



# EvacGo

## Consultant's Specification

**Scope of work:**

To design, supply, install, commission and maintain evacuation alert systems (EACIE) for use by fire and rescue services in buildings containing flats

The EvacGo system shall include all materials, equipment and wiring required to install the complete evacuation alert system. The system shall include but not be limited to one or more control panels, audible and visual alarm indicating devices and relays.

The system components shall fully support the Axis EN device protocol.

The installation shall include the laying of all cables required for connection of the alarm indicating and other devices, along with connections to the power supply as appropriate to the design. All cabling shall conform to the requirements and recommendations of the control panel manufacturer in line with your current COP. Any openings/chasings in walls, ceilings or floors shall be made good.

The system shall be designed such that no more than 80% of the available signalling / loop capacity is employed to allow for future requirements or changes to the system.

Normative references:

EN54-1:2011	Introduction
EN54-2:1997 +A1:2006	Control and indicating equipment
EN54-3:2001 +A1:2002 +A2:2006	Audible alarm devices
EN54-4:1997 +A1:2002 +A2:2006	Power supply equipment
EN54-17:2005	Short-circuit isolators
EN54-18:2005	Input/output devices
EN54-23:2010	Visual alarm devices
EN54-25:2008	Components using radio links
BS8629	Code of Practice
BS8629:2019	Code of Practice

The operation and functions described in this document are for guidance only.

The EvacGo evacuation alert system shall be designed, installed and commissioned in accordance with the BS-8629:2019 Code of Practice and BS-5839: Part1:2017.

The responsible company should be able to demonstrate their competence to design, install and commission the system, e.g. by certification to BAFE SP207, LPS1014 or another applicable national scheme.

The equipment manufacturer shall operate a quality management system in accordance with ISO 9001:2000. In addition, the equipment shall be manufactured under a recognised factory control procedure such as the Vds scheme.

All evacuation alert devices used shall be independently certified as complying with the relevant EN54 standard.

## **Standards applicable to the 'Evacuation Alert Control & Indicating Equipment' (EACIE)**

### **Enclosure/cabinet**

The vandal-resistant cabinet shall be constructed of high-tensile steel finished to RAL 9006 silver grey and shall be certified to STS 205 Issue 4/BR2. A red label approximately 200 mm square with a flame symbol and the words "For Fire and Rescue Service Use Only" shall be firmly fixed to the front door of the EACIE.

### **Locking mechanism**

The cabinet shall incorporate a high-security lock to EN 1303:2015. The locking mechanism shall be operated by copy-protected keys that are carried by the FRS, and the supply of spare or replacement keys shall be strictly controlled in order to prevent operation/access by unauthorised persons.

The Building Safety Manager shall ensure that keys used for maintenance purposes are controlled so that they are readily available to authorised/trained users. The Building Safety Manager shall also ensure that keys are available for maintenance purposes and are returned promptly after use.

The locking mechanism shall incorporate:

- Solid steel construction, with locking bars extending across lock body for additional strength.
- A patented cylinder system that provides four thousand million key combinations so that each lock is unique.
- Anti-drill cylinder formed of several composites of metal – HSS – Hard Soft System (patented) with anti-glue facility; cylinder cannot be extracted.
- Two anti-hacksaw locking bars each containing two hardened steel rollers.

## **EvacGo Control & Indicating Equipment (EACIE)**

### **Functional description**

The EvacGo CIE shall be the central controller of the complete system. It shall receive and process analogue information from the evacuation alert devices, providing audible and visual indication of evacuation.

The EvacGo CIE cabinet will reveal controls and indicators for Fire and Rescue Service use only. Service and maintenance controls and indicators shall not be visible, and access provided via a dedicated key lock.

It shall be easy to configure all basic operating characteristics and variables through the virtual user interface on the CIE to satisfy the detection zone and output mapping of the building. A PC tool operating under the Windows™ operating system shall also be available to fully program the panel.

