

iBusway for Lighting management

Canalis - DALI technical and installation guide



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A simple,

Lighting management is an essential means of providing users with greater comfort, whilst at the same time reducing their energy bill.

An affordable, easily-implementable solution for medium-sized tertiary buildings and workshops is available:

Canalis in combination with DALI

- > Offices
- > Workshops
- > Car parks
- > Supermarkets
- > Logistics centers
- > Data-centers



economical solution

Greater comfort for users

Lighting management makes it possible to compensate for light variations due to weather and sunlight by creating a uniform luminous flux. A well-lit workstation has a direct impact on the well-being of the employees and the quality of their work, as well as on their safety.

And better energy efficiency

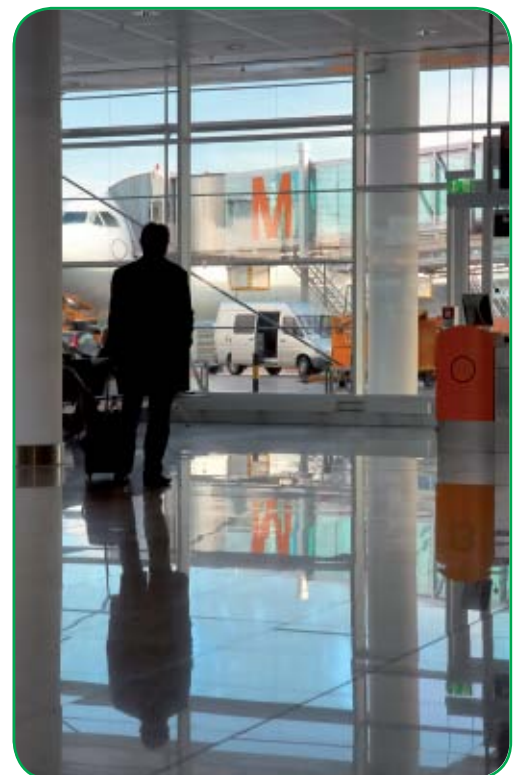
Controlling lighting by zone, creating lighting scenarios on the basis of occupancy time, switching off lights in unoccupied zones, etc. Lighting management optimises the use of equipment to significantly reduce electricity consumption.

35%

Lighting share of a building's electricity consumption

20%

Achievable savings thanks to energy management



Technical characteristics





Definition



DALI stands for Digital Addressable Lighting Interface and is a protocol set out in the technical standard IEC 62386

DALI is an international standard that guarantees the exchangeability of dimmable ballasts from different manufacturers

Systems

Conception of simple and cost saving technology, answering to lighting management constraints Standard, applied for all manufacturers, follows electronic ballast Standard IEC 60929 and defined in IEC 62386 (specific **DALI**)

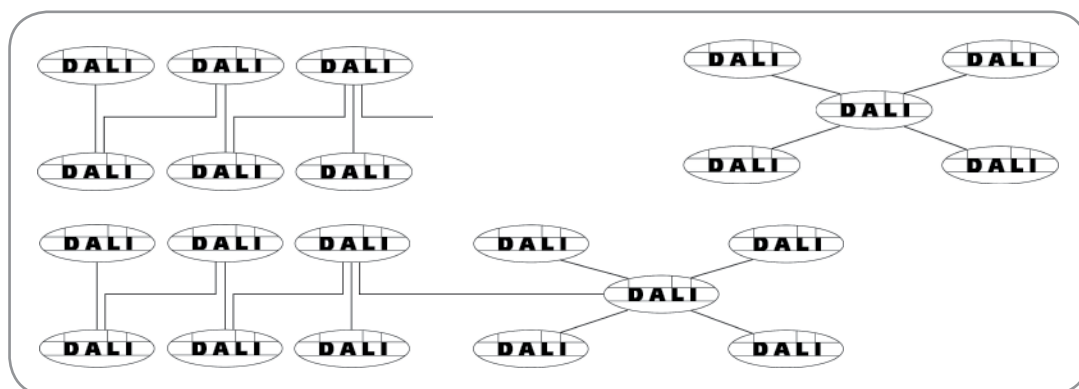
Parameters

- Has been defined for:
 - a maximum of 64 single units (individual addresses)
 - could be integrated into 16 groups (group addresses)
 - a maximum of 16 scenes (scene light values).
- Designed for decentralized intelligence with:
 - individual addresses
 - group assignments
 - light scene values
 - fading times
 - emergency lighting level (in case of bus failure)
 - power on lighting level.

