

WHITE-RODGERS™

50D50U-843

ALL-SPARK™

## 24V Non-Integrated Spark Ignition Module INSTALLATION INSTRUCTIONS

**FAILURE TO READ AND FOLLOW ALL INSTRUCTIONS CAREFULLY BEFORE INSTALLING OR OPERATING THIS CONTROL COULD CAUSE PERSONAL INJURY AND/OR PROPERTY DAMAGE.**

### DESCRIPTION

The All-Spark™ 50D50U-843 is a non-integrated 24V single stage spark ignition module. This module is designed to replace either 24V Intermittent Pilot (IP) or 24V Direct Spark Ignition (DSI) applications. Additional modifications can be made to replace applications with a rollout switch or edge card harness.

The module is factory set to match Honeywell S8610U Intermittent Pilot default settings (See Table 1). To replace Fenwal, Robertshaw, Johnson Controls, BASO, Carrier and other valid part numbers, additional configuration through the White-Rodgers Connect Mobile App or 7-segment display is available.

Agency Approval: ANSI Z21.20 Standard through UL



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### INCLUDED IN THE BOX

- 1 – 50D50U-843 Ignition Module
- 1 – 11-pin Harness Assembly
- 1 – Vent Damper Jumper Plug (installed on module)
- 1 – Local Flame Sense Jumper Wire (installed on module)
- 6 – 3/16" QC crimp on terminals
- 4 – 1" Sheet Metal Mounting Screws
- 1 – 1/4" 14-16 AWG QC and shrink wrap sleeve
- 1 – Fault Code Label for optional use
- 1 – Installation Instructions

### VIEW INSTALLATION RESOURCES



### ELECTRICAL SPECIFICATIONS

Specification	Value	Unit
Input Voltage	18-30	VAC
Input Current Max	800	mA
Line Frequency	50/60	Hz
Inducer Relay at 120V	3.0/6.0	FLA/LRA
Inducer Relay at 240V	1.5/3.0	FLA/LRA
Main Gas Valve Relay Max (Direct Spark System Only)	4.0	Amp
Main Gas Valve Relay Max (Intermittent Pilot System)	2.0	Amp
Pilot Gas Valve Relay Max	2.0	Amp
Alarm Relay	1.0	Amp
Flame Current to indicate Flame Loss	< 0.50	µA DC
Spark Rate	20	Hz
Spark Gap	0.1-0.2	inches

#### OPERATING TEMPERATURE RANGE

-40° to 176°F (-40° to 80°C)

#### HUMIDITY RANGE:

5 to 95% relative humidity (non-condensing)

#### MOUNTING AND INSTALLING:

Leave at least ¼ in. clearance between sides of module and grounded metal

#### TIMINGS:

See Table 1 on page 3.

#### GASES APPROVED:

Natural, Manufactured, Mixed, Liquid Petroleum, LP Gas Air Mixtures



**Failure to comply with the following warnings could result in personal injury or property damage**

- Installation should be done by a qualified heating and air conditioning contractor or licensed electrician.
- All wiring must conform to local and national electrical codes and ordinances.
- Following installation or replacement, follow manufacturer's recommended installation/service instructions to ensure proper operation.

#### **FIRE HAZARD**

- Do not exceed the specified voltage.
- Protect control from direct contact with water (dripping, spraying, rain, etc.).
- If the control has been in direct contact with water, replace the control.
- Label all wires before disconnection when servicing controls. Wiring errors can cause improper and dangerous operation.
- Route and secure wiring away from flame.

#### **SHOCK HAZARD**

- Disconnect electric power before servicing.
- Ensure proper earth grounding of appliance.
- Ensure proper connection of line neutral and line hot wires.
- Ensure control has 1/4" clearance between all sides of control and grounded metal.

#### **EXPLOSION HAZARD**

- Shut off main gas to appliance until installation is complete.



## MOBILE APP CONFIGURATION (PREFERRED)

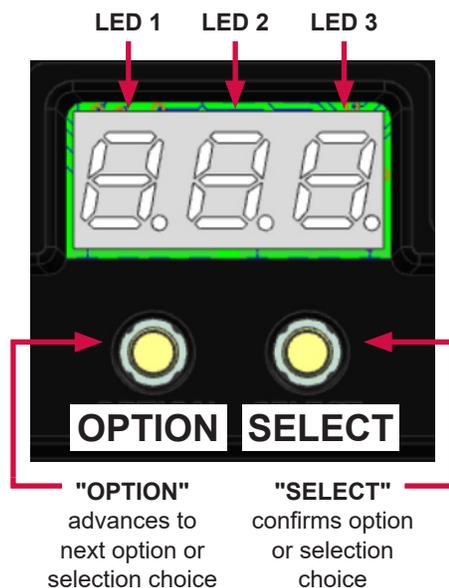
### For fastest setup, use White-Rodgers Connect App:

1. Download from iOS App Store or Google Play Store
2. Open White-Rodgers Connect App
3. Touch "Connect to Control" on the home page
4. Place Device above NFC Logo on Module, wait for check mark
5. Configure all settings in App
6. Touch "Update Control"
7. Place Device above NFC Logo on Module, wait for check mark

- App tutorial available on homepage of White-Rodgers Connect
- NFC available on iOS 13 and greater (iPhone 7 and up) and all Android devices



