CONTROL LOGIC DESCRIPTION DOCUMENT

Configuration #: 6M70F0

Input/Output Table:

Inputs	Qty	Outputs	Qty
Inside Temperature	4	Variable Speed Stage	2
		Single Speed Stage	2
		Inlet	1
		Curtain	1
		Heater	1
		Cooling Stage	1
		Alarm	1

Equipment Required:

Item	Description	Qty
IC-610	Intelligent Control, 6 inputs / 10 outputs	1
CIP-1/6	Curtain Inlet Position	1
VPM-2	Variable Power Module 2 Outputs (10 Amperes)	1
2004-1K	Temperature Probe - Red (-6.0°F to 168.6°F)	4

Configuration Versions:

Version	Date	Modification
F0	08/16/2006	New.

1. GENERAL

The IC-610 is a powerful control, which can be programmed to work in many types of buildings just by changing the configuration logic. The configuration logic is the software that makes the relation between the sensor readings, the parameters and the outputs. This software is stored in a chip identified with the configuration number, as shown in the title of this document, and as it appears on your left hand side label of your control. Please always provide this configuration number when you discuss with your provider.

To install properly and fully understand your IC-610, it is important to read both the **IC-610 user's manual** and this Control Logic Document. The user's manual informs you on safety issues, warranty, sensors, how to change parameters and many others characteristics of the IC-610, whereas this document explains all particularities of this configuration logic. Section 2 explains what the user can control with adjustable parameters while the section 3 contains information for the alarm.

Definition

Throughout this document, the following terminology is used.

- **DRT** →   **D**esired **R**oom **T**emperature. This is the temperature goal for the room and it is also the reference temperature for all relative settings. Note that the DRT is affected by the growth curve function. See the user's guide for more detail.
- **RSP** →   **R**elative **S**et **P**oint. This is the number of degrees relative to the DRT where a function begins.
- **Differential** →   Number of degrees changed before stopping the output. For example, with a differential = 1.0°F, the IC-610 turns on a fan at 70.0°F when temperature increases, but it will shut it off only at 69.0°F when the room is cooling down. The differential is necessary to avoid oscillations.
- **Modulation Band** → Number of degrees a variable speed fan takes to reach its full speed.

Expressions in *ITALICS* are user's parameters.

Ventilation System Overview

This configuration controls 2 variable speed stages, both of which can work off a minimum ventilation timer when below their RSPs. There are 2 On/Off stages that run full time at maximum speed when above their respective RSP. There is also an inlet that will open according to stage activation and a natural curtain that will be controlled according to the temperature. A cooling output will be activated on a timer when above its RSP. A heater output will be used when temperature is too low.

Refer to the building layout and the wiring schematics in attachment for a typical installation.

2. PARAMETER DESCRIPTION

Parameter # 1

   ROOM TEMPERATURE
   This parameter displays the average of the four temperature probes. All outputs will follow this temperature. The ROOM TEMPERATURE is displayed to the nearest 0.1°F from -6.0°F to 168.6°F.
F3: See note 1.

Parameter # 2

   DESIRED ROOM TEMPERATURE (DRT)
   This parameter is used to establish the target room temperature. The *DRT* is used as the reference point for other relative settings. When the GROWTH DAY is activated, the control takes charge of this parameter so, to have access to this parameter, GROWTH DAY must be set to OFF. The *DRT* is adjusted in 0.1°F increments from 32.0 °F to 120.0°F.
F2: *ADJUST DAY* (4 points)
   This parameter is used to establish the days on the growth curve function. The *ADJUST DAY* is adjusted in 1 day increments from day 1 to day 127. (For more details see User's Manual).
F3: *ADJUST TEMP* (4 points)
   This parameter associates a temperature value for each day defined on the growth day function. The *ADJUST TEMP* is adjusted in 0.1°F increments from 32.0°F to 120.0°F. (For more details see User's Manual).

Parameters # 3-6

   INSIDE TEMPERATURE 1-4
   These parameters display the temperature of the respective temperature probe. The logic also checks this parameter to determine if a temperature is too high or too low, at which point the alarm will be activated. Each INSIDE TEMPERATURE is displayed to the nearest 0.1°F from -6.0°F to 168.6°F.
F3: See note 1.

Note1: In addition to the readout of the probe, the probe parameters can record the lowest and highest values reached. To access the Hi/Lo recorded values, press F3 at the respective probe parameter. To clear the respective Hi/Lo values, after pressing F3, press and hold the + and - buttons until CLR appears on the LED display.

Parameters # 7

   HEATER RSP
   This parameter is used to establish the temperature RSP at which the heater begins to operate. *HEATER RSP* is adjusted in 0.5°F increments from -10.0°F to 5.0°F.
F2: *HEATER DIFF*
   This parameter is used to establish the differential of the heater output. The *HEATER DIFF* is adjusted in 0.5°F increments from 0.5°F to 5.0°F.

Parameter # 8

   FAN 1 RSP
   This parameter is used to establish the temperature RSP at which fan 1 begins to modulate. When ROOM TEMPERATURE reaches *FAN 1 RSP*, fan 1 will start to modulate from *FAN 1 MIN SPEED* (at *FAN 1 RSP*) to finish at 100% (when temperature is at the end of *FAN 1 MOD BAND*). When the ROOM TEMPERATURE is below *FAN 1 RSP*, fan 1 will run according to the minimum ventilation timer at *FAN 1 MIN SPEED*. This parameter is adjusted in 0.5°F increments from -10.0°F to 30.0 °F.

