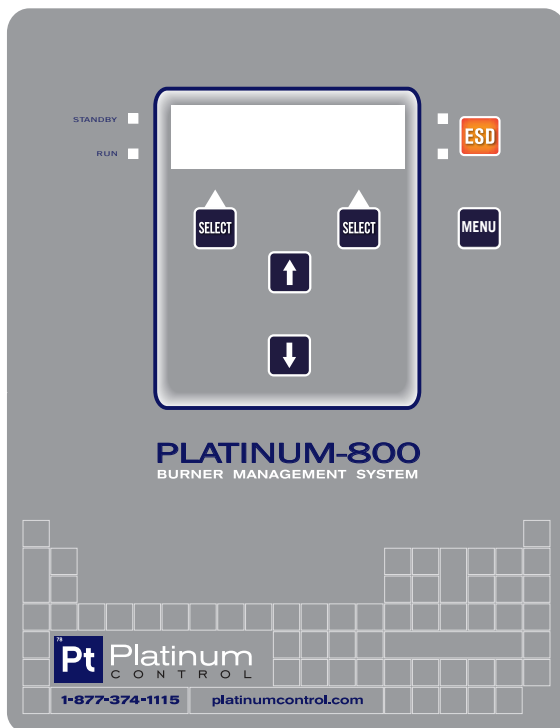


**PLATINUM-800**

Platinum  
CONTROL

PLATINUM-800  
Burner Management System

# MANUAL



Latest Update: 2/15/2016

Software Version: 3.05

Revision: 1.0

## PLATINUM CONTROL

2822 West 5th Street, Fort Worth, TX 76107

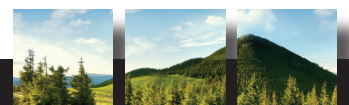
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please visit [www.platinumcontrol.com](http://www.platinumcontrol.com)



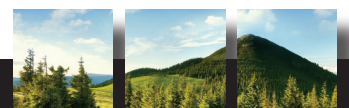
## TABLE OF CONTENTS

<b>WARRANTY STATEMENT</b>	<b>6</b>
<b>INTRODUCTION</b>	<b>8</b>
CERTIFICATIONS	8
POWER	8
OPERATION	8
BMS MODE	8
IGNITER MODE	8
FLARE + MODE	9
FLARE MODE	9
<b>COMPONENTS AND SPECIFICATIONS</b>	<b>10</b>
SHIPPING BOX CONTENTS	10
MICROCONTROLLER BOARDS	11
IGNITION MODULE	13
PILOT ASSEMBLY	13
<b>INSTALLATION</b>	<b>14</b>
PRE-INSTALLATION REQUIREMENTS	14
EXAMPLE OF A FUEL GAS TRAIN	15
MOUNTING THE MAIN CONTROL BOX	16
INSTALLING SOLENOID VALVES	16
MOUNTING THE PILOT ASSEMBLY	20
INSTALLING THE IGNITION MODULE	21
INSTALLING THERMOCOUPLE(S)	23
CONNECTING EXTERNAL DEVICES ON MAIN BOARD	26
CONNECTING EXTERNAL DEVICES ON AUXILIARY BOARD	27
GROUNDING WIRES	30
CONNECTING MAIN BOARD TO MAIN CONTROL BOX	32
CONNECTING POWER TO THE MAIN CONTROL BOX	32
CONNECTING POWER TO THE AUXILIARY BOARD	35
<b>SETUP</b>	<b>36</b>
POWERING UP	36
FRONT PANEL	36
INITIAL SETUP	37
MODE/SOLENOIDS: POWER	37
MODE/SOLENOIDS: MODE	37
MODE/SOLENOIDS: SOLENOIDS	38
MODE/SOLENOIDS: ESD SOL	38
MODE/SOLENOIDS: PILOT SOL	39

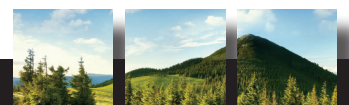




MODE/SOLENOIDS: MAIN SOL	39
<b>FACTORY SETUP</b>	<b>40</b>
MODE/SOLENOIDS	40
PEAK/HOLD SOL	40
IGNITION CONTROL: FLAME SENSE	40
IGNITION CONTROL: VENT TIME	40
IGNITION CONTROL: PILOT	40
IGNITION CONTROL: SPARK DELAY	41
IGNITION CONTROL: MAIN DELAY	41
INPUTS/OUTPUTS: STATUS RELAY	44
INPUTS/OUTPUTS: ROD SHORT DET	44
GENERAL: PASSWORD	45
GENERAL: LEDS	45
GENERAL: DISPLAY	45
GENERAL: SET TIME & DATE	45
LOG: VIEW LOG	46
LOG: SAVE LOG TO USB	47
LOG: CLEAR LOG	47
MODBUS SETUP: MOD BAUD	47
MODBUS SETUP: MOD PARITY	47
MODBUS SETUP: MOD STOP BITS	48
MODBUS SETUP: MOD ADDRESS	48
4-20 SETUP: 4-20 OUT	48
4-20 SETUP: RAMP OPEN	48
4-20 SETUP: IN 1	48
4-20 SETUP: IN1UPESD	48
4-20 SETUP: IN1UPALM	48
4-20 SETUP: IN1LOALM	49
4-20 SETUP: IN1LOESD	49
4-20 SETUP: IN 2	49
4-20 SETUP: IN2UPESD	49
4-20 SETUP: IN2UPALM	49
4-20 SETUP: IN2LOALM	50
4-20 SETUP: IN2LOESD	50
4-20 SETUP: 420 OUT 4MA	50
4-20 SETUP: 420 OUT 20MA	50
FACTORY RESET	50
SOFTWARE VERSION	50
SAVE AND EXIT	50
<b>OPERATING PARAMETERS MENU</b>	<b>51</b>



MAIN ON	51
MAIN OFF	51
HIGH TEMP	51
T2 ESD	51
T3 ESD	51
LOW TEMP	51
<b>OPERATING</b>	<b>52</b>
POWERING UP	52
SMART START	53
RUNNING	53
RUNNING WITH REMOTE ON/OFF	55
RUNNING WITH LOW BATTERY CONDITION	55
CONFIRM PROPER FUNCTIONALITY OF THE FLAME SENSING PROBE	55
<b>RATINGS</b>	<b>56</b>
POWER SUPPLY	56
POWER CONSUMPTION (RUNNING - NO SOLENOIDS)*	56
FUSE	56
CLOCK BACKUP BATTERY	56
STATUS OUTPUT RELAY	57
<b>TROUBLESHOOTING</b>	<b>57</b>
ESD SCREEN MESSAGES	57
ERROR SCREEN MESSAGES	70
MISCELLANEOUS MESSAGES	76
TIPS FOR TROUBLESHOOTING	76
<b>CONCLUSION</b>	<b>77</b>
ADDENDUM DRAWINGS	78
PLATINUM-800 BASIC P&ID	78
PLATINUM-800 SETUP SCREEN LAYOUT	79



## WARRANTY STATEMENT

Platinum Control warrants all of its manufactured products to be free from defects in material and workmanship, under normal use intended for the product, for a period of twelve (12) months from the date of installation, not to exceed twenty-four (24) months from the date of shipment from Platinum Control facilities. The warranty does not cover damage to end devices. The warranty shall be void for any one of the following reasons:

1. If the product is installed or modified by personnel not trained by, or considered representatives of, Platinum Control.
2. If the product is installed improperly.
3. If there is damage to the product caused by misuse.
4. If there is willful or intentional damage to the product.
5. If the product is neglected.
6. If the product is damaged or destroyed by Acts of God (i.e., hurricane, tornado, lightning, etc.).






Warranty repairs are FOB (Freight On Board) origin; the customer is responsible for shipping costs to Platinum's facility. All repairs are to be mailed to the below address:

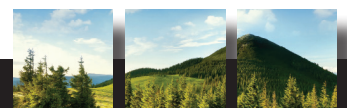
Platinum Control, Technical Services Department  
2822 West 5th Street, Fort Worth, Texas 76107






If you have technical support questions, please contact 877.374.1115 or 817.529.6485 for help.

On-site calls are subject to labor and travel charges to and from site.

### WARNING

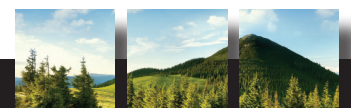
- A.  EXPOSURE TO SOME CHEMICALS MAY DEGRADE THE SEALING PROPERTIES OF MATERIALS USED IN THE FOLLOWING DEVICE: STATUS OUTPUT RELAY K1.  
L'EXPOSITION A CERTAIN PRODUIT CHIMIQUE PEUX DEGRADER L'ETANCHEITE DE MATERIAUX UTILISES DANS LES COMPOSANTS SUIVANTS: STATUS OUTPUT RELAY K1.
- B.  EXPLOSION HAZARD - DO NOT REMOVE OR REPLACE FUSES OR PLUG-IN MODULES UNLESS POWER HAS BEEN DISCONNECTED OR THE AREA IS KNOWN TO BE FREE OF IGNITABLE CONCENTRATION OF FLAMMABLE GASES OR VAPORS.  
RISQUE D'EXPLOSION – COUPER LE COURANT OU S'ASSURER QUE L'EMPLACEMENT EST DESIGNE NON DANGEREUX AVANT DE REMPLACER LES FUSIBLES OU LES MODULES.
- C.  EXPLOSION HAZARD. DO NOT DISCONNECT THE EQUIPMENT WHILE THE CIRCUIT IS LIVE OR UNLESS THE AREA IS KNOWN TO BE FREE OF IGNITABLE CONCENTRATIONS.  
RISQUE D'EXPLOSION – AVANT DE DECONNECTER L'EQUIPMENT, COUPER LE COURANT OU S'ASSURER QUE L'EMPLACEMENT EST DESIGNE NON DANGEREUX.
- D.  DO NOT OPEN THE PLATINUM BMS UNLESS THE AREA HAS BEEN DETERMINED TO BE NON-HAZARDOUS.  
NE PAS OUVRIR L'UNITE BMS PLATINUM SANS S'ASSURER QUE L'EMPLACEMENT EST DESIGNE NON DANGEREUX.
- E.  RISK OF EXPLOSION - ANY SUBSTITUTION OF PARTS OR ASSEMBLIES MAY COMPROMISE SUITABILITY OF CLASSIFICATION, CAUSING INJURY OR DEATH.  
RISQUE D'EXPLOSION – LA SUBSTITUTION DE COMPOSANTS PEU RENDRE CE MATERIEL INACCEPTABLE POUR LES EMBLEMENTS.



- F. THE PLATINUM BMS IGNITION MODULE IS NOT RATED AND THEREFORE MUST BE MOUNTED IN AN UNCLASSIFIED AREA OR EXPLOSION PROOF CLASS I, DIVISION I ENCLOSURE.  
 LE MODULE DE HAUT-VOLTAGE PLATINUM (HIGH VOLTAGE UNIT) DOIT ETRE INSTALLE DANS UN EMPLACEMENT NON-CLASSIFIE OU DANS UNE BOITE ANTIDÉFLAGRANTE CLASSE I DIVISION 1.
- G. SUBSTITUTION OF COMPONENTS MAY IMPAIR SUITABILITY FOR CLASSIFICATION, WHICH COULD CAUSE FAULTY OPERATION, INJURY OR DEATH.  
 SUBSTITUER DES COMPOSANTS PEUX ALTERER LA CERTIFICATION DU PRODUIT ET CAUSER DES ACCIDENTS OU LA MORT.
- H. BEFORE BEGINNING THE INSTALLATION OR OPERATION OF A PLATINUM BMS, PLEASE READ THIS ENTIRE MANUAL.  
 AVANT DE COMMENCER L'INSTALLATION OU L'OPERATION DE L'UNITE BMS PLATINUM, IL EST IMPORTANT DE LIRE CE MANUEL ENTIEREMENT.
- I. USE WIRES RATED 90 °C OR WIRES RATED AT LEAST 30°C ABOVE THE MAXIMUM AMBIENT.  
 UTILISER DES FILS ÉLECTRIQUES CERTIFIÉS A 90 °C OU CERTIFIÉS PLUS DE 30 °C AU-DESSUS DE LA TEMPÉRATURE AMBIANTE.
- J. BATTERY MUST ONLY BE CHANGED IN AN AREA KNOWN TO BE NON-HAZARDOUS. BATTERY MUST BE SECURED PROPERLY WITH VELCRO AND STRAP TO PREVENT FROM FALLING.  
 CHANGER LA BATTERIE SEULEMENT SI L'ENVIRONNEMENT EST DÉSIGNÉ NON DANGEREUX. LA BATTERIE DOIT ETRE SECURISÉE AVEC LE VELCRO ET LA SANGLE POUR PREVENIR UNE CHUTE.

**NOTE**

All Platinum BMS systems are intended for oil and gas industry, direct and indirect natural draft fired heaters only, and are not to be used for residential or commercial buildings of any kind.



## INTRODUCTION

The PLATINUM-800 Burner Management System (BMS) is specifically designed to monitor and re-ignite natural draft gas burners used in heating systems for oil and gas production equipment.

### CERTIFICATIONS

- Class I, Division 2, Groups C and D
- C22.2 No.0-10 General Requirements – Canadian Electrical Code, Part II
- ANSI Z21.20 –2014
- CAN/CSA C22.2 No. 60730-2-5-2014 Automatic electrical controls for household and similar use-Part2-5: Particular requirements for automatic electrical burner control systems

### POWER

The PLATINUM-800 includes a built-in battery charger that has the ability to charge sealed lead acid (SLA) batteries from either solar or line power. The battery charger automatically controls the solar panel voltage and output current to provide maximum power point tracking (MPPT). The PLATINUM-800 BMS can be powered three different ways:

1. Line power from 12-28 VDC
2. Line power from 17-28 VDC with battery backup
3. Solar panel with battery backup

### OPERATION

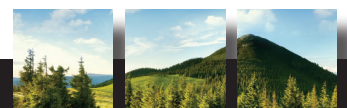
The Platinum BMS monitors for the presence of a pilot flame through an igniter rod which feeds a signal back to a microcontroller to determine a safe sequence of events based on the signal.

### BMS MODE

In BMS mode, one of the primary functions is to control temperature by monitoring and controlling temperature ranges set by the user. The BMS also controls the ESD, pilot, and main solenoids. In the absence of a lit pilot, the BMS will shut off all gas sources feeding the pilot and main burner, and wait for a user set delay timer before attempting a re-ignition sequence. In the event of a positive ignition, the system will sense the flame and proceed with monitoring. In the event of a flame ignition failure, the system will lock out the ignition process after three (3) attempts and await an operator to troubleshoot and reset the system. The 4-20 mA expansion card also allow the BMS to control the main burner through an analog pressure input.

### IGNITER MODE

In IGNITER mode, the BMS controls the ESD, pilot, and main solenoids. In the absence of a lit pilot, the BMS will shut off all gas sources feeding the pilot and main burner, and wait for a user set delay timer before attempting a re-ignition sequence. In the event of a positive ignition, the system will sense the flame and proceed with monitoring and the process to be controlled. In the event of a flame ignition failure, the system will lock out the ignition process after three (3) attempts and





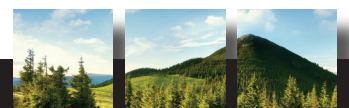
await an operator to troubleshoot and reset the system.

### **FLARE + MODE**

In FLARE + mode, the BMS controls the pilot solenoid only. This mode does not control the main or ESD valves. In the absence of a flame, the BMS will complete a timed, continuous retry for positive ignition. When the flame is not detected, the pilot valve will close to allow for a delay time before attempting a re-ignition sequence. In the event of positive ignition, the system will sense the flame and proceed with monitoring. In the event of a flame ignition failure, the BMS will restart automatically without any limitations.

### **FLARE MODE**

In FLARE mode, the BMS does not control solenoids. In the absence of a flame, the BMS will wait for a fixed delay time (5 seconds) before attempting a re-ignition sequence. In the event of positive ignition, the system will sense the flame and proceed with monitoring. In the event of a flame ignition failure, the BMS will restart automatically without any limitations.



## COMPONENTS AND SPECIFICATIONS

### SHIPPING BOX CONTENTS

Upon receipt of shipping box, inspect contents for physical damage or missing parts, and become familiar with the system.

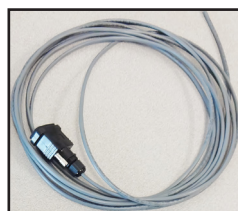
Components that will be shipped with the PLATINUM-800:



PLATINUM-800 MAIN CONTROL BOX



PN: CABLE, HIGH VOLTAGE, BLUE, 6'



PN: CABLE, 4 CONDUCTOR, GRAY, 20'



PN: CABLE, GROUND, BLACK, 6'



PN: IGNITION MODULE, POTTED



MOUNTING HARDWARE



PN: PILOT ASSEMBLY

Temperature Device: Type-K Thermocouple (Optional)  
Solenoid Valves (Optional)

DO NOT install Solenoid Valves that are in excess of:

- Single coil: 15 Watts
- Single coil peak/hold: 23.6 Watts

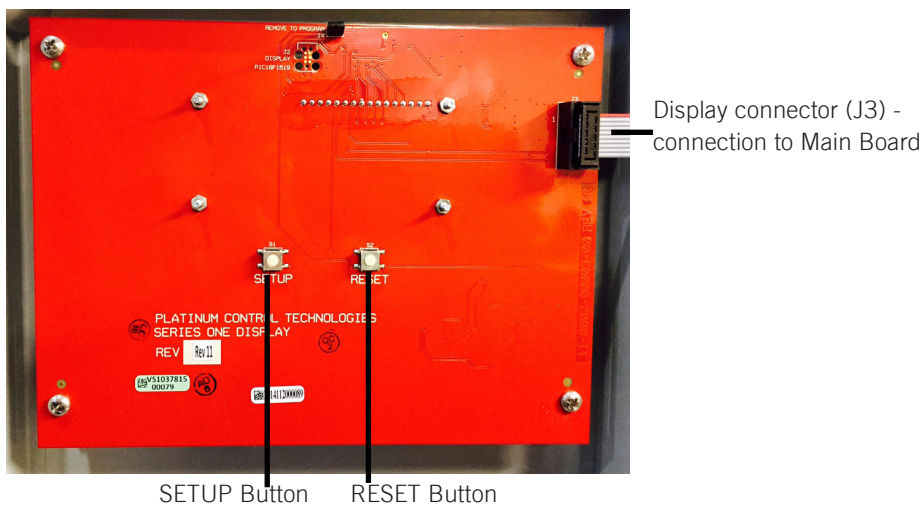
Low watt and peak/hold solenoid valves are recommended for solar applications. Any substitutions of solenoid valves must be reviewed and approved by Platinum Control. Solenoid Valves outside these parameters will impair the operation of the system, potentially causing injury or death.



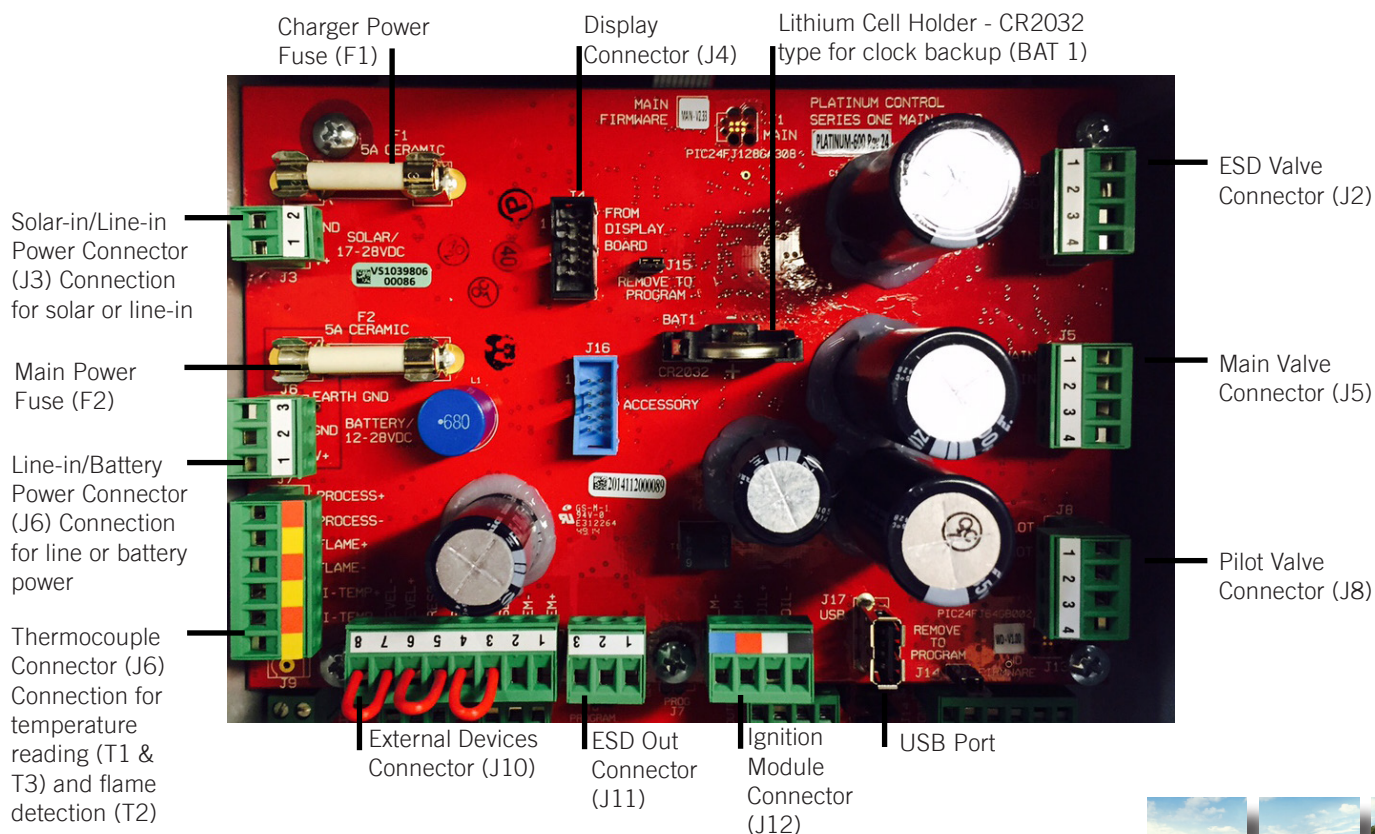
## MICROCONTROLLER BOARDS

### PLATINUM-800 DISPLAY BOARD

The PLATINUM-800 Display Board is located in the door of the Main Control Box and provides the user-interface functions of the BMS, including the display and front panel keys. Two (2) push-buttons are located on the board; the RESET push-button is used to reboot the system and the SETUP button allows you to setup the various system options.