The EvacGo CIE shall support up to 240 address/devices on the signalling loop. The CIE shall fully support the sub-addressing capabilities of the relevant output devices.

The EvacGo CIE shall contain one to four signalling loop drivers depending on the system design requirements. Each signalling loop shall be capable of supplying at least 500mA of power for evacuation alert devices or any other output devices for DDA purposes.

The EvacGo CIE shall fully support the sub-addressing capabilities of loop devices incorporating this feature and any radio-based devices within the loop protocol.

The EvacGo CIE must provide system integrity thus ensuring:

- Enhanced monitoring of ALL loop circuits
- Detection of a fault which may not be visible until an alarm condition
- Ability to select/program for specified current consumption for individual circuits.

The EvacGo CIE shall provide a diagnostic monitoring feature for all signalling loop, alarm device output and auxiliary supply output circuits to monitor voltage, current load etc. This information shall be documented and available to view at Level 2. In addition, diagnostic monitoring of the signalling loop return current pulses shall be provided at Level 3.

The EvacGo CIE shall incorporate a real-time clock for time stamping events in the event history log and for scheduling of time-related functions.

A single EvacGo CIE shall have the capability to configure and operate 32 evacuation alert zones. In a network system, the overall system shall have the capability for up to 2000 zones.

All fault conditions (except CPU system fault) shall be non-latching.

It shall be possible to install a network communications card to allow the connection of up to 200 control panels or other peripheral devices. The network shall offer peer-to-peer operation and have a fault-tolerant capability. The time to propagate an evacuation alert condition across the network shall not exceed three seconds.

Updates to the EvacGo CIE operating software shall be simple to undertake and shall not require the use of replaceable components. The operating program and configuration memory shall be stored in non-volatile memory and shall not rely on batteries for retention. The EvacGo CIE shall incorporate separate microprocessors for signalling loop control and central operation.

## Panel construction

The EvacGo CIE shall be of metal construction. It shall be capable of surface mounting. Wiring terminations are to be situated towards the rear of the unit.

The internal housing shall meet IP30 minimum ingress protection classification finished in RAL 7035. It shall not be possible to open the enclosure without a key or special tool.

## Panel indications

The EvacGo CIE shall be equipped with a virtual display for service and maintenance use only.

The virtual display shall be simultaneously capable of indicating the presence of evacuation alerts, faults and tests in accordance with the requirements of EN54-2.

In addition, the virtual display should have the following minimum LED indicators provided in accordance with the requirements of EN54-2:

Power On	Green
Evacuation Alert	Red
Fault	Yellow
Disabled	Yellow
Test	Yellow
Fire Routing Activated	Yellow
Fire Routing Disabled	Yellow
Fire Routing Fault	Yellow
Pre-Alarm	Yellow
Fire Protection Activated	Red
Sounders Silenced	Yellow
Sounders Disabled	Yellow
Sounder Fault	Yellow
System Fault	Yellow
Delayed	Yellow

## Firefighter controls

The EvacGo CIE shall be provided with the following minimum manual controls:

- Silence fault button
- Evacuate toggle (sound alarms in evacuation zone)
- Green high-intensity LED indication for power healthy
- Yellow high-intensity LED indication for power fault
- Yellow high-intensity LED indication for general fault
- Red high-intensity LED indication for evacuate zone activated
- Yellow high-intensity LED indication for evacuation zone in fault
- Slide-in label for text location, customisable on site if required change by local fire brigade.

## Networking

The EvacGo CIE shall be capable of networking up to 200 network nodes on a secure fault-tolerant network.

A zoning facility will allow the networked system to share up to 2000 zones and true peer-to-peer, cross-panel reporting, control and site-wide cause and effect functionality.

Simply adding and connecting a network card will allow any node/control panel or remote terminal to be networked. All other nodes on the system will be instantly aware of a panel as soon as it is given a valid network node address, allowing additional panels to be added at any time with a minimum amount of reprogramming and the facility to prevent the transmission of fires or faults during commissioning on network systems.

