

EHID - Introduction

Controllable Electronic Ballasts for HID Lamps

Patent Pending

EHID **Optimize Your Lighting System**



With over 40 years of experience in the design, production and supply of ballasts and other magnetic and electronic accessories for the lighting industry, Eltam has undertaken the challenge of leading the international market of high performance electronic ballasts by developing a range of electronic ballasts for HID lamps – Eltam EHID.

Eltam EHID encompass unique technologies that allow sophisticated levels of monitoring and control.

EHID coincides with the worldwide movement to achieve Energy Efficient Lighting.

The EHID series presents a significant advance in electronic ballast technology by offering flexibility and compatibility with varied communication systems as well as complete autonomous ballast control.

The following pages will present the unique technologies and significant advantages of the EHID ballasts.

Energy Efficient Lighting



By using EHID, you can start saving money from day 1.

Two main factors influence the operating costs of lighting systems: energy consumption and maintenance.

- Energy costs** - The price of electricity is increasing and this trend is expected to persist. The use of efficient electronic ballasts can save up to 50% of power consumption per luminaire.
- Maintenance** - Besides direct energy costs, there are additional expenses involved in maintaining a lighting system. These include the operational costs of maintaining the system and replacing burnt or deteriorated lamps.

EHID method for saving time and money:

| Energy Savings | Preventive Maintenance |
|---|---|
| - Low loss ballasts | - Improved lamp life – fewer lamp replacements |
| - Fixed and steady power factor (also during dimming) | - Improved lumen maintenance |
| - Steady power consumption regardless of voltage fluctuations | - Online monitoring – streamlines the maintenance procedure |
| - Dimming capabilities | |
| - Online monitoring – measures real time electrical data | |
| Up to 50% savings of electricity costs! | Up to 30% savings of maintenance costs! |

Typical saving scenario - Annual Calculation

Working assumptions:

- 1,000 luminaire site
- 250W lamp
- kWh price €0.1
- Price difference between a 250W magnetic system and 250W electronic ballast = €60.00

| | Annual Consumption kWh | Annual Cost Per Lamp € | Cost Saving Per Lamp % | Saving Per 1000 Lamps € |
|--|------------------------|------------------------|------------------------|-------------------------|
| Working hours - lamp | | | | |
| Without dimming (10hrs a day) | 912.5 | €91.25 | | |
| With dimming (5hrs 100%, 5hrs 50%) | 680.5 | €68.44 | 25% | €22,810 |
| Ballast losses | | | | |
| Magnetic ballast | 30W | €10.95 | | |
| EHID ballast | 18W | €4.92 | 45% | €6,022 |
| Constant power consumption / steady lamp wattage | | | | |
| Magnetic ballast output - up to 17% surplus (5% in average) | 45.62W | €4.562 | | |
| EHID– steady output | 0W | €0 | 100% | €4,562 |
| Preventive maintenance costs - lamp replacement | | | | |
| Magnetic ballast- at least 2 days per month for maintenance crews 2 employees + a car - €200 per day × 12 = €4800 | | €4.80 | | |
| EHID - on-line monitoring, improved lamp life and improved lumen maintenance | | €1.00 | 80% | €3,800 |
| Overall annual cost saving on a 1,000 luminaire site | | | | €37,194 |

Break-Even Point (BEP) – 21 months

EHID

Technical Data



Physical Data:

- Firm metal case IP20 up to IP65; light weight design; base plate with slots for M4 bolts
- Push-in terminals with lever-button – accepts up to 2.5mm² solid/stranded wire

Electrical Data:

Input:

- Wide range of supply voltages - AC 198V-264V / 50-60Hz & DC 198V-254V
- No inrush current
- Constant power consumption
- Power factor > 0.98 (no need for correction)
- THD-A < 10% (“clean” power consumption)

Output:

- Ignition: 4kV pulses (max. line load capacitance 250pF)
- Stable lamp power output independent of supply voltage or lamp voltage
- Lamp operates at low frequency square wave (83Hz)
- Low SPR



Technical Features:

- Smart ignition regime - computed ignition attempts and shutdown are implemented according to actual conditions
- Innovative design allows for exceptionally low ballast losses
- Same ballast can operate all types of HID lamps: MH (quartz & ceramic), HPS and Mercury lamps
- Lamp operates at low frequency square wave (83Hz):
 - Prevents acoustic resonance
 - Flicker free
 - Improved lamp longevity and lumen maintenance
 - Prevents partial glow discharge in the lamp and high leading voltage peaks
- Broad operating temperature range: -20°C < Ta < +50°C
- Power Factor > 0.98, registered patents for active power factor correction
- Negligible inrush current on activation (prevents fuse/CB tripping)
- Complete digital control achieved by a single state-of-the-art microprocessor allowing for:
 - Fewer control components
 - Greater flexibility in quality control formulas
 - Greater control over data and program variables
 - Easily upgradable programs
 - Lower power losses in comparison with other brands of ballasts with square wave lamp current operation

Regulation Compliance:

- EN 61347-2-12 Safety (VDE approved)
- RoHS
- EMC:
 - EN61000-3-2 - input current harmonics
 - EN55015 - 9KHz-30MHz conducted interference (radio disturbance)
 - EN61547 - immunity to network interference (EMC)

Safety Features:

- Internal temperature control protects the ballast
 - Output power reduction when internal temperature rises above 85°C
 - Shutdown when internal temperature rises above 90°C (4 restarts after cooling)
- Protection against lamp faults (EOL): “DC condition” (rectification), cycling, ignition failure, “No Load” protection, short-circuit at lamp terminals, external arc, high/low lamp voltage. (Shutdown can be reset)
- Protection at abnormal mains conditions: over-voltage, under-voltage and network interference (EN61547)

Controlling and Monitoring:

- Internal data accumulation and external communication facilitate real-time monitoring and/or periodical analysis and diagnosis
- Lamp monitoring: end of life, defective lamp, etc.
- Various communication protocols (input from control device) – DALI, PWM, PLC (Power Line Communication)
- Automatic dimming can be set to respond to a programmable schedule (multiplex scenes) or variable conditions, such as occupancy and daylight harvesting

EHID

Controlling & Monitoring






With the introduction of electronic ballasts to the lighting industry, the option of communication with the lighting system has become possible. The ballast serves as the communication platform facilitating real-time malfunction identification, control, dimming and complete system monitoring.



EHID enable control and monitoring of single lamps or a group of lamps through a variety of smart solutions. Accordingly, energy consumption reaches optimal levels.

EHID series enables digital control of all the parameters via a number of communication protocols. The communication options available include: DALI, PWM and PLC - Power Line Communication.

The table below outlines the benefits of each communication protocol and the factors to be taken into consideration when selecting the appropriate control and monitoring for your lighting system.

| | Benefits | Considerations |
|---|---|---|
|  | <ul style="list-style-type: none"> • Internationally excepted standard (IEC 62386) • Low voltage, polarity-independent control input • Addressing options: entire system, group-wise or individual • Scene memory • Feedback in the event of defective lamp • No group pre-wiring required • Every DALI ballast can be individually addressed • No need for scene memory modules • Synchronized scene transitions • Feedbacks from ballast and lamp condition • Simple integration with facility management system | <ul style="list-style-type: none"> • Additional wiring required • Maximum 64 ballasts can be controlled by the same controller • Requires a control system • Limited operating distance |
|  | <ul style="list-style-type: none"> • No additional wiring required • Long distance operation - up to 3km • Addressability • Low maintenance costs • Plug & Play solution • 128 ballasts can be controlled by the same controller | <ul style="list-style-type: none"> • Not standardized for lighting application • Other consumers on the power line might interfere • Requires a control system |
|  | <ul style="list-style-type: none"> • No additional wiring required • Dimming scene according to a unique algorithm • Pre-programmed dimming scenes • Optimization of lighting • No special control system required to serve the scene module | <ul style="list-style-type: none"> • No controlling opportunities • New calibration of the power must be done manually |



ELTAM Ein-Hashofet Ltd., Kibbutz Ein Hashofet, 19237 Israel
 Tel: +972-4-903-5300, Fax: +972-4-903-5507
 eltam@eltam-eh.com, www.eltam-eh.com



Patent Pending

design • 04-82.17666