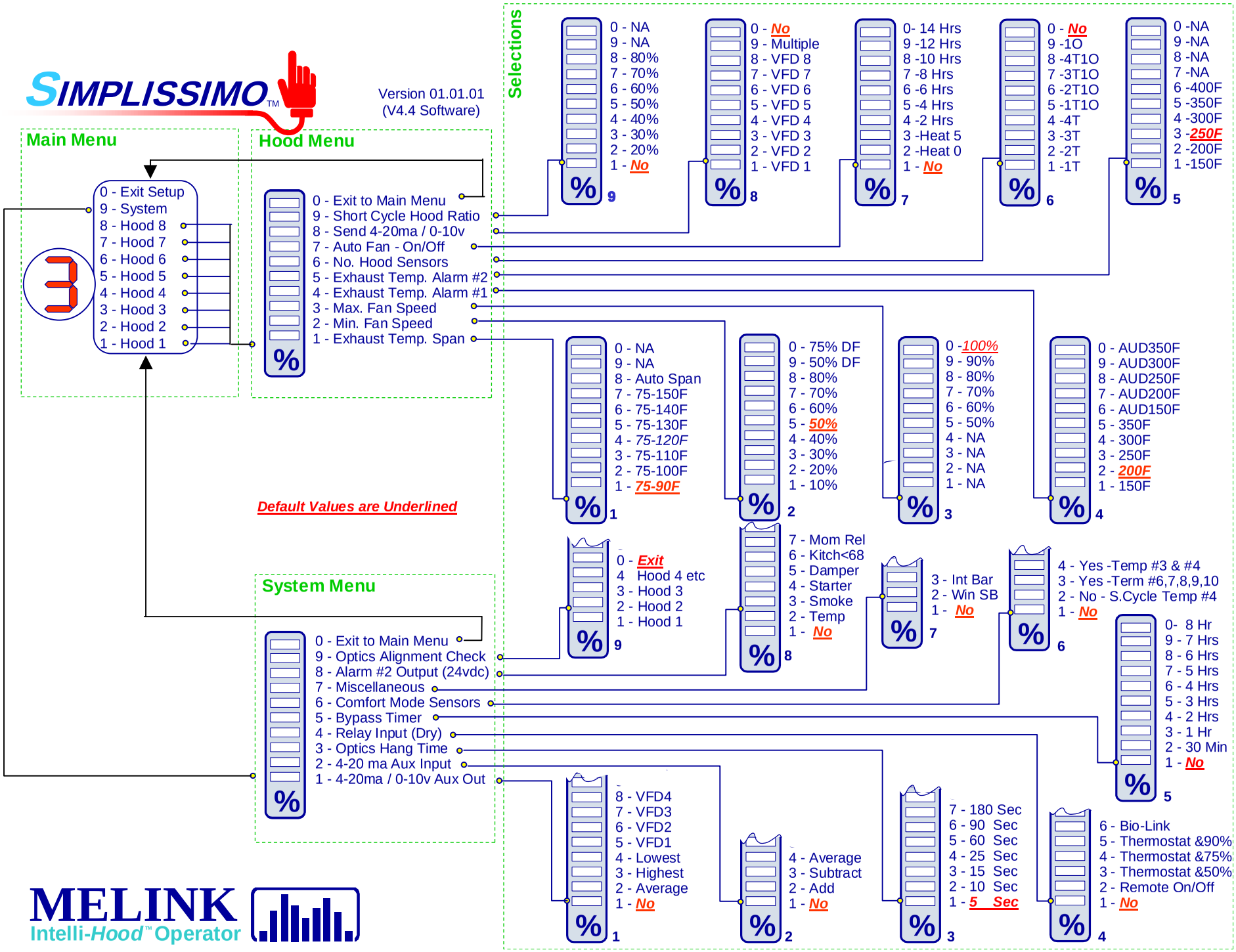
Bar Graph	VFD Speed	Exhaust Temp V3.7-V4.4/V4.5	Kitchen Temp (c)	Outside Temp (o)	Optics Align.
Top	91-100%	146+/150+	96+	91+	2.71+V
	81-90%	141-145/140-149	91-95	81-90	2.41V-2.7V
	71-80%	136-140/130-139	86-90	71-80	2.11V-2.4V
	61-70%	131-135/120-129	81-85	61-70	1.81V-2.1V
	51-60%	126-130/110-119	76-80	51-60	1.51V-1.8V
	41-50%	121-125/100-109	71-75	41-50	1.21V-1.5V
	31-40%	116-120/90-99	66-70	31-40	0.91V-1.2V
	21-30%	111-115/80-89	61-65	21-30	0.61V-0.9V
	11-20%	106-110/70-79	56-60	11-20	0.31V-0.6V
Bottom	0-10%	100-105/60-69	50-55	0-10	0.00V-0.3V

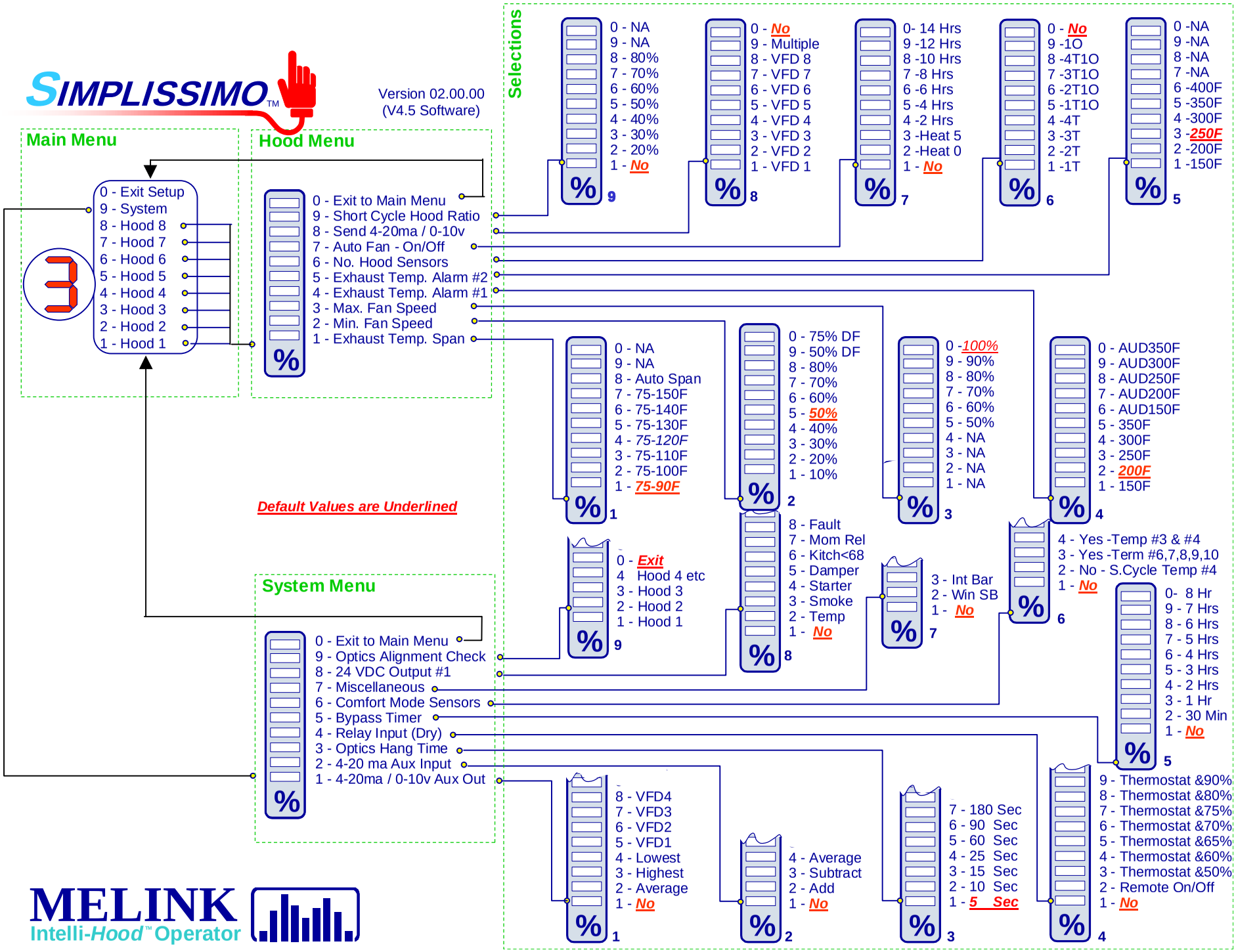
Normal Display Mode

- Bar graph will display VFD speed (non-blinking) for each hood.
- 7-segment display will display hood number (non-blinking).
- If there is a fault with the hood currently being displayed then the hood number will be displayed on the 7-segment display (non-blinking), the fault(s) will be displayed on the bar graph (non-blinking), and the fault led will be ON.
  - A Temperature fault will light the bottom LED of the bar graph.
  - A VFD fault will light the second LED of the bar graph.
  - There will be 3 beeps every hour as long as there is a fault on any hood.
- If the BYPASS switch is pressed, then the 7-segment display will display 'E' and bar graph will display VFD speed (blinking).
- If the hood being displayed is causing an alarm condition (exhaust or smoke), then the bar graph and the 7-segment display will be blinking.
- If a given hood's optic channel cannot be calibrated, then the clean LED will flash green/red. Otherwise the clean LED will be green.
- VFD speed will be scaled to display 0 to 100% with each LED representing 10%.

Calibration

- Fans will calibrate when they are turned on or every 24 hours if fans are running at minimum speed at that given time. If fans are not running at minimum speed at the time recalibration is supposed to occur after 24 hours, then calibration will wait for a subsequent 24 hour time when the fans are running at minimum speed. If fans cannot calibrate after 3 days in succession, then the clean LED will blink red/green and the fans will go to 100% speed.
- If any given optics channel cannot calibrate, the VFD associated with that hood will run at 100% speed and flash the clean LED red/green when this hood's VFD speed is being displayed.


SIMPLISSIMO™
Version 01.01.01
(V4.4 Software)
Main Menu
Hood Menu
Selections
0 - Exit Setup
9 - System
8 - Hood 8
7 - Hood 7
6 - Hood 6
5 - Hood 5
4 - Hood 4
3 - Hood 3
2 - Hood 2
1 - Hood 1
3
0 - Exit to Main Menu
9 - Short Cycle Hood Ratio
8 - Send 4-20ma / 0-10v
7 - Auto Fan - On/Off
6 - No. Hood Sensors
5 - Exhaust Temp. Alarm #2
4 - Exhaust Temp. Alarm #1
3 - Max. Fan Speed
2 - Min. Fan Speed
1 - Exhaust Temp. Span
0 - NA
9 - NA
8 - 80%
7 - 70%
6 - 60%
5 - 50%
4 - 40%
3 - 30%
2 - 20%
1 - No
0 - No
9 - Multiple
8 - VFD 8
7 - VFD 7
6 - VFD 6
5 - VFD 5
4 - VFD 4
3 - VFD 3
2 - VFD 2
1 - VFD 1
0- 14 Hrs
9 -12 Hrs
8 -10 Hrs
7 -8 Hrs
6 -6 Hrs
5 -4 Hrs
4 -2 Hrs
3 -Heat 5
2 -Heat 0
1 - No
0 - No
9 -1O
8 -4T1O
7 -3T1O
6 -2T1O
5 -1T1O
4 -4T
3 -3T
2 -2T
1 -1T
0 -NA
9 -NA
8 -NA
7 -NA
6 -400F
5 -350F
4 -300F
3 -250F
2 -200F
1 -150F
0 - NA
9 - NA
8 - Auto Span
7 - 75-150F
6 - 75-140F
5 - 75-130F
4 - 75-120F
3 - 75-110F
2 - 75-100F
1 - 75-90F
0 - 75% DF
9 - 50% DF
8 - 80%
7 - 70%
6 - 60%
5 - 50%
4 - 40%
3 - 30%
2 - 20%
1 - 10%
0 -100%
9 - 90%
8 - 80%
7 - 70%
6 - 60%
5 - 50%
4 - NA
3 - NA
2 - NA
1 - NA
0 - AUD350F
9 - AUD300F
8 - AUD250F
7 - AUD200F
6 - AUD150F
5 - 350F
4 - 300F
3 - 250F
2 - 200F
1 - 150F
Default Values are Underlined
System Menu
0 - Exit to Main Menu
9 - Optics Alignment Check
8 - Alarm #2 Output (24vdc)
7 - Miscellaneous
6 - Comfort Mode Sensors
5 - Bypass Timer
4 - Relay Input (Dry)
3 - Optics Hang Time
2 - 4-20 ma Aux Input
1 - 4-20ma / 0-10v Aux Out
0 - Exit
4 Hood 4 etc
3 - Hood 3
2 - Hood 2
1 - Hood 1
7 - Mom Rel
6 - Kitch<68
5 - Damper
4 - Starter
3 - Smoke
2 - Temp
1 - No
3 - Int Bar
2 - Win SB
1 - No
4 - Yes -Temp #3 & #4
3 - Yes -Term #6,7,8,9,10
2 - No - S.Cycle Temp #4
1 - No
0- 8 Hr
9 - 7 Hrs
8 - 6 Hrs
7 - 5 Hrs
6 - 4 Hrs
5 - 3 Hrs
4 - 2 Hrs
3 - 1 Hr
2 - 30 Min
1 - No
8 - VFD4
7 - VFD3
6 - VFD2
5 - VFD1
4 - Lowest
3 - Highest
2 - Average
1 - No
4 - Average
3 - Subtract
2 - Add
1 - No
7 - 180 Sec
6 - 90 Sec
5 - 60 Sec
4 - 25 Sec
3 - 15 Sec
2 - 10 Sec
1 - 5 Sec
6 - Bio-Link
5 - Thermostat &90%
4 - Thermostat &75%
3 - Thermostat &50%
2 - Remote On/Off
1 - No
MELINK
Intelli-Hood™ Operator