## ON BOARD CONFIGURATION (7-SEGMENT OPTION)



### General LED Display Details:

	Condition	LED Display	Description
	Module Power Up	888	During power up, each LED will be steady.
Integrated TSTAT = OFF	Standby	0n	Normal operation on powered systems, no heat call present
Integrated TSTAT = ON	Standby	00F	Normal operation with no heat call; LED 1 and 2 displays the current temperature and LED 3 displays the unit

### Additional Notes:

- User is only allowed to enter menu when module is in standby
- Standby is only available on systems that power the module with dedicated 24V (to access menu on systems that power module only through TH-W, see table below)
- Module will ignore heat call when menu is open

### Configuration Menu Operation:

	Action	Module Status	Button Press	Duration
Module powered by 24V	Enter Configuration Menu	In Standby (Integrated TSTAT = OFF)	OPTION	< 3 seconds
Module powered by TH-W	Enter Configuration Menu	Unpowered	OPTION while applying 24V to TH-W terminal	> 3 seconds
Module powered by 24V	Enter Configuration Menu	In Standby (Integrated TSTAT = ON)	OPTION	> 3 seconds
	Advance 1 Option Menu Item	In Configuration Menu	OPTION	< 2 seconds
	Enter Selections Menu Level	At Options Menu Level	SELECT	< 2 seconds
	Advance 1 Selection Item	At Selections Menu Level	OPTION	< 2 seconds
	Confirm Selection	On Chosen Selection	SELECT	< 2 seconds
Integrated TSTAT = OFF	Exit Configuration Menu	On No. 3.0* in Configuration Menu	OPTION	< 2 seconds
Integrated TSTAT = ON	Exit Configuration Menu	On No. 3.5* in Configuration Menu	OPTION	< 2 seconds

\*See Table 1 on Page 3 for Configuration Menu Options and Selections

**Table 1: Configuration Menu Options**

\* Factory Default Setting

No.	Menu Item	LED 1 (flash)	LEDs 2 & 3 Display	Unit	Description / Rule
1.0	System Ignition Type	5 4 5	IP*, dS	N/A	Intermittent Pilot (IP) or Direct Spark (DS)
<b>1. IP System menu will be displayed if System Ignition Type is set to 'IP'</b>					
1.1	Tries for Ignition	t r y	C* (continuous), 1, 2, 3	N/A	Number of times the module will retry ignition before going to auto restart delay.
1.2	Trial for Ignition (TFI) Timing	1 9 n	90*, 4, 15, 30, 60	Seconds	The time the module will spark for each try
1.3	Pre-purge	P r E	0*, 15, 30, 45	Seconds	Delay time before spark ignition attempt
1.4	Inter-purge	l n t	0*, 15, 30, 45	Seconds	Delay time in-between spark attempts
1.5	Flame Sense Type	F L S	LCL*, rEt	N/A	Local (LCL) or Remote (rEt) flame sense.
1.6	Auto Restart Time	A U t	5*, 60	Minutes	Delay time after module reports Gas Valve Off Lockout or No Flame During TFI Error. Module resets and goes back to standby.
1.7	Reset to Default	C F d	no*, YES	N/A	Reset IP system selections back to default
1.8	Integrated Thermostat	t S t	OFF*, On	N/A	If ON, install Integrated Thermostat Temperature Sensor and see No. 3.1 for more selections
<b>2. DS system menu will be displayed if System Ignition Type is set to 'DS'</b>					
2.1	Tries for Ignition	t r y	1*, 2, 3	N/A	Number of times the module will retry ignition before going to auto restart delay.
2.2	Trial for Ignition Timing	1 9 n	4*, 7, 10, 11, 15, 21	Seconds	The time the module will spark for each try
2.3	Pre-purge	P r E	30*, 45, 0, 15	Seconds	Delay time before spark ignition attempt
2.4	Inter-purge	l n t	30*, 45, 90, 0, 15	Seconds	If 2 or 3 tries for ignition are selected, 0 seconds inter-purge will not be available
2.5	Post-purge	P S t	0*, 5, 15, 30	Seconds	Delay time after heat call has ended
2.6	Flame Sense Type	F L S	Lcl*, rEt	N/A	Local (LCL) or Remote (rEt) flame sense
2.7	Auto Restart Time	A U t	5*, 60	Minutes	Delay time after module reports Gas Valve Off Lockout or No Flame During TFI Error. Module resets and goes back to standby.
2.8	Inducer/Pressure Switch Option	l n d	On*, OFF	N/A	If module being replaced has inducer/pressure switch option, enable this setting to ON
2.9	Reset to Default	C F d	no*, YES	N/A	Reset DS system selections back to default
2.10	Integrated Thermostat	t S t	OFF*, On	N/A	If ON, Install Integrated Thermostat Temperature Sensor and see No. 3.1 for more selections
<b>3. Integrated Thermostat selections will be available if No. 1.8 or 2.10 is set to 'ON'</b>					
3.1	Temperature Unit	S C L	aF*, aC	N/A	Fahrenheit or Celsius
3.2	Temperature Offset	0 F 5	-9 - 0* - 9 (°F)	°F	This is the desired temperature for the space being heated
			-5 - 0* - 5 (°C)	°C	
3.3	Cycle Rate	C Y C	SLo, nor*, FSt	N/A	Slow, Normal, Fast
3.4	Reset to Default	t F d	no*, YES	N/A	Reset Integrated Thermostat selections to default
<b>Temperature Set Point Range**</b>			40 - 80 60*	°F	(Set Point - Offset) cannot be less than 40 °F (5 °C) or greater than 80 °F (27 °C)
			5 - 27 20*	°C	

