

# NetGain Motors, Inc.

800 South State Street / Suite 4 / Lockport, IL 60441 / 630-243-9100 / 630-685-4054 (FAX)

Code	Fault	Set Condition	Level
1	<a href="#"><u>Over Voltage</u></a>	Key-switch voltage or capacitors voltage is above the maximum level allowed for the controller.	Blocking
2	<a href="#"><u>Under Voltage</u></a>	Key-switch voltage or capacitors voltage is below the minimum level allowed for the Controller.	Blocking
3	<a href="#"><u>User Over Voltage</u></a>	Key-switch voltage is above the maximum level defined by the user via related parameter.	Blocking
4	<a href="#"><u>User Under Voltage</u></a>	Key-switch voltage is below the minimum level defined by the user via related parameter.	Blocking
5	<a href="#"><u>Inverter 1 Over Current</u></a>	Inverter 1 phase current exceeded its current limit.	Blocking
6	<a href="#"><u>Inverter 2 Over Current</u></a>	Inverter 2 phase current exceeded its current limit.	Blocking
7	<a href="#"><u>Not Assigned</u></a>	-	-
8	<a href="#"><u>Inverter 1 Over Temperature</u></a>	Inverter 1 power module temperature is above +100°C.	Blocking
9	<a href="#"><u>Inverter 2 Over Temperature</u></a>	Inverter 2 power module temperature is above +100°C.	Blocking
10	<a href="#"><u>Inverter 1 High Temperature</u></a>	Inverter 1 power module temperature is above +80°C.	Limiting
11	<a href="#"><u>Inverter 2 High Temperature</u></a>	Inverter 2 power module temperature is above +80°C.	Limiting
12	<a href="#"><u>Inverter 1 Under Temperature</u></a>	Inverter 1 power module temperature is below -40°C.	Blocking
13	<a href="#"><u>Inverter 2 Under Temperature</u></a>	Inverter 2 power module temperature is below -40°C.	Blocking
14	<a href="#"><u>Inverter 1 Current Sensor Fault</u></a>	Current sensor of Inverter 1 measures an invalid offset at key on.	Blocking
15	<a href="#"><u>Inverter 2 Current Sensor Fault</u></a>	Current sensor of Inverter 2 measures an invalid offset at key on.	Blocking
16	<a href="#"><u>Not Assigned</u></a>	-	-
17	<a href="#"><u>Inverter 1 Temp Sensor Fault</u></a>	Difference between Inverter 1 and microprocessor temperature greater than 70°C.	Stopping
18	<a href="#"><u>Inverter 2 Temp Sensor Fault</u></a>	Difference between Inverter 2 and microprocessor temperature greater than 70°C.	Stopping
19	<a href="#"><u>Motor 1 Over Temperature</u></a>	Motor 1 temperature is above the Motor 1 Over Temperature defined by the user via related parameter.	Stopping
20	<a href="#"><u>Motor 2 Over Temperature</u></a>	Motor 2 temperature is above the Motor 2 Over Temperature defined by the user via related parameter.	Stopping

