

ExactLogic BACnet Communicating Exhaust Fan Controller EXL01650 Sequence Datasheet

Exhaust Fan – Schedule/Temperature/Push Button Control



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Operating Sequence

This Exhaust Fan Controller is able to control two different exhaust fans via temperature control. The fan command can be enabled by an ON for Heat command, ON for Cool command, Scheduled Occupied command, or Manual Override command. EF#1 and EF#2 use different points for the On for Heat command, ON for Cool command, and Manual Override command. However they do use the same Scheduled Occupied command. Damper control can be used with BO-2 associated with EF#1 and BO-3 associated with EF#2. A delay before the fans starting to allow the dampers to open is set with AV-41(EF#1) and AV-42(EF#2) initially set to 30 seconds.

During normal operation the display will show the current room temperature, the status of each exhaust fan command, and if current sensor inputs are provided the current fan amps for each exhaust fan.

Internal/External Thermistor Control

The thermostat control sequence can use the internal thermistor or an external thermistor connected to AI-2. Setting BV-67 to OFF (default) EF#1 will use the internal thermistor. Setting BV-67 to ON EF#1 will use the external thermistor. EF#2 will always use the internal thermistor for its control sequence.

The controlling temperature for EF#1 is located at AV-20. This value will be displayed on the LCD of the thermostat and should be used on any workstation displays. The controlling temperature for EF#2 is located at AI-0.

Control Sequence - ON for Heat or ON for Cool

EF# 1 and EF#2 use different selection points to command each fan ON for Heat or ON for Cool. BV-60 is used for EF#1 and BV-61 is used for EF#2. When these points are set to OFF the cooling command will control the exhaust fan, and when ON the heating command will control the exhaust fan. Each exhaust fan also has separate enable setpoints for the heating and cooling commands. EF#1 uses AV-50 for heat and AV-51 for cool. EF#2 uses AV-52 for heat and AV-53 for cool.

Each exhaust fan can be commanded ON via a Manual Override point, BV-55 for EF#1 and BV-56 for EF#2. Each exhaust fan can also be commanded OFF via a Unit Disable point, BV-65 for EF#1 and BV-66 for EF#2.

Note: Each exhaust fan command has a 60 second ON/OFF anti short cycle.

Control Sequence – Scheduled Occupied

The Schedule Occupied command is controlled by BO-5. EF#1 and EF#2 are both controlled by this point. When commanded ON, both exhaust fans will run until occupancy is commanded OFF.

Each exhaust fan can be commanded ON via a Manual Override point, BV-55 for EF#1 and BV-56 for EF#2. Each exhaust fan can also be commanded OFF via a Unit Disable point, BV-65 for EF#1 and BV-66 for EF#2

Control Sequence – External Occupied

The exhaust fans can be set occupied by an external sensor or switch connected to BI-5. When using an occupancy sensor that is either always ON/OFF set BV-51 to ACTIVE. If the occupancy sensor is a momentary switch, set BV-50 and BV-51 to ACTIVE. When using a momentary switch a user adjustable timeout is set at AV-36. The first press of the switch will activate the timeout and turn the fan ON; after the timeout expires the fan will turn OFF. A second press of the switch, before the timeout expires, will turn the fan off immediately.

Control Sequence – Exhaust Fan Alarm

Exhaust Fan alarms can be triggered from analog or digital current sensors inputs to AI-3/BI-3 for EF#1 and AI-4/BI-4 for EF#2. The analog/digital selection is made with BV-52 for EF #1 and BV-53 for EF #2. Each exhaust fan has its own alarm setpoint, AV-45 for EF#1 and AV-46 for EF#2.

The exhaust fan alarm will be ACTIVE if the exhaust fan amps are below its setpoint for 15 seconds and the exhaust fan command is ON. Each exhaust fan also has separate alarm reset points, BV-26 for EF#1 and BV-36 for EF#2. These resets points will auto reset after 15 seconds.