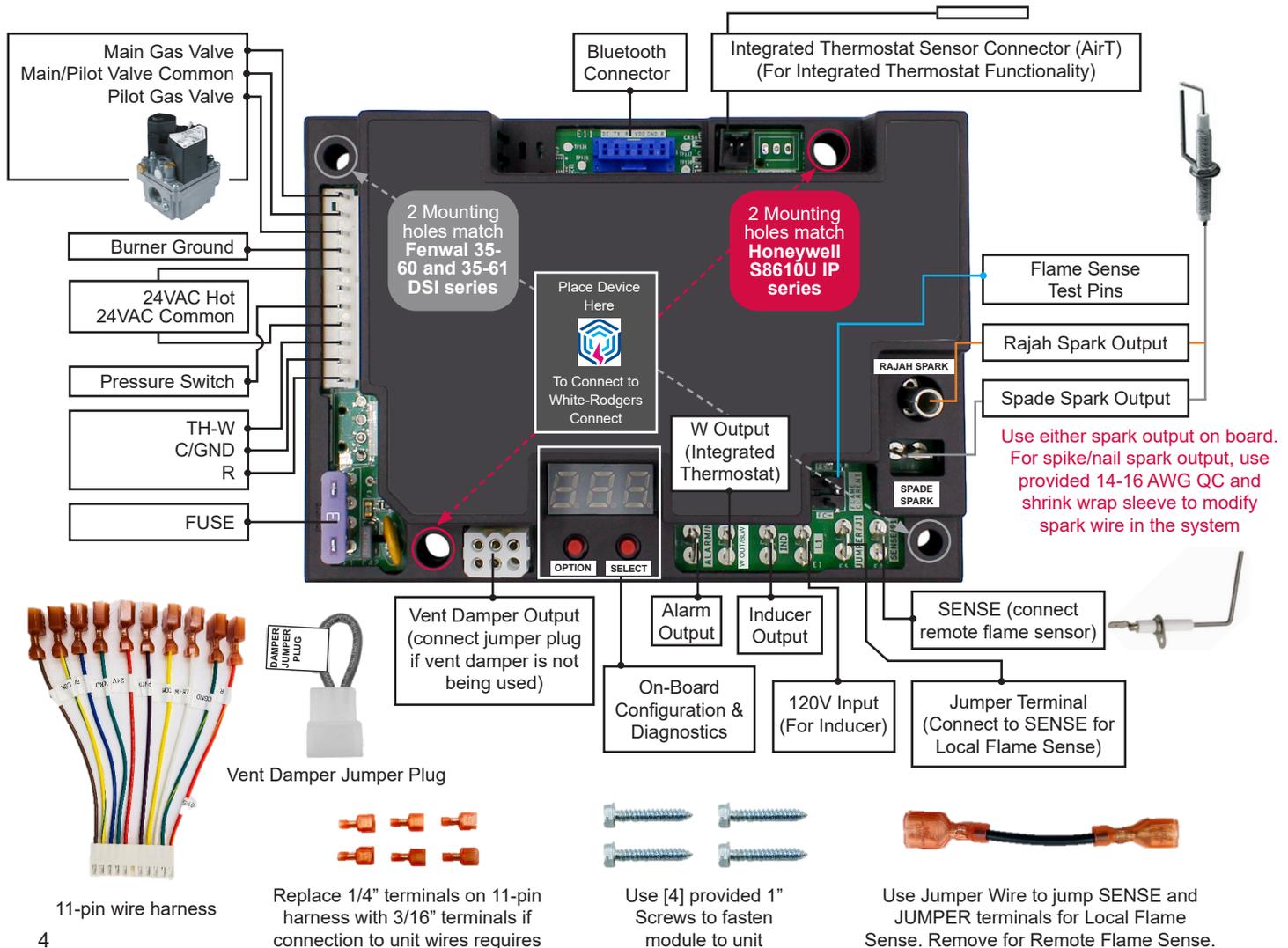
\*\*To view/change Set Point value, press OPTION after No. 3.4 (module exits menu and goes to standby), press OPTION again and the current Set Point will be shown. For further configuration, see Integrated Thermostat section on page 8.

