elka elektronik

Novelties 2009/2010

**Room automation with LON, KNX/EIB gateways,**
**Measuring and control technology, sensor technology**

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Contents

# Projects & references

## One-stop supply – From infrastructure through to room operation devices

Nowadays, modern buildings are no longer conceivable without solutions out of open building automation.

To get the greatest benefit out of a building over the whole period of use, architecture and technology must be adapted to one another right at the beginning of the planning stage. Thus modifications in room order and use of the rooms can be implemented flexibly and with the least financial burden.

For more than 10 years ELKA has been developing and fabricating components for building automation with LON. With this modular system and the flexible components, ELKA counts among the leading manufacturers of products for modern building automation with the bus system LON in Europe.

Public buildings, schools, hotels and large office buildings, for instance, are the projects that have been equipped with LON-components from ELKA.

**Theobald-Ziegler-School**
Preungesheim, near Frankfurt / Main, Germany
School in passive house technology
Scope of supply: room operation, actor technology (licht, sun protection), system components

**Rhenus Logistik Office building**
Dortmund, Germany
Scope of supply: room operation (heating-climate-ventilation, light, sun protection)


**DEZ Interspar subsidiary**
Austriy
Scope of supply: actor technology, system components

**Central office for public services**
Recklinghausen, Germany
Scope of supply: room operation, actor technology, (heating-climate-ventilation, light, sun protection), system components

**Community & senior citizen centre**
Lüstringen, Germany
Floor space (GFA): 19.200 m²
Scope of supply: room operation, actor technology (heating-climate-ventilation, light, sun protection)


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$O_2$ World Berlin, Germany
Floor space (GFA): 60.000. m², 17.000 seats
Scope of supply: room operation, actor technology (light)

## $O_2$ World: Lighting control with LON

The $O_2$ World in Berlin is one of the state-of-the-art multi-function areas in the world. Since September 2008, 17000 visitors have been enjoying top concerts, sporting events and entertainment.

For the complete lighting control LON-components from ELKA were used. In the player's booth, the public rooms, the entertainment boxes and for the floodlight more than 2500 light groups are dimmed or switched via LON.

ELKA has developed a modular LON system of controllers, modules and operating devices which saved costs and time particularly in the integration of the lighting control of the 59 entertainment boxes.

Each of the loges has 4 dimmable and 6 switchable light groups with a presence-controlled lighting in the sanitary area. Per entertainment box only one LON-node in form of a LON Basic Controller BC10 RLF had to be installed. All necessary dimming, relay, push-button sensor and presence detector modules could be connected rapidly and favourably-priced at the local interface of the controller, without generating further costs for LNS-node licences and infrastructure components. The low number of LON-nodes and the fact that nearly all commands are bound in the modular structure considerably reduce the data traffic on the LON bus and in connection with the LON-controllers operated at 230 V supply voltage increase the operational liability of the system.

The so-called black-box switching describes a light scene which is run centrally via the LON-bus. It controls a uniform lighting mood, for instance in the entertainment boxes at the start of a live act and during the breaks, and at the end of the event restores the last light mood set. For each box, all logic grids, timers and scene controllers needed to store a light scene are stored in the corresponding LON controller.

During project planning, the nearly identical structure of the lighting control in the boxes made it possible to transfer the complex control from a "test-room" to all further LON-controllers in the entertainment boxes.

*More information on the technical realization of the lighting control in one entertainment box with LON-components from ELKA have been illustrated graphically in room solution 3.1*

*All room solutions can be downloaded at www.elka.de.*


**Bio-hotel Stanglwirt**
Tirol, Austria
Scope of supply:
room operation, actor technology (heating-climate-ventilation), system components


**MAN headquarters**
Munich, Germany
Floor space (GFA): 7.000 m²
Scope of supply:
room operation (heating-climate-ventilation, light), system components

**Süddeutsche Zeitung Publishing house**
Munich, Germany
Floor space (GFA): 78.400 m²
Scope of supply:
room operation


**L-Bank**
Karlsruhe, Germany
Scope of supply:
room operation (heating-climate-ventilation, light, sun protection)


**Loft 12 (InnSide Hotel)**
Düsseldorf, Germany
Scope of supply: room operation, actor technology, (heating-climate-ventilation, light, sun protection)

# Planning

## LON-components in standard situations. situationen. ELKA Room Solutions

In functional buildings like hotels, schools or offices it is often possible to apply one room concept to several rooms. Under the aspect of sustained usability of the building, identical rooms are combined in a modular network of individual room solutions.

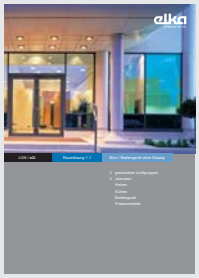
The ELKA room solutions have been developed to simplify planning for standard rooms. Each of the hitherto realised room solutions describes another room type (office, hotel, entertainment box). The sample applications show clearly and in detail which functions must be fulfilled in the relevant room and describe the suitable LON-components for these requirements.

At the end of each room solution you can find a calculation per room, in which the LON-components used are listed with unit prices. You can thus use them as basis for your planning, work out invitations to tender easily and calculate the costs for several identical rooms.

In the menu item “planning” at www.elka.de you can find many precious tips and aids all around project planning with LON-components from ELKA.

