Wake Speed Device Error Code Reference Guide

Legend:

Auto Restart	Description
False (Manual Intervention Required)	The device will **not** automatically clear this fault; it requires manual action (reset, clearing the fault, or fixing the underlying issue).
True (Attempted Auto-Clear)	The device will attempt to clear the fault automatically after a condition change, but manual review is recommended if the fault persists.

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1. Quick Reference Error Summary

Error No.	Title	Short Description	Auto Restart
12	Battery Temperature Too High	Battery temperature is too hot. Check sensor placement and programming.	False
13	High Battery Voltage (VBat+)	Measured voltage at VBat+ is too high. Check external influences like solar.	False
14	Low Battery Voltage (VBat+)	Battery voltage is too low. Check connections, fuses, and battery health.	False
15	High Battery Voltage (VBat+)	Measured voltage at VBat+ is too high. Check programming and external sources.	False
16	Faulty Battery Temperature Sensor	Battery temperature sensor is defective. Replace the sensor.	False
21	High Alternator Temperature	Alternator is overheating. Check temperature sensor and cooling.	False
24	High Alternator Temperature (Severe)	Alternator is overheating significantly. Check for damage or malfunction.	False
25	Rapid Alternator Temperature Increase	Alternator temperature is rising quickly. Check for damage or overheating.	False
31.39	Internal Device Error	Internal error detected. Attempt to reprogram device. If unsuccessful, contact support.	**True**
41	High Internal FET Temperature	The internal field-effect transistor (FET) is overheating. Check device temperature and ventilation.	False
42	Missing Required Sensor	A necessary sensor is missing or not connected. Check wiring and sensor presence.	False
43	No Voltage on VAlt+ Line	Check for blown fuses on the alternator circuit.	False
44	Voltage Offset Between VAlt+ and VBat+	Significant voltage difference between VAlt+ and VBat+. Check wiring and external sources.	False
45	High Alternator Voltage (VAlt+)	Alternator voltage is too high. Check settings and external sources.	False
46	High Battery Bank Voltage	Battery bank voltage is too high. Check charging settings and external sources.	False
51	Battery Charging Bus Disconnected	The battery charging bus has been disconnected. Check BMS and CAN communication.	False
52	Bus Disconnected Due to High Voltage	Battery bus disconnected due to excessive voltage. Check BMS settings and battery health.	False
53	Invalid Battery Instance Number	The battery instance number is incorrect. Check BMS configuration.	False
54	Multiple BMS Aggregation Error	The Wake Speed device is trying to aggregate too many BMSs.	False
55	AEBus Device Warning or Fault	The AEBus device (Discovery battery) has reported a warning or fault. Check device status and resolve issues.	False
56	Too Many VEreg Devices	There are too many VEreg devices connected to the system.	False
57	Bus Disconnected Due to Low Voltage	Battery charging bus disconnected due to low voltage. Check battery health and charging settings.	False
58	Bus Disconnected Due to High Current	Battery charging bus disconnected due to excessive current. Check battery health and charging settings.	False
59	Bus Disconnected Due to High Temperature	Battery charging bus disconnected due to high battery temperature. Check battery health and cooling.	False

Error No.	Title	Short Description	Auto Restart
61	Bus Disconnected Due to Low Temperature	Battery charging bus disconnected due to low battery temperature. Check battery health and heating.	False
62	Battery Reached Upper Limit	The battery has reached its maximum charging voltage. Stop charging.	False
71.79	Internal Device Error	Internal error detected. Attempt to reprogram device. If unsuccessful, contact support.	False
82	DC-DC Primary Over-voltage	Primary battery (high-side) of the DC-DC converter is experiencing excessive voltage.	False
83	DC-DC Primary Under-voltage	Primary battery (high-side) of the DC-DC converter is experiencing low voltage.	False
84	DC-DC Secondary Over-voltage	Secondary battery (low-side) of the DC-DC converter is experiencing excessive voltage.	False
85	DC-DC Secondary Under-voltage	Secondary battery (low-side) of the DC-DC converter is experiencing low voltage.	False
86	DC-DC Converter Overheating	The DC-DC converter is overheating. Check temperature and cooling.	False
87	DC-DC Configuration Error	A configuration value has exceeded the limits of the DC-DC converter. Check settings.	False
88	Multiple Devices Controlling DC-DC	Conflict between multiple devices trying to control the DC-DC converter.	False
89	Incorrect DC-DC Converter Attached	The attached DC-DC converter does not match the specified make and model.	False
91	BMS Sync Lost	The BMS synchronization has been lost.	False
92	Regulator Forced into Idle	The regulator has been forced into idle mode. Check configuration and external factors.	False
93	DVCC Lock Lost	The device has lost the DVCC lock.	False