SIMPLISSIMO™
Version 02.00.00
(V4.5 Software)
Main Menu
0 - Exit Setup
9 - System
8 - Hood 8
7 - Hood 7
6 - Hood 6
5 - Hood 5
4 - Hood 4
3 - Hood 3
2 - Hood 2
1 - Hood 1
Hood Menu
0 - Exit to Main Menu
9 - Short Cycle Hood Ratio
8 - Send 4-20ma / 0-10v
7 - Auto Fan - On/Off
6 - No. Hood Sensors
5 - Exhaust Temp. Alarm #2
4 - Exhaust Temp. Alarm #1
3 - Max. Fan Speed
2 - Min. Fan Speed
1 - Exhaust Temp. Span
System Menu
0 - Exit to Main Menu
9 - Optics Alignment Check
8 - 24 VDC Output #1
7 - Miscellaneous
6 - Comfort Mode Sensors
5 - Bypass Timer
4 - Relay Input (Dry)
3 - Optics Hang Time
2 - 4-20 ma Aux Input
1 - 4-20ma / 0-10v Aux Out
Selections
0 - NA
9 - NA
8 - 80%
7 - 70%
6 - 60%
5 - 50%
4 - 40%
3 - 30%
2 - 20%
1 - No
9
0 - No
9 - Multiple
8 - VFD 8
7 - VFD 7
6 - VFD 6
5 - VFD 5
4 - VFD 4
3 - VFD 3
2 - VFD 2
1 - VFD 1
8
0- 14 Hrs
9 -12 Hrs
8 -10 Hrs
7 -8 Hrs
6 -6 Hrs
5 -4 Hrs
4 -2 Hrs
3 -Heat 5
2 -Heat 0
1 - No
7
0 - No
9 -1O
8 -4T1O
7 -3T1O
6 -2T1O
5 -1T1O
4 -4T
3 -3T
2 -2T
1 -1T
6
0 -NA
9 -NA
8 -NA
7 -NA
6 -400F
5 -350F
4 -300F
3 -250F
2 -200F
1 -150F
5
0 - NA
9 - NA
8 - Auto Span
7 - 75-150F
6 - 75-140F
5 - 75-130F
4 - 75-120F
3 - 75-110F
2 - 75-100F
1 - 75-90F
1
0 - 75% DF
9 - 50% DF
8 - 80%
7 - 70%
6 - 60%
5 - 50%
4 - 40%
3 - 30%
2 - 20%
1 - 10%
2
0 -100%
9 - 90%
8 - 80%
7 - 70%
6 - 60%
5 - 50%
4 - NA
3 - NA
2 - NA
1 - NA
3
0 - AUD350F
9 - AUD300F
8 - AUD250F
7 - AUD200F
6 - AUD150F
5 - 350F
4 - 300F
3 - 250F
2 - 200F
1 - 150F
4
Default Values are Underlined
0 - Exit
4 Hood 4 etc
3 - Hood 3
2 - Hood 2
1 - Hood 1
9
8 - Fault
7 - Mom Rel
6 - Kitch<68
5 - Damper
4 - Starter
3 - Smoke
2 - Temp
1 - No
8
3 - Int Bar
2 - Win SB
1 - No
7
4 - Yes -Temp #3 & #4
3 - Yes -Term #6,7,8,9,10
2 - No - S.Cycle Temp #4
1 - No
6
0- 8 Hr
9 - 7 Hrs
8 - 6 Hrs
7 - 5 Hrs
6 - 4 Hrs
5 - 3 Hrs
4 - 2 Hrs
3 - 1 Hr
2 - 30 Min
1 - No
5
8 - VFD4
7 - VFD3
6 - VFD2
5 - VFD1
4 - Lowest
3 - Highest
2 - Average
1 - No
1
4 - Average
3 - Subtract
2 - Add
1 - No
2
7 - 180 Sec
6 - 90 Sec
5 - 60 Sec
4 - 25 Sec
3 - 15 Sec
2 - 10 Sec
1 - 5 Sec
3
9 - Thermostat &90%
8 - Thermostat &80%
7 - Thermostat &75%
6 - Thermostat &70%
5 - Thermostat &65%
4 - Thermostat &60%
3 - Thermostat &50%
2 - Remote On/Off
1 - No
4
MELINK
Intelli-Hood™ Operator

Section 2:
Troubleshooting And Component Compatibility

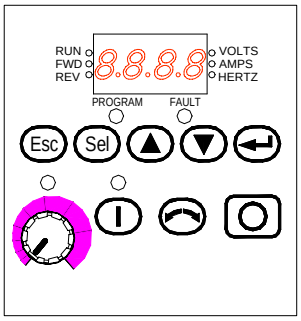
MELINK
Intelli-*Hood*® Operator

TROUBLESHOOTING @ MELINK KEYPAD

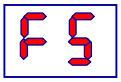
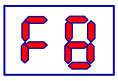
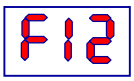
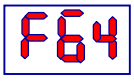
	PROBLEM:		ITEMS TO CHECK:
①	KEYPAD APPEARS NORMAL BUT FANS NOT RUNNING	CLEAN / FAULT	a. Determine which hood is not working - refer to digit next to bar graph. b. Determine fan speed by counting # of bars illuminated on bar graph, if any. c. Push 100% bypass switch to see if all fans go to full speed. d. Check if exhaust fan on roof is running. - Check if fan disconnect switch is turned on. - Check if fan belt is adjusted for proper tension and replace if necessary. - Check if motor is functional and replace if necessary.
②	KEYPAD DISPLAYS "E" AND BARGRAPH FLASHING	CLEAN / FAULT	a. Press the 100% bypass switch to return to the 'auto mode'.
③	KEYPAD IS BLANK AND FANS ARE RUNNING	CLEAN / FAULT	a. Press fan switch on Keypad to see if Keypad activates. b. Check for tripped breaker that feeds the I/O Processor. c. Open I/O Processor panel to verify power LED is on. d. Check for tripped breaker inside I/O Processor. Reset if necessary.
④	KEYPAD IS BLANK AND FANS ARE NOT RUNNING	CLEAN / FAULT	a. Press fan switch on Keypad to see if Keypad activates. b. Check breakers for I/O Processor and exhaust fans. c. Check display on Drives for a fault (ie.. OC1,OH2). e. Press the Drive reset switch, or turn off breaker and turn back on after 30 sec. f. Refer to Troubleshooting @ Drive Keypad on other side.
⑤	KEYPAD SHOWS 1ST LED AND FAULT LIGHT	TEMP FAULT 1ST LED CLEAN / FAULT	a. Determine which hood has a 'temp fault' - refer to the digit next to bar graph. b. Check cable connections between each Temp Sensor and I/O Processor. c. Check to see if resistance at Temp Sensor is about 100 Ohms. d. Check *Simplissimo* hood menu #6 is set to correct number of Temp Sensors.
⑥	KEYPAD SHOWS 2ND LED AND FAULT LIGHT	DRIVE FAULT 2ND LED CLEAN / FAULT	a. Determine which hood has a 'drive fault' - refer to the digit next to bar graph. b. Check cable connections between each Drive and I/O Processor. c. Check display on Drives for a fault (i.e..OC1.OH2). d. Press Drive reset switch, or turn off breaker and turn back on after 30 sec. e. Refer to Troubleshooting @ Drive Keypad on other side.
⑦	CLEAN LIGHT FLASHES RED/GREEN	CLEAN / FAULT	a. Determine which hood needs Optics cleaned - refer to digit next to bar graph b. Remove Optic covers for that hood and clean lenses with a clean soft cloth. c. Press the fan switch off… and on again to recalibrate the Optics.
⑧	KEYPAD SHOWS 3RD LED AND FAULT LIGHT	OPTICS FAULT 3RD LED CLEAN / FAULT	a. Check for blockage of infrared beam, i.e. cleaning rag or fire suppression pipe. b. Check 'gain' switch on Optic receiver board to verify proper hood length. c. Check alignment of Optics in *Simplissimo* System Menu #9. d. Check cable connections between Optics and I/O Processor. … press the fan switch off and on again to recalibrate the Optics. .

Rev. 10-01

MELINK
Intelli-*Hood*® Operator



TROUBLESHOOTING @ DRIVE KEYPAD

PROBLEM:		ITEMS TO CHECK:
 Under Voltage	**F4,** Under Voltage	a. Check AC power input to drive for low voltage or line power interruption.
 Over Voltage	**F5,** Over Voltage	a. Check AC power input to drive for high line voltage . Assure deceleration time is set at 60 sec.
 Motor Overload	**F7,** Motor Overload	a. Output current to motor exceeds limit set by parameter P033. Check motor and fan for conditions that may cause excessive motor current. b. Check for appropriate Start Boost (A084).
 Heatsink Over Temp.	**F8,** Heatsink Over Temp.	a. Check to see if cooling fan is running. If not, replace fan. b. Check for blocked or dirty heat sink fins. Verify that ambient temperature is not over 104deg. F.
 Hardware Overcurrent	**F12,** Hardware Over Current	a. The drive output current has exceeded the hardware current limit. Check to see if the drive is sized properly for the motor. b. Check for appropriate Start Boost (A084).
 Ground Fault	**F13,** Ground Fault	a. Check the motor and external wiring for a grounded condition.
 Drive Overlaod	**F64,** Drive Overload	a. Drive rating of 150% for 1 min. or 200% for 3 sec. has been exceeded. Reduce load or extend Acceleration time.
 Communication Loss	**F81,** Communication Loss	a. Check wiring to RS485 port b. Check wiring connections c. Verify I/O Processor is operating properly

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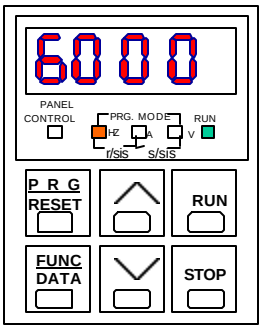


TROUBLESHOOTING @ DRIVE KEYPAD

PROBLEM:		ITEMS TO CHECK:
OC 1	**OC 1,** over current during acceleration	a. Remove run command to Drive by turning off fan switch on Melink Keypad. Green light on Drive that says RUN should go out. Press PRG/RESET on drive to remove fault. Or, turn off breaker to drive and then back on again after 30 sec. b. If OC 1 still occurs check if motor circuit is shorted or grounded. c. If OC 1 still occurs verify that program for torque boost is set for fan application (consult with Melink on exact function # based on Drive type). d. If OC 1 still occurs verify that program for acceleration is set for minimum of 5-10 seconds (consult with Melink on exact function # based on Drive type).
OC 2	**OC 2,** over current during deceleration	a. Remove run command to Drive by turning off fan switch on Melink Keypad. Press PRG/RESET on Drive to remove fault. Or, turn off breaker to Drive and then back on again after 30 sec. b. If OC2 still occurs check if motor circuit is shorted or grounded. c. If OC 2 still occurs verify that program for deceleration is set for minimum of 60 seconds (consult Melink on exact function # based on Drive type).
OC 3	**OC 3,** over current at constant speed	a. Remove run command to Drive by turning off fan switch on Melink Keypad. Press PRG/RESET on Drive to remove fault. Or, turn off breaker to Drive and then back on again after 30 sec. b. If OC3 still occurs check if motor circuit is shorted or grounded. c. If OC3 still occurs check if there is a load fluctuation being caused by bad bearings and or unevenly balanced fan wheel.
OU	**OU,** over voltage protection	a. Remove run command to drive by turning off fan switch on Melink Keypad. Press PRG/RESET on drive to remove fault. Or, turn off breaker to drive and then back on again after 30 sec. b. If OU still occurs verify that the actual supply voltage to the Drive is within the allowable rated voltage of the Drive.
OH 2	**OH2,** external alarm input	a. Remove run command to drive by turning off fan switch on Melink Keypad. Press PRG/RESET on drive to remove fault. Or, turn off breaker to drive and then back on again after 30 sec. b. If OH2 still occurs verify there is continuity between the THR and CM terminals. A jumper or NC relay for the fire suppression system should be installed.
OL	**OL,** overload protection	a. Remove run command to drive by turning off fan switch on Melink Keypad. Press PRG/RESET on drive to remove fault. Or, turn off breaker to drive and then back on again after 30 sec. b. If OL still occurs verify that program for overload protection is set at the FLA rating of the motor (consult Melink on exact function # based on Drive type).

Advanced Troubleshooting

This section will deal with phenomena that are not mentioned in the standard troubleshooting guide. The following actions take a more subjective approach to the problems.

General Procedure For Isolating Bad Components

Temperature Sensors

- Verify correct number of sensors are programmed for the hood and that all plug-n-play connections are secure.
- Ensure no "Y" cables are plugged in at the IOP. Plugging temperature "Y" cables in at the IOP can cause erratic behavior due to the wiring used internally. Always plug these in at the sensor.
- Check resistance between Pin 1 and Pin 2 at the end of the cable plugged into the IOP. Resistance value should be approximately 109Ω per sensor. If there is more than one sensor, multiply 109Ω by the number of temperature sensors for that hood to get an approximate value.
    - If resistance is incorrect, check temperature probe and cable individually to determine problem component and replace as necessary.
    - If issue is low resistance (i.e. approximately half to a third of expected value) and a "Y" is being used, verify that a temperature "Y" is in place and not an APU "Y". The APU "Y" will put the resistances in parallel, effectively reducing it to the point that the system will never operate at more than minimum speed on temperature.
- If temperature faults are still present after these checks, it is possible that the problem is coming from the optic circuit (this has been known to happen in the past). To check for this condition, eliminate any optics on non-calibrated channels in the Simplissimo programming as well as disconnecting the cables from the IOP. If the system now runs fine, the culprit is probably in the optics portion. If the system does not work, it is possibly a bad Autocal board that may need to be replaced.

Optic Sensors

- Verify that the correct optic channels are programmed for the given system.
- Check optics alignment in Simplissimo System Menu #9.
    - If a strong signal is present (4-8 bars), verify that breaking the beam reduces the signal to one bar.
    - If a weak signal (2-3 bars) or no signal (1 bar) is present, increase the gain setting on the receiver.
- If system is running at full speed for no apparent reason, try re-calibrating the optics (turning system on and off). Also try programming out the optics and re-testing the system.
    - If the system runs normally in temperature only, but at full speed with the optics then check the voltage output from the receiver. There should be 1-2 volts (DC) between the ground post on the Autocal board and the respective receiver points on the Autocal. The test points are labeled RCV0 through RCV3 for channels 1 through 4 respectively. If the voltage is below one volt with the gain setting at the appropriate level, the optic boards will need to be replaced.
- If possible, switch optic boards from malfunctioning channel with boards from a working optic channel. If the problem jumps with the optic boards, then the problem is with either the emitter or receiver. If the problem does not move, then the optic boards are fine and more checks need to be made:
    - If possible, try to isolate if the problem is in the cables by switching the optics "Y" (with all existing cables attached) with a working channel. If the problem moves at this point, then the problem can most likely be attributed to a bad cable. If the problem does not move at this point then the Autocal board is probably malfunctioning and should be replaced.
    - Check cables: Use a "pigtail plug" (female plug with wires that can be twisted together for a continuity check) to short two pins together and check for continuity at the other end of the cable. Also check for shorts to other pins. The optic channel uses pins 1, 2, and 3 on the 4-pin cables. Replace any bad cables and retest system.

- Change out optic "Y" cable at IOP. Preferably switch with a working optic channel in order to ensure a good "Y" is being used. If a "Y" from a working optic channel is not being used, try a second "Y" if the first one does not remedy the problem to reduce the possibility that the replacement "Y" is bad.

APUs

- Check cables using the "pigtail plug". Only pins one and two are used for the APUs.
- Verify the 24 VDC signal is coming from the Autocal board.
- Verify correct "Y" is being used. If a temperature "Y" has been substituted, the APUs will not work correctly.
- If APU runs but is noisy, check for interference from screws mounting the filter ring.
- Replace as necessary.

Keypad

- The 100% button can sometimes become stuck, causing the system to try and remain in bypass. Try cycling the button to see if it will perform as expected. If not, replace keypad.

I/O Board

- If seem to have fluctuating power on the system, check that all wire terminations are secure and that input power is the correct voltage. Also check wire terminations between Autocal and I/O boards.

Autocal Board

- Since this is the "brains" of the system, a bad component can cause a variety of problems with the system. If after performing previous checks the problem does not become apparent, then the Autocal board is the most likely culprit.

  When changing the Autocal board, stay grounded (use ground strap if available) to protect board from electro-static discharge (ESD).

Single-phase to three-phase applications:
Problem: Existing single-phase motor starter still being used (utilizing drive to convert to three-phase) and existing motor starter trips out even at low current draw.
Possible solution: The starter could be thinking that it is losing a phase. Try eliminating the existing starter from the motor circuit and utilize an external run relay (can run off of existing coil). This way the previous method of operation may continue to be used.

Drives:

Slowing Down Fan Speeds:
There may be occasions that require that the maximum speed may need to be adjusted. One example would be converting a short-circuit hood to exhaust only (i.e. turning off MUA fan). To do this, reset the maximum frequency (setting F03 on the GE drives) to the appropriate level. In order for the keypad to display a full ten bars at maximum speed, the base frequency must be adjusted in the drive programming. This will re-scale the control signals so that the fans will run at the appropriate speed throughout the full range.