F2: *FAN 1 MIN SPEED*

This parameter is used to establish the minimum speed of fan 1. When the ROOM TEMPERATURE is below the *FAN 1 RSP*, fan 1 will run according to the minimum ventilation timer at minimum speed. The *FAN 1 MIN SPEED* is adjusted in 1% increments from 12% to 100%.

F3: *FAN 1 MOD BAND*

This parameter is used to establish the range of temperature where fan 1 speeds up as ROOM TEMPERATURE increases. Fan 1 increases its speed from its minimum speed (*FAN 1 MIN SPEED* at *FAN 1 RSP)* to its maximum speed at the end of the *FAN 1 MOD BAND*. The *FAN 1 MOD BAND* is adjusted in 0.5°F increments from 0.5°F to 10.0°F.

Parameter # 9

FAN 2 RSP

This parameter is used to establish the temperature RSP at which fan 2 begins to modulate. When ROOM TEMPERATURE reaches *FAN 2 RSP*, fan 2 will start to modulate from *FAN 2 MIN SPEED* (at *FAN 2 RSP*) to finish at 100% (when temperature is at the end of *FAN 2 MOD BAND*). When ROOM TEMPERATURE is below *FAN 2 RSP*, fan 2 will run according to the minimum ventilation timer at *FAN 2 MIN SPEED* if the *FAN 2 ON TIMER* option is set to ON. The *FAN 2 RSP* is adjusted in 0.5°F increments from -10.0°F to 30.0 °F.

F2: *FAN 2 MIN SPEED*

This parameter is used to establish the minimum speed of fan 2. When ROOM TEMPERATURE is below the *FAN 2 RSP*, fan 2 will run according to the minimum ventilation timer at minimum speed if *FAN 2 ON TIMER* is set to ON. The *FAN 2 MIN SPEED* is adjusted in 1% increments from 12% to 100%.

F3: *FAN 2 MOD BAND*

This parameter is used to establish the range of temperature where fan 2 speeds up as ROOM TEMPERATURE increases. Fan 2 increases its speed from its minimum speed (*FAN 2 MIN SPEED* at *FAN 2 RSP)* to its maximum speed at the end of the *FAN 2 MOD BAND*. The *FAN 2 MOD BAND* is adjusted in 0.5°F increments from 0.5°F to 10.0°F.

Parameter # 10

MIN VENT TIMER DUTY CYCLE

This parameter is used to establish the cycle of a period of time for the minimum ventilation timer. When ROOM TEMPERATURE is below the *FAN 1-2 RSP*, that fan will be activated during a cycle of time (*MIN VENT TIMER DUTY CYCLE*) of a period (*MIN VENT TIMER PERIOD*). The *MIN VENT TIMER DUTY CYCLE* is adjusted in 1% increments from 0% to 100%.

> **Ex:** See *MIN VENT TIMER PERIOD* for example.

F2: *MIN VENT TIMER PERIOD*

This parameter is used to establish the period for the minimum ventilation timer. When ROOM TEMPERATURE is below the *FAN 1-2 RSP*, that fan will be activated during a cycle of time (*MIN VENT TIMER DUTY CYCLE %*) of a period (*MIN VENT TIMER PERIOD)*. The *MIN VENT TIMER PERIOD* is adjusted in 1 minute increments from 1 minute to 20 minutes.

> **Ex:** *DRT* = 70.0°F
> *FAN # RSP* = 2.0°F
> *MIN VENT TIMER DUTY CYCLE* = 50%
> *MIN VENT TIMER PERIOD* = 2 minutes
>
> When inside temperature is below 72.0°F, Fan # will cycle ON 1 minute at minimum speed and OFF 1 minute.

F3: *FAN 2 ON TIMER*

This parameter is used to determine if fan 2 will work off the minimum ventilation timer. If this option is set to (1) YES, fan 2 will cycle on minimum ventilation timer when ROOM TEMPERATURE is below its RSP. If this option is set to (0) NO, fan 2 will be inactive when ROOM TEMPERATURE is below its RSP.

Parameter # 11

FAN 3 RSP

This parameter is used to establish the RSP at which fan 3 begins to operate. When ROOM TEMPERATURE reaches *DRT + FAN 3 RSP*, fan 3 will be activated. The *FAN 3 RSP* is adjusted in 0.5°F increments from -10.0°F to 30.0°F.

F2: *FAN 3 DIFF*

This parameter is used to establish the differential for fan 3. When the ROOM TEMPERATURE reaches *DRT + FAN 3 RSP - FAN 3 DIFF*, fan 3 will be deactivated. The *FAN 3 DIFF* is adjusted in 0.5°F increments from 0.5°F to 5.0°F.

Parameter # 12

FAN 4 RSP

This parameter is used to establish the RSP at which fan 4 begins to operate. When ROOM TEMPERATURE reaches *DRT + FAN 4 RSP*, fan 4 will be activated. The *FAN 4 RSP* is adjusted in 0.5°F increments from -10.0°F to 30.0°F.

