Digital Alarm Protocols for Grouped Living Homes

Easy read supporting document of Application Guidance for BS8521-2:2020: Part 2: Specification for NOW-IP

Developed by TSA

Version: 1

Moving to Digital Alarm Protocols

Analogue telephone networks are being decommissioned by communication network providers, and so service providers have recognised the need to replace the analogue infrastructure that is used for Technology-Enabled Care (TEC). The 'digital shift' or 'analogue to digital transition' has a particular impact on alarm systems that provide both voice and data communication. Good quality voice communication between carers, TEC alarm service users and the Alarm receiving Centre (ARC) is crucial in determining an appropriate response to an alarm alert, whilst alarm data exchanges provide essential and real-time information on the identity, location and type of alarms being raised (e.g. "a smoke detector has been activated in the hallway"). It is the combination of these voice and data exchanges that we refer to as an alarm communication protocol.

Traditional 'analogue' alarm systems use audible communications, which may seem obvious for 'voice', but also include sequences of tones to represent alarm data. However, the regulatory obligations on communications providers to support tone-based signalling have been removed, and the providers therefore advise that analogue tone signalling methods carry a risk of failure on digital networks. In very basic terms, the analogue tones at times, are not well received over a digital network and can cause increased call failures from a TEC alarm connecting to an ARC.

So instead, we are advising to use 'IP (internet protocol) for communication methods for voice, data or video. This means that standards for alarm protocols also need to adopt 'IP' descriptions in their communication methods.

Grouped and Dispersed Protocols

Many different 'alarm protocols' have emerged over time, reflecting the range of systems that were created by multiple design & manufacturing organisations. Many of these systems were optimised for the provision of alarm services into individual dwellings ('dispersed' alarms) or for mobile alarm devices.

Others were designed to enable multiple residents to raise alarms across a single communication path, typically from a block of flats or properties in a communal housing scheme. These are described as 'grouped' alarm systems, as they provide additional functionality, for example to allow multiple alarms to be recognised, queued and prioritised on a single call, or to help recognise that care staff are no longer on-site, thereby changing how alarms are routed and handled, for example calls to be sent to an alarm receiving centre during out of hours.

We may want to connect technologies from different suppliers, where residents can then choose their preferred devices. However, the existence of multiple communication protocols for different products poses challenges to this desire for interoperability. Therefore, great efforts have been made to standardise alarm protocols, as follows:

- For 'dispersed' alarms, equipment providers should be using a **Cenelec technical specification**.
- For specialised 'grouped living' alarm systems we should all be using the **relevant BSI standard**.

> **A little history:** BS8521-2 derives from earlier work (2016-17) on a digital (IP) communication protocol called 'NOWIP', which was created by a TSA working group consisting of the majority of UK technology suppliers. NOWIP was released for BSI adoption in 2017, at which point it became known as BS8521-2. The numbering of the standard follows-on from an earlier analogue alarm protocol (BS8521-1).

Application Guidance

Alarm services are often employed in life-critical situations. The alarm systems therefore need to be trustworthy, which means they need to work reliably and accurately. Inevitably, this means that the definition of an alarm protocol needs to be precise and detailed. BS8521-2 defines the protocol requirements for the communication between an Alarm Receiving Centre (ARC) and a grouped-living scheme. However, the potential users and implementers of the standard have identified a number of issues where guidance on the application of the standard would be helpful.

These issues have been captured by a Special Interest Group (SIG10) of the TSA Quality Improvement Programme, and an Application Guide has been created.

This guidance is primarily aimed at ensuring that the digital social alarm emergency call is set up in a consistent manner to allow for interoperability between grouped social alarms and ARC platforms of different manufacturers.

The issues addressed by the Application Guide can be summarised as follows:
- Grouped-living systems can be configured in different ways, which can affect the way they are represented to an Alarm Receiving Centre (ARC). Diagrams are presented within the guidance to give a visual representation of the options.
- The physical network connections between 'grouped schemes' and ARCs can also come in different methods, such as broadband (landline) or cellular network connections. Each of these may offer different data rates, signal strengths and power back-up options. The design authority for an end-to-end TEC solution needs to know the details to confirm that overall resilience standards are being met.
- Recommendations for the use of 'heartbeat' messages are included, to help monitor the health of grouped scheme equipment.
- The use of encryption methods and 'virtual private networks' (VPN) for the protection of personal or sensitive data are defined.
- Checklists for testing and commissioning of group schemes are proposed to be carried out ahead of sign off & go live date.
- Training and qualifications for engineering staff are captured.
- A register for ongoing compliance testing of ARC and grouped scheme interoperability is introduced and a live version of the register will be held on the TSA website. The register is to inform commissioners/purchasers of where interoperability between a range of devices & ARC platforms either has been deployed, are currently in testing phase, or no testing has commenced.

For any comments or queries relating to the full guidance document, please contact the TSA's ALL IP Team on ALLIP@tsa-voice.org.uk.