

# DIZ

## DOEPKE-INFO-ZEITUNG

FREE CUSTOMER NEWSLETTER BY DOEPKE SCHALTGERÄTE GMBH

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## The easy way to convenient lighting control

### The new DALI Gateway from Doepke

In the same way that Salvador Dali skilfully used light in his pictures to give emphasis, modern lighting facilities using the DALI bus system, named after the artist, generate homely lighting scenes and provide optimal illumination for workplaces through the individual combination of different lamp groups and brightnesses.

The Digital Addressable Lighting Interface (DALI) enables control of all types of luminaires. The control line can be installed in virtually any desired topology with a maximum line length of up to 300 metres. This means that even complex lighting constellations are possible at a reasonable price, especially as the two-core control line can be carried together with the supply line, for example, in a five-core standard cable. In comparison to conventional wiring, this enables potential savings in terms of both time and materials – not to mention the significant increase in convenience for installation and maintenance.

The DALI Gateways from Doepke allow operation of up to 64 electronic



No matter which luminaire: DALI is universal

ballasts on a bus, which can be joined together to form a maximum of sixteen groups. A maximum of sixteen storable lighting scenes ensure the greatest possible flexibility. In order to avoid undesired interference, the lighting scene storage can be locked. The allocation of ballast addresses is performed automatically by the DALI Gateway.

The device is operated by four buttons on the front of the housing. The intuitive menu structure and the clear plain text display have a user-friendly design. The combination and configuration of ballasts into lighting groups and scenes is thus very straightforward to perform. Minimum and maximum dimming values, as well as the dimming and

▲ Similar on the outside, different on the inside: The light control devices for conventional wiring (left) and for connection to Dupline

fade speeds, can be set individually for each group. Lighting groups can very easily be combined into lighting scenes and their brightness stored.

Even without any additional components, the groups can be operated and lighting scenes can be stored and recalled directly on the DALI Gateway. DALI faults (ballast errors, lamp faults, etc.) are automatically identified and shown on the display. Firmware updates are possible at any time thanks to the USB interface

► Continue to page 2



## Fiat Lux – Let there be light!

### Criteria for selecting future light sources

► After the familiar incandescent bulb was demoted to a 'discontinued model' by EU regulations, it then became necessary to look for an alternative source of light for the future – at the latest by the time that reserves of old bulbs were exhausted.

The first alternative, the compact fluorescent bulb – also known as the energy-saving bulb (ESB) – is now considered to be a transitional solution. If the bulbs break, they pose serious health and environmental risks. Furthermore, at low temperatures there are often start-up difficulties or it may take some time to reach full brightness. The familiar minimum brightness of the incandescent bulb and the cosy light setting through the use of dimmer switches is not possible.

The second alternative, the LED bulb, does not have any of these disadvantages and is even more economical. It is, however, still very expensive and is therefore only very slowly coming into use.

Once a decision has been taken to use one of the two alternatives, the change of light source can be performed quickly. If the bulbs are to be dimmed, it is essential to ensure that a dimmable variant is chosen. Unfortunately this does not ensure that it will be possible to dim the lights without any problems. The ESB requires relatively high levels of control for ignition and in some circumstances has a tendency to flicker or flash. The LED also has such a tendency or – depending on the manufacturer and dimmer operating

mode – can only be dimmed within a restricted range and sometimes cannot be completely switched off.

In general, dimmers originally designed for incandescent and halogen bulbs are not suitable for ESB/LED bulbs. Even if the combination works, the emission of increased interference pulses may lead to strong radio interference, which in some cases would far exceed normative threshold values. The cause of this interference is the integrated control devices found in the bases of ESB/LED bulbs. The current state of these bulbs no longer have anything in common with the resistive load and also differ greatly from each other, depending on the selected dimmer operating mode. In the event of a trailing edge, the current flow sets in

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with a delay and ends at the latest with the truncated phase, but does not immediately reduce the voltage to zero. This leads to an increased minimum brightness. In comparison to the trailing edge, the current in the event of a leading edge sets in immediately with peak shape and is much higher, but then fades away again very quickly. In the

event of several ESB/LED loads connected in parallel, the currents that are added together can lead to activation of the short-circuit detection or destruction of the power semiconductor.

The latter also heats up greatly due to the high current at the moment of switching on, which would inevitably trip the thermal overload shutdown in the event of loading with the nominal load.

The only remedy – if the interference emissions are disregarded for now – is in both cases is to drastically reduce the power compared to the specified (resistive) maximum load of the respective dimmer. For Doepke dimmers, the guide value is:  $\frac{1}{4}$  of the nominal load in the event of leading edge,  $\frac{1}{2}$  of the nominal load in the event of trailing edge. In the event of trailing edge, a resistive base load connected in parallel is required (incandescent lamp > 10 W or base load element FS-GE) to achieve the minimum dimming brightness. In the event of leading edge, this may be necessary in order to completely switch the lamp off.



Ralf Schüler  
Development

## The easy way to convenient lighting control (continued from page 1)

▼ Continued from page 1:

The new DALI Gateway from Doepke

already implemented in the DALI Gateway.

