The Role of Fire Alarms in the Internet of Things
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1. INTRODUCTION

The changes in technology in recent years has opened up a wide range of opportunities for the Fire Industry and smoke alarms, heat alarms and multi-sensor alarms in particular and some of the key changes are:

- Development of RF short range transceivers including performance, range reliability, miniaturization and reduced cost.
- Internet infrastructure allowing worldwide dissemination and storage of data, which is easily accessible.
- The ubiquitous mobile phone (and notepads, laptops) provide easy access to the data and easy configuration of devices.
- Fire alarms are now part of a myriad number of household and other devices that connected to the IoT, giving all sorts of facilities to users.
2. FEATURES CURRENTLY AVAILABLE

The following are some of the fire alarm features that are currently available.

1. Interconnection between alarms so that when one detects fire, all alarms. The technology used includes proprietary RF protocols (including some with mesh configurations), Low Energy Blue Tooth, Z-Wave, Zig bee etc. Many alarms can operate for 10 years on a primary battery, but a variety of power options are currently available to support local regulations.

The next revision of EN 14604 will probably require a minimum of 3 years battery operation. Remote silencing of alarms will be addressed in the next revision of EN 14604 as smoke alarms will only be allowed to be hushed in line of sight i.e. so user knows there is no fire. (This will affect some alarms already on the market).

2. Notification on mobile devices of a fire, location of the fire, nuisance alarms, low battery faults, end of life/replacements date etc. This normally requires the smoke/heat/fire alarms to communicate with a Gateway designed to process the signals or directly from the alarm to the WiFi router. Alternatively alarms can have GSM transceivers for direct connection to the mobile phone networks.

3. Remote functionality enables housing associations and landlords to remotely monitor the performance and status of devices in the property, and provides tenants with the ability to report issues, as well as to receive updates and notifications directly. Smart panels can improve tenant-landlord/housing association interaction, streamline maintenance management processes and automate required paper trails.

4. Technology can be used to develop predictive algorithm and monitor data in real time over the internet to identify properties with an increased risk of fire, enabling Fire and Rescue Services and Landlords to take action before a potential incident occurs.
3. FURTHER INFORMATION

Further information on various IoT based solutions can be found at
https://www.eielectronics.com
https://www.fireangel.co.uk
https://www.fireangel.co.uk/predict
https://www.aico.co.uk
https://nest.com/uk

4. REFERENCES AND APPLICABLE STANDARDS

Good design practise is normally to, at least, meet the appropriate standard(s). In the absence of specific standards for fire alarm it is suggested that the following are consulted for guidance:

1. Revision of EN14604 (for RF range, battery duration etc.)
2. ETSI documentation on allowed frequencies, power levels etc.
3. RED European Directive.
4. EN54-25 on Radio Interlinking etc.
5. EN50131 series on Security Standards, comprehensive guidance.
6. EN50134 Social Alarm systems (includes recommendations on RF etc.)
7. FIA Guidance on RF system and design and installation.
8. Encryption is very important and should be included ensuring fire alarms can’t be hacked through the internet. There is much advice on how this can be done.
9. BS5839-1
10. BS5839-6
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