

ECG-SPOT



3/2001

Information for our partners in the lighting industry



SEE THE WORLD IN A NEW LIGHT

OSRAM



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Hans-Peter Birkhofer

the insert in this issue of ECG SPOT illustrates that “digital” does not necessarily mean “DALI”.

The family of DALI control units from OSRAM has grown. The familiar “DALI BASIC” is now complemented by the more convenient “DALI ADVANCED”. This new system is characterised by a wider range of functions and is equipped with a remote control, sensors and operating elements that communicate with each other wirelessly.

Two dominant trends can be seen in the field of standard ECG: smaller dimensions and multiwatt operation, particularly of T5 fluorescent lamps with a diameter of 16 mm.

Changes can also be expected as regards the operation of T8 lamps (26 mm). As a result of the energy efficiency regulations in force throughout Europe, the majority of magnetic control gear (CCG) will be replaced by ECG by the year 2005. In this context, there is a risk of so-called cheap ECG products being used instead of high-quality electronic control gear which could thus damage the good reputation of electronics in lighting installations owing to their considerably poorer properties. Here, we must act responsibly to protect both the lighting industry as a whole and also its customers.

Together with its customers, OSRAM will continue to concentrate on an “added-value strategy” in the future, meaning that we will develop products that are characterised by application-oriented properties and reliability, but still at a favourable price.

With this in mind, I would like to thank you for our successful partnership and wish you all the best and every success for 2002.

Yours, *H. P. Birkhofer*

Hans-Peter Birkhofer – Marketing Manager, Electronic Control Gear

Dear reader,

Even in the lighting industry, the year 2001 that is now drawing to a close was marked by a global economic downturn. However, it was also a year of above-average growth in the use of electronic components. The motivating factors behind this development were energy savings, on the one hand, and a desire for greater convenience, on the other.

Closed and open-loop light control systems will also prove to be significant driving forces in the lighting market in the future. The new DALI (Digital Addressable Lighting Interface) standard will play an important role in this context.

There is now a wide range of digital DALI ECG products on the market. However,

Simple and convenient

DALI ADVANCED – The new DALI light control system

Right for every application

OSRAM already presented DALI BASIC at Light + Building 2000. It is a light control system for simple DALI - applications, i.e. lighting solutions based on the "Digital Addressable Lighting Interface", the new digital interface standard for electronic control gear (ECG).

The new DALI ADVANCED light control system has now been developed for more complex applications, such as large offices and conference rooms, where numerous groups of luminaires need to be operated for different light scenes.

All components in the system use the time proven 433 MHz radio communication standard. Only the controller (Fig. 1) needs a cable to communicate with the DALI ECG.



Fig. 1. The DALI ADVANCED controller as the "command centre"



Fig. 2. Numerous light scenes can be activated via the eightfold switch



Fig. 3. The hand-held comfort transmitter guarantees extremely convenient operation

Back to simple operation

Double, fourfold and eightfold switches (Fig. 2) are available for operation. These can also be combined to permit flexible configuration of the control points to suit the individual requirements of the user. In addition, there are two remote controls – a miniature hand-held transmitter and a comfort model (Fig. 3). The latter permits easy activation of 16 individual groups. This transmitter also permits central switch override dimming of lighting scenes, as well as the additional operation of eight radio-controlled groups, e.g. floor standing luminaire dimmers or Venetian blind motor drives. Moreover,

it can be used to store and retrieve five light scenes. DALI ADVANCED is also capable of incorporating constant light and motion detection functions.

Menu-controlled set-up

As with DALI BASIC, the focus of the DALI ADVANCED light control system is again on simple set-up and operation, despite its far greater complexity. All that is needed for set-up is the simple, hand-held programmer with LC display (Fig. 4), which can be used for several DALI installations. Once the radio link to the controller has been established automatically, all the settings can be programmed with the help of the step-by-step menu.



Fig. 4. Menu guidance makes for simple programming

Sensors replace eyes and manual operation

Two types of sensors – a light only sensor and a combined sensor for light and motion (Fig. 5) make the DALI system even more convenient. Thanks



Fig. 5. The combined sensor makes the DALI ADVANCED light control system even more convenient

to radio signal transmission with battery power, the sensors can easily be positioned anywhere in the room to suit the prevailing conditions and provide optimum motion detection or maintain the brightness level. Up to eight additional sensors can also be integrated into the system at any time to provide the required functions.