For cause and effect, any input device can be programmed to operate any output device on any panel and, to simplify the programming, all the configuration data is contained within one user-friendly network configuration file.

## **Software**

A PC Configuration Tool shall be available for configuration of the EvacGo CIE and for retention of configuration data.

The PC Configuration Tool shall be graphically based and operate under Windows 10™ operating systems.

Software features shall include:

### **Configuration Tool**

- Virtual terminal
- Up to 200 configurable evacuation alert zones/output groups per panel.

### **Service Tool**

- Download system information
- 5000 memory event log
- Provide a device history of every device – last activated, tested, when created
- Extract event log information
- Provide operational defined reports in the event of an incident.

## **Configuration**

It shall be possible to configure ALL basic configuration parameters and settings from the EvacGo virtual display or from the PC Configuration Tool. Both serial and USB connections from the EACIE to the PC are to be available. It shall be permitted to configure enhanced/extended features and functions from the PC Configuration Tool only.

## **Power supplies**

All power supplies (integral to the Evacuation Alert control panel or remote) shall be certified to EN54-4 and shall be capable of supporting 72-hour standby requirements. The EACIE shall have a built-in or remote battery temperature sensor. Battery voltage, temperature and charging voltage should be visible on the virtual display without the need to remove or measure any cables.

All power supplies shall be capable of operating from a mains supply of 200-240VAC 50/60Hz.

## **Additional System Components**

### **Service and maintenance**

Maintenance features included within each EvacGo CIE shall include:

- Dedicated key lock for maintenance use only
- Ability to provide device history for every device (date created, last test, last activated)
- Ability to view software versions of all PCBs on the control panel
- Ability to enable zone test(s) and sounder self-test
- Cross-network viewing of each panel's status
- Ability to view battery charger and temperature
- Ability to view loop voltages and current.

### **Evacuation alert devices**

The system shall be compatible with, and fully capable of using, all of the features of the following AV detection, alarm indicating and other devices.

The devices shall be independently certified as complying with requirements of EN54 Part 3, 5, 7, 11, 13, 17, 18, 23 & 25. The independent approvals body shall be the British Standards Institute (BSI), Loss Prevention Certification Board (LPCB) or Vertrauen durch Sicherheit (VDS).

In addition to the basic requirements of EN54, the system shall offer the following optional features with requirements:

- The system must utilise digital transmission techniques combined with suitable error checking and fast response capability using flag setting and grouping options.
- All devices must use soft and safe addressing methods with the address held in non-volatile memory within the main body of the device.
- There must be provision on the addressable loop for a capacity of at least 240 separate device addresses, each with a capability for control and monitoring.
- All devices shall incorporate bi-directional short-circuit isolators, offer low current consumption of less than 100 $\mu$ A.
- The alarm devices shall be capable of being supplied in either red or white.

### **Output modules (DDA interface)**

The protocol must utilise digital transmission techniques combined with suitable error checking and fast response capability using flag setting and grouping options.

Devices must use soft and safe addressing methods with the address held in non-volatile memory within the main body of the device.

The device shall provide bi-colour LED status indication under panel control that can flash green if preferred under normal conditions, but which will illuminate red under alarm activation.

Devices shall incorporate bi-directional short-circuit isolators.

The line modules must offer low current consumption of less than 250 $\mu$ A in quiescent and nominal 6mA in alarm conditions.

The line modules shall be third-party certified to both EN54-18 and EN54-17.

The output module variants should include both volt-free changeover relay and fully supervised load switching versions, both rated 30VDC 2A.

The device shall allow interrogation remotely via the panel or via a hand-held programmer to determine status and production data.

Line modules shall be available in a choice of mechanical housings to cater for different application needs, including surface-mount and mini "in box" options.

Line modules shall be provided with pluggable terminal blocks to aid field-wiring termination.

Device software shall feature a distinctive type ID to allow the panel configuration software to identify the device type for group monitoring and control purposes.

### **Wall sounders**

The protocol must utilise digital transmission techniques combined with suitable error checking and fast response capability using flag setting and grouping options.

