

The world's first
autonomous
lighting control system.



Agenda

1. About Us
2. Smart Lighting Overview
3. Our Solution & How it Works
4. Key Differentiators
5. Price Model
6. Customer Journey
7. Case Studies
8. Roadmap
9. Open Discussion and Next Steps

About Us

Our Mission

Conserve energy by making Smart Lighting mainstream for commercial buildings. Our technology removes every financial, technical and operational barrier to adoption.

About Us

JDRF Electromag

- Canadian owned and operated.
- 25 people with deep expertise in machine-learning, edge-computing, data-fusion, semiconductor design, micro-optics, and RF.
- ~\$9M in secured funding for pre-commercial R&D, including \$3.5M from [SDTC](#).
- Commercial launch: January 2023

Smart Lighting Overview

The Big Picture

Indoor commercial lighting represents nearly 10% of all electricity consumption in Canada.

Smart Lighting Overview

The Opportunity

Smart Lighting can cut lighting-related energy use by an average of 45%-50%.

Smart Lighting Overview

What is Smart Lighting?

A luminaire with a daylight & motion sensor that is capable of variable brightness control, digital communication, energy measurement and diagnostics.

Smart Lighting Overview

How does Smart Lighting Save Energy?

1. Motion Detection: shut-off small zones when not in use.
2. Daylight Harvesting: dim perimeter lights during the day.
3. High-End Trim: lower maximum power consumption.

The problem with Smart Lighting.

Smart Lighting Overview

The **Problem** with Smart Lighting

1. Cost: 2-3x more than the code-compliant alternative.
2. Complexity: technical expertise needed to design, setup, and maintain.
3. Time: deployments take several weeks to months.
4. Risk: project costs, deployment time and outcomes are not guaranteed.

Smart Lighting Overview

The State of the Smart Lighting Industry

1. Smart Lighting is not required by code.
2. Less than 5% of new construction or retrofits use Smart Lighting.
3. The industry has no way to remove a single, let alone all, barriers to adoption.

A radical rethink
of Smart Lighting is
required.

Introducing
Autonomous
Lighting Control.

Our Solution

Removes Every Barrier to Adoption

1. Costs the same as the code-compliant alternative.
2. Requires no design, setup, or maintenance.
3. Self-configures in minutes with no human involvement.
4. Delivers guaranteed compliance with the latest energy standard and a fixed cost.



A Sensor and a **System** in One

A fresh approach to the deployment of smart lighting made possible by advancements in machine learning, edge-computing and sensor fusion.



How it Works

PROCESS 1: NETWORK BUILDING

Sensors build a secure wireless mesh network using near infrared light as the MFA mechanism.



How it Works

PROCESS 2: PHYSICAL DISCOVERY

- Each sensor localizes the relative position of its neighbors and detects windows, walls, and doorways.
- The range and bearing is accurate to 20" (51 cm) and 20°.



How it Works

PROCESS 3: GROUP CREATION

- Sensors use data generated in the building to create all motion, daylight and wall switch groups.
- Groups comply with ASHRAE 90.1 v2019 and continually adapt to change.



How it Works

PROCESS 4: DECENTRALIZED CONTROL

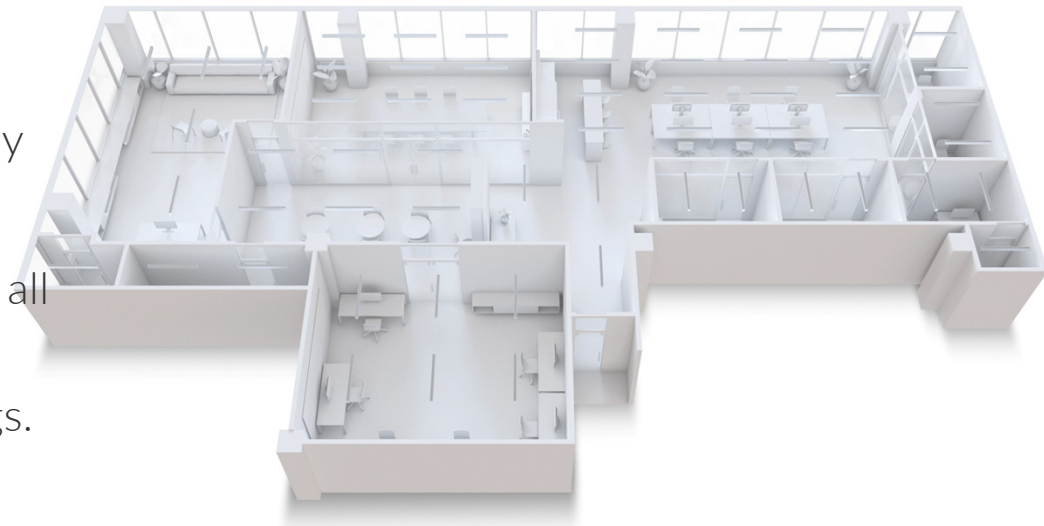
- Devices communicate directly to each other without external control hardware or the need for a remote connection.
- The decentralized architecture eliminates single points of failure, minimizes communication latency while supporting all Smart Lighting features.



How it Works

PROCESS 5: MAINTAIN

- Sensors can be added, removed, replaced and relocated without any user involvement.
- The system automatically updates all network settings, group configurations and system settings.



Our Solution

Product Lineup



Sensor



Wall
Switch



Touch
Screen



Controlled
Receptacle



Mobile
App.

Touch Screen & Controlled Receptacle available Q4, 2023

Key Differentiators

	CONVENTIONAL SMART LIGHTING CONTROL	AUTONOMOUS LIGHTING CONTROL
Price per fixture (QTY 1,000)	\$140 - \$200 CDN	\$100 CDN
Added price per fixture compared to building code (QTY 1,000)	Extra \$65 - \$125 CDN	No added cost
Price	Variable & opaque	Fixed & transparent

Key Differentiators

	CONVENTIONAL SMART LIGHTING CONTROL	AUTONOMOUS LIGHTING CONTROL
Planning Time (QTY 1,000 fixtures)	1-2 Weeks	None
Design Time (QTY 1,000 fixtures)	3-4 Weeks	None
Onsite Setup Time (QTY 1,000 fixtures)	6-8 Weeks	None

Key Differentiators

	CONVENTIONAL SMART LIGHTING CONTROL	AUTONOMOUS LIGHTING CONTROL
Reliability	Several single points of failure	Zero points of failure
Adaptability	Static, hard-coded group configuration	Dynamic, responsive group configuration
Maintainability	Expertise required	No expertise required

Price Model

A paradigm shift

1. Price transparency: clear, predictable and consistent.
2. Available to all: product is available on a non-exclusive basis.
3. Fixed: system price is a depends only on the quantity of devices.

Customer Journey

Evaluation Kit

1. Available now
2. Gets customers started



REAL WORLD RESULTS

Case Study 1

McMaster Innovation Park

- 135 Autonomy Sensors.
- Secure Bluetooth mesh networks formed in under 15 minutes.
- 20 occupancy groups automatically formed within 5 minutes.
- 10 daylight groups automatically formed within 5 minutes.
- Message latency (within three sigma) of 85 milli-seconds.



Case Study 2

Oakville Town Hall

- 165 Autonomy Sensors.
- Secure Bluetooth mesh networks formed in under 15 minutes.
- 35 occupancy groups automatically formed within 5 minutes.
- 15 daylight groups automatically formed within 5 minutes.
- Message latency (within three sigma) of 80 milli-seconds.





Please contact your local Hi-Tech Sales office
for Project Pricing and additional Technical Info

Email: HTS@hi-techsales.ca