High demands – met to perfection

As a further step into the world of digital light control, DALI ADVANCED successfully expands the functions of DALI BASIC. Both systems offer great flexibility for adaptation to widely differing requirements. As a logical extension, the range of DALI light control systems from OSRAM is to be rounded out by "DALI Professional" in the near future.

Michael Hani,
OSRAM Munich



Perfect electronics



PTU 150/220-240 shows its strength in high pressure discharge lamps

Electronics is in

As with low pressure discharge lamps more than ten years ago, a clear trend is now also emerging towards the electronic operation of high-pressure discharge lamps. The introduction of ceramic technology has been one of the contributory factors in this context.

Needless to say, OSRAM recognised this trend at an early stage and has been constantly expanding its familiar range of POWERTRONIC control gear, for instance by adding the PTU 35/230-240L presented in ECG SPOT 1/2001. This product family is now being joined by a 150 W version.

POWERTRONIC electronic control gear provides lamp operation for maximum lighting comfort, enhanced operational reliability and high efficiency at low cost.

A universal ECG in every respect

With the system concept in mind, the PTU 150/220-240 has been optimised for operation with a variety of 150 W lamps. These include metal

halide lamps with ceramic (HCl) or quartz burners (HQI), each with different bases and in all the usual colour appearances (Fig. 1). Lamps of similar design from other manufacturers can also be operated on the PTU 150/220-240.

This design benefits both luminaire manufacturers (OEMs) as a result of reduced stocking and greater flexibility, as well as users, because they are free to choose between HCl and HQI technology when replacing lamps.

The new ECG is not only flexible as regards the choice of lamp, but also offers the user the possibility of catering to different applications.

The basic unit is designed for installation in a luminaire by the OEM. The cable clamp (PTU-SR) available as an accessory can be snapped on the basic unit. In this way, the ECG is transformed into an "stand-alone" component that can, for example, be operated in a suspended ceiling void independently of a downlight (Fig. 2). The prerequisites for this are easily achieved by the use of cable clamps on both the mains cable and

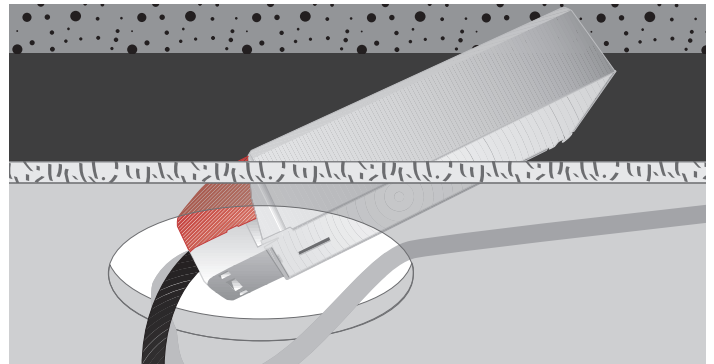
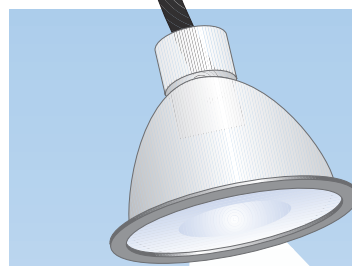


Fig. 2. Easy installation into ceilings voids is assured



The strengths of the PTU 150/220-240 at a glance

- Optimised system: HCl or HQI lamp and POWERTRONIC
- Flicker-free operation of different lamps thanks to 130 Hz square-wave control
- One device for two applications: installation in luminaires or with cable clamp as a separate wiring accessory
- Separation of ECG and lamp up to 3 m, thanks to reliable IGBT ignition (maximum permissible cable capacitance: 200 pF)
- Easy to use and reliable: microprocessor for monitoring and controlling all operating parameters
- 50% longer useful lamp life compared to CCG operation permits longer maintenance intervals thanks to lamp-protecting ignition and operation
- Less marked colour shift thanks to precise output control (particularly for quartz lamps)
- Long ECG service life of 50,000 h with a failure probability of 10% (at maximum permissible temperature $t_c = 80^\circ\text{C}$) thanks to heavy duty electronic components
- Extremely low power loss (13 W) thanks to well-proven PTU circuit technology
- Very good thermal characteristics (t_a up to 50°C)
- Thermal cut-out of the ECG (to prevent destruction) in the event of unacceptably high ambient temperatures
- Compact design (basic unit: $163 \times 88 \times 39 \text{ mm}^3$) and low weight
- Complies with standards