Note: Drives with covers (such as the GE/Fuji models) will run with the covers either on or off. However, always power down the drive before installing or removing the cover. The only reason the drive should be powered with the cover off is during troubleshooting, with extreme care being taken to ensure safe practice is being used to protect personnel and hardware.

Problem	Display	Probable Cause	Items to Check	Action
No Display	Blank	Power not turned on.	- Check for power on input terminals.	- Verify appropriate circuit breaker is turned on and that fuses are not blown.
		Drive malfunction.	- Verify that power was not applied to the output side of the VFD.	- Drive will have to be replaced. *First determine cause of failure to ensure that problem is not repeated.*
Drive Not Receiving Run Command	No green run light; display flashing.	Circuit not being completed between FWD and CM terminals.	- Verify cable connections are secure and the drive is connected to the correct port as programmed in the Simplissimo.	- Secure any loose cables; edit Simplissimo if necessary.
		System not activated.	- Verify that keypad is turned on or power to the IOP is off.	
		Loose connections; bad VFD cable	- Verify continuity between terminals FWD and CM. - Disconnect control cable and verify 24VDC potential between terminals FWD and CM. - Verify continuity between pin 3 and pin 6 on the VFD cable.	
Drive Not Receiving Speed Reference	Green run light illuminated, but display is at 0 Hz	Drive programming.	- Verify drive is set to operate off of terminal inputs.	
		Loose connections; bad VFD cable.	- Verify all connections are secure.	
Drive Running at Wrong Speed	Running frequency.	Switch in wrong position (AF-300 P11 only).	- Ensure that SW1 is in the "Sink" position and SW2 is in the "Off" position.	
		Interference; Electric "Noise"	- Ensure that drive output is run in dedicated conduit. Power coming in to the drives may be in shared conduit.	
		Bad cable; bad channel on I/O processor	- Verify that correct reference signal is coming from I/O processor.	- Check for either 4-20mA signal between pins 5 and 1 or 0-10VDC signal between pins 5 and 7.

AC Tech Drives

Display	Fault	Description/Possible Causes
AF	High Temperature Fault	Ambient temperature too high; cooling fan failed
CF	Control Fault	Blank or corrupted EPM installed. Perform factory reset (Parameter 48) or change EPM.
cF	Incompatibility Fault	Incompatible EPM installed. Perform factory reset (Parameter 48) or change EPM.
dF	Dynamic Braking Fault	Drive sensed dynamic braking resistors overheating.
EF	External Fault	TB-13A and/or TB-13C set to external fault input and is open to TB-2. Check Parameter 10 and/or 12.
GF	Data Fault	User data and OEM defaults in EPM corrupt.
HF	High DC Bus Voltage Fault	Line voltage too high; Decel too fast; Overhauling load
JF	Serial Fault	Serial link lost
LF	Low DC Bus Voltage Fault	Line voltage too low.
OF	Output Transistor Fault	Phase to phase/ground short circuit; Failed output transistor; Boost settings too high; Acceleration too fast.
PF	Current Overload Fault	VFD undersized for application; Mechanical problem with equipment.
SF	Single-Phase Fault	Single-phase input has been applied to three-phase
UF	Start Fault	Start command was present when drive was powered up. Must wait two seconds after power up to apply Start command if START METHOD is set to NORMAL.
F1	EPM Fault	EPM missing or damaged.
F2-F9, Fo	Internal Faults	Control board has sensed a problem. Consult AC Tech.

Output Wire Lengths

Due to possibility for interference, the distance between the drive output and the motor being controlled must be less than a specified distance. If the distances specified below must be exceeded, an output filter must be installed on the application. When installing output filters, the filters should be as close to the drive as possible and must be installed no farther than 15 feet (4.5 m) from the drive in order to be effective. Installing the filters farther away than 15 feet will cause the filters to absorb the harmonics and voltage spikes, causing them to fail prematurely.

GE P11 Drives

Drives 7.5 HP and larger

Motor Insulation Level	1000V	1300V	1600V
460 VAC Input Voltage	66 ft (20 m)	328 ft (100 m)	1312 ft (400 m) *
230 VAC Input Voltage	1312 ft (400 m) *	1312 ft (400 m) *	1312 ft (400 m) *

* For this case the cable length is determined by secondary effects and not voltage spiking.

Drives 5 HP and smaller

Motor Insulation Level	1000V	1300V	1600V
460 VAC Input Voltage	66 ft (20 m)	165 ft (50 m) *	165 ft (50 m) *
230 VAC Input Voltage	328 ft (100 m) *	328 ft (100 m) *	328 ft (100 m) *

* For this case the cable length is determined by secondary effects and not voltage spiking.

Drives In General

Input Voltage	Distance
208/230 VAC	200 ft (61 m)
460 VAC	66 ft (20 m)
680 VAC	45 ft (14 m)

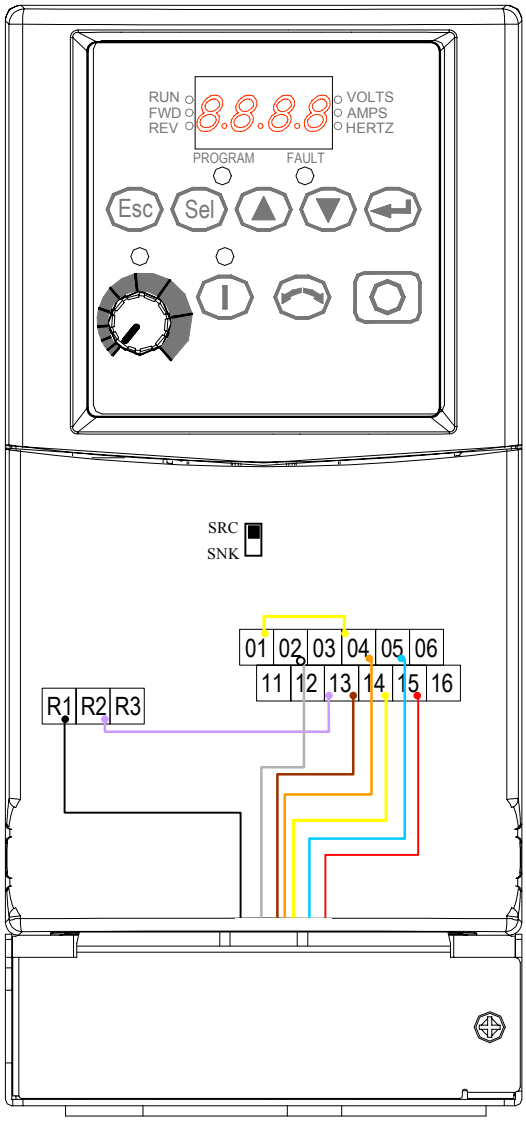
Optic Gain Settings/Compatibility

Gain Setting	Rev A Emitter & Rev C Receiver	Rev B Emitter & Rev D Receiver
Top	5'-11'	4'-8'
Middle	11'-25'	8'-18'
Bottom	25'-50'	18'-40'

Note: Optics are not cross-compatible (i.e. Rev A Emitter will not work with Rev D Receiver)

Section 3:
Drive Connections

A-B PowerFlex 4 Drive Terminal Connections

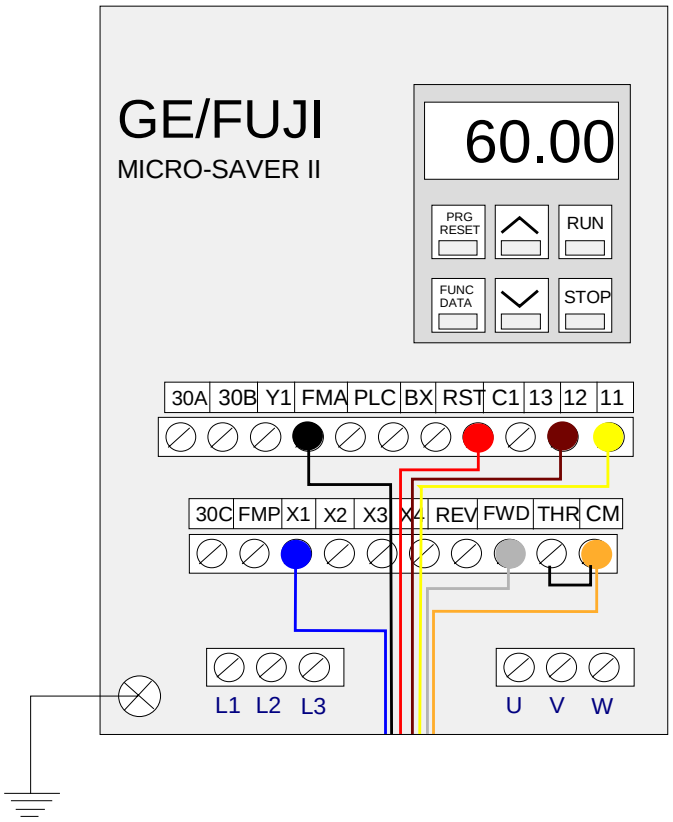


Notes:

- Move SNK/SRC switch to SNK
- Set AutoCal dipswitches to 0-10VDC

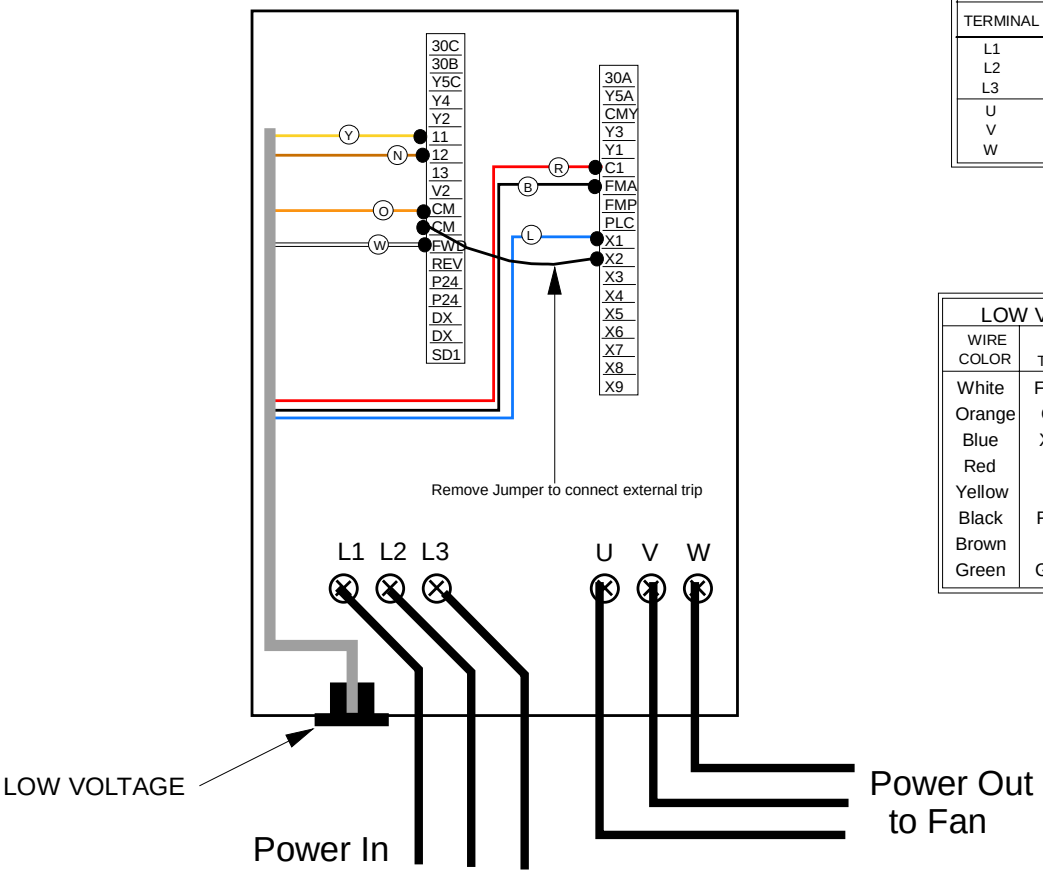
Color	Terminal	Pin	Purpose
Red	15	1	4-20mA Speed Ref.
Black	R1	2	0-10 VDC Feedback
White	02	3	Run Command
Blue	05	4	Bypass Command
Yellow	14	5	Signal Common
Orange	04	6	FWD/Bypass Common
Brown	13	7	0-10 VDC Speed Ref.
Stop/External Trip Jumper Connected Between 01 and 04. Run status jumper between 13 and R2.			

GE Micro$averII Drive Terminal Connections



Color	Terminal	Pin	Purpose
Red	C1	1	4-20 mA
Black	FMA	2	0-10 VDC Out
White	FWD	3	Run Command
Blue	X1	4	Bypass Command
Yellow	11	5	Signal Common
Orange	CM	6	FWD/Bypass Common
Brown	12	7	0-10 VDC In
External Trip Jumper Connected Between THR and CM			

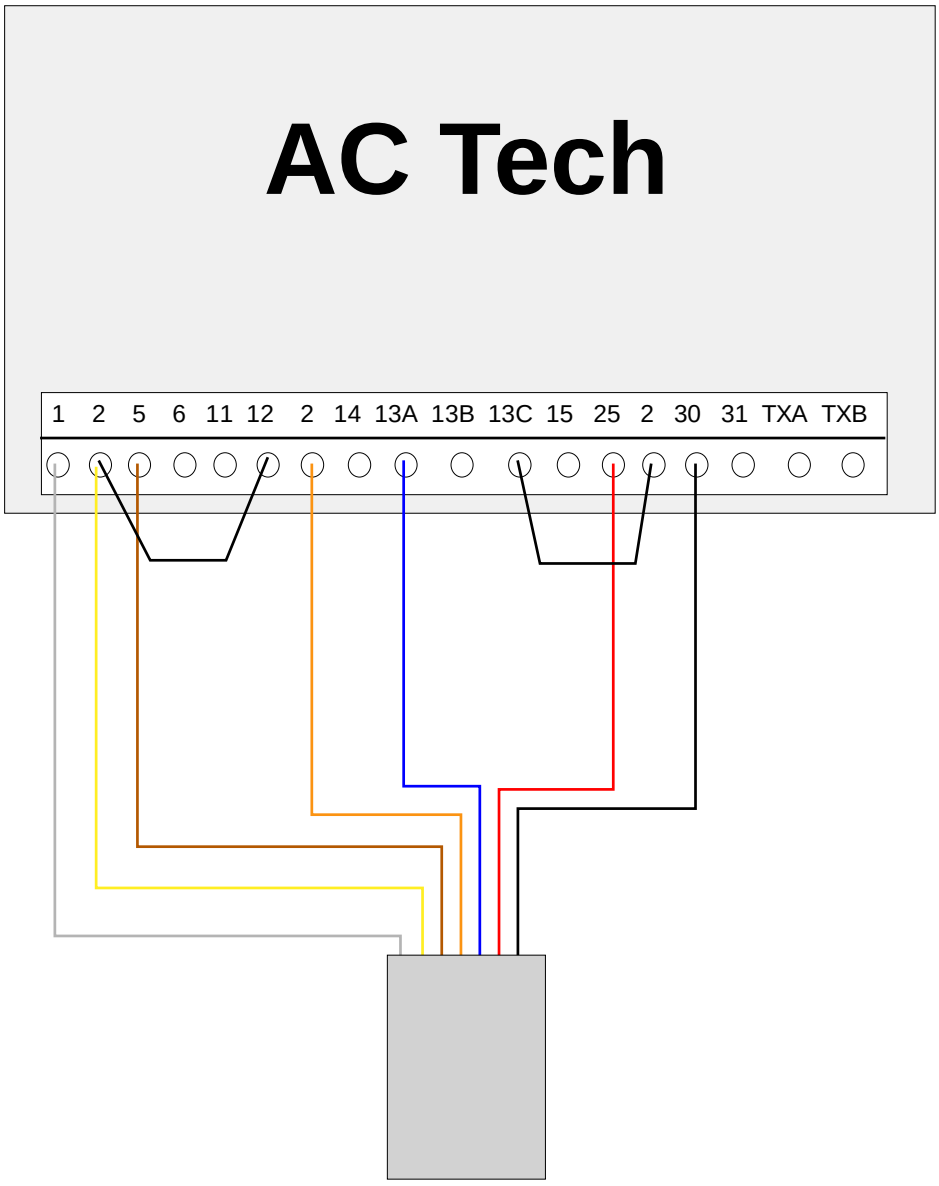
P11 Terminal Connections



HIGH VOLTAGE LEGEND	
TERMINAL	FUNCTION
L1 L2 L3	3Phase Input from breaker panel
U V W	3Phase Output to fan motor

