Firex Stand FI 2010

Integrated Fire Alarms for High Rise Residential Buildings

Fire Alarms in Purpose-Built Blocks

- In the UK a fire alarm is not normally installed in the common areas
- The smoke detectors in corridors are normally only used to operate smoke ventilation systems
- Each flat should have its own domestic alarm to notify the occupant if there is a fire
- Occupants are expected to put the fire out or leave the dwelling and call the Fire and Rescue Service
- Other occupants will not be aware of the fire and so are expected to ‘stay put’

Fire Alarms in Purpose-Built Blocks

- If the alarm is raised by someone outside the flat there could be significant delay and the exact location may not be clear
- The time taken for the FRS to arrive is about eight minutes in urban areas
- The time to locate the fire, set up a bridgehead and get water on the fire can be as long as twenty minutes
- It would be better to call the FRS automatically, provided that false alarms can be avoided

UK Standards and Guidance

Home Office Guidance for Purpose Built Flats

- Assumes occupants will be able to escape and raise the alarm if a fire occurs
- Assumes construction materials and fire stopping will prevent a fire spreading out of the flat of origin
- Says ‘a communal fire detection and alarm system will inevitably lead to a proliferation of false alarms’
- Says ‘the [only] alternative to a “stay put” policy is one involving simultaneous evacuation’
- Says it is ‘unnecessary and undesirable’ for a communal fire alarm system to be provided

Home Office Guidance for Purpose Built Flats

- Says a communal fire alarm should only be used to call a manned alarm receiving centre in ‘unusual circumstances’
- Doesn’t consider the benefits of a communal fire alarm system being used to call the FRS, especially for vulnerable people
- Says if a risk assessment cannot prove the adequacy of the standard of construction it is ‘unduly pessimistic’ for simultaneous evacuation [and a fire alarm] to be adopted and suggests getting a second opinion

UK Fire Alarm Installation Standards BS 5839 parts 1 & 6

- Fire alarms ARE required in individual flats and are covered by BS 5839-6
- Domestic alarm systems should be locally powered and controlled
- The rest of the block is covered by BS 5839-1, which does not have any relevant guidance
- This means that communal systems that ARE installed may not be suitably designed

BS 9991 - Property Protection & Business Continuity

Fire safety in the design, management and use of residential buildings – Code of practice

Annex B (normative) says that a fire that is contained to one dwelling can very easily cause damage that will affect the habitability of other dwellings

“The fire precautions and management should provide adequate control against fire development to protect against *loss of contents, damage to fabric and building services, loss of dwellings and the social cost to the community, need to provide rehousing, loss of personal effects of the tenants, and loss of operational continuity for the business providing the housing”*

The earliest possible response from the FRS can not only help save lives, but can also help save homes, possessions and a lot of disruption - and money!

Requirements for Integrating Fire Alarms in Flats with Communal Alarm Systems

- Fire alarm systems in flats must be designed so that false alarms do not normally occur
- False alarms that do occur must not trigger the communal fire alarm
- Fire alarm systems in flats must be designed so that real fires are recognised quickly
- The communal system must only be triggered by a confirmed fire signal from a flat

Benefits of Integrating Fire Alarms in Flats with Communal Alarm Systems

- An integrated system can be linked to an alarm receiving centre, who will inform the FRS of the exact location of the fire, saving valuable intervention time
- An alarm receiving centre can inform the premises management, who can initiate their own procedures
- An integrated system can also warn occupants who are at immediate risk, leaving everyone else to ‘stay put’
- Fires in unoccupied flats will not go unnoticed
- Faults on domestic systems can be flagged and fixed in a timely manner
- User testing can be monitored and analysed and action taken if necessary

BS 5839-6 Equipment Grades

BS 5839-6 defines six grades of fire alarm

- **F2** - replaceable battery only – *for owner occupied dwellings*
- **F1** - fixed battery with a ten-year life – *for rental dwellings*
- **D2** - mains with a replaceable battery – *for owner occupied dwellings*
- **D1** - mains with fixed ten-year life battery – *for rental dwellings*
- **C** - mains with a control panel and power supply in the flat, monitored wiring and 72-hour standby battery
- **A** - a BS 5839-1 commercial alarm system with a control panel and power supply in the flat, with 72-hour standby battery

BS 5839-6 Coverage Categories

BS 5839-6 defines three categories of coverage

- **LD3** - escape routes only
- **LD2** - escape routes and areas of high risk, such as kitchens and electricity cupboards
- **LD1** - all rooms, including areas of high risk, except toilets and bathrooms