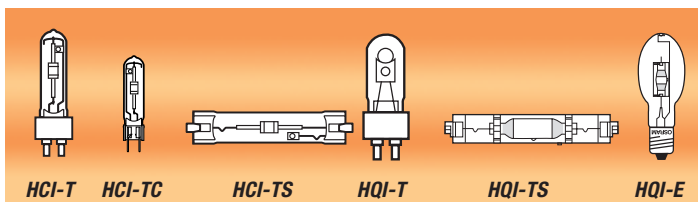


Fig. 1. The POWERTRONIC PTU 150 is ideal suitable for operating many different 150 W lamp versions



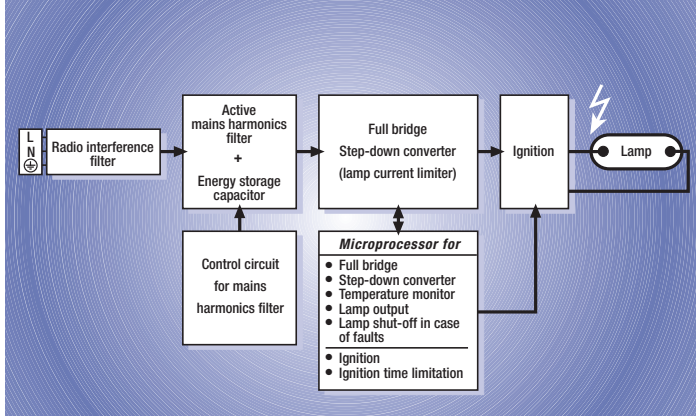


Fig. 3. The block circuit diagram shows the intelligent "internal workings" of the PTU 150/220-240

the connecting cable to the luminaire. The cover ensures the required protection against electric shock.

The well-proven IGBT lamp ignition makes it possible to ignite and operate lamps at distances of up to 3 m from the ECG without difficulty.

The microprocessor at the monitoring centre

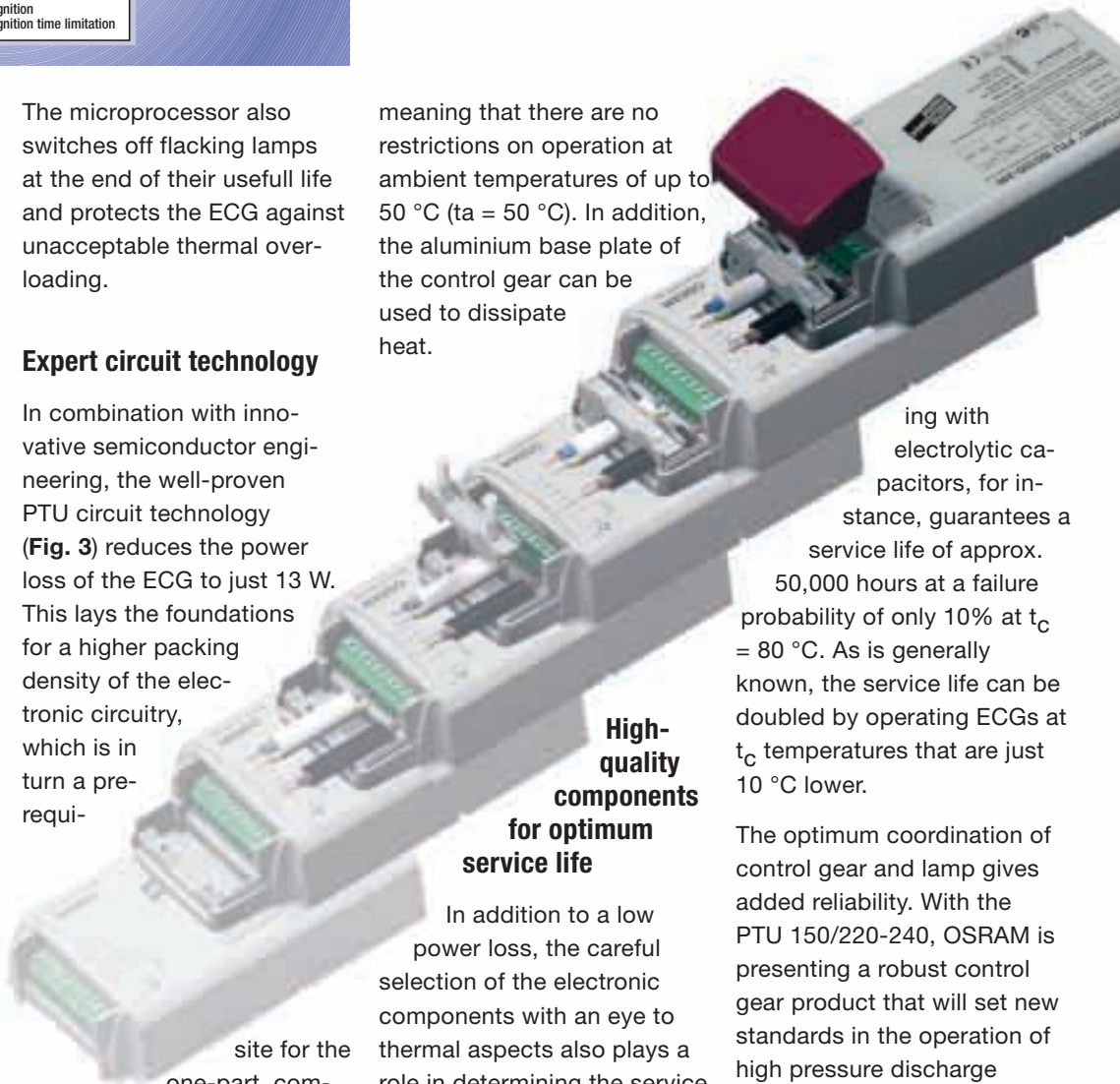
A microprocessor in the ECG monitors all the operating parameters of the lamp and ECG to ensure optimum compliance with the specified performance of the lamp. This enables the lighting designer to compile an accurate plan for the lighting installation.