You can find sample applications and planning aids for the integration of LON-bus components as well as describing texts to read or download how to work out invitations to tender.

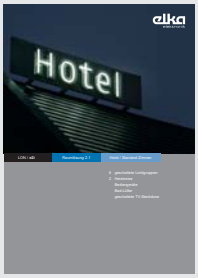
**Download**
All Room Solutions can be downloaded under “service” at www.elka.de.



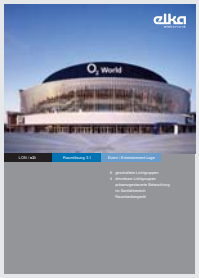
Room Solution 1.1 Office / Control panel without display

Room Solution 1.2 Office / Control panel with (RCM)

Room Solution 1.3 Office / 3-room multi-axis solution




Room Solution 2.1 Hotel / Standard room




Room Solution 3.1 Event / Entertainment box

Application
Heating control / single room

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# Trainings & seminars


> **"Learning is like rowing against the current. Once you stop, you will drift back."**
> (Laozi)

For three years now ELKA has offered seminars and trainings for building automation with LON.

**Basic seminar**
In practical and vivid lessons on two successive days, the participants of the basic seminar learn how to solve tasks in room automation in an energy-efficient and uncomplicated way by means of LON-components from ELKA. The basic seminar focuses on parameterization and commissioning of different products out of the ELKA product range. →

**Training for planners**
**(Half-day and/or all-day lecture)**
The half-day lectures mainly treat the energy-efficient use of a LON bus system in the building, with examples and comparison of costs in office and hotel construction.

The all-day seminar also trains the extensive bus control of an office floor, from the determination of the individual room functions, via the choice of the components needed up to the preparation of the invitation to tender.

You want to take part in a planner's seminar? Please send your inquiry to sales@elka.de. As soon as we know the next training date, we will inform you.

**Basic seminar "Building automation with LON-components from ELKA-Elektronik"**

**Dates 2009 (seminars held in German language)**
13 -14 May – 7th Basic seminar
14 -15 September – 8th Basic seminar

**Seminars held in English or Russian language on request.**

The offer is directed mainly to system integrators and electricians.

The basic seminar aims at getting to know and effectively using the functionalities of the modular ELKA LON-components.

Costs for detailed training literature, beverages and meals are EUR 100.00 per day/person (plus VAT). On request, the amount can be credited to an order with a value of goods of EUR 5,000.00 min.

The basic seminar is held in our seminar rooms in Lüdenscheid, Germany.

Further information and the enrolment sheet can be obtained at www.elka.de.

You want to take part in a basic seminar, but none of the above mentioned dates suits you?

Or do you have questions on the subject LON and on the ELKA products?

Please contact us. We will be pleased to fix an individual training data or an advisory talk in your company.

Please contact Ms Wiebke Hilger:
Email: w.hilger@elka.de

| RCM | art.-no. 131 1x 5xx | FTT | | PlugIn |
|---|---|---|---|---|

**Room-Climate-Module (RCM)**

Room operation panel as a LON compact device. It is available in all popular design styles of the companies Berker, Gira and Jung. The necessary assembly set is not encluded in delivery.

The function of the RCM can be extended with 6 integrated digital inputs (depending on type). These digital inputs can also be used as digital outputs. At the digital input standard installation switches, push-buttons and potential-free contacts can be connected. Optional an external temperature sensor can be connected.

Functions:
- measurement of the room temperature via an internal and/or external sensor (optional)
- setpoint alteration
- display and setting of operation modes and fan speed

Each button and LED can be set individually via PlugIn. A project specific version concerning the amount of buttons, LED and the printing is available on request.

Hint to the use of the external temperature sensor TF-33K (Art.-No. 110 01 320):
Only the use of temperature sensors of this type is allowed! The sensor cable can be extended up to a distance of 50 m by the use of a two-core cable (1,5 mm²). A shielded cable must be used if the cable is laid in a conduit or near by an electric power line cable.

**Technische Daten**
- network type: TP/FT (78 kb/s)
- transceiver: FT-X2
- supply voltage: 24 V DC ± 10 %
- power consumption: typ. 1 W
  max. 1,3 W
- operating elements / indicator
  number LED: 0…8
  number push-buttons: 0…2
  turning knob: 0…1
  design Jung: central plate always with turning knob
- digital input
  number: 0…6
  cable length: max. 5 m
- temperature sensor
  internal: 1 (NTC)
  metering range: 0…40 °C
  external: 1 (TF-33K, art.-no. 110 01 320)
  cable length: max. 50 m (with 1,5 mm²)
- digital output
  number: 0…6
  voltage/current: 5 V / 0,8 mA
- connection
  LON, supply voltage: terminal block Ø 0,4…0,8 mm
  input/output: cord set (assembly set)
- protection type: IP 20
- dimensions: depends on design
- mounting: junction switch box Ø 60 mm

Frames and the neccessary assembly set are not included in the delivery unit.