Network typology

DALI connection configuration permits both star and series connections

Existing networks could be extended without difficulty



Transmission medium



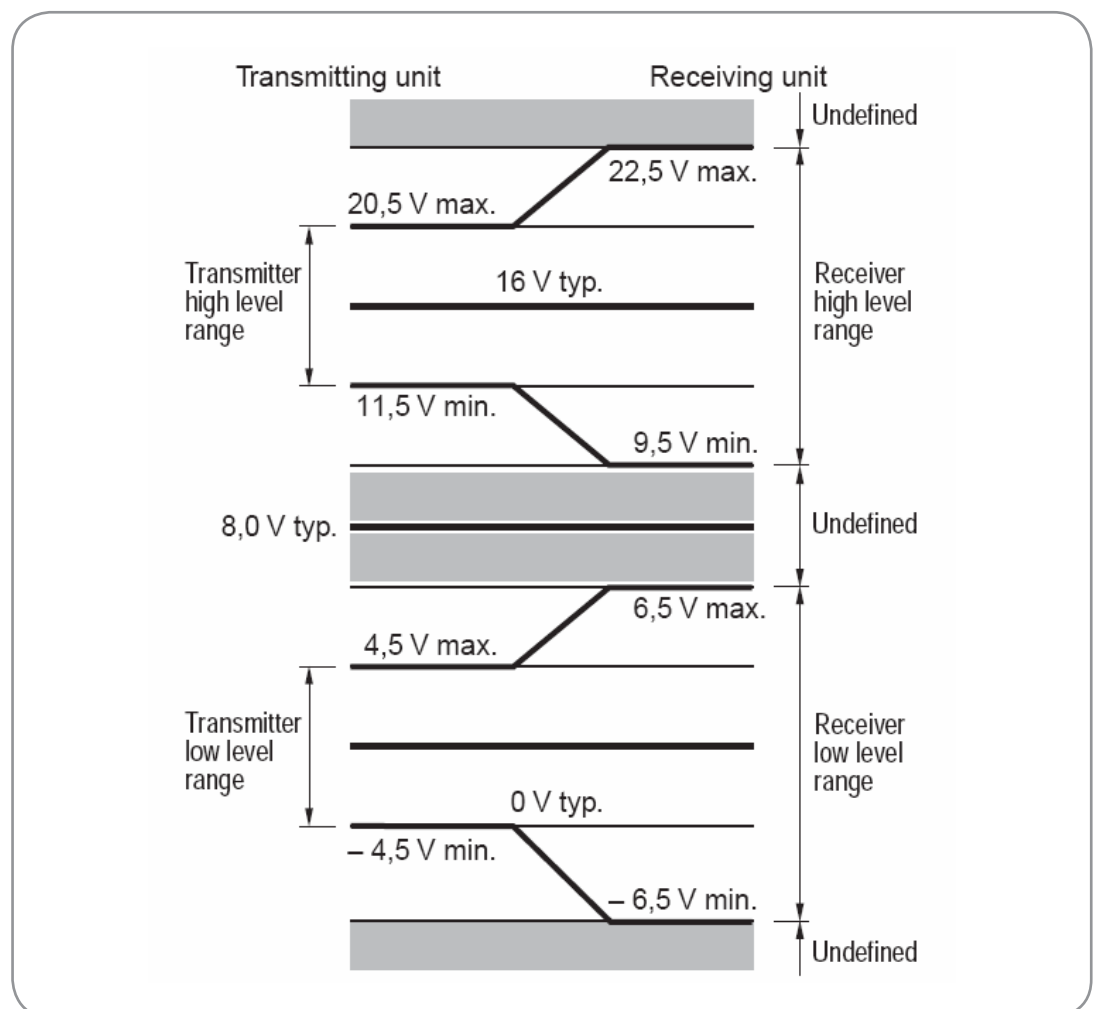
- Specific cables are not compulsory regarding the low baud rate.
- Every standard cable could be used.