The microprocessor also ensures that the lamps are always operated at constant power, despite the change in operating voltage during lamp's service life. Moreover, intelligent monitoring also ensures gentle lamp ignition. The slower decline in luminous flux and lower lamp mortality, which results in the useful lamp life being 50% longer compared to operation with conventional control gear (CCG). The benefits for the user are longer maintenance intervals for the system and, ultimately, lower operating costs.

The microprocessor also switches off flicking lamps at the end of their useful life and protects the ECG against unacceptable thermal overloading.

Expert circuit technology

In combination with innovative semiconductor engineering, the well-proven PTU circuit technology (Fig. 3) reduces the power loss of the ECG to just 13 W. This lays the foundations for a higher packing density of the electronic circuitry, which is in turn a prerequisite



meaning that there are no restrictions on operation at ambient temperatures of up to 50 °C ($t_a = 50\text{ °C}$). In addition, the aluminium base plate of the control gear can be used to dissipate heat.

High-quality components for optimum service life

In addition to a low power loss, the careful selection of the electronic components with an eye to thermal aspects also plays a role in determining the service life of the control gear. High-quality electronic components, which means dispens-

ing with electrolytic capacitors, for instance, guarantees a service life of approx. 50,000 hours at a failure probability of only 10% at $t_c = 80\text{ °C}$. As is generally known, the service life can be doubled by operating ECGs at t_c temperatures that are just 10 °C lower.

The optimum coordination of control gear and lamp gives added reliability. With the PTU 150/220-240, OSRAM is presenting a robust control gear product that will set new standards in the operation of high pressure discharge lamps.

Dr. Claus Schmidt,
OSRAM Munich

Microprocessor benefits customers

- Defined shut-off to avoid blinking of the lamps at the end of their service life
- No radio interference from attempts to ignite faulty lamps
- Lamp service life extended by precisely defined control of the lamp current when starting
- Exact light planning possible, as defined lamp operating data are monitored and maintained
- Rapid, gentle re-ignition of lamps that are difficult to ignite
- Protection of the ECG against incorrect operation in the event of an excessive ambient temperature – Step 1: Output reduction, Step 2: Shut-off

Alternatives will be in demand

European Directive requires action

ECG replace CCG

The trend in the lighting industry towards energy efficient lighting systems using electronic control gear (ECG) will receive a major boost next year as a result of EU Directive 2000/55/EC. Starting in May 2002, it will no longer be legally permissible in the European Union to market luminaires that use conventional control gear (CCG) rated in Energy Efficiency Class D.