Other types on request.

| available types | operating- / indicating elements | design | type * assembly set RCM-MS.JOK ** assembly set RCM-MS.J | material / colour | Article number |
|---|---|---|---|---|---|
| Design Berker RCM (without assembly set)  | • 8 LED, 2 push-buttons, turning knob, digital input/output: 6 | S.1 | LON.S1-RCM8216.00 PW** | plastic polar white | 131 13 500 |
| | • 3 LED, 1 push-button, turning knob, digital input/output: 6 | K.1 | LON.K1-RCM3116.00 AN** | plastic anthracite coated | 131 13 501 |
| | • 8 LED, 2 push-buttons, turning knob, digital input/output: 0 | K.5 | LON.K5-RCM8210.00 ES* | plastic stainless steel coated | 131 13 502 |
| | • without operating- / indicating elements, digital input/output: 6 | K.1 | LON.K1-RCM0006.00 PW** | plastic polar white | 131 13 503 |
| Design Gira RCM (without assembly set)  | • 8 LED, 2 push-buttons, turning knob, digital input/output: 6 | F100 | LON.F100-RCM8216.00 RWG** | plastic pure white glossy | 131 14 500 |
| | • 3 LED, 1 push-button, turning knob, digital input/output: 6 | System 55 | LON.S55-RCM3116.00 AN** | plastic anthracite coated | 131 14 501 |
| | • 8 LED, 2 push-buttons, turning knob, digital input/output: 0 | System 55 | LON.S55-RCM8210.00 AL* | plastic aluminium coated | 131 14 502 |
| | • without operating- / indicating elements, digital input/output: 6 | System 55 | LON.S55-RCM0006.00 RW** | plastic pure white | 131 14 503 |
| Design Jung RCM (without assembly set)  | • 8 LED, 2 push-buttons, turning knob, digital input/output: 6 | LS990 | LON.LS990-RCM8216.00 WW** | plastic alpine white | 131 15 500 |
| | • 3 LED, 1 push-button, turning knob, digital input/output: 6 | LS990 | LON.LS990-RCM3116.00 AL** | aluminium | 131 15 501 |
| | • 8 LED, 2 push-buttons, turning knob, digital input/output: 0 | LS990 | LON.LS990-RCM8210.00 ES* | stainless steel | 131 15 502 |
| | • without operating- / indicating elements, digital input/output: 6 | LS990 | LON.LS990-RCM0006.00 WW** | plastic alpine white | 131 15 503 |

**TF-33K** | **art.-no. 110 01 320**

**Temperature sensor (NTC)**
**to be used in connection with**
- **digital input/output, art.-no. 130 01 302**
- **Raum-Climate-Module (FTT)**

Hint to the use of the external temperature sensor TF-33K (Art.-No. 110 01 320):
Only the use of temperature sensors of this type is allowed! The sensor cable can be extended up to a distance of 50 m by the use of a two-core cable (1,5 mm²). A shielded cable must be used if the cable is laid in a conduit or near by an electric power line cable.

**Technical data**
- sensor element: NTC
- connection cable: PVC, 2 x 0,75 mm², 4 m
- dimensions sensor: plastic cap Ø 6 mm, 43 mm length

| temperature [°C] | resistance [kΩ] (analyzer Ri > 1 MΩ) |
|---|---|
| 5 | 85,2790 |
| 10 | 66,7785 |
| 15 | 52,3300 |
| 20 | 41,2720 |
| 25 | 33,0000 |
| 30 | 26,2810 |
| 35 | 21,1370 |
| 40 | 17,0850 |

Please note: The resistance values can only be measured when the sensor is connected.

**RCM-MS.Jx** | **art.-no. see below**

**Assembly set for mounting of Room-Climate-Modules (FTT), art.-no. 131 1x 5xx**

Assembly set consisting of:
- Bearing ring for fixing of the RCM in a standard installation box.
- terminal block (4-pole)
- tailored connection cable for inputs / outputs (l = 0,8 m)

**Technical data**
- connection: terminal block 4 x 2 pole Ø 0,4…0,8 mm
- connecting cable (only type RCM-MS.J)
  type: LiYV 0,14
  length: 0,8 m

Please note:
Type RCM-MS.JOK the tailored connection cable is not encluded in the scope of delivery.

| type | version | article number |
|---|---|---|
| RCM-MS.JOK | for RCM without external I/O components | 131 15 998 |
| RCM-MS.J | for RCM with external I/O components (with connection calbe) | 131 15 999 |

**TS 6.6-DC ULF** | **art.-no. 130 01 302** | **FTT** | **PlugIn**

**Digital input/output 6-fold, flush-mounted (Push-button interface)**

Flush-mounted module for monitoring and evaluation of potential-free contacts (e.g. window contacts, push-buttons, switches) or for LED control. The 6 available channels can be parameterized both as input or output. The contacts are supplied from the device itself. Definition of the functionality via LNS PlugIn.

The cable set for connection of the inputs/ outputs is included in the scope of supply.

An external temperature sensor (NTC) can be connected to one of the digital inputs (type TF-33K, art.-no. 110 01 320).