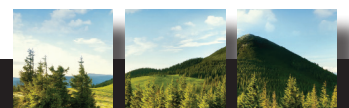
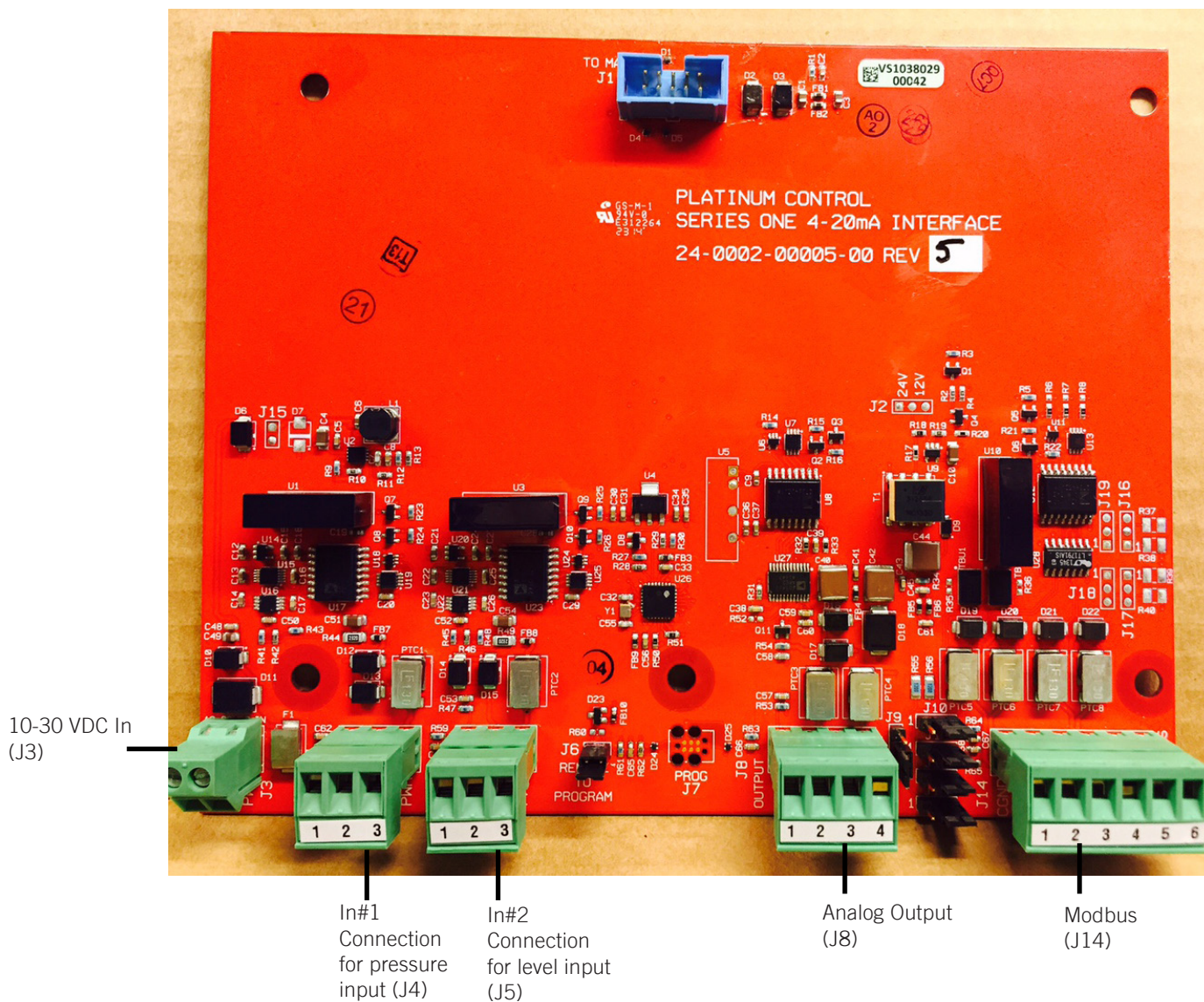
### PLATINUM-800 MAIN BOARD





## PLATINUM-800 4-20 BOARD

The PLATINUM-800 4-20 board is located in the body of the Main Control Box behind the Main Board. The expansion board provides one 4 mA to 20 mA industrial control output interface, two 4 mA to 20 mA industrial control input interfaces, and an RS-422/485 physical interface for support of Modbus.



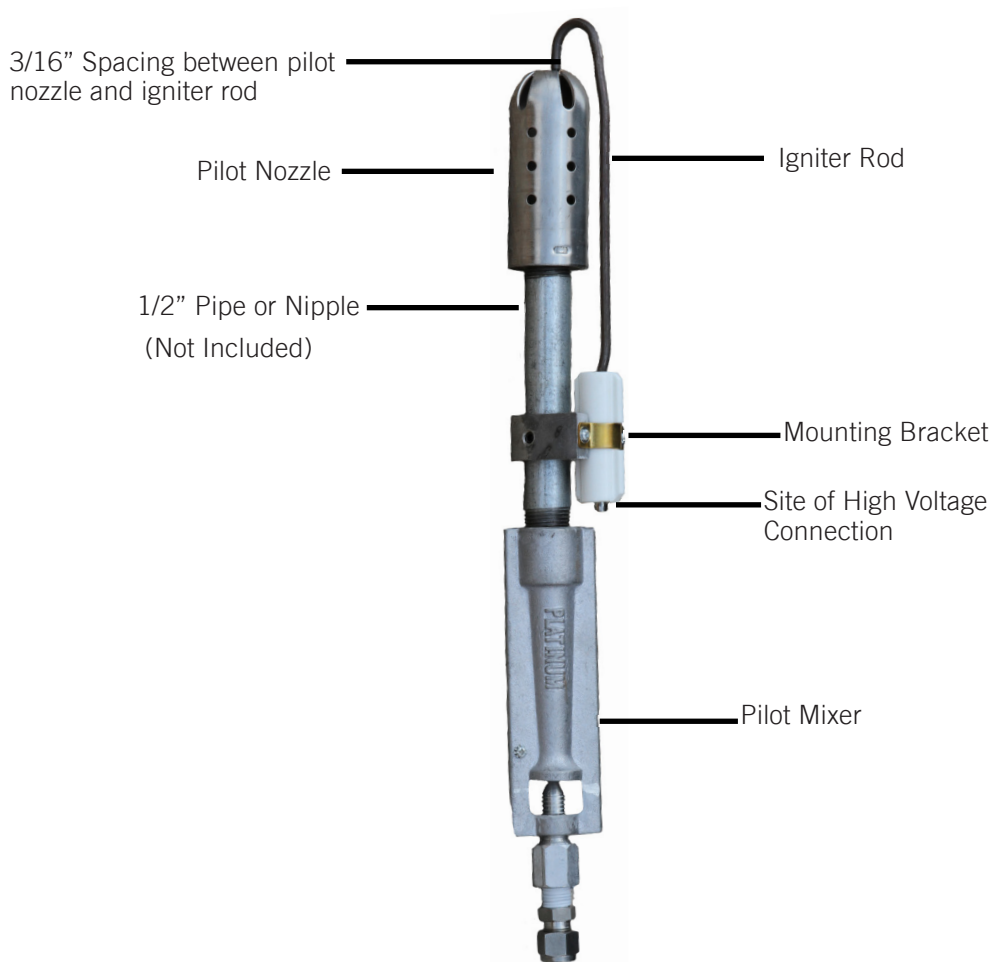
## IGNITION MODULE

The Ignition Module is connected to the Main Control Box with the Four-Conductor Cable and to the Pilot Assembly with the High Voltage Cable and Ground Cable.



## PILOT ASSEMBLY

The Platinum Pilot Assembly consists of the Igniter Rod, Pilot Nozzle, and Pilot Mixer.



## INSTALLATION

Please visit [platinumcontrol.com](http://platinumcontrol.com) for the most current version of this manual and additional technical resources.

### PRE-INSTALLATION REQUIREMENTS

In order to properly install the BMS the following items will be required:

- Fuel Train Requirements:

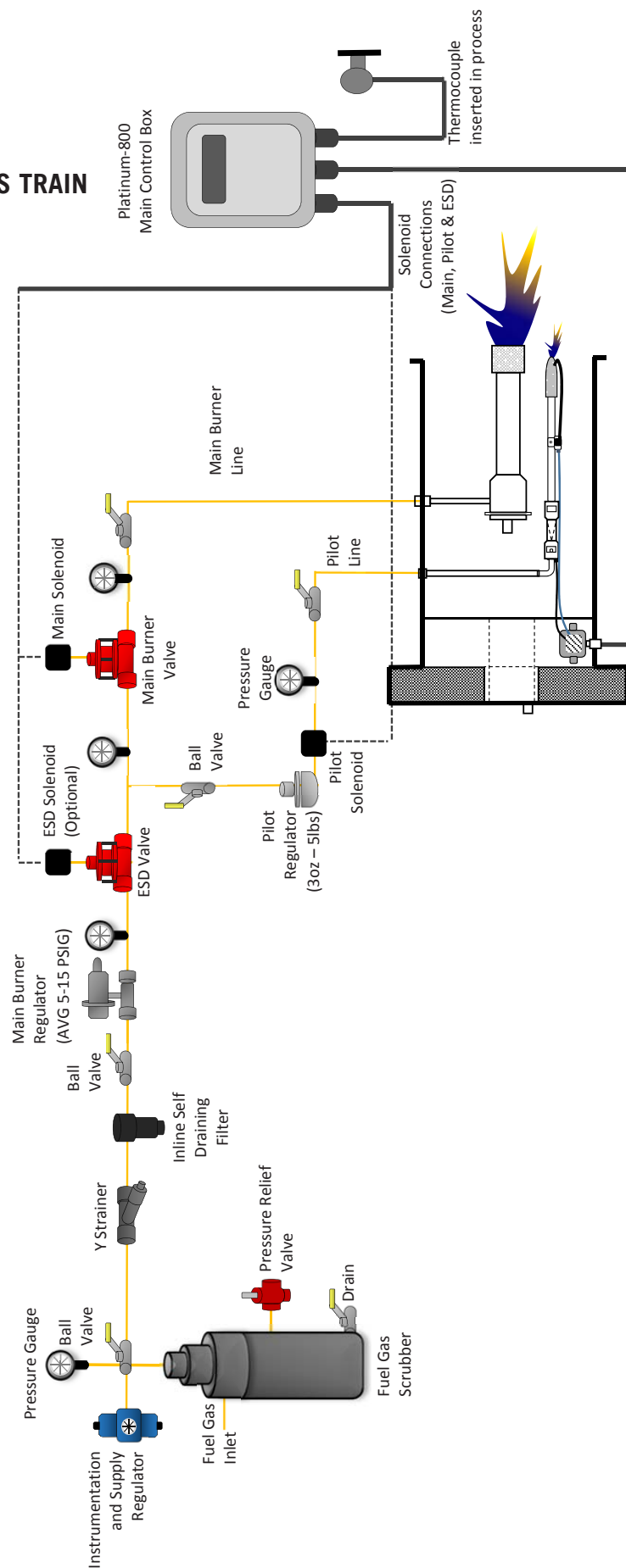
REQUIREMENT	BMS MODE	IGNITER MODE	FLARE + MODE
Main regulator	X	X	
Pilot regulator	X	X	X
Main control valve	X	X	
Pilot solenoid	X	X	X
Pressure gauge for main valve	X	X	
Pressure gauge for pilot valve	X	X	X
Main ball valve, recommended but not necessary	X	X	X

- Unistrut or alternate hardware to mount the Main Control Box. The unit must be mounted within 15 feet of the arrestor (longer cables available, if needed).
- Arrestor needs to be large enough to mount the Ignition Module inside of the arrestor.
- Power Requirements:

<b>LINE POWER</b>	12-28 volts allowed  24 volts required for use with 24 or 12 volt high-watt or peak/hold high-watt solenoids
<b>LINE WITH BATTERY</b>	17-28 volts (24 V recommended) 12 V SLA battery (capacity depends on application)
<b>SOLAR WITH BATTERY</b>	17.3 Vmp solar panel (size depends on application) 12 V SLA battery (capacity depends on application)



## EXAMPLE OF A FUEL GAS TRAIN



## MOUNTING THE MAIN CONTROL BOX

The Main Control Box contains two (2) microcontroller boards. The Display Board is mounted in the door, and the Main Board is mounted in the main body of the case. They are connected by one (1) multi-conductor flat cable.

### STEPS

1. Attach the Main Control Box mounting hardware to the back of the Main Control Box with the hardware provided. Specific instructions are located in the Main Control Box mounting hardware package.
2. Mount the Main Control Box in a secure area.
3. The Main Control Box will need to be within 15 feet of the arrestor. (If this is not possible, please contact us for a longer Four-Conductor Cable.)

### WARNING

- A. DO NOT open the Platinum BMS Main Control Box unless the area has been determined to be non-hazardous.
- B. Adherence to local classification of areas is crucial to safety and operation.
- C. In retrofit applications, contents may be hot and a cool down period will be required before removing and/or installing any equipment.

## INSTALLING SOLENOID VALVES

### SOLENOID OPERATION

The PLATINUM-800 can operate both 12V and 24V solenoids. Operation with single coil and single coil peak/hold (PWM) solenoids is available. Solenoid installations can then be optimized for any of the following:

- Power consumption
- Gas flow
- Solenoid cost

The PLATINUM-800 can operate different solenoid types on each of the three (3) outputs: ESD, Pilot and Main.

The limitations are as follows:

- The voltage rating for each solenoid must be the same as the other solenoids in the system.
- 11.6 W solenoids must be run with 24 V solenoid voltage and 24 V line system power.





- 23.6 W peak/hold solenoids must be run with 24 V solenoid voltage and 24 V line system power.

Examples of valid solenoid combinations:

<b>POWER</b>	Solar/Battery	<b>POWER</b>	Solar/Battery
<b>SOLENOID VOLTAGE</b>	12 V	<b>SOLENOID VOLTAGE</b>	12 V
<b>ESD</b>	None	<b>ESD</b>	Peak/hold 11.6 W 12 V
<b>PILOT</b>	0.55 W 12 V	<b>PILOT</b>	1.4 W 12 V
<b>MAIN</b>	0.55 W 12 V	<b>MAIN</b>	1.4 W 12 V

<b>POWER</b>	Line/Battery	<b>POWER</b>	Line - 24 V
<b>SOLENOID VOLTAGE</b>	24 V	<b>SOLENOID VOLTAGE</b>	24 V
<b>ESD</b>	None	<b>ESD</b>	Peak/hold 23.6 W 24 V
<b>PILOT</b>	1.4 W 24 V	<b>PILOT</b>	Peak/hold 10.6 W 24 V
<b>MAIN</b>	1.4 W 24 V	<b>MAIN</b>	Peak/hold 23.6 W 24 V

<b>POWER</b>	Line - 24 V
<b>SOLENOID VOLTAGE</b>	24 V
<b>ESD</b>	11.6 W 24 V
<b>PILOT</b>	11.6 W 24 V
<b>MAIN</b>	11.6 W 24 V

## WARNING

DO NOT install Solenoid Valves that are in excess of 11.6 W single coil 12/24 VDC, 11.6 W peak/hold 12 VDC, or 23.6 W peak/hold 24 VDC. Low watt or peak/hold solenoid valves are recommended for solar applications. Any substitutions of solenoid valves must be reviewed and approved by Platinum. Solenoid Valves outside these parameters will impair the operation of the system, potentially causing injury or death.

As there are a number of different solenoid valve system configurations, suitable solenoid valve types will vary based on the application. Supported types are:

1. 12/24 V low-power single coil Solenoid Valve (0.55 W)
2. 12/24 V low-power single coil Solenoid Valve (1.4 W)
3. 24 V single coil Solenoid Valve (11.6 W)
4. 12/24 V peak/hold single coil solenoid valve (10.6 W or 11.6 W)
5. 24 V peak/hold single coil solenoid valve (23.6 W)

It is very important that you use the appropriate Solenoid Valves. Not all solenoid configurations and/or types are supported in every region. Check your local codes for approved solenoid types prior to installation. DO NOT try to substitute Solenoid Valves outside the above specifications without first consulting with Platinum.



## STEPS

1. Install the Pilot Solenoid Valve into the tubing between the pilot pressure regulator and the arrestor in the tubing line. Install the Main Solenoid Valve into the tubing before the main temperature control valve in the tubing line. If used, install the ESD Solenoid Valve as the first thing after the inlet pressure regulator into the tubing line controlling the pneumatic ESD Valve.

### TIP

Be sure to orient Solenoid Valves correctly with the respective valve flow direction. ASCO Solenoids are configured port 1 out, port 2 in and port 3 vent.

2. Open the lid of the Main Control Box by simply unlatching the two (2) latches.

### WARNING

DO NOT open the Main Control Box lid forcefully. The multi-conductor flat cable connects the Main Board and the Display Board and opening the lid forcefully could potentially cause damage to the boards.

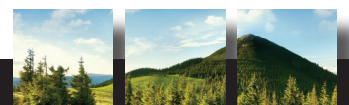
3. Safely unplug the multi-conductor flat cable from the Main Board and unscrew the 4 screws holding the Main Board to the box. Place the Main Board in a safe, anti-static location. Platinum recommends using the Anti-static Bag included in the shipping box. Fold over the bag for better protection. ALWAYS practice safe anti-static methods, such as discharging your hands to earth ground prior to handling electronics.

### WARNING

DO NOT drill any holes in the Main Control Box without at least removing the Main Board. Any damage to the microcontroller boards while drilling holes is not covered under the warranty.



4. Determine the best method to run the wiring to each solenoid. This will typically be flex conduit or rigid conduit. The conduit can be run directly to each solenoid or preferably to each in series through a three-way conduit junction box attached to each solenoid. It is preferable to have the fewest penetrations possible into the Main Control Box. Locate all holes in the Main Control Box to the front edge so as not to interfere with the microcontroller board or the battery, if used. The battery must be secured with the velcro provided with the assembly. The velcro should be placed on the bottom of the battery and



the straps attach to the side of the enclosure and go around the battery side to ensure proper securement and avoid movement.



5. Install Meyers hubs, seals and conduit as required.

### **WARNING**

Always follow local codes for sealing, electricity, etc. Proper sealing methods will need to be used when changing areas of classification.



6. Pull wires through conduit and connect to solenoids as required. Be sure to pull ground wires to terminate the solenoid grounds as well.
7. When installing flex conduit it is good practice to install a service or drip loop where warranted. Check local codes for approved conduit types prior to installation of conduit.



8. On the right hand side of the Main Board there are three (3) connectors for the different solenoid valves. Each connector is labeled for the respective valve; ESD, PILOT, and MAIN.
9. Single coil (S.Coil) solenoid valves are connected as in the figure below.



10. Single coil (S.Coil) peak/hold solenoid valves are connected as in the figure below.



#### TIP

If polarity sensitive Solenoid Valves are used, terminal #2 on the solenoid connector is the negative connection and terminal #1 on the solenoid connector is the positive connection.

## MOUNTING THE PILOT ASSEMBLY

### STEPS

1. Open flame arrestor or remove the flame cell. You will want enough room to properly mount the Pilot Assembly to the burner.
2. The Pilot Assembly needs to be mounted so that the Pilot Nozzle tip is positioned at the flame end of the burner and the Pilot Mixer is partially positioned inside of the arrestor to allow enough air to the mixer.
3. Determine the length of 1/2" pipe/nipple that will be needed for the extension of the Pilot Assembly. The length of the pipe/nipple will depend on the length of the burner and positioning of Pilot Assembly, as mentioned previously.
4. Slide the Igniter Rod and mounting bracket onto the 1/2" pipe/nipple before screwing the pipe/nipple into the Pilot Nozzle tip end of the Pilot Assembly.
5. The Igniter Rod will need to be positioned so that the tip of the rod is 3/16" away from the top opening of the Pilot Nozzle within the gas stream. (See Pilot Assembly Diagram)
6. Secure the Igniter Rod to the 1/2" pipe/nipple by tightening the 2 black screws on the mount with a 1/8" Allen key.

### WARNING

Don't over tighten the set screws on the bracket that mounts the Igniter Rod to the nipple on the Pilot Assembly.



7. Attach the black Ground Cable to the Pilot Assembly by removing the small screw located on the end of the pilot mixer. Place the screw through the hole located in the Ground Cable and screw back into the Pilot Mixer.

**WARNING**

Don't over tighten screw to prevent stripping the threads or breaking the screw.

8. Pull back the boot on the blue High Voltage Cable to expose the connector. Push the connector into the end of the Igniter Rod until you hear a small click. Then pull the boot over the connector and onto the Igniter Rod ending.
9. Position the Pilot Assembly to the burner. The Igniter Rod will need to be positioned on top of the Pilot Assembly and adjacent to the burner. Once the Pilot Assembly is in the correct position on the burner, securely fasten the Pilot Assembly tip approximately 1" behind the tip of the burner. Make sure that the securing device isn't touching the igniter rod.



**NOTE**

Platinum Control does not tune burners or guarantee efficiency. We strongly recommend that a qualified burner technician inspect and tune the burners upon completion of the installation.

## INSTALLING THE IGNITION MODULE

The Ignition Module, common to all Platinum BMS models, is a small sealed module which houses the High Voltage Ignition Transformer. The Ignition Module produces a high voltage spark through the Igniter Rod, and senses the presence of a flame through the Igniter Rod.

### STEPS

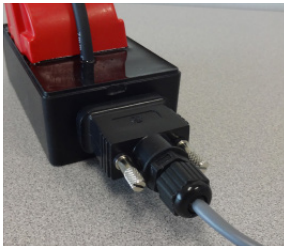
1. Use a screwdriver to attach the end of the gray Four-Conductor Cable with the connector to the matching connector on the side of the Ignition Module and secure with the two built in screws.

**NOTE**

Finger tightening the screws is not sufficient.







**WARNING**

The Ignition Module itself is not rated and **MUST** therefore be mounted inside the flame arrestor (unclassified area) or explosion proof Class I, Division I rated enclosure for external mounting.

2. Pick a secure mounting location in the flame arrestor making sure to capture the ground wires from both the ignition module and the pilot assembly under the head of the mounting bolt. Do not over tighten mounting hardware. Earth ground must be established.

**TIP**

Mounting the ignition module and associated wiring in the lower portion of the flame arrestor will help prevent damage to these parts in the event of a main burner flame back flash.

**WARNING**

**DO NOT** mount the Ignition Module on the bottom inside wall of the arrestor. The Ignition Module must be mounted up and away from any possible liquid accumulation.

3. Attach the blue High Voltage Cable from the Pilot Assembly to the Ignition Module and secure.
4. Run Four-Conductor Cable through auxiliary coupling on flame arrestor. When installing on older flame arrestors, a spare coupling may not exist. In the event an auxiliary coupling is not available, make arrangements to professionally install this connection or 1/2" Meyers hub into the flame arrestor.
5. Drill a hole through the bottom of the Main Control Box and install the 1/2" Meyers hub and run 1/2" Flex Conduit from the Meyers hub on the arrestor to the Meyers hub on the Main Control Box. Install seal if required.