# INSTALLATION

## MOUNTING AND WIRING DIAGRAM

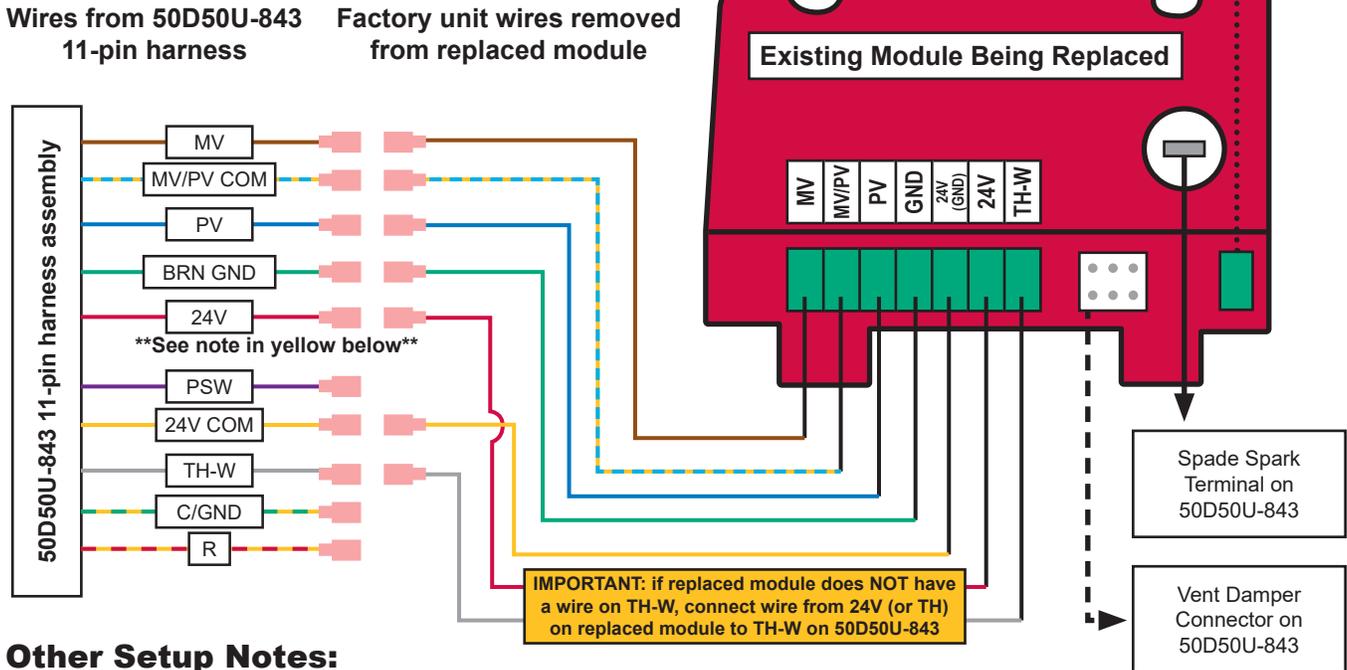
NOTE: All wiring should be installed according to local and national electrical codes and ordinances

1. If using White-Rodgers Connect to configure, connect to app and configure settings of new module before installation. If not using app to configure, skip this step.
2. Disconnect electrical power and gas supply to unit, then remove unit access panels.
3. Individually disconnect and transfer each wire from the existing module and connect to appropriate QC terminal on 50D50U-843 11-pin harness or dedicated spade terminals on 50D50U-843 module. Once all wires have been transferred, remove existing module. **TIP:** first take pictures of old setup for reference.
  - Strip and re-wire 11-pin harness with provided 3/16" loose QC terminals if necessary
4. 50D50U-843 can be mounted in any orientation. Select a location that will not damage, obstruct or place any stress on the terminations or harness. Ensure a clearance of 1/4" between the sides of module and grounded metal.
5. Mount 50D50U-843 in the unit using mounting holes noted below. Be certain not to damage any components such as transformers, wire harness or blower wheels when drilling or installing screws.
6. Take note and match old control's damper plug and flame sense operation with the new 50D50U-843.
  - Example: if old module had damper plug and remote flame sensor installed, keep damper plug installed on 50D50U-843 and remove jumper wire for remote flame sense.
7. Plug 11-pin harness with wires transferred from old module to new 50D50U-843. Ensure all wires are secured to harness.
8. Reconnect electric power to unit.
9. If not using White-Rodgers Connect to configure, use 7-segment LED Display to change settings to match old module. See page 2 on how to enter and operate Configuration menu and page 3 for explanation of settings.
10. Install Fault Code Label in a viewable location.
11. Reinstall unit access panels and reconnect gas supply to the unit.
12. Verify unit is operating correctly per the configuration selected.