F2: *FAN 4 DIFF*

This parameter is used to establish the differential for fan 4. When the ROOM TEMPERATURE reaches *DRT + FAN 4 RSP - FAN 4 DIFF*, fan 4 will be deactivated. The *FAN 4 DIFF* is adjusted in 0.5°F increments from 0.5°F to 5.0°F.

Parameter # 13

The inlet will close continously 1 minute after the curtain opens.
INLET POSITION FAN 1 MIN

This parameter is used to establish the position of the inlet when only fan 1 is running at its minimum speed. The *INLET POSITION FAN 1 MIN* is adjusted in 1% increments from 0% to 100%.

F2: *INLET POSITION FAN 1 MAX*

This parameter is used to establish the position of the inlet when fan 1 is running at its maximum speed (ROOM TEMPERATURE is equal to or above *FAN 1 RSP + FAN 1 MOD BAND*). The *INLET POSITION FAN 1 MAX* is adjusted in 1% increments from 0% to 100%.

Parameter # 14

The inlet will close continously 1 minute after the curtain opens.
INLET POSITION FAN 2 MIN

This parameter is used to establish the position of the inlet when only fan 2 is running at its minimum speed. The *INLET POSITION FAN 2 MIN* is adjusted in 1% increments from 0% to 100%.

F2: *INLET POSITION FAN 2 MAX*

This parameter is used to establish the position of the inlet when fan 2 is running at its maximum speed (ROOM TEMPERATURE is equal to or above *FAN 2 RSP + FAN 2 MOD BAND*). The *INLET POSITION FAN 2 MAX* is adjusted in 1% increments from 0% to 100%.

Parameter # 15

The inlet will close continously 1 minute after the curtain opens.
INLET POSITION FAN 3

This parameter is used to establish the position of the inlet when fan 3 is activated (ROOM TEMPERATURE is equal to or above *FAN 3 RSP*). *INLET POSITION FAN 3* is adjusted in 1% increments from 0% to 100%.

F2: *INLET POSITION FAN 4*

This parameter is used to establish the position of the inlet when fan 4 is activated (ROOM TEMPERATURE is equal to or above *FAN 4 RSP*). *INLET POSITION FAN 4* is adjusted in 1% increments from 0% to 100%.

Parameter # 16

COOLING RSP

This parameter is used to establish the temperature RSP at which the cooling begins to operate. When the ROOM TEMPERATURE reaches *DRT + COOLING RSP*, the cooling output will be activated according to its timer. The *COOLING RSP* is adjusted in 0.5°F increments from -20.0°F to 30.0°F.

F2: *COOLING DIFF*

This parameter is used to establish the differential for the cooling output. When the ROOM TEMPERATURE reaches *DRT + COOLING RSP - COOLING DIFF*, the cooling output will be deactivated. The *COOLING DIFF* is adjusted in 0.5°F increments from 0.5°F to 5.0°F.

Parameter # 17

COOLING DUTY CYCLE

This parameter is used to establish the active cycle of a period of time for the cooling. When ROOM TEMPERATURE is equal to or above the *COOLING RSP*, cooling will be activated during a cycle of time (*COOLING DUTY CYCLE)* of a period (*COOLING PERIOD*). The *COOLING DUTY CYCLE* is adjusted in 1% increments from 0% to 100%.

> **Ex:** See *COOLING PERIOD* for example.

F2: *COOLING PERIOD*

This parameter is used to establish the duration of the cooling period. When the ROOM TEMPERATURE is above or equal to the *COOLING RSP*, cooling will be activated during a cycle of time (*COOLING DUTY CYCLE)* of a period (*COOLING PERIOD*). The *COOLING PERIOD* is adjusted in 1 minute increments from 1 minute to 20 minutes.

> **Ex:** *DRT* = 70.0°F
> *COOLING RSP* = 12.0°F
> *COOLING DIFF* = 1.0°F
> *COOLING DUTY CYCLE* = 10%
> *COOLING PERIOD* = 10 minutes

When ROOM TEMPERATURE reaches 82.0°F, the cooling will cycle ON 1 minute and OFF 9 minutes. Cooling will deactivate when temperature drops to 81.0°F.

Parameter # 18

CURTAIN OPEN RSP

This temperature is used to adjust the temperature at which the curtain will stop closing and the control exits natural mode. When the ROOM TEMPERATURE reaches *DRT + CURTAIN OPEN RSP + 0.3°F*, the curtain will stop closing. The control exits natural mode when the ROOM TEMPERATURE drops to *DRT + CURTAIN OPEN RSP*. This parameter is adjusted in 0.1°F increments from -5.0°F to 20.0°F.

F2: *RUN TIME OPEN*

This parameter is used to establish the duration of the run time when the curtain opens. When temperature rises to *DRT + CURTAIN OPEN RSP + CURTAIN DEAD BAND*, the curtain will open during *RUN TIME OPEN* and will keep its position for *CURTAIN DELAY BETWEEN MOVE*. The *RUN TIME OPEN* is adjusted in 1 second increments from 5 to 300 seconds.

> **Ex:** See *CURTAIN DEAD BAND* for example.

