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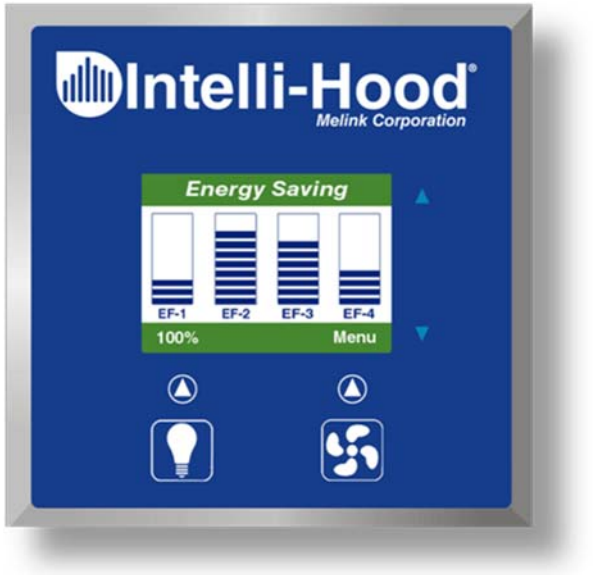
Intelli-Hood®

OPERATION MANUAL



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I. About this Document

The purpose of this document is to provide basic Operation and Maintenance information for the Intelli-Hood Kitchen Ventilation Control System. The intended audience of this document is the end user of the system: the building owner, kitchen manager, kitchen staff, or maintenance technician.
This document will instruct the reader on basic operation, maintenance, and troubleshooting.

II. Related Documents

Related documents should be referenced as needed for additional information.

203-3101 Submittal and Technical Overview

- Provides brief overview of system and high level description of each component.

203-3102 Operations and Maintenance Manual

- This document.
- Provides information regarding basic operation, maintenance, and troubleshooting

203-3103 Installation Manual

- Provides detailed installation instructions of the components including mechanical installation of parts, power wiring, and control wiring.

VFD Manuals

- Refer to documents provided by VFD OEM for information regarding any aspect of the Variable Frequency Drives including power wiring, control wiring, programming, and faults.

III. Glossary of Abbreviations

The following terms and abbreviations are used throughout literature pertaining to the Intelli-Hood System.

- IH: Intelli-Hood
- VFD: Variable Frequency Drive
- TP: Touchpad
- APU: Air Purge Unit
- SC: System Controller
- HC: Hood Controller
- AT: Aux Touchpad

IV. Operational Modes of the Intelli-Hood

There are four (4) Modes of the Intelli-Hood. The Modes are defined below. Other sections of the manual will describe more detail about how the Intelli-Hood system changes modes.

Energy Saving Mode

Energy Saving Mode is the operational state when one or more exhaust fans are on. In most cases, all exhaust fans controlled by Intelli-Hood will be in Energy Saving Mode at the same time, however, in some installations, it is possible that some fans be in Energy Saving Mode while others remain in Standby.

Standby Mode

In Standby Mode, the exhaust fans are not operating, but Intelli-Hood is monitoring temperature and optic sensors. The Touchpads are typically used to manually change the mode of the system between Standby and Energy Saving Mode. Depending on conditions detected by sensors and programmable options, it is possible for Intelli-Hood to automatically change modes.

100% Mode (Bypass)

100% Mode (also referred to as Bypass or Sensor Bypass) is a secondary function. Typically, the Intelli-Hood is set to appropriately send the exhaust fans to full speed based on conditions detected by temperature and optic sensors. The kitchen staff person has the ability to send the fans to full speed by placing the system into 100% Mode when it is currently operating in Energy Saving Mode. 100% Mode is a timed function with a default expiration time of 10 minutes. After the timer expires, fans will revert back to Energy Saving Mode.

Emergency Fire Mode

Emergency Fire Mode is triggered by the hood fire suppression system or other fire prevention system of the building. This mode is activated when the main power (120 or 230 VAC single phase) to the Intelli-Hood System Controller is shut off. Through control wiring and programming of VFDs, the exhaust fans are commanded to run at full speed. In most cases, supply fan VFDs are commanded to stop running. In this mode, the Intelli-Hood System Controller, User Interfaces and Hood Sensors have no power and function.

V. Touchpad

The Touchpad is the primary user interface point of the Intelli-Hood system. Every Intelli-Hood is equipped with at least one Touchpad. Some systems are installed with multiple Touchpad's. Figure 1 illustrates the Touchpad and descrptions of each component are listed below.

