

Advanced Diagnostics: Introduction to ECU Blink Sequence

The ECU flashes three different code types, distinguishable by the number of digits. See the table below for a description of each.

ECU Code Types			
# of Digits in Sequence	Code Type	When each Code is Flashed	Digit Value Range
2	Firmware Version Number	Displayed twice when IGN is turned on after being off less than 30 seconds.	0 to 9
3	ECU Model Number	Displayed once when power is first applied to the ECU. Displayed once when IGN is turned on after being off more than 30 seconds.	0 to 9
4	Error Code – Active Errors	Whenever IGN is on, Defrost Mode is disabled , and any active error is set. Code(s) will blink repeatedly until all errors are cleared.	0 to 3
	Error Code – Historical Errors	Whenever IGN is on, Defrost Mode is enabled , and any error has occurred in last 10 ignition cycles. Codes will blink repeatedly.	

The Gen 5 ECU has a red LED that is visible from the connector side of the ECU, as shown in the photo below.



LED

There are two types of LED blinks, a long blink that indicates a zero, and a short blink that indicates a one. In this document we will refer to a long blink as a DASH - and a short blink as a DOT • When reading the LED blink sequence, digits will be separated by a one second period of no blink (LED off). See below for an example of an error code.

	First Digit	Second Digit	Third Digit	Fourth Digit
LED Blink Sequence	•••	-	•	-
Numeric Value	3	0	1	0



Advanced Diagnostics and Troubleshooting Guide

Advanced Diagnostics: Firmware Version Number

The Firmware Version Number is displayed two times when the ignition is turned on **after being off for less than 30 seconds**. The Firmware Version Number is a two digit number and can be found under "FW:" on the label on the ECU's case. Each digit can be a 0 to a 9.



GEN 5 ECU
DC: 0223

PN: 246404

REV: - FW: 1.4
SW123: 000

MODEL NUMBER

FW NUMBER

Advanced Diagnostics: ECU Model Number

The ECU Model Number is displayed once when power is first applied to the ECU, and once more whenever the ignition is turned on **after being off for more than 30 seconds**. The ECU Model Number is a three-digit number. Each digit can be a 0 to a 9. The three-digit number corresponds to the last three digits of the Vintage Air ECU part number, the ECU part number is a 6-digit number found on the label on the ECU's case. For example, the Vintage Air 246404 ECU will flash the following blink sequence.

	First Digit	Second Digit	Third Digit
LED Blink Sequence	-
Numeric Value	4	0	4

Advanced Diagnostics: ECU Start-up Blink Sequence

- When power is first applied to the ECU, the ECU will flash *ECU Model Number* one time. See the **Diagnostics: Reading the ECU Model Number** section for more information.
- Once power has been applied, and the ignition is turned on, the ECU will flash the *Firmware Version Number* two times.
 - If there are any error codes, and the blower is set to any on position, then the codes will flash at this time. The error codes flashing are active codes if the control panel is set to DASH, or historic codes if the control panel is set to DEFROST.
 - NOTE: If this is the first ignition cycle after power is applied to the ECU, when the system is turned on by moving the blower control to any on position, the actuators will run their initialization sequence.
- Once the ignition is turned off, and more than 30 seconds have passed, on the next ignition cycle the ECU will flash the ECU Model Number one time.
- Once the ignition is turned off, and less than 30 seconds have passed, on the next ignition cycle the ECU will flash the Firmware Version Number two times.

Advanced Diagnostics: Reading a Diagnostic Code Beginning with a 0 or a 1

If your diagnostic code begins with a “0” or a “1”, use the below diagram to determine which errors are active.

The below example indicates there are two active errors, the first is “Over Voltage Error” and the second is “Sw5V Error”. Refer to the Summary table for Error Definitions and possible causes.

0 1 0 2

0	N/A	0	N/A	0	N/A	0	N/A
1	Config EEData Chksum Error	1	Over Voltage Error	1	Low Voltage Error	1	Evap Temp Snsr Error
		2	Config RAM Chksum Error	2	Low Voltage Warning	2	Sw5V Error
		3	Over Voltage Error AND Config RAM Chksum Error	3	Low Voltage Error AND Low Voltage Warning	3	Evap Temp Snsr Error AND Sw5V Error

Advanced Diagnostics: Reading a Diagnostic Code Beginning with a 2 or a 3

If your diagnostic code begins with a “2” or a “3”, use the below diagram to determine which errors are active.

The below example indicates there is one active error, “Blower Control Cal Error”. Refer to the Summary table for Error Definitions and possible causes.

2 0 0 1

2	N/A	0	N/A	0	N/A	0	N/A
3	Brownout Detected	1	Blend Control Cal Error	1	Mode Control Cal Error	1	Blower Control Cal Error
		2	N/A	2	N/A	2	N/A
		3	N/A	3	N/A	3	N/A



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Advanced Diagnostics: Diagnostic Code Summary Table

Diagnostic Codes Possible/ Error	Error Title	Solutions
1XXX	Config EEData Chksum Error	<ul style="list-style-type: none"> • ECU must be sent in to VA
01XX	Over Voltage Error	<ul style="list-style-type: none"> • Remove battery charger • Verify alternator output isn't exceding 15.5V
11XX		
03XX		
13XX		
02XX	Config RAM Chksum Error	<ul style="list-style-type: none"> • ECU must be returned to VA
12XX		
03XX		
13XX		
0X1X	Low Voltage Error	<ul style="list-style-type: none"> • Verify the red battery lead has a good crimp and clean contact area • Verify the 10 amp fuse is seated fully. It should be very difficult to remove from holder
1X1X		
0X3X		
1X3X		
0X2X	Low Voltage Warning	<ul style="list-style-type: none"> • Verify the battery voltage is above 10.5V
1X2X		
0X3X		
1X3X		
0XX1	Evap Temp Snsr Error	<ul style="list-style-type: none"> • Verify the thermistor is plugged into JM1 on the ECU • Measure the resistance between the thermistor black leads disconnected from JM1
1XX1		
0XX3		
1XX3		
0XX2	Sw5V Error	<ul style="list-style-type: none"> • With key on, verify voltage at pin 8 of JF8 connector • If battery voltage is present at pin 9 and 15 with key on at JF9 and not at pin 8 on JF8, replace ECU
1XX2		
0XX3		
1XX3		
3XXX	Brownout Detected	
21XX	Blend Control Cal Error	<ul style="list-style-type: none"> • Verify the voltage sweep on JF8 pin 2. Should sweep from 0V to 5V on white/red
31XX		
2X1X	Mode Control Cal Error	<ul style="list-style-type: none"> • Verify the voltage sweep on JF8 pin 4. Should be 0V to 5V on white/yellow
3X1X		
2XX1	Blower Control Cal Error	<ul style="list-style-type: none"> • Verify the voltage sweep on JF8 pin 5. Should be 0V to 5V on white/green
3XX1		

NOTE: "X" can represent any number between 0-9