

ROAM Frequently Asked Questions

Last Revised: July 21, 2009

1. **Question:** What is ROAM?

Answer: ROAM is a remote streetlight management solution that allows system owners and operators to view, monitor and control their lighting from a secure remote location.

2. **Question:** How does ROAM work?

Answer: A patented diagnostic photocontrol collects operational information from the light fixture and transmits the information wirelessly to a network operations center, where the information is optimized and accessed by owners and operators from a secure web portal via the internet.

3. **Question:** Will I have to purchase new lighting fixtures in order to utilize ROAM?

Answer: No. The ROAM photocontrol is backward compatible with any fixture featuring a locking type receptacle. The ROAM photocontrol has embedded diagnostic and wireless technology and simply replaces the existing photocontrol atop the fixture.

4. **Question:** Does ROAM work on LED fixtures?

Answer: Yes. ROAM will work on any light source greater than 45 watts and less than 1000 watts which includes HID, LED, CFL, Induction and incandescent.

5. **Question:** What equipment will I be required to purchase in order to use ROAM?

Answer: Customers purchase ROAM photocontrols (to replace existing photocontrols on light fixtures) and one “gateway” or collection point for every 2,000 photocontrols. The ROAM package also includes software licenses for users to access lighting data from the customer portal.

Optional equipment, depending on customer requirements can include hand-held devices, GPS locators and rugged Toughbook laptop computers, however this equipment is not required for ROAM to function.

6. **Question:** What is the “gateway” or collection point?

Answer: The gateway serves as a central collection point for multiple ROAM photocells in its vicinity, rather than each ROAM photocell attempting to send information back to the network operation center independently. One gateway services up to 2,000 nodes. The gateway is capable of backhauling data via either cellular uplink or direct internet (Ethernet) connections.

7. **Question:** What fixture and equipment conditions can the ROAM photocell diagnose?

Answer: The ROAM photocontrol can detect the following conditions:

- Fully Operational
- Fixture Malfunction
- No Communication
- Unspecified Malfunction
- Partial Report
- Unregistered
- No Power at Activation
- Low Wattage
- Operational with Issues*
 - Cycling
 - Dayburner

- Group Control
- Excessive Power
- Low Voltage
- High Voltage
- High V Delta
- High Current
- Node 120, Fixture 240V

8. **Question:** How reliable are ROAM photocontrols?

Answer: Failure rate on ROAM photocontrols is < 1% per year (based on 1 Year with 22,000+ nodes in deployment)

9. **Question:** Is cellular coverage required for ROAM to operate?

Answer: No. If cellular service is weak or not available, the ROAM gateway can be configured to backhaul data via a high speed internet connection.

10. **Question:** What happens if there is a cellular outage or the ROAM network goes down?

Answer: If there is a ROAM or cellular network problem, photocontrols on streetlights will default to standard photocontrol dusk/dawn operation. The network will continue working to repair itself and when it comes back on-line, all data will be available again. Data is rarely lost in these circumstances, and diagnostics can be manually “re-run” in the event of an outage of this type.

11. **Question:** How reliable is the ROAM network?

Answer: Very reliable. The longest period of service disruption in ROAM’s history was < 1 day in which the system was purposely taken down for server maintenance. No data loss was encountered.

12. **Question:** On what frequency does the ROAM system operate and is RF interference a problem?

Answer: ROAM meets all applicable FCC requirements and operates at 2.4GHz. RF interference can occur but it is typically temporary. A chronic RF interference problem can be overcome with a higher power radio or other measures depending on the situation, but this is not typically necessary.

13. **Question:** Is my lighting data secure and safe?

Answer: The strongest encryption is used to ensure that lighting data is secure as it travels throughout the system and housed at the network operation center. The network operations center is protected by power back-up and disaster recovery procedures. In addition, a user id and password is required to access lighting data from the web portal.

14. **Question:** Is it possible to turn lights on/off or set a schedule for on/off operation using ROAM?

Answer: Yes. Streetlights can be turned on or off manually or by issuing a scheduled on/off operation. The average latency is 2-4 minutes. Latency may be shorter or longer

depending on the number of streetlights being commanded or scheduled on/off, distance and lamp type.

15. **Question:** Does ROAM include a Work Order Management Module?

Answer: Yes. ROAM includes a module designed to support creation and management of work orders for streetlights.

16. **Question:** Can ROAM dim?

Answer: ROAM has the architecture in place to get dimming commands to a ROAM enabled fixture. ROAM is currently engaged with several fixture manufacturers to develop solutions which allow the fixture to execute that command. The solutions include integrating dimmable electronic ballasts/drivers and a ROAM dimming control module (ROAM DCM) into a fixture. The ROAM dimming control module would be compatible with any fixture that has a 0-10V enabled dimmable driver available through your preferred ballast manufacturer. Both the ROAM DCM and the dimmable ballast/driver must be properly integrated into the fixture at the time the fixture is manufactured. The ROAM DCM will be available in volume production in early Summer of 2010.