2. Detailed Troubleshooting by Error Category

Category A: Battery Voltage & Temperature Errors (12 - 16)

No.	Title	Long Description	Hints (Troubleshooting Steps)
12	Battery Temperature Too High	The measured battery temperature has exceeded the configured upper limit.	1. Validate the location of the battery temp sensor: it must be on the **negative terminal** in the middle of the battery bank. 2. Check the battery temperature programming in the Wake Speed device. 3. Check the actual temperature at the batteries. 4. Check for excessive ambient heat sources; consider adding cooling fans or ventilation to the battery compartment if necessary.
13 **15**	High Battery Voltage (VBat+)	The voltage measured at the VBat+ terminal has exceeded the programmed upper/maximum limit. Error **15** is specifically triggered by exceeding Max Bat Volts (CPB).	1. Check the voltage at the **red wire** and then separately the **red and yellow wire** and compare it against programming. 2. Likely caused by an external voltage affecting the bus bar (e.g., solar/MPPT). 3. Check voltage at the bus bars when the WS500 is off for external power sources like an MPPT. 4. Ensure the Wake Speed device is programmed with the correct battery voltage settings.
14	Low Battery Voltage (VBat+)	The measured voltage at the VBat+ terminal is too low for the device to operate.	1. Check the **15-amp fuse** on the **red wire**. 2. Check the **3-amp fuse** on the **red/yellow wire**. 3. Check all wires are connected securely and that no fuses are blown. 4. Check the voltage on the batteries using a multimeter. 5. Compare the voltage of the batteries vs. the voltage at the alternator. 6. Verify the Wake Speed device's programming for minimum battery voltage settings.
16	Faulty Battery Temperature Sensor	The device has detected a short circuit in the battery temperature sensor.	1. **Replace the battery temperature sensor** with a new, compatible one, as the sensor is defective.

Category B: Alternator & Related Voltage Errors (21 - 25, 43, 45)

No.	Title	Long Description	Hints (Troubleshooting Steps)
21	High Alternator Temperature	The measured alternator temperature has exceeded the programmed upper limit.	1. Validate the temperature at the alternator diodes. 2. Check the alternator temperature setting in programming. 3. Verify the alternator temperature sensor is working correctly; replace if faulty. 4. Check for overloading or cooling issues/airflow obstructions.
24	High Alternator Temperature (Severe)	The alternator temperature has reached a very high level, indicating a potential malfunction or severe issue.	1. This is a critical overheating state; there is a **possible bad alternator**. 2. Reference and perform all checks for Error 21 above. 3. Inspect the alternator for any signs of damage or overheating. 4. Reduce the load on the alternator if possible.
25	Rapid Alternator Temperature Increase	The alternator temperature is increasing rapidly, suggesting internal damage.	1. Inspect the alternator for any signs of damage or overheating, especially for **faulty bearings or windings**. 2. Check for a **loose temp sensor connection**. 3. Check for any unusual noises or vibrations.
43	No Voltage on VAlt+ Line	The Wake Speed device is not detecting any voltage on the VAlt+ line.	1. Check the **15-amp fuse** on the **red wire**. 2. Check the **3-amp fuse** on the **red/yellow wire**. 3. Check the **large fuse** between the alternator and batteries. 4. Inspect the alternator for damage and verify wiring between the alternator and the Wake Speed device.
45	High Alternator Voltage (VAlt+)	The voltage at the VAlt+ line has exceeded the programmed maximum battery voltage.	1. **Voltmeter the alternator** and compare the measured voltage to the programmed battery charge. 2. Check voltage at the red wire and red/yellow wire with the Wake Speed off and on to validate if the Wake Speed is outputting the wrong voltage or if an external factor like MPPT is influencing it. 3. Ensure no external sources are applying power to the batteries separately from the alternator.

