Emergency Lighting
Introduction to Adaptive Evacuation

From static to adaptive escape routing

EATON
Powering Business Worldwide

Increased difficulty in evacuation situations

Changing risks in a fast-moving world are forcing commercial buildings to re-evaluate safety strategies. The ability to detect danger, alert occupants and evacuate them is essential. But contending with diverse threats – fire, terrorism, civil unrest, major crime, extreme weather – in complex, high-risk and densely populated buildings is a difficult challenge. The complexity of large scale buildings can lead to increased difficulty in evacuation situations.

Airport

Large number of access and exit points. Long escape routes. Managing the flow of people (land side vs air side). Occupants unfamiliar with surroundings. High fluctuation in number of people present.

Shopping Malls

Large buildings, housing retail, leisure, hospitality, entertainment and transport facilities. Sophisticated layout with various exit points, which may be unknown to visitors. High potential for congestion at busy times. Reputational risk.

Education

Multiple buildings on a single site. Large population indoors and outdoors. Numerous escape routes. High fluctuation in number of people present.

Offices

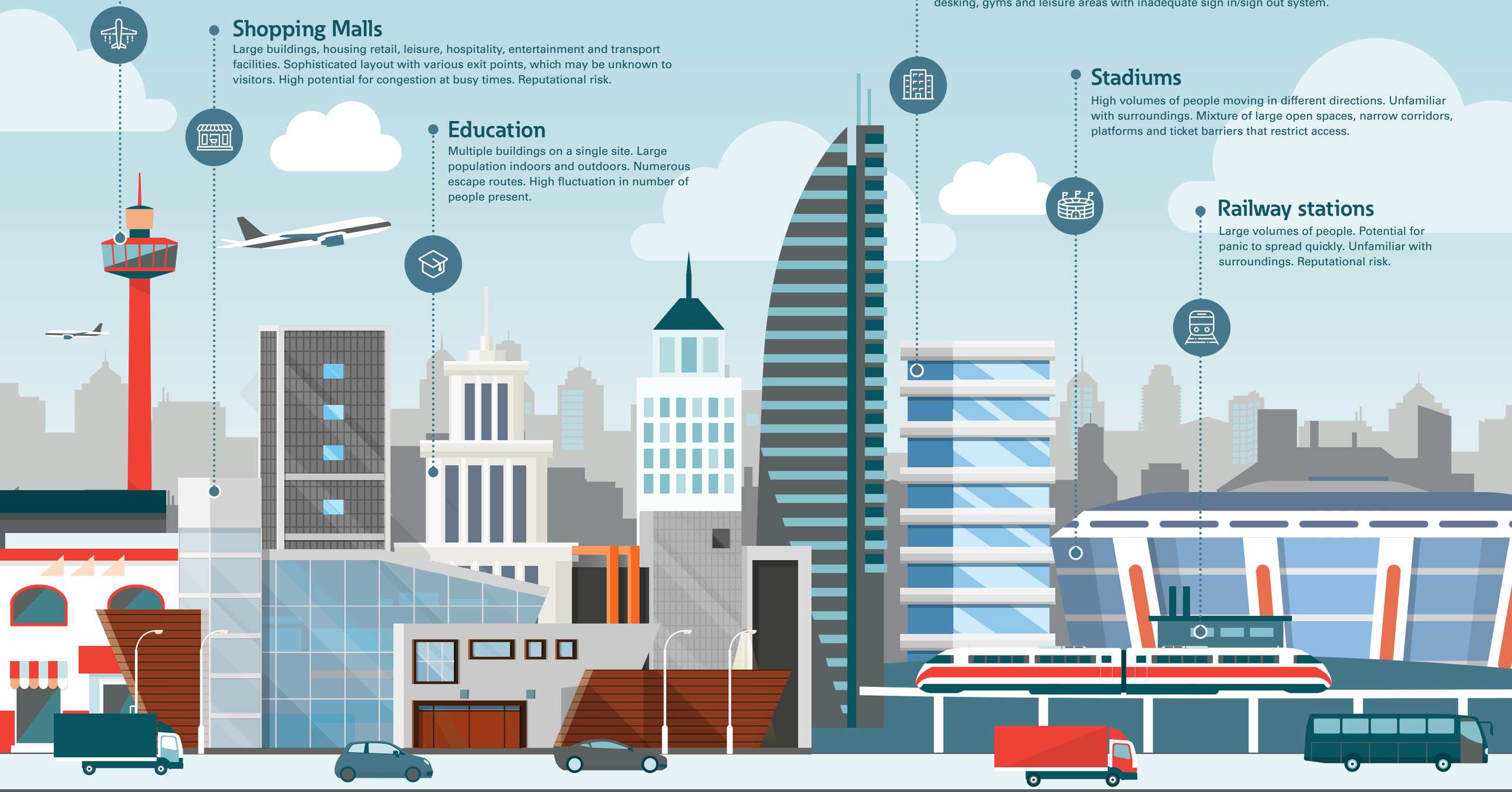
Buildings increasingly large and complicated, with multiple businesses on premises. Flexible working creates difficulty in ascertaining employees' whereabouts. Multi–use facilities, hot desking, gyms and leisure areas with inadequate sign in/sign out system.

Stadiums

High volumes of people moving in different directions. Unfamiliar with surroundings. Mixture of large open spaces, narrow corridors, platforms and ticket barriers that restrict access.

Railway stations

Large volumes of people. Potential for panic to spread quickly. Unfamiliar with surroundings. Reputational risk.



UK Statistics for the population

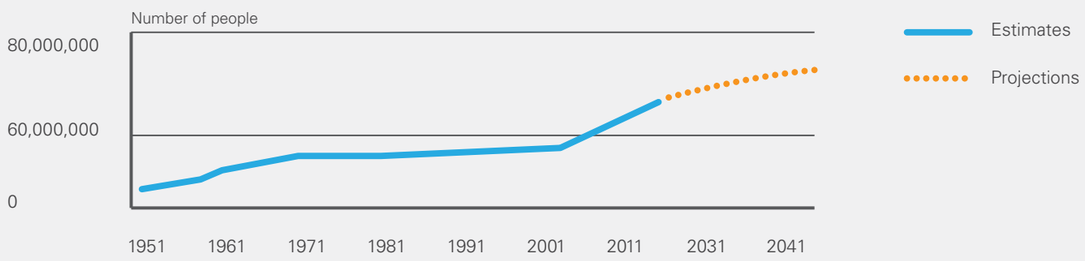
The UK population is consistently increasing year on year and there are a number of contributors to this. The births and deaths ratio has widened, the population is aging and immigration has increased. All of this leads to a varied population of ages, nationalities and abilities. With this in mind, the ability to clearly mark and highlight safe escape route is absolutely critical.

In mid-2017, the population of the UK reached a new high of 66 million, marking an increase of 0.6% from the previous year's total of 65.6 million – the lowest annual growth since 2004. As seen in Figure 1, this was largely a continuation of recent trends; the UK population has grown year-on-year since 1982, with growth rates since 2005 consistent between 0.6% and 0.8%. In future years, the UK population is set to grow further still. The projected population surpasses 70 million in 2029 and reaches 72.9 million by 2041 – increases of 6.1% and 10.4%, respectively, from 2017

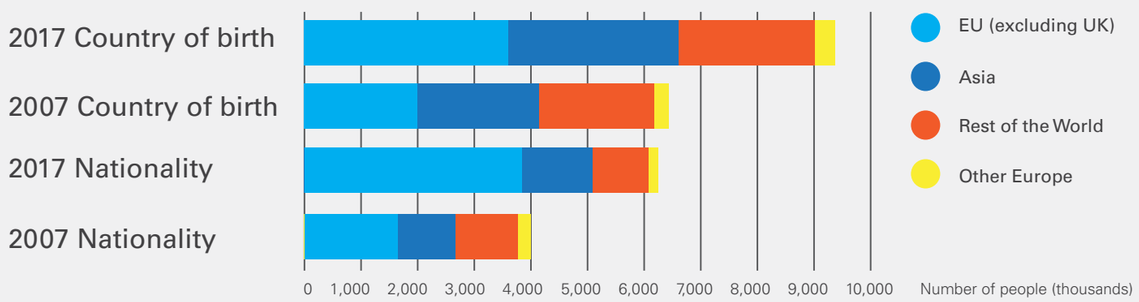
The UK has a growing diverse population. People are living and working longer. Due to immigration and global working practices, the population is becoming more cosmopolitan. Work places are also becoming more accessible to people with different abilities

With the above in mind, and the fact that buildings are becoming more complex and multi use, it is imperative that Life Safety systems can visually guide you to a place of safety!

UK populatuon
estimates and projections, 1951 to 2041



Non-British and non-UK-born population of the UK
by country of birth and nationality, 2007 and 2017



The ability of the public to recognise emergency exit signs is crucial in emergency situations requiring evacuation of a building. However, research has shown that only

of people may see conventional exit signs during evacuation from an unfamiliar environment. As a result, occupants may become confused or be inclined to return to the point where they entered the building, which can lead to overcrowding, congestion and delayed evacuation.

In a controlled test carried out by an independent association, 85% of people noticed the Adaptive Evacuation signs and

of those people moved to the nearest exit.

***Work*Safe**

Protect your people and property

In large and complex commercial buildings facing a growing diversity of safety risks from fire to terrorism, evacuation planning is pivotal. To promote safer evacuations, Eaton has developed an Adaptive Evacuation System that, unlike fixed signage, uses digital technology to switch between a number of predefined routes and guide people towards the safest available exit in a given scenario.

Adaptive evacuation

Adaptive:
Capable of changing in response to changes in environment.