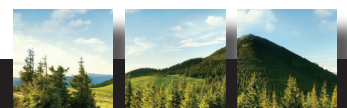
**TIP**

Leave a drip loop or service loop when installing the flex conduit.

**WARNING**

Always follow local codes for sealing, electricity, etc. Proper sealing methods will need to be used when changing areas of classification.

6. Run a ground wire with the Four-Conductor Cable through the flex conduit connection from the arrestor to the Main Control Box.



### TIP

It is good practice to run the ground wire with the Four-Conductor Cable and terminate at each end of the Meyers hub. If possible, separate and secure the high voltage cable from the Four-Conductor Cable.

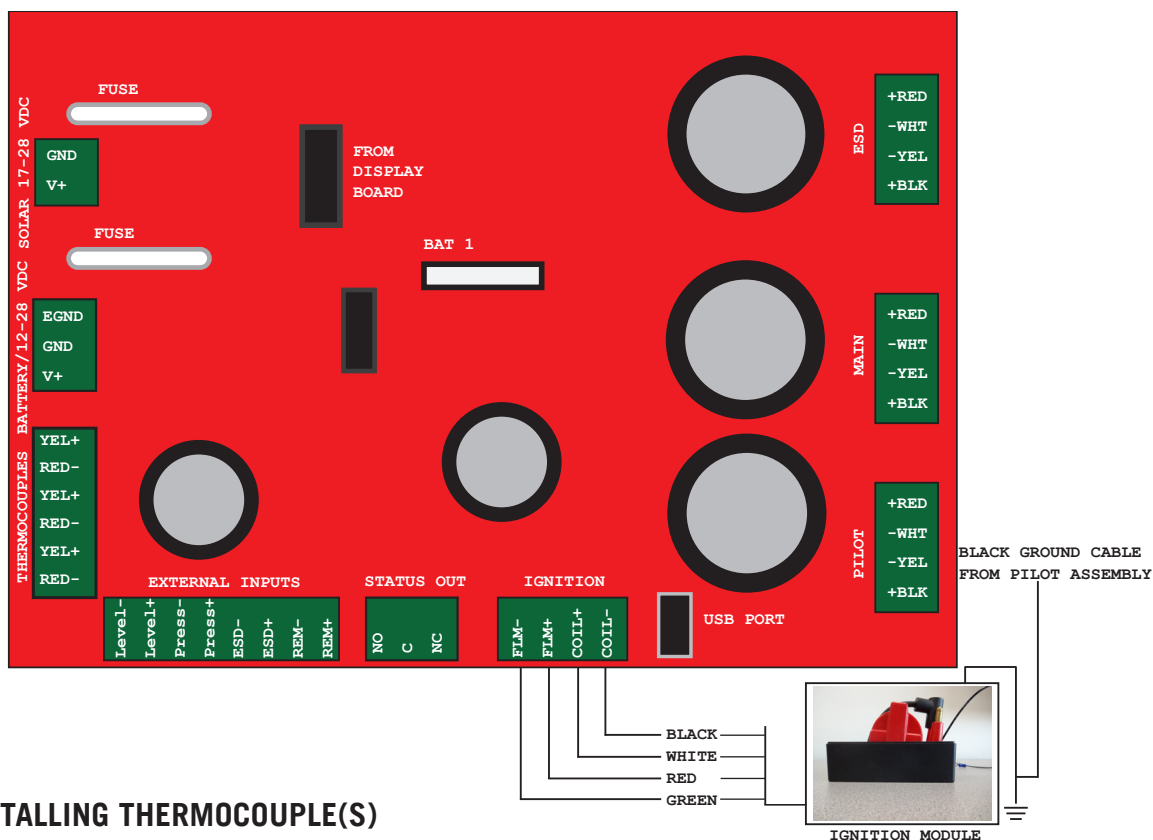
- Once the Four-Conductor Cable and ground wire have been run through the flex conduit into the Main Control Box.

### NOTE

The Four-Conductor Cable interconnects the Main Controller Box and the Ignition Module.

- Insert each wire from the Four-Conductor Cable into the terminal on the connector with the following order:

Coil -	Black Wire
Coil +	White Wire
FLM +	Red Wire
FLM -	Green Wire



### INSTALLING THERMOCOUPLE(S)

### NOTE

Thermocouple must be Type-K and of non-grounded type.

For CSA compliant installations, (1) T1 and T3 thermocouples must be located next to each



other and (2) the high temperature setting for T1 and T3 must be the same.

## IMPORTANT!

THE CORRECT TERMINAL PLACEMENT MUST BE USED BASED ON THE INTENDED FUNCTION OF THE THERMOCOUPLE(S). REFERENCE THE BELOW WHEN DETERMINING THE APPROPRIATE TERMINAL SLOT FOR THE THERMOCOUPLE.

### TERMINAL BLOCK J9

(T1) - USED FOR MEASURING PROCESS TEMPERATURE.

(T2) - USED FOR FLAME DETECTION OR HIGH TEMPERATURE SHUTDOWN.

(T3) - USED FOR MEASURING TEMPERATURE TO PERFORM A HIGH TEMPERATURE SHUTDOWN OR AUXILIARY TEMPERATURE CONTROL.

1. The Type-K Thermocouple(s) will need to be placed in a thermowell in the vessel. The use of thermal grease is recommended.
2. Type-K connection wires (1 red-negative and 1 yellow-positive) will need to run from the Thermocouples to the Main Control Box.

### WARNING

Only type-K wire (not supplied) can be used with the Type-K Thermocouple.

3. Drill a hole through the bottom of the Main Control Box and install the 1/2" Meyers hub and run 1/2" Flex Conduit from the Meyers hub on the arrestor to the Meyers hub on the Main Control Box. Install seal if required.

### TIP

Leave a drip loop or service loop when installing the flex conduit.

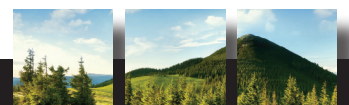
### WARNING

Always follow local codes for sealing, electricity, etc. Proper sealing methods will need to be used when changing areas of classification.

4. Attach 1/2" flex conduit connector to the Thermocouples. Run 1/2" Flex Conduit from the Meyers hub on Main Control Box to hub on the Thermocouples. Be sure to run the 2 connection wires through before securing the flex conduit to the Meyers hub.
5. Insert the wires into the terminals on the connectors with the following order:  
PROCESS TEMPERATURE  
T1 Connector on J9 Terminal Block

Terminal Name

Terminal Location





Process+	Yellow
Process -	Red

#### FLAME DETECTION

T2 Connector on J9 Terminal Block

Terminal Name	Terminal Location
Flame+	Yellow
Flame -	Red

#### HIGH TEMP SHUTDOWN

T3 Connector on J9 Terminal Block

Terminal Name	Terminal Location
Hi Temp+	Yellow
Hi Temp-	Red

### 6. Temperature Control

#### Basic Temperature Control

- Basic temperature control can be accessed through the front panel menu key.
- The basic process control is controlled by Thermocouple T1.
- T1 can be set for 4 set points. These set points are, Low Temp ESD, Main ON, Main OFF and High Temp ESD. The ESD set points can be set to temperatures where if the temperature go beyond that set point the unit will ESD.
- The other 2 set points control the heating process on and off.

#### Main On Temperature Control

- The Main On temperature setting controls when the main burner comes on. The Main On set point allows the Main Burner to come on when the temperature is below this set point but not above the Main OFF Temperature.
- The Main OFF temperature sets where the main burner is turned off. When the process control is running, the unit cycles the main burner between the Main ON Temperature and the Main OFF Temperature.
- Up to two more thermocouples could be activated in this mode on T2 and T3.

#### ESD Triggers

- When the extra thermocouples are enabled they can be set to trigger ESDs on other parts of the burner. Each of these thermocouple can be set to an ESD temperature. Each trigger is independent.

### 7. Temperature Control with Auxiliary Control

- This additional control feature can be activated when more than one thermocouple is enabled. An additional option will appear to select which thermocouple the



Auxiliary control will use. Auxiliary control can be set to T2 or T3. Thermocouple temperature settings are configured like the standard temperature control. When the Auxiliary control is active the control logic operates as follows:

- All ESDs are independent. If any Thermocouple exceeds their set value the unit will ESD.
- The Main Burner On occurs when both Thermocouples are below their individual On temperatures.
- The Main burner OFF occurs when either temperature set point is reached.

## CONNECTING EXTERNAL DEVICES ON MAIN BOARD

### WARNING

DO NOT connect voltage to any of these inputs. **DRY CONTACTS ONLY.**

Terminal Name	Terminal Location
---------------	-------------------

Level +	Terminal #7
---------	-------------

Level -	Terminal #8
---------	-------------

Level Switch: This contact looks for a normally closed switch when the switch is satisfied, and will cause an ESD state when the switch is opened.

Pressure+	Terminal #5
-----------	-------------

Pressure-	Terminal #6
-----------	-------------

Pressure Switch: This contact looks for a normally closed switch when the switch is satisfied, and will cause an ESD state when the switch is opened.

ESD+	Terminal #3
------	-------------

ESD-	Terminal #4
------	-------------

Remote ESD Switch: This signal will direct the system to ESD the burner when the switch is open. A remote system should be used to shut down the burner.

REM+	Terminal #1
------	-------------

REM-	Terminal #2
------	-------------

Remote On/Off Switch: This switch can be configured in one of three ways:

- (1) Remote On/Off: This signal will direct the system to enter the OFF state. The burner is ON when the switch is closed. Open the switch only in the RUN (burning) state. If the contacts are closed, the burner will start. If the contacts are open, the burner will stop. A remote system should be used to control the burner.



#### NOTE

The Platinum BMS must be placed in the RUN (burning) state to enable this feature. (Local interface overrides the feature if the system is in OFF or ESD.)

- (2) Proof of Closure: These terminals would be connected to the proof of closure contact on the ESD valve. If the valve position indicated does not match the position expected, the unit will go into an ESD state.

Valve closed = normally closed

Valve open = normally open

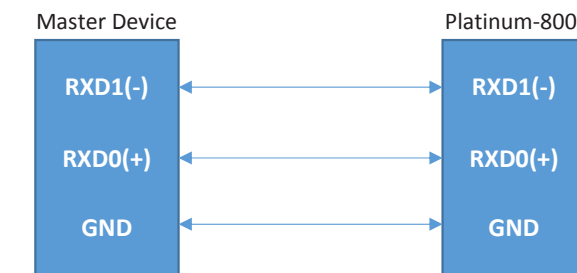
- (3) Main: This option is only available when the BMS Mode: Igniter is selected. When the contact is closed, the main is turned on, when the contact is open, the main is turned off. This allows external control of the main without affecting the pilot.

### CONNECTING EXTERNAL DEVICES ON AUXILIARY BOARD

#### Modbus (J14)

For complete MODBUS functionality information including registers, please refer to the MODBUS.PDF manual on our website ([platinumcontrol.com/support](http://platinumcontrol.com/support)).

Below is the example for connections of a simple half-duplex connection without adding termination resistors.

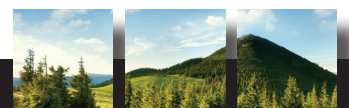


#### Jumper Position

- J10 1 – J10 2
- J11 1 – J11 2
- J12 2 – J12 3
- J13 2 – J13 3

#### Analog Pressure Input In#1 (J4)

- The Pressure input can be used to monitor fuel train pressure and create alarms/ESD at specific set points. The value transmitted by the transducer can be read on the BMS display as well as in the MODBUS registers. The pressure can also be used to control the process instead of using temperature (thermocouples). This application is often

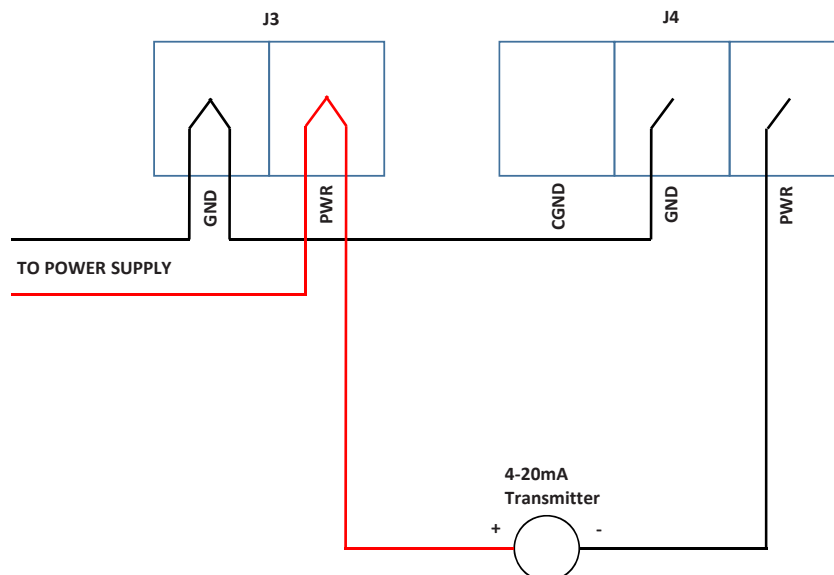


used in combustors set-up when the main valve should be open only within a specific pressure bandwidth. To activate this feature you must turn on Channel 1 Pressure sensor input. The configuration is performed in the 4-20mA Setup Menu. The menu allows for the span of the sensor to be configured, the units displayed, the alarm set points and ESD set points. You can also Enable or disable these alarms and ESDs if they are not required in your application. When the 4-20mA channel is set up, the option for controlling the main valve via pressure will appear in the Main Setup menu under Thermo./Pressure. When pressure is selected the BMS process will then be controlled by the 4-20mA Pressure channel.

- The Pressure settings can then be entered through the front panel menu key. Once the Main on and Main off are set, they will determine when the Main solenoid will be open. As an example, if Main On is 7oz and Main Off is 3 oz, the main solenoid will be open for any pressures higher than 7 oz and will close as soon as the pressure reaches 3 oz.
- In this mode, Thermocouple T1 is automatically enable to allow high temperature shutdown. If no thermocouple is used, the Thermocouple input T1 should be shorted.

	<b>Terminal Name</b>	<b>Terminal Label</b>
Pressure Ground	CGND	Terminal #1
Pressure -	GND	Terminal #2
Pressure +	PWR	Terminal #3

There are many types of transducers on the market, but the ones most commonly used are units requiring power from the BMS. Below is a description on how these standalone modules are connected on the 4-20 mA board.



## NOTE

Self powered transducer units can simply connect to terminal J4 GND/PWR.



#### Analog Level Input In#2 (J5)

- This analog input is dedicated to monitor external level sensors and create alarms/ESD at specific set points. The value transmitted by the transducer can be read on the BMS display as well as in the MODBUS registers. Each alarm and ESD can be enabled or disabled independently through the setup menu. Please refer to Pressure section above for electrical connections.

	Terminal Name	Terminal Label
Level Ground	CGND	Terminal #1
Level -	GND	Terminal #2
Level +	PWR	Terminal #3

#### Analog Output (J8)

- Configurable for control of a proportional solenoid valve, or for output indication (display and MODBUS) of the thermocouple T1 temperature, In#1 or In#2 input measurements.

	Terminal Name	Terminal Label
Output Ground	CGND	Terminal #1
Output -	GND	Terminal #2
Output +	IN	Terminal #3
Power Supply	VSPL	Terminal #4

#### NOTE

If a separate power supply is not used, terminal VSPL can be used for 4-20 loop power supply.

### CONNECTING STATUS OUT

Maximum connection ratings:  
30 VDC / 2 A - 60 W

These contacts are used for a Status Out signal. The status output can be operated in one of three different modes: ESD, Run or Pilot.

In ESD mode, the status output relay NC contacts are closed when the unit is not in an ESD state. In an ESD state, the NC contacts are open.

In Plt mode, the status output NC contacts are closed when the pilot is lit. If the pilot is not lit, the NC contacts are open and the system shuts down.

In Run mode, the status output NC contacts are closed when the unit is running. The NC contacts are open when the unit is not running.

- |                |                 |
|----------------|-----------------|
| a. Terminal NO | Normally Open   |
| b. Terminal C  | Common          |
| c. Terminal NC | Normally Closed |



## GROUNDING WIRES

### STEPS

1. You should have multiple disconnected ground wires in the Main Control Box. The number of ground wires will depend on the specific setup.
2. Create a termination site inside of the Main Control Box for grounding.
3. Connect all of the ground wires inside of the box to this termination site.
4. Run a ground wire from Terminal Block J2 pin#3 to the termination site in the Main Control Box.
4. Connect the termination site to a grounding rod. Ideally, there should be one common point of earth ground for termination.

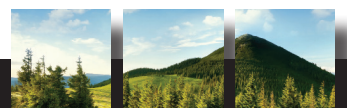
### NOTE

The recommended wire gauge for grounding wires is 14-16.

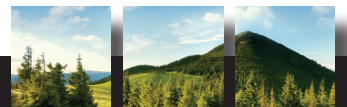
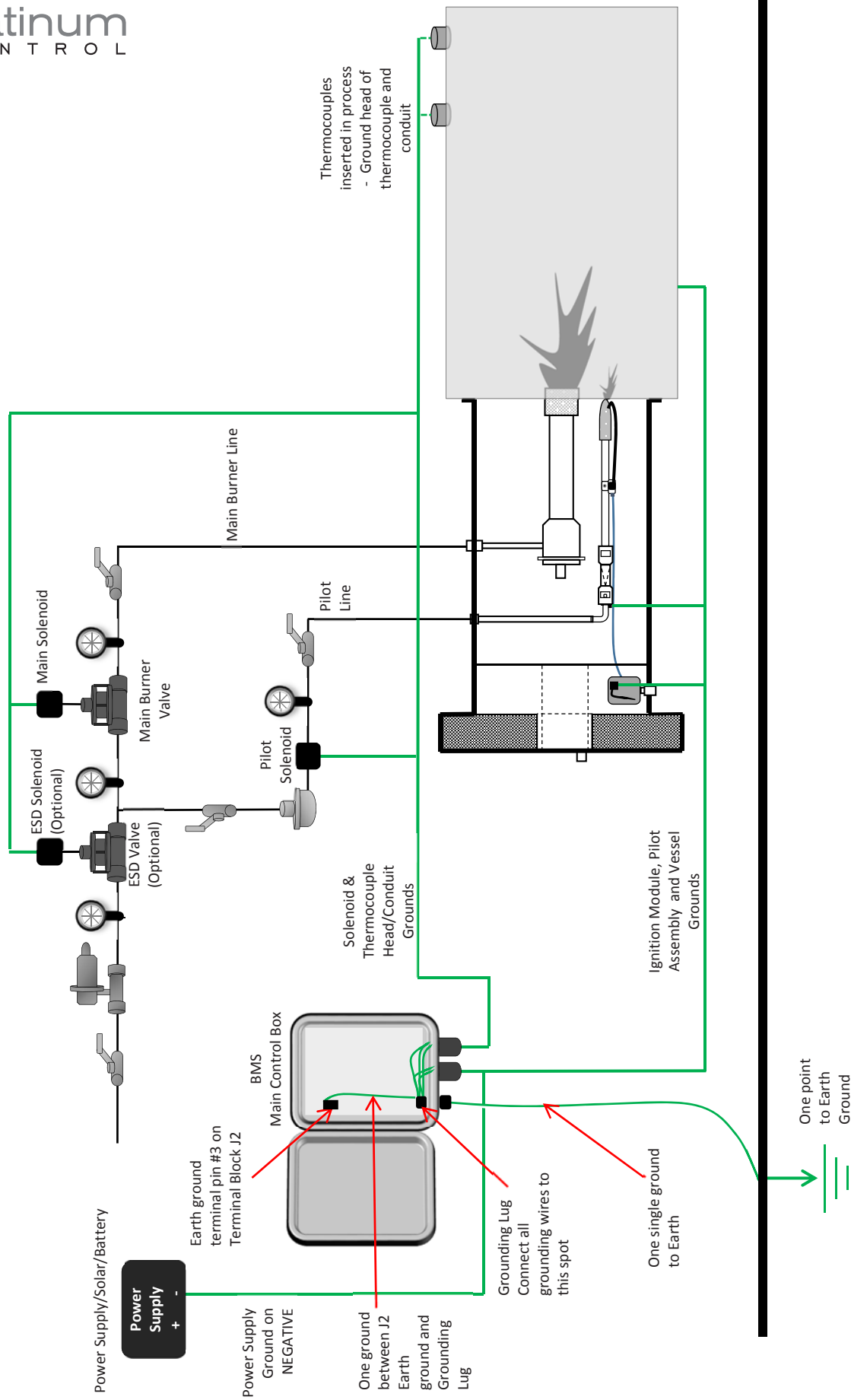
The type-K thermocouples are of non-grounded type. However, the head of the thermocouple and conduit should be grounded.

### WARNING

Always follow local codes for proper grounding methods.



## Platinum-800 Grounding



## CONNECTING MAIN BOARD TO MAIN CONTROL BOX

### STEPS

1. Re-connect the Main Board back onto the Main Control Box with the four (4) screws.  
Make sure the Main Board is secure.
2. Reconnect the multi-conductor cable to connect the Main Board (located in the right hand side of the Main Control Box) with the Display Board (located in the left hand side door of the Main Control Box).

### WARNING

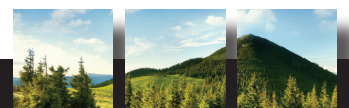
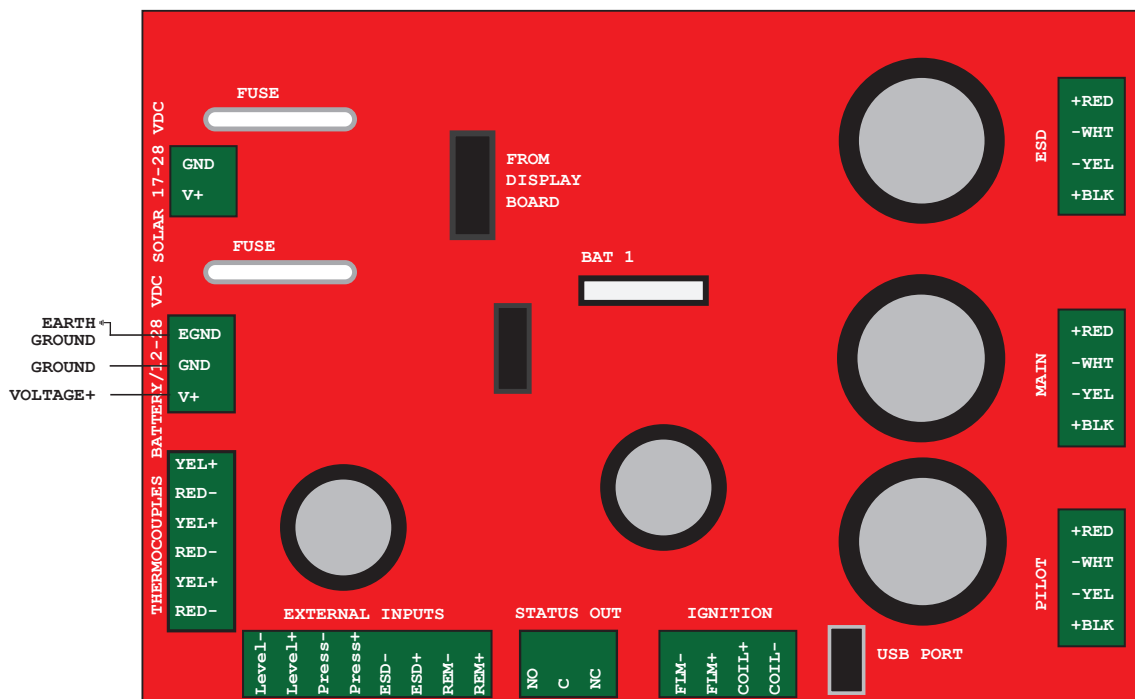
DO NOT connect the cable from the Display Board to the Accessory Connector (J16) or damage may occur.