Motion/Humidity Option Card

The Motion/Humidity Option Card can be used for Motion Only, Humidity Only, or Motion/Humidity together. In order to use the Motion Sensor (either stand alone or with Humidity), BV-64 must be set to ACTIVE. The Humidity Sensor can be enabled by setting AV-31 to 4. These settings will automatically provide the required voltage to power the sensors. The motion sensor status will show on BI-1. Once the motion sensor does not sense motion, the delay at AV-81 is used to delay the ACTIVE to INACTIVE command to the Scheduled Occupied command at BO-5, priority array entry 10. The Humidity value is shown on AI-1. The Humidity Sensor will automatically be scaled by setting AV-31 to 4.

Disabling of the Splash, Setup Menu, or Field Service Mode

When the thermostat is installed in a public location there may be times when the setup of the thermostat will need to be disabled to prevent tenants from changing the configuration while still giving them access to change the setpoints and control after hours modes. The following points have been added to allow this:

- BV-57 = Setting ACTIVE will disable the “EXACTLOGIC” splash display after key presses
- BV-58 = Setting ACTIVE will disable access to the Setup Menu where the Network/MAC/Baud Rate/etc are set
- BV-59 = Setting ACTIVE will disable access to the Field Service Mode where Time/Schedule/Setpoints/etc are set

Installation

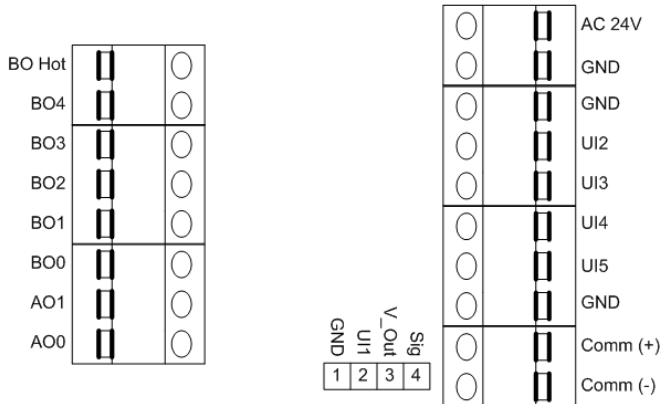


Fig. 4

*Note: Thermostat Common Relay point (BO Hot) usually 24VAC/DC or R

AC 24V 24VAC/DC Hot
 GND Neutral/Ground
 GND Neutral/Ground
 UI2..... Universal Input 2
 UI3..... Universal Input 3
 UI4..... Universal Input 4
 UI5..... Universal Input 5
 GND Neutral/Ground
 Comm (+)..... Network Positive Line
 Comm (-) Network Negative Line
 BO Hot..... Com, 24VAC Hot for relays*
 BO4 Relay 5 Output, 24VAC/DC
 BO3 Relay 4 Output, 24VAC/DC
 BO2 Relay 3 Output, 24VAC/DC
 BO1 Relay 2 Output, 24VAC/DC
 BO0 Relay 1 Output, 24VAC/DC
 AO1 Analog Output 1, 0-10V
 AO0 Analog Output 0, 0-10V

1 Neutral/Ground
 2 Universal Input 1
 3 Analog Output 2
 4 Reserved

Output Wiring

Output/Label	Operation
BO0	Exhaust Fan #1 Start/Stop
BO1	Exhaust Fan #2 Start/Stop
BO2	Exhaust Fan #1 Damper
BO3	Exhaust Fan #2 Damper
BO4	
AO0	
AO1	

Reserved BACnet Points

The following are points reserved by the thermostat for operation.