## When replacing Honeywell S8610U – Intermittent Pilot (IP)

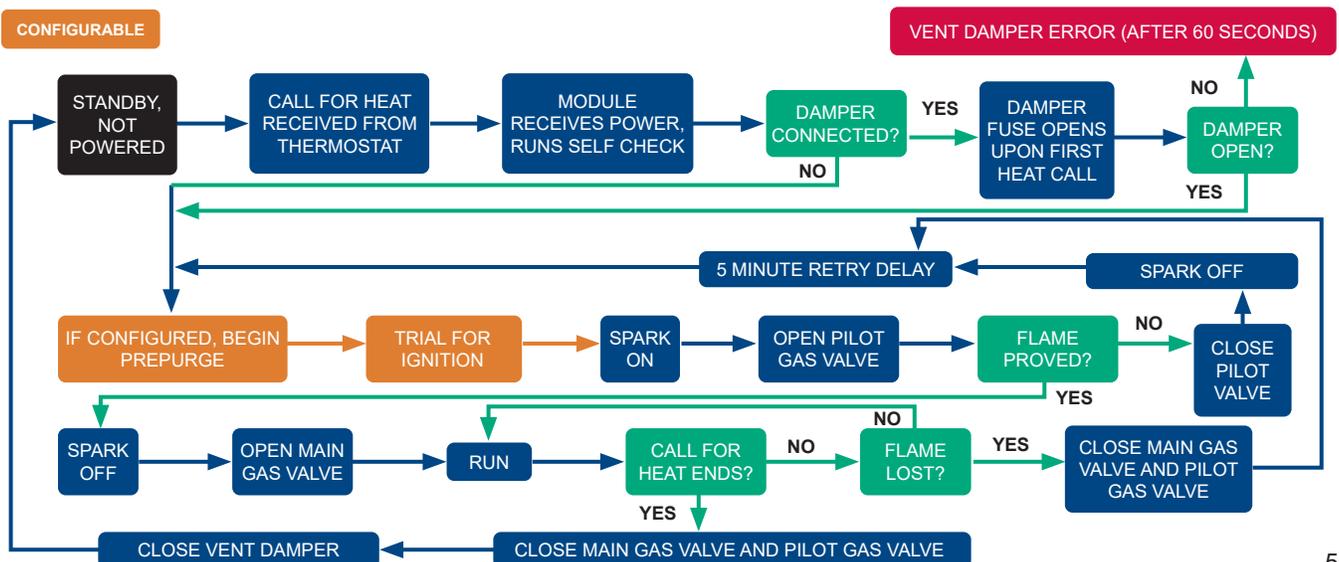
**Default Settings for 50D50U-843  
match S8610U Default Settings**



### Other Setup Notes:

- Keep vent damper jumper plug installed on 50D50U-843 if replaced module has it installed
  - When installing 50D50U-843 with this setup, leave 24V terminal on 50D50U-843 unconnected and insulated (module will receive power from TH-W)
- To use module with a vent damper, remove vent damper jumper plug and connect damper harness assembly to vent damper connector on 50D50U-843
- Once 50D50U-843 receives power with a vent damper connected, an internal circuit will open (non-reversible; module with the jumper plug will no longer work)
- If there is no TH-W terminal on the replaced module, connect the wire from 24V or 25V (2) terminal on old module to TH-W on new 50D50U-843 and leave 24V on 50D50U-843 unconnected and insulated
- For systems with air proving switch (APS), connect output of APS to TH-W on 50D50U-843
- If default settings are not being used on replaced S8610U, match correct settings to 50D50U-843 through White-Rodgers Connect App or 7-segment Configuration Menu
- Follow all safety guidelines on page 1 and directions under **MOUNTING AND WIRING DIAGRAM** on page 4

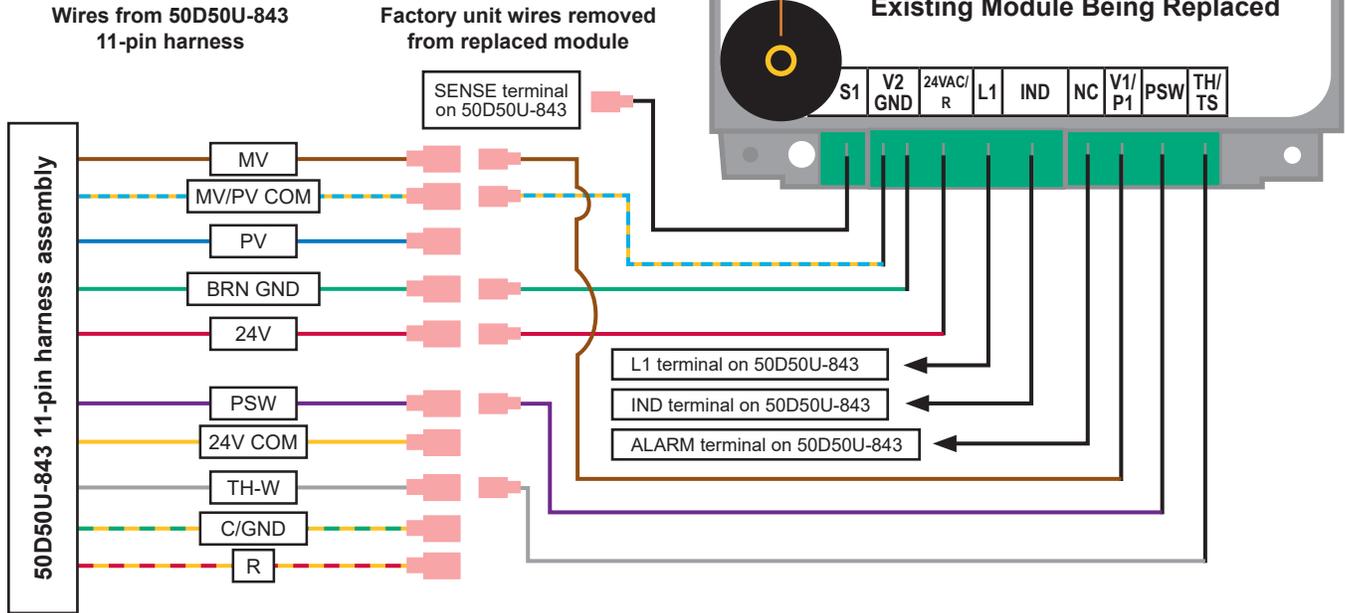
### Sequence of operation when 50D50U-843 is configured to replace S8610U:



# When replacing Fenwal 35-60 or 35-61 – Direct Spark Ignition (DSI)

## To Configure Module:

1. Determine the configuration and timings for the module being replaced. Can be found from manufacturer literature or label on module.
2. Use White-Rodgers Connect OR 7-segment LED and follow Table 1 to select proper settings.