The DALI Gateway is available in two different versions:

» The lighting scene control device

LSG 4DALI for conventional wiring allows eight lighting scenes and groups to be controlled via external buttons.

» The DALI Gateway DCI 4DALI for the Dupline system is controlled in the standard fashion using the

Dupline bus. In this way, 16 lighting groups and 16 lighting scenes can be operated.

Both variants additionally have two pushbutton inputs for a central on/off function, which allow ballast control

even without configuration. The power supply and control are performed with 24 V DC.



Günter Düselder  
Product Management

## STANDARDISATION



## The right choice

## Selective residual current operated protective devices

Requirements for selectivity of residual current operated protective devices (RCDs) in accordance with DIN EN 61008-1 (RCCBs) or DIN EN 61009-1 (RCBOs) can be found in the installation regulations DIN VDE 0100-530 (selection and installation of electrical equipment – switchgear and control gear) Section 535.2.2. A residual current operated protective device used for example in a main distribution board must have a rated residual current of at least three times any RCDs connected downstream, e.g. in sub-distribution boards.

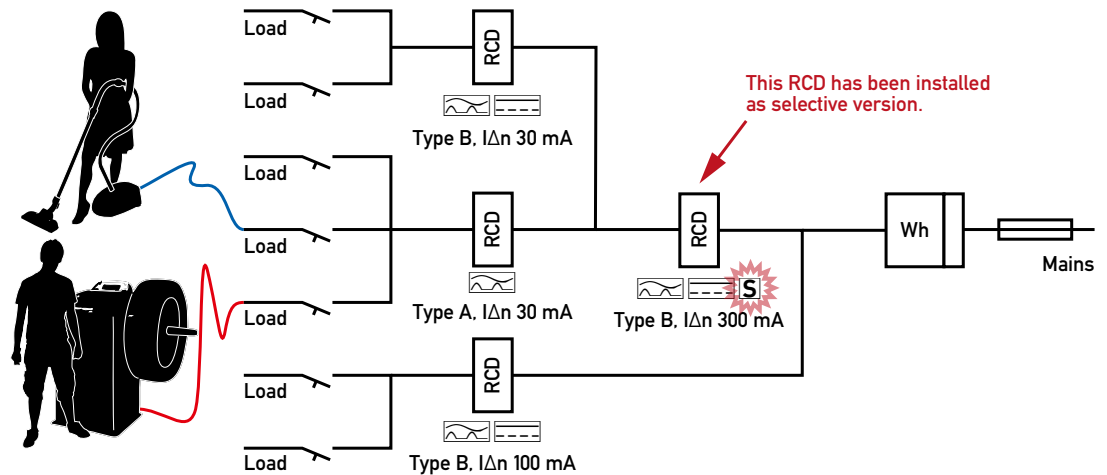
Compliance with switch-off times in accordance with DIN VDE 0100-410 is also ensured for selective RCDs if the protective measure "Automatic switch-off of power supply" in accordance with 411.4.4 and 411.5.3 is implemented.

To implement fire protection in accordance with DIN VDE 0100-420, selective RCDs with a rated residual current of  $\leq 300$  mA may be used.

If better retention of supply is required in special sections of electrical systems, then, for example, a selective residual current operated protective device in accordance with DIN VDE 0100-705 Section 705.422.7 must be used, if the system parts to be protected are intended for intensive livestock farming.



Günter Grünebast  
Head of Standardisation/Testing/Certification



In order that the lights do not go out everywhere in the event of a fault: the correct combination of selective and standard RCDs protects non-affected parts of the system against unnecessary production downtime.

## Coordination of selective residual current circuit-breakers

### The art of only switching off affected system segments in the event of a fault

#### There are many opinions and stories about selectivity between RCDs.

This is an important issue, as a fault in just one system part has, in practice led to complete system failure on numerous occasions. In such cases, system availability is reduced, which entails high downtime costs. Furthermore, incorrect setup can also lead to cancellation of protective measures in the event of direct or indirect contact. The rising dissatisfaction of operators both in terms of confidence in the technology and in the qualifications of installers should only be mentioned in passing.

The correct coordination of the protective equipment with differing suitability for detecting residual currents must be observed. The aim here is to switch off the faulty system part, while keeping the fault-free system parts operational.

Appropriate RCDs must be selected in accordance with the residual current to be expected. If smooth DC residual currents or high-frequency residual currents are to be expected in final circuits, a B or B+ type RCD must be used, if necessary in a selective version.

If A or F type RCDs are used in

system parts with the abovementioned residual current types, tripping within the fixed defined values may no longer occur under certain circumstances. The summation current transformer of the mains-side RCD is premagnetised in the event of smooth DC residual currents, as a result of which its tripping behaviour is changed to the point of complete failure. In this case, the electrical system is insufficiently or not at all protected on the mains side with regard to automatic switch-off in accordance with VDE 0100-410 and possibly with regard to the required fire protection.