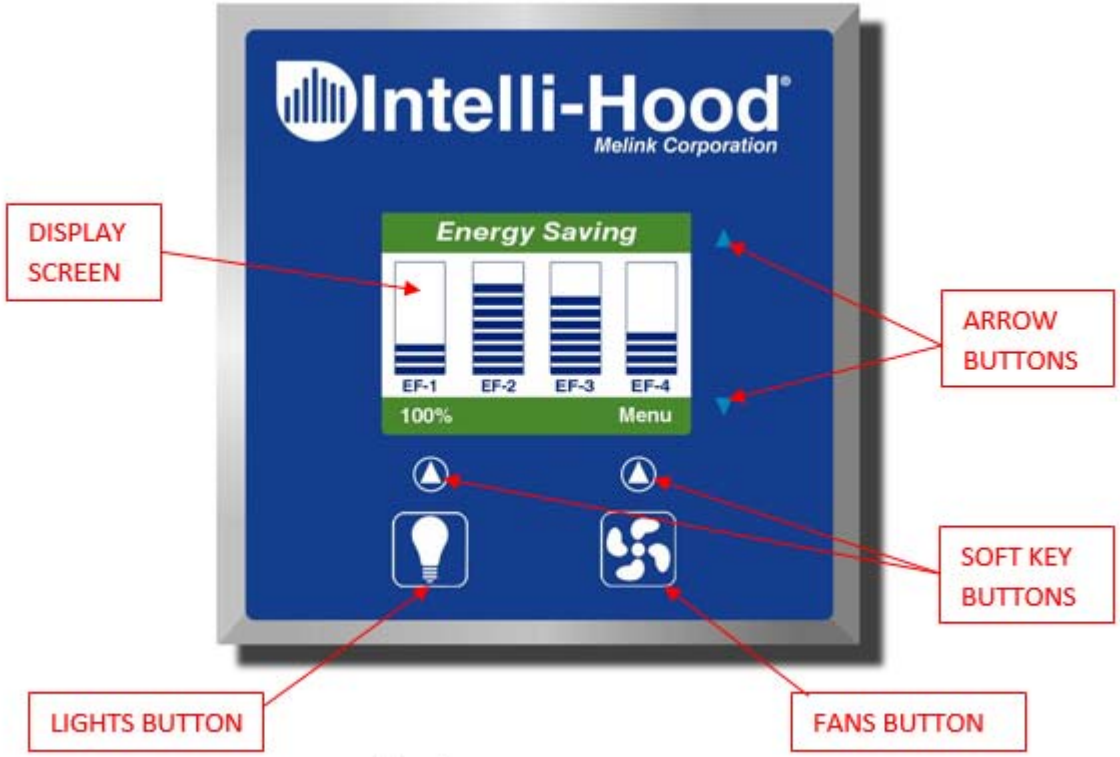


Figure 1: Touchpad

Fans Button

The Fans Button is typically used to change the state of the system between STANDBY MODE (exhaust fans off) and ENERGY SAVING MODE (exhaust fans running).

Lights Button

The Lights Button is typically used to turn the lights of the hood on/off. This function is optional and may not be used in all installations of Intelli-Hood. Consult the design documents of your particular installation to determine if this button is used.

Display Screen

The Display Screen shows the operational state of the Intelli-Hood system. Symbols and Messages that appear on the screen are explained elsewhere in this manual.

Softkey Buttons

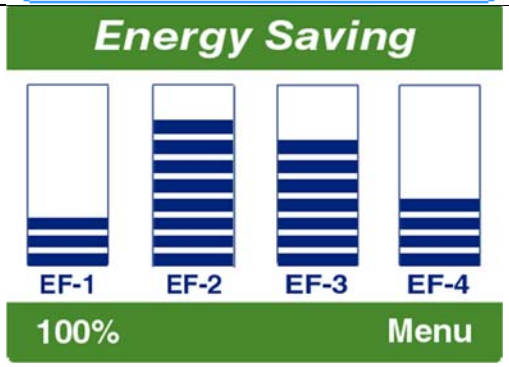
Two Softkey Buttons below the Display Screen are used for the function displayed on the screen. In Normal Operation Modes, the Right Button is used to access programming and help Menus, and the left button is used to active the "100% Fan Speed Mode". In Programming Modes, the functions of the buttons change.

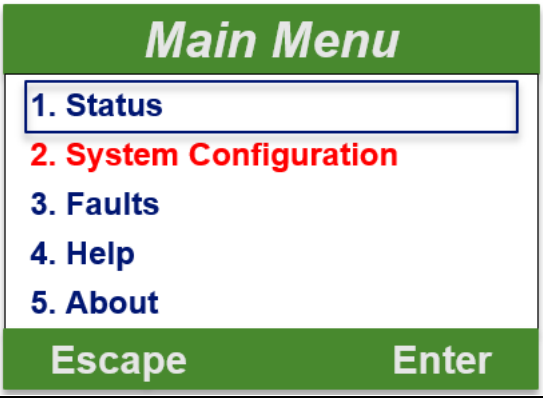
Arrow Buttons

Two Arrow Buttons are used to move among programming parameters and change programming values.

Display Screen

The Display shows the status of the Intelli-Hood System. Screenshots of the display in various situations are shown Figures 2 through x.

	Standby Mode • Intelli-Hood logo splash screen • Fans are off • Right Softkey can be used to enter Menus
	Energy Saving Mode • Energy Saving in top bar denotes Energy Saving Mode. • At least one fan associated to this Touchpad is in Energy Saving Mode, but not necessarily all fans. • Display will scroll through the Hoods and Fans that are Active and display their operating speeds. • Left Soft Key can be used to send the system to 100% Mode. • Right Soft Key can be used to enter Menus
	100% Mode • "Bypass Mode" in top bar denotes 100% Mode. • Display will scroll through the Hoods and Fans and display their operating speeds.

	• Left Soft Key can be used to send the system to "Normal" Energy Saving Mode. • Right Soft Key can be used to enter Menus
	Menus Home Screen • The screenshot shown is the Main Menu Screen, the first screen of the Menus. • Arrows and Enter key (right softkey) can be used to make choices. • ESC button (left softkey) will exit the Menu and return to the operating screen(s). • Refer to the Menus section of this document for more information regarding menus.

Typical Operation

The FANS button is typically used to change the system mode from Standby to Energy Saving and vice-versa. If multiple Touchpads are installed, then it is possible to program relationships to dictate which fan is controlled by each Touchpad.

VI. Touchpad Main Menu

Status Menu

The Display Menu will allow the Kitchen Staff Person or Maintenance Technician to view basic system status items such as Faults, VFD Speeds, and Hood Sensor status in a list format. The Display Menu is accessible to any user.

System Configuration Menu

The System Configuration Menu is a mean by which one can change the setup of the Intelli-Hood system for the particular kitchen installation. The number of hoods, fans, and many parameters can be configured through the System Configuration Menu. The Intelli-Hood Technical Menu contains detailed information about the System Configuration Menu.

When one selects System Configuration Menu from the Main Menu, the screen will prompt the user to input a pass code to proceed. This pass code is intended to prevent the accidental access of the System Configuration Menu. One should not attempt to modify the System Configuration Menu parameters without a thorough knowledge of Intelli-Hood programming. Refer to the Intelli-Hood Technical Manual or contact Melink Corporation or your Intelli-Hood Regional Distributor for more assistance.

Faults Menu

The Faults Menu contains information about any active faults as well as suggestions for resolution.

Help Menu

The Help Menu contains instructions for contacting Technical Support and other information.

About Menu

The About Menu contains information about the device including firmware version, S/N, IP Address, and current time.