Analog Inputs

Instance	Object Name	Description	Read/Write	Default
AI-0	Room Temp-Internal	Reading of the internal thermistor in counts. 0-1024	R	variable
AI-1	Humidity	Reading from the Humidity sensor add-on card	R	variable
AI-2	Ext. EF #1 Room Temp	Optional external room temperature input	R	variable
AI-3	EF #1 Amp Sensor	Current sensor for exhaust fan #1 status	R	variable
AI-4	EF #2 Amp Sensor	Current sensor for exhaust fan #2 status	R	variable
AI-5	Analog Input 05	Reading of the external input 5 in counts. 0-1024	R	variable

Analog Outputs

Instance	Object Name	Description	Read/Write	Default
AO-0	Analog Output 0	0-10V output for control of heating	R/W	0.0
AO-1	Analog Output 1	0-10V output for control of cooling	R/W	0.0
AO-2	Analog Output 2	Variable 0-14VDC, 150mA output	R/W	0.0

Analog Values

Instance	Object Name	Description	Read/Write	Default
AV-0	Mode of Operation	The mode that the thermostat is currently in. 0 = Heat Mode 1 = Cool Mode 2 = Idle 3 = Afterhours 4 = Unoccupied Idle 5 = Unoccupied Heat Mode 6 = Unoccupied Cool Mode	R	4
AV-1				
AV-2				
AV-3				
AV-4	Reserved	This point is reserved for internal thermostat use and its value cannot be changed		
AV-5	Reserved	This point is reserved for internal thermostat use and its value cannot be changed		
AV-6	Reserved	This point is reserved for internal thermostat use and its value cannot be changed		
AV-7	Reserved	This point is reserved for internal thermostat use and its value cannot be changed		
AV-8				

AV-9				
AV-10	PBMode 1=On	This point is reserved for internal thermostat use and its value cannot be changed	R	0
AV-11				
AV-12				
AV-13				
AV-14				
AV-15				
AV-16				
AV-17				
AV-18				
AV-19				
AV-20	EF#1 Room Temp	Selected from either AI-0 or AI-2. BV-67 is used for selection. This is the value displayed on the LCD of the thermostat and is used to control EF #1.	R	variable
AV-21				
AV-22				
AV-23				
AV-24				
AV-25				
AV-26				
AV-27				
AV-28				
AV-29				
AV-30	AI-0 Setup	Parameter used to set the input type. 0 = counts 1 = temperature 2 = 4-20mA 3 = 0-5V 4 = 0-10V 5 = pulse	R	1
AV-31	AI-1 Setup	See AV-30	R	0
AV-32	AI-2 Setup	See AV-30	R	1
AV-33	AI-3 Setup	See AV-30	R	0
AV-34	AI-4 Setup	See AV-30	R	0
AV-35	AI-5 Setup	See AV-30	R	0
AV-36	Momentary Switch Delay	The delay that is triggered after the first press of a momentary switch used for occupancy. This is the amount of time the fan will run before turning off automatically.	R/W	3600 sec
AV-37				
AV-38				
AV-39				
AV-40				
AV-41	EF#1 Fan Start Delay	Delay preventing the fans from starting before the damper opens.	R/W	30 sec
AV-42	EF#2 Fan Start Delay	Delay preventing the fans from starting before the damper opens.	R/W	30 sec
AV-43				
AV-44				
AV-45	EF#1 Fan Alarm	When EF #1 fan amps are below this setpoint,	R/W	2A