F2: *RUN TIME CLOSE*

This parameter is used to establish the duration of the run time when the curtain closes. When temperature drops to *DRT + CURTAIN OPEN RSP*, the curtain will close during *RUN TIME CLOSE* and keep its position for *CURTAIN DELAY BETWEEN MOVE*. However, if ROOM TEMPERATURE drops below *DRT + HEATER RSP*, the curtain will close continuously. The *RUN TIME CLOSE* is adjusted in 1 second increments from 5 to 300 seconds.

> **Ex:** See *CURTAIN DEAD BAND* for example.

F2: *CURTAIN DELAY BETWEEN MOVE*

This parameter is used to establish the time for which the curtain will not move when it is opening or closing according to the curtain timer. The *CURTAIN DELAY BETWEEN MOVE* is adjusted in 1 minute increments from 1 minute to 10 minutes.

> **Ex:** See *CURTAIN DEAD BAND* for example.

F2: *FIRST NATURAL MOVE*

This parameter is used to establish the time for which a curtain will open on the first opening cycle. When temperature has fallen below *DRT + CURTAIN OPEN RSP*, the next opening cycle will use *FIRST NATURAL MOVE* instead of *RUN TIME OPEN*. The *FIRST NATURAL MOVE* is adjusted in 1 second increments from 5 to 120 seconds.

> **Ex:** See *CURTAIN DEAD BAND* for example.

F2: *CURTAIN DEAD BAND*

This parameter is used to establish the temperature range within which the curtain will not move. When temperature is below *DRT + CURTAIN OPEN RSP + CURTAIN DEAD BAND* and above *DRT + CURTAIN OPEN RSP*, the curtain will stay put. Above this range, curtain will open and below this range, curtain will close. This parameter is adjusted in 0.1°F increments from 0.5°F to 2.0°F.

> **Ex:** ***DRT*** = 70°F,
> ***CURTAIN OPEN RSP*** = 7.0°F,
> ***CURTAIN DEAD BAND*** = 2.0°F,
> ***CURTAIN DELAY BETWEEN MOVE*** = 5 min,
> ***FIRST NATURAL MOVE*** = 120 sec,
> ***RUN TIME OPEN*** = 60 sec,
> ***RUN TIME CLOSE*** = 120 sec,
> ***HEATER RSP*** = -4.0°F.

- When the ROOM TEMPERATURE **increases**, the curtain will react as follows:
  > **until 67.0°F:** closes continuously.
  > **between 67.0°F and 77.3°F:** closes on a timer; close for 120 seconds and stay put for 5 minutes.
  > **between 77.4°F and 78.9°F:** does not move; this is the dead band.
  > **at 79.0°F and up:** opens on a timer; open for 120 seconds and stay put for 5 minutes on the first cycle, then open for 60 seconds and stay put for 5 minutes for all other cycles.
- When the ROOM TEMPERATURE **decreases**, the curtain will react as follows:
  > **until 78.7°F :** opens on a timer; open for 60 seconds and stay put for 5 minutes.
  > **between 78.7° F and 77.0°F:** does not move; this is the dead band.
  > **between 76.9°F and 67.0°F:** closes on a timer; close for 120 seconds and stay put for 5 minutes.
  > **at and below 67.0°F:** closes continuously.

F2: *# OF CYCLES TO STOP FANS*

This parameter is used to adjust the number of open cycles (*RUN TIME OPEN + CURTAIN DELAY BETWEEN MOVE)* it takes before the control enters natural mode and the fans shut down. *# OF CYCLES TO STOP FANS* is adjusted in 1 cycle increments from 1 to 6 cycles.

Parameter # 19
> *ACCELERATED OPEN*
> This parameter is used to activate the accelerated open feature when the ROOM TEMPERATURE is above *DRT + CURTAIN OPEN RSP + CURTAIN DEAD BAND + 5.0°F*. If this parameter is adjusted to 1(yes), the *RUN TIME OPEN* will be increased by *SECONDS INCREASE*. The *ACCELERATED OPEN* can be adjusted to 1(yes) or 0(no).

F2: *SECONDS INCREASE*
> This parameter is used to adjust the amount of time that will be added to *RUN TIME OPEN* when the ROOM TEMPERATURE is above *DRT + CURTAIN OPEN RSP + CURTAIN DEAD BAND + 5.0°F*. This parameter is adjusted in 1 second increments from 0 to 30 seconds.

Parameter # 20
> *CURTAIN EXERCISE CLOSE*
> This parameter is used to activate the curtain exercise feature that is used to remove the conditions (water, rodents, etc.) that can cause premature curtain failure. If this parameter is set to ON, the curtain will close for *CURTAIN EXERCISE DURATION* **every time the CURTAIN EXERCISE DAY COUNTER reaches the** *CURTAIN EXERCISE FREQUENCY*. After the closing delay, if the ROOM TEMPERATURE is above *DRT + CURTAIN RSP + CURTAIN DEAD BAND,* the curtain will open for *CURTAIN EXERCISE DURATION*. Adjusting this parameter to 0(no) will reset the day counter.
>> **Ex:** See *CURTAIN EXERCISE FREQUENCY*.