Building upon decades of expertise in the delivery of life safety systems, and particularly emergency lighting technologies, Eaton's Adaptive Evacuation System enables faster, safer and more agile evacuations, particularly when deployed alongside a public address/voice alarm solution that provides additional guidance.

When installed, the system is programmed with a range of potential exit routes. Based on information from CCTV, fire detection and other devices that pinpoint the nature and location of a hazard, it can select the safest and fastest route for occupants and an appointed system operator within the building is given the opportunity to accept or reject this recommendation, so that occupants can be directed accordingly.

Unlike 'active' and 'dynamic' systems, Eaton's technology is fully adaptable and its instructions can be modified in real-time. It has been extensively tested and conforms with current regulatory requirements, although the technology is so new that standards are still to be fully defined.

From Static to Adaptive Evacuation

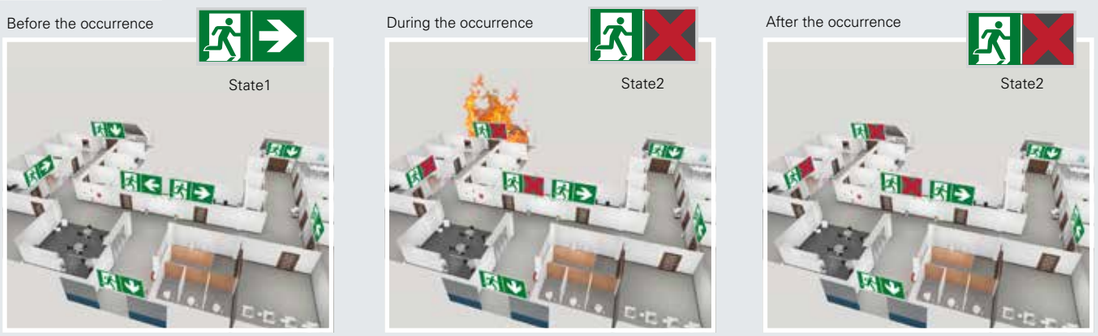
Types of Emeregncy lighting systems

STATIC

Lacking in movement, action, or change

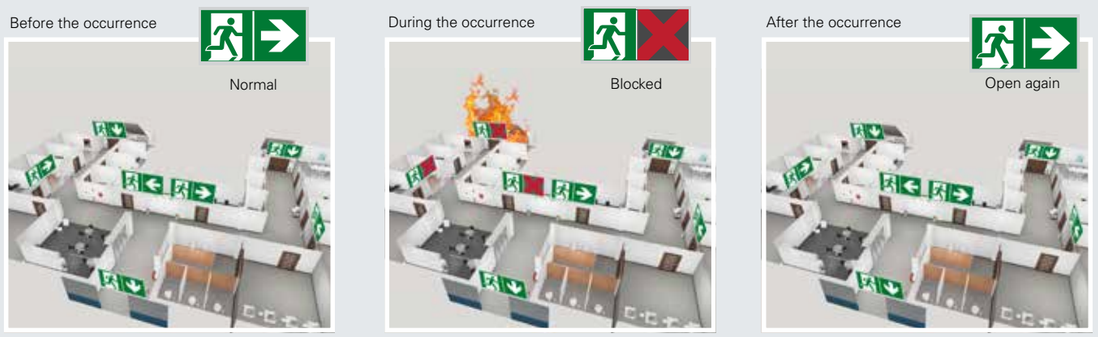
DYNAMIC

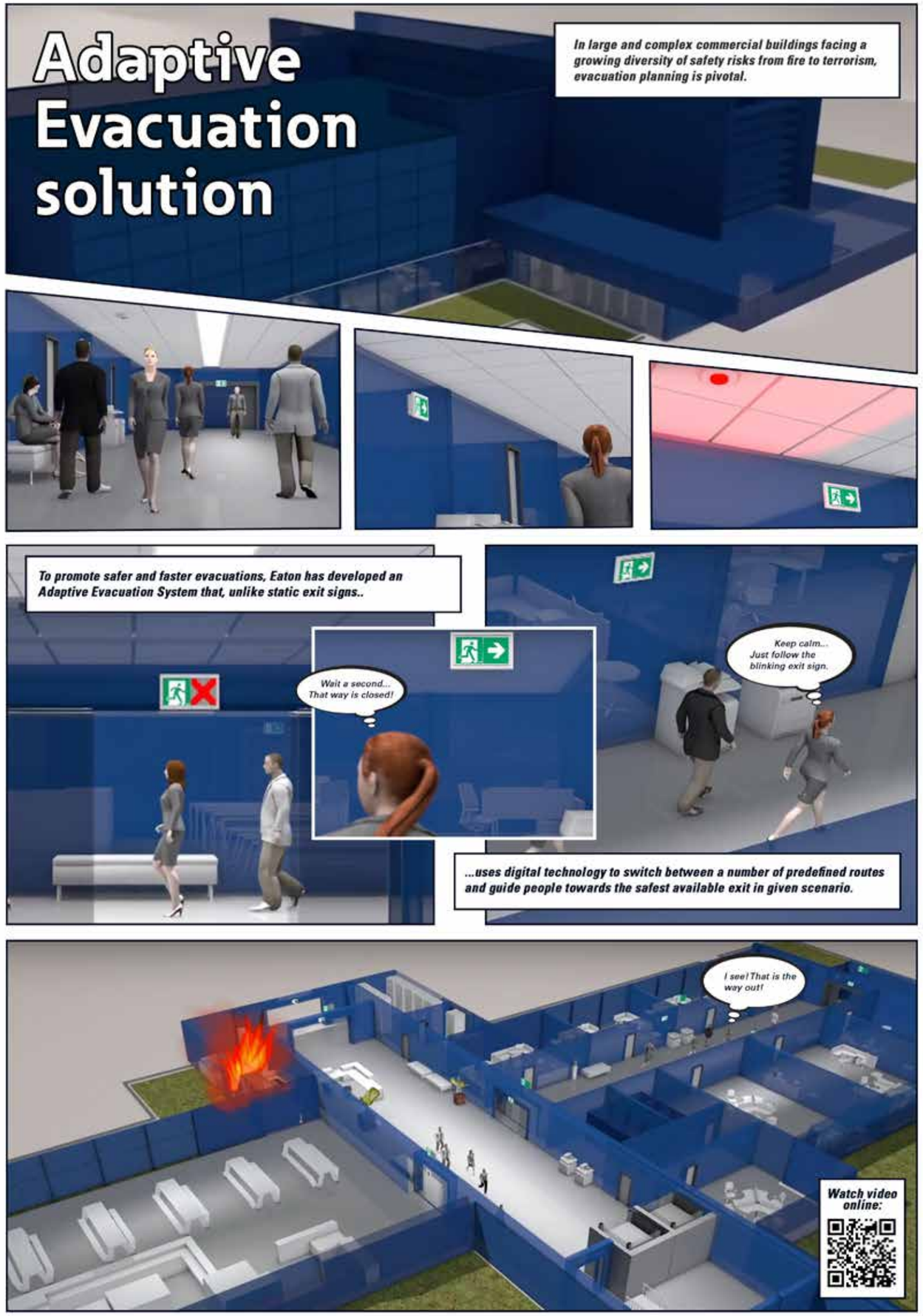
Characterised by a change, activity, or progress



ADAPTIVE

Capable of changing in response to changes in environment.





From Static to Adaptive Evacuation

1. Evacuation situation
with one exit blocked by works

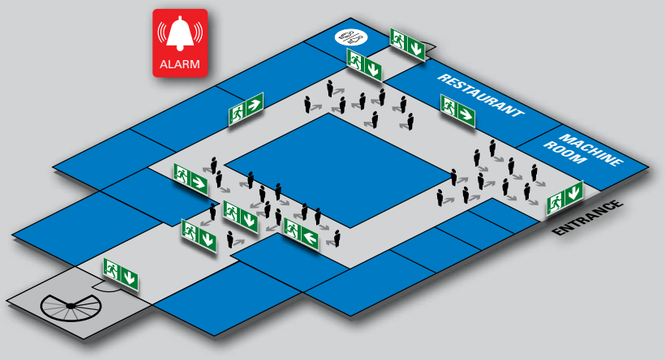
2. Evacuation situation
with one exit blocked by works and a high risk area
on the other side of the building

3. High risk situation
with need to contain people in a safe room

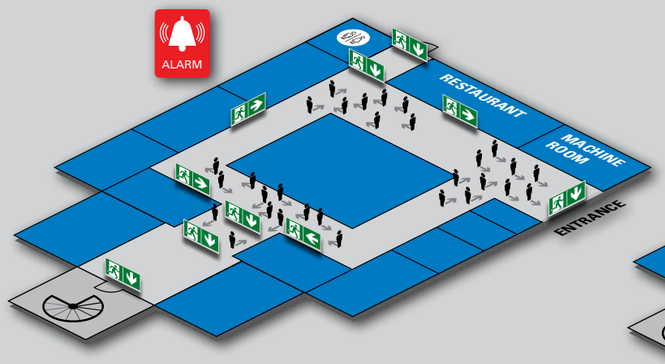
Static Emergency lighting (current state)

During an emergency situation, panic is heightened and decision-making can be impaired. This can lead to congestion, delays and, in some instances, guide people to unsafe places.

Research into crowd behaviour and advances in scenario-modelling technology have highlighted the need for evacuation strategies that are more adaptable to differing circumstances and buildings.



In a standard configuration, the exit signs positioned in accordance with the regulations indicate nearest exit.



Some research results show that people normally use the entrance they entered the building during an emergency, often leading to overcrowded exit routes and slower evacuation time.

Standard escape route signage will lead people to the nearest exit without taking into account the current situation.