	SP	trigger an alarm		
AV-46	EF#2 Fan Alarm SP	When EF #2 fan amps are below this setpoint, trigger an alarm	R/W	2A
AV-47				
AV-48				
AV-49				
AV-50	EF#1 Heat SP	The setpoint used to turn EF #1 ON for a Heat	R/W	60 F
AV-51	EF#1 Cool SP	The setpoint used to turn EF #1 ON for a Cool	R/W	80 F
AV-52	EF#2 Heat SP	The setpoint used to turn EF #2 ON for a Heat	R/W	60 F
AV-53	EF#2 Cool SP	The setpoint used to turn EF #2 ON for a Cool	R/W	80 F
AV-54				
AV-55	Trigger Deadband	Offset added to the Htg/Clg Setpoint to trigger the fan command	R/W	1° F
AV-56	Reset Deadband	Offset subtracted from the Htg/Clg Setpoint to reset the fan command	R/W	1° F
AV -57				
AV-58	Reserved	This point is reserved for internal thermostat use and its value cannot be changed	R	
AV-59	Ave Time Base	Factor used to average the room temperature. A small number will allow the room temperature to change faster over time. A large number will cause the room temperature to change slower over time.	R	100
AV-60	Cal Offset	The calibration offset for the internal thermistor.	R	variable
AV-61	Reserved	This point is reserved for internal thermostat use and its value cannot be changed	R	
AV-62	Reserved	This point is reserved for internal thermostat use and its value cannot be changed	R	
AV-63	Reserved	This point is reserved for internal thermostat use and its value cannot be changed	R	
AV-64	Reserved	This point is reserved for internal thermostat use and its value cannot be changed	R	
AV-65	Reserved	This point is reserved for internal thermostat use and its value cannot be changed	R	
AV-66	Reserved	This point is reserved for internal thermostat use and its value cannot be changed	R	
AV-67	Reserved	This point is reserved for internal thermostat use and its value cannot be changed	R	
AV-68	Reserved	This point is reserved for internal thermostat use and its value cannot be changed	R	
AV-69	Reserved	This point is reserved for internal thermostat use and its value cannot be changed	R	
AV-70	Reserved	This point is reserved for internal thermostat use and its value cannot be changed	R	
AV-71	Reserved	This point is reserved for internal thermostat use and its value cannot be changed	R	
AV-72	Reserved	This point is reserved for internal thermostat use and its value cannot be changed	R	
AV-73	After Hours Limit	The maximum hours the thermostat is allowed to run during afterhours time. Setting this will set the thermostat to occupied operation. (0-99.9 hrs)	R/W	5.0 hrs
AV-74	After Hours Timer	The current amount of afterhours time left.	R	0.0 hrs
AV-75	Reserved	This point is reserved for internal thermostat use	R	0

		and its value cannot be changed		
AV-76	Reserved	This point is reserved for internal thermostat use and its value cannot be changed	R	0
AV-77	Reserved	This point is reserved for internal thermostat use and its value cannot be changed	R	0
AV-78	Reserved	This point is reserved for internal thermostat use and its value cannot be changed	R	0
AV-79	Reserved	This point is reserved for internal thermostat use and its value cannot be changed	R	0
AV-80	Reserved	This point is reserved for internal thermostat use and its value cannot be changed	R	0
AV-81	Motion OFF Delay	The amount of time to delay the ON->OFF transition of the motion sensor occupied command after no motion is detected	R/W	900 sec
AV-82	Analog Value 082			
AV-83	Analog Value 083			
AV-84	Analog Value 084			
AV-100	Analog Value 100	Internal thermistor display descriptor. The present value is automatically transferred. The AV description holds the descriptor to display.	R	variable
AV-101	Analog Value 101	EF#1 Command. The AV description holds the descriptor to display.	R/W	
AV-102	Analog Value 102	EF#1 Amps. The AV description holds the descriptor to display	R/W	
AV-103	Analog Value 103	EF#2 Command. The AV description holds the descriptor to display	R/W	
AV-104	Analog Value 104	EF#2 Amps. The AV description holds the descriptor to display	R/W	
AV-105	Analog Value 105	EF#1 On/Off Status. The AV description holds the descriptor to display	R/W	
AV-106	Analog Value 106	EF#2 On/Off Status. The AV description holds the descriptor to display	R/W	
AV-107	Analog Value 107	Display descriptor. Transfer the value to display to the present value. The AV description holds the descriptor to display	R/W	
AV-108	Analog Value 108	Display descriptor. Transfer the value to display to the present value. The AV description holds the descriptor to display	R/W	
AV-109	Analog Value 109	Display descriptor. Transfer the value to display to the present value. The AV description holds the descriptor to display	R/W	
AV-110	Analog Value 110	Display descriptor. Transfer the value to display to the present value. The AV description holds the descriptor to display	R/W	
AV-111	Analog Value 111	Display descriptor. Transfer the value to display to the present value. The AV description holds the descriptor to display	R/W	
AV-112	Analog Value 112	Outside Air Display descriptor. Transfer the value to display to the present value. The AV description holds the descriptor to display	R/W	