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21	<a href="#">Motor 1 High Temperature</a>	Motor 1 temperature is above the motor Start Cutback Temperature defined by the user via related parameter.	Limiting
22	<a href="#">Motor 2 High Temperature</a>	Motor 2 temperature is above the motor Start Cutback Temperature defined by the user via related parameter.	Limiting
23	<a href="#">Motor 1 Temp Sensor Fault</a>	Motor 1 temperature sensor value is out of permitted range.	Limiting
24	<a href="#">Motor 2 Temp Sensor Fault</a>	Motor 2 temperature sensor value is out of permitted range.	Limiting
25	<a href="#">High Voltage</a>	Key-switch Voltage or Capacitors Voltage is above the Controller Starting Cutback Voltage defined by the user via related parameter.	Limiting
26	<a href="#">Low Voltage</a>	Key-switch Voltage or Capacitors Voltage is below the Controller Starting Cutback Voltage defined by the user via related parameter.	Limiting
27	<a href="#">Microprocessor Over Temperature</a>	Microprocessor temperature is above 125°C.	Blocking
28	<a href="#">+5V Supply Failure</a>	+5V supply is outside the +5V ± 10% range.	Blocking
29	<a href="#">+12V Supply Failure</a>	+12V supply is outside the +12V ± 10% range.	Blocking
30	<a href="#">Encoder 1 Fault</a>	Sin/Cos inputs values are above/below the fault thresholds or spin sensor offset is not right.	Blocking
31	<a href="#">Encoder 2 Fault</a>	Sin/Cos inputs values are above/below the fault thresholds.	Blocking
32	<a href="#">Driver Output 1 Open/Short</a>	Driver Output 1 is either opened or short-circuited.	Blocking
33	<a href="#">Driver Output 2 Open/Short</a>	Driver Output 2 is either opened or short-circuited.	Blocking
34	<a href="#">Driver Output 3 Open/Short</a>	Driver Output 3 is either opened or short-circuited.	Blocking
35	<a href="#">Digital Output 1 Open/Short</a>	Digital Output 1 is either opened or short-circuited.	Blocking
36	<a href="#">Digital Output 2 Open/Short</a>	Digital Output 2 is either opened or short-circuited.	Blocking
37	<a href="#">EEPROM Failure</a>	Error during read/write operation in EEPROM memory.	Blocking
38	<a href="#">EEPROM Corrupted</a>	Memory CRC doesn't match.	Blocking
39	<a href="#">Driver Output 4 Open/Short</a>	Driver Output 4 is either opened or short-circuited.	Blocking
40	<a href="#">PreCharge Circuit Fault</a>	Pre-charge of internal line capacitors is too fast or capacitors voltage is fixed to zero during precharge.	Blocking
41	<a href="#">PreCharge Failed</a>	Pre-charge phase fails to charge capacitors till the voltage level of key input.	Blocking

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42	<a href="#">Main Contactor Welded</a>	Before closing the line contactor, internal capacitors are loaded for short time and voltage doesn't go down.	Blocking
43	<a href="#">Main Contactor Did Not Close</a>	The difference between key switch and capacitors voltage is too high after the contactor has been powered.	Blocking
44	<a href="#">Interlock Disabled</a>	Interlock input is not active and line contactor is open.	Stopping
45	<a href="#">Static Return to Off Traction</a>	One or more traction inputs are active at the key on, after an Emergency stop or a controlled stop procedure.	Warning
46	<a href="#">Static Return to Off Hydraulic</a>	One or more hydraulic/pump inputs are active at the key on after a controlled stop procedure.	Warning
47	<a href="#">Traction Throttle Fault</a>	A fault condition of traction throttle is detected.	Stopping
48	<a href="#">Hydraulic Throttle Fault</a>	A fault condition of hydraulic/pump throttle is detected.	Stopping
49	<a href="#">Brake Throttle Fault</a>	A fault condition of brake throttle is detected.	Stopping
50	<a href="#">Service Time Expired</a>	Service Timer has expired.	Warning
51	<a href="#">Low Battery State of Charge</a>	Battery state of charge estimated is lower than minimum value defined by the user via related parameter.	Limiting
52	<a href="#">Wrong Parameter</a>	Parameter setting is out of the permitted range.	Blocking
53	<a href="#">Restart Required</a>	Changed a parameter setting.	Blocking
54	<a href="#">Can Bus Off</a>	Bus Off condition detected.	Stopping
55	<a href="#">Can Open Circuit</a>	Messages no longer received.	Stopping
56	<a href="#">Can Bad Wiring or Short Circuit</a>	Can bus synchronization phase failed or bus off condition detected.	Blocking
57	<a href="#">Not Assigned</a>	-	-
58	<a href="#">Not Assigned</a>	-	-
59	<a href="#">Not Assigned</a>	-	-
60	<a href="#">Not Assigned</a>	-	-
61	<a href="#">Not Assigned</a>	-	-
62	<a href="#">Net Timeout Heartbeat</a>	At least one Heartbeat hasn't been received during the startup of the network or after the synchronization phase.	Stopping