- Public
- Shops
- High risk area
- Emergency exit
- Blinking luminaire

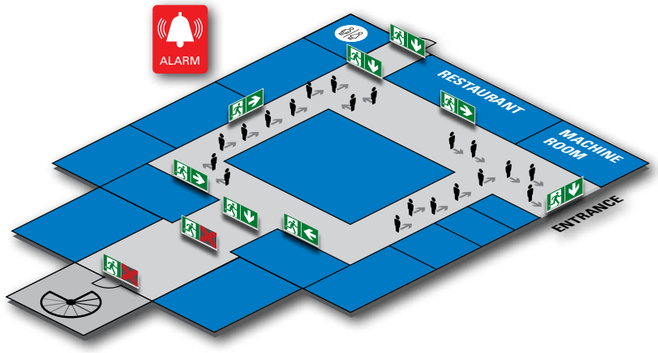
Adaptive Evacuation

Eaton has developed an **Adaptive Evacuation** System that is capable of switching between a number of predefined routes and guiding people towards the safest exit.

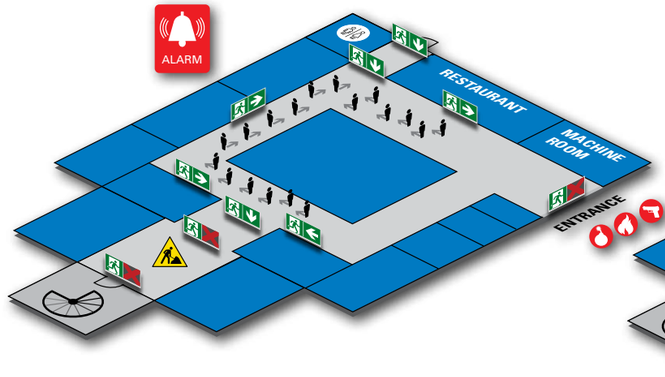
The Matrix luminaire can show either different arrow directions or a red cross depending on predefined scenarios.

The red cross functionality is particularly effective when keeping people confined to one place is the safest option (such as during attacks in schools).

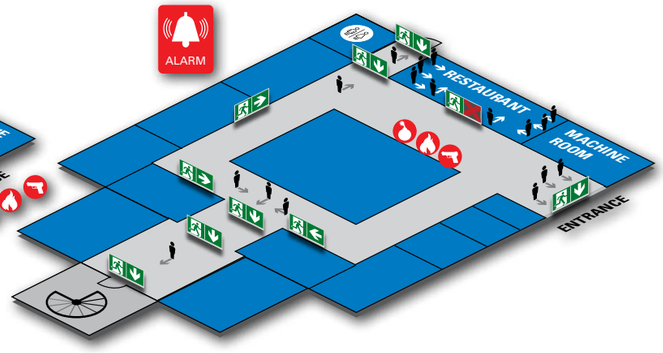
Matrix is equipped with a new **Increased Affordance** functionality (IA) which enables even better recognition by flashing or animated arrows.



In evacuation mode, exit routes can be highlighted with a dynamic sign (blinking sign) for better visibility and though all exit routes can be found more easily.



In case of blocked exit routes (because of works or any other incident), people will be redirected to the safe route.



When containment measures need to be taken, Matrix CGLine+ will not only lead to but also keep people in a safe place.

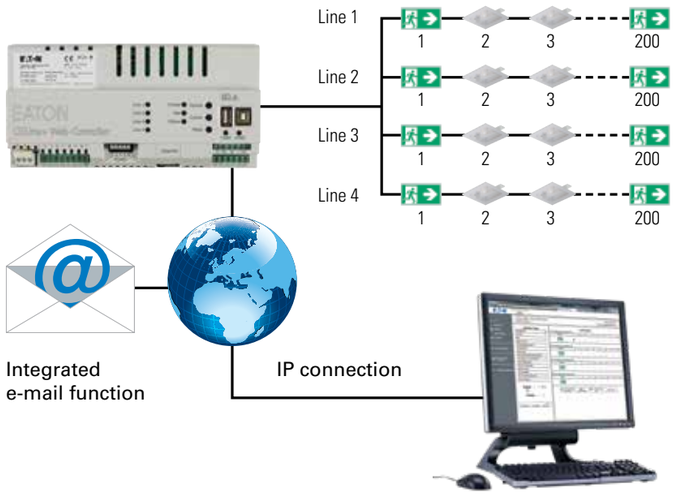
Self-Contained CGLine+

The Matrix CGLine+ is an adaptive escape sign luminaire that enables real-time adjustment of exit routes according to the nature and location of a hazard. Matrix CGLine+ can adjust the direction of the arrow it displays, with the aim of improving the speed and safety of emergency evacuations in commercial buildings

The self-contained Matrix escape sign luminaire displays an arrow that can point in any one of four different directions. The additional ability to scroll the arrow from one side to the other increases its visual impact among the general population and helps to alert people with hearing impairments. It can also display a red cross to indicate that a particular exit route has become closed, blocked or dangerous.

Scenario active

Default mode



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Eaton's Adaptive Evacuation Solutions.

Central Power Supply

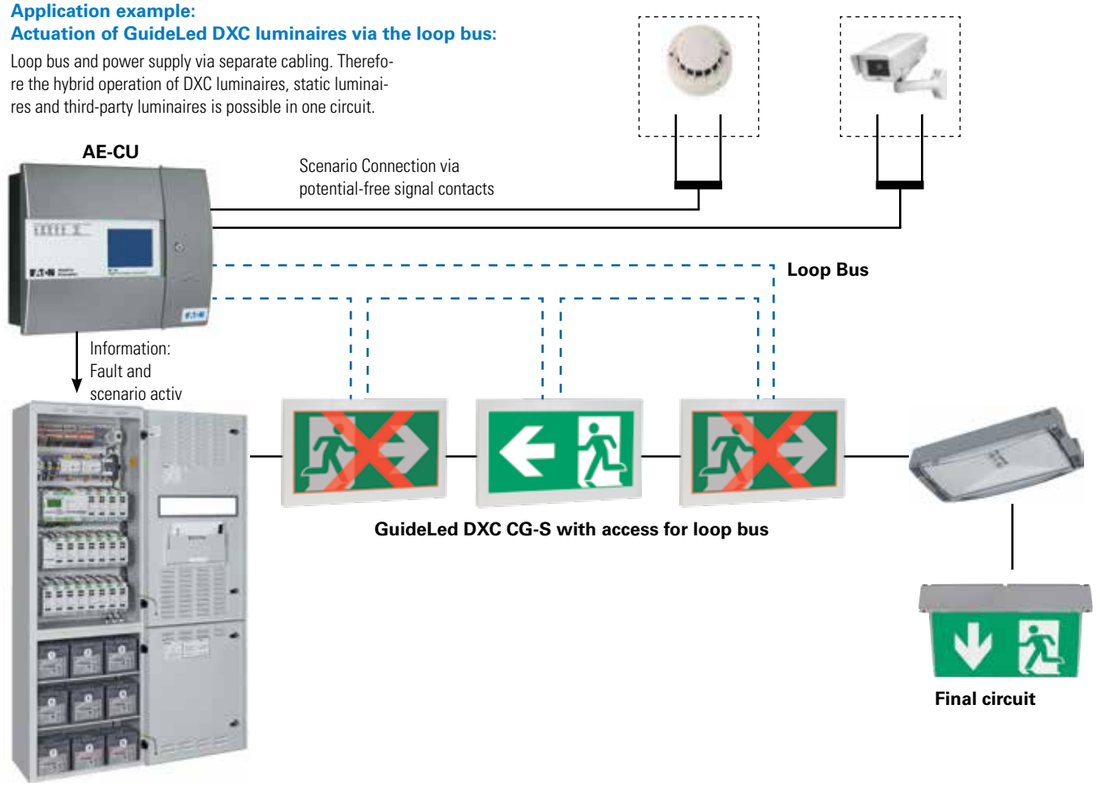
System-technical measures for ensuring self-rescue in cases of evacuation have top priority in dynamic hazard situations. AE-CU technology in combination with GuideLed DXC exit sign luminaires enable dynamic danger situations such as in cases of fire, attacks or natural catastrophes to be actively responded to. The shortest route out of a building is not always the safest.

The control unit with non-volatile program memory and large touch display automatically monitors and controls all components in the AE-CU system as well as the functionality of the connected adaptive luminaires. Faults occurring are shown on the display, forwarded via signal contacts and saved to an inspection book.

As well as providing a dependable supply of power (230V AC/220 V DC) to safety and exit luminaires, the central battery system ZB-S tests itself automatically and individually monitors each CG-S luminaire (up to 20 per circuit), and it does all this using the power supply cable alone

Application example:
Actuation of GuideLed DXC luminaires via the loop bus:

Loop bus and power supply via separate cabling. Therefore the hybrid operation of DXC luminaires, static luminaires and third-party luminaires is possible in one circuit.



Matrix CGLine+ luminaire

The Matrix CGLine+ is an adaptive escape sign luminaire that enables **real-time adjustment** of exit routes according to the nature and location of a hazard. Matrix CGLine+ can **adjust the direction of the arrow** it displays, with the aim of **improving the speed and safety of emergency evacuations** in commercial buildings.

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...for flexible signage

Matrix is the first exit sign luminaire which can be configured in order to show a different evacuation direction (4 different arrows) or prohibit access to works zones or dangerous areas (red cross) without additional parts or pictogram foils.

The luminaire can work for 1 and 3 h emergency duration, this makes the planning easy and keeps the variance on stock low.

The luminaire is available with IP42 and IP65 and can therefore be used in normal indoor conditions and also in areas with higher level of dirt and humidity.

