

CAR DEALERSHIPS

Executive Summary

Want to save energy on your parking lot lighting.

You could shut down specific lamps of multi-lamp poles, put them on schedules, enable a daylight harvesting program, without ever having to run new control wires.

DimOnOff will help you do that, easily, and with a great payback.

Please, read on.

- The Dimonoff system can uniformly switch off the desired amount of light and perform rotations among lights during the week;
- A typical project enabling to control 30 lights costs less than 5000\$, excluding installation costs;
- A typical project enabling to control 30 lights (1000W) can save between 2800\$ and 5300\$ per year on energy costs;
- For a typical project enabling to control 30 lights, the return on investment time is below 18 months;
- The system is shipped pre-programmed so that users do not have to configure anything.

The DimOnOff® solution

Exterior lighting represent very large costs of energy for commercial parking lots, car dealerships, parks and a multitude of other environments. Lighting sources are

often in the order of 400W to 1000W, and are traditionally controlled by photocells. These areas are typically lit from sunset to sunrise the next day, but the majority of these environments closes at 21h, and do not require the exterior lighting to be at 100% for the rest of the night.

- The parking lots lighting control is a perfect example where DimOnOff Powerline lighting control products offer unique characteristics and important financial advantages:
- Its installation does not necessitate any dedicated control wiring

The DimOnOff® solution allows to install an addressable & intelligent relay in each exterior luminary (either in the head of the luminary, or at its base, depending on the power wiring configuration).

The addition of addressable relays enables remote individual control (on or off), manual or automated, of each lamp. Commands are communicated to the relays through the powerline (the existing power cables), eliminating the need to run new control wires that traditional automation & control systems would require.

Other control solutions would have required to break the pavement or concrete of the parking lot in order to run new control wires (costs around \$50k to \$70k), because typically, the different lamps of a same luminary are all powered by the same circuit, and are therefore not addressable

A typical DimOnOff project to control 40 luminaries costs less than 8100\$ (excluding installation - typically \$3450 for installation);

The DimOnOff® lighting control system allows to automatically shutdown the exterior night lighting system, according to a user-defined schedule, as detailed and complex as you desire.

A DimOnOff® panel equipped with a numerical clock is installed in the electrical room, allowing light-up or shutting down specific lamps according to certain specific schedules, or based on the detection of specific events.

Other conditions such as the rate of electricity or hour of the day or date (ex : holidays) can also easily be taken into consideration.

Typically, car dealerships will choose to shut down up to half of the parking lot and building exterior lights, between 10h PM and sunrise;

Important energy savings can be realized, offering a very quick Return on investment

Only in energy, the project will produce savings (at Quebec rate of \$0.045/kWh) of up to 3000\$ per year for a typical project of 40 400W-lamps (2200\$ in energy and 800\$ in maintenance costs) ;

Hydro-Québec offers financial support of up to 100\$ per lap for these types of projects;

With Hydro-Québec support, the same project presents a 16.3 months payback period (including material and installation costs). Without Hydro-Québec financial support, the project still presents a quick payback of 32.3 months.

The system may be sold pre-configured - The contractor will have no programming to do

Other very good applications for the DimOnOff relays:

Control of the operating hours of Air compressors in a garage. Experience shows that air hoses will always show some leakage, and that compressors will go on & off uselessly during the night.

DimOnOff relays may also control the operation exterior power plugs, such as for block heaters, in order to enable power-up only if temperature goes lower than a set temperature.

Figure 1: Relay 10A DimOnOff®

The DimOnOff® technology allows to create virtual groups of relays (i.e., dynamically, via software, over the

powerline). For example, in the case of parking lots, a contractor will traditionally create 2 or 3 groups each comprised of half/third of the lamps. Lamps are distributed in an alternating fashion in each of these groups. This way, at the chosen shut-down time, the numerical clock will execute the power-off of one or several groups of lamps. A standard car dealership parking lot will be equipped with around 40 lamps consuming each 400W, and if ½ of it is shutdown between 10hPM and 6hAM, very large energy savings are created (2200\$ per year in Québec at 0.045\$/kWh-commercial Tariff, 3220\$ in Ontario at 0.066\$/kWh, and much more in New-England and the West coast states). Moreover, the lighting power being reduced by half, it becomes less intrusive for the residents in the neighborhood.