The minimum lead diameter depends on the length of the network:

Lead length	Minimum lead diameter
Up to 100 meters	0.50 mm
100 to 150 meters	0.75 mm (section used in Canalis KBA/KBB)
Above 150 meters	1.50 mm

Technical characteristics

- Serial transmission:
 - 16 bits
 - Baud rate 1.2 kBit/s.
- Electrical signal:
 - the low-level has been defined at 0 V (- 4.5 V to + 4.5 V)
 - the high-level has been defined at 16 V (9.5 V to 22.5 V)
 - a maximum voltage decrease of 2 V between sender and receiver is admissible
 - maximum current 250 mA.



Canalis

Canalis is a comprehensive and consistent busbar trunking system for lighting and power distribution in all types of buildings.

The principle



Fixed components: the Canalis power distribution element

The fixed installation components distribute the electricity throughout the building and provide connection points for the mobile components.



Mobile components: tap-off units or columns for power and VDI outlets

Mobile components are used to connect fixed components to workstations.



Schneider Electric offers you up to:

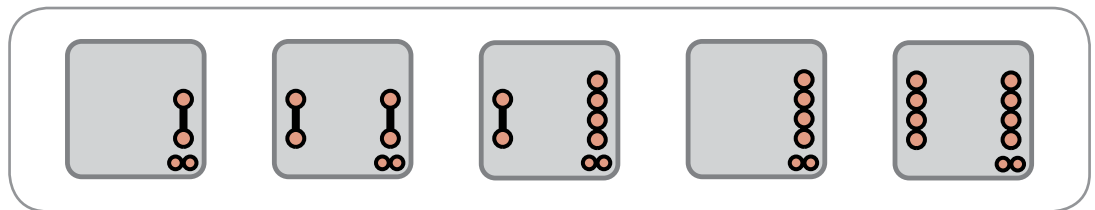
- 50 % saving on installation time through prefabricated trunking and connector solutions.
- 10 % savings on initial investment for a solution with higher value.
- 80 % savings on the cost of subsequent office space rearrangements.
- Fewer risks and last-minute surprises during installation.

KBA/KBB properties

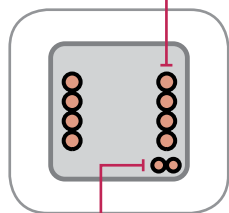
KBA/KBB

Rated current at 35°C (I _{nc}) for standard circuit operation	25 A or 40 A
Rated insulation voltage (U _i)	690 V
Rated operating voltage (U _e)	230...400 V
Impulse withstand voltage (U _{imp})	4 kV
Frequency (f)	50/60 Hz