## CONNECTING POWER TO THE MAIN CONTROL BOX

### WARNING

DO NOT connect voltage or power wires until everything has been connected and installed on the unit, and only after you have metered and checked continuity or voltage for the correct and required amount of power.

### 10.1 LINE POWER





## STEPS

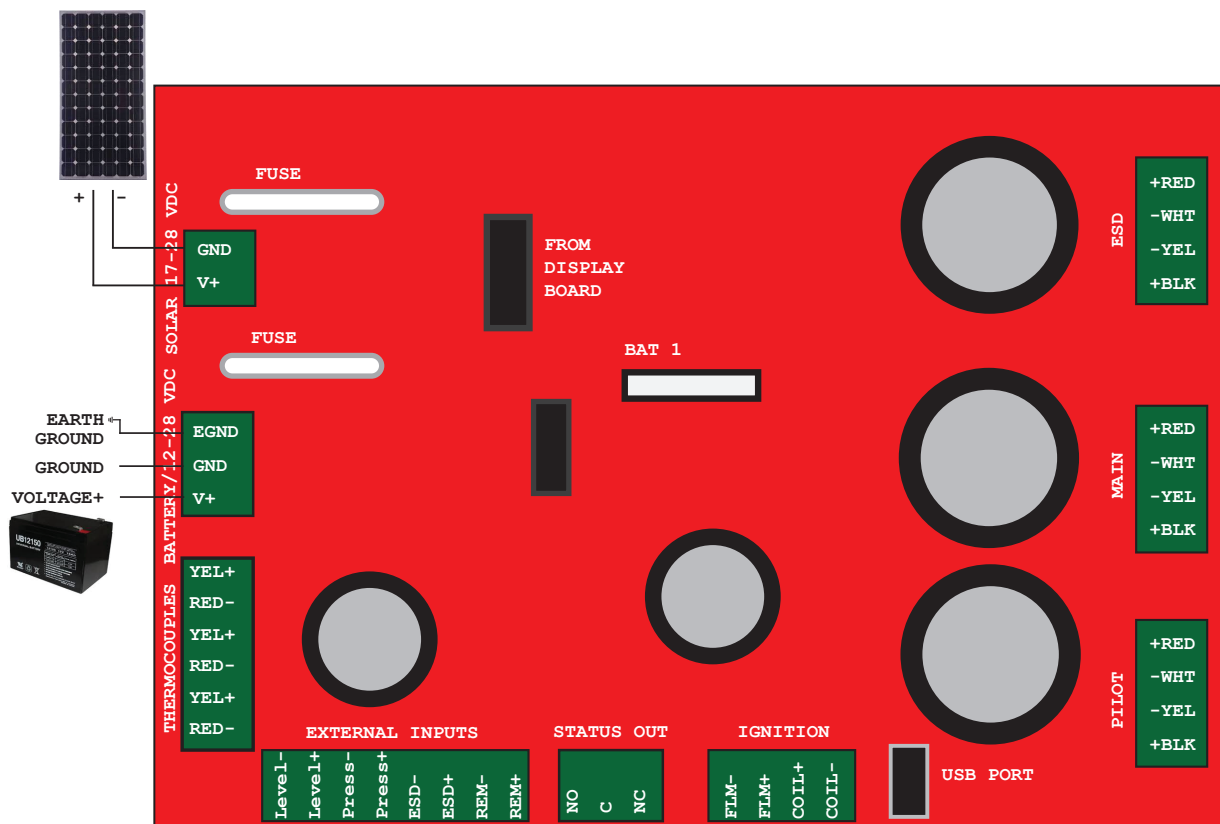
1. Locate power connector J3 (three (3) terminal) on the middle left hand side of the Main Board, labeled “Battery/12-28VDC”.
2. Insert the positive, negative and earth ground wires from the power supply into the terminals with the following order:

Terminal V+	Positive Wire
GND	Negative Wire
Earth GND	Earth Ground Wire

## NOTE

Must have earth ground connected.

## 10.2 SOLAR POWER WITH BATTERY BACKUP



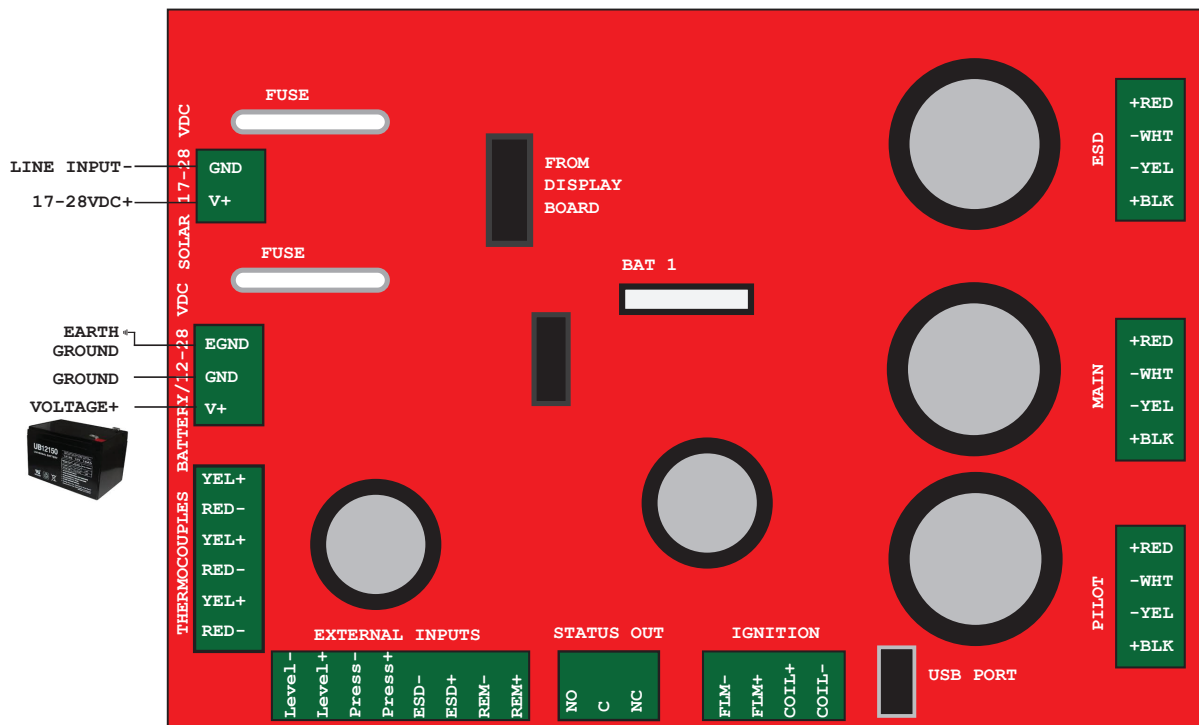
## STEPS

1. Locate the first power connector J6 (three (3) terminal) on the middle left hand side of the Main Board, labeled “Battery/12-28 VDC”.



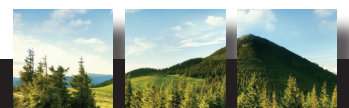
2. Insert the positive, negative and earth ground wires from the battery bank into the terminals with the following order:
  - a. Positive Wire      Terminal V+
  - b. Negative Wire      Terminal GND
  - c. Earth Ground Wire    Terminal EGND
3. Locate a second power connector J3 (two (2) terminal) on top left hand side of the Main Board, labeled “Solar/17-28VDC”.
7. Insert the positive and negative wires from the solar panel into the terminals with the following order:
  - a. Positive Wire      Terminal V+
  - b. Negative Wire      Terminal GND

### 10.3 LINE POWER WITH BATTERY BACKUP



### STEPS

1. Locate the first power connector J6 (three (3) terminal) on the middle left hand side of the Main Board, labeled “Battery/12-28 VDC”.
2. Insert the positive, negative and earth ground wires from the battery bank into the



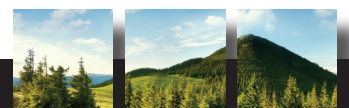
terminals with the following order:

- a. Positive Wire      Terminal V+
  - b. Negative Wire      Terminal GND
  - c. Earth Ground Wire      Terminal EGND
3. Locate a second power connector J3 (two (2) terminal) on top left hand side of the Main Board, labeled “Solar/17-28V”.
  4. Insert the positive and negative wires from the power supply into the terminals with the following order:
    - a. Positive Wire      Terminal V+
    - b. Negative Wire      Terminal GND

## **CONNECTING POWER TO THE AUXILIARY BOARD**

The 4-20 mA and Main board should have a separate power supply. To take full advantage of the isolation feature, it is recommended the use of a separate power supply for the 4-20 mA board, or the use of a DC/DC converter.

1. Locate the power connector J3 on the left hand side of the 4-20 Board, labeled “10-30 VDC IN”
2. Insert the positive and negative wires from the power supply into the terminals with the following order:
  - a. Positive Wire      Terminal PWR
  - b. Negative Wire      Terminal GND



## SETUP

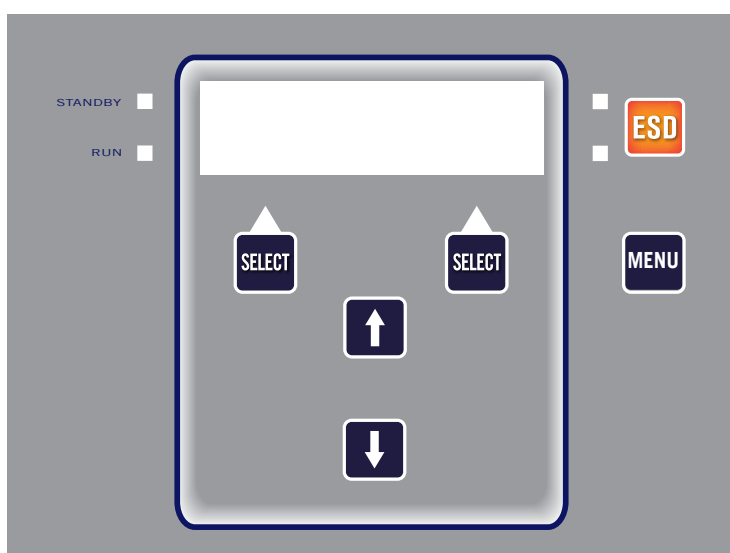
### WARNING

Prior to powering up the PLATINUM-800, a second inspection of wiring, solenoid flow direction and setup is recommended.

### POWERING UP

Close the Main and Pilot gas source valves and proceed to power up the system.

### FRONT PANEL



### SOFT KEYS

SELECT (left)	Performs the function displayed on the bottom left line of the screen read-out. The function will vary depending on the current state of the system.
SELECT (right)	Performs the function displayed on the bottom right line of the screen read-out. The function will vary depending on the current state of the system.
ESD	Shuts down any ongoing operating and changes the output of the ESD output contacts.
↑, ↓ Arrows	Change the setting currently displayed on the screen during SETUP mode.
MENU	Access to the menu setup screens for temperature control and setpoints. A password is required for access to these screens. Key presses password: SELECT (right), ↑, ↓, ↑, ↓, SELECT (left)

### PANEL INDICATORS

STANDBY	Blue status LED indicates whether the PLATINUM-800 has power and is not running.
RUN	Green status LED indicates the PLATINUM-800 is running and in the burn condition.
ESD	Two white status LEDs indicate the PLATINUM-800 is in an emergency shutdown condition.



## INITIAL SETUP

When the PLATINUM-800 is initially powered up, the system will go through an initialization and testing process and then into a short required setup. The screens will allow you to select the type of input power, solenoid type and solenoid voltage.

The following screens will appear in the below order, prompting you to choose the required selections. There will be a main menu screen with a Down (↓) arrow allowing you to enter into the sub-menus of the main menu. Use the Up (↑)/Down (↓) keys to cycle through to the desired selection, then press the Next button to advance to the next sub-menu screen or the Prev button to go backwards to the previous sub-menu screens. Use the Up (↑) arrow to exit out of the sub-menu and advance on to the next main menu.

AVAIL- ABILITY	SETUP SCREEN	DESCRIPTION	DETAILS	
Flare Flare + Igniter BMS	<b>MODE/SOLENOIDS: POWER</b>	The PLATINUM-800 can be powered from line power, solar with a battery backup, or line power with a battery backup.  <b>NOTE</b>  Incorrect selection of the power mode can result in emergency shutdown and/or improper operation.	Setting Options:	
			Solar + Bat	17 V MPP power input to connector J3 (Solar/17-30V)  12 V SLA battery to connector J6 (Battery/12-28V)
			17-28V + Bat	17-30 VDC power input to connector J3 (Solar/17-28V)  12 V SLA battery to connector J6 (Battery/12-28V)
			12-28V Line	10-30 VDC power input to connector J6 ( Battery/12-28V)
Flare Flare + Igniter BMS	<b>MODE/SOLENOIDS: MODE</b>	The PLATINUM-800 can be operated in four different modes: BMS, IGNITER, FLARE + and FLARE.	BMS	Solenoid control; temperature control; 3 relights, then shutdown; user selectable ignition delay
			IGNITER	Solenoid control; 3 relights, then shutdown; user selectable ignition delay
			FLARE +	Pilot solenoid control; 5 second delay before ignition
			FLARE	No solenoid control; 5 second delay before ignition

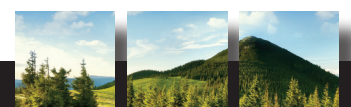




AVAIL- ABILITY	SETUP SCREEN	DESCRIPTION	DETAILS												
Flare + Igniter BMS	<b>MODE/SOLENOIDS: SOLENOIDS</b>	<p>The PLATINUM-800 allows different types of solenoids for each of the ESD, pilot and main outputs. Different models of solenoids operate at different voltages. Accordingly, the solenoid voltage must be selected for the solenoids chosen to run with this system.</p> <p><b>NOTE</b></p> <ul style="list-style-type: none"><li>• All connected solenoids must be rated for the selected voltage.</li><li>• Solenoids inappropriate for the currently selected voltage will not appear in the solenoid selection menus.</li></ul>	<p>Setting Options:</p> <table><tr><td>+12V</td><td>Voltage for 0.55W, 1.4W, and Peak/Hold solenoids</td></tr><tr><td>+24V</td><td>Voltage for 0.55W, 1.4W, 12W and Peak/Hold solenoids</td></tr></table>	+12V	Voltage for 0.55W, 1.4W, and Peak/Hold solenoids	+24V	Voltage for 0.55W, 1.4W, 12W and Peak/Hold solenoids								
+12V	Voltage for 0.55W, 1.4W, and Peak/Hold solenoids														
+24V	Voltage for 0.55W, 1.4W, 12W and Peak/Hold solenoids														
Igniter BMS	<b>MODE/SOLENOIDS: ESD SOL</b>	<p>The PLATINUM-800 allows different types of solenoids for each of the ESD, pilot and main outputs. Each output must be set separately.</p>	<p>Setting Options:</p> <table><tr><td>None</td><td>No solenoid</td></tr><tr><td>&lt;1W</td><td>Single coil solenoid</td></tr><tr><td>1-10W</td><td>Single coil solenoid</td></tr><tr><td>10-15W</td><td>Single coil solenoid - not available on 12V supply</td></tr><tr><td>P/H &lt;12W</td><td>Peak/hold solenoid</td></tr><tr><td>P/H 24W</td><td>Peak/hold solenoid - not available on 12V supply</td></tr></table> <p>If Peak/Hold solenoid is selected, the next main menu screen will allow you to select the Duty Cycle for the ESD Solenoid.</p>	None	No solenoid	<1W	Single coil solenoid	1-10W	Single coil solenoid	10-15W	Single coil solenoid - not available on 12V supply	P/H <12W	Peak/hold solenoid	P/H 24W	Peak/hold solenoid - not available on 12V supply
None	No solenoid														
<1W	Single coil solenoid														
1-10W	Single coil solenoid														
10-15W	Single coil solenoid - not available on 12V supply														
P/H <12W	Peak/hold solenoid														
P/H 24W	Peak/hold solenoid - not available on 12V supply														



AVAIL- ABILITY	SETUP SCREEN	DESCRIPTION	DETAILS	
Flare + Igniter BMS	<b>MODE/SOLENOIDS: PILOT SOL</b>	The PLATINUM-800 allows different types of solenoids for each of the ESD, pilot and main outputs. Each output must be set separately.	Setting Options:	
			None	No solenoid
			<1W	Single coil solenoid
			1-10W	Single coil solenoid
			10-15W	Single coil solenoid - not available on 12V supply
			P/H <12W	Peak/hold solenoid
			P/H 24W	Peak/hold solenoid - not available on 12V supply
			If Peak/Hold solenoid is selected, the next main menu screen will allow you to select the Duty Cycle for the Pilot Solenoid.	
Igniter BMS	<b>MODE/SOLENOIDS: MAIN SOL</b>	The PLATINUM-800 allows different types of solenoids for each of the ESD, pilot and main outputs. Each output must be set separately.	Setting Options:	
			None	No solenoid
			<1W	Single coil solenoid
			1-10W	Single coil solenoid
			10-15W	Single coil solenoid - not available on 12V supply
			P/H <12W	Peak/hold solenoid
			P/H 24W	Peak/hold solenoid - not available on 12V supply
			If Peak/Hold solenoid is selected, the next main menu screen will allow you to select the Duty Cycle for the Main Solenoid.	



## FACTORY SETUP

From the idle screen, press the SETUP button on the back of the Display Board to enter the factory setup menu.

The following screens will appear in the below order, prompting you to choose the required selections. Use the Up (↑)/Down (↓) keys to cycle through to the desired selection, then press the Next button to advance to the next screen.

AVAIL- ABILITY	SETUP SCREEN	DESCRIPTION	DETAILS
Flare Flare + Igniter BMS	<b>MODE/SOLENOIDS</b>	See Initial Setup for details.	
Flare + Igniter BMS	<b>PEAK/HOLD SOL</b>	See Initial Setup for details.	
Flare Flare + Igniter BMS	<b>IGNITION CONTROL: FLAME SENSE</b>	This is a variable parameter that allows a time delay for a pilot flame to re-establish; prevent nuisance shutdowns if the main burner comes on hard, and removes the flame from the Pilot Tip momentarily.	Default Setting: 3 s Setting Range: 0-5 s
Igniter BMS	<b>IGNITION CONTROL: VENT TIME</b>	This parameter allows you to adjust the delay time required to eliminate excess gas prior to ignition of the pilot. The vent delay state occurs before each ignition sequence.	Default Setting: 15 s Setting Range: 15-300 s
BMS	<b>IGNITION CONTROL: PILOT</b>	The pilot operational status has three setting options:  Tracks Main - The pilot turns on and off in conjunction with the main, relating to temperature set points.  Temperature Control - The pilot turns on and off based on the Pilot Off set point in the Operating Parameters Menu.  Always On - The pilot lights initially and remains on.	Default Setting: Always On Setting Options: Tracks mn. Temp Ctrl Always On





AVAIL- ABILITY	SETUP SCREEN	DESCRIPTION	DETAILS
Igniter BMS	<b>IGNITION CONTROL: SPARK DELAY</b>	This parameter allows you to adjust the delay from the opening of the pilot solenoid until the first ignition spark to allow for different delays in gas flow to the pilot .	Default Setting: 0 s Setting Range: 0-5 s
Igniter BMS	<b>IGNITION CONTROL: MAIN DELAY</b>	The main valve delay is the time from successful ignition of the pilot to the opening of the main valve. This allows the pilot to stabilize and create air movement within the fire tube for successful main light off.	Default Setting: 5 s Setting Range: 0-300 s
BMS	<b>TEMPERATURE: BMS CTRL</b>	Allows for Pressures to control the process control. <b>NOTE</b> 4-20 CH1 must be enabled for this option to appear.	Default Setting: TEMP Setting Options: TEMP PRESS
Flare Flare + Igniter BMS	<b>TEMPERATURE: THERMO</b>	The PLATINUM-800 has the ability to operate with up to 3 thermocouples for temperature sensing. <b>NOTE</b> For more details, see the installation section - INSTALLING THERMOCOUPLES.	Default Setting: T1/T3 Setting Options: None T1 T1/T3 T1/T2/T3
BMS	<b>TEMPERATURE: AUXILIARY</b>	Allows for a secondary process control on a second Thermocouple. <b>NOTE</b> Aux Thermocouple used is dependent on how many are enabled.	Default Setting: None Setting Options: None T2 T3
Flare Flare +	<b>TEMPERATURE: FLAME DET</b>	Flame detection may be performed with a thermocouple or the igniter rod. <b>NOTE</b> For more details, see the installation section - INSTALLING THERMOCOUPLES.	Default Setting: Rod Setting Options: Therm Rod
Flare Flare + Igniter BMS	<b>TEMPERATURE: TEMP SCALE</b>	This parameter enables you to display and read temperatures in Celsius or Fahrenheit.	Default Setting: F Setting Options: F C



AVAIL- ABILITY	SETUP SCREEN	DESCRIPTION	DETAILS
Flare Flare + Igniter BMS	<b>TEMPERATURE: T2 LABEL</b>		Default Setting: T2 Setting Options: T2 PROC STACK HBATH
Flare Flare + Igniter BMS	<b>TEMPERATURE: T3 LABEL</b>		Default Setting: T3 Setting Options: T3 PROC STACK HBATH