Binary Inputs

Instance	Object Name	Description	Read/Write	Default
BI-0			R	
BI-1	Motion	Motion sensor status from the add-on card	R	
BI-2			R	
BI-3	EF#1 Fan Status	EF#1 digital fan status	R	
BI-4	EF#2 Fan Status	EF#2 digital fan status	R	
BI-5	Ext Occupied Relay	Optional occupied relay/switch	R	

Binary Outputs

Instance	Object Name	Description	Read/Write	Default
BO-0	EF#1 S/S	Exhaust Fan #1 Start/Stop command	R/W	OFF
BO-1	EF#2 S/S	Exhaust Fan #2 Start/Stop command	R/W	OFF
BO-2	EF#1 Damper	Exhaust Fan #1 Damper Output	R/W	OFF
BO-3	EF#2 Damper	Exhaust Fan #2 Damper Output	R/W	OFF
BO-4	Binary Output 4		R/W	OFF
BO-5	Scheduled Occupied	Logical point only. Used for scheduling purposes. INACTIVE is unoccupied.	R/W	OFF

Binary Values

Instance	Object Name	Description	Read/Write	Default
BV-0	Binary Value 000			
BV-1	Binary Value 001			
BV-2	PB Toggle Status	This point is reserved for internal thermostat use and its value cannot be changed	R	
BV-3	BI-5 EF On Status	This point is reserved for internal thermostat use and its value cannot be changed	R	
BV-4				
BV-5				
BV-6				
BV-7				
BV-8				
BV-9				
BV-10	Program Status	Used to determine if the sequence was loaded correctly on a BACnet Restore or power up.	R	OFF
BV-11				
BV-12				
BV-13				
BV-14				
BV-15				
BV-16				
BV-17				
BV-18				
BV-19				
BV-20				

BV-21				
BV-22				
BV-23				
BV-24				
BV-25	EF#1 Fan Alarm	EF#1 fan amps are below setpoint. The alarm status must be on for 15 seconds, and the fan command must be on.	R	OFF
BV-26	EF#1 Fan Alarm Reset	Resets EF#1 alarm	R/W	OFF
BV-27	EF#1 Fan Amps Status	Status of the EF1 alarm before the 15 second delay	R	OFF
BV-28				
BV-29				
BV-30	EF#1 Heat Status	Status of the exhaust fans ON for Heat command	R	OFF
BV-31	EF#1 Cool Status	Status of the exhaust fans ON for Cool command	R	OFF
BV-32	EF#2 Heat Status	Status of the exhaust fans ON for Heat command	R	OFF
BV-33	EF#2 Cool Status	Status of the exhaust fans ON for Cool command	R	OFF
BV-34	Binary Value 034			
BV-35	EF#2 Fan Alarm	EF#2 fan amps are below setpoint. The alarm status must be on for 15 seconds, and the fan command must be on.	R	OFF
BV-36	EF#2 Fan Alarm Reset	Resets EF#2 alarm	R/W	OFF
BV-37	EF#2 Fan Amps Status	Status of the EF#2 alarm before the 15 second delay	R	OFF
BV-38				
BV-39				
BV-40	Occupied Status	The status of this point switches the thermostats occupancy settings. ON when the thermostat is in Occupied Setpoint Mode or After Hours Mode.	R	OFF
BV-41	Warmup	A Warmup command has been sent to the thermostat. When ON the thermostat will switch to occupied settings.	R/W	OFF
BV-42	Cooldown	A Cooldown command has been sent to the thermostat. When ON the thermostat will switch to occupied settings.	R/W	OFF
BV-43	Occ Set point Mode	The thermostat has been commanded occupied via BO-5, or a Warmup/Cooldown command has been sent via BV-41/BV-42.	R	OFF
BV-44	After Hours Status	The thermostat has been set to after hours mode. When ON the thermostat will switch to occupied settings.	R	OFF
BV-45	Reserved	This point is reserved for internal thermostat use and its value cannot be changed	R	Off
BV-46	EF#1 S/S Status	Status point for the EF#1 command	R	OFF
BV-47	EF#2 S/S Status	Status point for the EF#2 command	R	OFF
BV-48				
BV-49	Update Descriptors	When ON descriptor changes are sent to the thermostats LCD, this point will auto reset to OFF.	R/W	OFF
BV-50	BI-5 Momentary Switch	Set ACTIVE when using a momentary switch for occupancy	R/W	OFF
BV-51	BI-5 for Occupancy	ON = BI will be used to indicate zone occupancy OFF = BI is not used for occupancy	R/W	OFF