**Technical data**
- network type: TP/FT (78 kb/s)
- transceiver: FT-X2
- supply voltage: 24 V DC ± 10 % (SELV)
- power consumption: typ. 1 W max. 1,3 W
- cable length: max. 5 m
- digital inputs for potential-free contacts
  number: 0…6 (dep. on paraterization)
- digital outputs (load type LED)
  number: 0…6 (dep. on paraterization) 4,3 V / 0,8 mA
- connection
  LON, supply voltage: plug-in terminal Ø 0,4…0,8 mm
  inputs/outputs: prepared cable
- protection type: IP 20
- dimensions (WxHxD): 52 x 52 x 20 mm
- mounting: installation box Ø 60 mm
- external temperature sensor (NTC)
  admissible type: TF-33K, art.-no. 110 01 320
  cable length: max. 50 m (with 1,5 mm²)

| LON.MT701-CT.x | art.-no. 130 0x 10x | FTT / IP | 230 V AC | PlugIn |
|---|---|---|---|---|

**Minitableau MT701 colour touch**

Operation and display panel with high-resolution LC-display and excellent colour depth. Suitable for connection to TP/FT-10 networks.

Functions:
- 50 display pages max. with up to 16 display and operation elements each for free project planning (arrangement at pixel-level)
- up to 25 background pictures with a colour depth of 4096 colours each
- dithering and transparent colours possible
- vertical or horizontal installation (portrait / landscape)
- cleaning function
- integrated logic functions and timer
- internal alarm management (signal can be given via an installed acoustic sensor switch)
- password protection for all pages (4 password protection levels)
- programming via
  1. Ethernet-connection (Webserver: project data and firmware)
  2. USB (project data and firmware)
  3. LON (due to download times only a differential download is recommended)

The Minitableau can be combined with different design frames in high-quality materials like aluminium, stainless steel and glass. Frames in the design series of the companies Berker, Gira and Jung are compatible.

It can be configured via LNS-PlugIn with integrated preview-function (sensitive with simulation and jump to the relevant parameter field). Integrated web-server.

**Technical data**

| | |
|---|---|
| • network type: | TP/FT (78 kb/s) |
| • supply voltage: | 230 V AC ± 10 % |
| • transceiver: | FTXL |
| • power consumption: | min. 8,3 VA<br>max. 14,8 VA |
| • interfaces: | LON TP / FT-10<br>USB (type B)<br>Ethernet RJ45 |
| • display: | TFT (active, colour) |
| size: | 5,7” |
| resolution: | 320 x 240 pixel (landscape)<br>240 x 320 pixel (portrait) |
| colour depth: | 4096 colours |
| brightness levels: | 3 |
| background pictures: | max. 25 |
| file formats: | jpg, bmp |

functions
- flexible network variable interface: 1000 network variables max.
- webserver with possibility to download project data and firmeware
- 50 user pages max. with up to 16 display and operating elements each
- icons: Standard icons contained; further can be loaded. Free assignment to each display element and each status line.
- 80 logical elements max. (AND, NAND, OR, NOR, XOR, UND with return, all lockable with filter function)
- 40 timer and locking functions max.
- weekly timer: 16 channels with 8 lines each (astro and random function)
- 50 interference messages max.
- protection type: IP 40 (installed)
- dimensions: depending on the design frame chosen
- flush-mounting or hollow wall: installation housing WxHxD: 212 x 124 x 75 mm (type EG.MT701-CT, art.-no. 135 17 120)

Mounting scheme: Minitableau MT701 ct with design frame and installation housing.

Design frame and installation housing are not included in the scope of supply.

Available: October 2009

| type | version | art.-no. |
|---|---|---|
| LON.MT701-CT.EJ | Minitableau MT701 ct for design frames series ELKA and Jung | 130 01 100 |
| LON.MT701-CT.B-W | Minitableau MT701 ct with *white passepartout* for design frames in series Berker glass, back printed polar white or Berker refined stainless steel | 130 03 100 |
| LON.MT701-CT.B-SW | Minitableau MT701 ct with *black passepartout* for design frames in series Berker glass, back printed polar white or Berker refined stainless steel | 130 03 101 |
| LON.MT701-CT.G | Minitableau MT701 ct for design frames in series Gira aluminium, glass | 130 04 100 |

**EG.MT701-CT** | **art.-no. 135 17 120**

**Installation housing for MT701 colour touch**

Installation housing of sturdy synthetic material for flush or hollow wall mounting of Minitableau MT701 ct.

**Technical data**

- dimensions (WxHxD): 212 x 124 x 75 mm

**MT701R-x.xx** | **art.-no. 13x 1x xxx**

**Design frames for Minitableau MT701 colour touch**

| versions | design | type | material / colour | art.-no. |
|---|---|---|---|---|
|  | ELKA | MT701R-E.AL | Aluminium, natural colour anodized, front side ground and brushed (without fig.) for art.-no. 130 01 100 | 135 17 011 |
| | | MT701R-E.GL-SI | Glass (thermo-tempered), Back printed silver-metallic for art.-no. 130 01 100 | 135 17 012 |
|  | Berker | MT701R-B.GL-PW | Glass, high-gloss, back printed polar white (without fig.) for art.-no. 130 03 100 | 130 03 960 |
| | | MT701R-B.ES | Refined stainless steel, brushed, for art.-no. 130 03 101 | 130 03 961 |
|  | Gira | MT701R-G.GL-MT | Aluminium, glass: mint (without fig.) for art.-no. 130 04 100 | 130 04 960 |
| | | MT701R-G.GL-W | Aluminium, glass: white for art.-no. 130 04 100 | 130 04 961 |
| | | MT701R-G.GL-SW | Aluminium, glass: black (without fig.) for art.-no. 130 04 100 | 130 04 962 |
|  | Jung | MT701R-J.ES | Stainless steel (without fig.) for art.-no. 130 01 100 | 130 05 960 |
| | | MT701R-J.AL | Aluminium (without fig.) for art.-no. 130 01 100 | 130 05 961 |
| | | MT701R-J.GL | Glass, for art.-no. 130 01 100 | 130 05 962 |
| | | MT701R-J.AN | Industrial version (without fig.) anthracite, synthetic material, for art.-no. 130 01 100 | 130 05 963 |

| LS(20)-DC 16.64 | art.-no. 132 x1 225 | FTT | 230 V AC / 24 V DC | PlugIn |
|---|---|---|---|---|