The introduction of the second stage three-and-a-half years later will mark the end of the era of all CCG of Energy Class C, and quite rightly so. For example, an 18 W fluorescent

lamp operated on a Class C CCG has a total wattage of up to 28 W. In other words, the control gear consumes more than one-third of the system wattage. Class D CCG has even higher losses, and so a higher total power consumption.

Using the electronic alternative from OSRAM, the same lamp gives a system wattage of just 19 W. Compared to the "better" Class C, this is equivalent to energy savings of more than 30%. The new Directive is intended to significantly reduce the energy consumption of the fluorescent lamp luminaires.

Different principles, different performance

CCG is being replaced by ECG (Energy Class A), on the one hand, and by low-loss control gear (LLCG, Class B), on the other. The latter operate according to the same principle as CCG, but the energy losses are lower as a result of design-related measures.

If a fluorescent lamp is operated on a choke which is the principle of CCG and LLCG, the lamp current follows the same frequency of the mains voltage. The resultant stroboscopic effect can be a danger to people, particularly in combination with rotating machin-

ery. Every time the mains voltage passes through zero, there is a current gap until the lamp is re-ignited; every lamp ignition process requires the charge carriers to be built up anew.

Energy saving thanks to ECG

When using ECG, the lamp current is not dependent on the frequency of the mains voltage, because the mean electron density is constant over time in high frequency operation. Thus, stroboscopic effects no longer occur when a high-frequency supply voltage is used (ECG operation). Since there are no current gaps, there is no need to build up the charge carriers again, as necessary when using CCG and LLCG. Consequently, the same lamp type requires less power when operated on a high frequency supply voltage, for the same luminous flux.

The lower power consumption reduces the stress on the lamp and thus extends its service life. **ECG thus greatly improves the efficacy and service life of fluorescent lamps.**



Fig. 1. QT-ECO – The inexpensive alternative to CCG for luminaires with a maximum connected load of 25 W

Fig. 2. The QT-ECO 1x4-16/230-240 S control gear is suitable for operating sixteen different fluorescent lamp types



The cost of safety!

Towards the end of the lamp service life, uneven electrode erosion leads to asymmetric discharge, resulting in a voltage drop, and thus the release of more energy, immediately in front of the more severely eroded cathode. This situation can persist for a lengthy period of time. Owing to the heat generated as a result there is a serious risk of fire caused by a melting lamp base.

OSRAM ECG detects the critical condition and reliably shuts off the lamp.

An interrupt function prevents irritating attempts by the lamp to restart, so thermal overloading is prevented – an important contribution to greater safety. This ECG permanently monitors all the safety-related parameters. As there is not yet a uniform standard for this, some ECG manufacturers neglect safety functions for reasons of cost. Consequently, not all

ECGs ensure the safety of lighting systems.

Hot start for frequent switching

Modern ECG brings the cathodes up to their optimum emission temperature prior to ignition. This is particularly important for lamps with low wattages, as they are usually fitted with very less robust cathodes. Only an optimised hot start guarantees that the number of switching cycles

has little impact on the lamp service life. This important ECG characteristic, which has a positive effect on the operating costs, should not be ignored when looking for an inexpensive alternative to CCG.

Multiwatt guarantees flexibility

OSRAM is facing up to this challenge and expanding the QUICKTRONIC product family by adding two genuine, electronic alternatives to CCG for luminaires with a maximum connected load of 25 W: the **QT-ECO 1x4-16/230-240 S** and the **QT-ECO 1x18-24/230-240 S**, both of which are MULTIWATT ECG. They reduce the work involved in ordering, logistics and production because they can be used where various CCG types were necessary before.

A total of **sixteen different linear and circular fluorescent, as well as compact fluorescent lamps**, can be

operated on the QT-ECO 1x4-16/230-240 S. The **QT-ECO 1x18-24/230-240 S** is suitable for operating **ten different lamp types**. These two new ECG products are similar size to CCGs, making it possible to implement EU Directive 2000/55/EC with a minimum of design changes to the luminaires.

Martin Leyer,
OSRAM Munich

New OSRAM ECG offers an optimum alternative to CCG

- Energy savings of more than 30%
- Constant, flicker-free light without stroboscopic effects
- Improved lamp efficiency
- Increased lamp service life
- Safe shut-off of faulty and end-of-life lamps
- High switching resistance due to optimised ignition
- Less work in ordering, logistics and production

Assistance for long life



Dedicated ECG for ENDURA high performance lamps

System with endurance

The effort, manpower and materials required for maintenance work are putting an increasing burden on the cost efficiency of lighting systems. This is particularly true if the equipment is installed in places that are difficult to reach, such as “high factory ceilings”, busy road tunnels or street lighting.