More of the capability of the Matrix will be used with the scenarios which can be activated locally with a universal switch input which can react e.g. on a contact at a fire sensor. With rotary switches the standard and the scenario pictogram can be chosen.

... for signage adapted to the situation

The full function of the Matrix is used in combination with the AE CGLine+ system. Here the arrow in standard mode and for up to 30 different scenarios can be easily programmed via the PC-software and will be applied via the AE CGLine+ web-controller.

AE CGLine+ Web-Controller

...for better visibility

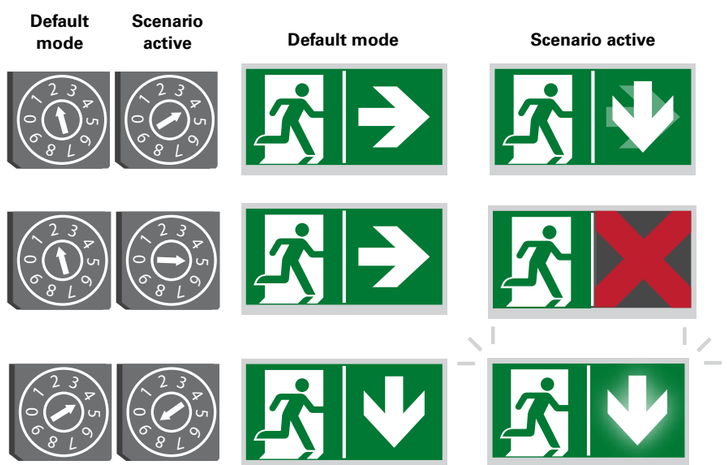
The scenario pictogram options include the dynamic sign, which means that the arrow can be animated or blinking and the red cross can bee static or blinking. This will make the luminaire more visible and help people in case of an evacuation to find the right way instinctively.

The luminaire has a high luminance of more than 1000 cd/m² and with that it can be easily recognised in bright surroundings.

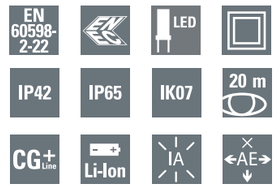
...for low operation costs

It is equipped with an eco-friendly and reliable Li-Ion battery with improved power consumption due to less self-discharge and optimized charging technology. The complete design is made for 10 years maintenance free operation.

Rotary switches on the luminaire



Matrix CGLine+ luminaire

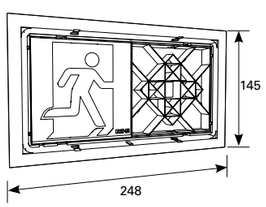


Matrix 20m CGLine+

- Escape sign luminaire with Matrix technology for changeable signage
- Can be used for standard exit route signage as an universal exit sign
- Without need for changing any pictogram foils or plates and with a selectable operating time (1 or 3h operation) it is an all-in-one solution in line with the European emergency lighting standards or for increased visibility by animated signage
- Especially for adaptive evacuation (AE) which means the luminaire can change its signage dependent on an event. With this the luminaire can redirect people to an safe exit route or block an unsafe route
- For connection to CGLine+ systems and adaptive evacuation AE CGLine+
- The signage can be changed via a switching contact at the luminaire connected to e.g. a smoke detector or panic switch or it can be programmed and controlled via AE CGLine+ system
- Reliable LED solution with high service lifetime and a very good perceptibility on account of high luminance of the white contrasting colour > 1000 cd/m²
- Environmentally-friendly due to modern lithium ion technology
- Robust design made from impact resistance polycarbonate with an IK grade of 07
- Available with IP42 and IP65 ingress protection (IP65 variant including two cable glands)
- Several cable entries on top and back for through-wiring of power and bus cable
- In addition to the automatic tests, manual tests can be started with a magnet
- Simple fault analysis and status display via bicolor LED
- Blocking function prevents unintended discharge during idle operating times (only with CGLine+ WEB-Controller)

Matrix CGLine+

Dimensional drawings (mm)



Luminous flux Φ_E/Φ_N at end of rated operating time	100% - 1 h 40% - 3 h
Testing system	Automatic test in compliance with EN 62034 Connection possible to the CGLine+ monitoring system
Type of mounting	Wall surface-mounting
Housing material	Polycarbonate
Housing colour	White
Weight	IP42 : 0,6 IP65 : 0,7
Degree of protection	IP42, IP65
Terminals	Screwless terminals (L, L', N, PE, CGLine+ bus) for flexible and rigid wires From 0.5 to 2.5 mm²
Connection voltage	230V ~ 50/60Hz
Permissible ambient temperature	+5°C to +35°C
Battery	3.6 V / 3.3 Ah Li-Ion
Light source	LED array

Ordering details

Order N°	Product	Viewing Distance	Duration	Consumption
40071777002	Matrix 1-3h CGLine+ IP42	20m	1/3h	6.6 W / 13.8 VA
40071777003	Matrix 1-3h CGLine+ IP65	20m	1/3h	6.6 W / 13.8 VA

Display possibilities with rotary switches:

Options "Default mode"

0	1	2	3	4	5
■	←	→	↑	↓	✕

Options "Scenario active"

						Arrows animated (IA functionality)*			
0	1	2	3	4	5	6	7	8	9
■	←	→	↑	↓	✕	←	→	↑	↓

*In combination with AE CGLine+ Web-Controller the Matrix can also show blinking arrows

Functions & Benefits

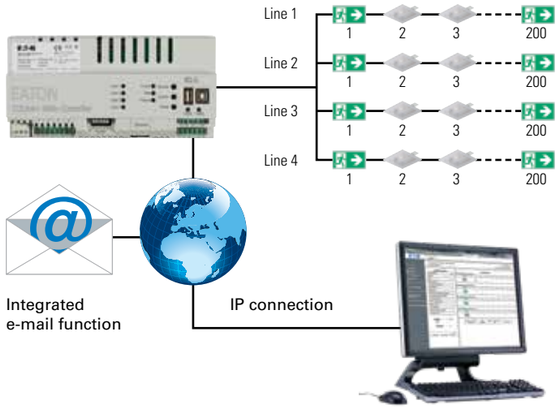
The CGLine+ system is a powerful system, perfectly in line with emergency lighting standards and regulations, that makes the operation of self-contained luminaire systems safe and convenient.The new CGLine+ Web-Controller can visualise a total of 800 CGLine+ luminaires.

Maintaining an overview is important if there are a large number of luminaires. Luminaires of each line can be allocated to up to 8 zones (up to 16 zones in case of installing only two lines).

The zones can be areas where the luminaires need to be brought together, for example on a floor, in an area or in a room.

Safety under control worldwide

An integrated web server is available for convenient visualization, control and monitoring of all connected CGLine+ luminaires. The controller can be accessed from any PC with an IP connection and a regular web browser without requiring any special software.



Automatic e-mail notification in case of faults

The integrated e-mail service automatically sends e-mails to up to ten recipients in case of allocatable events, for example in case of critical status. The aim of this function is to actively notify without delay those persons responsible for building safety about any faults, even if they have no direct connection with the controller at that point in time.

Tests are not forgotten, and are carried out at the right intervals for maximum safety

The timing and the intervals of regular function and duration tests can be conveniently and precisely set down to the minute,ensuring that the equipment is ready for operation at any time during the operating hours of the building. All test results are stored in the electronic log book for at least four years, in compliance with standards.

CGLine+ Bus

The communication of all data and commands takes place using the CGLine+ bus installed in a free topology using a two-wire unshielded cable.

Please ask for the dedicated CGLine+ brochure for detailed information about all features provided by the CGLine+ system.

Easy planning & commissioning

The AE CGLine+ system can combine standard CGLine+ luminaires and luminaires with Increased affordance functionality or a flexible solution with a changeable display like the Matrix CGLine+. Thus, there is only one system for standard emergency lighting and adaptive evacuation which means less installation effort and less complexity when planning and commissioning.

High range back-up

The system has an internal power back-up for the controller in order to be able to react to the trigger even though the mains supply might be broken.

The back-up supply is designed to keep the controller working for at least 3 hours with the maximum possible 800 luminaires connected to the 4 lines.

The function of the back-up is monitored and failure information will be submitted to the Controller if maintenance is required.

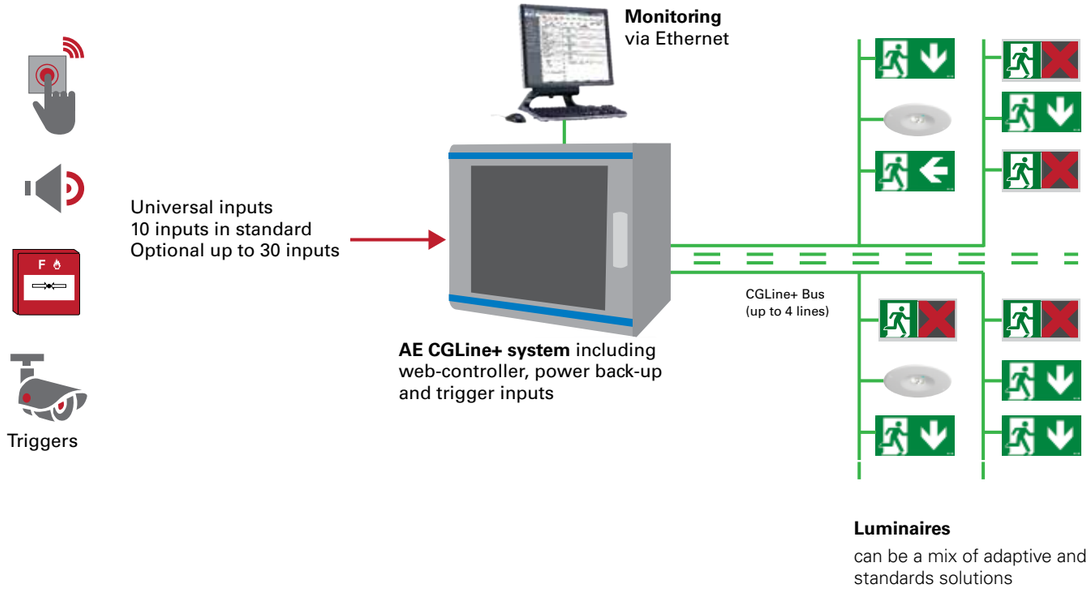
Long life system and low operating cost

The battery and charging technology of the back-up power supply ensures a long life time of the system. The electronics are designed for lowest losses, resulting in low operating cost. The battery can be easily replaced in order to keep the system ready in the shortest time.