F2: *CURTAIN EXERCISE FREQUENCY*
> This parameter is used to adjust the frequency at which the curtain exercise function will activate. When the CURTAIN EXERCISE DAY COUNTER reaches this parameter, the curtains will close for *CURTAIN EXERCISE DURATION*. If the temperature is still above *DRT + CURTAIN OPEN RSP + CURTAIN DEAD BAND*, the curtain will open for *CURTAIN EXERCISE DURATION*. This parameter is adjusted in 1 day increments from 1 to 100 days.
>> **Ex:** *CURTAIN EXERCISE FREQUENCY* = 60 days
>> *CURTAIN EXERCISE DURATION* = 3 minutes
>> **-** If the control is powered or the *CURTAIN EXERCISE CLOSE* is set to ON at 6:26pm, every 60 days at 6:26pm the curtain will close for 3 minutes. After the closing delay, if the ROOM TEMPERATURE is above *DRT + CURTAIN RSP + CURTAIN DEAD BAND,* the curtain will open for 3 minutes.

F3: *CURTAIN EXERCISE DURATION*
> This parameter is used to adjust the amount of time the curtain will open/close when the curtain exercise occurs. This parameter is adjusted in 1 minute increments from 1 to 5 minutes.

Parameter # 21
> **CURTAIN EXERCISE DAY COUNTER**
> This parameter displays how many days have passed since the last curtain exercise. The curtain exercise is done every *CURTAIN EXERCISE FREQUENCY*. This parameter is displayed to the nearest day from 1 to 100 days.

Parameter # 22
> *FAN 1 OPERATION IN NATURAL*
> This parameter is used to activate or deactivate the fan 1 in natural mode. If this parameter is set to ON, the fan 1 will be allowed to function in natural mode.

F2: *FAN 2 OPERATION IN NATURAL*
> This parameter is used to activate or deactivate the fan 2 in natural mode. If this parameter is set to ON, the fan 2 will be allowed to function in natural mode.

F2: *FAN 3 OPERATION IN NATURAL*

This parameter is used to activate or deactivate the fan 3 in natural mode. If this parameter is set to ON, the fan 3 will be allowed to function in natural mode.

F2: *FAN 4 OPERATION IN NATURAL*

This parameter is used to activate or deactivate the fan 4 in natural mode. If this parameter is set to ON, the fan 4 will be allowed to function in natural mode.

Parameter # 23

ALARM HI TEMP RSP

This parameter is used to establish the temperature RSP at which a high temperature alarm condition will occur. When the ROOM TEMPERATURE is greater than *DRT + ALARM HI TEMP RSP*, an alarm will occur. The *ALARM HI TEMP RSP* is adjusted in 0.1°F increments from 0.0°F to 40.0°F. **See also the alarm section 3 for other alarm conditions.**

F2: *ALARM LO TEMP RSP*

This parameter is used to establish the temperature RSP at which a low temperature alarm condition will occur. When the ROOM TEMPERATURE is lesser than *DRT + ALARM LO TEMP RSP*, an alarm will occur. The *ALARM LO TEMP RSP* is adjusted in 0.1°F increments from -20.0°F to 1.0°F. **See also the alarm section 3 for other alarm conditions.**

Parameter # 24

MANUAL OVERRIDE FAN 1

F2: *MANUAL OVERRIDE FAN 2*

These parameters are used to control manually the respective fan (1-2). When this parameter is set to AUTO, the respective fan (1-2) will follow the configuration logic. When this parameter is set to 0, the respective fan (1-2) will be deactivated. When this parameter is set to a value between 1 and 100, the respective fan (1-2) will run at the corresponding speed.

F2: *MANUAL OVERRIDE FAN 3*

F2: *MANUAL OVERRIDE FAN 4*

These parameters are used to control manually the respective fan (3-4). When this parameter is set to AUTO, the respective fan (3-4) will follow the configuration logic. When this parameter is set to 0, the respective fan (3-4) will be deactivated. When this parameter is set to ON, the respective (3-4) will be activated.

Parameter # 25

MANUAL OVERRIDE HEATER

These parameters are used to control manually the heater. When this parameter is set to AUTO, the heater will follow the configuration logic. When this parameter is set to 0, the heater will be deactivated. When this parameter is set to ON, the heater will be activated.

F2: *MANUAL OVERRIDE COOLING*

These parameters are used to control manually the cooling. When this parameter is set to AUTO, the cooling will follow the configuration logic. When this parameter is set to 0, the cooling will be deactivated. When this parameter is set to ON, the cooling will be activated.

F3: *MANUAL OVERRIDE CURTAIN*

These parameters are used to control manually the curtain. When this parameter is set to AUTO, the curtain will follow the configuration logic. When this parameter is set to 0, the curtain will stp moving. If the parameter is set to 1, the curtain will close and when this parameter is set to open, the curtain will be open.

Parameter # 26

GROWTH DAY

This parameter is used to program the current day of the growth curve function. The GROWTH DAY is adjusted in 1 day increments from day 1 to day 127. (For more details see User's Manual).

F2: *ADJUST DAY*

This is to adjust the growth day. Growth day can be turned OFF, or adjusted to any day value from 1 to 127.