This is why the operators of lighting installations of this kind are very much interested in extending the maintenance intervals. One way of doing so is to use the ENDURA system from OSRAM, which

also saves energy at the same time. The combination of the electrodeless fluorescent lamp with extremely reliable electronic control gear guarantees a service life of 60,000 hours and an extremely high luminous efficacy.

The ENDURA system offers luminous fluxes of up to 12,000 lm – values that are well above those of fluorescent tubes. This makes it possible to achieve a system luminous efficacy of up to 80 lm/W (Table).

Unique operating principle for decisive advantages

In the ENDURA lamp, the discharge required for generating the light takes place not between two heated electrodes, as in conventional fluorescent lamps, but in electrodeless fashion in a closed loop with no beginning and no end. The energy is coupled in from the outside by magnetic fields generated in coils (induction principle). As a result, the lamp contains no parts that can wear out which limits its service life.

The outcome of this unique operating principle is the ex-

tremely long service life of the ENDURA system of 60,000 hours. This is four to five times longer than conventional fluorescent tubes.

Perfectly coordinated combinations

The ENDURA system consists of an electrodeless fluorescent lamp and an electronic control gear unit. ECG-based operation guarantees high lighting comfort with flicker-free instant starting and constant, flicker-free light.

In this context, the user can select the version that it best suits to his specific requirements. The controlled power, long, slimline QUICKTRONIC QT ENDURA 100-150/220-240 L control gear is available for normal use. This version is suitable for operating the 100 W and 150 W lamps and has an optimised price/performance ratio.

The two compact, square QUICKTRONIC QT ENDURA 100-150/220-240 S and QUICKTRONIC QT ENDURA 100/220-240 S control gear units are variants which are also suitable for use in outdoor lighting. These versions also demonstrate their advantages when the ECG is installed at a long distance from the lamp, which can be up to 20 m.



Type	QT ENDURA 100-150/220-240 L	QT ENDURA 100/220-240 S	QT ENDURA 100-150/220-240 S
Lamp	100 W and 150 W	100 W	100 W and 150 W
Luminous flux	12,000 lm or 10,400 lm	8,000 lm	12,000 lm or 11,000 lm
System power consumption	152 W and 145 W controlled	107 W not controlled	153 W and 146 W not controlled
System luminous efficiency	79 lm/W or 72 lm/W	75 lm/W	79 lm/W or 75 lm/W
Dimensions	(420x40x30) mm ³	(182x101x43) mm ³	(182x101x43) mm ³
Temperature range Ta	-20 °C to +50 °C	-40 °C to +40 °C	-40 °C to +40 °C
Distance from ECG to lamp	Max. 2 m	Max. 20 m	Max. 20 m
Outdoor use	Only in protected luminaires	IP54	IP54
DC operation	154 V to 276 V DC	176 V to 290 V DC	176 V to 290 V DC
Connections	2-pin terminals	3-pin connector	3-pin connector

The system characteristics of ENDURA lamp and control gear offer extensive advantages for the user





Fig. 1. Three 150 W ENDURA lamps demonstrate their advantages in the decorative lighting at Karstadt's sportswear store in Hamburg (Hamburg Design GmbH Licht)

Reliable operation

In the ENDURA system, the electronic control gear safeguards the familiar, good operating characteristics of the QUICKTRONIC family:

The wide range of permissible ambient temperatures for the operation of ECG and ENDURA lamp means that virtually any field of application is possible (Figs. 1 to 3). The permissible temperatures are -20 °C to +50 °C when using the L version and -40 °C to +40 °C for the S versions. Consequently, these control gear units work just as well at the low temperatures in cold stores as they do in lighting installations where the thermal stresses are very high, such as in paper production.

System cost-efficiency

The extremely long service life and high luminous efficacy of the ENDURA system offer the



Fig. 2. Thirty five 150 W ENDURA lamps illuminate the tunnel between Genua and Ventimiglia

ideal prerequisites for every application where replacing lamps involves a great deal of time and effort and where cost efficiency and reliable operation are of great importance. These features were decisive for the use of the ENDURA system at Shinjo Station, Japan (cover).