Use any trigger you need

Dry contacts allow the connection of any trigger (Fire, CCTV, etc.) regardless the manufacturer, to the Eaton AE system. Commonly used, dry contacts are an easy and safe way of communication without the need for special protocols or gateways.

AE CGLine+ System configuration:



Luminaires

can be a mix of adaptive and standards solutions

AE-CU with loop bus technology

Performance

From static to adaptive escape route guidance

System-technical measures for ensuring self-rescue in cases of evacuation have top priority in dynamic hazard situations. AE-CU technology in combination with GuideLed DXC exit sign luminaires enable dynamic danger situations such as in cases of fire, attacks or natural catastrophes to be actively responded to. The shortest route out of a building is not always the safest.

The AE-CU system reliably triggers up to 240 adaptive exit sign luminaires via a short circuit and open circuit resistant loop bus.

The hazard scenario can be freely assigned to each adaptive exit sign luminaire via the AE-CU.

The control unit with nonvolatile program memory and large touch display automatically monitors and controls all components in the AE-CU system as well as the functionality of the connected adaptive luminaires. Faults occurring are shown on the display, forwarded via signal contacts and saved to an inspection book.

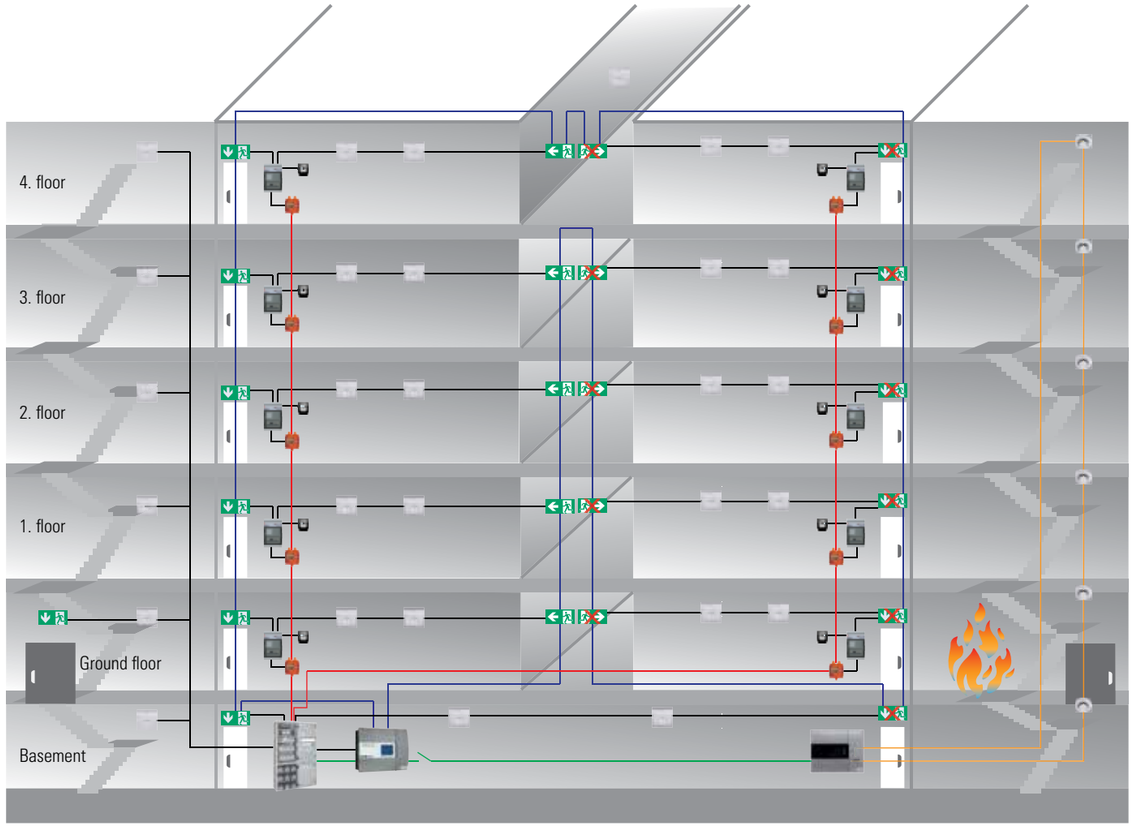
An integrated search function automatically detects all GuideLed DXC exit sign luminaires connected up during installation. Connection of central visualization is possible via an interface.

Features:

- Short circuit and open circuit resistant loop bus technology. This means no E30 cable routing of the loop bus line is required becau- se these are fail-safe with the first fault case.
- Adaptive actuation upon modification of the hazard situation. This provides increased levels of safety when a building is evacuated.
- Decentral configuration of the AE-CU for up to 240 GuideLed DXC exit sign luminaires. This enables flexible, low-cost planning.
- Due to separate cable routing of the 230V end circuits and 24V loop bus line to the adaptive GuideLed DXC exit sign lu- minaires, the hybrid operation of static and adaptive exit sign luminaires and the integration of escape luminaires and lumi- naires for general lighting is possible in the same circuit.
- Separate operating units for safety lighting and for the programming of scenarios provides increa- sed safety with subsequent modifications.
- Networking the AE-CU with EATON fire detection technology provides system integrity between alerting and evacuation.
- Self-addressing of the connected DXC luminaires simpli- fies the process for installation and commissioning.

AE-CU with loop bus technology

Installation example



* Due to simplifocation, only one circuit is shown pro fire zone/staircase/flat


= adaptive exit sign luminaire


= active adaptive exit sign luminaire


= escape luminaire


= central fire alarm system


= fire detector


= meter reader

= Luminaire circuit*

= loop bus

= fire detection bus

= E30 cable

= detection scenario

AE-CU with loop bus technology

Safe escape route

Adaptive escape sign luminaires for building evacuation as a supportive system-technical measure.

In hazard situations caused by e.g. fire, attacks, techni- cal plant faults (e.g. gas accidents) and natural catast- rophes, only safe escape routes should be used.

Static escape route guidance:

Exit sign luminaires designate the escape route out of the building always in the same direction, **independently** of a danger situation.

Dynamic escape route guidance:

Exit sign luminaires **block** unsafe escape routes in eva- cuation situations, thereby guiding those fleeing out of the building via the safe escape routes.

Adaptive escape route guidance:

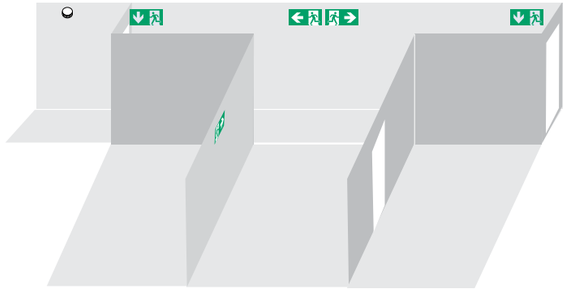
Exit sign luminaires **block** unsafe escape routes and **release these as soon as they become safe again.**

This enables dynamic hazard situations (e.g. in case of fire or attacks) to be flexibly responded to.

Aim of protection:

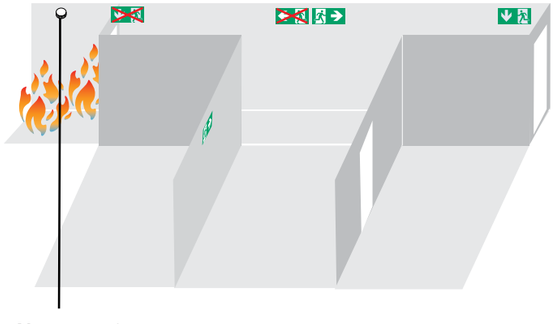
Safe self-rescue to ensure that rescue forces can take care of injured or disabled persons.

Before the occurrence:



Exit sign luminaires shows the fastest exit route.

During the occurrence:



Alarm e.g. via:

Fire detector,
video monitoring,
locking systems,
evacuation systems

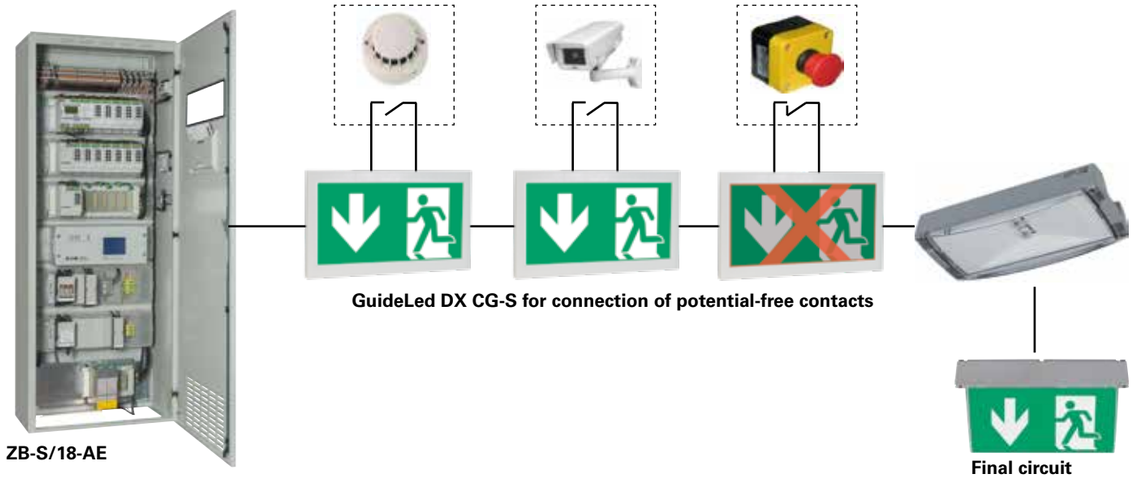
Exit sign luminaires block the unsafe exit route as they receive an information of e.g. a Fire detector, video monitoring, locking systems, evacuation systems. The safest exit route out of the building is now shown.