**DALI Controller**

Device to control luminairs with DALI ballasts. It provides the power supply (16 V DC) for up to 64 standard DALI ballasts. 16 DALI groups are supported. DALI devices can be assigned in any order, at which one DALI ballast can only be member of one group.

Moreover, each DALI ballast can be controlled individully autonomous of the membership to a DALI group via an absolute light value. Through this, the luminairs can be grouped in further non-DALI groups. It is recommended not to assign more than two DALI ballasts in such a non DALI group.

The DALI controller disposes of scene controllers, where 16 light values can be stored for each DALI group. Furthermore, time delays (swith-on, switch-off, stair case timer, time-controlled dimming actions) can be adjusted.

In addition software modules can be used like logics, constant light controllers, etc., which can be assigned individully to a luminair or a DALI group.

The DALI cable is monitored concerning short-circuit and interruption. If supported by the DALI ballast, more information are available:
- the actual light value (setpoint)
- error message, if the ballast has a malfunction
- error message, if the lamp fails

For start-up and maintenance the controller can be manual operated (push buttons, display). In complete operating DALI system a single DALI ballast can be exchanged without using the PlugIn.

**Technical data**
- network type: TP/FT (78 kb/s)
- transceiver: FTT10 A
- supply voltage: 230 V AC ± 10 %
- DALI: 64 devices / max. 16 groups
- DALI supply: 16 V / 128 mA
- manual operation is possible
- protection type: IP 20
- assembly width: 8 TE (approx. 140 mm)
- mounting: DIN-rail DIN EN 50022

Available: July 2009

| type | supply voltage | description | width [TE] * (1 TE = 18 mm) | art.-no. |
|---|---|---|---|---|
| LS20-DC 16.64 | 24 V DC | DALI Controller 16 x 64 | 8 | 132 11 225 |
| LS-DC 16.64 | 230 V AC | DALI Controller 16 x 64 | 8 | 132 01 225 |

* A distribution to several DIN-rails is possible using the e2i-sytem bus extension EST460E (art.-no. 140 01 901).

# LON modular system e2i / LON Basic Controller BC20-24 RLF + DALI module 16-fold

| BC20-24 RLF | art.-no. 130 01 630 | FTT / e2i | 24 V DC | PlugIn |
|---|---|---|---|---|

**LON Basic Controller BC20-24 RLF**

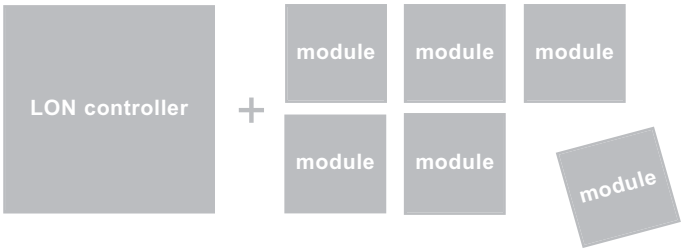
The Basic Controller BC20-24 RLF can be used for connection of up to six e2i DIN-rail mounted modules via a favourably-priced local sub-bus at only one LON-node.

Furthermore, the controller can be used to convert data from one network variable type into another, to realise logical links, to store scenes or to provide controllers.

**Technical data**

- network type: TP/FT (78 kb/s)
- transceiver: FT-X2
- supply voltage: 24 V DC ± 10 %
- power consumption (typ.): 100 mA
- number of connectable e2i-modules: 6 (depending on paramterization)
- protection: IP 20
- overall width: 4 pitches (approx. 72 mm)
- mounting: DIN-rail DIN EN 50022

LON controller with up to 6 LON e2i modules:




| EDC 16.64 | art.-no. 140 01 215 | e2i | 230 V AC | |
|---|---|---|---|---|

**DALI module 16-fold**

DALI module with manual operation level and two-digit 7-segment display for commissioning and maintenance.

The module supports up to 16 DALI groups. Each electronic ballast can be controlled individually via an absolute light value, independent of its affiliation with a DALI group, and random luminaires can be combined in further non-DALI groups. To avoid switching delays, not more than two electronic ballasts should be assigned to each non-DALI group.

The DALI lead is monitored with regard to short-circuit and supply voltage.

As far as supported by the DALI ballast, the following information are available per electronic ballast:

- the current absolute light value
- an error message, if the electronic ballast is not available
- an error message in case of a failure of the luminaire

**Technical data**

- supply voltage: via system bus from the series-connected LON Controller with e2i interface
- external supply: 230 V AC ± 10 %
- power consumption: 40 mA

DALI

- devices / groups: 64 / 16
- supply: 16 V / 128 mA
- manual operation / LC-display
- protection type: IP 20
- pverall width: 4 pitches (approx. 72 mm)
- mounting: DIN-rail DIN EN 50022

- light scene controller for up to 16 light values
- time functions (ON/OFF switch delay, time-dimming/ramp)
- many software function can be set

Available: July 2009

| SV230-24.xxxxDC | Art.-Nr. siehe unten | | 230 V AC | | |
|---|---|---|---|---|---|

**Power supply 24 V DC**

The power supply supplies e.g. the Basic Controller BC20-24 RLF (art.-no. 130 01 630) or the Room-Climate-Module (art.-no. 131 1x 5xx).

