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How is my alarm connected to the outside world?

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Insight from Matt Davies, Business Development Manager for Digital & Services at Memco

In my last article, 'What's behind the button?', we looked at the different types of lift alarm systems you're likely to find installed on lifts in the UK. We'll now look at the questions you need to be asking about how the alarm system on your lift is being supported.

Let's start by assuming you have a compliant, and well maintained, lift alarm on your lift (or lifts). Any passengers unlucky enough to find themselves trapped in the lift can press the alarm button and speak to someone who can get them help. This a great start, but the lift alarm is only as good as it's connection to the outside world. Without that vital link, your lift alarm is rendered useless.

1) Telephone Lines

Traditionally lift alarms have been connected to a telephone landline allowing alarm calls to be placed over the UK telephone network. It's worth noting at the point that the responsibility for providing a telephone landline falls onto the lift owner and not the lift maintenance company. The latter are only responsible for installing & maintaining the alarm equipment on/in the lift.

If your lift alarm is connected to a telephone line, it's important to understand how that line is being handled. Telephone lines serving lift alarms will show very low usage with, typically, only a few minutes of calls being placed every month. The knock on effective is that this can lead to lift alarm lines being cancelled by finance or IT/telecoms teams who aren't always clear on what the line is serving. It's therefore important that 'lift lines' are clearly identified to all involved, especially the "bill payer" (whomever that may be).

Having identified the line, the next question is, ‘what type of landline is the lift alarm connected too?’. Telephone lines in the UK broadly fall into two categories: analogue/copper lines and digital/fibre optic lines. The key difference here is the difference in levels of resilience between the two types.

Old analogue lines use copper cables and are supplied, from the telephone network itself, with their own power. This means that for an analogue line to fail the physical copper line needs to sustain damage. This will typically be due to extreme natural phenomena such as lighting strikes, or the classic overzealous ground workers cutting through lines whilst digging road works etc.

Analogue/copper lines are actively being removed and replaced with digital lines in the UK as part of the ‘digital switch’ to upgrade the UK telephone network. By the end of 2025 all analogue support will be withdraw across the UK network.

Digital lines use fibre optic cables. The fibre infrastructure is incapable of carrying its own power and so relies on the mains power in the building to function.

This highlights an inherent risk with the use of fibre lines for lift alarms. A mains power failure in a building will lead to the lifts stopping safely in the shaft but not necessarily at a landing. This can then trap passengers in the lift car, who then need to place an alarm call. However, if the mains power failure has also effectively “cut” the telephone line, the lift alarm has no way to call out.

Supporting fibre lines with an uninterrupted power supply (UPS) of some sort, typically a battery backup, is one option.

Make sure the UPS supports all of communication equipment used to support the fibre line and that there is a clear maintenance program in place to ensure the UPS is regularly tested and any batteries etc. are in good working order. Again, this responsibility falls to the lift owner (who is provisioning the line) and not the lift maintenance company.

The UPS must also have a suitable capacity for the application. The lift alarm equipment itself which include a battery capable of supporting at least 1 hour of standby and 15 minutes of voice communication. Most lift alarm manufacturers supply a battery that can support significantly more than the 1 hour of standby and 15 minutes of talk time; Memco for example supply a 4-hour battery as standard.

2) Mobile Gateways

Due to the challenges outlined above with telephone lines, gateways which route the alarm call over the mobile phone network are increasingly being used to connect lift alarms. These devices will occasionally be referred to as ‘wireless gateways’ or simple “GSMs”, although the latter term is somewhat misleading.

In contrast to telephone lines, gateways can be installed and maintained by your lift maintenance company. This keeps all the equipment associated with your lift alarm with a single maintainer, making fault finding and repair much easier to co-ordinate.

I mentioned above that gateways are often referred to simply as “GSMs” in the lift industry. GSM stands for ‘Global System for Mobile Communications’ and, strictly speaking, only refers to devices using the 2G mobile network. It’s important to understand that just as the landline network is evolving so is the mobile network. In fact, the mobile network is evolving at a much faster rate.

As mobile phone usage has switched from a voice to a data driven application, the network providers have had to invest in new technologies to meet the demand for ever quicker data speeds. 3G technology, only introduced in 2001, is already being retired by major UK network operators. By the end of 2025 2G will also be retired leaving only 4G available in the UK. Due to these changes it's important to understand the type of gateway connecting your lift alarm to the outside world and the timelines for any necessary upgrades.

Just like a fibre telephone line a gateway will require mains power to operate. So the same requirements apply around the provisioning of a UPS. Gateway specifically designed for lift applications have inbuilt battery backups which are backed in line with the lift safety standards. These gateways also come with remote monitoring options allowing you to check both battery condition and signal strength.

As well as the technology used in the gateway itself and it's important to understand how the SIM card Inside the gateway operates. As the gateway will be in a static location it will only be able to connect to the mobile network towers in the immediate area (unlike a consumer mobile phone which by its nature moves around).

To maximise the connectivity options for the gateway you should consider using a roaming SIM card. This is a SIM card which can run roam across multiple mobile networks ensuring you have the best selection of signal. There are two types of roaming SIM steered and non-steered. A steered roaming SIM will always try and connect to a parent network first which runs the risk of you connecting to a weak signal from that parent network. By contrast a non-steered roaming SIM will roam across all networks giving you the best possible connectivity options.

Managed Communication Services

Another option is to use a managed communication service whereby provisioning of hardware (including SIM card) is handled by the service provider. There are also options for the service provider to actively monitor the connection and inform you in the event of any connectivity issues. This means you will know if the communication has failed for any reason.

About the author: Matt Davies is Business Development Manager for Digital & Services at Memco. In addition to his role at Memco, Matt holds a seat on the British Standards Institute committee for lift safety and is the UK representative at the European Lift Association 'Telco Working Group' and the European Committee for Standardization 'TC10 Working Team 4' which is responsible for standards covering lift alarms.