LOW VOLTAGE CABLE LEGEND		
WIRE COLOR	VFD TERM	FUNCTION
White	FWD	Run command
Orange	CM	Run common
Blue	X1	Bypass command
Red	C1	4-20mA speed referance
Yellow	11	Speed referance common
Black	FMA	0-10V meter output
Brown	12	0-10V speed referance
Green	GND	Cable shield ground

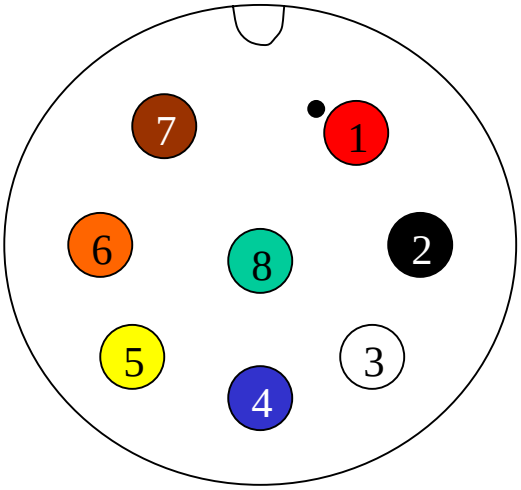
AC Tech Terminal Connections



FUNCTION	SIGNAL	Terminal	PIN #	RECPTACLE
Speed Reference to VFD	4-20 ma	25	1	Red
Frequency Meter from VFD	0-10 vdc	30	2	Black
Start/Stop Command	Dry	1	3	White
Full Speed Bypass Command	Dry	13A	4	Blue
Reference Signal Common	---	2	5	Yellow
Start/Stop Bypass Common	---	2	6	Orange
Speed Reference to VFD	0-10 vdc	5	7	Brown
Cable Shielding Drain	---	-	8	Green

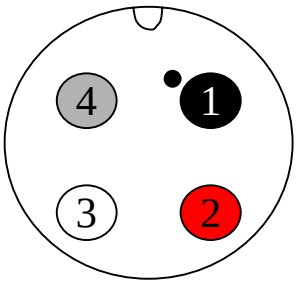
8-Pin (VFD) Cables

Pin	Older Cables	Receptacle/ Newer Cables	Terminal	Purpose
1	Black	Red	C1	4-20 mA
2	Red	Black	FMA	0-10 VDC Out
3	White	White	FWD	Run Command
4	Green	Blue	X1	Bypass Command
5	Brown	Yellow	11	Signal Common
6	Blue	Orange	CM	FWD/Bypass Common
7	Orange	Brown	12	0-10 VDC In
8	Bare	Green		GND



Male End View

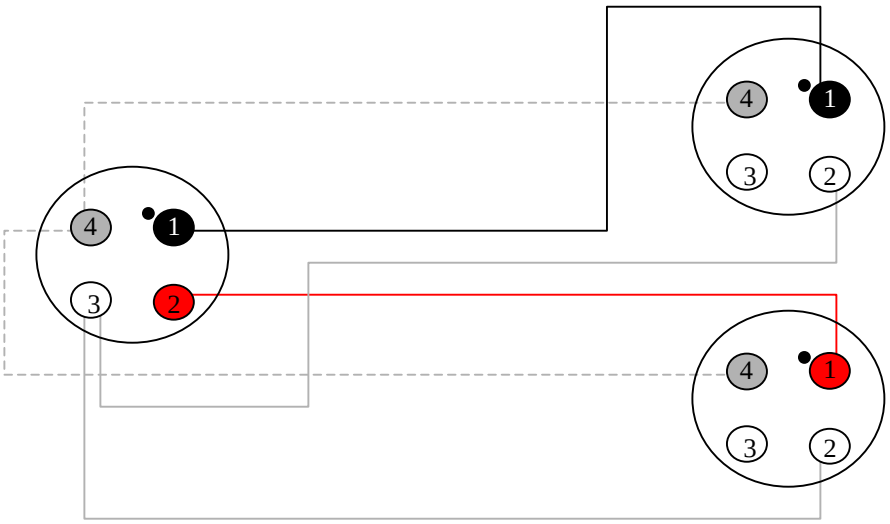
4-Pin Cables



Male End View

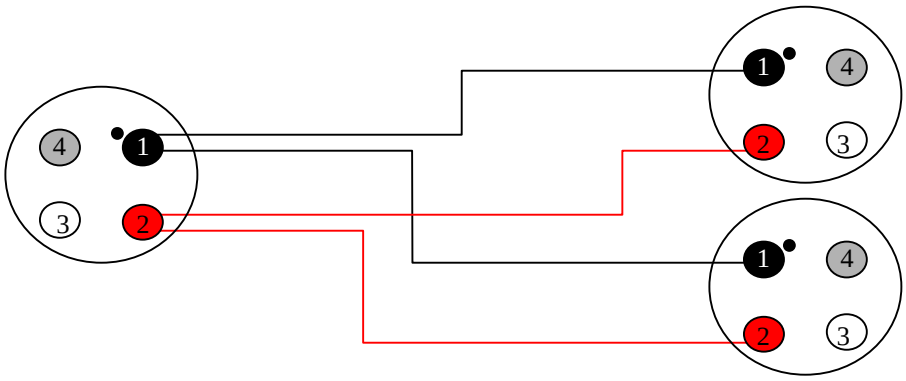
Pin	Color	Purpose
1	Black	Temp, Optic, APU
2	Red	Temp, Optic, APU
3	White	Optics Only
4	Shield	Drain

Temperature “Y” Connector



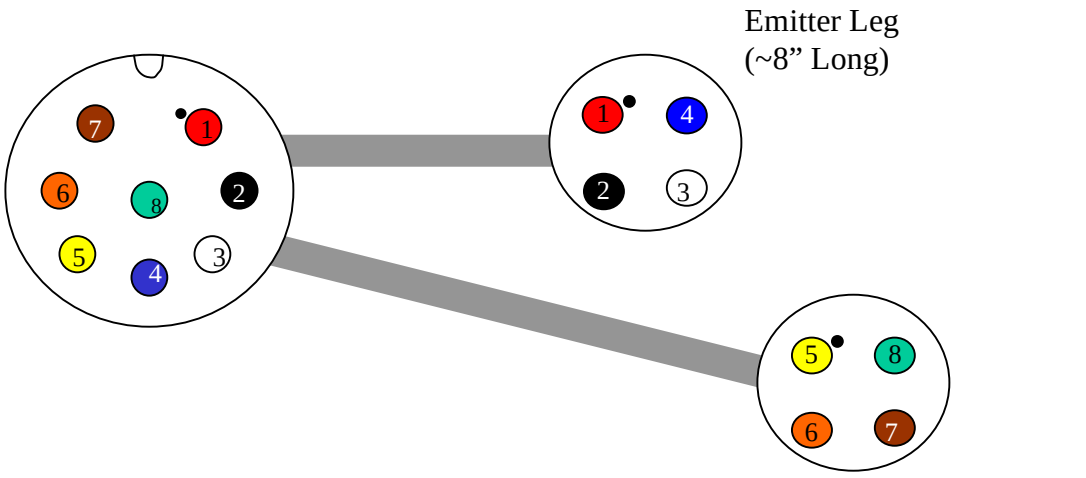
Note: Legs on temperature “Y”s are approximately 10” long.

APU “Y” Connector



Note: Legs on APU “Y”s are approximately 8” long.

Optic “Y” Connector



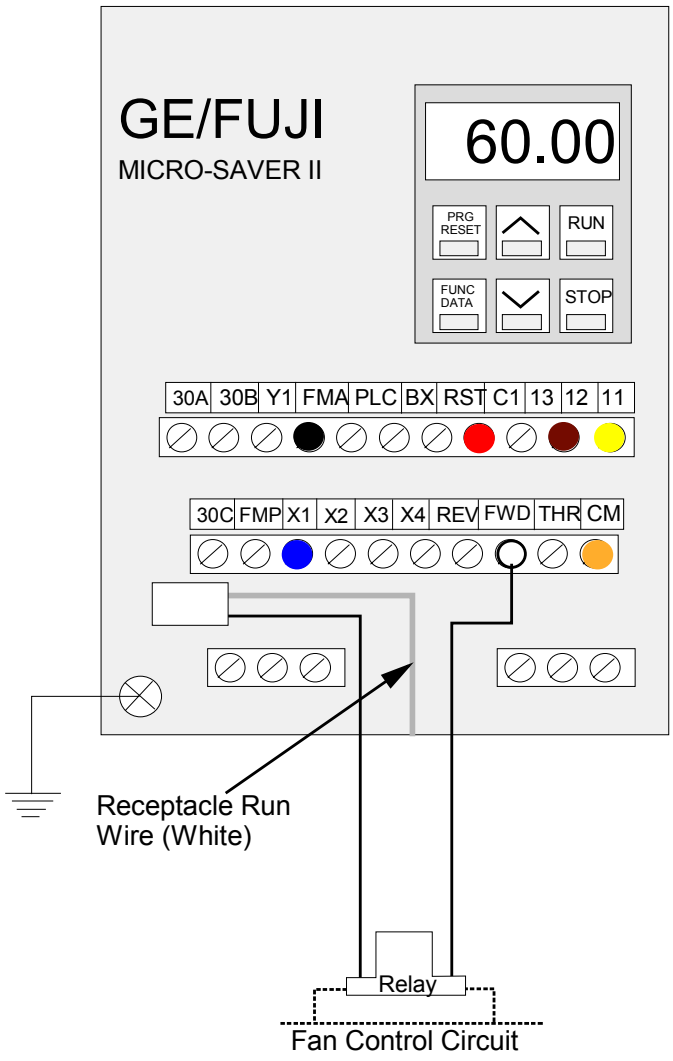
Communication Cable

GE Drive Master/Slave Terminal Connections

Master			Slave	
Terminal	**Purpose**		**Terminal**	**Purpose**
12	0-10 VDC Input	=>	12	0-10 VDC Input
11	Signal Common	=>	11	Signal Common
X1	Bypass Signal	=>	X1	Bypass Signal
CM	Common	=>	CM	Common

Note: Need to jumper in run command on slave drive (on GE drives terminal FWD to CM)

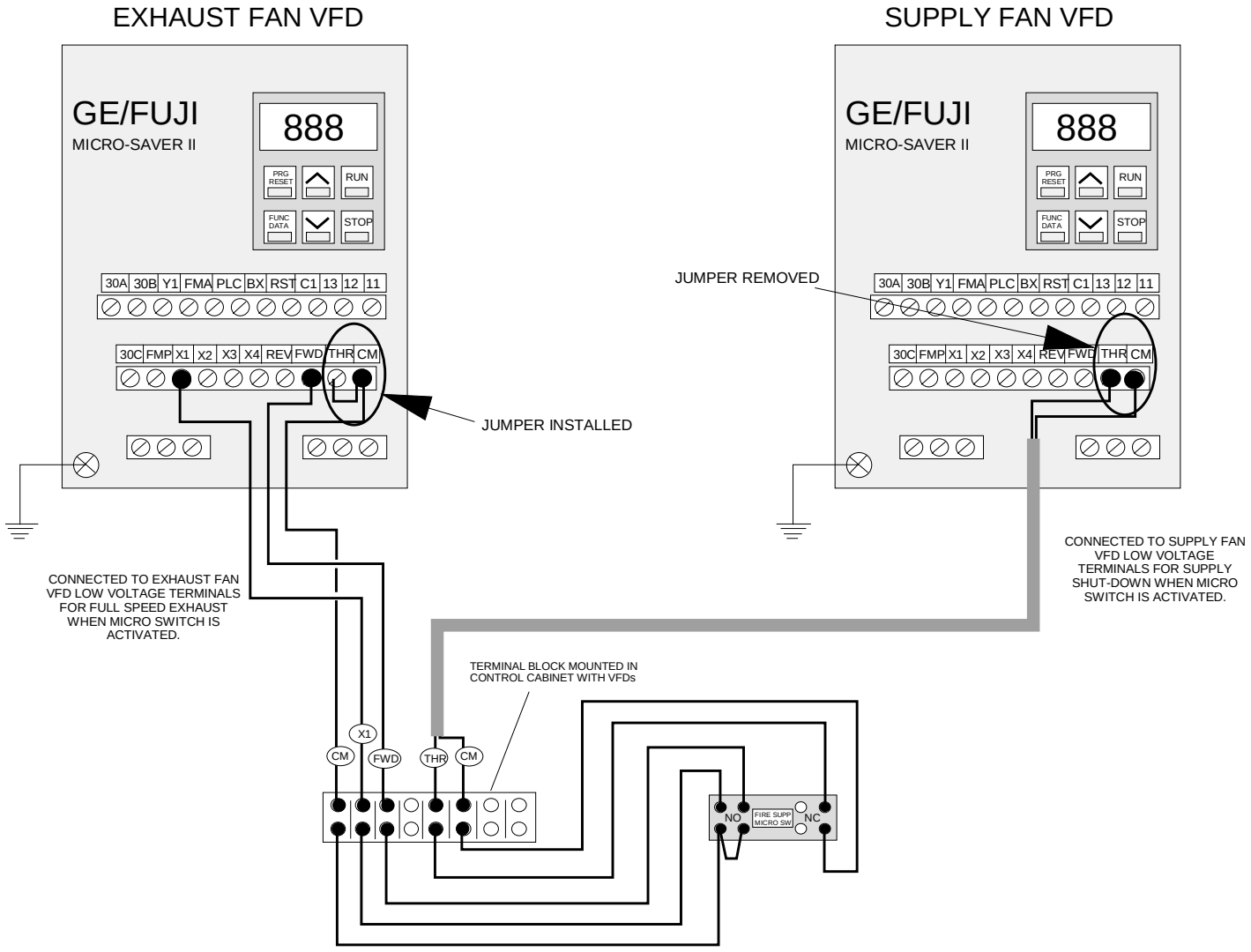
Drive Remote Run Command (Relay Connections)