AVAIL- ABILITY	SETUP SCREEN	DESCRIPTION	DETAILS
Flare Flare + Igniter BMS	<b>INPUTS/OUTPUTS: REMOTE</b>	<p>The PLATINUM-800 allows for remote control of the burner ON/OFF state. With the External Off Switch closed, the unit will function in its normal capacity.</p> <p>With these contacts open, the burner will enter the Remote System OFF state. If the burner is ON and the contacts are opened, the PLATINUM-800 will extinguish all flames and return to the Remote System OFF state (status contacts will only change state on an ESD or power loss). When the contacts are closed, the PLATINUM-800 will return to the vent delay and re-ignition sequence.</p> <p>The setting option Main is only available in Igniter mode. When the contact is closed, the main is turned on, when the contact is open, the main is turned off. This allows external control of the main without affecting the pilot.</p> <p>When configured for proof of closure, these terminals would be connected to the proof of closure contact on the ESD valve. If the valve position indicated does not match the position expected, the unit will go into an ESD state.</p> <p>Valve closed = normally closed Valve open = normally open</p> <p><b>NOTE</b> Any ESD condition will require the operator to restart the unit from the front panel.</p>	<p>Default Setting: Disabled</p> <p>Setting Options: Main ProofOfC On/Off Disabled</p>



AVAIL- ABILITY	SETUP SCREEN	DESCRIPTION	DETAILS
Flare Flare + Igniter BMS	<b>INPUTS/OUTPUTS: AUTO-ON MODE</b>	The PLATINUM-800 allows for the system to automatically restart if power fails in the Run condition. When this function is enabled, the system will automatically enter Run mode when power is re-established after performing a successful ignition sequence and entering the Run condition.	Default Setting: Off Setting Options: On (enabled) Off(disabled)
Flare Flare + Igniter BMS	<b>INPUTS/OUTPUTS: STATUS RELAY</b>	<p>The PLATINUM-800 status output relay can be operated in three different modes: ESD, Plt and Run.</p> <p>In ESD mode, the status output relay NC contacts are closed when the unit is not in an ESD state. In an ESD state, the NC contacts are open.</p> <p>In Plt mode, the status output NC contacts are closed when the pilot flame is detected. If the pilot flame is not detected, the NC contacts are open and the system shuts down.</p> <p>In Run mode, the status output NC contacts are closed when the unit is running. The NC contacts are open when the unit is not running.</p>	Default Setting: ESD Setting Options: ESD Plt Run
Flare	<b>INPUTS/OUTPUTS: ROD SHORT DET</b>	In Flare or Flare + modes only, the system will allow you to bypass the Flame Rod Short error.	Default Setting: Y Setting Options: Y (yes) N (no)



AVAIL- ABILITY	SETUP SCREEN	DESCRIPTION	DETAILS															
Flare Flare + Igniter BMS	<b>GENERAL: PASSWORD</b>	<p>The PLATINUM-800 allows the user to enable or disable a password to activate or deactivate the unit.</p> <p>Once the Password feature is enabled, a password will be required to access the Factory Setup Menu and the Operating Parameters Menu.</p>	<p>Default Setting: Off Setting Options: On Off</p> <p>Factory Setup Menu Password: Right Select, Down Arrow, Up Arrow, Left Select.</p> <p>Operating Parameters Menu Password: Left Select, Up Arrow, Down Arrow, Up Arrow, Down Arrow, Right Select</p>															
Flare Flare + Igniter BMS	<b>GENERAL: LEDS</b>	<p>The PLATINUM-800 allows the user to select different modes for the status LEDs. Power down occurs three (3) minutes after the last keypress.</p> <p><b>NOTE</b> If an ESD occurs with the LED mode set to off, it will automatically switch to pulse mode until a key is pressed.</p> <p>If there is at least one error not reviewed, the LED will double pulse every two seconds until you view the error. Consequently, all of the LED modes in Setup will be overridden until the error is viewed.</p>	<p>Default Setting: Pulse Setting Options:</p> <table><tr><th>Setting</th><th>Action</th><th>Current</th></tr><tr><td>Power Down</td><td>Status LED powers off after 3 m</td><td>0 mA</td></tr><tr><td>Pulse</td><td>Short pulse of active status LED every 2 s</td><td>&lt; 1 mA</td></tr><tr><td>Flash</td><td>1 s on, 1 s off flash of active status LED</td><td>~ 5 mA</td></tr><tr><td>Always On</td><td>Active status LED is always on</td><td>~ 10 mA</td></tr></table>	Setting	Action	Current	Power Down	Status LED powers off after 3 m	0 mA	Pulse	Short pulse of active status LED every 2 s	< 1 mA	Flash	1 s on, 1 s off flash of active status LED	~ 5 mA	Always On	Active status LED is always on	~ 10 mA
Setting	Action	Current																
Power Down	Status LED powers off after 3 m	0 mA																
Pulse	Short pulse of active status LED every 2 s	< 1 mA																
Flash	1 s on, 1 s off flash of active status LED	~ 5 mA																
Always On	Active status LED is always on	~ 10 mA																
Flare Flare + Igniter BMS	<b>GENERAL: DISPLAY</b>	<p>The PLATINUM-800 allows the user to select whether to keep the display on at all times or to turn off the display three (3) minutes after the last keypress.</p>	<p>Default Setting: Pwr Down Setting Options:</p> <table><tr><th>Setting</th><th>Action</th></tr><tr><td>Pwr Down</td><td>Display powers down</td></tr><tr><td>Always On</td><td>Display always on</td></tr></table>	Setting	Action	Pwr Down	Display powers down	Always On	Display always on									
Setting	Action																	
Pwr Down	Display powers down																	
Always On	Display always on																	
Flare Flare + Igniter BMS	<b>GENERAL: SET TIME &amp; DATE</b>	<p>The PLATINUM-800 allows the user to set the time and date so that logged events are saved with the time when they occurred.</p>																



AVAIL- ABILITY	SETUP SCREEN	DESCRIPTION	DETAILS
Flare Flare + Igniter BMS	<b>LOG: VIEW LOG</b>	<p>The PLATINUM-800 allows the user to view a list of logged events including detected causes for errors and ESDs. Events can include the information about a burn cycle including the number of relights, the time the flame was on, and the total time of the burn. Times are recorded in seconds.</p> <p>Example of an error or ESD:</p> <div> <div>Error @ 09:59:26 (10) 25 Feb 2013</div> <div>Reason for error or ESD</div> </div> <p>Example of Burn Off:</p> <div> <div>BurnOff @ 09:59:26 (3) 25 Feb 2013</div> <div>Relights: 00000000</div> <div>Flame Time: 00457800s</div> <div>Total Time On: 00457819s</div> </div>	<p><b>STEPS</b></p> <ol style="list-style-type: none"> <li>1. Press the Down key to view the most recent event. The time and date of the event will be shown briefly before the event is displayed. The number of the event is displayed in parenthesis. The oldest event is (1) and the highest number is the newest event.</li> <li>2. Pressing the Down soft key shows the next oldest event.</li> <li>3. Pressing the Up soft key shows the newest event.</li> <li>4. When the oldest event is displayed, pressing the Down soft key again will briefly display "Oldest Event".</li> <li>5. When the newest event is displayed, pressing the Up soft key again will briefly display "Latest Event".</li> </ol> <p><b>NOTE</b></p> <p>The event log is a record of the last 256 recorded events. If more than 256 events occur without clearing the log, the oldest events will be lost.</p> <p>When the unit is manually started using key presses to turn the unit on, then off, the Total Time On indicates that entire period. Time On indicates the time that the unit was enabled to run by the external input.</p> <p>The Flame Time reflects the time that a flame was detected during either of the above periods.</p>



AVAIL- ABILITY	SETUP SCREEN	DESCRIPTION	DETAILS
Flare Flare + Igniter BMS	<b>LOG: SAVE LOG TO USB</b>	<p>The PLATINUM-800 enables the user to copy collected log information onto a USB through the USB port on the Main Board.</p> <p>Approved USB devices include:</p> <ul style="list-style-type: none"> <li>Sandisk Cruzer Glide</li> <li>Amtron UFD-AF002GB (rated -40 to 85 C)</li> </ul> <p>Example Log:</p> <pre>S/N:0000000001 ESD @ 09:22:48( 3) 15Apr2014 System reset from power fail ESD @ 09:22:48( 2) 15Apr2014 Battery undervolt. 0.0V ESD @ 09:14:25( 1) 15Apr2014 Watchdog micro.not respond</pre>	<p><b>STEPS</b></p> <ol style="list-style-type: none"> <li>1. Source the appropriate USB device (see Save Log To USB).</li> <li>2. Connect the USB device to the USB port (J17) located on the Main Board.</li> <li>3. With the USB device connected, press the Down soft key to start the copying process.</li> <li>4. Once the copying process is completed, press the Okay soft key to continue on to the next screen.</li> <li>5. Remove the USB device once the process has completed successfully.</li> </ol>
Flare Flare + Igniter BMS	<b>LOG: CLEAR LOG</b>	<p>The PLATINUM-800 allows the user to clear the log of recorded errors and ESDs.</p> <p><b>NOTE</b></p> <p>The event record log is saved in non-volatile memory and is maintained even without power. The event log can be cleared with the menu operation.</p>	To initiate Clear Log, press (↑,↓,↑,↓) Up, Down, Up and then Down.
Flare Flare + Igniter BMS	<b>MODBUS SETUP: MOD BAUD</b>	This menu item will only be available when a Modbus Add On Card is installed on the PLATINUM-800 unit.	<p>Default Setting: 19200</p> <p>Setting Options: 19200 9600 4800 1200 Disabled 38400</p>
Flare Flare + Igniter BMS	<b>MODBUS SETUP: MOD PARITY</b>	This menu item will only be available when a Modbus Add On Card is installed on the PLATINUM-800 unit.	<p>Default Setting: None</p> <p>Setting Options: None Even Odd</p>



AVAIL- ABILITY	SETUP SCREEN	DESCRIPTION	DETAILS
Flare Flare + Igniter BMS	<b>MODBUS SETUP: MOD STOP BITS</b>		Default Setting: 1 Setting Options: 1 2
Flare Flare + Igniter BMS	<b>MODBUS SETUP: MOD ADDRESS</b>	This menu item will only be available when a Modbus Add On Card is installed on the PLATINUM-800 unit.	Default Setting: 5 Setting Options: 0-255
Flare Flare + Igniter BMS	<b>4-20 SETUP: 4-20 OUT</b>		Default Setting: Ramp Setting Options: Ramp Disable Prop Therm 1
Flare Flare + Igniter BMS	<b>4-20 SETUP: RAMP OPEN</b>	Only available when Ramp is selected for the 4-20 Output	Default Setting: 1 Setting Options: 1-60
Flare Flare + Igniter BMS	<b>4-20 SETUP: IN 1</b>		Default Setting: Disable Setting Options: Enable Disable
BMS	<b>4-20 SETUP: IN1UPESD</b>	Sets the Upper and lower Pressures for Alarm Notifications and ESD Shutdowns  <b>NOTE</b> These are for the 4 alarm ESD combinations.	Default Setting: Enabled Setting Options: Enable Disable  Default pressure values will be dependent on the setup of the 4-20 interface in the 4-20 menu in the Factory Setup
BMS	<b>4-20 SETUP: IN1UPALM</b>	Sets the Upper and lower Pressures for Alarm Notifications and ESD Shutdowns  <b>NOTE</b> These are for the 4 alarm ESD combinations.	Default Setting: Enabled Setting Options: Enable Disable  Default pressure values will be dependent on the setup of the 4-20 interface in the 4-20 menu in the Factory Setup





AVAIL- ABILITY	SETUP SCREEN	DESCRIPTION	DETAILS
BMS	<b>4-20 SETUP: IN1LOALM</b>	Sets the Upper and lower Pressures for Alarm Notifications and ESD Shutdowns  <b>NOTE</b> These are for the 4 alarm ESD combinations.	Default Setting: Enabled Setting Options: Enable Disable  Default pressure values will be dependent on the setup of the 4-20 interface in the 4-20 menu in the Factory Setup
BMS	<b>4-20 SETUP: IN1LOESD</b>	Sets the Upper and lower Pressures for Alarm Notifications and ESD Shutdowns  <b>NOTE</b> These are for the 4 alarm ESD combinations.	Default Setting: Enabled Setting Options: Enable Disable  Default pressure values will be dependent on the setup of the 4-20 interface in the 4-20 menu in the Factory Setup
Flare Flare + Igniter BMS	<b>4-20 SETUP: IN 2</b>		Default Setting: Disable Setting Options: Enable Disable
BMS	<b>4-20 SETUP: IN2UPESD</b>	Sets the Upper and lower Pressures for Alarm Notifications and ESD Shutdowns  <b>NOTE</b> These are for the 4 alarm ESD combinations.	Default Setting: Enabled Setting Options: Enable Disable  Default pressure values will be dependent on the setup of the 4-20 interface in the 4-20 menu in the Factory Setup
BMS	<b>4-20 SETUP: IN2UPALM</b>	Sets the Upper and lower Pressures for Alarm Notifications and ESD Shutdowns  <b>NOTE</b> These are for the 4 alarm ESD combinations.	Default Setting: Enabled Setting Options: Enable Disable  Default pressure values will be dependent on the setup of the 4-20 interface in the 4-20 menu in the Factory Setup



AVAIL- ABILITY	SETUP SCREEN	DESCRIPTION	DETAILS
BMS	<b>4-20 SETUP: IN2LOALM</b>	Sets the Upper and lower Pressures for Alarm Notifications and ESD Shutdowns  <b>NOTE</b> These are for the 4 alarm ESD combinations.	Default Setting: Enabled Setting Options: Enable Disable  Default pressure values will be dependent on the setup of the 4-20 interface in the 4-20 menu in the Factory Setup
BMS	<b>4-20 SETUP: IN2LOESD</b>	Sets the Upper and lower Pressures for Alarm Notifications and ESD Shutdowns  <b>NOTE</b> These are for the 4 alarm ESD combinations.	Default Setting: Enabled Setting Options: Enable Disable  Default pressure values will be dependent on the setup of the 4-20 interface in the 4-20 menu in the Factory Setup
Flare Flare + Igniter BMS	<b>4-20 SETUP: 420 OUT 4MA</b>	Only available when Therm 1 is selected for the 4-20 Output	Default Setting: 1F Setting Options: 0-299F
Flare Flare + Igniter BMS	<b>4-20 SETUP: 420 OUT 20MA</b>	Only available when Therm 1 is selected for the 4-20 Output	Default Setting: 300F Setting Options: 1-2500F
Flare Flare + Igniter BMS	<b>FACTORY RESET</b>	To reset the PLATINUM-800 to the factory default settings, a specific key sequence will need to be entered. After reset, the system will require reentry of the INITIAL SETUP options.	To initiate Factory reset, press (↑, ↓, ↑, ↓) Up, Down, Up and then Down.
Flare Flare + Igniter BMS	<b>SOFTWARE VERSION</b>	This menu displays the currently installed software versions for the BMS unit.	
Flare Flare + Igniter BMS	<b>SAVE AND EXIT</b>	This screen will allow you to exit the factory setup menu.	Press the down key to save and exit. Or you can press the SETUP push-button switch on the back of the Display Board at any time to exit the setup mode. All changes will be saved. Setup will automatically exit and save changes after three (3) minutes of no soft-key presses.



## OPERATING PARAMETERS MENU

To enter the operating parameters setup menu, press the MENU soft-key button located on the front panel. If the Password feature is enabled, you will be unable to access the menu without first entering the password. See section: Factory Setup - Password. This menu allows you to specify how certain functions/parameters are characterized within the BMS.

The following screens will appear:

AVAIL- ABILITY	SETUP SCREEN	DESCRIPTION	DETAILS
BMS	<b>MAIN ON</b>	Easily change the temperature set point to determine when the main burner will come on.	
BMS	<b>MAIN OFF</b>	Easily change the temperature set point to determine when the main burner will turn off.	
Igniter BMS	<b>HIGH TEMP</b>	This parameter allows you to enter a set point at which the BMS will ESD on high temperature shutdown.  This high temperature set point can be set independent of all other set points.	A thermocouple must be installed in terminal slot T1 for this parameter.
Igniter BMS	<b>T2 ESD</b>	This parameter allows you to enter a set point at which the BMS will ESD for the T2 thermocouple.	A thermocouple must be installed in terminal slot T2 for this parameter.
Igniter BMS	<b>T3 ESD</b>	This parameter allows you to enter a set point at which the BMS will ESD for the T3 thermocouple.	A thermocouple must be installed in terminal slot T3 for this parameter.
BMS	<b>LOW TEMP</b>	This parameter allows you to enter a set point at which the BMS will ESD on low temperature shutdown.	A thermocouple must be installed in terminal slot T1 for this parameter.



## OPERATING

### **WARNING**

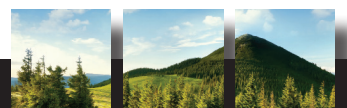
Prior to powering up the PLATINUM-800, a second inspection of wiring, solenoid flow direction and setup is recommended. Verify all power connections to the PLATINUM-800 Main Board.

### **POWERING UP**

Close the main and pilot gas source valves and proceed to power up the system. The display will show several product information screens then will display a test sequence.

If the system has not been previously configured, it will go into an abbreviated setup sequence. The input power type, solenoid voltage and the type of each solenoid must be selected before the system will become functional. Additional parameters may be set by pressing the SETUP push-button on the Display Board any time the system is not running or during an ESD condition.

It is recommended when changing the operational mode on the BMS, a factory reset should be performed prior to configuring the settings. See Factory Reset.



The power type text on the bottom left portion of the screen will vary depending on the type of power input. Use the ↑ , ↓ arrow soft key buttons to cycle through the available screens.

## SMART START

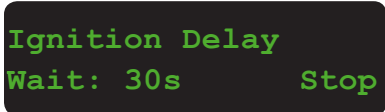
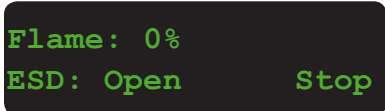
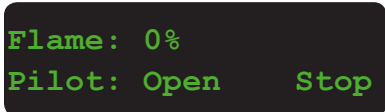
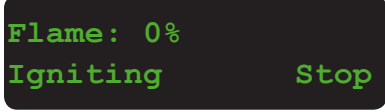
Smart Start is a way to reduce the startup time on a system that has already vented. The ignition delay (wait time) in BMS/IGNITER mode is user selectable from 15 to 300 seconds. However, the system monitors the time to determine how long the system has already been venting. The display will show a rotating bar (|, /, -, \, |) while it is in a delay state and not turned on. After the delay time has expired, the display will show \* as above. If the PLATINUM-800 is then turned on, the system will delay for a minimum of 15s. If the PLATINUM-800 ignition cycle starts before the wait time expires, the system will delay for the time remaining. Smart Start is not used in FLARE or FLARE + mode since the ignition delay time is fixed.

## RUNNING

After waiting a minimum of five (5) minutes for any gases in firetube to dissipate, open the main and pilot gas sources when ready to engage the BMS.

When you press the right select key (Run), the PLATINUM-800 will operate through the user set delay time while the system performs tests. The PLATINUM-800 will then follow the user set timing for the ignition sequence.

The below screens will vary based on the operational mode. To learn more about the different operational modes, please see the INTRODUCTION section.

<p>IGNITION DELAY</p> 	Initially, the PLATINUM-800 will display a screen while the system is delaying.
<p>ESD OPEN</p> 	Once the ignition delay has expired, the ESD valve will open.
<p>PILOT OPEN</p> 	After the spark delay time has expired, a series of forty (40) sparks will arc between the Igniter Rod Tip and the Nozzle Tip (ground).
<p>IGNITION</p> 	After the spark delay time has expired, a series of forty (40) sparks will arc between the Igniter Rod Tip and the Nozzle Tip (ground). After the spark delay time has expired, a series of forty (40) sparks will arc between the Igniter Rod Tip and the Nozzle Tip (ground).


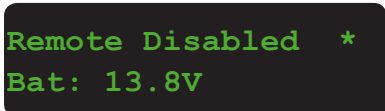
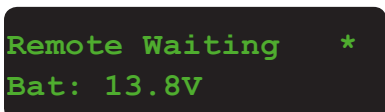
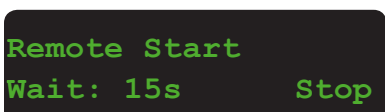


<p>FLAME DETECTION</p> 	<p>After ignition, the system will check for the presence of the Pilot flame.</p>
<p>MAIN SOLENOID</p>  	<p>Upon successful Pilot ignition, the preset Main Time Delay for the Pilot to stabilize will start counting.</p> <p>After the main delay, the main solenoid will turn on.</p>
<p>RUNNING</p>    	<p>When the PLATINUM-800 ignition sequence is complete and the system is running, a screen is shown with the flame quality and status of the Pilot (P) and Main (M) solenoids.</p> <p>Use the ↑ , ↓ arrow soft key buttons to cycle through the available screens. Screen outputs will vary depending on the operational mode and configurations.</p> <p><b>NOTE</b></p> <p>The first time the burner tries to ignite the pilot, it may take several attempts to purge air out of the pilot line.</p>
<p>PASSWORD PROTECTION</p> 	<p>If password protection is enabled, the following screen will be displayed before system start up, shut down or entering SETUP mode.</p>



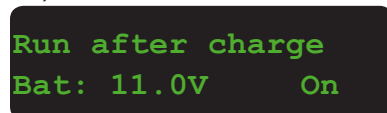
## RUNNING WITH REMOTE ON/OFF

If Remote On/Off mode is enabled the standby screens will change to show the status. To run in Remote On/Off mode, you must press the On (right select) key to start.

	Unit is in standby, On (right select) key has not been pressed and Remote On/Off input is closed.
	Unit is in standby, On key has not been pressed and Remote On/Off input is open.
	Unit is in standby, On key has been pressed and Remote On/Off input is open.
	Unit is starting Run, On key has been pressed and Remote On/Off input is closed.

## RUNNING WITH LOW BATTERY CONDITION

If the battery is depleted while running, the system will shut off and go into standby mode at 11 V. If the Auto On setting is enabled (On), the system will automatically restart after the battery has recharged to an acceptable level. The level varies on the mode of operation and the selected solenoid power ratings. If the system is waiting to restart, the Standby and Run LED panel indicators will display alternate flashes and the following screen will be displayed (if the display is on):



## CONFIRM PROPER FUNCTIONALITY OF THE FLAME SENSING PROBE

1. With the Pilot on, close the Pilot gas valve to starve the Pilot of gas. The loss of flame will cause the system to close the ESD, Main and Pilot Solenoid Valves (if installed and enabled - IGNITER/BMS only mode), initiate a re-ignition cycle, and then attempt a relight. Once the re-ignition cycle is confirmed, open the Pilot gas, and the Platinum BMS will automatically relight the Pilot. The number of retries is incremental for each attempt. A successful relight will be displayed with each relight. The relight number is reset to zero (0) if the Platinum BMS is set to the OFF state or reset after a shutdown.
2. Once the Pilot is proven, open the Main gas valve slowly and confirm air gas mixture is proper according to flame color. Platinum recommends the use of an analyzer.





#### NOTE

Platinum Control does not set burners, and strongly recommends that a qualified burner technician inspect and tune the burner upon completion of the installation.

#### NOTE

If the Main Control Box requires cleaning, use a damp cloth to avoid creation of anti-static discharge.