AE-CU with loop bus technology

Application example

Application example:
Triggering of GuideLed DX luminaires via potential-free contacts:

Potential-free signal contacts of fire detectors, CCTV or key switches to indicate areas as „locked, blocked or unsafe". As an example for areas where entry is forbidden for a specific time due to constructi- on measures. Parallel connection of the DX inputs is not possible.



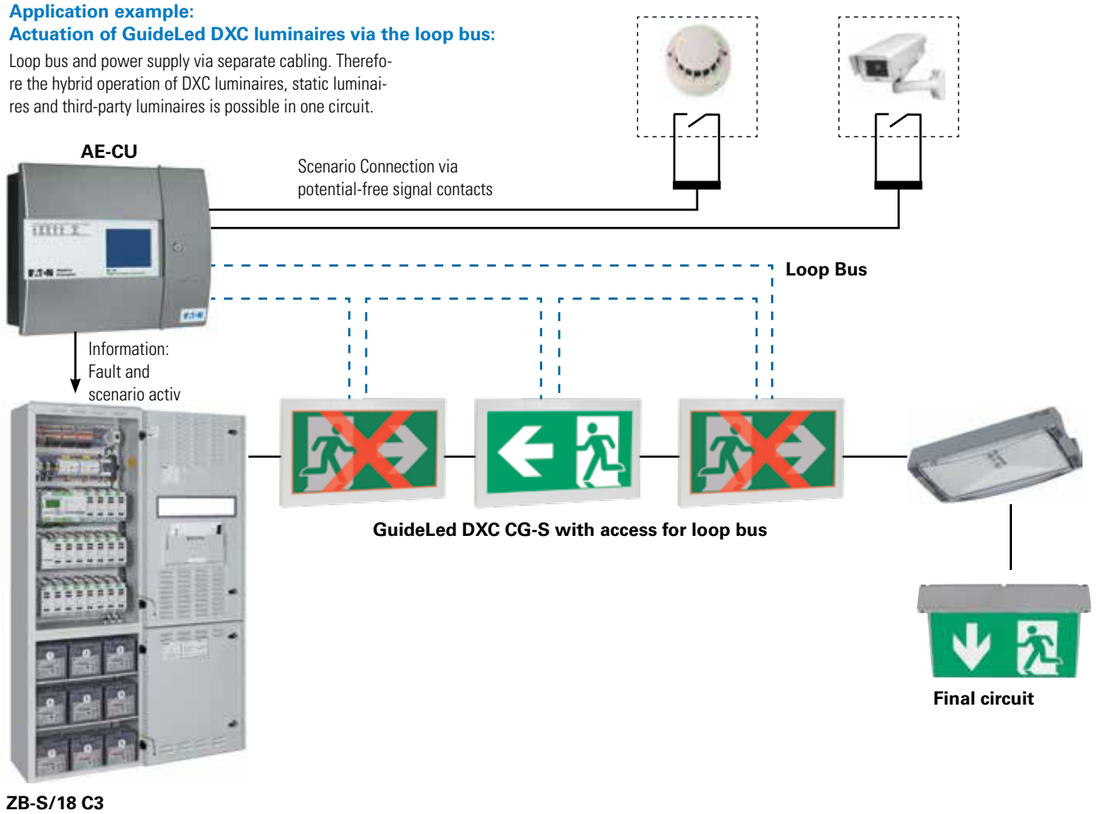
ZB-S/18-AE

GuideLed DX CG-S for connection of potential-free contacts

Final circuit

Application example:
Actuation of GuideLed DXC luminaires via the loop bus:

Loop bus and power supply via separate cabling. Therefo- re the hybrid operation of DXC luminaires, static luminai- res and third-party luminaires is possible in one circuit.



ZB-S/18 C3

GuideLed DXC CG-S with access for loop bus

Final circuit

Final circuit

AE-CU with loop bus technology

control matrix

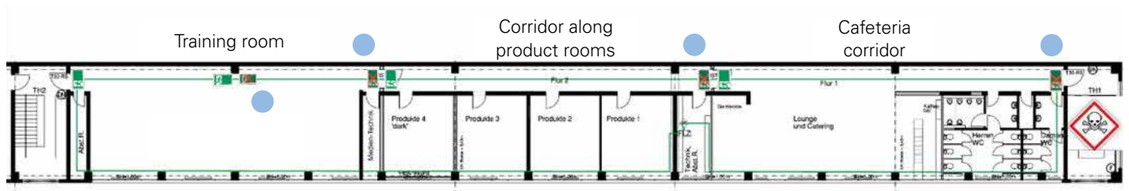
Application example:
Short circuit and open circuit resistant loop bus technology

short circuit-isolated separation

still safeguarded via loop communication
after isolation of the short circuit

AE-CU control matrix

Example: Client training center at a workplace



No.	Luminaire description: / Scenario:	SC 1 blocked	Corridor 1 + Cafeteria blocked	Corridor 2 + product rooms blocked	Training room blocked	SC 2 blocked
	Corridor 1, at door to SC 1	X				
	Corridor 1, at door to corridor 2			X	X	X
	Corridor 2, at door to corridor 1	X	X			
	Corridor 2, at door to training room				X	X
	Training room at door to corridor 2	X	X	X		
	Training room middle direction corridor 2	X	X	X		
	Training room middle direction SC 2					X
	Training room at door to SC 2					X

GuideLed 10011 DX CG-S

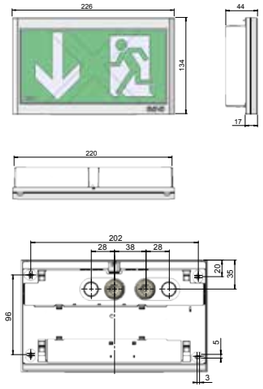
Wall mounting

GuideLed DX 10011 CG-S

- Escape sign luminaire with LED Lightguide technology for wall-mounting
- Additional function: Displaying a red 'X' to signify an area as closed or blocked
- **DX: activation via a switching input on the supply module e.g. smoke detector or panic switch via potential free contact**
- For adaption to the respective ambient conditions, the power supply module is equipped with different selectable operating modes, e.g. static or flashing red 'X'
- Very good perceptibility on account of high luminance of the white contrasting colour > 500 cd/m² in keeping with standard ISO 3864-1 and high uniformity Lmin/Lmax > 0.8
- Reduced battery costs on account of especially low power consumption
- Minimum service requirement due to high service life of the LEDs (50,000 hours)
- Installation of the LED pictogram without tools on the mounting set
- Without power supply: still visible pictogramm

GuideLed DX 10011 CG-S

Dimensions in mm



Please observe a distance of
10 mm above for mounting!

Viewing distance	20 m
Luminous Φ_E/Φ_N at the end of rated operating time (EBLF)	100 %
Housing material	PC, PMMA
Housing colour	Light grey RAL 7035
Weight	0.65 kg
Type of mounting	Wall mounting
Connection terminal	Mains 3 x 2 x 2.5 mm² Switch input 2 x 2 x 1.5 mm²
Connection voltage	220 - 240 V AC, 50/60 Hz 176 V - 275 V DC
Current consumption - battery operation (220 V)	7 mA
Power consumption mains operation (apparent power / effective power)	4.7 VA / 2.2 W
Inrush current	1.5 A
Permissible ambient temperature	-20 °C to +40 °C
Light source	LED batten

Ordering details - fastening set

Type	Scope of supply (LED pictograms must ordered seperate)	Order No.
GuideLed DX 10011 CG-S	Wall mounting set for GuideLed DX 10011 CG-S, Surface mounting, including LED supply with additional switching input and CG-S technology (20 addresses)	40071354646

Ordering details - LED pictograms (fastening set required)

Type	Scope of supply	Order No.
PL acc. to ISO 7010 [1]	LED piktogram for GuideLed DX/DXC 10011 CG-S, arrow left (PL), acc. to ISO 7010, 20 m	40071355550
PR acc. to ISO 7010 [1]	LED piktogram for GuideLed DX/DXC 10011 CG-S, arrow right (PR), acc. to ISO 7010, 20 m	40071355551
PU, acc. to ISO 7010 [1]	LED piktogram for GuideLed DX/DXC 10011 CG-S, arrow down (PU), acc. to ISO 7010, 20 m	40071355552
PO acc. to ISO 7010 [1]	LED piktogram for GuideLed DX/DXC 10011 CG-S, arrow up (PO), acc. to ISO 7010, 20 m	40071355553

[1] with additional option: red X

GuideLed 10011 DXC CG-S

Wall mounting

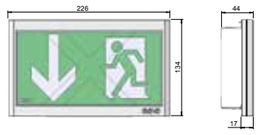
20 m | LED | IP20 | DIN 4844 | STAR

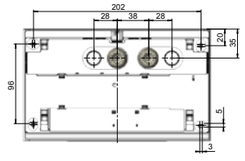
GuideLed DX 10011 CG-S

- Escape sign luminaire with LED Lightguide technology for wall-mounting
- Additional function: Displaying a red 'X' to signify an area as closed or blocked
- **DX: activation via a switching input on the supply module e.g. smoke detector or panic switch via potential free contact**
- For adaption to the respective ambient conditions, the power supply module is equipped with different selectable operating modes, e.g. static or flashing red 'X'
- Very good perceptibility on account of high luminance of the white contrasting colour > 500 cd/m² in keeping with standard ISO 3864-1 and high uniformity Lmin/Lmax > 0.8
- Reduced battery costs on account of especially low power consumption
- Minimum service requirement due to high service life of the LEDs (50,000 hours)
- Installation of the LED pictogram without tools on the mounting set
- Without power supply: still visible pictogramm

GuideLed DX 10011 CG-S

Dimensions in mm





Please observe a distance of 10 mm above for mounting!