## Other Setup Notes:

- If module being replaced does not have a terminal shown in the diagram above, leave that wire in the 50D50U-843 11-pin harness unconnected and insulated to prevent possibility of a short-circuit
  - For example, the 35-60 DSI series does not have 24VAC/R, so leave the 24V wire on 50D50U-843 un-used when replacing any module in the 35-60 DSI series
- Follow all safety guidelines on page 1 and directions under **MOUNTING AND WIRING DIAGRAM** on page 4

## Sequence of operation when 50D50U-843 is Configured to Replace 35-60 or 35-61:

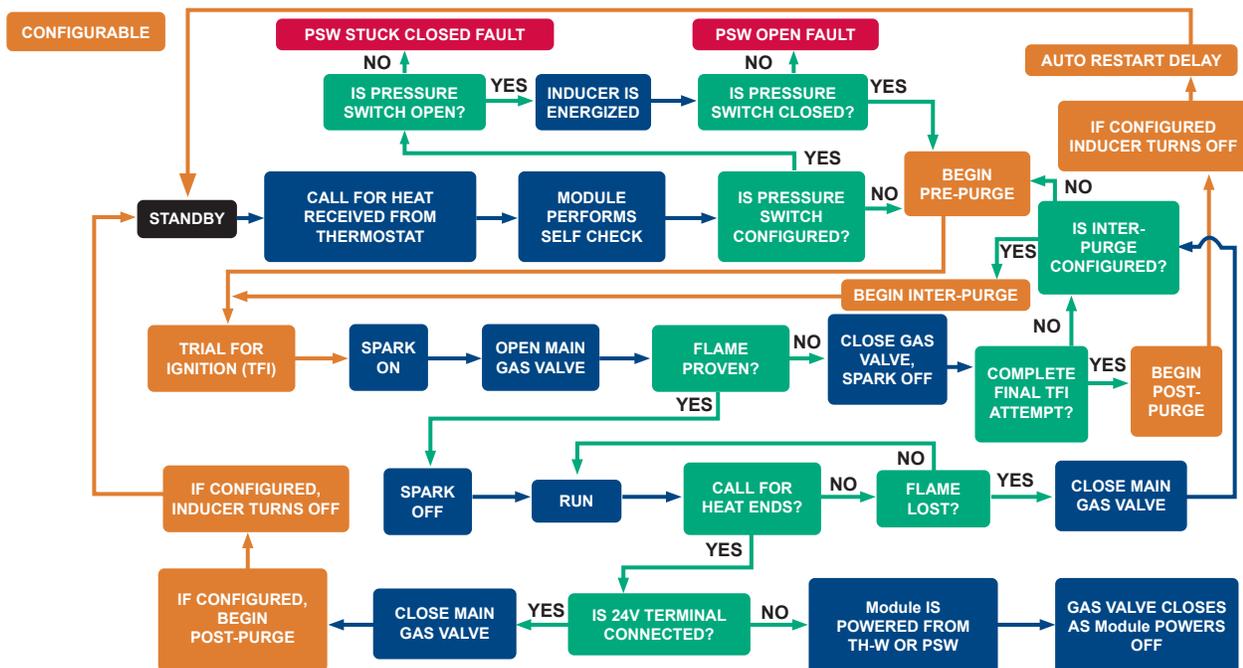


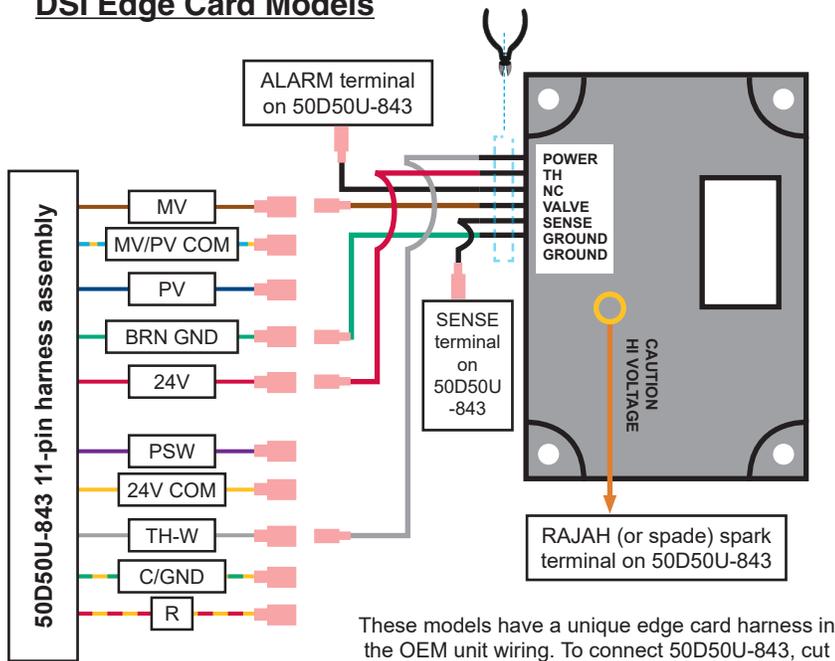
Table 2: 7-Segment Display Codes

STATUS CODES	Condition	LED 1	LED 2	LED 3	Comment/Troubleshoot Step
	Call for Heat (W) with Pre-Purge Active	<b>h</b>	<b>P</b>	<b>r</b>	Pre-purge is the delay during a heat call before a spark ignition attempt
	Call for Heat (W) with Inter-Purge Active	<b>h</b>	<b>I</b>	<b>P</b>	Inter-purge is the delay during a heat call in between spark ignition attempts
	Call for Heat (W) with Post-Purge Active	<b>h</b>	<b>P</b>	<b>o</b>	Post-purge is the delay immediately after a heat call has ended
	Call for Heat (W) Trial for Ignition Period Active	<b>t</b>	<b>F</b>	<b>I</b>	TFI is the time period in which the module attempts to spark for ignition
	Call for Heat (W) after flame is active	<b>h</b>	<b>t</b>		Appears when flame is active during normal heat call; Toggles with Weak Flame Signal (if applicable). When integrated thermostat is on, <b>h t</b> will toggle with temperature sensor reading
Weak Flame Signal Sensed	<b>F</b>	<b>L</b>	<b>o</b>	Check flame probe, clean or replace probe if needed	
Internal Module Error				LEDs will be blank, wait for module to reset; if problem persists, replace module	
Gas Valve On (GV) Error	<b>E</b>	<b>I</b>	<b>I</b>	GV is on when it shouldn't be, check GV	
Flame Sensed Out of Sequence	<b>E</b>	<b>0</b>	<b>4</b>	Check ignition source, gas valve or flame probe	
Vent Damper Error	<b>E</b>	<b>0</b>	<b>5</b>	Check Vent Damper and Vent Damper connections	
Loss of IRQ signal	<b>E</b>	<b>0</b>	<b>0</b>	Recycle power and replace module if problem persists	
Fuse Open	<b>E</b>	<b>0</b>	<b>6</b>	Replace 5 amp ATC fuse (F1)	
No Flame During TFI	<b>E</b>	<b>0</b>	<b>2</b>	Check ignition source, gas valve or flame probe	
Flame Out During Run	<b>E</b>	<b>0</b>	<b>3</b>	Check ignition source, gas valve or flame probe	
Gas Valve Off Error	<b>E</b>	<b>I</b>	<b>2</b>	Gas Valve off when it shouldn't be, check GV	