## RATINGS

### POWER SUPPLY

SOLAR / BATTERY MODE	Solar Input	<ul style="list-style-type: none"> <li>For use with solar panels rated at 17.3 V for maximum power</li> <li>Voc 30 V maximum</li> <li>Maximum usable input power -approx. 60 W</li> </ul>
	Power Control	<ul style="list-style-type: none"> <li>MPPT</li> </ul>
	Battery Output	<ul style="list-style-type: none"> <li>12 V sealed lead acid</li> </ul>
	Charging Current	<ul style="list-style-type: none"> <li>4 A output max</li> </ul>
LINE / BATTERY MODE	Line In	<ul style="list-style-type: none"> <li>17-28 VDC</li> </ul>
	Battery Output	<ul style="list-style-type: none"> <li>12 V sealed lead acid</li> </ul>
	Charging Current	<ul style="list-style-type: none"> <li>2 A output max</li> </ul>
LINE IN MODE	Line In	<ul style="list-style-type: none"> <li>12-28 VDC</li> </ul>

### POWER CONSUMPTION (RUNNING - NO SOLENOIDS)\*

0.2W (Platinum-500 & Platinum-600)

0.3W (Platinum-600M)

1.5W (Platinum-800) - with analog I/O utilized

*\*Display off and Flashing LED modes*

### FUSE

CERAMIC 250 V FAST 3AB 5A

### BATTERY

Werker Battery WKA12-14F2

Cables (provided with unit purchase):

2028276 Cable Assembly, Positive Battery Cable w/ AMP 3-350820-2 connector

2028278 Cable Assembly, Negative Battery Cable w/ AMP 3-350820-2 connector

### CLOCK BACKUP BATTERY

CR2032



## WARNING

The clock backup battery must be inserted and not depleted for proper operation. Replace every 10 years or as directed by the BMS.

## STATUS OUTPUT RELAY

Maximum connection ratings:

30 Vdc / 2 A - 60 W

# TROUBLESHOOTING

## ESD SCREEN MESSAGES

If the PLATINUM-800 detects a problem that does not require a restart, it will shut down any ongoing operation and display the cause(s) of the problem. The time/date and reason for shutdown will also be stored into the event log and can be viewed later.

For the following table, xx.xV, indicated the voltage reading at the time of the problem.

For example:

Line  
undervolt. 9.7V

MESSAGE	FAULT CONDITION	RECOMMENDED CORRECTIVE ACTION(S)
ADC Scan Fault	The checksum over all ADC registers fails.	(1) Capture the error log and report incident to qualified service personnel.
Battery overvolt. xx.xV	Battery voltage is above 14.5 V.	(1) This may indicate a failure with the battery charging circuit; refer to qualified service personnel.
Battery undervolt. xx.xV	The battery has been discharged to 10.5V or less.	(1) Check power feed from line or solar panel. (2) Check battery. (3) This error may indicate a failure of the battery charging circuit; refer to qualified service personnel.
Critical Operations Alarm	A critical operation failure, such as an invalid protected variable, occurs. Protected variables are checked against an inverted copy of the variable.	(1) Capture the error log and report the incident to qualified service personnel.



MESSAGE	FAULT CONDITION	RECOMMENDED CORRECTIVE ACTION(S)
ESD check type error	During verification of the ESD solenoid & wiring, the type of solenoid to verify was detected as corrupted, therefore the solenoid could not be verified correctly; Use Setup to select the correct solenoid type; This may indicate a problem with the Main Board.	(1) This error should not occur under normal operating conditions and may be caused as a result of memory corruption; corrective action escalation: (a) Consult error log for potentially related errors; (b) Reset system; (c) Reconfigure system; (d) Refer to qualified service personnel.
ESD latch coil problem	When checking solenoids pullup, the ESD solenoid latching circuit voltage is less than 3.78 V, indicating a short to ground. (Note, a latching solenoid type should not be used for the ESD solenoid valve.)	(1) Check wiring to ESD solenoid valve (2) Check ESD solenoid valve, replace if necessary (3) This error may indicate a failure of the solenoid driver circuit; refer to qualified service personnel. (NOTE: Use of a latch type solenoid for the ESD valve is not recommended.)
ESD latch solen. open circuit	When checking solenoids divider circuit, the ESD solenoid latching circuit voltage is below 7.0 V with pullup and pulldown active. When checking solenoids pullup, the ESD solenoid latching circuit voltage is below 1.0 V with pullup active. There is an open connection in either the ESD solenoid latch wiring or the ESD solenoid latch coil (latched solenoids only).	(1) Check wiring to ESD solenoid valve (2) Check ESD solenoid valve, replace if necessary (3) This error may indicate a failure of the solenoid driver circuit; refer to qualified service personnel. (NOTE: Use of a latch type solenoid for the ESD valve is not recommended.)
ESD on type error	Invalid ESD solenoid type (ESD Sol configuration parameter setting) detected when turning on.	(1) This error should not occur under normal operating conditions and may be caused as a result of memory corruption; corrective action escalation: (a) Consult error log for potentially related errors; (b) Reset system; (c) Reconfigure system; (d) Refer to qualified service personnel.
ESD peak/hold driver error	When checking solenoids divider circuit with peak and hold, low watt, or high watt solenoids, the ESD solenoid voltage is above 1.0 V with pull-ups and pulldowns active and PWM FET full on.	(1) Check wiring to ESD solenoid valve (2) Check ESD solenoid valve, replace if necessary (3) This error may indicate a failure of the solenoid driver circuit; refer to qualified service personnel.



MESSAGE	FAULT CONDITION	RECOMMENDED CORRECTIVE ACTION(S)
ESD release coil problem	When checking solenoids pullup, the ESD solenoid release circuit voltage is less than 3.78 V, indicating a short to ground. (Note, a latching solenoid type should not be used for the ESD solenoid valve.)	(1) Check wiring to ESD solenoid valve (2) Check ESD solenoid valve, replace if necessary (3) This error may indicate a failure of the solenoid driver circuit; refer to qualified service personnel. (NOTE: Use of a latch type solenoid for the ESD valve is not recommended.)
ESD rele. sol. open circuit	When checking solenoids divider circuit, the ESD solenoid latching circuit voltage is below 7.0 V with pullup and pulldown active. When checking solenoids pullup, the ESD solenoid latching circuit voltage is below 1.0 V with pullup active.	(1) Check wiring to ESD solenoid valve (2) Check ESD solenoid valve, replace if necessary (3) This error may indicate a failure of the solenoid driver circuit; refer to qualified service personnel. (NOTE: Use of a latch type solenoid for the ESD valve is not recommended.)
ESD shutdown type error	Invalid ESD solenoid type (ESD Sol configuration parameter setting) detected when turning on.	(1) This error should not occur under normal operating conditions and may be caused as a result of memory corruption; corrective action escalation: (a) Consult error log for potentially related errors; (b) Reset system; (c) Reconfigure system; (d) Refer to qualified service personnel.
ESD solenoid coil problem	When checking solenoids pullup, the ESD solenoid circuit voltage is less than 3.78 V, indicating a short to ground.	(1) Check wiring to ESD solenoid valve (2) Check ESD solenoid valve, replace if necessary (3) This error may indicate a failure of the solenoid driver circuit; refer to qualified service personnel.
ESD solenoid driver overtemp	Status bit from ESD solenoid driver indicates over temperature.	(1) Check the configuration of solenoid voltage (Solenoids configuration parameter) and solenoid type (ESD Sol configuration parameter) matches that of the ESD solenoid valve. (2) Check ESD solenoid valve, replace if necessary.
ESD solenoid driver powerfail	Status bit from ESD solenoid driver indicates powerfail.	(1) This error may indicate a power supply circuit failure; refer to qualified service personnel.
ESD solenoid open circuit	ESD solenoid (non-latched) voltage is below the open circuit voltage when checking solenoids divider with pullup and pulldown active: <ul style="list-style-type: none"> <li>• 7.0 V for 12 V solenoid voltage configuration</li> <li>• 11.0 V for 24 V solenoid voltage configuration</li> </ul>	(1) Check wiring to ESD solenoid valve (2) Check ESD solenoid valve, replace if necessary (3) This error may indicate a failure of the solenoid driver circuit; refer to qualified service personnel.



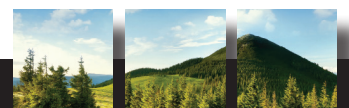
MESSAGE	FAULT CONDITION	RECOMMENDED CORRECTIVE ACTION(S)
ESD solenoid open, POC closed	ESD solenoid is open while proof of closure indicates closed.	(1) Check ESD solenoid valve for proper mechanical operation. (2) Check wiring between POC terminals of ESD solenoid valve and Remote input.
ESD solenoid overload (short)	Status bit from ESD solenoid driver indicates overload.	(1) Check wiring to ESD solenoid valve. (2) Check configuration of ESD solenoid valve matches that of actual valve used. (3) Check ESD solenoid valve, replace if necessary. (4) This error may indicate a failure of the solenoid driver circuit; refer to qualified service personnel.
ESD solenoid underload (open)	Status bit from ESD solenoid driver indicates underload.	(1) Check wiring to ESD solenoid valve. (2) Check configuration of ESD solenoid valve matches that of actual valve used. (3) Check ESD solenoid valve, replace if necessary. (4) This error may indicate a failure of the solenoid driver circuit; refer to qualified service personnel.
ESD solenoid closed, POC open	ESD solenoid is closed while proof of closure indicates open.	(1) Check ESD solenoid valve for proper mechanical operation. (2) Check wiring between POC terminals of ESD solenoid valve and Remote input.
ESD verify type error	Invalid ESD solenoid type (ESD Sol configuration parameter setting) detected when verifying ESD on.	(1) This error should not occur under normal operating conditions and may be caused as a result of memory corruption; corrective action escalation: (a) Consult error log for potentially related errors; (b) Reset system; (c) Reconfigure system; (d) Refer to qualified service personnel.
Flame detected during wait time	Flame detected during ignition vent time.	(1) Check Pilot valve for leaks and proper mechanical operation.
Flame rod short	A short has been detected between the flame rod and ground.	(1) Check flame rod for build up of soot or bent/damaged pilot assembly. (2) Check ION+/ION- wiring. (3) This error may indicate a failure of the flame detection circuit; refer to qualified service personnel.
High temperature alarm T1	Thermocouple input T1 indicates process temperature has risen above the configured high temperature alarm threshold (T1 High Temp configuration parameter setting).	(1) Check threshold temperature parameters. (2) Consult error log for possible related errors. (3) Check operation of T1 thermocouple (using meter), replace if necessary.



MESSAGE	FAULT CONDITION	RECOMMENDED CORRECTIVE ACTION(S)
High Temperature Alarm T3	Thermocouple input T3 indicates process temperature has risen above the configured high temperature alarm threshold (T3 High Temp configuration parameter setting).	(1) Check threshold temperature parameters. (2) Consult error log for possible related errors. (3) Check operation of T3 thermocouple (using meter), replace if necessary.
Invalid Flame Detect Mode	Invalid flame detect type (Flame det configuration parameter setting) detected.	(1) This error should not occur under normal operation conditions and may be caused as a result of memory corruption; corrective action escalation: (a) Consult error log for potentially related errors (b) Reset system (c) Reconfigure system (d) Refer to qualified service personnel
Invalid msg in handle retry	Invalid burn state message detected when attempting retries.	(1) This error should not occur under normal operation conditions and may be caused as a result of memory corruption; corrective action escalation: (a) Consult error log for potentially related errors (b) Reset system (c) Reconfigure system (d) Refer to qualified service personnel
Level Alarm	Level gauge input is open. The Level input circuit must be a closed loop to enable normal operation.	(1) Check equipment and/or sensor connected to Level input. (2) Check wiring between Pressure input and remote equipment.
Line overvolt. xx.xV	When operating in 12_28VLine or 17_28V+Bat power mode, the line voltage is above 32 V.	(1) Check power feed line system.
Line undervolt. xx.xV	When operating in 12_28VLine power mode with low watt solenoids, the line voltage is below 10.0 V with the buck boost off or it is below 8.5 V with the buck boost on.	(1) Check adequacy of power feed to system. (2) This error may indicate a power supply circuit failure; refer to qualified service personnel.
Line undervolt & high W sol.	When operating in 12_28VLine power mode with high watt solenoids, the line voltage is below 17 V.	(1) Check adequacy of power feed to system. (2) This error may indicate a power supply circuit failure; refer to qualified service personnel.
Low Temperature Alarm T1	Thermocouple input T1 indicates process temperature has fallen below the configured low temperature alarm threshold (Low Temp configuration parameter setting).	(1) System has failed to re-ignite when the process temperature fell below the Main On temperature threshold; check threshold temperature parameters (2) Consult error log for possible related errors (3) Check T1 thermocouple, replace if necessary



MESSAGE	FAULT CONDITION	RECOMMENDED CORRECTIVE ACTION(S)
Main check type error	Invalid Main solenoid type (Main Sol configuration parameter setting) detected when checking solenoids pullup.	(1) This error should not occur under normal operating conditions and may be caused as a result of memory corruption; corrective action escalation: (a) Consult error log for potentially related errors; (b) Reset system; (c) Reconfigure system; (d) Refer to qualified service personnel.
Main latch coil error	When checking solenoids pullup, the Main solenoid latching circuit voltage is less than 3.78 V, indicating a short to ground.	(1) Check wiring to Main solenoid valve. (2) Check Main solenoid valve, replace if necessary. (3) This error may indicate a failure of the solenoid driver circuit; refer to qualified service personnel.
Main latch solen. open circuit	When checking solenoids divider circuit, the Main solenoid latching voltage is below 7.0 V with pullup and pulldown active. When checking solenoids pullup, the Pilot solenoid latching voltage is below 1.0 V with pullup active.	(1) Check wiring to Main solenoid valve. (2) Check Main solenoid valve, replace if necessary. (3) This error may indicate a failure of the solenoid driver circuit; refer to qualified service personnel.
Main on type error	Invalid Main solenoid type (Main Sol configuration parameter setting) detected when turning on.	(1) This error should not occur under normal operating conditions and may be caused as a result of memory corruption; corrective action escalation: (a) Consult error log for potentially related errors; (b) Reset system; (c) Reconfigure system; (d) Refer to qualified service personnel.
Main peak/hold driver error	When checking solenoids divider circuit with peak and hold, low watt, or high watt solenoids, the Main solenoid voltage is above 1.0 V with pull-ups and pulldowns active and PWM FET full on.	(1) Check wiring to Main solenoid valve. (2) Check Main solenoid valve, replace if necessary. (3) This error may indicate a failure of the solenoid driver circuit; refer to qualified service personnel.
Main PC Test Error	The main processor has detected a program counter error.	(1) Capture the error log and report the incident to qualified service personnel.
Main release coil error	When checking solenoids pullup, the Main solenoid release circuit voltage is less than 3.78 V, indicating a short to ground.	(1) Check wiring to Main solenoid valve. (2) Check Main solenoid valve, replace if necessary. (3) This error may indicate a failure of the solenoid driver circuit; refer to qualified service personnel.





MESSAGE	FAULT CONDITION	RECOMMENDED CORRECTIVE ACTION(S)
Main release sol. open circuit	When checking solenoids divider circuit, the Main solenoid release voltage is below 7.0 V with pullup and pulldown active. When checking solenoids pullup, the Main solenoid release voltage is below 1.0 V with pullup active.	(1) Check wiring to Main solenoid valve. (2) Check Main solenoid valve, replace if necessary. (3) This error may indicate a failure of the solenoid driver circuit; refer to qualified service personnel.
Main shutdown type error	Invalid Main solenoid type (Main Sol configuration parameter setting) detected when shutting off.	(1) This error should not occur under normal operating conditions and may be caused as a result of memory corruption; corrective action escalation: (a) Consult error log for potentially related errors; (b) Reset system; (c) Reconfigure system; (d) Refer to qualified service personnel.
Main solenoid coil error	When checking solenoids pullup, the Main solenoid circuit voltage is less than 3.78 V, indicating a short to ground.	(1) Check wiring to Main solenoid valve. (2) Check Main solenoid valve, replace if necessary. (3) This error may indicate a failure of the solenoid driver circuit; refer to qualified service personnel.
Main solenoid driver overtemp	Status bit from Main solenoid driver indicates over temperature.	(1) Check that configuration of solenoid voltage (Solenoids configuration parameter) and solenoid type (Main Sol configuration parameter) matches that of the Main solenoid valve. (2) Check Main solenoid valve, replace if necessary.
Main solenoid driver powerfail	Status bit from Main solenoid driver indicates power fail.	(1) This error may indicate a power supply circuit failure; refer to qualified service personnel.
Main solenoid open circuit	Main solenoid (non-latched) voltage is below the open circuit voltage when checking solenoids divider with pullup and pulldown active: <ul style="list-style-type: none"> <li>• 7.0 V for 12 V solenoid voltage configuration</li> <li>• 11.0 V for 24 V solenoid voltage configuration</li> </ul>	(1) Check wiring to Main solenoid valve. (2) Check Main solenoid valve, replace if necessary. (3) This error may indicate a failure of the solenoid driver circuit; refer to qualified service personnel.
Main solenoid overload (short)	Status bit from Main solenoid driver indicates overload.	(1) Check wiring to Main solenoid valve. (2) Check configuration of Main solenoid valve matches that of actual valve used. (3) Check Main solenoid valve type, replace if necessary. (4) This error may indicate a failure of the solenoid driver circuit; refer to qualified service personnel.



MESSAGE	FAULT CONDITION	RECOMMENDED CORRECTIVE ACTION(S)
Main solenoid underload (open)	Status bit from Main solenoid driver indicates underload.	(1) Check wiring to Main solenoid valve. (2) Check configuration of Main solenoid valve matches that of actual valve used. (3) Check Main solenoid valve type, replace if necessary. (4) This error may indicate a failure of the solenoid driver circuit; refer to qualified service personnel.
Main solenoid open circuit	There is an open connection in either the main solenoid wiring or the main solenoid coil.	(1) Check wiring to Main solenoid valve. (2) Check Main solenoid valve, replace if necessary. (3) This error may indicate a failure of the solenoid driver circuit; refer to qualified service personnel.
Main verify type error	Invalid Main solenoid type (Main Sol configuration parameter setting) detected when verifying Main on.	(1) This error should not occur under normal operating conditions and may be caused as a result of memory corruption; corrective action escalation: (a) Consult error log for potentially related errors; (b) Reset system; (c) Reconfigure system; (d) Refer to qualified service personnel.
Maximum # of tries reached	Flame failed ignite within maximum number of tries.	(1) Check gas flow. (2) Check ESD and Pilot valves for proper mechanical operation.
Pilot check type error	Invalid Pilot solenoid type (PilotSol configuration parameter setting) detected when checking solenoids pullup.	(1) This error should not occur under normal operating conditions and may be caused as a result of memory corruption; corrective action escalation: (a) Consult error log for potentially related errors; (b) Reset system; (c) Reconfigure system; (d) Refer to qualified service personnel.
Pilot latch coil error	When checking solenoids pullup, the Pilot solenoid latching circuit voltage is less than 3.78 V, indicating a short to ground.	(1) Check wiring to Pilot solenoid valve. (2) Check Pilot solenoid valve, replace if necessary. (3) This error may indicate a failure of the solenoid driver circuit; refer to a qualified service personnel.
Pilot latch solen. open circuit	When checking solenoids divider circuit, the Pilot solenoid latching voltage is below 7.0 V with pullup and pulldown active. When checking solenoids pullup, the Pilot solenoid latching voltage is below 1.0 V with pullup active.	(1) Check wiring to Pilot solenoid valve. (2) Check Pilot solenoid valve, replace if necessary. (3) This error may indicate a failure of the solenoid driver circuit; refer to a qualified service personnel.



MESSAGE	FAULT CONDITION	RECOMMENDED CORRECTIVE ACTION(S)
Pilot on type error	Invalid Pilot solenoid type (PilotSol configuration parameter setting) detected when turning on.	(1) This error should not occur under normal operating conditions and may be caused as a result of memory corruption; corrective action escalation: (a) Consult error log for potentially related errors; (b) Reset system; (c) Reconfigure system; (d) Refer to qualified service personnel.
Pilot peak/hold driver error	When checking solenoids divider circuit with peak and hold, low watt, or high watt solenoids, the Pilot solenoid voltage is above 1.0 V with pull-ups and pulldowns active and PWM FET full on.	(1) Check wiring to Pilot solenoid valve. (2) Check Pilot solenoid valve, replace if necessary. (3) This error may indicate a failure of the solenoid driver circuit; refer to a qualified service personnel.
Pilot rele. sol. open circuit	When checking solenoids divider circuit, the Pilot solenoid release voltage is below 7.0 V with pullup and pulldown active. When checking solenoids pullup, the Pilot solenoid release voltage is below 1.0V with pullup active.	(1) Check wiring to Pilot solenoid valve. (2) Check Pilot solenoid valve, replace if necessary. (3) This error may indicate a failure of the solenoid driver circuit; refer to a qualified service personnel.
Pilot release coil error	When checking solenoids pullup, the Pilot solenoid release circuit voltage is less than 3.78 V, indicating a short to ground.	(1) Check wiring to Pilot solenoid valve. (2) Check Pilot solenoid valve, replace if necessary. (3) This error may indicate a failure of the solenoid driver circuit; refer to a qualified service personnel.
Pilot shutdown type error	Invalid Pilot solenoid type (PilotSol configuration parameter setting) detected when shutting off.	(1) This error should not occur under normal operating conditions and may be caused as a result of memory corruption; corrective action escalation: (a) Consult error log for potentially related errors; (b) Reset system; (c) Reconfigure system; (d) Refer to qualified service personnel.
Pilot solenoid coil error	When checking solenoids pullup, the Pilot solenoid circuit voltage is less than 3.78 V, indicating a short to ground.	(1) Check wiring to Pilot solenoid valve. (2) Check Pilot solenoid valve, replace if necessary. (3) This error may indicate a failure of the solenoid driver circuit; refer to a qualified service personnel.
Pilot solenoid driver overtemp	Status bit from Pilot solenoid driver indicates over temperature.	(1) Check that configuration of solenoid voltage (Solenoids configuration parameter) and solenoid type (PilotSol configuration parameter) matches that of the Pilot solenoid valve. (2) Check Pilot solenoid valve, replace of necessary.
Pilot solenoid driver powerfail	Status bit from Pilot solenoid driver indicates power fail.	(1) This error may indicate a power supply circuit failure; refer to qualified service personnel.