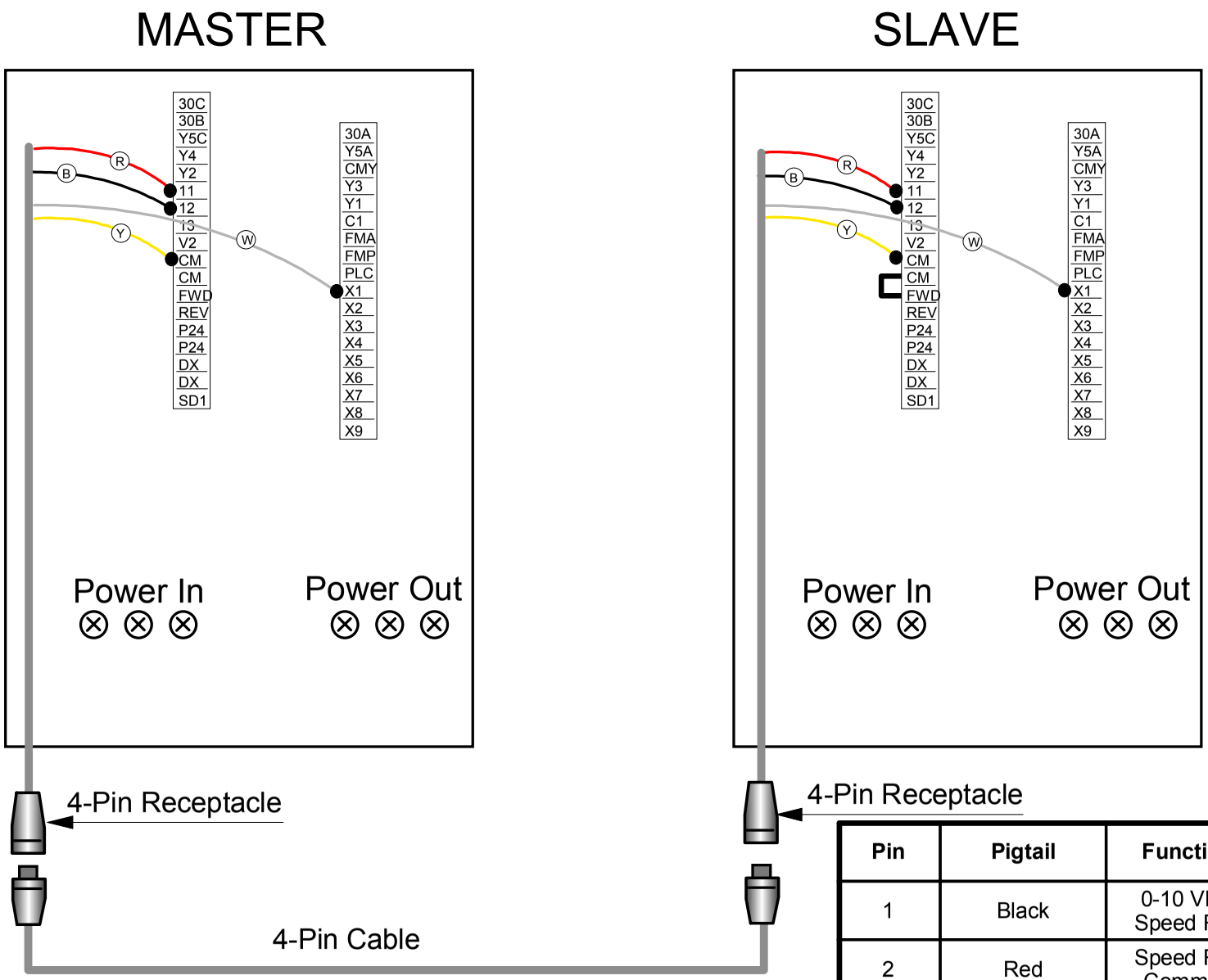
Note: On GE MicroSaverII drives where space is tight, terminal 30C may be used as a connection point.

VFD Fire Suppression Interlock

This configuration will shut down the supply fan and send the exhaust fan to full speed when fire suppression system is tripped.



P11 Terminal Master/Slave Connections



Note: On Microsaver drives the connections are to the same terminals, however the terminal block is oriented differently.

Pin	Pigtail	Function	Terminal **GE**/AC Tech
1	Black	0-10 VDC Speed Ref.	**12** / 5
2	Red	Speed Ref. Common	**11** / 2
3	White	Bypass Command	**X1** / 13A
4	Yellow	Bypass Common	**CM** / 2

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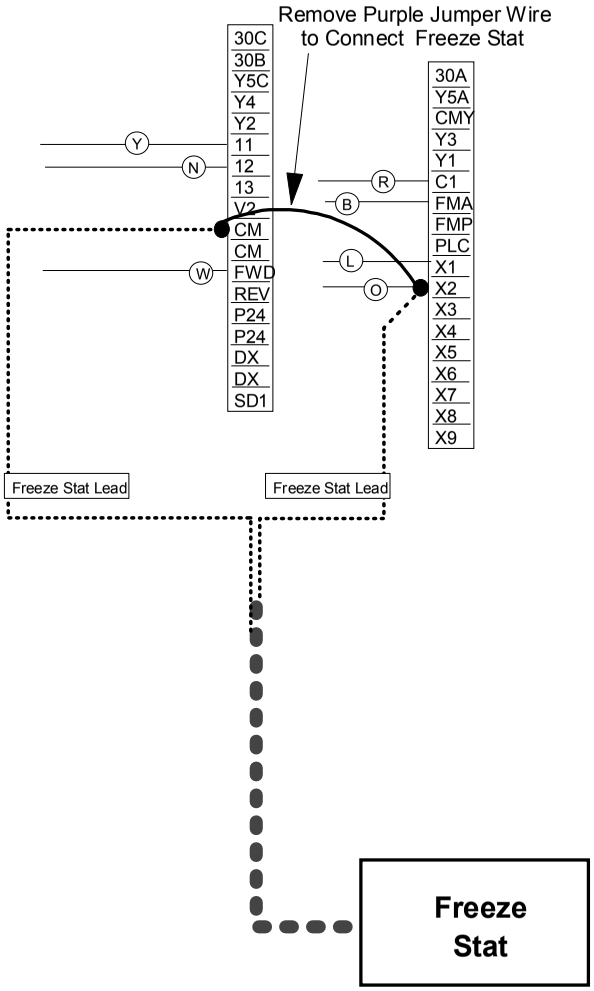
P11 Low Voltage Terminal Connections

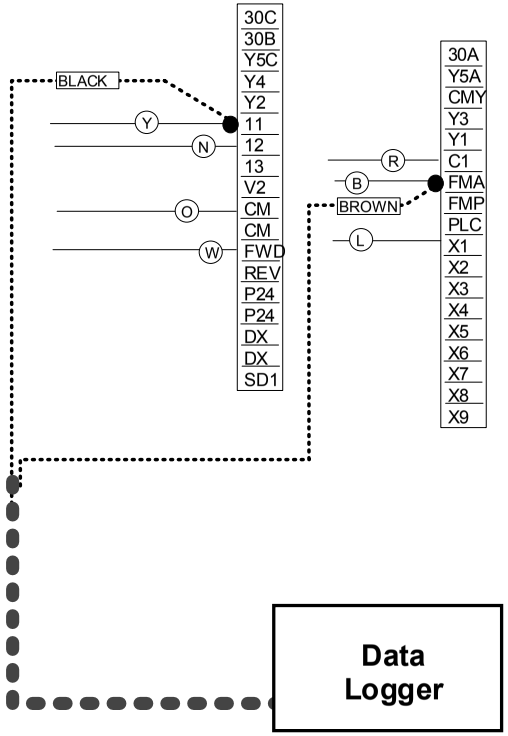
LOW VOLTAGE CONNECTIONS

FIELD WIRING

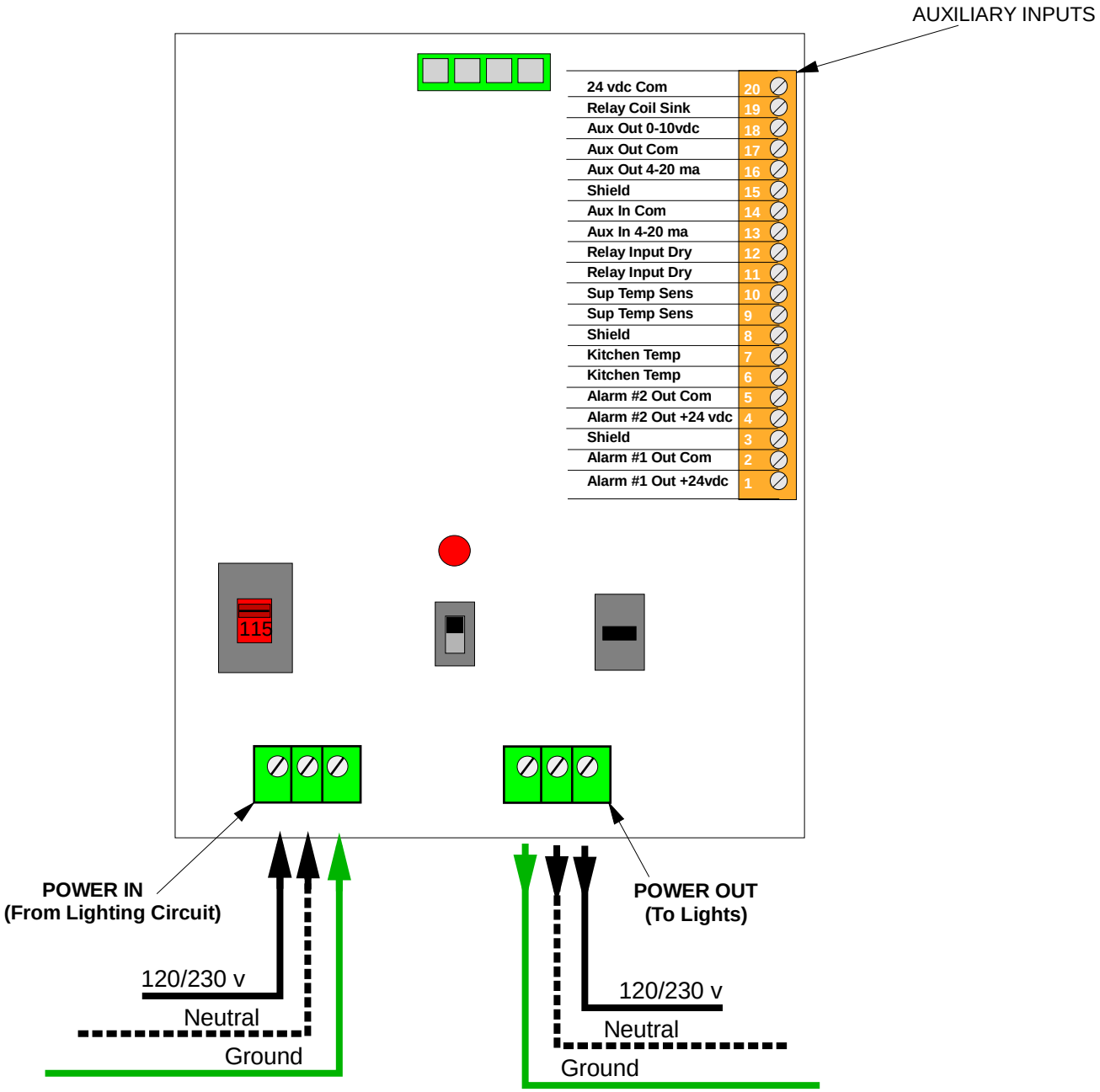
Supply Fan
Freeze Stat Connection



Exhaust Fans
#1 and #2
Data Logger Connection



Input/Output Board



Terminal	Purpose	Reference
1	Alarm #1 Common	Connections for 24VDC
2	Alarm #1 24VDC Out	Alarm #1 Output
3	Sheild	Shield for 24VDC Outputs
4	Alarm #2 24VDC Out	Connections for 24VDC
5	Alarm #2 Common	Alarm #2 Output
6	Kitchen Temperature	Connections for Kitchen
7	Kitchen Temperature	Temperature Sensor
8	Sheild	Temperature Sensor Sheild
9	Supply Temperature	Connections for Supply
10	Supply Temperature	Temperature Sensor

Terminal	Purpose	Reference
11	Relay Input	Connections for External Relay
12	Relay Input	Input
13	Auxiliary 4-20mA Input	External Speed Reference Signals -
14	Auxiliary 4-20mA Common	Follows System Menu Setting #2
15	Sheild	Auxiliary 4-20 mA Sheild
16	Auxiliary 4-20mA Out	Auxiliary Speed Reference Signals -
17	Auxiliary Out Common	Follows System Menu Setting #1
18	Auxiliary 0-10VDCOut	
19	Relay Coil Sink	Not Used in Current Configuration
20	24VDC Common	

Section 4:
Drive Programming

Allen Bradley - PowerFlex 4 Series VFD

Program Function Code Settings

Intelli-Hood Application

FUNC #	SETTING	DESCRIPTION
d001	Read Only	OUTPUT FREQUENCY
d002	Read Only	COMMANDED FREQUENCY
d003	Read Only	OUTPUT CURRENT
d004	Read Only	OUTPUT VOLTAGE
d007-d009	Read Only	FAULT CODES (Displays history of past three fault codes, with d007 being the most recent)
P031	VOLTS	MOTOR NP VOLTS - Set at motor rated volts (208, 220, 230, 380, 400, 460 ,480)
P032	60	MOTOR NP HERTZ - Set at rated frequency of motor
P033	AMPS	MOTOR OL CURRENT (Set to 110% of F.L.A. on motor nameplate)
P034	0	MINIMUM FREQ (Lowest frequency drive will output)
P035	60	MAXIMUM FREQ (Highest frequency drive will output)
P036	2	START SOURCE (2 = I/O Terminal 1 "Stop" = coast to stop)
P037	1	STOP MODE (1 = Clear Fault/Coast to stop)
P038	2	SPEED REFERENCE (2 = 0-10VDC Input)
P039	5	ACCELERATION TIME (in seconds)
P040	60	DECELERATION TIME (in seconds)
P041		RESET TO DEFAULTS (Setting this parameter to "1" will reset drive to A-B defaults
A051	4	DIGITAL INPUT 1 SELECT (4 = Preset frequency)
A052	0	DIGITAL INPUT 2 SELECT (0 = Not used)
A055	2	RELAY OUT SELECT (2 = Motor running)
A071	60	PRESET FREQUENCY 1 (in hertz)
A083	0%	S CURVE % (Adds time to accel/decel times to smooth ramp)
A084	1	START BOOST (1 = Variable torque setting 1)
A089	AMPS	CURRENT LIMIT (Drive protection; default is VFD rated amps x 1.5)
A091	2	PWM FREQUENCY (in kHz; sets carrier frequency)
A092	5	AUTO RESTART TRIES
A093	5	AUTO RESTART DELAY (in seconds)
A094	1	AUTO START AT POWER UP (1 = Enabled)
A095	1	REVERSE DISABLE (1 = Reverse disabled)
A100	0	FAULT CLEAR (0 = Ready, 1 = Clear active fault, 2 = Clear fault queue)
Prog AB PF4.XLS 06/11/03		

Notes:

1. Set Sink/Source switch to "Sink"
2. For high inertia fans, may need to increase start boost with A084 to 2, 3, or 4.
3. For problems with overvoltage faults, try increasing the value on the S curve % in A083.