Fig. 3. Industrial lighting lasts longer with the ENDURA system

ENDURA ECG – Just perfect

ECG operation	Flicker-free instant start Constant, flicker-free light No stroboscopic effect
Separate operation of lamp + ECG	Distance of up to 2 m or 20 m, depending on ECG type
DC operation	Emergency operation to DIN VDE 0108 is possible
Switching resistance	Any number of switching cycles
Dimensions	Square or oblong form to suit any luminaire design
System service life	60 000 h with 10 % failure probability for $T = T_{\text{cmax}}$ (70 °C)
Standards	Complies with all relevant standards

A comprehensive analysis is becoming more and more important when deciding on a lighting system. The capital expenditure is increasingly playing a secondary role, especially in difficult to maintain areas. In cases of this kind, one of the decisive factors is the consideration of the follow-up costs, such as ener-

gy and maintenance costs. The ENDURA system from OSRAM is synonymous with cost efficiency, offering distinct advantages in many sensitive applications when the whole picture is considered.

*Dr. Thomas Dreier,
OSRAM Munich*

Information at your fingertips



The Internet as an all-round research pool for ECG

The information pool is open

The Internet and the "World Wide Web" will shape the 21st century. The breadth and depth of information offered there is increasing all the time and is already being used by millions of people – with more and more joining them every day. After all, even former sceptics have come to recognise the enormous potential of this medium. Consequently, there's no alternative to the Internet today.

The success of the Internet is based on the rapid and easy exchange of information with worldwide access. Constant availability, prompt dissemination of the latest news, and easy-to-use access software (browsers) are other reasons for this march progress.

The volume of websites is increasing even more rapidly than use of the Internet: there

are billions of them today. Search engines and web catalogues make it easier to get an overview.

ECG on the Internet

The information on every aspect of electronic control gear (ECG) from OSRAM is becoming increasingly detailed and user-friendly. For instance, at

www.osram.com/products/electrical/ecg/technology/how.html

a block circuit diagram illustrates the mode of operation of an ECG device (Fig. 1). The main advantages of using control gear, such as energy savings and convenient lamp operation, as well as the positive effects on human health are also explained on these web pages as additional interesting aspects.



Fig. 1. Everything you ever wanted to know about ECG: the OSRAM websites provide competent answers

Spotlight on energy savings

The energy saving potential of lighting systems using ECG proves to be an extremely important argument for almost every user. In connection with the ban imposed

can likewise enter the electricity price of his utility company and thus determine his very own potential savings. This information naturally makes it far easier to calculate the pay-back period when converting an existing



Fig. 2. You can save energy with ECG: the OSRAM websites tell you how much

on CCG by EU Directive 2000/55/EC, the conversion of existing lighting installations is becoming increasingly important. To provide support in this area, the site at

www.osram.com/products/electrical/ecg/energy/howmuch.html

enables you to calculate the cost savings directly – see also ECG SPOT 2/2001, Page 8.

After selecting the required European country, the average cost of electricity (price per kWh) typical for this region is displayed. For individual calculations, an Internet user

lighting installation (Fig. 2).

Test of innovative light control concepts

Dimmable lighting installations are finding increasingly widespread use. Particularly attractive solutions can be developed using control gear based on the new interface standard for ECG, the "Digital Addressable Lighting Interface" (DALI). The web pages at

www.osram.com/products/electrical/dali/index.html offer exhaustive, detailed in-



formation covering every facet of the subject of DALI. The question "What is DALI?" is already answered on the first few pages. Reference installations, advantages, the complete product range and the technical manual are all stored here – in other words, everything about DALI.

At the link "Test DALI" you find an invitation to try out DALI on the basis of two selected scenarios (link to "Test Dali"). For example, the motion sensor function and daylight-dependent light control in conjunction with the full range of DALI functions is presented in the "Group Office" scenario.

Light control in conference rooms is another important topic. The DALI functions also offer a tool for this purpose. You can sit back and test the effect of the resultant lighting atmosphere from two different angles – that of a listener and that of the speaker. The *TOUCH-DIM* function can be called up with the central button. Buttons one to four invite you to try out the scenarios stored on the web, such as a slide or overhead presentation, a meeting or a reception.