Also, Groups of lights being turned on and off, are rotated from day to day. Therefore, the whole of the lighting system will be used uniformly, and helps to minimize the frequency of maintenance.

Project costs

With its powerline technology, DimOnOff® offers a simple solution, yet with a very quick installation time, and a solution that pays for itself quickly from the energy savings.

The following is the typical Bill of material required to implement a lighting control & automation system for a typical parking lot of 40 lamps - 400W:

Material:

40 REL-R-10 Relays 10A

1 CAB-CLK-4 Control panel with clock

Pre-configuration

Total 8,000.00 \$

Return on investment

If we assume a nominal power consumption of 400W per lamp and 40 lamps, we obtain the following energy consumption profile and annual energy savings generated by the system:

Power used by 40 lamps (in W): 16,000

Total usage (in h/day): 12

Total annual consumption (in KWh): 78,080

Cost of electricity (in \$) 3,465.50\$ (at a rate of \$0.045/kWh)

By shutting down half of the lights after 10hPM, we get the following savings:

Ratio lamps turned off / Total between 10hPM and 6hAM:
1/2

Annual savings (in KWh): 23,360

Annual savings (in \$): 1,155.16 \$

This calculation is based on a price of 0,045\$/KWh, which is the commercial tariff of Hydro-Québec. To encourage it commercial clients to take energy savings actions, Hydro-Québec gives a financial support for these projects. For the exterior lighting, it is possible to get as much as \$100 per lamp. In this case of a typical parking lot, we would therefore get the following financial support:

Number of lamps: 40
Grants per lamp: 100\$
Total grant: 4,000.00\$

Payback period for the project, with and without grants:
Payback(in years)
With HQ grants: 1.36
Without HQ grants: 2.69

Even without the grant, the system presents a quick payback. With the grant, it becomes a no-brainer! One should not oversee the savings on re-lamping costs. Since we will decrease the operating hours of the lamps, we will stretch the frequency of maintenance jobs and create additional direct savings. Without the DimOnOff® system, based on a 12h lighting mode per day, every day of the year, each light will be used 4380 hours per year. With the DimOnOff® system, a lamp will be turned on 12h one day then only 4h the next day. Annually, each lamp will be turned on 1,460 hours less. For a lighting module with a 16,000 hours life time, its **operating life will increase from 3.65 years to 5.47 years.**

Projects (specifically Parking lots)

A multitude of Car dealerships have been generating savings with the DimOnOff® system. Here is a partial list:

- Brantford Chrysler
- Brantford Honda-
- Eastway Chrysler, Ontario
- Forbes Ford, Grimsby
- Hogan Chevrolet, Scarborough, Ontario

- J. Lockwood Chrysler
- Johnston Chrysler, Guelph, Ontario
- Kerr Chevrolet
- Kerr Pontiac Cadillac
- North York Chevrolet
- Oakville Nissan Infiniti
- Performance Car
- Raceway Chrysler
- Scarborough Town Chrysler, Scarborough, Ontario
- Sterlington Honda
- VW Waterloo
- Wellington Motors, Guelph, Ontario

Note: Increase of theft

Customers equipped with the DimOnOff have not experienced an increase in car theft, since they have reduced by 50% their lighting.

Insurance companies require 2 things from car dealers in Québec: that their lot be fenced, and that the parking lot be lit at night. But there is no direction as to what the lighting level should be. In reality, we have been interviewing several of the main insurance companies that have all confirmed that a car dealership that would decrease its lighting level by 50% at night, would not get a raise in insurance rates.