GE/Fuji AF-300 Micro-Saver II Series VFD

Program Function Code Settings
Intelli-Hood Application

FUNC #	SETTING	DESCRIPTION
F00	1	DATA PROTECTION (0 = Allows Data Changing, 1 = Lock Settings)
F01	1	FREQUENCY COMMAND (1 = Frequency Signal Through Terminal Input)
F02	2	OPERATION COMMAND (2 = Fwd Run Command Through Terminal Input, STOP key inactive)
F03	60	MAXIMUM FREQUENCY (in Hz) (Set to 60 for USA, 50 for EU)
F04	60	BASE FREQUENCY (in Hz) (Set to 60 for USA, 50 for EU)
F05	VOLTS	MAXIMUM OUTPUT VOLTAGE (Set at motor rated volts: 208, 220, 230, 380, 400, 460 ,480)
F06	5	ACCELERATION TIME (in seconds)
F07	60	DECELERATION TIME (in seconds)
F08	1	TORQUE BOOST (1 = Normal Fan Application)
F09	85	METER ADJUSTMENT (Adjusts the Full Scale Voltage Level)
F10	4	MOTOR POLES (4 = Standard 4-Pole Motor)
F12	2	MOTOR SOUND (Higher C.F. = Lower Audible Noise + Greater Adverse Effects on Motor)
F13	5	RESTART ATTEMPTS (5 = 5 Restarts)
F14	4	RESTART AFTER MOMENTARY POWER FAILURE (4 = Restart Active, Resume at Last Freq)
F15	1	ELECTRONIC THERMAL OVERLOAD OPERATION (1= Active)
F16	AMPS	ELECTRONIC THERMAL OVERLOAD LEVEL (Set to Motor Rated FLA)
F17	0	DC BRAKE (0 = Inactive)
F21	60	MULTI STEP SPEED 1 (Set to Bypass Speed in Hz)
F28	1	S-CURVE ACC/DEC (1 = Weak S-Curve)
F29	--	FAULT MEMORY
F31	180	TORQUE LIMIT ACC/DEC (180 = Limit to 180%)
F32	180	TORQUE LIMIT CONSTANT (180 = Limit to 180%)
F34	0	BIAS FREQUENCY (0 = no offset)
F35	100	GAIN FOR FREQUENCY SIGNAL (in Percent of Maximum Frequency)
F36	0-60	HIGH LIMITER (Set to Air Balance Speed in Hz) [60 is Melink default]
F37	0	LOW LIMITER (in Hz)
F39	0	DATA INITIALIZATION (0 = Inactive, 1 = Reset to Factory Default Values)
F40	0	MONITORING SIGNAL (0 = Analog Signal to FMA Terminal)
F41	0	FMA TERMINAL (0 = Display Output Frequency)
F54	0	Y1 TERMINAL (0 = Drive Running State)
F57	0	THR TERMINAL (0 = Trip Function) (Jumper THR-CM)
F69	0	AUTOMATIC TORQUE VECTOR CONTROL (0 = Inactive)

Prog_MSII.123 06/23/00

Notes:
1. If trouble starting high inertia fans or operating at low speed, may need to increase torque boost F08 gradually to about 4. Keep as low as possible.
2. If problems with OU faults on high inertia fans, increase strength of s-curve with F28=2.

GE/Fuji AF-300 P11 Series VFD

Program Function Code Settings
Intelli-Hood Application

FUNC #	SETTING	DESCRIPTION
F00	1	DATA PROTECTION (0 = Allows Data Changing, 1 = Lock Settings)
F01	3	FREQUENCY COMMAND (3 = Frequency Signal Through Terminals 12 and/or C1)
F02	2	OPERATION COMMAND (2= Fwd Run Command Through Terminal Input, STOP key inactive)
F03	60	MAXIMUM FREQUENCY (in Hz) (Set to 60 for USA, 50 for EU)
F04	60	BASE FREQUENCY (in Hz) (Set to 60 for USA, 50 for EU)
F05	VOLTS	RATED VOLTAGE - Set at motor rated volts (208, 220, 230, 380, 400, 460 ,480)
F06	VOLTS	MAXIMUM VOLTAGE - Limits maximum outout voltage. Set to same as Rated Voltage F05.
F07	5	ACCELERATION TIME (in seconds)
F08	60	DECELERATION TIME (in seconds)
F09	0.1	TORQUE BOOST (0.1 = Normal Fan Application)
F10	1	ELECTRONIC THERMAL OVERLOAD OPERATION (1= Active for General-Purpose Motor)
F11	20 - 135%	ELECTRONIC THERMAL OVERLOAD LEVEL (% = (Motor FLA)/(VFD Rated A)x100)
		(Calculate Motor FLA as a Percentage of VFD FLA) [100 is Melink Default]
F12	5	ELECTRONIC THERMAL OVERLOAD TIME (in seconds)
F13	1	ELECTRONIC THERMAL OVERLOAD BRAKING (1 = Active for Built-In Resistor)
F14	3	RESTART AFTER MOMENTARY POWER FAILURE (3=Restart Active with Ride-Through)
F15	0-60	FREQUENCY HIGH LIMIT (Set to Air Balance Speed in Hz) [60 is Melink Default]
F16	0	FREQUENCY LOW LIMIT (in Hz)
F17	100	FREQUENCY GAIN (in Percent)
F18	0	FREQUENCY BIAS (in Hz)
F22	0	DC BRAKE (Braking Time) (0 = Inactive)
F26	2	MOTOR SOUND (Higher C.F. = Lower Audible Noise + Greater Adverse Effects on Motor)
F27	0	MOTOR TONE
F30	100	METER ADJUSTMENT (in Percent)
F31	0	METER OUTPUT (0 = Frequency in 0-10V Scale)
F40	150	DRIVING TORQUE LIMIT (in Percent)
F41	0	BRAKING TORQUE LIMIT (Automatic to Prevent OU Trip due to Regeneration Effect)
F42	0	AUTOMATIC TORQUE VECTOR CONTROL (0 = Inactive)
E01	0	X1 TERMINAL FUNCTION (0 = Multi-Step Frequency set in C05)
E02	9	X2 TERMINAL FUNCTION (9 = External Alarm Trip THR)
E03	8	X3 TERMINAL FUNCTION (8 = Alarm Reset)
C05	60	MULTI-STEP FREQUENCY 1 (Set to Bypass Speed in Hz)
P01	4	MOTOR POLES (4 = Standard 4-Pole Motor)
P02	kW	MOTOR CAPCITY (Set to Motor Rated Capacity in kW)
P03	AMPS	MOTOR CURRENT (Set to Motor Rated Current in Amps)
H03	0	DATA INITIALIZATION (0 = Inactive, 1 = Reset to Factory Default Values)
H04	5	AUTO RESET TIMES (5 = Five Reset Attempts)
H05	5	AUTO RESET INTERVAL (# of Seconds Between Attempts)
H07	1	ACC/DEC PATTERN (1 = Mild S-Curve)
H08	1	REVERSE LOCK (1 = Lock Reverse Operation)
H09	2	START MODE (2 = Smooth Restart Active)
H10	0	ENERGY-SAVING OPERATION (0 = Inactive)
		Prog_P11.123 02/01/02

Notes:

1. If problems with OU1, OU2, or OU3 fault on a high inertia fan; increase strength of s-curve with H07 = 2.
2. For high inertia fans, may need to increase torque boost with F09 = 0.1 to 0.9.
3. Set SW1 switch to "Sink".
4. Set SW2 switch to "Off".
5. If problems with noise on drive terminals 12 or C1, may be able to eliminate with C33. Setting range = 0.00 to 5.00 seconds. Higher value = lower noise + slower response.

AC Tech SCF Series VFD

Program Function Code Settings

Intelli-Hood Application

FUNC #	SETTING	DESCRIPTION
P01	01 or 02	LINE VOLTAGE (01 = High , 02 = Low) (Refer to nameplate voltage ratings, high and low)
P02	02	CARRIER FREQUENCY (02 = 6 kHz)
P03	02	START METHOD (02 = Start on Power-up)
P04	03	STOP METHOD (03 = Ramp)
P05	04	STANDARD SPEED SOURCE (04 = 4-20 mA, 03 = 0-10 VDC, 02 = Preset #1, 01 = Keypad)
P06	01	TB-14 OUTPUT (01 = None)
P07	01	TB-15 OUTPUT (01 = None)
P08	02	TB-30 OUTPUT (02 = 0-10 VDC Frequency)
P09	01	TB-31 OUTPUT (01 = None)
P10	04	TB-13A FUNCTION SELECT (04 = Preset Speed #1)
P11	01	TB-13B FUNCTION SELECT (01 = None)
P12	06	TB-13C FUNCTION SELECT (06 = External Fault)
P13	01	TB-15 OUTPUT (01 = None)
P14	01	CONTROL (01 = Terminal Strip Only)
P15	01	SERIAL LINK (01 = Disable)
P16	02	UNITS EDITING (02 = Whole Units)
P17	01	ROTATION (01 = Forward Only)
P19	05	ACCELERATION TIME (in seconds)
P20	60	DECELERATION TIME (in seconds)
P21	0	DC BRAKE TIME (in seconds)
P22	0	DC BRAKE VOLTAGE (in %)
P23	0	MINIMUM FREQUENCY (in Hz)
P24	60	MAXIMUM FREQUENCY (in Hz)
P25	180	CURRENT LIMIT (in % of VFD nameplate rating)
P26	30-100	MOTOR OVERLOAD (ratio in % of motor current rating to VFD current rating)
P27	60	BASE FREQUENCY (in Hz)
P28	1.0	FIXED BOOST (in %)
P29	0	ACCEL BOOST (in %)
P30	0	SLIP COMPENSATION (in %)
P31	60	PRESET SPEED #1 (in Hz)
P38	0	SKIP BANDWIDTH (in Hz)
P39	0	SPEED SCALING
P40	60	FREQUENCY SCALING (in Hz)
P41	200	LOAD SCALING (in %)
P42	20	ACCEL / DECEL #2 (in seconds)
P43	1	SERIAL ADDRESS
P44	225	PASSWORD (000 - 999)
P47	01	CLEAR HISTORY (01 = Maintain, 02 = Clear)
P48	02	PROGRAM SELECTION (01 = User Settings, 02 = OEM Settings, 03 = Reset to OEM defaults,
		04 = Reset to 60 Hz factory defaults, 05 = Reset to 50 Hz factory defaults, 06 = Translate)

Prog_ACTech_SCF.123 03/07/01

Notes:
1. If trouble starting high inertia fans or operating at low speed, may need to increase fixed boost P28 gradually. Keep as low as possible.
2. Use P50 to P60 for VFD monitoring (viewing only).
   P50 = Fault History, P51 = Software Code, P52 = DC Bus Voltage, P53 = Motor Voltage, P54 = Load, P55 = 0-10 VDC Input, P56 = 4-20 mA Input, P57 = TB Strip Status, P58 = Keypad Status, P59 = TB-30 Output, P60 = TB-31 Output
3. All the above settings are stored in the EPM Programmer file "MELINK_1".

TECO FM7500

Program Function Code Settings
Intelli-Hood Application

FUNC #	SETTING	DESCRIPTION
A01	V01	Output Frequency
A02	60	Run Scale
A03	Hz	Run Units
C01	0 Hz	Min Hz
C02	60 Hz	Max Hz
C03		Ramp
C04	5 sec	Acceleration Time
C05	60 sec	Deceleration Time
C06	.5 sec	S Time
C07	25%	Flux Plus
C08	H01	Hi Speed Flux
C09	0%	Slip Compensation
C10	0%	DC Hold
C11	C12 - 2kHz	Audible Frequency
D00		Motor Protection Section
D05	H01	Reverse - Disable
D06	H00	PF Trip - Enable
D07	H00	Imbalance Trip - Enable
D08	H01	DC Input - Disable
E01		Stop/Start
E02	E02	Ramp to Stop
E07		Auto Restart
E08	5	A/Rs Allowed (Restart Attempts)
E09	5 min	A/R Clear Time
E10	H00	Reset by PF - Enable
E11	H00	PF Ride Through - Enable
F00		References
F01	Analog in	Remote
F02	Console	Local
F03	Preset(100)	ESO (Emergency Systems Operation) - Bypass
R00 AN1	0%	0% when using 0-10vdc reference
R01	0%	Analog 1 zero% if input span
R02	100%	Analog 1 span
R03	60 hz	Set Bypass Speed

Prog_tecoFM7500.123 12/13/00

Notes:

GE/Fuji AF-300 C11 Series VFD

Program Function Code Settings
Intelli-Hood Application

FUNC #	SETTING	DESCRIPTION
F00	1	DATA PROTECTION (0 = Allows Data Changing, 1 = Lock Settings)
F01	3	FREQUENCY COMMAND (3 = Frequency Signal Through Terminal Input)
F02	2	OPERATION COMMAND (2= Fwd Run Command Through Terminal Input, STOP key inactive)
F03	60	MAXIMUM FREQUENCY (in Hz) (Set to 60 for USA, 50 for EU)
F04	60	BASE FREQUENCY (in Hz) (Set to 60 for USA, 50 for EU)
F07	5	ACCELERATION TIME (in seconds)
F08	60	DECELERATION TIME (in seconds)
F09	1	TORQUE BOOST (1 = Normal Fan Application)
F10	1	ELECTRONIC THERMAL OVERLOAD OPERATION (1 = Active for General-Purpose Motor)
F11	AMPS	ELECTRONIC THERMAL OVERLOAD LEVEL (Set to Motor FLA in Amps)
F12	5	ELECTRONIC THERMAL OVERLOAD TIME (in seconds)
F14	3	RESTART AFTER MOMENTARY POWER FAILURE (3 = Restart Active at Starting Frequency)
F15	0-60	FREQUENCY HIGH LIMIT (Set to Air Balance Speed in Hz) [60 is Melink Default]
F16	0	FREQUENCY LOW LIMIT (in Hz)
F17	0	FREQUENCY GAIN (0 = For 0 to +10VDC)
F18	0	FREQUENCY BIAS (in Hz)
F20	3	DC INJECTION BRAKE (Starting Frequency in Hz)
F21	0	DC INJECTION BRAKING LEVEL (in Percent)
F22	0	DC INJECTION BRAKING TIME (0 = Inactive)
F23	1	STARTING FREQUENCY (in Hz)
F25	1	STOP FREQUENCY (in Hz)
F26	2	MOTOR SOUND (Higher C.F. = Lower Audible Noise + Greater Adverse Effects on Motor)
F27	0	MOTOR TONE
F30	100	METER ADJUSTMENT (in Percent)
F31	0	METER OUTPUT (0 = Frequency in 0-10V Scale)
F36	0	30Ry OPERATION MODE (0 = Excited When Tripped)
E01	0	X1 TERMINAL FUNCTION (0 = Multi-Step Frequency set in C05)
E02	1	X2 TERMINAL FUNCTION (1 = Multi-Step Frequency set in C06)
E03	4	X3 TERMINAL FUNCTION (4 = External Alarm Trip THR) (Jumper X3-CM)
C05	60	MULTI-STEP FREQUENCY 1 (Set to Bypass Speed in Hz)
C06	60	MULTI-STEP FREQUENCY 2 (in Hz)
P00	2	MOTOR CHARACTERISTICS
H01	0	OPERATION TIME ACCUMULATION
H02	---	TRIP HISTORY
H03	0	DATA INITIALIZATION (0 = Inactive, 1 = Reset to Factory Default Values)
H04	1	AUTO RESET (1 = Active with 5 Attempts)
H06	1	FAN STOP OPERATION (1 = Active)
H20	0	PID CONTROL (0 = Inactive)

Prog_C11.123 07/11/00

Notes:

2. For high inertia fans, may need to increase torque boost with F09 = 0.1 to 0.9.
3. Set SW1 switch to "Sink".

GE/Fuji FVR-C9S Series VFD

Program Function Code Settings
Intelli-Hood Application

FUNC #	SETTING	DESCRIPTION
F00	1	DATA PROTECTION (0 = Allows Data Changing, 1 = Lock Settings)
F01	1	FREQUENCY COMMAND (1 = Frequency Signal Through Terminal Input)
F02	1	OPERATION COMMAND (1= Fwd Run Command Through Terminal Input, STOP key inactive)
F03	60	MAXIMUM FREQUENCY (in Hz) (Set to 60 for USA, 50 for EU)
F04	60	BASE FREQUENCY (in Hz) (Set to 60 for USA, 50 for EU)
F05	5	ACCELERATION TIME (in seconds)
F06	60	DECELERATION TIME (in seconds)
F07	1	TORQUE BOOST (1 = Normal Fan Application)
F08	1	ELECTRONIC THERMAL OVERLOAD RELAY OPERATION (1= Active for 4-Pole Motor)
F09	30 - 100%	ELECTRONIC THERMAL OVERLOAD RELAY LEVEL (% = (Motor FLA)/(VFD Rated A)x100)
		(Calculate Motor FLA as a Percentage of VFD FLA) [100 is Melink Default]
F10	1	RESTART AFTER MOMENTARY POWER FAILURE (1=Restart Active)
F11	0	GAIN FOR FREQUENCY SIGNAL (0= Maximum Signal at 10 VDC)
F12	50	DC BRAKE (Level)
F13	0	DC BRAKE (Braking Time) (0 = Inactive)
F14	1	STARTING FREQUENCY (in Hz)
F15	2	MOTOR SOUND (Higher C.F. = Lower Audible Noise + Greater Adverse Effects on Motor)
F16	--	FAULT MEMORY
F17	0	DATA INITIALIZATION (0 = Inactive, 1 = Reset to Factory Default Values)
F18	1	RETRY (1 = Number of Restart Attempts Fixed at 5)
F19	4	MOTOR CHARACTERISTICS (4 = Default)
F20	3	JUMP FREQUENCY RANGE
F21	0	JUMP FREQUENCY 1
F22	0	JUMP FREQUENCY 2
F23	0	JUMP FREQUENCY 3
F24	0-100	HIGH LIMITER (Set to Air Balance Speed as a % of Max. Freq) [100 is Melink default]
F25	0	LOW LIMITER (% of Max. Frequency)
F26	0	BIAS FREQUENCY
F27	0	THR TERMINAL FUNCTION (0 = THR Terminal to be used for External Trip) (Jumper THR-CM)
F28	1	BX TERMINAL FUNCTION (1 = BX Terminal to be used for Mulitstep Speed)
F29	60	MULTI SPEED SETTING 1 (in Hz)
F30	60	MULTI SPEED SETTING 2 (Set to Bypass Speed in Hz)
F31	60	MULTI SPEED SETTING 3 (in Hz)
F32	85	METER ADJUSTMENT SCALE (0 = 6.5 v at Full Scale, 99 = 10.3 v at Full Scale)
F33	0	METER OUPUT SELECTION (0 = Output Frequency at FM Terminal)

Prog_C9.123 06/23/00

Notes:
1. If problems with OC1 or OC2 fault, increase acceleration or deceleration times or gradualy increase torque boost to about 4, if necessary.
2. Torque boosts greater than 1 could have restarting problems after a momentary power loss for the C9 drives.

GE/Fuji AF-300 Micro-Saver II Series VFD

Program Function Code Settings
Electronic Motor Starter Application

FUNC #	SETTING	DESCRIPTION
F00	1	DATA PROTECTION (0 = Allows Data Changing, 1 = Lock Settings)
F01	0	FREQUENCY COMMAND (0 = Frequency Setting with Keypad Arrow Keys)
F02	2	OPERATION COMMAND (2 = Fwd Run Command Through Terminal Input, STOP key inactive)
F03	60	MAXIMUM FREQUENCY (in Hz) (Set to 60 for USA, 50 for EU)
F04	60	BASE FREQUENCY (in Hz) (Set to 60 for USA, 50 for EU)
F05	VOLTS	MAXIMUM OUTPUT VOLTAGE (Set at motor rated volts: 208, 220, 230, 380, 400, 460 ,480)
F06	30	ACCELERATION TIME (in seconds)
F07	30	DECELERATION TIME (in seconds)
F08	1	TORQUE BOOST (1 = Normal Fan Application)
F09	85	METER ADJUSTMENT (Adjusts the Full Scale Voltage Level)
F10	4	MOTOR POLES (4 = Standard 4-Pole Motor)
F12	2	MOTOR SOUND (Higher C.F. = Lower Audible Noise + Greater Adverse Effects on Motor)
F13	5	RESTART ATTEMPTS (5 = 5 Restarts)
F14	4	RESTART AFTER MOMENTARY POWER FAILURE (4 = Restart Active, Resume at Last Freq)
F15	1	ELECTRONIC THERMAL OVERLOAD OPERATION (1= Active)
F16	AMPS	ELECTRONIC THERMAL OVERLOAD LEVEL (Set to Motor Rated FLA)
F17	0	DC BRAKE (0 = Inactive)
F21	60	MULTI STEP SPEED 1 (in Hz)
F28	1	S-CURVE ACC/DEC (1 = Weak S-Curve)
F29	--	FAULT MEMORY
F31	180	TORQUE LIMIT ACC/DEC (180 = Limit to 180%)
F32	180	TORQUE LIMIT CONSTANT (180 = Limit to 180%)
F34	0	BIAS FREQUENCY (0 = no offset)
F35	100	GAIN FOR FREQUENCY SIGNAL (in Percent of Maximum Frequency)
F36	60	HIGH LIMITER (in Hz)
F37	0	LOW LIMITER (in Hz)
F39	0	DATA INITIALIZATION (0 = Inactive, 1 = Reset to Factory Default Values)
F40	0	MONITORING SIGNAL (0 = Analog Signal to FMA Terminal)
F41	0	FMA TERMINAL (0 = Display Output Frequency)
F54	0	Y1 TERMINAL (0 = Drive Running State)
F57	0	THR TERMINAL (0 = Trip Function) (Jumper THR-CM)
F69	0	AUTOMATIC TORQUE VECTOR CONTROL (0 = Inactive)
		Prog_MSII.123 06/23/00

Notes:
1. If trouble starting high inertia fans or operating at low speed, may need to increase torque boost F08 gradually to about 4. Keep as low as possible.
2. If problems with OU faults on high inertia fans, increase strength of s-curve with F28=2.

GE/Fuji AF-300 P11 Series VFD

Program Function Code Settings
Electronic Motor Starter Application

FUNC #	SETTING	DESCRIPTION
F00	1	DATA PROTECTION (0 = Allows Data Changing, 1 = Lock Settings)
F01	0	FREQUENCY COMMAND (0 = Frequency Setting with Keypad Arrow Keys)
F02	2	OPERATION COMMAND (2= Fwd Run Command Through Terminal Input, STOP key inactive)
F03	60	MAXIMUM FREQUENCY (in Hz) (Set to 60 for USA, 50 for EU)
F04	60	BASE FREQUENCY (in Hz) (Set to 60 for USA, 50 for EU)
F05	VOLTS	RATED VOLTAGE - Set at motor rated volts (208, 220, 230, 380, 400, 460 ,480)
F06	VOLTS	MAXIMUM VOLTAGE - Limits maximum outout voltage. Set to same as Rated Voltage F05.
F07	30	ACCELERATION TIME (in seconds)
F08	30	DECELERATION TIME (in seconds)
F09	0.1	TORQUE BOOST (0.1 = Normal Fan Application)
F10	1	ELECTRONIC THERMAL OVERLOAD OPERATION (1= Active for General-Purpose Motor)
F11	20 - 135%	ELECTRONIC THERMAL OVERLOAD LEVEL (% = (Motor FLA)/(VFD Rated A)x100)
		(Calculate Motor FLA as a Percentage of VFD FLA) [100 is Melink Default]
F12	5	ELECTRONIC THERMAL OVERLOAD TIME (in seconds)
F13	1	ELECTRONIC THERMAL OVERLOAD BRAKING (1 = Active for Built-In Resistor)
F14	3	RESTART AFTER MOMENTARY POWER FAILURE (3=Restart Active with Ride-Through)
F15	60	FREQUENCY HIGH LIMIT (in Hz)
F16	0	FREQUENCY LOW LIMIT (in Hz)
F17	100	FREQUENCY GAIN (in Percent)
F18	0	FREQUENCY BIAS (in Hz)
F22	0	DC BRAKE (Braking Time) (0 = Inactive)
F26	2	MOTOR SOUND (Higher C.F. = Lower Audible Noise + Greater Adverse Effects on Motor)
F27	0	MOTOR TONE
F30	100	METER ADJUSTMENT (in Percent)
F31	0	METER OUTPUT (0 = Frequency in 0-10V Scale)
F40	150	DRIVING TORQUE LIMIT (in Percent)
F41	0	BRAKING TORQUE LIMIT (Automatic to Prevent OU Trip due to Regeneration Effect)
F42	0	AUTOMATIC TORQUE VECTOR CONTROL (0 = Inactive)
E01	0	X1 TERMINAL FUNCTION (0 = Multi-Step Frequency set in C05)
E02	9	X2 TERMINAL FUNCTION (9 = External Alarm Trip THR)
E03	8	X3 TERMINAL FUNCTION (8 = Alarm Reset)
C05	60	MULTI-STEP FREQUENCY 1 (in Hz)
P01	4	MOTOR POLES (4 = Standard 4-Pole Motor)
P02	kW	MOTOR CAPCITY (Set to Motor Rated Capacity in kW)
P03	AMPS	MOTOR CURRENT (Set to Motor Rated Current in Amps)
H03	0	DATA INITIALIZATION (0 = Inactive, 1 = Reset to Factory Default Values)
H04	5	AUTO RESET TIMES (5 = Five Reset Attempts)
H05	5	AUTO RESET INTERVAL (# of Seconds Between Attempts)
H07	1	ACC/DEC PATTERN (1 = Mild S-Curve)
H08	1	REVERSE LOCK (1 = Lock Reverse Operation)
H09	2	START MODE (2 = Smooth Restart Active)

Prog_P11.123 08/08/01

Notes:

1. If problems with OU1, OU2, or OU3 fault on a high inertia fan; increase strength of s-curve with H07 = 2.
2. For high inertia fans, may need to increase torque boost with F09 = 0.1 to 0.9.
3. Set SW1 switch to "Sink".
4. Set SW2 switch to "Off".
5. If problems with noise on drive terminals 12 or C1, may be able to eliminate with C33.

GE/Fuji AF-300 C11 Series VFD

Program Function Code Settings
Electronic Motor Starter Application

FUNC #	SETTING	DESCRIPTION
F00	1	DATA PROTECTION (0 = Allows Data Changing, 1 = Lock Settings)
F01	0	FREQUENCY COMMAND (0 = Frequency Setting with Keypad Arrow Keys)
F02	2	OPERATION COMMAND (2= Fwd Run Command Through Terminal Input, STOP key inactive)
F03	60	MAXIMUM FREQUENCY (in Hz) (Set to 60 for USA, 50 for EU)
F04	60	BASE FREQUENCY (in Hz) (Set to 60 for USA, 50 for EU)
F07	30	ACCELERATION TIME (in seconds)
F08	30	DECELERATION TIME (in seconds)
F09	1	TORQUE BOOST (1 = Normal Fan Application)
F10	1	ELECTRONIC THERMAL OVERLOAD OPERATION (1 = Active for General-Purpose Motor)
F11	AMPS	ELECTRONIC THERMAL OVERLOAD LEVEL (Set to Motor FLA in Amps)
F12	5	ELECTRONIC THERMAL OVERLOAD TIME (in seconds)
F14	3	RESTART AFTER MOMENTARY POWER FAILURE (3 = Restart Active at Starting Frequency)
F15	60	FREQUENCY HIGH LIMIT (in Hz)
F16	0	FREQUENCY LOW LIMIT (in Hz)
F17	0	FREQUENCY GAIN (0 = For 0 to +10VDC)
F18	0	FREQUENCY BIAS (in Hz)
F20	3	DC INJECTION BRAKE (Starting Frequency in Hz)
F21	0	DC INJECTION BRAKING LEVEL (in Percent)
F22	0	DC INJECTION BRAKING TIME (0 = Inactive)
F23	1	STARTING FREQUENCY (in Hz)
F25	1	STOP FREQUENCY (in Hz)
F26	2	MOTOR SOUND (Higher C.F. = Lower Audible Noise + Greater Adverse Effects on Motor)
F27	0	MOTOR TONE
F30	100	METER ADJUSTMENT (in Percent)
F31	0	METER OUTPUT (0 = Frequency in 0-10V Scale)
F36	0	30Ry OPERATION MODE (0 = Excited When Tripped)
E01	0	X1 TERMINAL FUNCTION (0 = Multi-Step Frequency set in C05)
E02	1	X2 TERMINAL FUNCTION (1 = Multi-Step Frequency set in C06)
E03	4	X3 TERMINAL FUNCTION (4 = External Alarm Trip THR) (Jumper X3-CM)
C05	60	MULTI-STEP FREQUENCY 1 (in Hz)
C06	60	MULTI-STEP FREQUENCY 2 (in Hz)
P00	2	MOTOR CHARACTERISTICS
H01	0	OPERATION TIME ACCUMULATION
H02	---	TRIP HISTORY
H03	0	DATA INITIALIZATION (0 = Inactive, 1 = Reset to Factory Default Values)
H04	1	AUTO RESET (1 = Active with 5 Attempts)
H06	1	FAN STOP OPERATION (1 = Active)
H20	0	PID CONTROL (0 = Inactive)

Prog_C11.123 07/11/00

Notes:

2. For high inertia fans, may need to increase torque boost with F09 = 0.1 to 0.9.
3. Set SW1 switch to "Sink".

GE/Fuji FVR-C9S Series VFD

Program Function Code Settings
Electronic Motor Starter Application

FUNC #	SETTING	DESCRIPTION
F00	1	DATA PROTECTION (0 = Allows Data Changing, 1 = Lock Settings)
F01	0	FREQUENCY COMMAND (0 = Frequency Setting with Keypad Arrow Keys)
F02	1	OPERATION COMMAND (1= Fwd Run Command Through Terminal Input, STOP key inactive)
F03	60	MAXIMUM FREQUENCY (in Hz) (Set to 60 for USA, 50 for EU)
F04	60	BASE FREQUENCY (in Hz) (Set to 60 for USA, 50 for EU)
F05	30	ACCELERATION TIME (in seconds)
F06	30	DECELERATION TIME (in seconds)
F07	1	TORQUE BOOST (1 = Normal Fan Application)
F08	1	ELECTRONIC THERMAL OVERLOAD RELAY OPERATION (1= Active for 4-Pole Motor)
F09	30 - 100%	ELECTRONIC THERMAL OVERLOAD RELAY LEVEL (% = (Motor FLA)/(VFD Rated A)x100)
		(Calculate Motor FLA as a Percentage of VFD FLA) [100 is Melink Default]
F10	1	RESTART AFTER MOMENTARY POWER FAILURE (1=Restart Active)
F11	0	GAIN FOR FREQUENCY SIGNAL (0= Maximum Signal at 10 VDC)
F12	50	DC BRAKE (Level)
F13	0	DC BRAKE (Braking Time) (0 = Inactive)
F14	1	STARTING FREQUENCY (in Hz)
F15	2	MOTOR SOUND (Higher C.F. = Lower Audible Noise + Greater Adverse Effects on Motor)
F16	--	FAULT MEMORY
F17	0	DATA INITIALIZATION (0 = Inactive, 1 = Reset to Factory Default Values)
F18	1	RETRY (1 = Number of Restart Attempts Fixed at 5)
F19	4	MOTOR CHARACTERISTICS (4 = Default)
F20	3	JUMP FREQUENCY RANGE
F21	0	JUMP FREQUENCY 1
F22	0	JUMP FREQUENCY 2
F23	0	JUMP FREQUENCY 3
F24	100	HIGH LIMITER (% of Max. Frequency)
F25	0	LOW LIMITER (% of Max. Frequency)
F26	0	BIAS FREQUENCY
F27	0	THR TERMINAL FUNCTION (0 = THR Terminal to be used for External Trip) (Jumper THR-CM)
F28	1	BX TERMINAL FUNCTION (1 = BX Terminal to be used for Mulitstep Speed)
F29	60	MULTI SPEED SETTING 1 (in Hz)
F30	60	MULTI SPEED SETTING 2 (in Hz)
F31	60	MULTI SPEED SETTING 3 (in Hz)
F32	85	METER ADJUSTMENT SCALE (0 = 6.5 v at Full Scale, 99 = 10.3 v at Full Scale)
F33	0	METER OUPUT SELECTION (0 = Output Frequency at FM Terminal)
		Prog_C9.123 06/23/00

Notes:
1. If problems with OC1 or OC2 fault, increase acceleration or deceleration times or gradualy increase torque boost to about 4, if necessary.
2. Torque boosts greater than 1 could have restarting problems after a momentary power loss for the C9 drives.