MESSAGE	FAULT CONDITION	RECOMMENDED CORRECTIVE ACTION(S)
Pilot solenoid open circuit	Pilot solenoid (non-latched) voltage is below the open circuit voltage when checking solenoids divider with pullup and pulldown active: <ul style="list-style-type: none"><li>• 7.0 V for 12 V solenoid voltage configuration</li><li>• 11.0 V for 24 V solenoid voltage configuration</li></ul>	(1) Check wiring to Pilot solenoid valve. (2) Check Pilot solenoid valve, replace if necessary. (3) This error may indicate a failure of the solenoid driver circuit; refer to a qualified service personnel.
Pilot solenoid overload (short)	Status bit from Pilot solenoid driver indicates overload.	(1) Check wiring to Pilot solenoid valve. (2) Check configuration of Pilot solenoid valve matches that of actual valve used. (3) Check Pilot solenoid valve, replace if necessary. (4) This error may indicate a failure of the solenoid driver circuit; refer to a qualified service personnel.
Pilot solenoid underload (open)	Status bit from Pilot solenoid driver indicates underload.	(1) Check wiring to Pilot solenoid valve. (2) Check configuration of Pilot solenoid valve matches that of actual valve used. (3) Check Pilot solenoid valve, replace if necessary. (4) This error may indicate a failure of the solenoid driver circuit; refer to a qualified service personnel.
Pilot verify type error	Invalid Pilot solenoid type (PilotSol configuration parameter setting) detected when verifying Pilot on.	(1) This error should not occur under normal operating conditions and may be caused as a result of memory corruption; corrective action escalation: (a) Consult error log for potentially related errors; (b) Reset system; (c) Reconfigure system; (d) Refer to qualified service personnel.
Pilot/main sol. driver overtemp	Solenoid driver for both the Pilot and Main indicates over temperature.	(1) Check that configuration of solenoid voltage and solenoid type matches the actual Pilot and Main solenoid valves in use. (2) Check Pilot and Main solenoid valves, replace if necessary. (3) This error may indicate a failure of the solenoid driver circuit; refer to a qualified service personnel.
Pilot/main sol. driver powerfail	Solenoid driver for both the Pilot and Main indicates power fail.	(1) This error may indicate a power supply circuit failure; refer to qualified service personnel.
Pilot/main sol. overload (short)	Solenoid driver for both the Pilot and Main indicates overload.	(1) Check wiring to Pilot and Main solenoid valves. (2) Check configuration of Pilot and Main solenoid valves match that of actual valves used. (3) Check Pilot and Main solenoid valves, replace one or both if necessary. (4) This error may indicate a failure of the solenoid driver circuit; refer to qualified service personnel.



MESSAGE	FAULT CONDITION	RECOMMENDED CORRECTIVE ACTION(S)
Pilot/main sol. underload (open)	Solenoid driver for both the Pilot and Main indicates underload.	(1) Check wiring to Pilot and Main solenoid valves. (2) Check configuration of Pilot and Main solenoid valves match that of actual valves used.
Port Config Error	The checksum over all I/O port configuration registers fails.	(1) Capture the error log and report the incident to qualified service personnel.
Pressure Alarm	Pressure gauge input is open.	(1) Check equipment and/or sensor connected to Pressure input. (2) Check wiring between Pressure input and remote equipment.
Relights	NOT A FAULT. Number of times the flame has been re-lit since the system was last turned on (first ignition).	N/A
Remote ESD input	Remote ESD input is open.	(1) Check equipment connected to remote ESD input. (2) Check wiring between remote ESD input and remote equipment.
Safety Reset	Main processor fault condition was discovered by watchdog processor resulting in safety reset and recovery procedure by watchdog processor.	(1) Check error log for other error conditions that may have led to the safety reset condition. (2) Capture the error log and report the incident to qualified service personnel. (3) Press "Reset" (right Select) key to return to operational mode.
Solar overvolt. xx.xV	When operating in Solar+Bat power mode, the solar voltage is above 32 V.	(1) Check power feed line voltage. (2) Check solar panel operation.
Solar power setup	Invalid solar power configuration (Power configuration parameter contains an invalid setting value).	(1) This error should not occur under normal operating conditions and may be caused as a result of memory corruption; corrective action escalation: (a) Consult error log for potentially related errors; (b) Reset system; (c) Reconfigure system; (d) Refer to qualified service personnel.
Status output relay stuck	Main processor is unable to operate the status relay, indicating that the watchdog processor is holding main processor solenoid driver enable signal disabled.	(1) This error may indicate that the watchdog processor is holding main processor solenoid driver enable signal disabled; check log for safety reset. (2) This error may indicate a failure of the solenoid driver circuit; refer to qualified service personnel.
System ESD Reset	When an ESD occurs, the screen toggles between the error that caused the ESD and this screen.	(1) Check rotating error messages on front panel text display, and perform corrective actions. (2) Press "Reset" (right select) key to clear and return to operational mode.



MESSAGE	FAULT CONDITION	RECOMMENDED CORRECTIVE ACTION(S)
System Reset from Power Failure	System reset due to PWR_GOOD signal from 8 V regulator indicating power has fallen below 8 V.	(1) Most common cause of this error is interruption of line and/or battery power. Check power feed (2) This error may indicate a power supply circuit failure; refer to qualified service personnel.
Thermocouple T1 not connected	Thermocouple input T1 is measuring below valid range indicating it is not connected.	(1) Check wiring and installation of T1 thermocouple. (2) Check operation of T1 thermocouple (using meter), replace if necessary.
Thermocouple T1 grounded	Thermocouple input T1 is measuring below valid range and indicating it is shorted to ground.	(1) Check wiring and installation of T1 thermocouple.
Thermocouple T2 not connected	Thermocouple input T2 is measuring below valid range indicating it is not connected.	(1) Check wiring and installation of T2 thermocouple. (2) Check operation of T2 thermocouple (using meter), replace if necessary.
Thermocouple T2 grounded	Thermocouple input T2 is measuring below valid range and indicating it is shorted to ground.	(1) Check wiring and installation of T2 thermocouple.
Thermocouple T3 not connected	Thermocouple input T3 is measuring below valid range indicating it is not connected.	(1) Check wiring and installation of T3 thermocouple. (2) Check operation of T3 thermocouple (using meter), replace if necessary.
Thermocouple T3 grounded	Thermocouple input T3 is measuring below valid range and indicating it is shorted to ground.	(1) Check wiring and installation of T3 thermocouple
U3 Solenoid driver fault	A readback mismatch occurs in the status word from the solenoid driver U3.	(1) Capture the error log and report the incident to qualified service personnel.
U9 Solenoid driver fault	A readback mismatch occurs in the status word from the solenoid driver U9.	(1) Capture the error log and report the incident to qualified service personnel.
Unrecoverable main error	Watchdog processor reset the main processor.	
User press of ESD button	A user has pressed the front panel emergency shutdown key.	(1) Normal operation; press "Reset" (right select) key to clear and return to operational mode.
Vbb supply overvolt. xx.xV	Buck-boost power supply voltage is above the over-voltage threshold: <ul style="list-style-type: none"> <li>• 16.5 VDC for 12 V solenoid voltage configuration</li> <li>• 26.4 VDC for 24 V solenoid voltage configuration</li> </ul>	(1) This error may indicate a power supply circuit failure; refer to qualified service personnel.



MESSAGE	FAULT CONDITION	RECOMMENDED CORRECTIVE ACTION(S)
Vbb supply undervolt. xx.xV	Buck-boost power supply voltage is below the under-voltage threshold: <ul style="list-style-type: none"> <li>• 13.5 VDC for 12 V solenoid voltage configuration</li> <li>• 21.6 VDC for 24 V solenoid voltage configuration</li> </ul>	(1) Check adequacy of power feed to system.  (2) This error may indicate a power supply circuit failure; refer to qualified service personnel.
Vesd supply overvolt. xx.xV	ESD solenoid power supply voltage is above the over-voltage threshold: <ul style="list-style-type: none"> <li>• 16.5 VDC for 12 V solenoid voltage configuration</li> <li>• 26.4 VDC for 24 V solenoid voltage configuration</li> </ul>	(1) This error may indicate a power supply circuit failure; refer to qualified service personnel.
Vesd supply undervolt. xx.xV	ESD solenoid supply voltage is below the under-voltage threshold: <ul style="list-style-type: none"> <li>• 13.2 VDC for 12 V solenoid voltage configuration</li> <li>• 21.3 VDC for 24 V solenoid voltage configuration</li> </ul>	(1) Check adequacy of power feed to system.  (2) This error may indicate a power supply circuit failure; refer to qualified service personnel.
Vmain supply overvolt. xx.xV	Main solenoid power supply voltage is above the over-voltage threshold: <ul style="list-style-type: none"> <li>• 16.5 VDC for 12 V solenoid voltage configuration</li> <li>• 26.4 VDC for 24 V solenoid voltage configuration</li> </ul>	(1) This error may indicate a power supply circuit failure; refer to qualified service personnel.
Vmain supply undervolt. xx.xV	Main solenoid supply voltage is below the under-voltage threshold: <ul style="list-style-type: none"> <li>• 13.2 VDC for 12 V solenoid voltage configuration</li> <li>• 21.3 VDC for 24 V solenoid voltage configuration</li> </ul>	(1) Check adequacy of power feed to system.  (2) This error may indicate a power supply circuit failure; refer to qualified service personnel.
Vpilot supply overvolt. xx.xV	Pilot solenoid power supply voltage is above the over-voltage threshold: <ul style="list-style-type: none"> <li>• 16.5 VDC for 12 V solenoid voltage configuration</li> <li>• 26.4 VDC for 24 V solenoid voltage configuration</li> </ul>	(1) This error may indicate a power supply circuit failure; refer to qualified service personnel.





MESSAGE	FAULT CONDITION	RECOMMENDED CORRECTIVE ACTION(S)
Vpilot supply undervolt. xx.xV	Pilot solenoid supply voltage is below the under-voltage threshold: <ul style="list-style-type: none"> <li>13.2 VDC for 12 V solenoid voltage configuration</li> <li>21.3 VDC for 24 V solenoid voltage configuration</li> </ul>	(1) Check adequacy of power feed to system. (2) This error may indicate a power supply circuit failure; refer to qualified service personnel.
Watchdog Flash Test Error	The watchdog processor has detected a flash memory error.	(1) Capture the error log and report the incident to qualified service personnel.
Watchdog Micro. not responding	The watchdog processor has stopped communicating with the main processor.	(1) This indicates a failure of the watchdog processor subsystem; a press of “Reset” (right select) key will issue a hardware reset to the watchdog processor. (2) If the condition persists, the watchdog circuit has failed; refer to qualified service personnel.
Watchdog PC Test Error	The watchdog processor has detected a program counter error.	(1) Capture the error log and report the incident to qualified service personnel.
Watchdog RAM Test Error	The watchdog processor has detected a RAM error.	(1) Capture the error log and report the incident to qualified service personnel.

## ERROR SCREEN MESSAGES

If the PLATINUM-800 detects a serious problem, it will restart the system then display the problem that was detected. The time/date and reason for the shutdown will also be stored into the event log and can be viewed later.

MESSAGE	FAULT CONDITION	RECOMMENDED CORRECTIVE ACTION(S)
Array bounds error	An attempt was made to access the data log outside of its array boundary.	(1) This error should not occur under normal operating conditions and may be caused as a result of memory corruption; corrective action escalation: (a) Consult error log for potentially related errors; (b) Reset system; (c) Reconfigure system; (d) Refer to qualified service personnel.
Burn state transition error	An invalid state was detected in the burn state machine.	(1) This error should not occur under normal operating conditions and may be caused as a result of memory corruption; corrective action escalation: (a) Consult error log for potentially related errors; (b) Reset system; (c) Reconfigure system; (d) Refer to qualified service personnel.



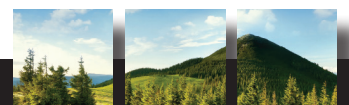
MESSAGE	FAULT CONDITION	RECOMMENDED CORRECTIVE ACTION(S)
CPU configur. word mismatch	The configuration word mismatch reset bit in the RCON register (of the microprocessor) is set.	(1) Capture the error log and report the incident to qualified service personnel.
CPU illegal opcode	The illegal opcode bit in the RCON register (of the microprocessor) is set.	(1) Capture the error log and report the incident to qualified service personnel.
CPU match error	The value other than 0-9 was detected when handling digits.	(1) This error should not occur under normal operating conditions and may be caused as a result of memory corruption; corrective action escalation: (a) Consult error log for potentially related errors; (b) Reset system; (c) Reconfigure system; (d) Refer to qualified service personnel.
CPU trap conflict	The trap conflict reset bit in the RCON register (of the microprocessor) is set.	(1) Capture the error log and report the incident to qualified service personnel.
CPU VDD brownout	The brown-out reset bit in the RCON register (of the microprocessor) is set.	(1) Capture the error log and report the incident to qualified service personnel.
CPU watchdog timeout	The watchdog timer internal to the processor has timed out.	(1) Capture the error log and report the incident to qualified service personnel.
Invalid buck-boost voltage	An invalid buck boost voltage setting (Solenoids configuration parameter) was detected.	(1) This error should not occur under normal operating conditions and may be caused as a result of memory corruption; corrective action escalation: (a) Consult error log for potentially related errors; (b) Reset system; (c) Reconfigure system; (d) Refer to qualified service personnel.
Invalid burn display state	An invalid state was detected in the burn state machine.	(1) This error should not occur under normal operating conditions and may be caused as a result of memory corruption; corrective action escalation: (a) Consult error log for potentially related errors; (b) Reset system; (c) Reconfigure system; (d) Refer to qualified service personnel.
Invalid display of smart vent	Invalid smart vent display state detected.	(1) This error should not occur under normal operating conditions and may be caused as a result of memory corruption; corrective action escalation: (a) Consult error log for potentially related errors; (b) Reset system; (c) Reconfigure system; (d) Refer to qualified service personnel.



MESSAGE	FAULT CONDITION	RECOMMENDED CORRECTIVE ACTION(S)
Invalid ESD solenoid type	An invalid ESD solenoid type (Esd Sol configuration parameter setting) was detected.	(1) This error should not occur under normal operating conditions and may be caused as a result of memory corruption; corrective action escalation: (a) Consult error log for potentially related errors; (b) Reset system; (c) Reconfigure system; (d) Refer to qualified service personnel.
Invalid flame detect mode	An invalid flame detect mode (Flame det configuration parameter) was detected.	(1) This error should not occur under normal operating conditions and may be caused as a result of memory corruption; corrective action escalation: (a) Consult error log for potentially related errors; (b) Reset system; (c) Reconfigure system; (d) Refer to qualified service personnel.
Invalid key type	An invalid key press key code was detected.	(1) This error should not occur under normal operating conditions and may be caused as a result of memory corruption; corrective action escalation: (a) Consult error log for potentially related errors; (b) Reset system; (c) Reconfigure system; (d) Refer to qualified service personnel.
Invalid latch voltage	Solenoid voltage (Solenoids configuration parameter) set to 24V and solenoid type (PilotSol or Main Sol configuration parameter) set to latched.	(1) Check configuration of solenoid voltage (Solenoids configuration parameter) and solenoid type (PilotSol and Main Sol configuration parameters).
Invalid LED mode	Invalid LED mode setting (LEDs configuration parameter) was detected	(1) This error should not occur under normal operating conditions and may be caused as a result of memory corruption; corrective action escalation: (a) Consult error log for potentially related errors; (b) Reset system; (c) Reconfigure system; (d) Refer to qualified service personnel.
Invalid main solenoid type	An invalid Main solenoid type (Main Sol configuration parameter setting) was detected.	(1) This error should not occur under normal operating conditions and may be caused as a result of memory corruption; corrective action escalation: (a) Consult error log for potentially related errors; (b) Reset system; (c) Reconfigure system; (d) Refer to qualified service personnel.



MESSAGE	FAULT CONDITION	RECOMMENDED CORRECTIVE ACTION(S)
Invalid menu state error	An invalid state was detected in the Menu state machine.	(1) This error should not occur under normal operating conditions and may be caused as a result of memory corruption; corrective action escalation: (a) Consult error log for potentially related errors; (b) Reset system; (c) Reconfigure system; (d) Refer to qualified service personnel.
Invalid month value	An invalid month value was detected.	(1) This error should not occur under normal operating conditions and may be caused as a result of memory corruption; corrective action escalation: (a) Consult error log for potentially related errors; (b) Reset system; (c) Reconfigure system; (d) Refer to qualified service personnel.
Invalid number of thermocouples	An invalid number of thermocouples (Thermocouples configuration parameter) was detected.	(1) This error should not occur under normal operating conditions and may be caused as a result of memory corruption; corrective action escalation: (a) Consult error log for potentially related errors; (b) Reset system; (c) Reconfigure system; (d) Refer to qualified service personnel.
Invalid operating mode	Invalid operating mode (Mode configuration parameter) detected.	(1) This error should not occur under normal operating conditions and may be caused as a result of memory corruption; corrective action escalation: (a) Consult error log for potentially related errors; (b) Reset system; (c) Reconfigure system; (d) Refer to qualified service personnel.
Invalid password state	An invalid password state detected.	(1) This error should not occur under normal operating conditions and may be caused as a result of memory corruption; corrective action escalation: (a) Consult error log for potentially related errors; (b) Reset system; (c) Reconfigure system; (d) Refer to qualified service personnel.



MESSAGE	FAULT CONDITION	RECOMMENDED CORRECTIVE ACTION(S)
Invalid pilot mode	An invalid power mode (Power configuration parameter) was detected.	(1) This error should not occur under normal operating conditions and may be caused as a result of memory corruption; corrective action escalation: (a) Consult error log for potentially related errors; (b) Reset system; (c) Reconfigure system; (d) Refer to qualified service personnel.
Invalid pilot solenoid type	An invalid Pilot solenoid type (PilotSol configuration parameter setting) was detected.	(1) This error should not occur under normal operating conditions and may be caused as a result of memory corruption; corrective action escalation: (a) Consult error log for potentially related errors; (b) Reset system; (c) Reconfigure system; (d) Refer to qualified service personnel.
Invalid power mode	An invalid power mode (Power configuration parameter) was detected.	(1) This error should not occur under normal operating conditions and may be caused as a result of memory corruption; corrective action escalation: (a) Consult error log for potentially related errors; (b) Reset system; (c) Reconfigure system; (d) Refer to qualified service personnel.
Invalid screen in menu display	Invalid front panel menu display screen index detected.	(1) This error should not occur under normal operating conditions and may be caused as a result of memory corruption; corrective action escalation: (a) Consult error log for potentially related errors; (b) Reset system; (c) Reconfigure system; (d) Refer to qualified service personnel.
Invalid screen in setup display	Invalid setup menu display screen index detected.	(1) This error should not occur under normal operating conditions and may be caused as a result of memory corruption; corrective action escalation: (a) Consult error log for potentially related errors; (b) Reset system; (c) Reconfigure system; (d) Refer to qualified service personnel.



MESSAGE	FAULT CONDITION	RECOMMENDED CORRECTIVE ACTION(S)
Invalid screen in time display	Invalid time display screen index detected.	(1) This error should not occur under normal operating conditions and may be caused as a result of memory corruption; corrective action escalation: (a) Consult error log for potentially related errors; (b) Reset system; (c) Reconfigure system; (d) Refer to qualified service personnel.
Invalid setup state error	Setup state machine attempted to transition to an invalid state.	(1) This error should not occur under normal operating conditions and may be caused as a result of memory corruption; corrective action escalation: (a) Consult error log for potentially related errors; (b) Reset system; (c) Reconfigure system; (d) Refer to qualified service personnel.
Invalid status mode	Invalid status relay mode (Status Relay configuration parameter) detected.	(1) This error should not occur under normal operating conditions and may be caused as a result of memory corruption; corrective action escalation: (a) Consult error log for potentially related errors; (b) Reset system; (c) Reconfigure system; (d) Refer to qualified service personnel.
Main state transition error	Main state machine attempted to transition to an invalid state.	(1) This error should not occur under normal operating conditions and may be caused as a result of memory corruption; corrective action escalation: (a) Consult error log for potentially related errors; (b) Reset system; (c) Reconfigure system; (d) Refer to qualified service personnel.
Menu state transition error	Menu state machine attempted to transition to an invalid state.	(1) This error should not occur under normal operating conditions and may be caused as a result of memory corruption; corrective action escalation: (a) Consult error log for potentially related errors; (b) Reset system; (c) Reconfigure system; (d) Refer to qualified service personnel.
Non-volatile Mem check failed	Flash memory check failure.	(1) Capture the error log and report the incident to qualified service personnel.
RAM test failed	Class B ram test failure.	(1) Capture the error log and report the incident to qualified service personnel.



MESSAGE	FAULT CONDITION	RECOMMENDED CORRECTIVE ACTION(S)
Wrong voltage for solen. type	Solenoid voltage (Solenoids configuration parameter) set to 24V and solenoid type (PilotSol or Main Sol configuration parameter) set to latched.	(1) Check configuration of solenoid voltage (Solenoids configuration parameter) and solenoid type (PilotSol and Main Sol configuration parameters).

## MISCELLANEOUS MESSAGES

The PLATINUM-800 may show messages to show the user a temporary condition. These messages are not stored into the log.

MESSAGE	REMEDIES/SOLUTION
High W sol. type not valid w/ 12V	High watt solenoids cannot be used with the system configured to run solenoids at 12 V. The system was set to run High watt, so the solenoid configuration has been cleared and must be setup again.
High watt P/H not valid w/ 12V	High watt peak/hold solenoids cannot be used with the system configured to run solenoids at 12 V. The system was set to run High watt P/H, so the solenoid configuration has been cleared and must be setup again.
Initial setup complete	The minimum amount of setup is completed to prevent the system from running in a hazardous mode. Additional setup should be performed to ensure that the system is completely configured.
Latched sol. type not valid w/ 24V	Latching solenoids cannot be used with the system configured to run solenoids at 24 V. The system was set to run latching, so the solenoid configuration has been cleared and must be setup again.
Not charging	The battery is not charging even with power available. The battery may be bad.
Problem found entering log	One or more serious problems was detected during the startup or caused a restart. The system will now enter the event log to show the error.