Viewing distance	20 m
Luminous Φ_E/Φ_N at the end of rated operating time (EBLF)	100 %
Housing material	PC, PMMA
Housing colour	Light grey RAL 7035
Weight	0.65 kg
Type of mounting	Wall mounting
Connection terminal	Mains 3 x 2 x 2.5 mm² Switch input 2 x 2 x 1.5 mm²
Connection voltage	220 - 240 V AC, 50/60 Hz 176 V - 275 V DC
Current consumption - battery operation (220 V)	7 mA
Power consumption mains operation (apparent power / effective power)	4.7 VA / 2.2 W
Inrush current	1.5 A
Permissible ambient temperature	-20 °C to +40 °C
Light source	LED batten

Ordering details - fastening set

Type	Scope of supply (LED pictograms must ordered seperate)	Order No.
GuideLed DX 10011 CG-S	Wall mounting set for GuideLed DX 10011 CG-S, Surface mounting, including LED supply with additional switching input and CG-S technology (20 addresses)	40071354646

Ordering details - LED pictograms (fastening set required)

Type	Scope of supply	Order No.
PL acc. to ISO 7010 [1]	LED piktogram for GuideLed DX/DXC 10011 CG-S, arrow left (PL), acc. to ISO 7010, 20 m	40071355550
PR acc. to ISO 7010 [1]	LED piktogram for GuideLed DX/DXC 10011 CG-S, arrow right (PR), acc. to ISO 7010, 20 m	40071355551
PU, acc. to ISO 7010 [1]	LED piktogram for GuideLed DX/DXC 10011 CG-S, arrow down (PU), acc. to ISO 7010, 20 m	40071355552
PO acc. to ISO 7010 [1]	LED piktogram for GuideLed DX/DXC 10011 CG-S, arrow up (PO), acc. to ISO 7010, 20 m	40071355553

AE-CU with loop bus technology

Overview device variants

AE-CU-W

AE-CU-E for integration in ZB-S/18-AE

AE-CU Relay modul

AE-CU

- AE-CU for the adaptive control of up to 240 GuideLed DXC luminaires
- Four short circuit and open circuit resistant loop lines each with 60 GuideLED DXC luminaires
- Two scenarios freely programmable for building evacuation, factory provided integrated
- More than two scenarios on request
- A maximum of six ZB-S/US-S systems can be connected per AE-CU. More than six ZB-S systems on request
- Automatic software address-setting of all GuideLed DXC luminaires for scenario control

1 LED displays:

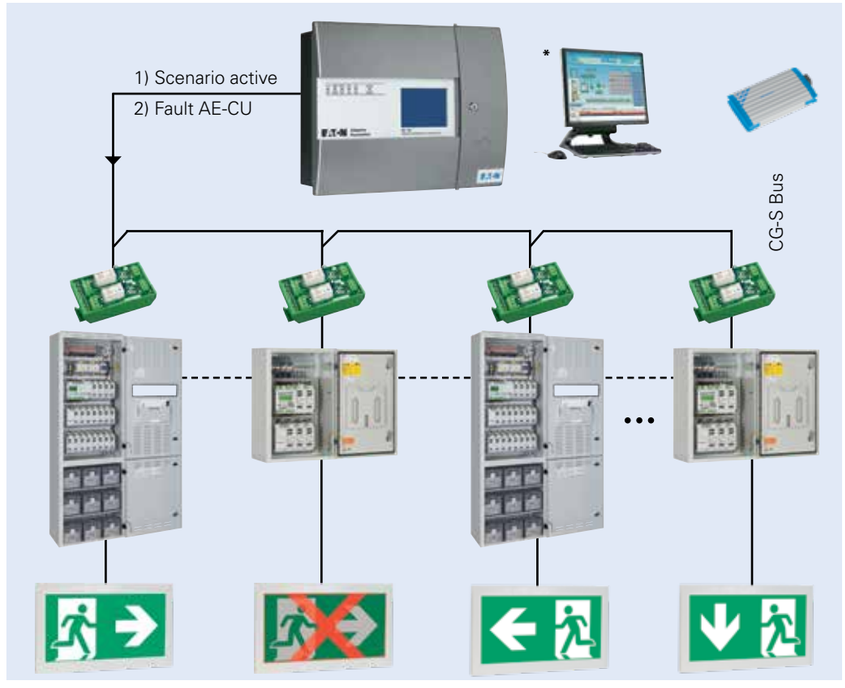
Power On, Scenario Active, General Fault, CPU Fault, Power Fault, General Disablement

2 Touch display, operating messages:

Scenario Active, Fault, Disablement

3 Fault messages:

Battery fault (AE-CU wall assembly), double address, earth fault, loop short circuit, charge fault, mains fault, loop communication fault, loop driver fault, trouble fault relay, CPU fault, loop overload, loop break at address, break -loop +loop



* At connection of a CGVision the messages „Scenario active" and „sum failure AE-CU"are shown on the control unit of the systems and on the CGVision. This messages are also listed in the test book with date and time.

AE-CU with loop bus technology

AE-CU wall housing

AE-CU-W

AE-CU-W

Adaptive Evacuation Control Unit for wall mounting with integrated battery-supported power supply using loop technique for controlling addressable adaptive exit sign luminaires with 230V / 216V AC/DC technology for safety lighting systems acc. to DIN VDE 0100-560, DIN EN 50172 and V DIN V VDE 0108-100. With automatic testing device and monitoring of loop bus communication and individual display of condition and name of loop BUS connection per GuideLed DXC luminaire.

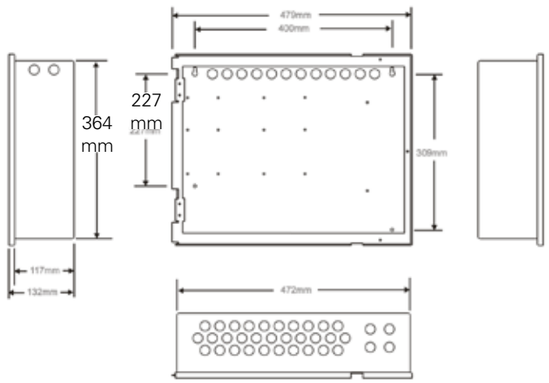
Primary rated voltage	230 V AC +10%, -15%
Primary rated current	75 mA
Nominal frequency	50 Hz
Protection rating	IP 30
Insulation class	I
Ambient temperature	-5°C to+40°C
Secondary rated voltage	18,5 V - 29,5 V
Battery	2 x 12 V / 12 Ah
Max. battery current	3.5 A
Charge characteristic	Constant voltage temperature-compensated
Min. backup power time	30 h
Weight with battery	14 kg
Dimensions (HxWxD in mm)	395 x 495 x 180
Basic housing material	Sheet steel, powder-coated
Material of front	Plastic
Inputs	
Addressable loop line	4
Scenario active inputs	2 (more on request)
Maximum ring length	2,000 m / I(ST)Y 4 x 2 x 0.8 mm
Maximum number of GuideLed DX/ DXC luminaires per loop	60
Outputs	
Zero-potential changeover contact	2
Contact load	24 V / 1 A
Fuse	1.35 A

Ordering details

Type	Scope of supply	Order No.
AE-CU-W*	Surface- / Recessed mounted wall housing	40071361359

*note: not suitable for AT-S+ and LP-STAR systems

Dimensions in mm



AE-CU with loop bus technology

AE-CU 19" recessed housing / relay modul

AE-CU-E

AE-CU-E

Adaptive Evacuation Control Unit for assembly in ZB-S/18-AE units using loop technique for controlling addressable adaptive exit sign luminaires with 230V / 216V AC/DC technology for safety lighting sys- tems acc. to DIN VDE 0100-560, DIN EN 50172 and V DIN V VDE 0108-100. With automatic testing de- vice and monitoring of loop bus communication and individual display of condition and name of loop BUS connection per GuideLed DXC luminaire.

Primary rated voltage	28.5 V/ DC
Primary rated current	4.2 A
Protection rating	IP 20
Insulation class	I
Ambient temperature	-5°C to+40°C
Secondary rated voltage	18.5 V- 29.6 V
Weight	8 kg
Dimensions (HxWxD in mm)	200 x 500 x 190
Material	Sheet steel, powder-coated
Inputs	
Addressable loop line	4
Scenario active inputs	2 (more on request)
Maximum ring length	2,000 m / I(ST)Y 4 x 2 x 0.8 mm
Maximum number of GuideLed DX/ DXC luminaires per loop	60
Outputs	
Zero-potential changeover contact	2
Contact load	24 V / 1 A
Fuse	1.35 A

Ordering details

Type	Scope of supply	Order No.
AE-CU-E*	Installation variant for ZB-S/18-AE	40071361360

Relay module

AE-CU-E

Information units ‚scenario active' and ‚fault' are reported to the ZB-S by the AE-CU via the relay mo- dule (installed in a ZB-S/US-S). Six ZB-S/US-S can be connected per AE-CU. More on request.