GE/Fuji AF-300 Micro-Saver II Series VFD

Program Function Code Settings

Bob Evans EMS Application

FUNC #	SETTING	DESCRIPTION
F00	1	DATA PROTECTION (0 = Allows Data Changing, 1 = Lock Settings)
F01	1	FREQUENCY COMMAND (1 = Frequency Signal Through Terminal Input)
F02	2	OPERATION COMMAND (2 = Fwd Run Command Through Terminal Input, STOP key inactive)
F03	60	MAXIMUM FREQUENCY (in Hz) (Set to 60 for USA, 50 for EU)
F04	60	BASE FREQUENCY (in Hz) (Set to 60 for USA, 50 for EU)
F05	VOLTS	MAXIMUM OUTPUT VOLTAGE (Set at motor rated volts: 208, 220, 230, 380, 400, 460 ,480)
F06	30	ACCELERATION TIME (in seconds)
F07	30	DECELERATION TIME (in seconds)
F08	1	TORQUE BOOST (1 = Normal Fan Application)
F09	85	METER ADJUSTMENT (Adjusts the Full Scale Voltage Level)
F10	4	MOTOR POLES (4 = Standard 4-Pole Motor)
F12	2	MOTOR SOUND (Higher C.F. = Lower Audible Noise + Greater Adverse Effects on Motor)
F13	5	RESTART ATTEMPTS (5 = 5 Restarts)
F14	4	RESTART AFTER MOMENTARY POWER FAILURE (4 = Restart Active, Resume at Last Freq)
F15	1	ELECTRONIC THERMAL OVERLOAD OPERATION (1= Active)
F16	AMPS	ELECTRONIC THERMAL OVERLOAD LEVEL (Set to Motor Rated FLA)
F17	0	DC BRAKE (0 = Inactive)
F21	0-60	MULTI STEP SPEED 1 (Set to Air Balance Speed in Hz) [60 is Melink default] (Jumper X1-CM)
F28	1	S-CURVE ACC/DEC (1 = Weak S-Curve)
F29	--	FAULT MEMORY
F31	180	TORQUE LIMIT ACC/DEC (180 = Limit to 180%)
F32	180	TORQUE LIMIT CONSTANT (180 = Limit to 180%)
F34	0	BIAS FREQUENCY (0 = no offset)
F35	100	GAIN FOR FREQUENCY SIGNAL (in Percent of Maximum Frequency)
F36	60	HIGH LIMITER (in Hz)
F37	0	LOW LIMITER (in Hz)
F39	0	DATA INITIALIZATION (0 = Inactive, 1 = Reset to Factory Default Values)
F40	0	MONITORING SIGNAL (0 = Analog Signal to FMA Terminal)
F41	0	FMA TERMINAL (0 = Display Output Frequency)
F54	0	Y1 TERMINAL (0 = Drive Running State)
F57	0	THR TERMINAL (0 = Trip Function) (Jumper THR-CM)
F69	0	AUTOMATIC TORQUE VECTOR CONTROL (0 = Inactive)
Prog_MSII.123 06/23/00		

Notes:
1. If trouble starting high inertia fans or operating at low speed, may need to increase torque boost F08 gradually to about 4. Keep as low as possible.
2. If problems with OU faults on high inertia fans, increase strength of s-curve with F28=2.

GE/Fuji AF-300 C11 Series VFD

Program Function Code Settings

Bob Evans EMS Application

FUNC #	SETTING	DESCRIPTION
F00	1	DATA PROTECTION (0 = Allows Data Changing, 1 = Lock Settings)
F01	3	FREQUENCY COMMAND (3 = Frequency Signal Through Terminal Input)
F02	2	OPERATION COMMAND (2= Fwd Run Command Through Terminal Input, STOP key inactive)
F03	60	MAXIMUM FREQUENCY (in Hz) (Set to 60 for USA, 50 for EU)
F04	60	BASE FREQUENCY (in Hz) (Set to 60 for USA, 50 for EU)
F07	30	ACCELERATION TIME (in seconds)
F08	30	DECELERATION TIME (in seconds)
F09	1	TORQUE BOOST (1 = Normal Fan Application)
F10	1	ELECTRONIC THERMAL OVERLOAD OPERATION (1 = Active for General-Purpose Motor)
F11	AMPS	ELECTRONIC THERMAL OVERLOAD LEVEL (Set to Motor FLA in Amps)
F12	5	ELECTRONIC THERMAL OVERLOAD TIME (in seconds)
F14	3	RESTART AFTER MOMENTARY POWER FAILURE (3 = Restart Active at Starting Frequency)
F15	60	FREQUENCY HIGH LIMIT (in Hz)
F16	0	FREQUENCY LOW LIMIT (in Hz)
F17	0	FREQUENCY GAIN (0 = For 0 to +10VDC)
F18	0	FREQUENCY BIAS (in Hz)
F20	3	DC INJECTION BRAKE (Starting Frequency in Hz)
F21	0	DC INJECTION BRAKING LEVEL (in Percent)
F22	0	DC INJECTION BRAKING TIME (0 = Inactive)
F23	1	STARTING FREQUENCY (in Hz)
F25	1	STOP FREQUENCY (in Hz)
F26	2	MOTOR SOUND (Higher C.F. = Lower Audible Noise + Greater Adverse Effects on Motor)
F27	0	MOTOR TONE
F30	100	METER ADJUSTMENT (in Percent)
F31	0	METER OUTPUT (0 = Frequency in 0-10V Scale)
F36	0	30Ry OPERATION MODE (0 = Excited When Tripped)
E01	0	X1 TERMINAL FUNCTION (0 = Multi-Step Frequency set in C05)
E02	1	X2 TERMINAL FUNCTION (1 = Multi-Step Frequency set in C06) (Jumper X2-CM)
E03	4	X3 TERMINAL FUNCTION (4 = External Alarm Trip THR) (Jumper X3-CM)
C05	60	MULTI-STEP FREQUENCY 1 (in Hz)
C06	0-60	MULTI-STEP FREQUENCY 2 (Set to Air Balance Speed in Hz) [60 is Melink Default]
P00	2	MOTOR CHARACTERISTICS
H01	0	OPERATION TIME ACCUMULATION
H02	---	TRIP HISTORY
H03	0	DATA INITIALIZATION (0 = Inactive, 1 = Reset to Factory Default Values)
H04	1	AUTO RESET (1 = Active with 5 Attempts)
H06	1	FAN STOP OPERATION (1 = Active)
H20	0	PID CONTROL (0 = Inactive)
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Notes:

GE/Fuji FVR-C9S Series VFD

Program Function Code Settings

Bob Evans EMS Application

FUNC #	SETTING	DESCRIPTION
F00	1	DATA PROTECTION (0 = Allows Data Changing, 1 = Lock Settings)
F01	1	FREQUENCY COMMAND (1 = Frequency Signal Through Terminal Input)
F02	1	OPERATION COMMAND (1= Fwd Run Command Through Terminal Input, STOP key inactive)
F03	60	MAXIMUM FREQUENCY (in Hz) (Set to 60 for USA, 50 for EU)
F04	60	BASE FREQUENCY (in Hz) (Set to 60 for USA, 50 for EU)
F05	30	ACCELERATION TIME (in seconds)
F06	30	DECELERATION TIME (in seconds)
F07	1	TORQUE BOOST (1 = Normal Fan Application)
F08	1	ELECTRONIC THERMAL OVERLOAD RELAY OPERATION (1= Active for 4-Pole Motor)
F09	30 - 100%	ELECTRONIC THERMAL OVERLOAD RELAY LEVEL (% = (Motor FLA)/(VFD Rated A)x100)
		(Calculate Motor FLA as a Percentage of VFD FLA) [100 is Melink Default]
F10	1	RESTART AFTER MOMENTARY POWER FAILURE (1=Restart Active)
F11	0	GAIN FOR FREQUENCY SIGNAL (0= Maximum Signal at 10 VDC)
F12	50	DC BRAKE (Level)
F13	0	DC BRAKE (Braking Time) (0 = Inactive)
F14	1	STARTING FREQUENCY (in Hz)
F15	2	MOTOR SOUND (Higher C.F. = Lower Audible Noise + Greater Adverse Effects on Motor)
F16	--	FAULT MEMORY
F17	0	DATA INITIALIZATION (0 = Inactive, 1 = Reset to Factory Default Values)
F18	1	RETRY (1 = Number of Restart Attempts Fixed at 5)
F19	4	MOTOR CHARACTERISTICS (4 = Default)
F20	3	JUMP FREQUENCY RANGE
F21	0	JUMP FREQUENCY 1
F22	0	JUMP FREQUENCY 2
F23	0	JUMP FREQUENCY 3
F24	100	HIGH LIMITER (% of Max. Frequency)
F25	0	LOW LIMITER (% of Max. Frequency)
F26	0	BIAS FREQUENCY
F27	0	THR TERMINAL FUNCTION (0 = THR Terminal to be used for External Trip) (Jumper THR-CM)
F28	1	BX TERMINAL FUNCTION (1 = BX Terminal to be used for Mulitstep Speed) (Jumper BX-CM)
F29	60	MULTI SPEED SETTING 1 (in Hz)
F30	0-60	MULTI SPEED SETTING 2 (Set to Air Balance Speed in Hz) [60 is Melink Default]
F31	60	MULTI SPEED SETTING 3 (in Hz)
F32	85	METER ADJUSTMENT SCALE (0 = 6.5 v at Full Scale, 99 = 10.3 v at Full Scale)
F33	0	METER OUPUT SELECTION (0 = Output Frequency at FM Terminal)

Prog_C9.123 06/23/00

Notes:
1. If problems with OC1 or OC2 fault, increase acceleration or deceleration times or gradualy increase torque boost to about 4, if necessary.
2. Torque boosts greater than 1 could have restarting problems after a momentary power loss for the C9 drives.

Default Overload Settings

M$: Function F16 P11: Function F11

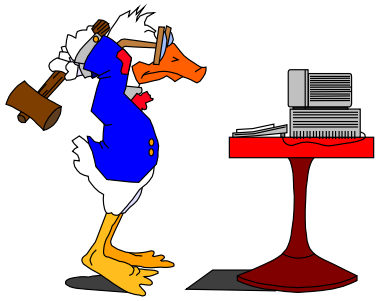
Note: Actual motor FLA's may vary. Settings below are for general reference.

	115 Volt		Protect	200 Volt		Protect	230 Volt		Protect	460 Volt		Protect	575 Volt		Protect
HP	FLA	+10 %	No OLs	FLA	+10 %	No OLs	FLA	+10 %	No OLs	FLA	+10 %	No OLs	FLA	+10 %	No OLs
1/2	4	4.4		2.3	2.53		2	2.2	2.8	1	1.1	1.4	8	8.8	
3/4	5.6	6.16		3.2	3.52		2.8	3.08	4	1.4	1.54	2	1.1	1.21	
1	7.2	7.92		4.15	4.565		3.6	3.96	5	1.8	1.98	2.5	1.4	1.54	
1 1/2	10.4	11.44		6	6.6		5.2	5.72	7.5	2.6	2.86	3.5	2.1	2.31	
2	13.6	14.96		7.8	8.58		6.8	7.48	8	3.4	3.74	4	2.7	2.97	
3				11	12.1		9.6	10.56	12	4.8	5.28	5.6	3.9	4.29	
5				17.5	19.25		15.2	16.72	17.5	7.6	8.36	9	6.1	6.71	
7 1/2				25	27.5		22	24.2	25	11	12.1	12	9	9.9	
10				32	35.2		28	30.8	35	14	15.4	17.5	11	12.1	
15				48	52.8		42	46.2	50	21	23.1	25	17	18.7	
20				62	68.2		54	59.4	60	27	29.7	30	22	24.2	
25				78	85.8		68	74.8	80	34	37.4	40	27	29.7	
30				92	101.2		80	88	100	40	44	50	32	35.2	
40				120	132		104	114.4	125	52	57.2	60	41	45.1	
50				150	165		130	143	150	65	71.5	80	52	57.2	
60				177	194.7		154	169.4	225	77	84.7	90	62	68.2	
75				221	243.1		192	211.2	300	96	105.6	110	77	84.7	
100				285	313.5		248	272.8	350	124	136.4	150	99	108.9	
125				358	393.8		312	343.2	400	156	171.6	175	125	137.5	
150				415	456.5		360	396	450	180	198	225	144	158.4	
200				550	605		480	528	600	240	264	300	192	211.2	
+200 Hp		115 Volt			200 Volt			230 Volt			460 Volt			575 Volt	
Amps/Hp				2.75			2.4			1.2			0.96		

Section 5:
Helpful Phone Numbers and Contact Information

Helpful Phone Numbers:

		Phone	Website
Technical Support			
	AC Tech	1-800-217-9100	www.actechdrives.com
	General Electric	1-800-533-5885	www.ge.com
	Melink Corporation	1-877-477-4190	www.melinkcorp.com
Car Rental			
	Alamo	1-800-327-9633	www.goalamo.com
	Avis	1-800-331-1212	www.avis.com
	Budget	1-800-527-0700	www.budget.com
	Dollar	1-800-800-4000	www.dollar.com
	Enterprise	1-800-736-2227	www.enterprise.com
	Hertz	1-800-654-3131	www.hertz.com
	National	1-800-227-7368	www.nationalcar.com
	Thrifty	1-800-367-2277	www.thrifty.com
Airlines			
	America West	1-800-235-9292	www.americawest.com
	American Airlines	1-800-433-7300	www.aa.com
	ComAir	1-800-354-9822	www.comair.com
	Delta	1-800-221-1212	www.delta.com
	Northwest	1-800-225-2525	www.nwa.com
	Southwest	1-800-435-9792	www.southwest.com
	TWA	1-800-221-2000	www.twa.com
	US Airways	1-800-428-4322	www.usairways.com
	United	1-800-241-6522	www.ual.com



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