3. ALARM

The alarm relay is normally activated, but it will deactivate 2.6 seconds or more after a power failure or after one of the following events occurs:

a. IC-610 is defective.
b. ROOM TEMPERATURE exceeds the limits *ALARM HI* or *LO TEMP RSP*.
c. ROOM TEMPERATURE is defective; open/short circuited, varies more than 20.0°F in a one-minute period.

ATTACHMENTS

- Parameter Table
- Labels
- Wiring Diagram

PARAMETER TABLE

DESCRIPTION			CONTROL VALUES					
		*	MIN	MAX	PRESET			
1. ROOM TEMPERATURE	**deg F**	🚫	-6.0	168.6	*****			
F2: Probe Input #	deg. F	🚫	-6.0	168.6	PRB 1-4			
F3: Hi/Lo	deg. F	CLR	-6.0	168.6	*****			
2. DESIRED ROOM TEMP	**deg. F**	📊	32.0	120.0	75.0			
F2: Adjust Day	day	none	1	127	1	10	20	30
F3: Adjust Temperature	deg. F	none	32.0	120.0	78.0	75.0	70.0	65.0
3. INSIDE TEMP 1	**deg F**	🚫	-6.0	168.6	*****			
F2: Probe Input #	deg. F	🚫	-6.0	168.6	PRB 1			
F3: Hi/Lo	deg. F	CLR	-6.0	168.6	*****			
4. INSIDE TEMP 2	**deg F**	🚫	-6.0	168.6	*****			
F2: Probe Input #	deg. F	🚫	-6.0	168.6	PRB 2			
F3: Hi/Lo	deg. F	CLR	-6.0	168.6	*****			
5. INSIDE TEMP 3	**deg F**	🚫	-6.0	168.6	*****			
F2: Probe Input #	deg. F	🚫	-6.0	168.6	PRB 3			
F3: Hi/Lo	deg. F	CLR	-6.0	168.6	*****			
6. INSIDE TEMP 4	**deg F**	🚫	-6.0	168.6	*****			
F2: Probe Input #	deg. F	🚫	-6.0	168.6	PRB 4			
F3: Hi/Lo	deg. F	CLR	-6.0	168.6	*****			
7. HEATER RSP	**deg. F**	none	-10.0	5.0	-2.0			
F2: Heater Diff	deg. F	none	0.5	5.0	1.0			
8. FAN 1 RSP	**deg. F**	none	-10.0	30.0	0.0			
F2: Fan 1 Min Speed	%	none	12	100	50			
F3: Fan 1 Mod Band	deg. F	none	0.5	10.0	2.0			
9. FAN 2 RSP	**deg. F**	none	-10.0	30.0	2.0			
F2: Fan 2 Min Speed	%	none	12	100	50			
F3: Fan 2 Mod Band	deg. F	none	0.5	10.0	2.0			
10. MIN VENT TIMER DUTY CYCLE	**%**	none	0	100	100			
F2: Min Vent Timer Period	min	none	1	20	5			
F3: Fan 2 On Timer	0(no), 1(yes)	none	0	1	0			
11. FAN 3 RSP	**deg. F**	none	-10.0	30.0	4.0			
F2: Fan 3 Diff	deg. F	none	0.5	5.0	1.0			
12. FAN 4 RSP	**deg. F**	none	-10.0	30.0	5.0			
F2: Fan 4 Diff	deg. F	none	0.5	5.0	1.0			
13. INLET POSITION FAN 1 MIN	**%**	none	0	100	10			
F2: Inlet Position Fan 1 Max	%	none	0	100	20			
14. INLET POSITION FAN 2 MIN	**%**	none	0	100	30			
F2: Inlet Position Fan 2 Max	%	none	0	100	40			
15. INLET POSITION FAN 3	**%**	none	0	100	60			
F2: Inlet Position Fan 4	%	none	0	100	100			
16. COOLING RSP	**deg. F**	none	-20.0	30.0	15.0			
F2: Cooling Diff	deg. F	none	0.5	5.0	1.0			

DESCRIPTION		*	MIN	MAX	PRESET		
17. COOLING DUTY CYCLE	**%**	none	0	100	10		
F2: Cooling Period	min	none	1	20	20		
18. CURTAIN OPEN RSP	**deg. F**	none	-5.0	20.0	7.0		
F2: Run Time Open	sec	none	5	300	20		
F2: Run Time Close	sec	none	5	300	40		
F2: Curtain Delay Between Move	min	none	1	10	3		
F2: First Natural Move	sec	none	5	120	30		
F2: Curtain Dead Band	deg. F	none	0.5	2.0	1.0		
F2: # of Cycle to Stop Fans		none	1	6	2		
19. ACCELERATED OPEN	**0=no**	none	0	1	1		
F2: Seconds Increase	sec	none	0	30	10		
20. CURTAIN EXERCISE CLOSE	**0=no**	none	1	0	1		
F2: Curtain Exercise Frequency	day	none	1	100	60		
F3: Curtain Exercise Duration	min	none	1	5	3		
21. CURT. EXE. DAY COUNTER	**day**	🚫	OFF, 1	100	60		
22. FAN 1 OPERATION IN NATURAL	**on/off**	none	OFF	ON	ON		
F2: Fan 2 Operation in Natural	on/off	none	OFF	ON	OFF		
F2: Fan 3 Operation in Natural	on/off	none	OFF	ON	OFF		
F2: Fan 4 Operation in Natural	on/off	none	OFF	ON	OFF		
23. ALARM HI TEMP RSP	**deg. F**	none	0.0	40.0	15.0		
F2: Alarm Lo Temp RSP	deg. F	none	-20.0	1.0	-7.0		
24. MANUAL OVERRIDE FAN 1		none	AUTO, 0	100	AUTO		
F2: Manual Override Fan 2		none	AUTO, 0	100	AUTO		
F2: Manual Override Fan 3		none	AUTO, 0	ON	AUTO		
F2: Manual Override Fan 4		none	AUTO, 0	ON	AUTO		
25. MANUAL OVERRIDE HEATER		none	AUTO, 0	ON	AUTO		
F2: Manual Override Cooling		none	AUTO, 0	ON	AUTO		
F3: Manual Override Curtain 0=Stop, 1=Close		none	AUTO, 0	1, OPEN	AUTO		
26. GROWTH DAY	**day**	🚫	OFF	127	OFF		
F2: Adjust day	day	none	OFF	127	OFF		