Network Diagnostics Menu

The Network Diagnostics Menu runs some tests to determine what (if any) network issues could be preventing the System Controller from accessing the Melink servers. Tests included are: checking for security keys, validating the DNS server, and verifying that ports 22, 80, and 123 are open.

VII. Aux Touchpad

The Aux Touchpad (AT) is a secondary user interface point of the Intelli-Hood system. The Aux Touchpad is intended to be used in large installations with hoods and fans where there is desire to operate some fans without operating other fans. Aux Touchpads provide additional on/off user interface points to the Intelli-Hood system. Up to 10 Aux Touchpads can be installed on an Intelli-Hood.

The Aux Touchpad can not show status or speeds of the fans. The Aux Touchpad can indicate a fault, but it can not indicate the fault type. The Intelli-Hood Configuration parameters can not be adjusted with a Aux Touchpad. Therefore, the Aux Touchpad should never be used as the only user Interface Device of an Intelli-Hood installation.

Fans Button

The Fans Button is used to change the state of the system from STANDBY MODE (exhaust fans off) to ENERGY SAVING MODE (exhaust fans running). When the system is in ENERGY SAVING MODE, the green indicator light under the fans button will illuminate.

Lights Button

The Lights Button will control an output signal to turn the lights of the hoods on/off. The indicator light under the button will show the state of the lights output.

100% Mode Button

The 100% Mode Button may be used to change the system from ENERGY SAVING MODE to 100% MODE. The 100% Button will have no function if the system is in STANDBY MODE. The indicator light under the 100% Button shows that exhaust fans are in 100% MODE.

Fault Light

The Fault Light is an alarm indicator light. The Fault Light indicates a fault of some type. There are several fault types as listed in the Troubleshooting Section. The Aux Touchpad does not show the fault type. A Fault Message will appear on one of the Touchpad Devices.

VIII. Methods of Turning Fans On/Off

It is important to understand that there are several methods by which the fans can turn on and off (change from STANDBY to ENERGY SAVING MODE). Depending on the installation, different methods may be used. In various installations, some methods are disabled. Refer to the installation documents of the individual installation to understand how a particular installation is setup. Refer to the Intelli-Hood Technical Guide for programming information for how to change the features and sequence of operations.

Fans Button

In most Intelli-Hood installations, the kitchen staff person will use the Fans Button to turn the fans on/off. However, sometime, the keypad is disabled and the Fans Button will have no funtion. There will be other methods to turn the fans on/off. Refer to the other possible methods described below.

If there are multipe user interface devices on an Intelli-Hood system, then relationships are be setup in programming parameters such that Keypad A controls some hoods while Keypad B controls other hoods. Refer to a the Technical Manual for more information regarding system programming.

Auto On/Off by Hood Temperature

The Intelli-Hood system can be programmed to turn on automatically by hood temperature. When the temperature in the hood reaches a certain threshold (100F), the fans will turn on. In most kitchens, several exhaust fans share a common supply fan. In these kitchens, if one hood triggers its fan to turn on, then the other exhaust fans and the supply fan must turn on as well. In other kitchens, exhaust fans may be able to turn on independently of one another.

Auto-Off is a separate function from Auto-On. The system can be programmed such that if a hood is below a setpoint temperature (75F), then the exhaust fan will shut off. Similar to the Auto-On function, hoods that share the supply fan cannot turn off independently of one another. Therefore, all hoods associated to a common supply fan must be below the setpoint temperature before any of them turn off automatically.

Remote Input by Toggle Switch

Intelli-Hood can be programmed to turn the fans on/off based on the state of an external toggle switch, such as a traditional wall or hood mounted switch. This setup is common in retrofit projects where Intelli-Hood is being installed after the kitchen has been in use for many years. The existing kitchen staff may not want to change the method of turning fans on/off. Intelli-Hood can be setup to accept a signal from the existing toggle switch.

Remote Input by Special Hood Feature such as Water Wash, Ultraviolet Light System, Hood Damper System

Some exhaust hood systems have sophisticated control panels that may control Water Wash, UV Lights, or Hood Damper Systems. These systems have their own electronic sequence of operation for processes that must be performed before the exhaust fans are turned on. When Intelli-Hood is interfaced to these Hood System, the sequence of operation will vary. Sometimes the Intelli-Hood will trigger the Hood Panel while in other

installations, the Hood Panel will give a start signal to Intelli-Hood. Refer to project-specific documentation for more information.

Remote Input by Building Automation System

The Intelli-Hood System supports BACnet protocol. Through BACnet communication, a Building Automation Network may command Intelli-Hood system to turn fans on/off at specific times.

High Temperature Alarm Mode

High Temperature Alarm Mode is similar to Auto On Function. When the temperature of a hood reaches a setpoint (default setting is 200F), the exhaust fan will turn on full speed and run for a minimum time of 5 minutes. After the 5 minute time period, the Intelli-Hood system will operate in normal Energy Saving Mode. High Temperature Alarm mode is a default feature of Intelli-Hood.

Internal Clock Schedule

Intelli-Hood can be programmed to turn on and off at specific times of the day based on the real time clock of the Intelli-Hood Controller.

Multiple Modes

Intelli-Hood can be programmed such that several of the above methods can turn on a system. For example, Intelli-Hood can be programmed to turn on at a specific time of day every day, but if a kitchen staff person wanted to start or stop the fans with the Touchpad or Aux Touchpad, then he/she would be able to do so.

IX. Emergency Fire Mode aka Purge Mode

Per the building safety codes in most jurisdictions, when a fire occurs in the kitchen, all exhaust fans are required to run at full speed and all supply air sources are required to shut off. Intelli-Hood can be triggered into this mode by shutting off the 120/230V single phase input power System Controller. Through wiring and programming of the Variable Frequency Drives, the drives will run at full speed. In most installations, the Intelli-Hood System Controller input power is wired through a fire relay or from a shunt-tripped breaker such that it automatically loses power in the event of a fire.

X. Program Settings

Below is a list of program settings for Intelli-Hood. Please reference the Program Settings Explanation Manual for additional details.