The device must use soft and safe addressing methods with the address held in non-volatile memory within the main body of the device.

Devices shall incorporate bi-directional short-circuit isolators.

The wall sounder must offer low current consumption of less than 100µA in quiescent and nominal 5mA in alarm conditions.

The wall sounder shall be third-party certified to both EN54-3 and EN54-17 (latest editions).

The wall sounder shall provide facility for volume adjustment together with a maximum sound pressure output of up to 100dBA.

The wall sounder shall provide a choice of up to 32 tone settings enabled via software selection through the panel configuration.

Sounder tones shall be capable of being synchronised under panel control.

The device shall allow interrogation remotely via the panel or via a hand-held programmer to determine status and production data.

The wall sounder shall be designed to operate over a system loop voltage range of 15 to 30VDC.

The wall sounder shall provide a surface-mount capability with a back box that incorporates 20mm cable gland connection options.

The wall sounder body shall be moulded from impact-resistant red thermoplastic and IP65 rated as standard.

Device software shall feature a distinctive type ID to allow the panel configuration software to identify the device type for group monitoring and control purposes.

### **Intelligent wireless devices**

All wireless communication shall operate within the radio frequency band 868 whilst offering a choice of at least seven channels within the waveband. Wireless devices shall provide interference monitoring with automatic channel hopping to ensure successful transmission and receipt of communications. The wireless



devices shall incorporate power management software to automatically increase signal strength if required or reduce power to optimise battery life when possible (with programmable override).

All wireless devices shall communicate to the central CIE via wired translator interfaces that transfer wireless messages to the addressable loop and vice versa.

All wireless devices shall be individually addressable.

All wireless traffic shall be encrypted using a proprietary protocol for security and increased system integrity.

### **Wire to wireless translator interface**

The wire to wireless translator devices shall be compliant with and third-party certified by a recognised notified body to both EN54-25 and EN54-18 (and EN54-17 if appropriate).

Translators shall be low-current devices that are powered directly from the addressable loop.

Translators shall act as interfaces between the compatible addressable control panel and a number of addressable wireless devices.

The form of communication between translator and wireless devices shall be bi-directional for enhanced monitoring and control functionality.

The translator shall incorporate a digital display to provide status information, reinforced by LED indicators to aid system maintenance.

It shall be possible to undertake basic configuration tasks using programming buttons designed for engineer access.

A dedicated software program provided by the manufacturer shall provide comprehensive engineer system configuration and monitoring capabilities.

The translator housing shall be protected to IP65 levels to enable mounting in a variety of environmental conditions.

It shall be possible to configure at least 32 wireless devices to each translator.

Translators shall use two orthogonally-positioned aerials to maximise communication efficiency within an application.

### **Wireless wall sounders**

Wireless devices shall be compliant with and third party-certified by a recognised notified body to both EN54-25 and EN54-3.

Wireless devices shall be powered by readily-available primary cells that will support the device fully for at least two years before triggering a first battery-fault condition.

Wireless devices shall be powered by both a primary and secondary battery such that the secondary battery can guarantee full functionality for a period of at least two months after an initial battery low-power fault is generated.

Wireless devices shall provide interference monitoring with automatic channel hopping to ensure successful transmission and receipt of communications.

Wireless devices shall incorporate power-management software to automatically increase signal strength if required or reduce power to optimise battery life when possible (with programmable override).

Wireless devices shall communicate to the central CIE via wired translator interfaces that transfer wireless messages to the addressable loop and vice versa.

Wireless devices shall be individually addressable.

It shall be possible for service engineers to monitor signal strength levels from each wireless device using dedicated computer software provided by the manufacturer.

All wireless traffic shall be encrypted using a proprietary protocol for security and increased system integrity.

Wireless wall sounders shall incorporate an internal status LED indicator.

Wireless wall sounders shall provide a nominal maximum sound pressure output in excess of 98dB.

Wireless wall sounders shall have provision to adjust both sound volume and tone.



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