The minimum for new flats is a Grade D1 or D2, Coverage LD2

BS 5839-6 Domestic Fire Alarm Components

‘Typical’ Grade D1 or D2 Fire Alarms

- The most common fire alarms in dwellings
- Each fire alarm is mains-powered with its own battery
- Linked by non fire-rated cable
- The cable and equipment are not monitored for faults
- Smoke, heat and multi-criteria alarms available
- Grade D1 devices have a fixed battery, so the system needs to be replaced every ten years
- The test and silence control is on the ceiling, which can be a problem for those with limited mobility

- Sounder frequency >2kHz does not pass through walls and doors as effectively as commercial sounders, which are <1kHz
- The balcony sounders recommended in BS 9991 are mains-powered but with no standby battery
- Grade D can be linked to a communal system via a simple relay, but this risks unnecessary evacuations due to false alarms

Grade A Fire Alarms

- BS 5839-1 commercial fire alarm system and power supply in each flat
- Fire-rated cables
- Monitored for equipment and wiring faults
- Uses commercial fire detectors and alarm devices
- Can be linked to an alarm receiving centre
- Suitable for life and property protection
- Controls available at floor level
- Controls are complicated to use
- Needs servicing by a third-party, which requires regular access

Grade C Fire Alarms – Hush Pro

- Analogue addressable fire alarm system to BS 5839-6 Annex B
- Uses EN 54 certified commercial fire detectors and sounders
- Linked by non fire-rated cable
- Monitored for equipment and wiring faults
- Can be used wherever Grade D is specified
- Can be stand-alone (as Grade D) or linked to a C-TEC communal system
- Simple ground-level controls for test & silencing
- Suitable for life and property protection

Grade C Fire Alarms – Hush Pro

- Easy to integrate with a C-TEC communal system via a two-way ‘Landlord’s Interface’ in the common area
- Easily connected to a cooker shut-off control
- Easily triggered by a sprinkler flow valve
- Sounders have standby power and can be installed on balconies
- Does not need servicing by a third-party

Avoiding False Alarms

- One solution could be to install a separate heat detector and sounder connected to a communal system in each flat
- Heat detectors will only trigger when the temperature is rising very quickly, which is a reliable indication of a real fire
- This will avoid false alarms of the communal system but will trigger reliably if a fire develops in the escape route of a flat
- However, this wastes valuable intervention time and may be too late for anyone in the flat where the fire started
- Also, BS 5839-1 requires that the communal alarm is serviced regularly, and so access will be needed to every flat at least once a year, which can be difficult

The C-TEC Solution – Hush Pro

- C-TEC use commercial smoke detectors with advanced algorithms that resist false alarms from non-fire sources such as vaping, steam and electrical interference
- However they will trigger if there is enough smoke
- This risk can be virtually eliminated by using multi-sensor fire detectors, where the sensitivity to smoke is reduced unless the temperature measured by an integrated heat sensor confirms there is a real fire
- The absence of false alarms can be verified by monitoring the system via the Cloud

Hush Pro Fire Levels

- Hush Pro has two ‘Fire Levels’….
- **Fire Level 1** (a probable false alarm) sounds the alarm in the flat but is ignored by the communal alarm
- **Fire Level 1** can be silenced at floor level, after which a two-minute timer runs before the alarm re-sounds
- **Fire Level 2** (a confirmed fire) sounds a different alarm and also signals to the communal alarm, which calls the alarm receiving centre
- **Fire Level 2** cannot be silenced

Fire Level 1

Fire Level 1

Triggering a smoke detector or heat detector in the kitchen sounds an alarm in the flat ONLY

The alarm can be hushed for two minutes and will then re-sound

The alarm can be hushed again

Fire Level 2

Fire Level 2

Triggering the heat element of a multi-sensor sounds a different alarm in the flat and reports the fire to the communal system

The FL2 alarm cannot be hushed

The communal system can call the FRS via an alarm receiving centre

The communal system's cause and effects program operates, for instance sounding the alarm in flats in the same corridor