#	Parameter	Default Value	Range of Values
Hood Controller Parameters			
HCxx-01	Hood Controller Address	1	0 To 39
HCxx-02	Name	HC-x	Up to 20 Characters
HCxx-03	Optic Sensor	Yes	Yes or No
HCxx-04	Temp Channel 1	Hood	No, Hood, On/Off, Supply, Space, Auto Span
HCxx-05	Temp Channel 1 Span Max. (°F)	90	50F To 200F (Increments Of 5F)
HCxx-06	Temp Channel 2	No	No, Hood, On/Off, Supply, Space, Auto Span
HCxx-07	Temp Channel 2 Span Max. (°F)	Match Channel 1	50F To 200F (Increments Of 5F), Match Channel 1
HCxx-08	Temp Channel 3	No	No, Hood, On/Off, Supply, Space, Auto Span
HCxx-09	Temp Channel 3 Span Max. (°F)	Match Channel 1	50F To 200F (Increments Of 5F), Match Channel 1
HCxx-10	Temp Channel 4	No	No, Hood, On/Off, Supply, Space, Auto Span
HCxx-11	Temp Channel 4 Span Max. (°F)	Match Channel 1	50F To 200F (Increments Of 5F), Match Channel 1
HCxx-12	Temp Actual Channel 1	Measured Temp	User Inputs Actual Temperature 0 To 500F
HCxx-13	Temp Actual Channel 2	Measured Temp	User Inputs Actual Temperature 0 To 500F
HCxx-14	Temp Actual Channel 3	Measured Temp	User Inputs Actual Temperature 0 To 500F
HCxx-15	Temp Actual Channel 4	Measured Temp	User Inputs Actual Temperature 0 To 500F
HCxx-16	Temp Channel 1 Span Min. (°F)	75	50F to 90F (Increments of 1F)
HCxx-17	Temp Channel 2 Span Min. (°F)	Match Channel 1	50F to 90F (Increments of 1F), Match Channel 1
HCxx-18	Temp Channel 3 Span Min. (°F)	Match Channel 1	50F to 90F (Increments of 1F), Match Channel 1
HCxx-19	Temp Channel 4 Span Min. (°F)	Match Channel 1	50F to 90F (Increments of 1F), Match Channel 1
HCxx-20	Optic Smoke Density	Medium	Low, Medium, or High
HCxx-21	BACnet Device Instance ID	0	0 to 4194302
HCxx-22	Active on BACnet	No	Yes or No

Exhaust Hood Parameters			
EHxx-01	Primary Exhaust ID	1	1 to 39
EHxx-02	Name	Hood xx	Up To 20 Characters
EHxx-03	Minimum Speed	30%	30% To 100%, Increments Of 5%
EHxx-04	Maximum Speed	100%	30% To 100%, Increments Of 5%
EHxx-05	Temperature Sensor Node(s)	None	01-1 to 39-4
EHxx-06	Optic Sensor Node(s)	None	1 to 39; Sensors listed in format of "Address".
EHxx-07	Auto On Hood Temperature	Not Used	Not Used, Auto On 70F - 120F
EHxx-08	Auto On Space Differential	Not Used	Not Used, Room Difference +1F - +40F
EHxx-09	Auto Off Hood Temp	Not Used	Not Used, Auto Off 65F - 100F
EHxx-10	Auto Off Space Differential	Not Used	Not Used, Room Difference +1F - +20F
EHxx-11	Auto On/Off Grouping	Yes	Yes Or No

EHxx-12	Temperature Alarm Auto On	200F	Not Used, System, 100F, 125F, 150F, 200F, 250F, 300F
EHxx-13	Short Cycle Ratio	Not Used	Not Used, 20%, 30%, 40%, 50%, 60%, 70%, 80%
EHxx-14	Exhaust Volume	1000	0 to 100,000
EHxx-15	Hood Group	1	1-10
EHxx-16	Optic Hang time	System	System, 5, 10, 15, 30, 45, 60, 120, 180, 300

Exhaust Fan Parameters

EFxx-01	Primary Exhaust Address	1	1 to 39
EFxx-02	Name	EF-xx	Up To 5 Characters
EFxx-03	Output Type	ABB ACH550	System Output Allen Bradley Powerflex 4/40 Allen Bradley Powerflex 400 ABB ACH550 Trane TR200 Allen Bradley Powerflex 52x LSIS SV-iS7 Siemens G120P Schneider Altivair 212 Yaskawa Z100
EFxx-04	BACnet Device Instance ID	0	0 to 4194302
EFxx-05	Display Status	Yes	Yes or No
EFxx-06	Active on BACnet	Yes	Yes or No

Aux Airflow Parameters

AAxx-01	Aux Airflow Address	41	40 to 128
AAxx-02	Name	AA-xx	Up To 5 Characters
AAxx-03	Algorithm	Average	Average, Highest, Lowest
AAxx-04	Related Airflows	None	List All Exhaust and Aux Airflows
AAxx-05	Output Type	ABB ACH550	System Output Allen Bradley Powerflex 4/40 Allen Bradley Powerflex 400 ABB ACH550 Trane TR200 Allen Bradley Powerflex 52x LSIS SV-iS7 Siemens G120P Schneider Altivair 212 Yaskawa Z100
AAxx-06	Design Airflow	1000	0 to 100,000
AAxx-07	BACnet Device Instance ID	0	0 to 4194302
AAxx-08	Display Status	Yes	Yes or No
AAxx-09	Active on BACnet	Yes	Yes or No