Ordering details

Type	Scope of supply	Order No.
Relay module	Relay module connection set for use per ZB-S/US-S for connection to a AE-CU	40071361422

AE-CU with loop bus technology

Description

AE-CU-W

AE-CU-W

Adaptive Evacuation Control Unit AE-CU-W for wall mounting with integrated battery-supported power supply using loop technique for controlling addressable adaptive exit sign luminaires with 230V / 216V AC/DC technology for safety lighting systems acc. to DIN VDE 0100-560, DIN EN 50172 and V DIN V VDE 0108-100. With automatic testing device and monitoring of loop bus communication and individual display of condition and name of loop BUS connection per GuideLed DXC luminaire.

Developed, manufactured and tested according to ISO 9001.

Pre-equipped for connection of 4 short circuit-resistant and open circuit resistant, faile-safe loop lines each for control of 60 adaptive exit sign luminaires and recording of two scenarios (more scenarios on request).

Free assignment of two scenarios for each individual adaptive exit sign luminaire via RS 232 interface and Windows-based configuration software.

Touchscreen display for display of operating states and operation of the controller.

Slot for network card

2 monitored outputs for scenario active for BMS connection

1 potential-free changeover contact General fault for BMS connection

1 x RS 232 interface

1 interface for optional protocol printer

Earth fault monitoring

Technical data:

Mains voltage: 230 V AC / 50 Hz

Power supply unit: 24 V DC / 3.0 A

Emergency power supply: 2 x 12 V / 12 Ah

Dimensions: W 497 x H 397 x D 180 mm

Type: CEAG AE-CU-W

Manufacturer: EATON

AE-CU-E

AE-CU-E

Adaptive Evacuation Control Unit AE-CU-E for assembly in ZB-S/18-AE units using loop technique for controlling addressable adaptive exit sign luminaires with 230V / 216V AC/DC technology for safety lighting systems acc. to DIN VDE 0100-560, DIN EN 50172 and V DIN V VDE 0108-100. With automatic testing device and monitoring of loop bus communication and individual display of condition and name of loop BUS connection per GuideLed DXC luminaire.

Developed, manufactured and tested according to ISO 9001.

Pre-equipped for connection of 4 short circuit-resistant and open circuit resistant, faile-safe loop lines each for control of 60 adaptive exit sign luminaires and recording of two scenarios (more scenarios on request).

Free assignment of two scenarios for each individual adaptive exit sign luminaire via RS 232 interface and Windows-based configuration software.

Touchscreen display for display of operating states and operation of the controller.

Slot for network card

2 monitored outputs for scenario active for BMS connection

1 potential-free changeover contact General fault for BMS connection

1 x RS 232 interface

Earth fault monitoring

Technical data:

Supply voltage: 28,5 V DC

Dimensions: W 500 x H 200 x D 180 mm

Type: CEAG AE-CU-E

Manufacturer: EATON

Relay module

Relay module

Relay module for top hat rail installation, for connection of a central battery system of type ZB-S to the AE-CU via two zero-potential changeover contacts. With LED display for switching state of the relay.

Technical data:

Operating voltage: 22 V DC to 26 V DC

Current consumption: 7 - 9 mA

Ambient temperature: -0°C to +55°C

SELV protection

Material: PCB material, PC for the plastic parts

Maximum of six relay modules per AE-CU

Dimensions: H 77 x W 45 x D 40 mm

Type: CEAG Relay module

Manufacturer: EATON

Programming, commissioning and instruction

Programming and commissioning of the AE-CU by CEAG Service after successful installation by the electrical contractor and presentation of the scenario control matrix. Instruction of operating personnel regarding AE-CU device functionality.

Type: Programming, commissioning and instruction

Manufacturer: EATON

AE-CU with loop bus technology

GuideLed 10011 DX CG-S

GuideLed 10011 DX CG-S

GuideLed DX/DXC 10011 CG-S for parallel wall mounting

GuideLed 10011 DX CG-S

One-sided LED exit sign luminaire in keeping with German / European standards EN 60598-1, DIN EN 60598-2-22, DIN

4844-1 and DIN EN 1838 with additional function for displaying a red 'X' to signify an area as closed or blocked. With wall surface mounting set.

Exit sign in LED lightguide technology for especially uniform and

bright illuminationof the pictogram:

Lm >= 500 cd/m² of the white contrasting colour and

Lm >= 200 cd/m² across the entire pictogram

Uniformity Lmin/Lmax > 0.8.

Additional lightguide for displaying a red 'X'.

Increased visibility possible in bright surroundings with complex visual distractions via additional selectable function modes, e.g. flashing red 'X'.

Additionally, the escape sign will be dimmed during display of red 'X'.

High service life ensured by optimised LED operating conditions.

Increased safety ensured by use of high life time LEDs and optimized LED operating conditions.

Minimum service requirement due to high service life of the LEDs (50 000 hours).

With high light efficiency > 110 lm/W for reduced connected load.

Reduced battery costs on account of especially low power consumption.

Without power supply: still visible pictogramm.

Slender design with low mounting height of only 44 mm including pictogram and mounting set.

Installation of the LED pictogram without tools on the surface mounting set.

Special LED converter with integrated monitoring module for single luminaire monitoring with 20-digit address switches and additional switch input for connection to Eaton's Adaptive Evacuation with use of the EATON AE-CU, dataline and bus module or connection to local input, e.g. smoke detector.

Mixed operation of the connection systems (maintained light, non-maintained light and switched maintained light within a circuit without additional data or actuating cables to the luminares is possible in combination with suitable group or central battery systems with STAR technology.

Viewing distance: 20 m

Luminous flux at the end of the rated service time: 100%

Housing material: PC, PMMA Housing colour:

light grey RAL 7035

Connection terminal: Mains 3 x 2 x 2.5 mm²

Switch input 2 x 2 x 1.5 mm²

Supply voltage:

220- 240 VAC, 50/60 Hz /

176- 275 VDC

Current consumption- battery operation:

16 mA

Power consumption- mains operation: 8,0 VA / 3,9 W

Protection Class: II

Degree of protection: IP 20

Permissible ambient temperature:

-20° Celsius to +40° Celsius

Dimensions including wall mounting set:

W = 226, H = 134, D = 44

Type: CEAG GuideLed 10011 DX CG-S

Manufacturer: EATON

AE-CU with loop bus technology

GuideLed 10011 DXC CG-S

GuideLed 10011 DXC CG-S

GuideLed 10011 DXC CG-S

One-sided LED exit sign luminaire in keeping with German / European standards EN 60598-1, DIN EN 60598-2-22, DIN

4844-1 and DIN EN 1838 with additional function for displaying a red 'X' to signify an area as closed or blocked.

With wall surface mounting set. Integrated bus interface for connection to an AE CU controller.

Exit sign in LED lightguide technology for especially uniform and bright illuminationof the pictogram:

Lm >= 500 cd/m² of the white contrasting colour and

Lm >= 200 cd/m² across the entire pictogram

Uniformity Lmin/Lmax > 0.8.

Additional lightguide for displaying a red 'X'.

Increased visibility possible in bright surroundings with complex visual distractions via additional selectable function modes, e.g. flashing red 'X'.

Additionally, the escape sign will be dimmed during display of red 'X'.

High service life ensured by optimised LED operating conditions.

Increased safety ensured by use of high life time LEDs and optimized LED operating conditions.

Minimum service requirement due to high service life of the LEDs (50 000 hours).

With high light efficiency > 110 lm/W for reduced connected load.

Reduced battery costs on account of especially low power consumption.

Without power supply: still visible pictogramm.

Slender design with low mounting height of only 44 mm including pictogram and mounting set.

Installation of the LED pictogram without tools on the surface mounting set.

Special LED converter with integrated monitoring module for single luminaire monitoring with 20-digit address switches and additional bus interface for connection to Eaton's Adaptive Evacuation with use of the EATON AE-CU.

Mixed operation of the connection systems (maintained light, non-maintained light and switched maintained light within a circuit without additional data or actuating cables to the luminaires is possible in combination with suitable group or central battery systems with STAR technology.

Viewing distance: 20 m

Luminous flux at the end of the rated service time: 100%

Housing material: PC, PMMA
Housing colour:

light grey RAL 7035

Connection terminal: Mains 3 x 2 x 2.5 mm²

Bus interface 2 x 2 x 1.5 mm²
Supply voltage:

220- 240 VAC, 50/60 Hz /

176- 275 VDC

Current consumption- battery operation: 16 mA

Power consumption- mains operation: 8,0 VA / 3,9 W

Protection Class: II

Degree of protection: IP 20

Permissible ambient temperature:

-20° Celsius to +40° Celsius

Dimensions including wall mounting set:

W = 226, H = 134, D = 44

Type: CEAG GuideLed 10011 DXC CG-S

Manufacturer: EATON

Detect

As a business critical issue, you'll need to work with fire safety experts. You can count on us to help protect your people, reputation and property.

Alert

Our wide range of products include audible and visual alarms, mass notification systems and specialist systems for people with disabilities.

Evacuate

It's essential you're informed about evacuation plans and procedures. The following articles are designed to help you stay up-to-date.

Eaton is a power management company with 2018 sales of $21.6 billion. We provide energy-efficient solutions that help our customers effectively manage electrical, hydraulic and mechanical power more efficiently, safely and sustainably. Eaton is dedicated to improving the quality of life and the environment through the use of power management technologies and services. Eaton has approximately 99,000 employees and sells products to customers in more than 175 countries.

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