In the reverse case of mains-side use of a type B switch, it is permitted to use a type A or type F switch on the load side. A prerequisite for this is selection of the load-side switch in accordance with the expected residual current.

Tripping times also play an important role: depending on the level of the residual current, switch-off times also change. The minimum non-switch-off time of mains-side selective RCDs must be greater than the maximum switch-off time of the load-side RCD.

The rated residual current of the mains-side RCD must be at least

three times that of the load-side RCD. Accordingly, at least a 300-mA-RCD in a selective design must be chosen on the mains side, if a 100-mA-RCD is to be installed on the load side.

The minimum non-tripping time of a selective RCD is 50 ms. For this reason, selective switches cannot be used for personal protection. Here, switch-off times for an RCD are defined as max. 40 ms. Therefore it logically follows that there are no 30-mA-RCDs with selective design available on the market.

Short-term delayed RCDs are not considered selective switches. These switches mostly have a non-tripping time of 10 ms. They display a high level of insensitivity with regard to larger current pulses, such as nearby lightning strikes or switching on of electronic power supplies.

They can nevertheless be used for personal protection, as, in the event of a fault, tripping reliably occurs after a maximum of 40 ms.



Heino Thoben-Mescher  
Product Management



## Otto Dzubigella: 25th anniversary at the company

A quarter of a century has passed since Mr Otto Dzubigella took up his role in the test bay department on 15 August and started playing a crucial role in developing this area. Today he is Group Manager and has a wealth of experience to draw on.

Mr Dzubigella has been active in the

◀ Otto Dzubigella, 25 years at Doepke

Works Council for 18 years – for four of which he was Chairman. Since 2012 he has also been a confidant for the disabled.

In his free time, Mr Dzubigella is devoted to his family and dog. He also loves going to watch his favourite team, Werder Bremen, play football. ■

## 20 years of production in Bickenriede

The anniversary of the subsidiary plant in Thuringia is being celebrated

Shortly after the reunification of Germany, the foundations of the Doepke subsidiary plant in Bickenriede (Thuringia) were being laid. Electronics production began in 1993, shortly followed by the establishment of the DLS 5 miniature circuit-breaker production line.

Employees can rightly be proud of their achievements: production in Bickenriede has overcome all challenges for two decades. On this occasion, the annual Doepke summer party is not being held at the main plant in Norden like normal, but instead in Bickenriede. The rather complicated logistical challenge was tackled gladly and expertly by the organising team and this represented the first opportunity for some Norden employees to visit the subsidiary plant in person.

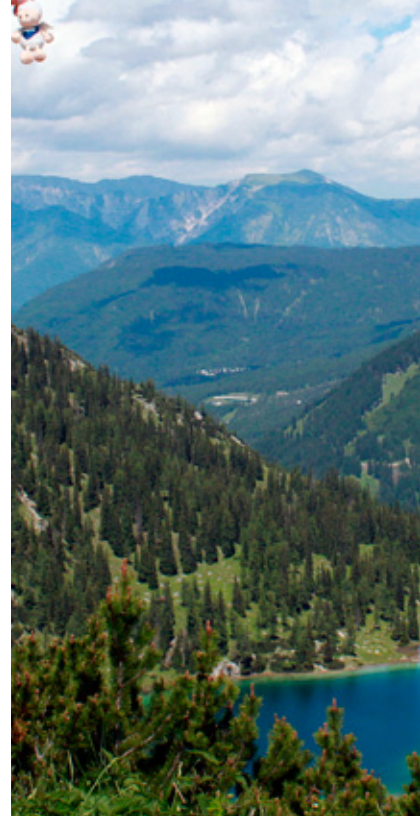
After a bus journey of almost eight hours, the Norden workforce were warmly welcomed by their colleagues. In the welcoming address, it was not only the management looked back with pride over the past years, but the Mayor of Anrode also gave a speech celebrating the shared success.



The preparations on location were exemplary: a sumptuous barbecue buffet – naturally starring the Thüringer Bratwurst sausage – as well as music and drinks made it an excellent summer party in Bickenriede. ■



Heidemann/Retzek



## The angel out and about... ...in the mountains

We met him in Austria while hiking in the Mieminger mountains. Under him you can see the Seebensee lake and behind him the 'Daniel' and 'grüner Ups' mountains. Shortly afterwards, he continued to the Zugspitze mountain, which was not far away, but there he could no longer be distinguished in the photos.

Thank you to Ms Lange from our Schwarz sales agency for the photo and description of the sighting.

Do you have a photo of the Doepke angel out and about that you would like to send us for publication? Send us your picture with the location and a brief description to [info@doepke.de](mailto:info@doepke.de); we would love to see it. ■

### PUBLISHER

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### QUARTERLY QUOTE

*A man's life is interesting primarily*

*when he has failed – I well know.*

*For it's a sign that he tried to surpass himself.*

*Georges Clemenceau*

### DATES / NOTES

**efa Leipzig**  
16–18 Oct.  
Stand G21, hall 5

**SPS/IPC/Drives**  
26–28 Nov.  
Stand 4-261, hall 4