System Parameters

SY-01	Address	1	1
SY-02	Name	System Controller	Up To 20 Characters

SY-03	Relay 1 Output	MUA Damper	None Exhaust Temp Alarm Smoke Fan On MUA Damper Temperature Fault Optic Fault VFD Fault System Fault 24/7
SY-04	Groups Affecting Relay 1 Output	1	1 to 10
SY-05	Relay 2 Output	MUA Damper	Same as SY-03
SY-06	Groups Affecting Relay 2 Output	1	1 to 10
SY-07	24VDC Output 1	MUA Damper	Same as SY-03
SY-08	Groups Affecting 24VDC Output 1	1	1 to 10
SY-09	24VDC Output 2	MUA Damper	Same as SY-03
SY-10	Groups Affecting 24VDC Output 2	1	1 to 10
SY-11	Digital Input 1	70% Min Speed	None Remote On/Off Remote Enable/Disable 50% Min Speed 60% Min Speed 70% Min Speed 80% Min Speed 90% Min Speed 100% Min Speed External Fault Input Lights On/Off External Alert
SY-12	Groups Affected by Digital Input 1	1	1 to 10
SY-13	Digital Input 2	Remote On/Off	Same as SY-11
SY-14	Groups Affected by Digital Input 2	1	1 to 10
SY-15	Digital Input 3	None	Same as SY-11
SY-16	Groups Affected by Digital Input 3	1	1 to 10
SY-17	Analog Output Algorithm	Average	None, Average, Highest, Lowest
SY-18	Analog Output Source	None	List all Aux Airflows
SY-19	Analog Input Function	Not In Use	Not in Use, Highest, Add, Average, Aux. Highest, Aux. Add, Aux. Average
SY-20	Analog Input Minimum	0	0 to 100
SY-21	Analog Input Maximum	100	0 to 100
SY-22	Analog Input Scale	100	0 to 100
SY-23	Analog Input Remote On Threshold	0	0 to 100
SY-24	Analog Input Associated Groups	1	1 to 10
SY-25	Bypass Timer	10 min	30 sec, 1 min, 5 min, 10 min, 20 min, 30 min, 1 hr, 2 hr, 4 hr
SY-26	Optic Hang Time	15 sec	5 sec, 10 sec, 15 sec, 30 sec, 60 sec, 90 sec, 120 sec, 180 sec, 240 sec, 300 sec
SY-27	Fan Speed Reporting Method	VFD Feedback	VFD Feedback, Command Speed
SY-28	Temperature Alarm Auto On	200F	Not Used, 100F, 125F, 150F, 200F, 250F, 300F

SY-29	Temperature Alarm Auto Off	Not Used	Not Used, On-10F, On-20F, On-30F
SY-30	Temperature Alarm Tone	No	Yes or No
SY-31	Temperature Alarm Hoods to Activate	All Hoods	All Hoods, Hood Group, Hood Only, None
SY-32	Data Log Sample Rate	5 minutes	10s, 30s, 1min, 2min, 3min, 5min, 10min, 30min
SY-33	Auto On, Manual Off, Delay Time	2 minutes	10s, 30s, 1min, 2min, 3min, 5min, 10min, 30min
SY-34	Unit Display	12H/F	12H/F, 24H/F, 12H/C, 24H/C
SY-35	Analog Output Min	0	0 to 100
SY-36	Analog Output Max	100	0 to 100
SY-37	VFD Baud Rate	9600 Baud	9600 Baud, 19200 Baud, 38400 Baud, 57600 Baud, 115200 Baud
SY-38	VFD Serial Mode	8-E-1	8-N-1, 8-E-1, 8-O-1
SY-39	Time Zone	New York, US	Relevant Time Zones
SY-40	Display Language	English	English, Francais, Espanol, Deutsche
SY-41	Use DHCP	Yes	Yes or No
SY-42	Static IP	192.168.200.101	Valid IP Address
SY-43	Netmask	255.255.255.0	Valid IP Address
SY-44	Gateway	0.0.0.0	Valid IP Address
SY-45	DNS Server 1	0.0.0.0	Valid IP Address
SY-46	DNS Server 2	0.0.0.0	Valid IP Address
SY-47	BACnet Device Instance ID	654000	0 to 4194302
SY-48	BACnet Auto Number	Yes	Yes or No
SY-49	BACnet Port	47808	47808 to 65535
SY-50	BACnet DNET	654	1 to 65534
SY-51	BACnet Watchdog	300	0 to 600 (seconds)

Touchpad Parameters

TPx-01	Touchpad Hood Network Address	1	1-10
TPx-02	Name	TP-01	Up To 20 Characters
TPx-03	Light Controller Addresses	System Controller	System Controller, LC-01 to LC-10
TPx-04	Bypass Softkey Visible	Yes	Yes Or No
TPx-05	Associated Groups On/Off	1	1 to 10
TPx-06	Lights Button Active	Yes	Yes Or No
TPx-07	Fans Button Active	Yes	Yes Or No
TPx-08	Hood Groups Displayed	1	1 to 10

Aux Touchpad Parameters

ATx-01	Aux Touchpad Address	1	0-9
ATx-02	Name	AT-1	Up To 20 Characters
ATx-03	Light Controller Addresses	System Controller	System Controller, LC-01 to LC-10
ATx-04	Bypass Button Active	Yes	Yes Or No
ATx-05	Lights Button Active	Yes	Yes Or No
ATx-06	Fans Button Active	Yes	Yes Or No
ATx-07	Associated Groups On/Off	1	1 to 10

Scheduling Parameters

SDxx-01	Schedule ID	1	1 to 10

SDxx-02	Schedule Name	Schedule x	Up to 20 Characters
SDxx-03	Groups	All Selected	1 to 10
SDxx-04	Action Start	None	None, Fans On, Fans Off, Preset Minimum, Calculated Minimum
SDxx-05	Action End	None	None, Fans On, Fans Off, Preset Minimum, Calculated Minimum
SDxx-06	Month Start	January	January through December
SDxx-07	Day Start	1	1 to 31
SDxx-08	Month End	December	January through December
SDxx-09	Day End	31	1 to 31
SDxx-10	Days of Week	All Selected	Sun to Sat
SDxx-11	Time Start	08:00	00:00 to 23:59
SDxx-12	Time End	22:00	00:00 to 23:59
SDxx-13	Preset Speed	100	0 to 100