The primary switched-mode power supply has a long-range input and is short-circuit, overload and idle-run proof.

To compensate the voltage drop on long leads, the output voltage can be increased to up to 28 V DC.

Display of the operating state via LED.

**Technical data**

- supply voltage / type
  SV230-24.1250DC, SV230-24.2500DC: 100…240 V AC
  130...350 V DC
  SV230-24.5000DC: 230 V ± 10 %
  280…350 V DC
- nominal frequency: 48…63 Hz
- output voltage: 24 V DC ± 3 %
- short-circuit and overload-proof
- protection type: IP 20
- overall width: see table
- mounting: DIN-rail DIN EN 50022

| type | output voltage @ 24 V DC | power output | residual ripple | overall width | art.-no. |
|---|---|---|---|---|---|
| SV230-24.1250DC | 1,25 A | 30 W | 40 mVpp | 4 pitches (approx. 70 mm) | 140 01 915 |
| SV230-24.2500DC | 2,50 A | 60 W | 20 mVpp | 6 pitches (approx. 105 mm) | 140 01 916 |
| SV230-24.5000DC | 5,00 A | 120 W | 20 mVpp | 8 pitches (approx. 140 mm) | 140 01 917 |

**RLQ.xxx** | **art.-no. 110 01 6xx** | **24 V DC**

**Sensors for measuring the room air quality**

Depending on the type, these sensors measure the $CO_2$ concentration, the relative humidity and the ambient temperature.

The $CO_2$ sensor is equipped with a precise two-beam measuring cell and thus maintenance-free.

Types with an electronic, short-circuit proof signal output 24 V DC / 0.9 A and/or an analog output (0…10 V) are available.

All versions have an acoustic sensor-switch to signalize limit value overranges.
With the $CO_2$ sensor, the measured $CO_2$ concentration is displayed via a multi-colour LED at the front of the device (traffic-light function).
The humidity/temperature sensor additionally has a dew point calculation.

**Technical data**

| | |
|---|---|
| • supply voltage: | 24 V DC ± 10 % |
| • signal output: | 24 V DC / 0,9 A @ 25 °C |
| • analog output: | 0…10 V DC (load > 1 kΩ) |
| • housing colour: | pure white |
| • protection type: | IP 30 |
| • dimensions: | 74 x 74 x 28 mm |
| carbon dioxide ($CO_2$) | |
| • measuring principle: | non-dispersive infrared technology (NIDR) |
| • sensor: | two-beam infrared measuring cell, maintenance-free |
| • measuring range: | 0…2000 ppm |
| • analog output: | 0…2000 ppm = 0…10 V |
| humidity | |
| • measuring range: | 0…95 % r. F |
| • analog output: | 0…100 % r. F. = 0…10 V |
| temperature | |
| • measuring range: | 0…50 °C |
| • analog output: | 0…50 °C = 0…10 V |
| • mounting: | surface-mounting or in a Ø 60 mm installation box |

| type | variable | output signal | display | art.-no. |
|---|---|---|---|---|
| RLQ.C-10R | $CO_2$ | signal output 0…10 V | LED | 110 01 601 |
| RLQ.CTF-10R | $CO_2$ | signal output 0…10 V | LED | 110 01 602 |
| | relative humidity | 0…10 V | | |
| | dew point | signal output | | |
| | temperature | 0…10 V | | |
| RLQ.TF-10R | relative humidity | 0…10 V | – | 110 01 603 |
| | dew point | signal output | | |
| | temperature | 0…10 V | | |

# Terms and Conditions of Sale, Delivery and Payment with effect from 01.08.2007

§ 1 Validity

These terms and conditions are valid in so far as no agreement to the contrary has been made in writing. Any conflicting or deviating terms and conditions on the part of the customer are not binding for us even if we have not explicitly opposed them or if we have executed the delivery without objection.

§ 2 Conclusion of contract – written form

(1) Our offers are without obligation unless otherwise stated in writing. An order is not deemed to have been accepted until it has been acknowledged by us in writing.

(2) All agreements, declarations and other data are invalid unless made in writing; telephone calls must be confirmed in writing. Confirmation by telecommunication is sufficient to meet the requirement of the written form.

§ 3 Scope of deliveries and services

(1) The documents, drawings, weight specifications, samples etc. attached to our offer are only approximately decisive in so far as nothing to the contrary is derived from the offer.

(2) The right is explicitly reserved to modify the design, the layout, the material selected and the production process even after acknowledgement of the order has been dispatched, as long as the price and/or the essential performance data or the delivery time are not changed as a result and the customer can reasonably be expected to accept this.

§ 4 Delivery times

(1) The delivery time specified by us in the acknowledgement of the order is without obligation unless otherwise agreed in writing. Deliveries are explicitly subject to our obtaining delivery correctly and on time ourselves. The delivery time starts with the date on which our acknowledgement of the order is dispatched, but not before complete clarification of all issues relating to technical details.