## TIPS FOR TROUBLESHOOTING

ISSUE	REMEDIES/SOLUTION
Fuel is not properly getting to the pilot tip.	<ul style="list-style-type: none"> <li>• Check the pilot orifice for plugging.</li> <li>• Make sure fuel gas is passing through the regulator and burner valves.</li> </ul>
The pilot is not sparking.	<ul style="list-style-type: none"> <li>• Confirm that the igniter rod is positioned approx. 3/16" away from the tip of the pilot nozzle.</li> <li>• Be sure that the ignition cables are properly terminated.</li> <li>• Confirm that the Four-Conductor Cable is terminated properly.</li> <li>• Observe the igniter rod for any damage.</li> <li>• Make sure the igniter rod is not touching any metal on the firetube, burner nozzle, nipples, etc.</li> </ul>



ISSUE	REMEDIES/SOLUTION
The main burner is not lighting.	<ul style="list-style-type: none"> <li>• Ensure gas supply is going to main burner.</li> <li>• Make sure that the burner valve is opening and gas is passing through it.</li> <li>• Verify that the Main Control Box is reading Main On.</li> </ul>
The Main Control Box keys are not functioning properly.	<ul style="list-style-type: none"> <li>• Check to see if the multi-conductor cable is connected properly between the Display and Main boards.</li> </ul>
No display on the Main Control Box.	<ul style="list-style-type: none"> <li>• Check to see if the fuses are blown on the Main Board.</li> <li>• Check all power connections.</li> <li>• Press any key on the front panel to turn display back on if display/LED time-out has occurred.</li> </ul>
The incorrect temperature is reading out on the display.	<ul style="list-style-type: none"> <li>• If the temperature is stuck a -1F then the thermocouple might be bad or the associated wiring is not connected properly.</li> </ul>
The pilot lights, but then goes out.	<ul style="list-style-type: none"> <li>• Make sure the ignition cables are terminated properly.</li> <li>• Make sure that the Pilot Assembly is mounted properly.</li> <li>• Check wire connection to igniter rod.</li> <li>• Check to see if the pilot nozzle has eroded away.</li> <li>• Check ground wire.</li> </ul>
The pilot sparks, but does not light.	<ul style="list-style-type: none"> <li>• Make sure the pilot orifice is not plugged.</li> <li>• Verify pilot gas is getting to the pilot tip.</li> <li>• Confirm the pilot solenoid is opening.</li> </ul>
The main burner comes on and the pilot goes out.	<ul style="list-style-type: none"> <li>• Drafting from main may be pulling pilot flame away from nozzle. Reposition pilot nozzle further forward of main burner nozzle. 1" to 1-1/2" average.</li> <li>• Check pilot and main pressures.</li> <li>• Decrease velocity of main burner opening by pinching main burner ball valve as a test. Solve permanently by installing "slow flow" valve.</li> <li>• Reposition igniter rod.</li> </ul>
When the main lights, the flame burns forward in the arrestor.	<ul style="list-style-type: none"> <li>• Check to see if the primary air shutter is closed.</li> <li>• Verify firetube is free of obstacles that would prevent drafting, such as debris, sooting, collapsed firetube.</li> <li>• The burner tube could be cold and have back pressure. In this case, heating the firetube with pilot, or burner at lower volume will warm firetube to improve drafting.</li> <li>• Make sure stack arrestors or wildlife protection screens on stack are not plugged or restricting draft.</li> <li>• Confirm adequate pressure on main fuel gas line.</li> </ul>

## CONCLUSION

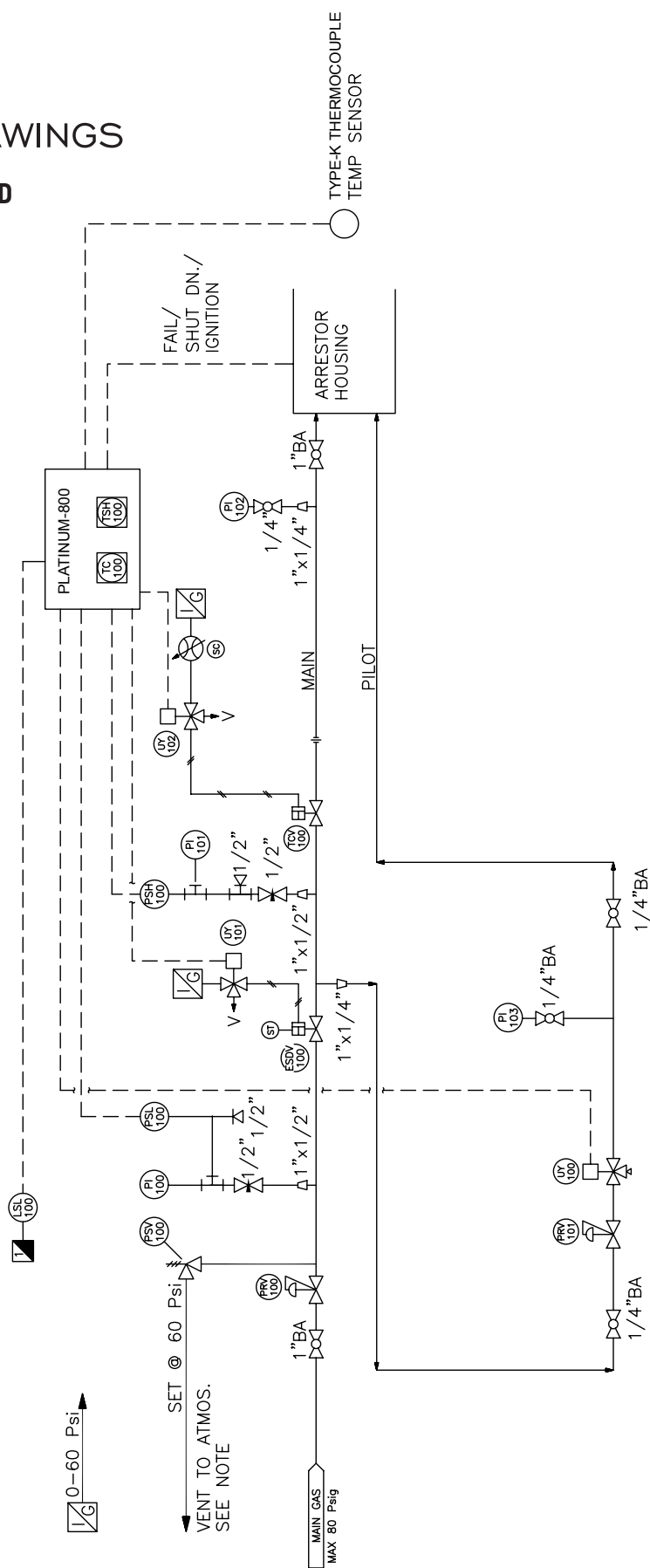
The Platinum Burner Management System is simple and safe to use, and provides extensive operator feedback. For technical assistance, contact Platinum Control or your local authorized distributor.



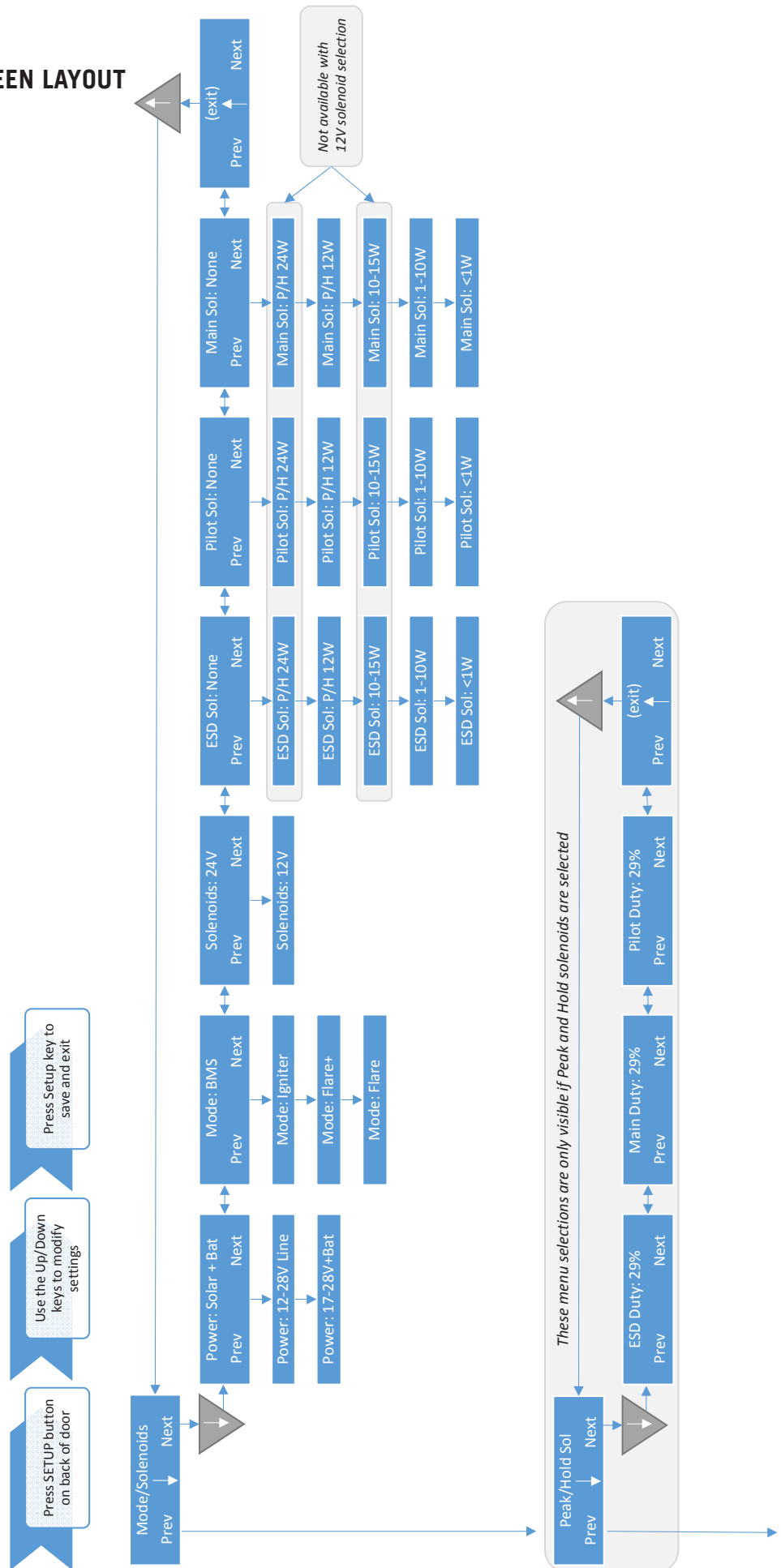


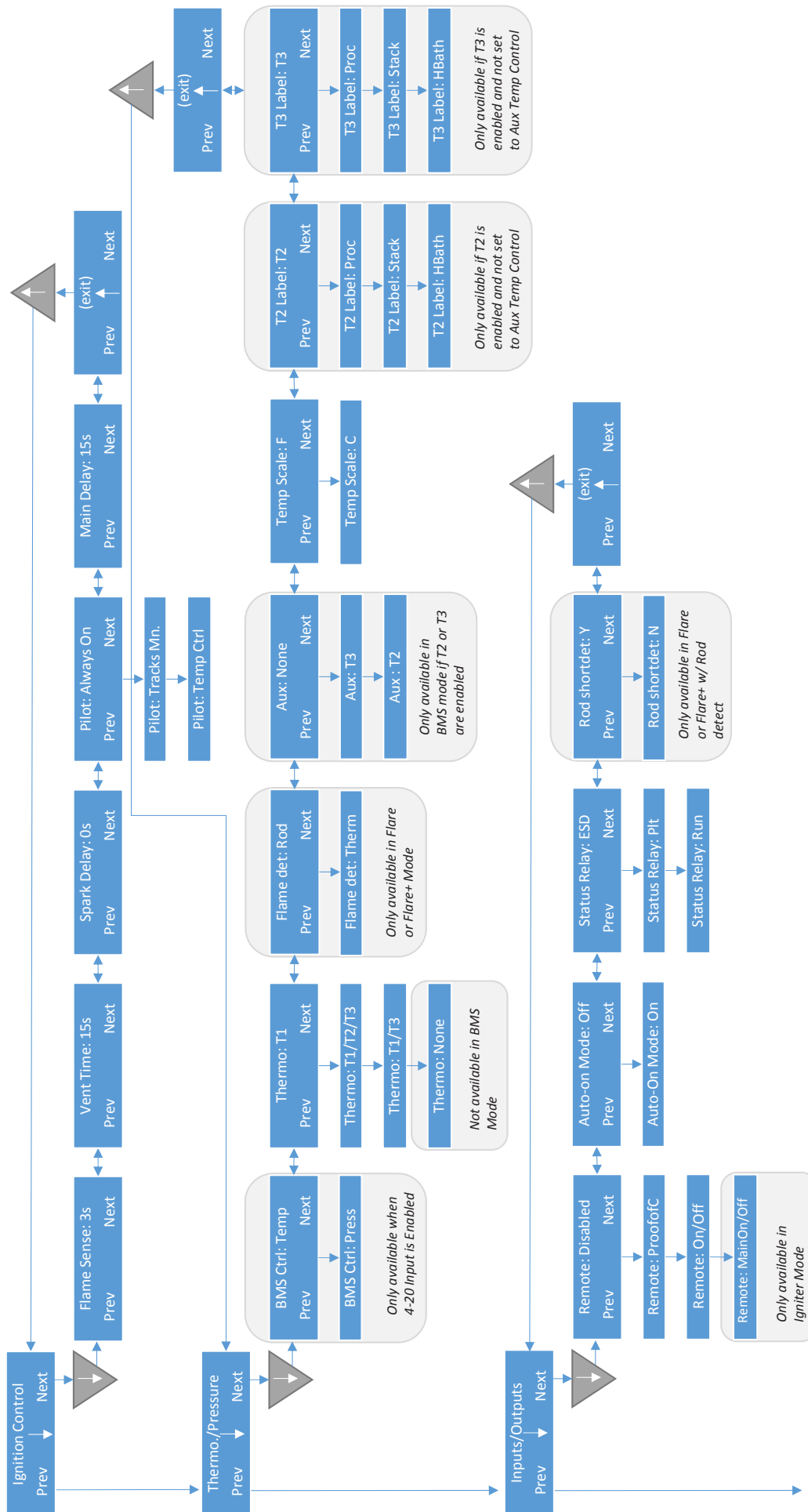
## ADDENDUM DRAWINGS

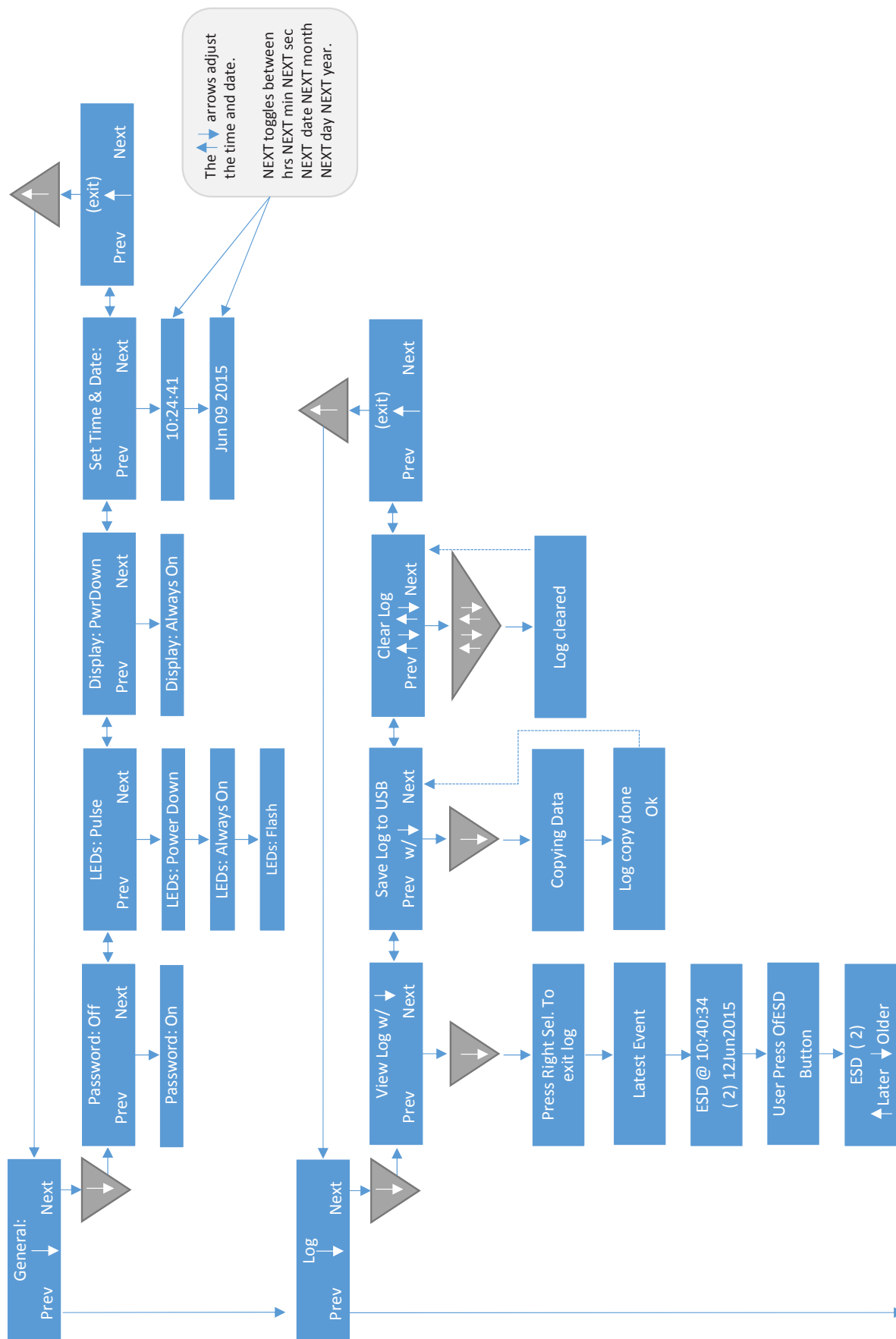
### PLATINUM-800 BASIC P&ID

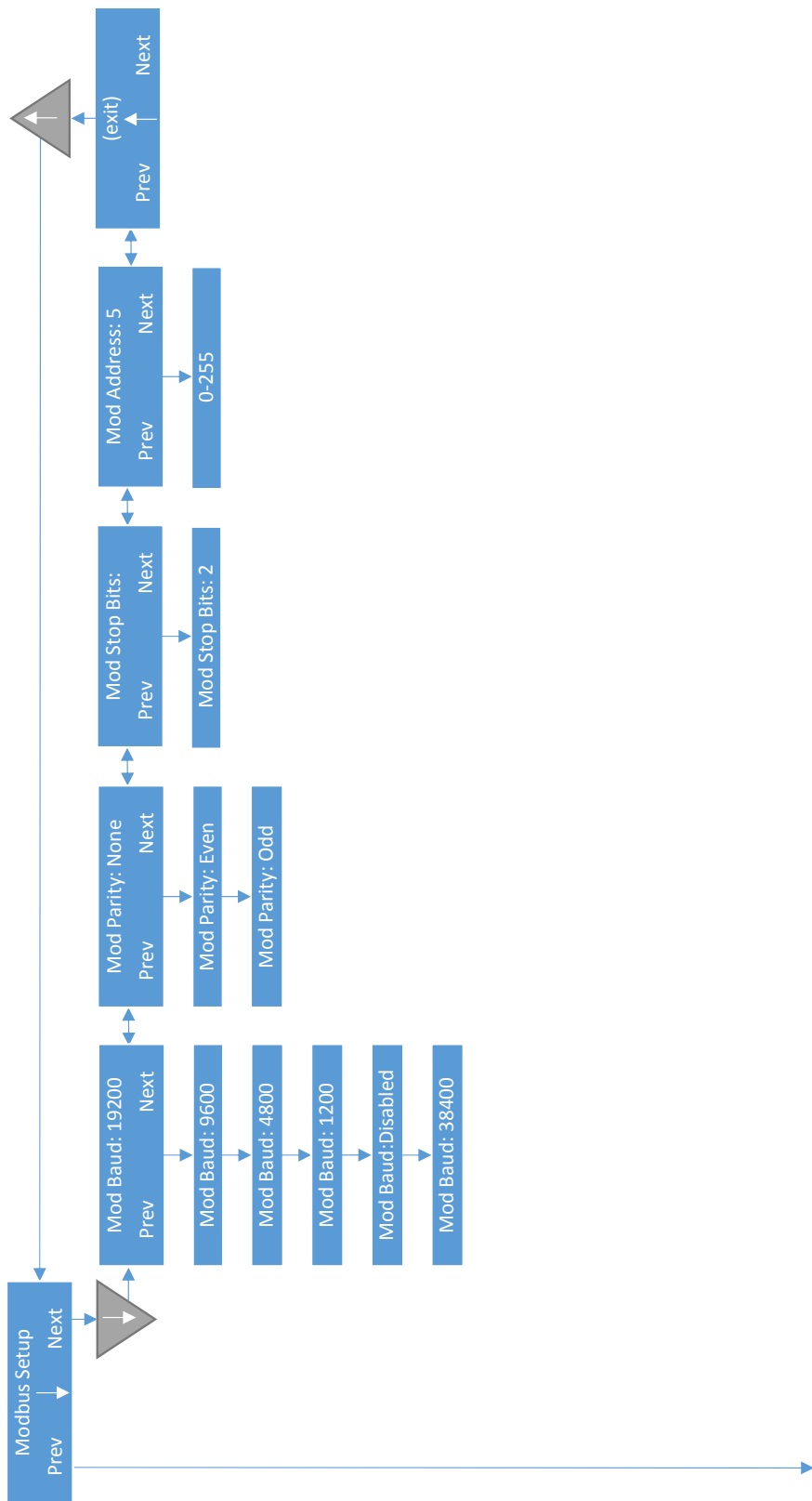


# PLATINUM-800 SETUP SCREEN LAYOUT

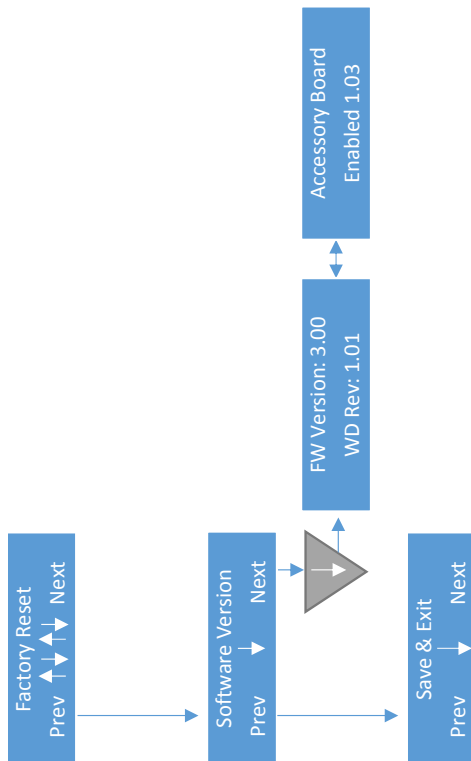


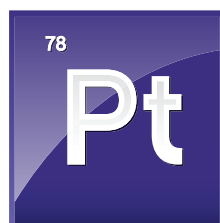




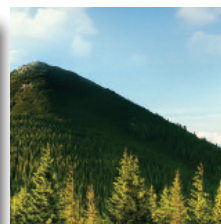
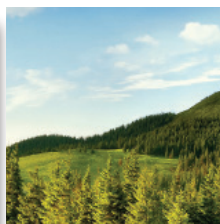
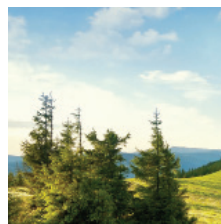








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