Configurations validated



Power conductors



Remote-control circuit

Remote-control circuit

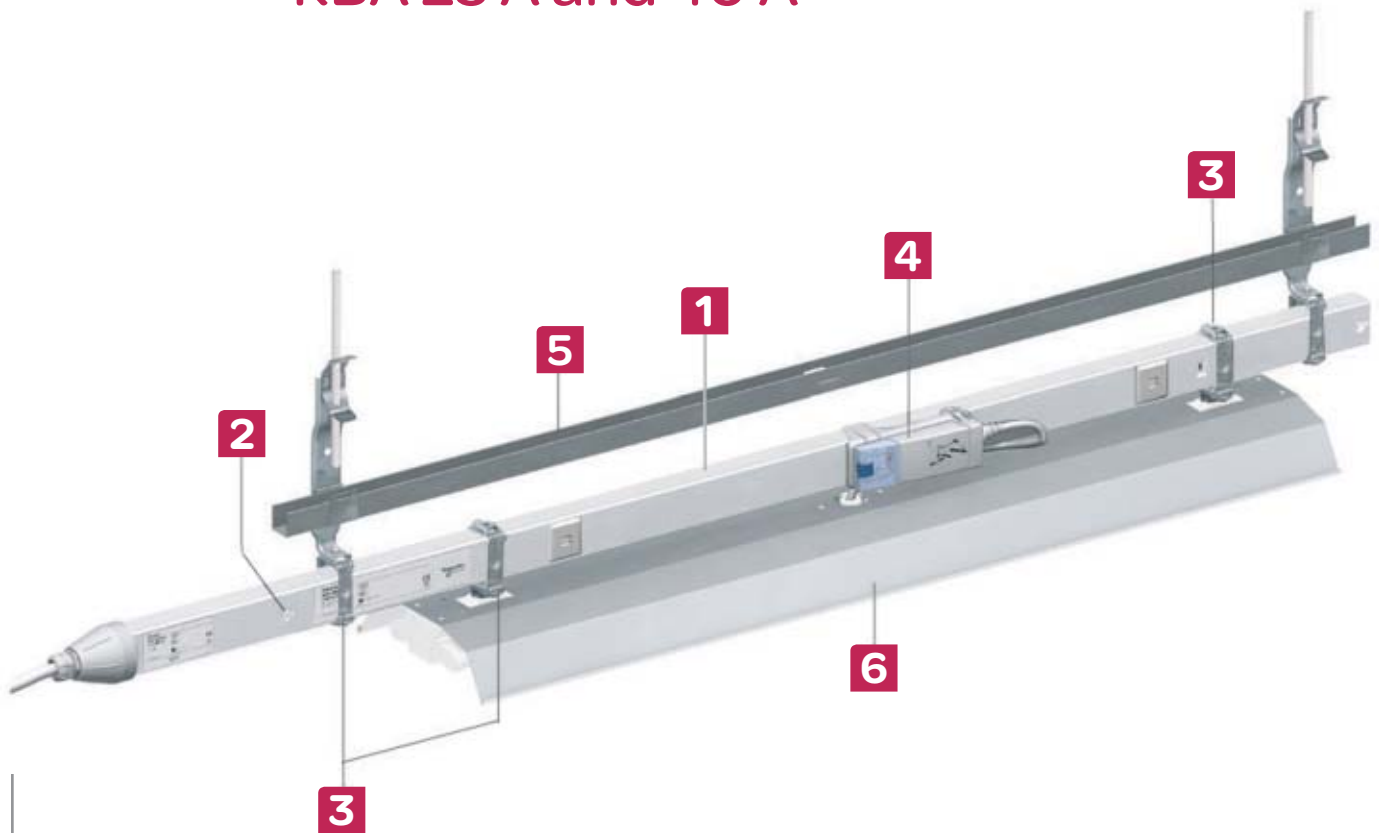
Composition	Twisted pair, unshielded (10 twists/m)	
Cross-section and type of conductor	mm ²	2 x 0.75 copper
Rated insulation voltage (U _i) (between power circuit and bus)	V	500
Rated operational voltage (U _e) (max. U between bus + and - poles)	V	50
Maximum operational current (I _e)	A	2
Linear resistance	mΩ/m	52
Linear capacitance	pF/m	30
DALI maximum lenght	m	150

Expert advice

Canalis characteristics: refer to Catalogue Canalis 20 to 1000 A (DEBU022EN).

Technical specifications

KBA 25 A and 40 A



- Fire resistance:
 - resistant to flame propagation in compliance with standard IEC 60332 - part 3
 - materials resistant to abnormal heat (glow-wire test as per IEC 60695-2).
- All plastic components are halogen free. Straight lengths constitute the basic structure of the line and are made up of:
 - a carrier casing **1**, crimp closed, made of hot-galvanized sheet steel, pre-lacquered RAL 9003 white.
- This casing also serves as the protective earth conductor (PE):
 - a ribbon cable for KBA (one or two ribbon cables for KBB) with two or four insulated conductors made of copper, 2.5 mm² for 25 A and 6 mm² for 40 A
 - tap-off outlets every 0.5, 1 or 1 meter, on both sides of the trunking
 - an additional twisted cable (2 x 0.75 mm², remote-control circuit) on request
 - an electrical jointing unit ensuring automatic and simultaneous connection of all live conductors. The contacts are clamp + spring type and exert no forces on the plastic parts. The jointing unit is maintenance free
 - a mechanical jointing unit ensuring rigid assembly of two components. The jointing unit is maintenance free.