(2) The delivery time is extended if unforeseeable and/or unavoidable and/or exceptional events occur, in particular strikes of any kind and failure on the part of our suppliers to deliver to us on time, even if these events do not occur until a delay has already set in. The customer must be notified of this in writing without delay.

(3) If shipment is delayed at the request of the customer or for other reasons beyond our control, the customer bears the resulting additional costs as well as the risk of accidental loss or of accidental deterioration of the goods to be delivered from the time when he is advised that the goods are ready for shipment.

(4) If the goods are stored at our factory (or on the premises of a person authorized by us), we are entitled to charge at least 0.5% of the price of the consignment for each month or part therefore during which the goods are stored. We reserve the right to further claims.

(5) The right to make deliveries in instalments or prematurely is reserved on principle.

(6) In the event of a delay in delivery for which we are liable, the customer is entitled to claim compensation for default at a rate of up to 3% of the value of the delivery per complete week, but not more than 15% in total. If the customer sets us a deadline appropriate to the circumstances in the event of delayed delivery and if this deadline expires without delivery being made, the customer is entitled to opt for compensation instead of fulfilment and to withdraw from the contract. The precondition for demanding compensation instead of fulfilment is that the breach of obligation for which we are responsible is not trivial.

(7) The above ruling does not apply if the contract is for delivery by a fixed date as defined by § 376 German Commercial Code (HGB). The same applies if the customer has lost interest in the transaction due to the delay.

(8) The adherence by us to the delivery time is subject to the punctual and correct fulfilment of the customer's contractual duties, in particular of his financial obligations.

§ 5 Passing of the risk, shipment, packaging

(1) The risk is passed to the customer from the time the goods leave our factory or our distribution depot respectively (Incoterms 2000), even in the case of delivery by instalments.

(2) The goods are shipped at the customer's risk and expense. If no shipping instructions are given by the customer, we select the least expensive means of transport and the least expensive route.

(3) Packaging is charged at cost price unless otherwise agreed.

(4) We reserve the right to take out a transport insurance policy. In the event of damage in transit, settlement shall be made in accordance with the terms of our insurance policy against submission of the following documents:
a) ascertainment of the facts by the transport company (e. g. forwarder's receipt),
b) original consignment note,
c) transfer of the claims arising from the damage incurred.

(5) The customer is under obligation to notify us in writing within 8 days of receipt of the consignment of any damage occurring in transit. The damaged parts are to be returned carriage paid to our Lüdenscheid factory or carriage paid to our respective distribution depot.

§ 6 Prices, terms of payment, securities

(1) Our prices are calculated ex works or ex respective distribution depot (in accordance with Incoterms 2000).

(2) Our prices are based on the cost factors relevant at the time of the offer being submitted (acknowledgement of the order). If they change between the time of the contract being concluded and shipment of the goods, we reserve the right to modify the price in reasonable proportion to the increased costs.

(3) All payments by the customer must be made with no deduction whatsoever onto our bank account in Lüdenscheid by the specified dates. Netting options are due to the customer only when claims are undisputed or have been established with legal force. In these cases the customer also has a right of retention. He furthermore has a right of retention if the right of retention is based on a defective delivery for which we are liable. In these cases the right of retention may be exercised only in proportion to the defect.

(4) If the customer's economic circumstances undergo changes capable of casting doubt on the fulfilment of the financial obligations after the date of dispatch of our acknowledgement of the order, we are entitled to withhold delivery of the goods or to demand security. If the customer fails to meet our request for the furnishing of security within a reasonable time, we are entitled to withdraw from the contract.

(5) We grant 2 % discount if payment is made within 10 days of the date of the invoice. No discount is granted on payments made in arrears or by bill of exchange. The maximum credit term is 30 days net cash.

(6) Our agents and sales representatives are not authorized to accept payments or means of payment unless they have collection authority.

(7) Bills of exchange and cheques are accepted only in payment; all bank, discount and collection charges are charged to the customer. Payments made by bill of exchange or by cheque are deemed to have been made only when the respective sum has been credited to our account.

(8) If the customer defaults in payment, we are entitled to charge default interest at a rate of 8 % above the respective base lending rate.

§ 7 Warranty for defects

(1) In the event of defects, we are liable to the extent of rectifying faults in design, production, colour, quality or other aspects of workmanship at our discretion free of charge within a reasonable period, either by eliminating the defect free of charge or by supplying a non-defective item. Any replaced parts are to be returned to us on request; to this extent the rules governing withdrawal from the contract are applicable.

(2) We accept liability for defects that have occurred and have been reported in due time in goods and parts delivered on the basis of reference samples and acceptance samples only if the delivered parts deviate from the reference samples and acceptance samples submitted to and approved by the customer. Failure on the part of the customer to carry out an adequate performance test of such a sample places the onus on the customer and releases us from liability for defects as well as from any other liability.

(3) Our liability for defects is subject to the customer having given detailed written notice of any patent defects according to § 377 German Commercial Code (HGB) within 6 days of having received the goods. Latent defects must be reported in detail in writing within the same period, calculated from the time of their becoming patent.