Analog Output Module Parameters

AOMx-01	Address	101	1 to 254
AOMx-02	Name	AOM-x	Up to 20 Characters
AOMx-03	Analog Output 0 Algorithm	Average	None, Average, Highest, Lowest
AOMx-04	Analog Output 0 Related Airflows	None	List All Exhaust and Aux Airflows
AOMx-05	Analog Output 0 Min	0	0 to 100
AOMx-06	Analog Output 0 Max	100	0 to 100
AOMx-07	Analog Output 0 Type	0-10VDC	0-10VDC, 0-20mA
AOMx-08	Analog Output 1 Algorithm	Average	None, Average, Highest, Lowest
AOMx-09	Analog Output 1 Related Airflows	None	List All Exhaust and Aux Airflows
AOMx-10	Analog Output 1 Min	0	0 to 100
AOMx-11	Analog Output 1 Max	100	0 to 100
AOMx-12	Analog Output 1 Type	0-10VDC	0-10VDC, 0-20mA
AOMx-13	Analog Output 2 Algorithm	Average	None, Average, Highest, Lowest
AOMx-14	Analog Output 2 Related Airflows	None	List All Exhaust and Aux Airflows
AOMx-15	Analog Output 2 Min	0	0 to 100
AOMx-16	Analog Output 2 Max	100	0 to 100
AOMx-17	Analog Output 2 Type	0-10VDC	0-10VDC, 0-20mA
AOMx-18	Analog Output 3 Algorithm	Average	None, Average, Highest, Lowest
AOMx-19	Analog Output 3 Related Airflows	None	List All Exhaust and Aux Airflows
AOMx-20	Analog Output 3 Min	0	0 to 100
AOMx-21	Analog Output 3 Max	100	0 to 100
AOMx-22	Analog Output 3 Type	0-10VDC	0-10VDC, 0-20mA
AOMx-23	Digital Input 0	None	Same as SY-11
AOMx-24	Groups Affected by Digital Input 0	1	1 to 10
AOMx-25	Digital Input 1	None	Same as SY-11
AOMx-26	Groups Affected by Digital Input 1	1	1 to 10
AOMx-27	Digital Input 2	None	Same as SY-11
AOMx-28	Groups Affected by Digital Input 2	1	1 to 10
AOMx-29	Digital Input 3	None	Same as SY-11
AOMx-30	Groups Affected by Digital Input 3	1	1 to 10

Digital Input Module Parameters

DIMx-01	Address	111	1 to 254
DIMx-02	Name	DIM-x	Up to 20 Characters
DIMx-03	Digital Input 0	None	Same as SY-11
DIMx-04	Groups Affected by Digital Input 0	1	1 to 10
DIMx-05	Digital Input 1	None	Same as SY-11
DIMx-06	Groups Affected by Digital Input 1	1	1 to 10
DIMx-07	Digital Input 2	None	Same as SY-11
DIMx-08	Groups Affected by Digital Input 2	1	1 to 10
DIMx-09	Digital Input 3	None	Same as SY-11
DIMx-10	Groups Affected by Digital Input 3	1	1 to 10
DIMx-11	Digital Input 4	None	Same as SY-11
DIMx-12	Groups Affected by Digital Input 4	1	1 to 10
DIMx-13	Digital Input 5	None	Same as SY-11
DIMx-14	Groups Affected by Digital Input 5	1	1 to 10
DIMx-15	Digital Input 6	None	Same as SY-11
DIMx-16	Groups Affected by Digital Input 6	1	1 to 10
DIMx-17	Digital Input 7	None	Same as SY-11
DIMx-18	Groups Affected by Digital Input 7	1	1 to 10
DIMx-19	Digital Input 8	None	Same as SY-11
DIMx-20	Groups Affected by Digital Input 8	1	1 to 10
DIMx-21	Digital Input 9	None	Same as SY-11
DIMx-22	Groups Affected by Digital Input 9	1	1 to 10
DIMx-23	Digital Input 10	None	Same as SY-11
DIMx-24	Groups Affected by Digital Input 10	1	1 to 10
DIMx-25	Digital Input 11	None	Same as SY-11
DIMx-26	Groups Affected by Digital Input 11	1	1 to 10
DIMx-27	Digital Input 12	None	Same as SY-11
DIMx-28	Groups Affected by Digital Input 12	1	1 to 10
DIMx-29	Digital Input 13	None	Same as SY-11
DIMx-30	Groups Affected by Digital Input 13	1	1 to 10
DIMx-31	Digital Input 14	None	Same as SY-11
DIMx-32	Groups Affected by Digital Input 14	1	1 to 10
DIMx-33	Digital Input 15	None	Same as SY-11
DIMx-34	Groups Affected by Digital Input 15	1	1 to 10

Digital Output Module Parameters

DOMx-01	Address	111	1 to 254
DOMx-02	Name	DOM-x	Up to 20 Characters
DOMx-03	Relay 0 Output	None	Same as SY-03
DOMx-04	Groups Affecting Relay 0 Output	1	1 to 10
DOMx-05	Relay 1 Output	None	Same as SY-03
DOMx-06	Groups Affecting Relay 1 Output	1	1 to 10
DOMx-07	Relay 2 Output	None	Same as SY-03
DOMx-08	Groups Affecting Relay 2 Output	1	1 to 10

DOMx-09	Relay 3 Output	None	Same as SY-03
DOMx-10	Groups Affecting Relay 3 Output	1	1 to 10
DOMx-11	Relay 4 Output	None	Same as SY-03
DOMx-12	Groups Affecting Relay 4 Output	1	1 to 10
DOMx-13	Relay 5 Output	None	Same as SY-03
DOMx-14	Groups Affecting Relay 5 Output	1	1 to 10
DOMx-15	Relay 6 Output	None	Same as SY-03
DOMx-16	Groups Affecting Relay 6 Output	1	1 to 10
DOMx-17	Relay 7 Output	None	Same as SY-03
DOMx-18	Groups Affecting Relay 7 Output	1	1 to 10

Virtual Input Module Parameters

VIMx-01	Address	1	1 to 254
VIMx-02	Name	VIM-x	Up to 20 Characters
VIMx-03	Virtual Input 1	None	Same as SY-11
VIMx-04	Groups Affected by Virtual Input 1	1	1 to 10
VIMx-05	Virtual Input 2	None	Same as SY-11
VIMx-06	Groups Affected by Virtual Input 2	1	1 to 10
VIMx-07	Virtual Input 3	None	Same as SY-11
VIMx-08	Groups Affected by Virtual Input 3	1	1 to 10
VIMx-09	Virtual Input 4	None	Same as SY-11
VIMx-10	Groups Affected by Virtual Input 4	1	1 to 10
VIMx-11	BACnet Device Instance ID	0	0-4194302

