



White paper

# Energy saving TLD starter development

## **RT-RK Computer Based Systems LLC**

Narodnog Fronta 23a  
21000 Novi Sad  
Serbia

phone: +381 (0)21 4801 100  
fax: +381 (0)21 450 721  
e-mail: [info@rt-rk.com](mailto:info@rt-rk.com)  
[www.rt-rk.com](http://www.rt-rk.com)

## Customer

The customer is a world known international company playing significant role in various fields of consumer electronic market, as entertainment, communication, home appliances and especially, lighting.

## Project Overview

The goal of the project is a development of new generation of TLD starters targeting energy saving.

The project deals with development and industrialization of a new, innovative, but yet cost-effective device, which incorporates the functions of a regular TLD starter, extended with local intelligence. The local intelligence relies on the sensors installed on the device, like presence detection sensor or daylight sensor.

The main challenges of the project were:

- Complete product development (from feasibility study to industrialization), including electronic and casing
- Low per-unit price
- High performance and reliability

The initial concept developed by the development center of the customer had several flaws: too high costs for successful market entry and unreliable operation in some configurations.

The project started as feasibility study aiming to find a new approach providing more cost-effective solution. The feasibility study showed that RT-RK is able to develop such device with significantly lower price than the initial design, while the performances are same or better.

As a next step, a product development project was initiated, targeting development of the production ready design. The estimated production quantity was 100k+ per year.

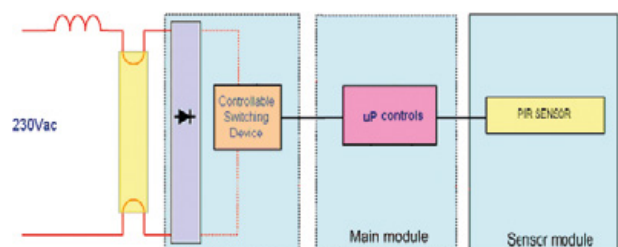
The developed device is able to ignite and cut down a fluorescent tube operating on conventional electro-

magnetic gear, depending on the sensor readings. It consists of three main components: switching element, micro controller and sensing element. The switching element is chosen to withstand the power and durability requirements. The micro controller is responsible for sensor reading, control logic and for lamp ignition and extinguishing procedures. Depending on the sensor chosen, various applications are possible.

The complete electronic is enclosed by a plastic housing. Main design is provided by the customer, while the final drawings, models and simulation were done by RT-RK. According to the drawings, tools for molding and plastic injection were produced and successfully verified. The complete unit is industrialized, in terms of manufacturability and mass production aspects (component tolerances, test points for post-production verification, etc.)

The design of the new is retrofit, so it can be used as a replacement for conventional starters in existing fluorescent luminary installation, in a plug-and-play fashion.

During the development, the appropriate IEC standards were considered and satisfied. The durability, stability and safety requirements were taken into account during device design and component selection. The thermal dissipation of the electronic components was managed in order to ensure safe and robust operation in the plastic housing. The system was intensively tested with numerous lamp configurations, including capacitive and inductive gears (ballasts), lamps from different manufacturers of various power.



*Structure of the developed device*

The development lasted one year. It involved a hardware engineer for schematics and PCB design, a mechanic engineer for modeling and design, one engineer

for power and analog electronic design, an engineer for software development, two test engineers and a project manager.

## **Benefits**

The project covered the complete development from the product idea until the industrialized product, consisting of electronics and plastic housing. All development steps and production of pilot series were either conducted or organized by RT-RK, in correspondence with the customer. The final solution fulfills the customer requirements both in terms of price and performances. The complete development process and costs were transparent to the customer via regular meetings and appropriate reports

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