BV-52	EF#1 Fan Status Digital	OFF= Fan Status determined by analog current sensor ON Fan Status determined by digital current switch	R/W	OFF
BV-53	EF#2 Fan Status Digital	OFF= Fan Status determined by analog current sensor ON Fan Status determined by digital current switch	R/W	OFF
BV-54				
BV-55	EF#1 Manual Override	When ON, the exhaust fan run command will remain on	R/W	OFF
BV-56	EF#2 Manual Override	When ON, the exhaust fan run command will remain on	R/W	OFF
BV-57	Disable Splash	When ACTIVE, the "EXACTLOGIC" splash will not show after key presses	R/W	OFF
BV-58	Disable Setup Menu	When ACTIVE, there will be no access to the Setup Menu where the Network/MAC/Baud Rate is set	R/W	OFF
BV-59	Disable FSM Menu	When ACTIVE, there will be not access to the Field Service Mode where the Time/Schedule/Point Access is set	R/W	OFF
BV-60	EF#1 ON for H/C	Selects if the exhaust fan will run on a heat command or cool command. OFF = Cool, ON = Heat	R/W	OFF
BV-61	EF#2 ON for H/C	Selects if the exhaust fan will run on a heat command or cool command. OFF = Cool, ON = Heat	R/W	OFF
BV-62				
BV-63				
BV-64	Enable Motion	When ACTIVE, the power to the Motion add-on card is set to the proper voltage	R/W	OFF
BV-65	EF#1 Disable	When ON, the exhaust fan will remain OFF	R/W	OFF
BV-66	EF#2 Disable	When ON, the exhaust fan will remain OFF	R/W	OFF
BV-67	EF#1 Room Temp Select	When OFF, the internal thermistor is selected for the control of EF#1. When ON, an external thermistor attached to AI-2 is selected for control of EF#1	R/W	OFF
BV-68	Backlight Off/On	When ON the LCD backlight will remain on	R/W	OFF
BV-69				
BV-70	Reserved	This point is reserved for internal thermostat use and its value cannot be changed		
BV-71	C/F	Sets the thermostat to display temperatures in Celsius or Fahrenheit. This point is set through the setup menu. ON = F, OFF = C	R	ON
BV-72				
BV-73				
BV-74	Reserved	This point is reserved for internal thermostat use and its value cannot be changed		
BV-100	Binary Value 100	Enable internal thermister descriptor	R/W	ON
BV-101	Binary Value 101	Enable descriptor	R/W	ON
BV-102	Binary Value 102	Enable descriptor	R/W	ON
BV-103	Binary Value 103	Enable descriptor	R/W	ON

BV-104	Binary Value 104	Enable descriptor	R/W	ON
BV-105	Binary Value 105	Enable descriptor	R/W	OFF
BV-106	Binary Value 106	Enable descriptor	R/W	OFF
BV-107	Binary Value 107	Enable descriptor	R/W	OFF
BV-108	Binary Value 108	Enable descriptor	R/W	OFF
BV-109	Binary Value 109	Enable descriptor	R/W	OFF
BV-110	Binary Value 110	Enable descriptor	R/W	OFF
BV-111	Binary Value 111	Enable descriptor	R/W	OFF
BV-112	Binary Value 112	Enable outside air descriptor	R/W	OFF