Category C: Internal & Core System Issues (31.39, 71.79, 41, 42, 44, 46)

No.	Title	Long Description	Hints (Troubleshooting Steps)
31-39 71-79	Internal Device Error	The Wake Speed device has encountered an internal error (software corruption, hardware malfunction).	1. **Format and reprogram the device.** Follow the reprogramming instructions provided in the Wake Speed manual. 2. Ensure the **latest firmware version** is installed. 3. If reprogramming fails, contact Wake Speed technical support.
41	High Internal FET Temperature	The temperature of the internal field-effect transistor (FET) has exceeded the allowed limit.	1. Check the temperature of the compartment that the WS500 is housed in. 2. Ensure there is **adequate ventilation** around the device. 3. Reduce excessive load. 4. If the issue persists, contact technical support.
42	Missing Required Sensor	The Wake Speed device is missing a sensor that is required for proper operation, and it is configured to FAULT out.	1. Check all wires are attached versus what the app is expecting to see. 2. Make sure none of the wires are loose. 3. Make sure all fuses are not blown. 4. Verify the device's configuration to identify the missing sensor.
44	Voltage Offset Between VAlt+ and VBat+	The voltage difference between the VAlt+ and VBat+ sense lines has exceeded the allowed limit ($2.5V$).	1. **Voltmeter the voltage** coming out of the alternator vs. where the red wire and the red/yellow wire are located. 2. **Resistance is likely causing a voltage drop** somewhere in between. 3. Compare the voltage coming out of the alternator and going into the battery bank to see if there is any voltage drop. 4. Check red or red/yellow wire vs. purple and grey wire voltages. 5. Check for an external source applying power to the batteries separately from the alternator.
46	High Battery Bank Voltage	The voltage greatly exceeded the expected upper battery limit as measured at VAlt+.	1. **Voltmeter the alternator** and compare to programmed battery charge. 2. Check voltage at the red wire and red/yellow wire with the Wake Speed off and on to validate if the Wake Speed

No.	Title	Long Description	Hints (Troubleshooting Steps)
			is outputting the wrong voltage or if an external factor like MPPT is influencing it. 3. Review the BMS settings and charging profile. 4. Test each battery individually.

Category D: BMS/CAN Bus & Charging Limit Errors (51 - 62, 91 - 93)

No.	Title	Long Description	Hints (Troubleshooting Steps)
51	Battery Charging Bus Disconnected	Received a generic CAN message that the battery charging bus has been disconnected.	1. Check the **BMS for error messages** or fault codes. 2. Verify the **CAN communication** between the Wake Speed and the BMS. 3. Inspect the wiring and connections to the battery bus.
52 **57** **58** **59** **61**	Bus Disconnected (Voltage) (Current/Temp)	CAN command from the BMS requesting disconnection due to: **52 High Voltage**, **57 Low Voltage**, **58 High Current**, **59 High Temperature**, or **61 Low Temperature**.	1. Check **BMS settings** for thresholds that are triggering the disconnection. 2. Monitor the specific parameter (V, I, or Temp) to ensure it is within range. 3. For temp issues (59, 61), improve ventilation/cooling or ensure the battery's heating function is working. 4. Inspect all wiring.
53	Invalid Battery Instance Number	Received an invalid battery instance number (needs to be from 1 to 100).	1. **Verify the battery instance number** is correctly configured in the BMS.
54	Multiple BMS Aggregation Error	The Wake Speed device is trying to aggregate too many BMSs.	1. Ensure that **only one BMS** is connected and configured correctly for the system.
55	AEBus Device Warning or Fault	The AEBus device (Discovery battery) has sent a warning or fault status.	1. Treat all warnings as pending disconnect and fault. 2. Check the **AEBus device for error messages**. 3. Verify communication; if necessary, reset or replace the AEBus device. 4. This is a self-restarting fault to see if it clears.
56	Too Many VEreg Devices	Excessive number of VEreg (Victron) devices detected, causing conflicts.	1. **Reduce the number of VEreg devices** connected to the system if possible.
62	Battery Reached Upper Limit	A CAN status has been received that the battery has reached its upper limit, but not yet disconnecting. Charging should stop.	1. Review the **BMS settings and charging profile** to ensure they are configured correctly. 2. Monitor the battery voltage to ensure it doesn't exceed the maximum limit.
91	BMS Sync Lost	An existing BMS sync has been lost, and the regulator is in an alternate mode ('Get Home' mode).	1. If using a **Lynx BMS**, verify the **jumpers are set from 1 to 3 and 4 to 8**. 2. Ensure the **white wire is in port 9** of the Lynx BMS. 3. Validate the Lynx BMS is programmed to **Alternator ATC** (Allowed-to-Charge). 4. Check the BMS for error codes. 5. Verify the CAN communication and inspect all wiring/connections between the two devices.
92	Regulator Forced into Idle	The regulator has been manually forced into Idle mode.	1. Check the **Feature-in line** for an unexpected voltage application. 2. Check programming for an **RPM-based trigger** that may be forcing the idle mode. 3. Review the regulator's configuration settings or external trigger settings.
93	DVCC Lock Lost	The device has lost the DVCC lock, reverting to non-DVCC mode of operation.	1. Check for any **communication errors** between the Wake Speed device and other components. 2. Verify all hardware connections are secure.

