Understanding and Troubleshooting IOTA Self-Diagnostic Status Codes

IOTA® Self Diagnostic and Self Testing models are designed to simplify lighting code compliance by automatically conducting monthly and annual life safety tests and reporting on system status. The results of these diagnostic tests are displayed via an indicator light on all models, and additionally communicated via Bluetooth® on AELR models. Routinely inspecting the indicator light or review electronic test records is a requirement for building owners to ensure that critical life safety equipment is operable when it is needed the most. This document provides an overview of the various conditions that can be reported as a result of automatic testing, and suggests any troubleshooting steps that may be taken if an error is encountered.

> Note: the blink pattern and indicator color for each operating mode or fault condition varies from model to model. Additionally, not all operating modes or fault conditions may be reported. Consult the installation instructions or product labeling for a diagnostic code key for your model.

OPERATING MODES

These status indications display during routine operation of your IOTA model and usually indicate that it is performing correctly.

Battery is Charging:

> This indicates that the IOTA model is receiving AC utility power and is charging its battery(ies). After installation, this is typically the first operating mode that will be displayed. If a power loss occurs when the battery is charging, the IOTA model will still deliver emergency power to the luminaire(s), however it may be unable to maintain its full illumination level for 90 minutes. It is important to allow the IOTA model to fully charge after installation or after a 90-minute discharge test to ensure operational readiness.

Battery is Fully Charged/Ready:

> This indicates that the IOTA model is fully charged and ready to supply emergency power to the luminaire(s) for a full 90-minutes (or longer).

OPERATING MODES, CONTINUED

Emergency Mode:

This indicates that the IOTA model cannot detect unswitched AC power and is supplying the luminaire(s) via battery power.

Troubleshooting

If this operating mode is encountered during normal conditions where AC power is present, then it is possible the IOTA model is wired incorrectly (for example: the unswitched input may be connected to a local on/off control that is switched off, or the unit connector/test switch may be disconnected). The distribution panel feeding the emergency circuit may have additionally been tripped. Inspect the distribution panel or wiring and remedy any issues before re-inspecting the IOTA model. If this operating mode is still being displayed, call Tech Support at (855) 363-9527.

Unit is Performing a Test

This indicates that the IOTA model is performing an automatic monthly or annual life-safety test or a load calibration. The luminaire(s) will be receiving battery power from the IOTA model and will be illuminated regardless of any local controls. If the IOTA model detects any issue during the automatic test or load calibration, it will indicate a fault condition.

Insufficient Charge:

Note: this status does NOT indicate an issue with the IOTA model, but rather, this status will be displayed after attempting to initiate a Manual Test while the battery is not fully charged. The IOTA model will attempt to complete the Manual Test, but may end the test early if there is insufficient battery charge.

Troubleshooting

If an Insufficient Charge condition is displayed, then allow the unit to charge for 24 hours before re-initiating the Manual Test.

FAULT CONDITIONS

These status indicators will display if your IOTA model detects a problem during routine operation or while conducting an automatic or manual self-diagnostic test. If a fault is displayed, this means that your critical life safety equipment may fail to perform as intended during an emergency power-loss event. Fault conditions **must be addressed by the facility manager** to ensure lighting code compliance.

Battery May Be Missing/Battery Disconnected:

The IOTA model has detected that the battery circuit has not been engaged. For Emergency Driver models, this may mean that the unit connector has not been mated or that the test accessory has not been plugged in. For Emergency Inverter models, this may mean that the battery connectors have not been mated.

Troubleshooting

Inspect the unit connector, test accessory, or battery connectors and ensure they have been connected properly. Trigger a Manual Test (see Installation Manual, note: the battery must be fully charged to initiate a test, so this step may need to be performed 24-48 hours after correcting any wiring issues). If the fault condition is still displayed, contact Tech Support at (855) 363-9527.

Battery Failure:

During a diagnostics test, the IOTA model will measure several aspects of the battery(ies)'s electrical performance to ensure it is operating at peak condition. Battery performance can naturally degrade over time, and these diagnostic checks are an important factor in maintaining your critical life safety equipment. IOTA models will automatically test things such as whether the battery is able to fully charge or whether the battery is supplying sufficient voltage to power the load. If one of these measurements indicates a battery issue, the IOTA model will display a Battery Failure.

Troubleshooting

If a Battery Failure is indicated, ensure that the IOTA model is receiving unswitched AC power from the distribution panel and allow it to charge for 24 hours (Emergency Drivers) or 48 hours (Emergency Inverters). Trigger a Manual Test (see Installation Manual). If the fault condition is still displayed, the IOTA model may need to be replaced. Contact Tech Support at (855) 363-9527.

Electronics Failure/Charge Failure:

The IOTA model will perform certain diagnostic checks to ensure that its electronic components are working properly. An Electronics Failure/Charge Failure will be displayed in the rare case that there is an issue with the IOTA electronic components themselves.

Troubleshooting

An Electronics Failure may only be addressed by replacing the IOTA model. Contact Tech Support at (855) 363-9527.

FAULT CONDITIONS

Emergency Load Failure:

When the IOTA Self-Diagnostic model is first engaged (by either mating the unit connector, connecting the test switch, or mating the battery connectors), it will perform a Load Calibration within 48 hours. This Load Calibration allows the IOTA model to store information about its connected load and perform diagnostic checks to ensure that the emergency load is operating properly. These diagnostic checks happen during a self-test where the IOTA model will measure whether the electrical operating characteristics of the load has changed or whether an open circuit or short circuit has occurred. If an issue is detected with the load during testing, the IOTA model will display an Emergency Load Failure.

Troubleshooting

If an Emergency Load Failure is indicated, check the wiring from the IOTA model to the load. Often a short circuit or open circuit may be caused by loose or shorted wires. If the wiring is correct, measure the voltage at the output and ensure that this voltage is within the acceptable voltage range listed on the IOTA model's unit label or specification sheet. If this voltage is out of range, then contact Tech Support at (855) 363-9527. If the voltage is within range, trigger a manual Load Calibration (see Installation Manual), then allow the unit to charge for 24 hours before triggering a Manual Test (see Installation Manual). If the Emergency Load Failure is still indicated, then it is possible that the IOTA model is working properly, but the emergency luminaire(s) is/are compromised. Contact the luminaire manufacturer for next steps, and be sure to notify them of the steps you took to validate that the IOTA model is working. If it can be proven that the emergency luminaire(s) is/are working correctly, then as a last step, the IOTA model may need to be replaced. Contact Tech Support at (855) 363-9527.

Abnormal Temperature/Temperature Out of Range

The IOTA model is designed to operate within certain temperature limits (see the unit label, installation instructions, or specification sheet). If the IOTA model measures an ambient temperature outside of it's operating limits during operation, the IOTA model will display an Abnormal Temperature/Temperature Out of Range fault. Note: in power loss conditions, the IOTA model will still attempt to power the emergency load regardless of the ambient temperature of the unit.

Troubleshooting

If an Abnormal Temperature/Temperature Out of Range fault is displayed, the unit is likely installed in an improper environment where extreme temperatures are possible. Consult the installation instructions or specification sheet for the rated operating temperature of the IOTA model and the environments it is suitable to operate in. Move or replace the IOTA model if the current conditions are unacceptable.

To learn more about IOTA Self-Diagnostic models, visit us online at iotaengineering.com or call us at 1-800-866-4682