Gas Valve Off Lockout	<b>E</b>	<b>2</b>	<b>2</b>	Excessive GV off error, module will enter auto-restart delay and reset	
Air Temperature Sensor Error	<b>E</b>	<b>I</b>	<b>0</b>	Check Integrated Thermostat Sensor and AirT connection	
Wrong 24VAC Supply	<b>E</b>	<b>0</b>	<b>8</b>	Check supply voltage source. Must be >18VAC and <30VAC	
Pressure Switch Open	<b>E</b>	<b>0</b>	<b>1</b>	Check Pressure Switch connection	
Pressure Switch Stuck Closed	<b>E</b>	<b>0</b>	<b>9</b>	Check Pressure Switch connection	
TH-W / Limit Open Error	<b>E</b>	<b>I</b>	<b>3</b>	Module is not receiving 24 V on TH-W terminal during integrated thermostat mode; Check system wiring, safety switches and connection at W OUT / BLWR terminal	
PSW Mis-wire Error	<b>E</b>	<b>E</b>	<b>I</b>	Module has received 24V on PSW terminal when it shouldn't; Check configuration and wiring at PSW	
Connectivity Error	<b>E</b>	<b>C</b>	<b>I</b>	Recycle power, if problem persists, use on board configuration	

Operation	Module Status	Action	Duration of Action	LED Display	Extra Notes
<b>Fault Code Recall</b>	Standby	Hold OPTION and SELECT together	2-5 seconds	<b>F L t</b> after 2 seconds	<ul style="list-style-type: none"> <li>A maximum of 5 error codes are stored in the sequence they occur</li> <li>Press OPTION button &lt; 1 second to advance to next fault code</li> <li>When OPTION button is pressed after last error code, LEDs return to current status of unit</li> <li><b>E n o</b> will be displayed if there are no error codes stored</li> </ul>
<b>Fault Code Reset</b>	Standby	Hold OPTION and SELECT together	5-10 seconds	Alternates between <b>C L r</b> and <b>F L t</b> after 5 seconds	<ul style="list-style-type: none"> <li>Once both OPTION and SELECT are released after holding them together for 5-10 seconds, the LEDs will flash <b>C L r</b> 3 times to indicate the error codes have been successfully erased, module will then return to current status</li> <li>Error codes are stored in the module's memory for up to 14 days (error codes stored in systems powered by TH-W will have no expiration)</li> </ul>
<b>Unlock Settings</b>	Standby	Hold OPTION and SELECT together	10-20 seconds	<b>U n L</b> after 10 seconds	<ul style="list-style-type: none"> <li>All settings on the control will lock after 10 consecutive calls for heat</li> <li>Once both OPTION and SELECT are released after holding them together for 10-20 seconds, the LEDs will flash <b>U n L</b> 3 times to indicate the settings have been unlocked</li> </ul>