Virtual Output Module Parameters

VOMx-01	Address	11	1 to 254
VOMx-02	Name	VOM-x	Up to 20 Characters
VOMx-03	Virtual Output 1	None	Same as SY-03
VOMx-04	Groups Affecting Virtual Output 1	1	1 to 10
VOMx-05	Virtual Output 2	None	Same as SY-03
VOMx-06	Groups Affecting Virtual Output 2	1	1 to 10
VOMx-07	Virtual Output 3	None	Same as SY-03
VOMx-08	Groups Affecting Virtual Output 3	1	1 to 10
VOMx-09	Virtual Output 4	None	Same as SY-03
VOMx-10	Groups Affecting Virtual Output 4	1	1 to 10
VOMx-11	BACnet Device Instance ID	0	0-4194302

Aux Lighting Controller Parameters

LCx-01	Lighting Controller Address	1	0-9
LCx-02	Name	ALC-1	Up To 20 Characters

Analog Input Module Parameters

AIMx-01	Aux Power Hood Network Address	131	131-140
AIMx-02	Name	AIM-01	Up To 20 Characters
AIMx-03	AI0 Function	Not In Use	Not In Use, Highest, Add, Average, Aux. Highest, Aux. Add, Aux. Average
AIMx-04	AI0 Minimum	0	0 to 100

AIMx-05	AI0 Maximum	100	0 to 100
AIMx-06	AI0 Type	0-20mA	0-20mA, 0-10VDC
AIMx-07	AI0 Scale	100	0 to 100
AIMx-08	AI0 Remote On Threshold	0	0 to 100
AIMx-09	AI0 Associated Groups	1	1 to 10
AIMx-10	AI1 Function	Not In Use	Not In Use, Highest, Add, Average, Aux. Highest, Aux. Add, Aux. Average
AIMx-11	AI1 Minimum	0	0 to 100
AIMx-12	AI1 Maximum	100	0 to 100
AIMx-13	AI1 Type	0-20mA	0-20mA, 0-10VDC
AIMx-14	AI1 Scale	100	0 to 100
AIMx-15	AI1 Remote On Threshold	0	0 to 100
AIMx-16	AI1 Associated Groups	1	1 to 10
AIMx-17	AI2 Function	Not In Use	Not In Use, Highest, Add, Average, Aux. Highest, Aux. Add, Aux. Average
AIMx-18	AI2 Minimum	0	0 to 100
AIMx-19	AI2 Maximum	100	0 to 100
AIMx-20	AI2 Type	0-20mA	0-20mA, 0-10VDC
AIMx-21	AI2 Scale	100	0 to 100
AIMx-22	AI2 Remote On Threshold	0	0 to 100
AIMx-23	AI2 Associated Groups	1	1 to 10
AIMx-24	AI3 Function	Not In Use	Not In Use, Highest, Add, Average, Aux. Highest, Aux. Add, Aux. Average
AIMx-25	AI3 Minimum	0	0 to 100
AIMx-26	AI3 Maximum	100	0 to 100
AIMx-27	AI3 Type	0-20mA	0-20mA, 0-10VDC
AIMx-28	AI3 Scale	100	0 to 100
AIMx-29	AI3 Remote On Threshold	0	0 to 100
AIMx-30	AI3 Associated Groups	1	1 to 10
AIMx-31	AI4 Function	Not In Use	Not In Use, Highest, Add, Average, Aux. Highest, Aux. Add, Aux. Average
AIMx-32	AI4 Minimum	0	0 to 100
AIMx-33	AI4 Maximum	100	0 to 100
AIMx-34	AI4 Type	0-10VDC	0-20mA, 0-10VDC
AIMx-35	AI4 Scale	100	0 to 100
AIMx-36	AI4 Remote On Threshold	0	0 to 100
AIMx-37	AI4 Associated Groups	1	1 to 10
AIMx-38	AI5 Function	Not In Use	Not In Use, Highest, Add, Average, Aux. Highest, Aux. Add, Aux. Average
AIMx-39	AI5 Minimum	0	0 to 100
AIMx-40	AI5 Maximum	100	0 to 100
AIMx-41	AI5 Type	0-10VDC	0-20mA, 0-10VDC
AIMx-42	AI5 Scale	100	0 to 100
AIMx-43	AI5 Remote On Threshold	0	0 to 100
AIMx-44	AI5 Associated Groups	1	1 to 10
AIMx-45	AI6 Function	Not In Use	Not In Use, Highest, Add, Average, Aux. Highest, Aux. Add, Aux. Average

AIMx-46	AI6 Minimum	0	0 to 100
AIMx-47	AI6 Maximum	100	0 to 100
AIMx-48	AI6 Type	0-10VDC	0-20mA, 0-10VDC
AIMx-49	AI6 Scale	100	0 to 100
AIMx-50	AI6 Remote On Threshold	0	0 to 100
AIMx-51	AI6 Associated Groups	1	1 to 10
AIMx-52	AI7 Function	Not In Use	Not In Use, Highest, Add, Average, Aux. Highest, Aux. Add, Aux. Average
AIMx-53	AI7 Minimum	0	0 to 100
AIMx-54	AI7 Maximum	100	0 to 100
AIMx-55	AI7 Type	0-10VDC	0-20mA, 0-10VDC
AIMx-56	AI7 Scale	100	0 to 100
AIMx-57	AI7 Remote On Threshold	0	0 to 100
AIMx-58	AI7 Associated Groups	1	1 to 10