KBB 25 A and 40 A



- The continuity of the protection conductor is ensured automatically. Proper tightening at the end of the assembly operation is ensured by a captive screw with a notched base **2**. The two components are instantly assembled. Electrical and mechanical jointing is carried out simultaneously.
- Other line components:
 - the fixing system **3** for supporting of both trunking and luminaires, **6** with final automatic locking around the trunking.
 - The maximum distance between two fixing points is 3 meters (KBA) or 5 meters (KBB).
 - The luminaires can be installed at any point on the line (including the jointing units):
 - 16 A tap-off units **4** with or without fuses, used to supply luminaires under live conditions
 - the cable-support system **5** for running adjacent circuits such as telephone lines, emergency lighting, etc
 - flexible lengths to change direction or avoid obstacles.

Implementation

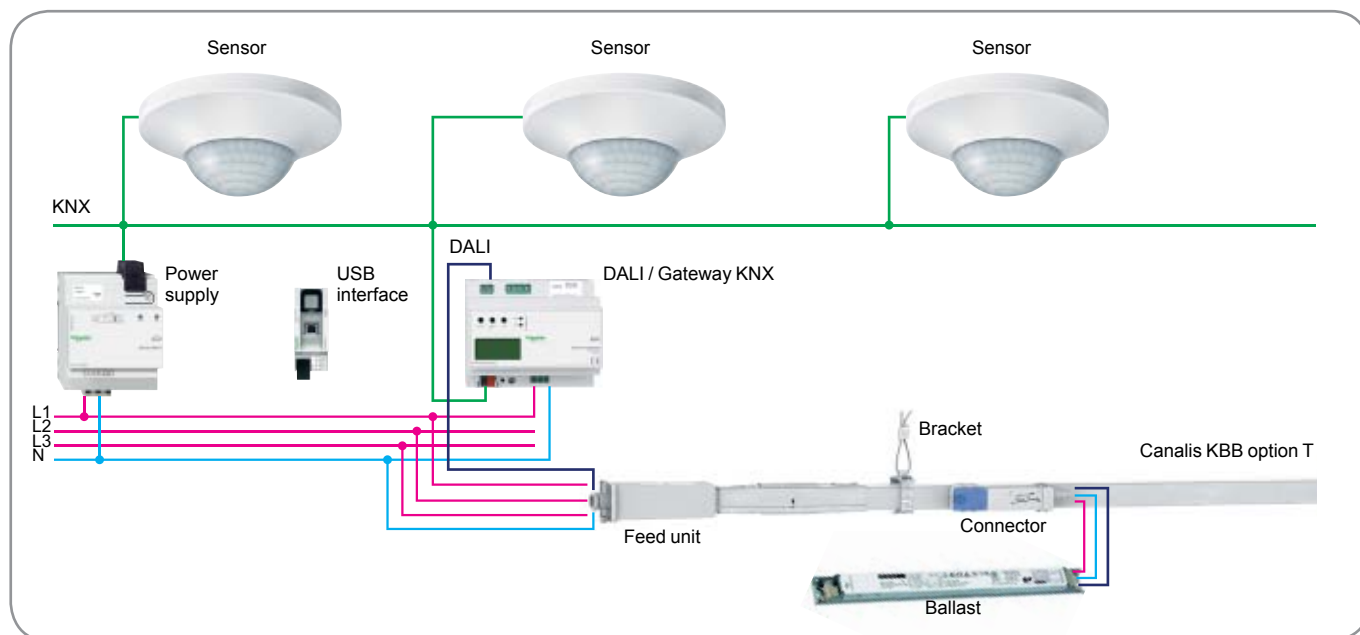


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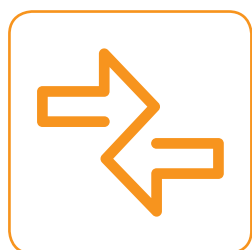
Architectures