Note: heat call is ignored when module is in Error Code Recall, Reset or Unlock Settings menu explained above

## DSI Edge Card Models

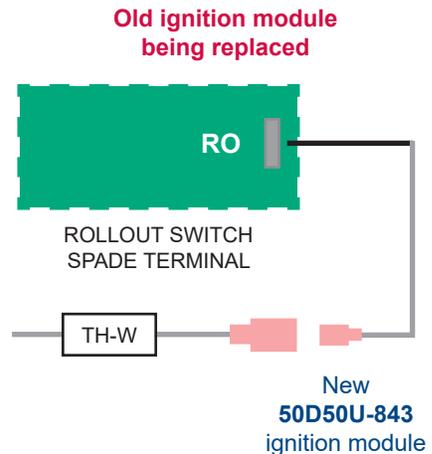


These models have a unique edge card harness in the OEM unit wiring. To connect 50D50U-843, cut each individual wire from the edge card harness, attach ¼" QC spade terminal and connect directly to 11-pin harness.

## Additional Wiring Scenarios

### For Modules With a Rollout Switch

For modules that have a separate rollout switch terminal, take the wire connected to the rollout switch on the old ignition module and plug it into the TH-W terminal on the 50D50U-843 11-pin harness.



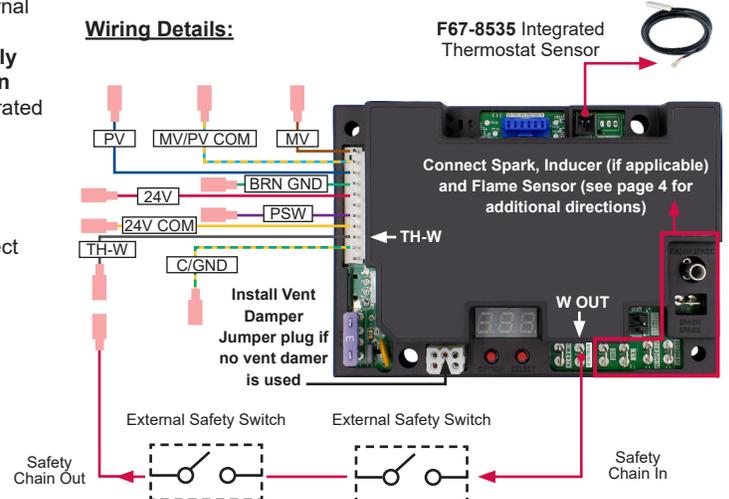
All-Spark™ 50D50U-843 has been designed with a new integrated thermostat feature that allows the module to create its own call for heat without using an external thermostat in the system. This feature requires a dedicated 24V path wired to the 50D50U-843 ignition module (24V terminal on 11-pin harness). **This feature is only designed for radiant, infrared and tube heat applications. Refer to diagram on the right to properly wire all safety switches in the system.** Steps to use integrated thermostat feature are listed below:

1. Purchase White-Rodgers Integrated Thermostat Sensor **F67-8535**
2. Connect sensor to AirT connector input on All-Spark board
3. Secure sensor in desired heating location of space
4. Configure Integrated Thermostat settings through White-Rodgers Connect App or 7-segment LED Display (see Table 1 on page 3)
5. **Connect W Out Terminal to input of safety chain**
6. **Connect Safety chain output to TH-W on 11-pin harness**
7. Connect power to the ignition module
  - a. Note: if using 7-segment LED Display to configure, 24V power must first be connected to module. Follow all safety guidelines outlined on page 1 and wiring instructions explained under **MOUNTING AND WIRING DIAGRAM** on page 4
8. Connect gas and ensure unit is heating correctly

## Integrated Thermostat Feature

For radiant, infrared and tube heater applications only

### Wiring Details:



**IMPORTANT: Connect W Out on 50D50U-843 module to input of safety switches (limit, rollout, etc.) and connect output of safety switches to TH-W on 50D50U-843**

### How To View and Change Temperature Set Point (TSP):

Temperature Range: 40 - 80 °F (68 °F is default) or 5 - 27 °C (20 °C is default) | (Set Point - Offset) can't be less than 40 °F (5 °C) or greater than 80 °F (27 °C)

Action	Module Status	Button Press	Duration
Enter TSP Menu	Integrated T-STAT <b>ON</b> , Standby	OPTION	< 3 seconds
Advance TSP 1 degree	TSP Menu	SELECT	< 3 seconds
Retreat TSP 1 degree	TSP Menu	OPTION	< 3 seconds
Confirm TSP selection	TSP Menu	SELECT	> 3 seconds
Enter Configuration Menu	Integrated T-STAT <b>ON</b> , Standby	OPTION	> 3 seconds

CnF will display after 3 seconds

### Integrated Thermostat Offset:

- Offset is most applicable when sensor is unable to be placed in the desired heating location
- When sensor is in a location warmer than desired, use the negative offset (if sensor is in location colder than desired, use positive offset)
  - Example: set point = 65 °F, actual temperature of desired location = 63 °F, sensor reading = 68 °F, use an offset of -5 °F

**TECHNICAL SUPPORT: 1-888-725-9797**