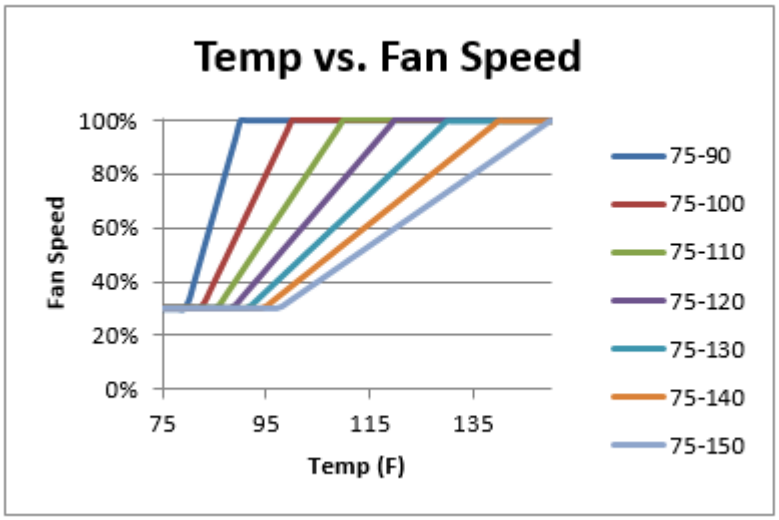
XI. Optimizing Energy Savings

Understanding Fan Speed Modulation, Building Balance, and Smoke Capture

At its core, Melink Corporation believes that all citizens should strive to be efficient with energy usage. Melink would like Kitchen Managers and Maintenance technicians to understand a little bit about how Intelli-Hood operates in order to make smart decisions about the setup and save as much energy as possible.

Melink Corporation assumes that a kitchen is designed for correct amounts of exhaust and supply air before Intelli-Hood is installed. If a kitchen does not have sufficient smoke capture or is out of balance, then the exhaust and supply systems must be corrected before Intelli-Hood is installed. Intelli-Hood cannot correct building imbalances on its own.

Intelli-Hood uses two types of sensors to control fan speed. Temperature sensors installed in the exhaust duct monitor the temperature of the exhaust air. Programming parameters for minimum/ maximum temperature and minimum/maximum speed determine the relationship of fan speed to temperature. The second sensor set is optical sensors. Any time that the optic sensors see smoke or other effluent, the System Controller sends the VFDs to full speed.



Tuning the temperature and speed setpoints is very important to gaining maximum energy savings. One method is to set the Intelli-Hood maximum temperature 10 to 20 degrees Fahrenheit more than the actual maximum temperature of the hood exhaust air. Thus, when there is maximum cooking load with no smoke, the fan runs at 80 to 90% speed, and the only time that the fans will run at 100% speed is when the optical sensors see effluent.

Also, adjusting the minimum speed as low as possible is improves energy savings as well. The default minimum speed is 30%. It is possible to change the minimum speed below 30%; however, one should be aware that when the minimum speed is extremely low, smoke may roll out of the hood before the optic sensors see it and it may cause issues with the motor not being able to spin. Minimum speeds below 30% cause too much stress on fan motors and should not be used.

It should be noted that fan motor energy consumption has a cubic relationship with fan motor speed (per the Fan Laws). Thus, a fan running at 90% of maximum speed uses 73% (0.90 * 0.90 * 0.90) of the energy as the fan running at 100% speed. A fan running at 50% speed uses 13% of the energy. Thus, most of the energy savings come from trimming the high end of the fan speed profile. It is more important to shave off speed at the high end by properly calibrating temperature span than it is to shave off speed at the low end with the minimum speed when looking at motor energy savings. Regardless, it is still important to recognize that a significant portion of energy savings often comes from conditioned air savings, which has a linear relationship with fan speed.

XII. Maintenance

Cleaning the Optic Sensors

The Intelli-Hood Optic Sensors must be cleaned periodically. The time between cleanings will vary depending on the application and quantity of grease in the airstream of a ventilation hood. Optic sensors in applications with high amounts of grease may need to be cleaned a 2 or 3 times per month. Some applications may have optic sensors that can go several months between cleanings.

If the sensors get too much contamination on the lenses, an optic fault will occur. The fans will run at full speed until the sensors are cleaned and reset.

In order to clean the optic sensors, follow the steps below. Cleaning of the optic sensors may be performed with the fans on or off.

- Press the pushbutton latches on the sides of the optic box and remove the cover.
- Wipe the lens of the optic circuit board with a soft, moist cloth
- Replace the cover of the optic box ensuring that the cable connecting the optic box cover to the optic bracket is not in front of the lens.

Cleaning the Hoods

When doing a general cleaning of the kitchen hood, cover the optic sensors with plastic wrap and thick tape before using high pressure water, steam or other cleaning chemicals in the hood.

Do not get any of the circuit boards in any other devices of Intelli-Hood wet.

Cleaning the Temperature Sensors

Temperature sensors rarely need to be cleaned. If extremely large amounts of grease and other contamination build on the sensor, the probes should be brushed or wiped clean.

Maintenance of Touchpad and Aux Touchpad Devices

Do not use a sharp kitchen utensil or other object to press buttons on the Touchpad or Aux Touchpad. Press the buttons with human fingers only.

Clean the keypad surfaces with a moist cloth. Light-duty cleaning chemicals such as Simple-Green and 409 may be used.

XIII. Troubleshooting

Intelli-Hood Touchpad Devices will display fault messages when fault conditions arise. Also, if the Intelli-Hood has internet access and is properly configured, email messages can be sent to owners or managers of the kitchen alerting them of the situation. Aux Touchpads will illuminate their Fault Light, but one must consult a Touchpad in order to see the fault message.

Below is a comprehensive list of potential faults that can occur.

Fault Text	**Meaning**
<Fan Name> VFD Comm. Fault	Lost communication to the VFD for the listed fan
<Fan Name> VFD Fault <VFD Error Code>	VFD tripped with the listed fault code
<Exhaust Hood Name> Temp Fault	Temperature probe is missing
<Exhaust Hood Name> Optic Fault	Optics associated with Exhaust Hood but Hood Controller is configured with optics disabled; Optic receiver signal is too low for detection; Optic receiver missing; Optic emitter missing; Optic receiver signal is too strong for detection
External Fault	A digital input set for External Fault is active
External Alert	A digital input set for External Alert is active
<Device Name> Lost. Comm	Lost communication to the named device. This includes Hood Controllers, Auxiliary Lighting Controllers, Digital Output Modules, Digital Input Modules, Analog Output Modules and Analog Input Modules