Constant brightness control with the Schneider Electric **KNX/DALI** gateway



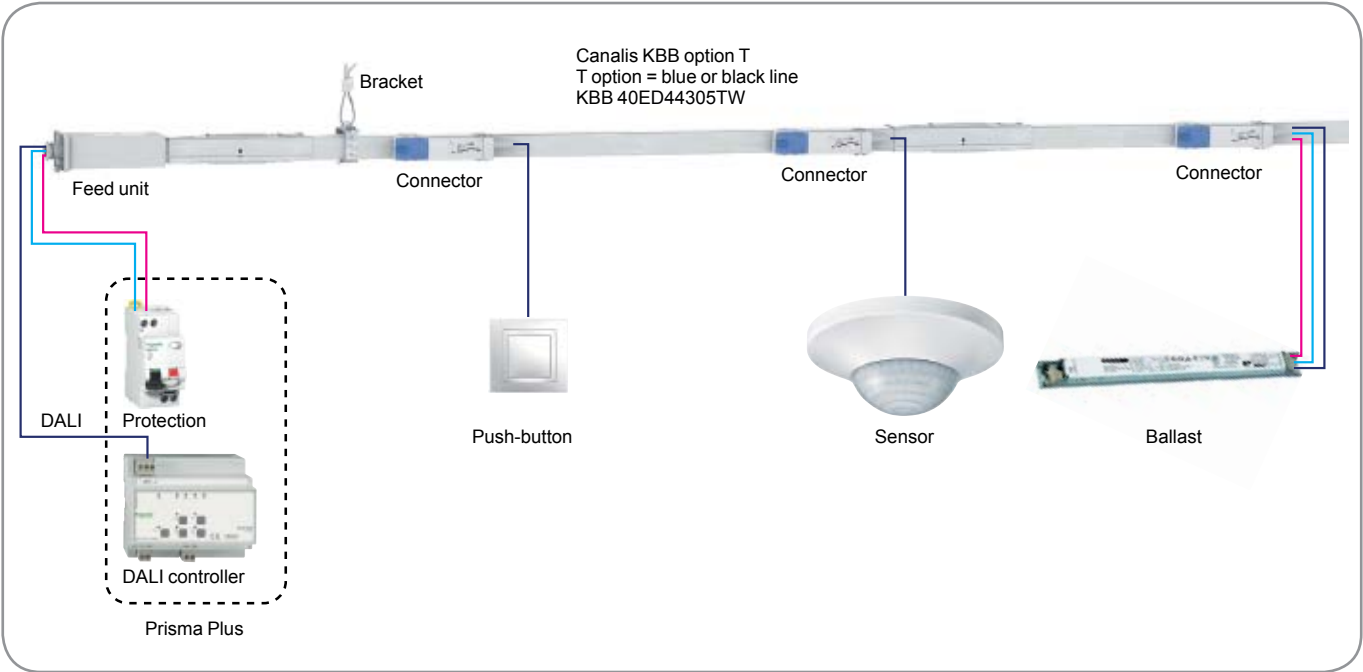
References to be used



Category	Company	Products	Reference (examples)
Distribution	Schneider Electric	Canalis KBA/KBB option T	KBB40ED44305TW
Fixing		Universal bracket	KBB40ZFU
Connectors		Tap-off units	KBC16DCB21
		Special accessory for bus option	KBC16ZT1
Sensors		Occupancy sensor	MTN630919
Supply		Feed unit	KBB40ABD44TW
		KNX power supply	MTN684016
Command		USB programming interface	MTN681829
Ballasts DALI compatible	Other suppliers	DALI/KNX gateway	MTN680191

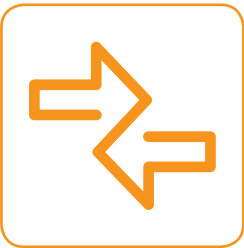


DALI architecture from a switchboard



Sensor and push-button fed by the bus line, no power supply requested.