You can go to

www.osram.com/products/electrical/dali/technical_programming.html

to read about how to program schemes and groups, as well as how to operate the system. A detailed description of the DALI systems is to be found in the DALI Manual, which you can call up via a separate navigation item in "Alles über DALI" (Everything about DALI).

The right ECG at a glance

The technical data sheets (Fig. 3) are an absolute must when it comes to selecting electronic control gear. OSRAM has stored the new look of this detailed product information in the new e-catalogue, e.g. at

<http://catalog.osram.com>

This extensive database enables you to download technical data sheets containing the very latest updates.

Visual assistance is offered by a product illustration and the lamp wiring diagram in the header, which make daily work easier at a click of the mouse.

As in the past, there are also links to the technical data sheets of the matching lamp/



Fig. 3. The data sheets give you certainty: the use of ECG can easily be optimised for specific applications in this way

ECG combination, along with the product designations.

The technical information has been expanded to include such items as "Declarations of conformity". The corresponding document is stored for every control gear version.

Questions answered quickly

The frequently asked questions (FAQs) have been updated and their structure adapted to that of the catalogue. For example, questions and answers concerning electronic transformers have been grouped under a separate sub-items, resulting in greater clarity and faster access.

Questions that are not on the web are answered as quickly as possible: a simple e-mail is

enough to get in touch with the experts at OSRAM.

Major progress has again been achieved in expanding and optimising the websites: OSRAM is getting even closer to its goal of supplying every-possible kind of information about ECG from a single source – the Internet.

Cornelia Fürst,
OSRAM Munich



News in brief



New 3 and 4-lamp control gear for 14 W FH (TS) fluorescent lamps

The QT-FH 3x14/230-240 and QT-FH 4x14/230-240 members of the QUICKTRONIC electronic control gear family stand for simple wiring of three and four lamp systems using the 14 W FH fluorescent lamp. These ECG units are particularly suitable for use in lighting solutions with modular ceiling luminaires, where the emphasis is on maximum convenience.

In these new ECGs, the return of the lamp cables is effected within the circuitry, greatly simplifying compliance with maximum cable lengths for ECG/lamp variation and the wiring itself.

Needless to say, the QT-FH 3x14/230-240 and QT-FH 4x14/230-240 electronic control gears come in the familiar OSRAM quality. Being high-end quality products, these QUICKTRONIC ECG units with Cut Off technology and end-of-life detection offer all the prerequisites for maximum energy efficiency.

Among other things, Cut Off technology prolongs the lamp service life, for instance, as the cathodes are subjected to less stress as a result of there being no continuous cathode heating.

End-of-life detection (EoL) guarantees maximum safety at the end of the lamp service life in that the ECG reliably detects fault conditions and switches the lamp off.

Optimum combination: OPTOTRONIC control gear and LED module

The OPTOTRONIC electronic AC to DC transformers were specifically designed for operating LED modules. The devices are designed for rated voltages of 10 V and 24 V and supply an electronically stabilised direct voltage.

Within the specified power range, several modules can be operated in parallel on one converter. For instance, between 1 and 16 red EFFECTlights with a wattage of 1.2 W each can be connected to the new OT20/230-240/24 with an output voltage of 24 V and a wattage range of 1.2 W to 20 W. The outstanding advantages of the OPTOTRONIC converter are as follows:

- Electronically stabilised, constant DC voltage at the output
- Parallel connection of several modules within the specified wattage range
- Electronically reversible shut-off in the event of short-circuits, overloading or overheating

- Can be operated in Class III luminaires
- Compact dimensions
- High reliability as power supplies are exactly matched to the LED modules
- Compact, functional power supply units for installation in applications where space is tight
- Cable clamp and terminal cover for stand-alone installation
- Good



price/performance ratio

In addition to the new OT20/230-240/24 converter, the OSRAM range includes further devices for 10 V and 24 V modules.

Electronic control gear overview

The ECG system overview was presented for the first time in early 2000. This overview answers any and every question concerning the appropriate pairing of electronic control gear and envisaged lamp. Experts would now be unwilling to do without this tool, which can be used equally well as a poster or a

desk mat. After being updated to include the new electronic control gear products, such as the QUICKTRONIC DALI range and the QUICKTRONIC MULTIWATT versions, this overview is now available again from all OSRAM sales offices.

However, the opposite question "Which lamps can be operated on a specific ECGs?" can also be answered instantly. These combinations are available in the format of a desktop calendar – again from any OSRAM sales office.