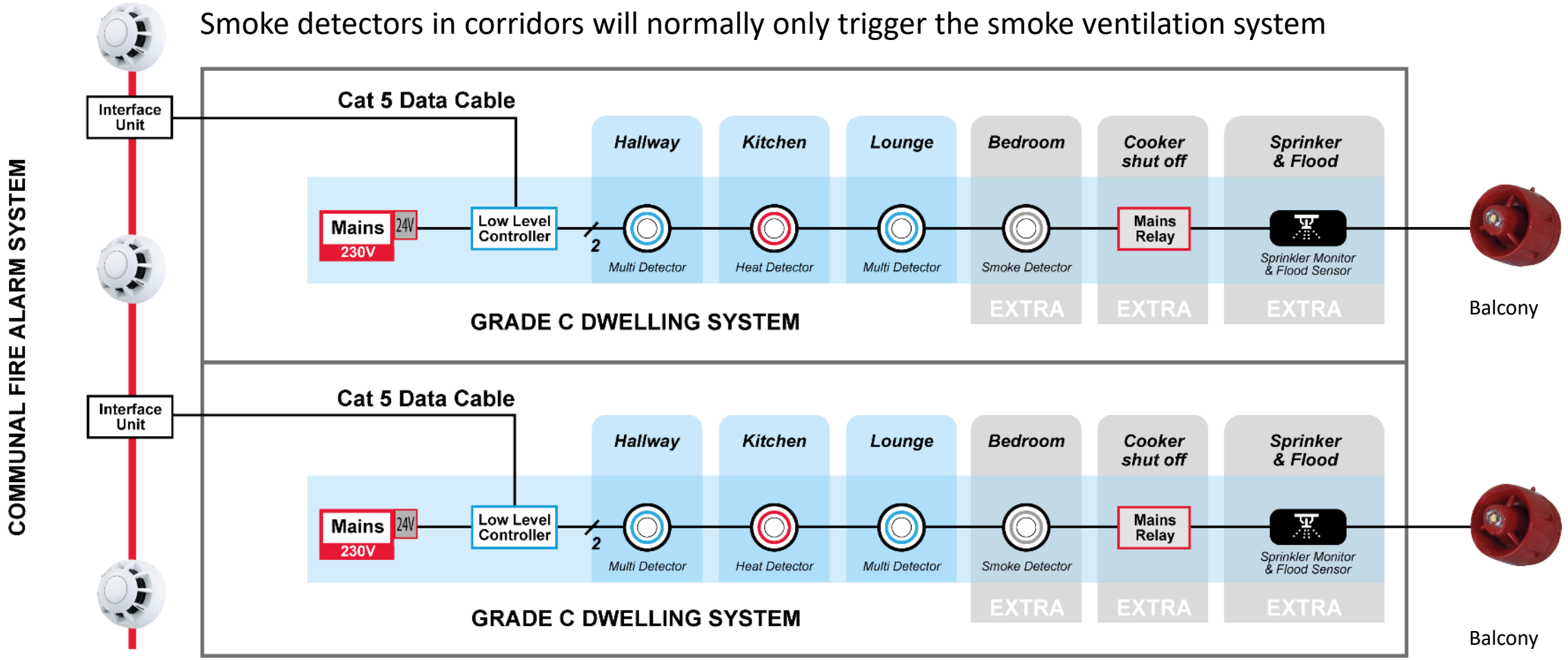
Installing a heat detector in the kitchen and multi-sensors in every other room will give the highest degree of false alarm resistance with the greatest certainty of fast operation in a real fire

Linking Hush Pro to a Communal Alarm

- Hush Pro is linked to the communal fire alarm using a two-way data link to a ‘landlord’s’ interface
- The link has 3000-volt isolation so that damage to the cable or the alarm devices in the flat cannot affect the communal alarm – and vice-versa
- All ‘events’ are recorded in the Cloud, including user tests, faults, Fire Level 1 alarms and Fire Level 2 alarms

Hush-Pro Installation

Smoke detectors in corridors will normally only trigger the smoke ventilation system



Manual Evacuation (Fire Level 3)

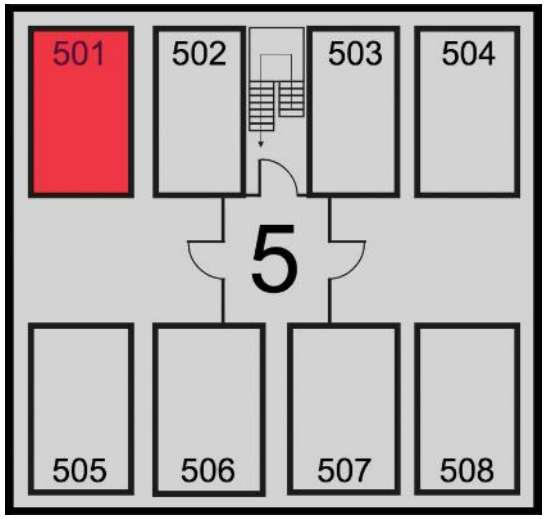
- Hush-Pro and the communal fire alarm system can also be used to provide the functionality of a BS 8629 Evacuation Alert System, but at much lower cost
- Evacuation can be initiated via a BS 8629 compliant controller or via other secure means, such as keyswitches on the communal control panel
- In this case, the Hush-Pro alarm sounders operate as Alert sounders and play a different (Fire Level 3) tone or voice message that overrides FL1 or FL2 signals