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63	<a href="#"><u>Net RPDO Timeout</u></a>	At least one PDO hasn't been received.	Stopping
64	<a href="#"><u>Main Contactor Close Command Timeout</u></a>	Pre-charge timer has expired before the master sends the power ready request.	Blocking
65	<a href="#"><u>Blocking Request From Master</u></a>	Fault Request is received from Master.	Blocking
66	<a href="#"><u>Not Assigned</u></a>	-	Not Assigned
67	<a href="#"><u>Net Startup Timeout</u></a>	The node hasn't been able to synchronize itself to the network.	Blocking
68	<a href="#"><u>Net External Failure</u></a>	At least one Node has become not operational.	Stopping
69	<a href="#"><u>Net Mains Manager Wrong Sequence</u></a>	The Main Contactor Manager has executed a wrong powering procedure.	Blocking
70	<a href="#"><u>Net Mains Manager Precharge Too Slow</u></a>	DC Bus Voltage will not increase after discharging phase.	Blocking
71	<a href="#"><u>Net Mains Manager Closing Too Slow</u></a>	The main contactor doesn't close.	Blocking
72	<a href="#"><u>Net Mains Manager Powering Alarm</u></a>	At least one fault has occurred on Main Contactor Manager Controller.	Blocking
73	<a href="#"><u>CO Synchro Failed</u></a>	At least one node of the network could be wrong configured or switched off.	Blocking
74	<a href="#"><u>CO Synchro Lost</u></a>	At least one node of the network could be wrong configured or switched off during operation.	Stopping
75	<a href="#"><u>Stopped For System Fault</u></a>	Node is stopped because another node has a stopping/blocking fault condition.	Stopping
76	<a href="#"><u>Blocked for System Fault</u></a>	Node is blocked because another node has a stopping/blocking fault condition.	Blocking
77	<a href="#"><u>BMS Wall Charge</u></a>	The TAU Node sets a blocking fault.	Blocking
78	<a href="#"><u>BMS Stop</u></a>	The TAU Node sets a stopping fault	Stopping
79	<a href="#"><u>BMS Fault</u></a>	The TAU Node sets a blocking fault.	Blocking
80	<a href="#"><u>BMS Limiting</u></a>	The TAU Node limits its current to the required value from BMS.	Limiting
81	<a href="#"><u>Steering Sensor Fault</u></a>	A fault condition of steering sensor is detected.	Limiting
82	<a href="#"><u>CAN Protocol Run Time Error</u></a>	Wrong Request for Driver Outputs	Limiting
83	<a href="#"><u>Programming Required</u></a>	Controller Firmware Programming	Blocking
84	<a href="#"><u>DigInputs Overvoltage</u></a>	Digital Input Supply has reached dangerous value	Blocking
85	<a href="#"><u>Inverter Model Not Supported</u></a>	Inverter model is not supported by the firmware.	Blocking

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97	<a href="#">Commission In Progress</a>	Spin sensor commission is in progress	Warning
98	<a href="#">Commission End Success</a>	Spin sensor commission end successfully	Stopping
99	<a href="#">Commission End Errors</a>	Spin sensor commission end with errors	Stopping
100	<a href="#">Internal Software Fault 1</a>	Internal Error.	Blocking
101	<a href="#">Internal Software Fault 2</a>	Internal Error.	Warning
102	<a href="#">Internal Software Fault 3</a>	Internal Error.	Warning
103	<a href="#">Internal Hardware Fault 1</a>	Internal Error.	Blocking
104	<a href="#">Internal Hardware Fault 2</a>	Internal Error.	Blocking
105	<a href="#">Internal Hardware Fault 3</a>	Internal Error.	Blocking
106	<a href="#">Internal Hardware Fault 4</a>	Internal Error.	Blocking
107	<a href="#">Internal Software Fault 4</a>	Internal Error.	Blocking

- **Level:** anomalous working conditions are indicated by different alarm levels, classified as follows, depending on their effects on the system:

Level	Priority	Action	Icon
Blocking	1 (THE HIGHEST)	<ul style="list-style-type: none"> <li>• Main Contactor: Opened</li> <li>• Motors: Disabled</li> <li>• Outputs: Disabled</li> </ul>	
Stopping	2	<ul style="list-style-type: none"> <li>• Main Contactor: Closed</li> <li>• Motors: Stopped</li> <li>• Outputs: Enabled</li> </ul>	
Limiting	3	<ul style="list-style-type: none"> <li>• Main Contactor: Closed</li> <li>• Motors: Limited</li> <li>• Outputs: Enabled</li> </ul>	

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<b>Warning</b>	<b>4 (THE LOWEST)</b>	<ul style="list-style-type: none"><li>• Main Contactor: Closed</li><li>• Motors: Enabled</li><li>• Outputs: Enabled</li></ul>	
<b>Ready</b>	<b>No Faults</b>	<ul style="list-style-type: none"><li>• Main Contactor: Closed</li><li>• Motors: Enabled</li><li>• Outputs: Enabled</li></ul>	