(4) Our liability for defects is moreover subject to the goods having been faultlessly installed, commissioned and utilized under strict observance of our operating instructions.

(5) In the event of subsequent fulfilment being a failure, the customer is entitled to assert his right to terminate the contract or to reduce the purchase price in case of substantial defects.

(6) If the damage has been caused with intent or through gross negligence, the statutory regulations shall apply. In so far as we have culpably infringed an essential contractual obligation, we are liable to pay compensation for the damage, including compensation instead of fulfilment; our liability is limited to foreseeable damage. The same applies if the customer asserts claims for compensation rather than fulfilment.

(7) The liability to pay compensation under the terms of the German Product Liability Act remains unaffected, as does the liability to pay compensation for personal injury, be it physical injury or impairment of health, including the death of a person.

(8) The limitation period is 24 months, calculated from the date of delivery.

(9) In the production of electronic modules in which components manufactured by third parties are processed, our liability for defects is limited to our assigning our claims against the respective components supplier to the customer if requested in writing to do so. Any liability on our part is precluded, however, if the customer is capable of recovering his losses from the respective components supplier.

(10) In the case of items made to order, a 10 % excess or short delivery is deemed to be contractually agreed.

§ 8 Provision of material by the customer

(1) All materials provided by the customer are supplied free of charge. Our inspection of incoming goods covers quantity and damage in transit. The components are not controlled for quality. Unless detailed documentation with respect to handling is provided by the customer, the components are handled in the same way as our own material. To this extent, the customer renounces the requirement for an inspection of incoming goods according to § 377 German Commercial Code (HGB). We take it for granted that a corresponding inspection of outgoing goods is carried out by the customer. At the same time the customer ensures that his liability insurer or product liability insurer respectively eliminates to this extent the exclusion of cover by agreement in accordance with 7.3 of the General Liability Conditions (AHB).

(2) We are not liable for damage caused directly or indirectly by the material provided by the customer; the ruling set out in § 7, point (6) remains unaffected.

(3) Any detailed technical documentation provided by the customer with respect to the material provided will be taken into account in our materials management.

§ 9 Other claims

(1) The customer is not entitled to claims for compensation other than those dealt with in § 7. This applies regardless of the legal nature of the claim asserted. Claims deriving from the German Product Liability Act remain unaffected.

(2) Any claims based on point (1) expire by limitation in the period specified in § 7, point (8).

§ 10 Retention of title

(1) We retain the title to the goods until receipt of all payments deriving from this supply contract, including any other contracts concluded between the customer and ourselves up to the time of conclusion of the present contract. The customer is entitled to resell the reserved goods in the ordinary course of business. However, he assigns to us even now all claims against the buyer or against third parties accruing to him from the resale at the level of the respective invoice value. The customer is authorized to collect these claims even after their assignment.
Our right to collect the claim ourselves remains unaffected by this. In particular we are entitled to demand that the customer notifies us of the assigned claim, its level and its liable party, provides all data necessary for the collection and surrenders the relevant documents to us without delay, and notifies the liable party in writing of the assignment.

(2) The customer is not entitled to pledge the reserved goods not to assign them by way of security to third parties.

(3) In the event of the customer's conduct being contrary to the terms of the contract, in particular in the event of default in payment, we are entitled to take possession of the goods again. Neither the repossession nor the pledging of the goods by us implies any declaration of withdrawal from the contract. The fact is rather that withdrawal is applicable only when explicitly declared by us in writing.

(4) The customer must notify us without delay of any seizures or other interventions by third parties.

(5) If the goods are resold together with other goods not belonging to us, the claim by the customer against the buyer is deemed to be assigned at the level of the delivery price agreed between ourselves and the customer.

(6) In the event of our title being lost due to incorporation, the customer assigns the claim for compensation due to him.

(7) The treatment and processing of the reserved goods by the customer are always done on our behalf.

(8) At the customer's request, we are obliged to release securities at our discretion if the realizable value of the claims to be secured exceeds our claim by more than 10 %.

§ 11 Place of performance – place of jurisdiction – applicable law – scope of validity

(1) The place of performance for all obligations arising from this contract, including any claim for termination, is Lüdenscheid.

(2) The place of jurisdiction is Lüdenscheid. This also applies to any actions on bills of exchange or cheques, in particular to claims arising from default proceedings. As long as judicial proceedings against us are not yet pending, however, we are entitled also to sue the customer at the court responsible for his domicile.

(3) Applicable law is the law of the Federal Republic of Germany (including UN Sales Convention).

(4) These Terms and Conditions of Sale, Delivery and Payment are valid only with respect to entrepreneurs as defined by § 14 German Civil Code (BGB).

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**Return of goods**

Returning goods generates costs and thus should be an exemption in working together as partners. If, however, there is no other way for you than to return the goods ordered, we will be prepared to take them back, under the following preconditions: The goods are faultless and in a quality to be resold, in original packaging and the return is announced to us in writing within 4 weeks after receipt of the goods, mentioning the quantity and article number. Please understand that we have to deduct 20 % for handling and examination.

After this period of time a return of the goods is possible only after individual agreement, in this case also with a deduction of 20 % for handling and examination. Special fabrications cannot be returned!
In case of returned goods, freight charges are to be borne by the customer. In general, the return of goods requires our prior agreement. Wrong deliveries and complaints are treated according to our General Conditions of Sale.

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