



What does an elevator need to be smart?

A case study for elevators at airports

Content

Smart systems in airport elevators	2
Solving the connectivity challenge	4
Ensuring every component in the system works together	6
Benefiting from intelligent, connected elevators	7



IOT DEVICES IN AIRPORT ELEVATORS

Alongside the rapid growth in air travel, airports have started modernizing their infrastructure and implementing smart building principles to handle large amounts of passenger traffic. Major airports today are prime examples of how the Internet of Things (IoT) is penetrating this industry, applying complex security systems and having a great need for user friendliness. As of late, energy efficiency has been thrown into this already broad mix of requirements. Smart building technology has been applied to this area with great benefit, creating a whole new technical environment which all systems need to adopt.

Elevators are no exception!



Smart systems in airport elevators

Elevators are an inherent component in security systems and constitute an integral part of the flow of people through terminals. Elevators therefore need to cooperate seamlessly with the remainder of the airport's ecosystem.

VIDEO SURVEILLANCE

"Area under CCTV" labels are omnipresent and for good reason. The mere fact that an area is monitored deters potential attackers and having good video coverage is crucial for any forensic analysis. Having a camera in the elevator cabin is beneficial for multiple reasons. During an alarm call, the call centre operator can instantly assess a situation and even prevent an unnecessary rescue trip if the cabin is empty. It also helps track a suspect or unknown person in the airport. Technically, most new installations use IP cameras for their high-quality images, inbuilt analytics, integration options and flexibility.

ACCESS CONTROL

Elevators used by both passengers and airport staff is no exception. To avoid travellers wandering into restricted areas, access control systems are used. In elevators, this is visible in the form of RFID card readers or PIN keypads. For proper functionality, the reader in the cabin requires more than just a way to let the controller know which floor should be unlocked. It also requires access to the access control server. This doubles the requirements on connectivity.

ADVERTISING

People travelling in an elevator cabin are a perfect audience for advertising. Airports do obviously use this communication channel and provide the space in elevator cabins for advertisements, typically for restaurants, shops and services provided at the airport. Compared to conventional paper ads in plastic clips, IoT brings LCD screens connected to online cloud management services. This enables effective, automated, and problem-free updates of content. All you need is power and data for the screen.

PUBLIC ADDRESS SYSTEMS

Public address systems serve an important role not only in emergency situations but also for last calls at airports for boarding and other messages we all know from our travels. People cannot afford to miss an important message just because they are in the elevator cabin. Of course, there are many analogue PA systems on the market, but their IP counterparts are gaining traction, and understandingly so given the flexibility IP brings.

EMERGENCY COMMUNICATION

Transferring emergency calls into the IoT mix provides a link to IP cameras located in the cabin. These cameras can not only be used to stream video separately to a Video Management System but also simultaneously for emergency video calls. Not to mention other benefits of VoIP, such as reliable DTMF transmission.



Solving the connectivity challenge

Using smart devices, the safety of the system relies on being able to ensure connectivity, and all elevator projects need to work around the limited number of wires in the travelling cable. Considering the above, several questions instantly arise:

01 How is connectivity provided to all these devices in the cabin?

IoT devices have a major edge in this area because IP connectivity can be tunnelled through only two wires in the travelling cable, even including power using Power over Ethernet (PoE) technology.

02 Where are these devices connected?

There are two options. You can connect them either to local services such as video monitoring, or to remote services in cloud, typical for VoIP calling between the cabin and call centre.

03 How is connectivity provided to the emergency dialler?

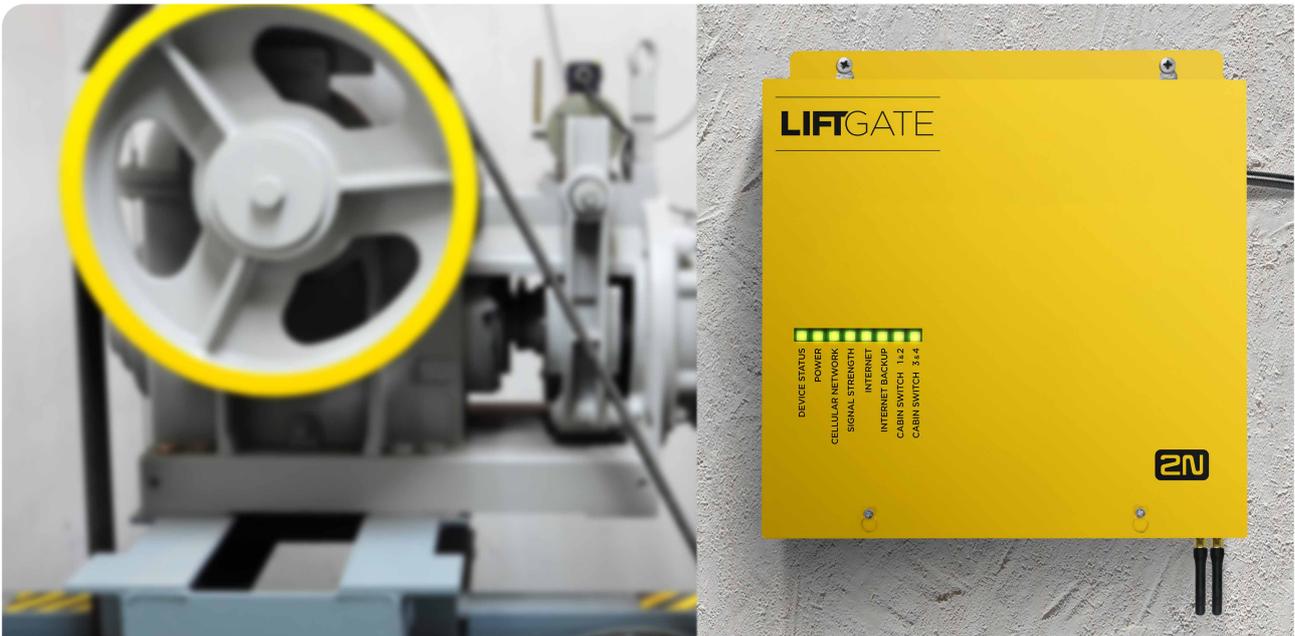
If the airport provides reliable connectivity to the Internet, including battery backup for power outage situations, then the dialler can be connected directly to this network. In other cases, an LTE router must be used. It will dynamically route the traffic through a local connection or cellular data connection. Due to liability issues, relying on independent cellular connectivity for critical communication is highly recommended.