References to be used



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Distribution	Schneider Electric	Canalis KBA/KBB option T	KBB40ED44305TW
Fixing		Universal bracket	KBB40ZFU
Connectors		Tap-off units	KBC16DCB21
		Special accessory for bus option	KBC16ZT1
Supply		Feed unit	KBB40ABD44TW
Protection		Circuit breakers	
Command		USB programming interface DALI Controller	MTN681829 MTN887251
Ballasts DALI compatible	Other suppliers		
Sensors DALI compatible			
Push-button DALI compatible			

3

Recommendations

- **Do not bind the power with low-current cables together (keep them as far apart as possible) (use a different raceway).**
- **Route the cables through 2 different circuits.**
- **Use a shielded cable between the gateway and the Canalis power supply unit.**
- **Do not use fuse connectors.**
- **The devices (gateway, power supply unit) are tested with respect to the performance of the Schneider Electric circuit breakers.**
- **Connect DALI on T option wires, do not mix power and network on same ribbon.**
- **Only the connector KBC16 can be used with bus connection device to connect to T option.**



Expert advice

Use the shortest possible connection to connect the shield to the PE on both sides (see the EMC guide) at the start of the power supply line and between 2 Canalis straight lengths (avoid using flexible connections).

Installing a ferrite on the input side of the power supply: improves the behaviour of the ballast in the event of interference: immunity against electromagnetic fields with radiated and conducted radiofrequencies (IEC 61000-4-3 and IEC 61000-4-6).

Reminder of Standards





Immunity for residential, commercial and light- industrial environments: **IEC 61000-6-1.**



Emission standard for residential, commercial and light-industrial environments: **IEC 61000-6-3.**



Digital Addressable Lighting Interface (DALI): **IEC 62386-101.**



Low-voltage switchgear and a controlgear assemblies, particular requirements for busbar trunking system: **IEC 60439-2.**

Useful links

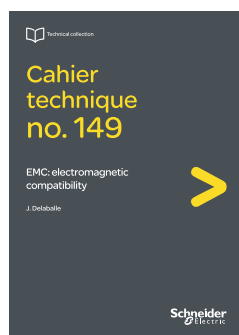




Technical documents



General catalogue Canalis 20 to 1000 A,
reference: DEBU022EN



Technical paper CT 149-EMC:
Electromagnetic compatibility,
reference: ECT149



Web

www.dali-ag.org


Dalicontrol or Wizard

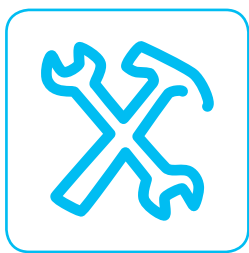
Free software of **DALI** configuration **DALI**
(<http://www.merten.de/html/en/2080.html>).

DALI-GATEWAY

15.02.2010
DALI-Comisioning-Software
(DALI-Control Service and Comisioning
Wizard Version 1.2)
20 MB

DALI-Comisioning-Software for the DALI-Gateway

 DALI-Tool-Software



Software

CanBrass & CanCAD

The CanBrass and CanCad applications

These tools, used to design the installation, allow graphic representation of the Canalis lines and tap-off units.

You can use the CanCad application to represent the layout of the Canalis lines in an AutoCad environment and thus validate project conformity.

These tools are intended for:

- electrical consultants
- the Schneider Electric sales agencies accompanying you throughout your projects.



Schneider Electric Local Support

Please do not hesitate to contact your Schneider Electric local support

Expert advice

- If you are part of Schneider Electric subsidiaries, please contact your Level 3 support.

Notes

Notes

Notes

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www.schneider-electric.com

Schneider Electric Industries SAS

35, rue Joseph Monier
CS30323
92506 Rueil-Malmaison
France
Tél. : +33 (0)1 41 29 85 00
<http://www.schneider-electric.com>

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