Category E: DC-DC Converter Errors (82 - 89)

No.	Title	Long Description	Hints (Troubleshooting Steps)
82 **83**	DC-DC Primary Battery Over/Under-voltage	The primary battery (high-side, HS) of the DC-DC converter has exceeded (**82**) or fallen below (**83**) its voltage limit.	1. Check the **primary battery voltage** to ensure it's within range. 2. Verify the DC-DC converter's configuration settings. 3. Inspect wiring. 4. For undervoltage, reduce the load if necessary.
84 **85**	DC-DC Secondary Battery Over/Under-voltage	The secondary battery (low-side, LS) of the DC-DC converter has exceeded (**84**) or fallen below (**85**) its voltage limit.	1. Check the **secondary battery voltage** to ensure it's within range. 2. Verify the DC-DC converter's configuration settings. 3. Inspect wiring.

No.	Title	Long Description	Hints (Troubleshooting Steps)
			4. For undervoltage, reduce the load if necessary. 5. Specific for 85: The 12V battery is below the allowed LVO (Low Voltage Out) cutout point of the converter (e.g., $8.0V$ minimum). Look at the **DST line** to see the measured 'low-side' (12V) voltage by the DCDC converter itself. This is a self-resetting fault.
86	DC-DC Converter Overheating	The DC-DC converter has exceeded its maximum operating temperature.	1. Check the converter's temperature. 2. **Improve ventilation and reduce load**. 3. Consider replacement if the issue persists.
87	DC-DC Configuration Error	One or more configuration values have exceeded the limits of the selected DC-DC converter.	1. **Review the DC-DC converter's manual** and ensure all configuration values are within specified limits. 2. Verify the connected components are compatible with the converter.
88	Multiple Devices Controlling DC-DC Converter	More than one device is attempting to control the DC-DC converter.	1. Ensure that **only one device** is configured to control the DC-DC converter. 2. Check for communication conflicts.
89	Incorrect DC-DC Converter Attached	The attached DC-DC converter does not match the same make/model specified in the configuration.	1. **Verify the make and model** of the attached DC-DC converter. 2. Ensure the converter is compatible with the Wake Speed device and configuration.

Standard Support Protocol Reminders

- **Firmware:** Always ask the customer for the current firmware version and confirm they have attempted to **reprogram the device** for internal errors (31.39, 71.79).
- **External Sources:** For all voltage errors (13, 15, 45, 46, 82, 84), specifically ask about **solar controllers (MPPT), shore power, or other charging sources** that may be connected.
- **Documentation:** Direct the customer to the relevant sections of the **Wake Speed manual** for programming and sensor placement verification.
- **Transfer Protocol:** If a customer asks to be transferred to a Sales Representative for technical support, inform them that the **Sales Rep no longer handles tech support, only sales**. Offer to transfer them to another technical agent if they require a different point of contact within our department.