* Restriction legend	
None	Parameter adjustable by the user and the supervisor
🔑⃠	Invisible to the user when supervisor mode is OFF
🔑	Read only to the user when supervisor mode is OFF
📈	Follow a growth curve when ramping function is ON
🚫	Cannot be changed
CLR	Press ⊞ ⊟ simultaneously to clear

6M70F0

1 Room Temperature
2 Desired Room Temp. (DRT)
3-6 Inside Probe 1-4
7 Heater Settings
8 Fan 1 Settings
9 Fan 2 Settings
10 Min Vent Settings
11 Fan 3 Settings
12 Fan 4 Settings
13-15 Inlet Position Settings
16-17 Cooling Settings
18 Curtain Settings
19 Accelerated Open
20 Curtain Exercise Settings
21 Curt. Exercise Day Counter
22 Fan # Operation in Nat
23 Alarm Settings
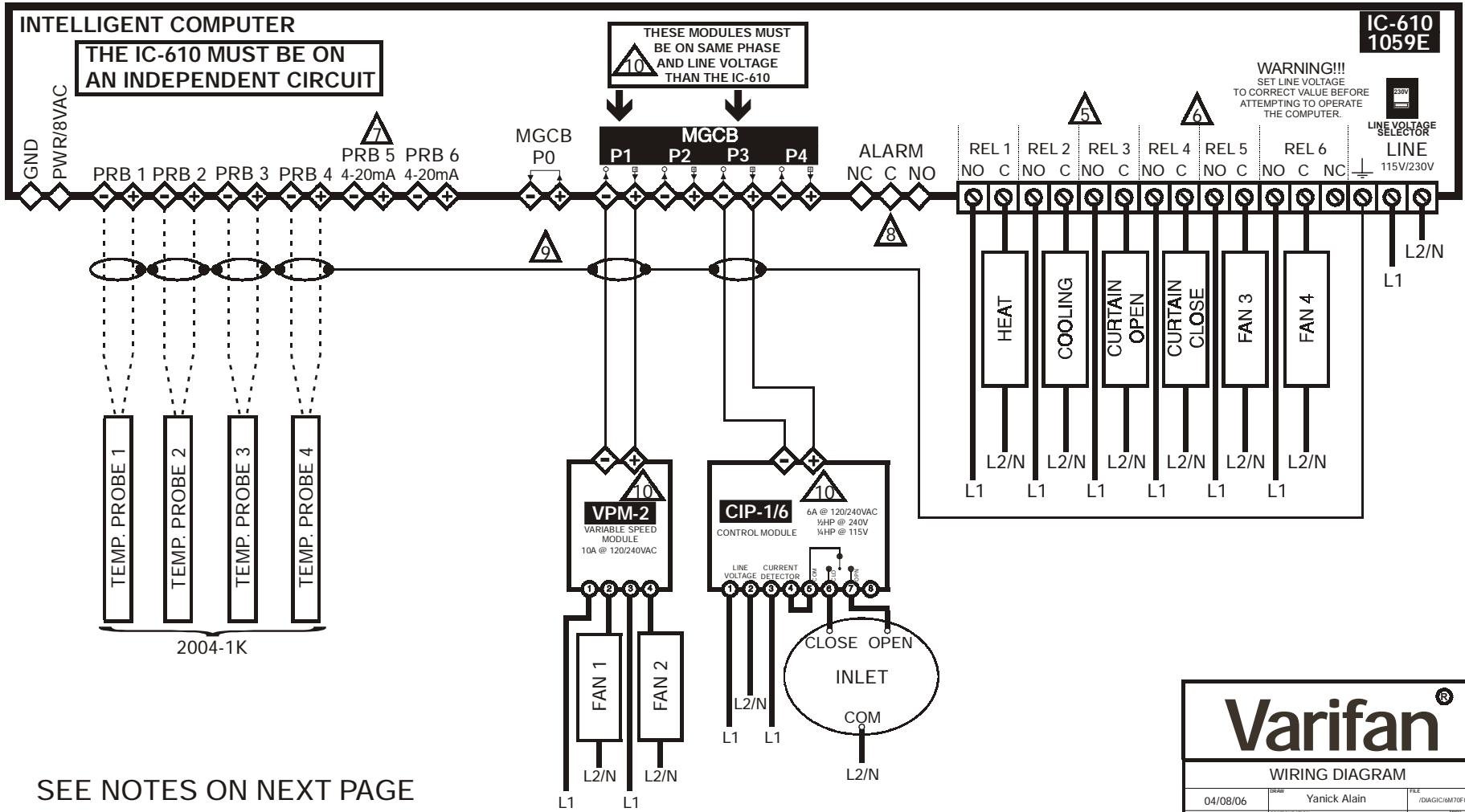**24-25** Manual Override
26 Growth Day