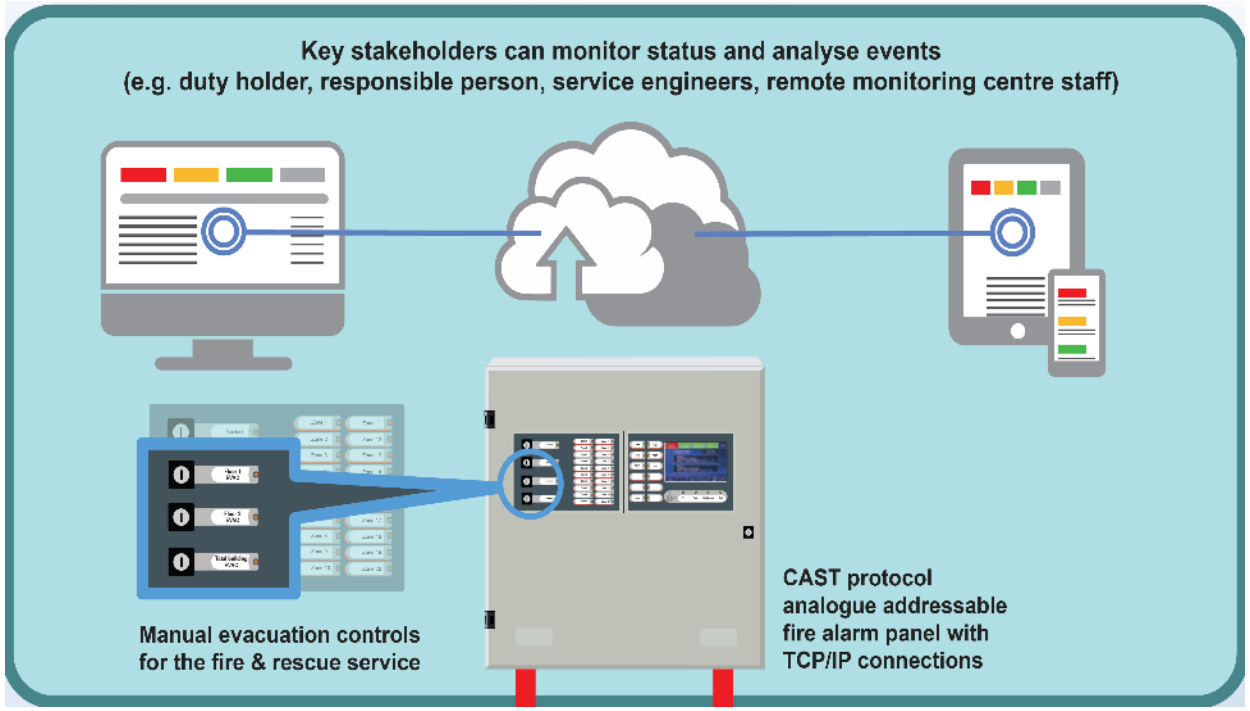
ENVISION IoT Data Gathering & Analysis - The ‘Cloud’

- All cables and devices on the communal alarm system and in the flats are monitored for faults and other events
- Fire events go directly to a manned alarm receiving centre for immediate action
- All events, including fire events, go to the ‘Cloud’ so premises management can monitor them via a web browser or mobile app
- Automatic push notifications and emails can be sent to premises management
- Multiple buildings can report to multiple locations

ENVISION IoT Data Gathering & Analysis

- Building plans can show exactly where events are happening - in real time
- Reports can be generated for:
  - False alarms
  - Real fire events
  - Faults
  - Equipment requiring service
  - Monthly user tests
- This allows duty holders to demonstrate due diligence via a verifiable audit trail
- It also allows maintenance contractors to demonstrate that they have carried out work





Summary of Hush-Pro Grade C System

- A false alarm resistant, fully monitored fire alarm system with a simple low-level controller
- Integrates into a C-TEC communal fire alarm system
- The communal fire alarm is connected to an alarm receiving centre for fast FRS response
- Can be connected to a C-TEC BS 8629 manual evacuation panel for use by the FRS
- Generates reports of system status, faults, false alarms, confirmed fires, and verify the system is being tested
- Uses less plastic, less power and fewer batteries than a Grade D system
- Has a replaceable 10-year battery so the whole system does not have to be replaced every 10 years

You're Safe with C-TEC

youcan.c-tec.com

HUSH PRO

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Visit us on Stand FI-1020