PROFIRE PF3100 BMS Controller

Shutdown Code Summary

Firmware Version: NA-40

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1. Introduction

This document is a reference for all the Shutdown Codes and Alarms that can currently be reported by the PF3100 Burner Management System (BMS) that is running firmware release NA-40. This list may be updated or changed in future releases.

2. Shutdown Codes and Alarms

The following table contains all the Shutdown Codes or Alarms that can be reported in the NA-00040 Firmware release. Please note that this document uses the "Alarm Code + 1." For example, the "Pilot Flame Detected While Off" alarm displays an Alarm Code of 0 on the Alert Screen, but has a Shutdown Code of 1.

Shutdown Code (Decimal)	Name	Description
1	Pilot Flame Detected While Off	Pilot flame is detected before the BMS has ignited the pilot.
2	Main Flame Detected While Off	Main Flame is detected before the BMS Ignited the pilot, or before entering the low fire or high fire state.
3	POC Contact Open	The Proof of Closure Contact is open when the BMS is not running in Low Fire or High Fire.
4	POLF Contact Open	Proof of Low Fire (Auxiliary) Contact is open when the BMS is not running in High Fire.
5	POC2 Contact Open	The Proof of Closure 2 (Auxiliary) Contact is open when the BMS is not running in Low Fire or High Fire.
6	POP Contact Open	Proof of Pilot (Auxiliary) Contact is open when the BMS is not running in Pilot, Low Fire or High Fire.
7	Level/Flow Contact Open	The Tank Level Contact is open.
8	Low Level/Flow	The 4-20mA Tank Level reading is below the Tank Level Low Setpoint.
9	Fuel Pressure Contact Open	The Fuel Pressure Contact is open.
10	Low Fuel Pressure	The 4-20mA Fuel Pressure reading is below the Fuel Pressure Low Setpoint.
11	Low Fuel Pressure Dry Contact	The Low Fuel Pressure (Auxiliary) Contact is open.
12	ESD Contact Open	The Emergency Shut Down contact is open.
13	Primary Process Temperature High ESD	The Process Temperature is above the High Temperature Shutdown Setpoint.
14	Incompatible Firmware	An IO Module connected to the BMS has a firmware version that does not match the BMS firmware version.
15	Process Thermocouple Error	A wiring or hardware error is detected on the Process Thermocouple.
16	Aux Thermocouple Error	A wiring or hardware error is detected on the Auxiliary Thermocouple
17	Pilot Solenoid Error	A wiring or hardware error is detected on the Pilot- Contact of the pilot solenoid.
18	SSV1 Solenoid Error	A wiring or hardware error is detected on the SSV1- Contact of the Safety Shutoff Valve 1 solenoid.
19	SSV2 Solenoid Error	A wiring or hardware error is detected on the SSV2- Contact of the Safety Shutoff Valve 2 solenoid.

Shutdown Code (Decimal)	Name	Description
20	HF Solenoid Error	A wiring or hardware error is detected on the HFV- Contact of the High Fire Valve solenoid.
21	Pilot Solenoid Error	A wiring or hardware error is detected on the Pilot+ Contact of the pilot solenoid.
22	SSV1 Solenoid Error	A wiring or hardware error is detected on the SSV1+ Contact of the Safety Shutoff Valve 1 solenoid.
23	SSV2 Solenoid Error	A wiring or hardware error is detected on the SSV2+ Contact of the Safety Shutoff Valve 2 solenoid.
24	HF Solenoid Error	A wiring or hardware error is detected on the HFV+ Contact of the High Fire Valve solenoid.
25	Low Voltage	The BMS, Temperature or Ignition Modules have detected that the system voltage is lower than the Low Voltage Alarm Threshold
26	High Voltage	The BMS, Temperature or Ignition Modules have detected that the system voltage is higher than the high Voltage Alarm Threshold
27	Pilot Module Comm Error	The PFRN connection with one or more of the IO modules has been lost.
28	Incomplete Commissioning	The commissioning date has not been set.
29	Cross Compare Failure	One of the microcontrollers on the BMS or IO modules does not agree with the other microcontroller when comparing status.
30	Cross Compare Packet Timeout	One of the microcontrollers on the BMS or IO modules failed to perform a cross comparison with the other microcontroller.
31	Factory Calibration Error	One or more of the configured modules have an incorrect or incomplete factory calibration
32	Invalid Configuration	One or more settings has failed a configuration check. This is usually set by a invalid temperature setpoint, interlock setpoint or appliance configuration.
33	Ignition Switch Stuck	The BMS Ignition Switch input is stuck in the start position.
34	Auxiliary Temperature High ESD	The Auxiliary Temperature reading is above the Auxiliary High Temperature Setpoint.
35	Temperature Module Ambient Temp Mismatch	The Temperature Module has a hardware fault.
36	Pilot Load Monitor Error	A wiring or hardware error is detected on a Pilot Flame Detection input.
37	Pilot Flame Detect Voltage Error	A wiring or hardware error is detected on a Pilot Flame Detection input.
38	Pilot Flame Quality Mismatch	A wiring or hardware error is detected on a Pilot Flame Detection input.
39	Main Load Monitor Error	A wiring or hardware error is detected on a Main Flame Detection input.
40	Main Flame Detect Voltage Error	A wiring or hardware error is detected on a Main Flame Detection input.
41	Main Flame Quality Mismatch	A wiring or hardware error is detected on a Main Flame Detection input.
42	Ion Pilot Module Valve Test Failed	A wiring or hardware error is detected on the Valve+ Contact of the Ignition Module solenoid.
43	Ion Pilot Module Valve Test Failed	A wiring or hardware error is detected on the Valve- Contact of the Ignition Module solenoid.

