



U.S. Department of Energy

Prototype Phase Technical Performance and Scoring Form

Connected Systems Track

This form is to be used by the competitor to report key performance metrics or capabilities of their prototype and the associated points they expect would be earned for these performance or capabilities. This form is in addition to the technical documentation that must be submitted as described in Appendix B of the Official Rules for each requirement. A summarized checklist of these technical documentation requirements is provided in Appendix D of the Official Rules. The L-Prize Expert Reviewer Panel will use this Technical Performance and Scoring Form in combination with submitted documentation and physical evaluation (where applicable) to determine the total number of points earned for a submission.

Instructions

1. Review Section III.6 of the L-Prize Official Rules to understand how this form will be used about how the total score for a submission will be determined.
2. Report the performance or capability and associated number of points earned for each requirement in this form, based on Appendix B of the Official Rules.
3. Provide any additional notes you would like the Expert Reviewer Panel to know about the performance, capability, or points earned.
4. Forms must be completed digitally; handwritten forms will not be accepted.
5. Save the file as a PDF and submit as part of your Prototype Phase submission at <https://www.herox.com/LPrize>

Technical Interoperability	The capability to physically connect two or more devices or systems.	
<p>Minimum Requirement(s) The lighting system must include network interfaces incorporated into system devices to enable exchange of data with other system devices. The interfaces must comply with at least one existing industry standard specification for basic physical network connectivity, such as: IEEE 802.3 (Ethernet), IEEE 802.11 (Wi-Fi), IEEE 802.15.4 (ZigBee, 6LoWPAN), Bluetooth Mesh, etc.</p>	<p>Possible Points n/a</p>	
<p>What industry standard specification(s) for basic physical network connectivity does the system comply with?</p>		
<p>Points are not applicable for this requirement.</p>	n/a	
<p>Provide any additional notes you would like the Expert Reviewer Panel to know about the technical interoperability or points earned.</p>		

System Resilience	The capability of the connected system to continue to function in the event of loss of connection to power, data network, and/or system controllers.	
<p>Minimum Requirement(s) With a loss of connection to the internet, all lighting control strategies (task tuning, scheduling, occupancy sensing, daylight harvesting, and manual control) must continue to be implemented by luminaires and associated control devices in their pre-programmed state prior to loss of connection.</p> <p>With loss of connection to electrical power of up to 48 hours, and upon power reconnection, all lighting control strategies must continue to be implemented by luminaires according to their configuration prior to loss of connection.</p>	<p>Possible Points Eight points (+8) will be awarded to systems that maintain control strategy implementation with loss of connection to the next higher networked element in the system's topology, such as a gateway.</p>	
<p>For which loss of connection(s) is the system able to continue to implement lighting control strategies? (Enter: loss of connection to internet, loss of power for 48 hours, and/or loss of connection to gateway/next higher network element)</p>		

<p>How many system resilience points are earned for this capability? (Enter 0 or 8)</p>	
<p>Provide any additional notes you would like the Expert Reviewer Panel to know about the system resilience capability or points earned.</p>	

Fault Detection and Diagnostics	The capability of the connected system to identify and diagnose faults and deliver notifications to operators about them.
<p>Minimum Requirement(s) The lighting system must have the capability to identify and report faults in the system including but not limited to device/equipment errors and loss of network communication. Methods must be provided for automatic notification of faults to building operators.</p>	<p>Possible Points Eight points (+8) will be awarded for systems that leverage the data provided by D4i drivers to detect and report specific faults including, at a minimum, LED array/module failure, LED driver failure, compromised performance (e.g., reduced light level, strobing light output) resulting from electrical power faults (over/under voltage and/or current), and electrical service interruption. The methods to detect and report these faults must be described.</p> <p>Eight additional points (+8) will be awarded for systems that can report remaining life for LED modules/boards and LED drivers, detect and diagnose the cause of LED array/module and LED driver failures (e.g., normal wear-out; accelerated wear-out due to high temperature, electric power faults), and predict potential faults so as to facilitate group or preventative maintenance.</p>
<p>Is the system able to detect and report specific faults including LED array/module failure, LED driver failure, compromised performance resulting from electrical power faults, and electrical service interruption? (Enter Yes or No)</p>	
<p>Is the system able to reporting remaining life of LED modules/boards and drivers, able to detect and diagnose causes of LED array/module and driver failures, and predict potential faults? (Enter Yes or No)</p>	
<p>How many fault detection and diagnostics points are earned for these capabilities? (Enter 0, 8, or 16)</p>	
<p>Provide any additional notes you would like the Expert Reviewer Panel to know about the fault detection and diagnostics capabilities or points earned.</p>	

Standards-Based Luminaire Level Lighting Control (LLLC)	A connected sensing/communication module with occupancy and ambient light sensing capabilities that can be directly installed into each luminaire through a standards-based Zhaga Book 20 or NEMA LS 20000-2021 sensor receptacle (shapes RR1, RR2, CC1, CC3, ORC5, or EM1) and connected to a standards-based D4i or ANSI C137.4 compliant driver.
Minimum Requirement(s) The connected system must provide a sensing/communication module that can be physically installed into a luminaire through a Zhaga Book 20 compliant sensor receptacle or a NEMA LS 20000-2021 compliant sensor receptacle (shapes RR1, RR2, CC1, CC3, ORC5, or EM1). The sensing/communication module must be D4i or ANSI-C137.4 compliant and directly connect to the DALI-bus terminals of a D4i or ANSI C137.4 compliant LED driver via a 2-wire connection. The sensing/communication module must, at minimum, provide occupancy and ambient light sensing capabilities.	Possible Points n/a
Which shape/size receptacle(s) is the sensor designed to be installed in? (Enter one of the following shapes from Zhaga Book 20: R44x17, R60x22, C22-T1A, C22-T1B, C22-T2, and/or one of the following shapes from NEMA LS 20000-2021: RR1, RR2, CC1, CC3, ORC5, EM1)	
Points are not applicable for this requirement.	n/a
Provide any additional notes you would like the Expert Reviewer Panel to know about the luminaire level lighting control sensor or points earned.	

Grid Services Capable	The capability of the connected system to provide grid services including load shed and load modulation.
<p>Minimum Requirement(s) The system must be able to reduce the energy consumption of the lighting system in a predefined way, on a temporary basis, in response to a signal (i.e., from a utility) without manual intervention. The method for configuring the system response must be accessible through a user interface and be specifically described. The system must be OpenADR 2.0a compliant.</p>	<p>Possible Points Eight points (+8) will be awarded for systems that have the capability to configure the system to respond to an OpenADR 2.0b price signal with a varying system response at different price levels. The method for configuring the system response must be accessible through a user interface and be specifically described.</p> <p>Eight additional points (+8) will be awarded for systems that include configuration features to facilitate meeting/maintaining occupant needs in the event of a grid services/demand response event. The system must include a configurable ramp rate and the ability to define spaces that will 1) always respond, 2) respond conditionally, and 3) never respond to a grid services/demand response event. Conditional responses must include, at a minimum, occupancy and daylight inputs. The method for configuring the system response must be accessible through a user interface and be specifically described.</p>
<p>Is the system able to respond to an OpenADR 2.0b price signal with varying system response at different price levels? (Enter Yes or No)</p>	
<p>Does the system include configuration features to meet/maintain occupant needs including configurable ramp rate and conditional responses? (Enter Yes or No)</p>	
<p>How many grid services capable points are earned for these capabilities? (Enter 0, 8, or 16)</p>	
<p>Provide any additional notes you would like the Expert Reviewer Panel to know about the grid services capabilities or points earned.</p>	