1 Curtain Open

2 Curtain Close

3 Fan 1

4 Fan 2

5 Fan 3

6 Fan 4

7 Heater

8 Cooling

9 Curtain Exercise

10 Natural Mode

WIRING DIAGRAM CONFIGURATION 6M70F0

INTELLIGENT COMPUTER

THE IC-610 MUST BE ON AN INDEPENDENT CIRCUIT

IC-610 1059E

THESE MODULES MUST BE ON SAME PHASE AND LINE VOLTAGE THAN THE IC-610

WARNING!!!
SET LINE VOLTAGE TO CORRECT VALUE BEFORE ATTEMPTING TO OPERATE THE COMPUTER.

230V
LINE VOLTAGE SELECTOR
115V/230V

GND PWR/8VAC PRB 1 PRB 2 PRB 3 PRB 4 PRB 5 4-20mA PRB 6 4-20mA MGCB P0 MGCB P1 P2 P3 P4 ALARM NC C NO REL 1 NO C REL 2 NO C REL 3 NO C REL 4 NO C REL 5 NO C REL 6 NO C NC LINE L2/N L1

TEMP. PROBE 1 TEMP. PROBE 2 TEMP. PROBE 3 TEMP. PROBE 4

2004-1K

VPM-2
VARIABLE SPEED MODULE
10A @ 120/240VAC

CIP-1/6
CONTROL MODULE

6A @ 120/240VAC
½HP @ 240V
¼HP @ 115V

LINE VOLTAGE   CURRENT DETECTOR

FAN 1 L2/N L1
FAN 2 L2/N L1

L2/N L1   L1

CLOSE OPEN
INLET
COM
L2/N

HEAT L2/N L1
COOLING L2/N L1
CURTAIN OPEN L2/N L1
CURTAIN CLOSE L2/N L1
FAN 3 L2/N L1
FAN 4 L2/N L1

SEE NOTES ON NEXT PAGE

Varifan®

WIRING DIAGRAM

04/08/06	DRAW Yanick Alain	FILE /DIAG/IC/6M70F0
	CONFIGURATION 6M70F0	WIR	REV 0

6M70F0

Electrician's notes
Wiring tips and hints (see guide for details)

1 ------------ (PROBE WIRING) SHIELDED WIRE AWG #18 WITH 16/30 STRANDING, 500FT/150M MAXIMUM LENGTH. (Ex.: DECA 73-310)
For other probe, refer to specific probe manual for appropriate maximum length and wire size or use AWG #18, 500FT/150M MAXIMUM LENGTH (whichever is shorter).

2 ———— (COMMUNICATION WIRING) SHIELDED LOW CAPACITANCE WIRE, (Capacitance between conductors @ 1Khz = 24PF/FT), TWISTED PAIR (8 twist/FT), AWG #18 TO 22, 750 FT/250 M MAX LENGTH. (Ex.: BELDEN 8761)

3 ━━━━ HIGH VOLTAGE WIRE INSTALLED ACCORDING TO LOCAL WIRING CODE.

4 INSTALL LOW VOLTAGE WIRES (PROBES, COMPUTER LINK OR POTENTIOMETER WIRES) AT LEAST 12 INCHES (30cm) AWAY FROM HIGH VOLTAGE WIRES (120/230VAC, 24VDC). ALWAYS CROSS HIGH AND LOW VOLTAGE WIRES AT A 90-DEGREE ANGLE.

5 RELAYS: 10A @ 250VAC RESISTIVE, MOTOR 1HP @ 250VAC, 1/2HP 120VAC AT EACH OUTPUT (OUT 1-6)

6 MAXIMUM 2 WIRES OF SAME SIZE PER BLACK TERMINAL, NO BIGGER THAN AWG #12, NO SMALLER THAN AWG #22.

7 1 WIRE ONLY PER GREEN TERMINAL. USE WIRE CONNECTOR IF YOU WANT TO CONNECT MORE THAN 1 WIRE.

8 CHECK INSTALLATION GUIDE FOR ALARM WIRING.

9 USE SHIELD FOR SHIELDING PURPOSE ONLY. CONNECT THE SHIELD TO THE CONTROL <u>CIRCUIT COMMON END ONLY</u>⏚. NEVER LEAVE THE SHIELD UNCONNECTED AT BOTH ENDS. NEVER CONNECT BOTH ENDS OF THE SHIELD TO <u>COMMON</u>⏚. THE USE OF A SHIELD FOR ALL PROBES AND POTENTIOMETERS IS **MANDATORY**.

10 THESE MODULES MUST BE ON SAME POWER PHASE AND LINE VOLTAGE AS THE CONTROLLER.