Shutdown Code (Decimal)	Name	Description
44	Process Temp Mismatch	The two Process Thermocouples are not reading the same temperature value (within 10 percent)
45	Aux Temp Mismatch	The two Auxiliary Thermocouples are not reading the same temperature value (within 10 percent)
46	Pilot Flame Fail	The system failed to ignite the Pilot Flame within the allocated number of retry attempts.
47	Main Flame Fail	The system failed to ignite the Main Flame within the allocated number of retry attempts.
48	High Fuel Pressure After Main On	High fuel pressure was detected on the 4-20mA input after the SSV1 and SSV2 valves have opened.
49	Stopped Via External Switch	The Ignition Switch on the BMS is in the Stop position.
50	User Stop	The Controller received a stop command from a UI Module or remote Modbus device
51	Safety Core Temperature Too High	The microcontroller on the BMS has detected that it is running above 115°C.
52	Safety Core Temperature Too Low	The microcontroller on the BMS has detected that it is running below -40°C.
53	Controller Firmware CRC Failed	The BMS Firmware is no longer valid.
54	Controller Settings CRC Failed	The BMS settings are no longer valid.
55	Ignition Module Valve Test Failed	Not implemented.
56	Input Pin Connection Test Fail	An internal problem was found on the BMS card.
57	State Mismatch	One of the microcontrollers on the BMS or IO modules does not agree with the other microcontroller on the system state.
58	ION Aux In Contact Open	One of the ion pilot modules aux in contacts is not satisfied.
59	ION AUX In Tripped	One of the ion pilot modules aux in contacts is not satisfied.
60	ION Aux In Contact Range Error	One of the ion pilot modules aux in contact is reading an invalid value, typically outside the 4-20mA range.
61	ION Aux In Contact Mismatch	One of the microcontrollers on the ion pilot module disagrees with the other microcontroller on the status of the aux in contact status.
62	ION Aux In Contact Cross Compare Failure	One or more of the microcontrollers on the ion pilot module has failed cross comparing their data values.
63	Level/Flow Input Range Error	The Level Input is measuring out of range.
64	Level/Flow Input Mismatch Error	One of the two internal Level Input reading measurements is faulty.
65	Pressure Input Range Error	Pressure Contact is measuring out of range.
66	Pressure Input Mismatch Error	One of the two internal Pressure Input reading measurements is faulty.
67	Start Contact Mismatch Error	One of the two internal Start Input reading measurements is faulty.
68	ESD Contact Mismatch Error	One of the two internal ESD Input reading measurements is faulty.
69	POC Contact Mismatch Error	One of the two internal POC Input reading measurements is faulty.
70	AUX In Contact Mismatch Error	One of the two internal Auxiliary Input reading measurements is faulty.
71	No Valid Primary Process Temperature	There are no Process Temperature inputs configured in the appliance.
72	No Valid Auxiliary Temperature	There are no Auxiliary Temperature inputs configured in the appliance, when it is configured for use as the Process Temperature.

Shutdown Code (Decimal)	Name	Description
73	Appliance Process Temp Mismatch	At least one of the Process Thermocouple Inputs in an appliance does not match the other process temperature measurements.
74	Appliance Aux Temp Mismatch	At least one of the Auxiliary Thermocouples in an appliance does not match the other Auxiliary Thermocouple measurements when the Auxiliary Temperature is configured for process control.
75	No Appliance Level/Flow	The appliance does not have a Level Input configured.
76	Placeholder ALARM	
77	Appliance Startup Cancelled	The appliance startup was cancelled by the User Interface or Modbus Module.
78	Appliance Startup Timeout	The appliance was not able to successfully start all of the BMS controllers within the appliance.
79	Appliance Startup Mismatch	During appliance startup one of the BMS modules reported settings that did not match the other BMS modules.
80	No Appliance Leader	NOT USED
81	Controller Disabled	This BMS has been disabled in the appliance settings.
82	Minimum Controllers Rule Violated	Less than the minimum number of controllers are running in the appliance so the entire appliance shutdown.
83	Controller Network Wiring Error	An IO Module is communicating on the Network PFRN Bus (Connected to the UI directly or through a Network Switch/Modbus Card)
84	IO Network Wiring Error	An interface module is communicating on the IO Module Network.
85	Failed to Prove Airflow While Running	The proof of airflow contact entered a failed state while running.
86	Failed to Prove Airflow While Purging	The proof of airflow contact entered a failed state while purging.
87	Multiple Primary Process Temperatures	More than one Primary Process Temperature Input is configured on the BMS.
88	Primary Process Temperature Configuration Error	The Process Temperature configuration is not valid.
89	Auxiliary Temperature Configuration Error	The Auxiliary Temperature configuration is not valid.
90	No Primary Process Temperature Configured	The Process Temperature Input has not been configured.
91	UV Flame Detect Fault	UV Scanner Fault Contact Open
92	UV Flame Detect Mismatch	UV Scanner “Flame On” and “Flame Off” contacts are indicating opposite flame state.
93	UV Input Out of Range	UV Scanner 4-20mA flame signal is invalid.
94	UV Input Address Fault	The UV Pilot Module has experienced a system error.
95	IO Expansion Input Invalid	One or more IO Expansion inputs configured as alarms have measurement errors.
96	I/O Expansion POAF Input Invalid	The Proof of Air Flow contact is not satisfied on the IO Expansion Card.
97	IO Expansion Analog Input High	One or more configured inputs on the IO Expansion card have read a value higher than the allowable range.
98	IO Expansion Analog Input Low	One or more configured inputs on the IO Expansion card have read a value lower than the allowable range.

Shutdown Code (Decimal)	Name	Description
99	IO Expansion Digital Input Open	One or more configured inputs on the IO Expansion card have an open contact status.
100	IO Expansion Configuration Error	An IO Expansion module is configured incorrectly.
101	Invalid Appliance Firing Rate Input	The IO Expansion input configured for firing rate is not measuring a valid 4-20mA signal.
102	Failed to Prove Purge Position	The controller is unable to determine the position of the TCV while purging.
103	Failed to Prove Pilot Position	The controller is unable to determine the position of the TCV while in the pilot state.
104	Failed to Prove Low Fire Position	The controller is unable to determine the position of the TCV while in the low fire state.
105	FARC Cross Limit Error	The damper position and fuel actuator position have fallen outside the allowable error in relation to each other.
106	FARC Valve Position Error	The valve position has fallen outside the range allowed by the valve error. (versus it's requested position).
107	FARC Damper Position Error	The damper position has fallen outside the range allowed by the damper error. (versus it's requested position).
108	FARC Configuration Error	FARC has been enabled and one of the following is not enabled: POAF, Forced Draft, Low Fire, PID.
109	PID Configuration Error	PID is enabled but the configuration is invalid.
110	Pilot Configuration Error	The pilot card configuration is incorrect. The minimum pilots running setting must be equal to or less than the number of pilot cards configured.
111	Bleed Valve Closed with Main Off	The bleed valve proof of open contact is open, indicating the bleed valve is closed (no flow) during main off.
112	Bleed Valve Open with Main ON	The bleed valve proof of open contact is closed, indicating that the bleed valve is open (flow) while the main is on.
113	The Bleed Valve Input is Invalid	The bleed valve proof of open contact input is invalid.
114	BMS Wait Timeout	A BMS wait input has timed out. This means that the BMS has been in a waiting state for longer than the wait timeout time.
115	IO Expansion Wait Timeout	An IO Expansion wait input has timed out. This means that the BMS has been in a waiting state for longer than the wait timeout time.
116	One or more descriptors are Invalid	Internal BMS Card Fault
117	Settings CRC Mismatch	Settings have been corrupted and cannot be verified

3. Revision History

Version Number	Date	Description
V1.0	29 OCT 2020	NA-40 Updates
V0.6	07 SEP 2017	NA-39 Updates