For many people, their instinct is to focus on priorities, which leads them to creating separate critical and non-critical communications. The problem, though, is that this simply doubles several parts of the solution, particularly data connectivity in the travelling cable. If you have the luxury of multiple pairs of wires available, it is no problem and you 'only' need several ethernet-to-two-wire converters to tunnel the IP over the cable pair. However, if we only have one pair available, then you have no choice, and you need to use it for everything.

But how can we guarantee that the critical components of the system are not jeopardised by the connectivity needs of non-critical communication? Fortunately, there is an elegant solution in form of **2N® LiftGate**.

04 What about battery backup?

Obviously, all the above-mentioned IoT devices require a power supply. However, you must be careful when you design the battery backup system to separate these devices according to critical devices which need a backup, and non-critical devices which need no backup for power outages.



Ensuring every component in the system works together

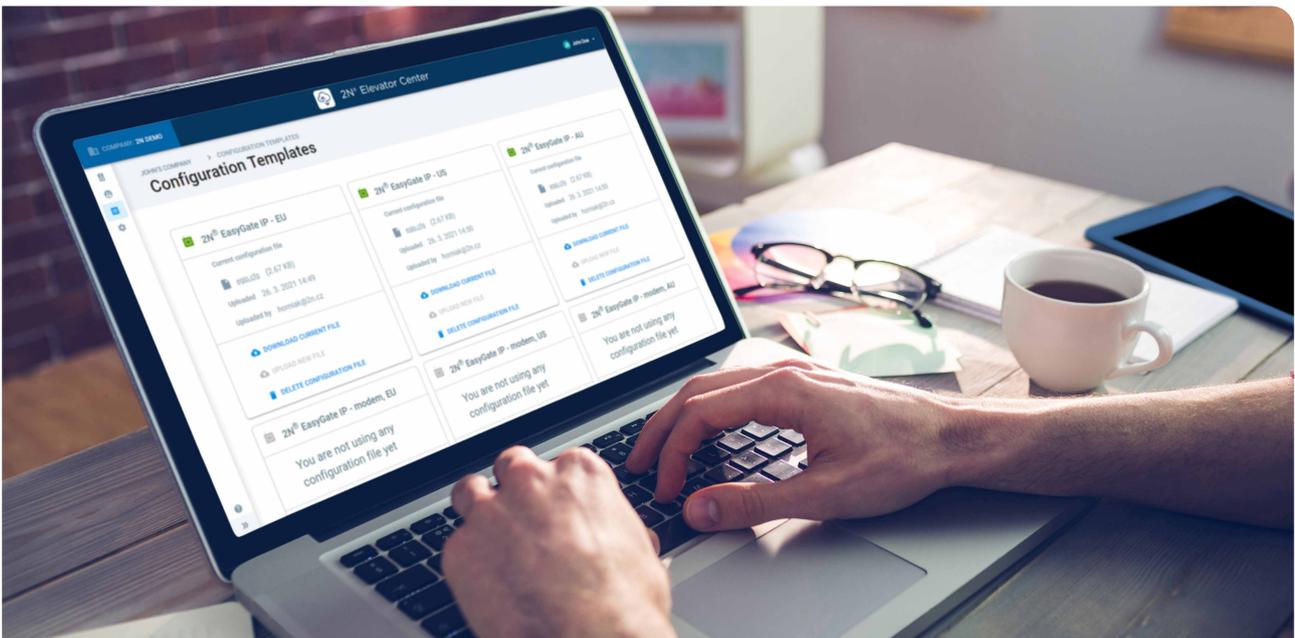
2N® LiftGate is an IoT gateway, and it talks to a group of other IoT devices. This understandably raises questions in terms of management. As with most smart devices, 2N® LiftGate also comes with an embedded web configuration tool, which is accessible either through the local network or remotely using a cloud service called 2N® Elevator Center. This IoT gateway comprises two devices:

The main 2N® LiftGate unit is the LTE router, which typically sits in the shaft or machine room. It provides cellular data connectivity, local LAN ports and a WAN port. The selection between LTE and WAN can be dynamic depending on the available connections. It also includes integrated UPS for hours of off-grid operation.

- WAN port is connected to the building network and provides the communication with the access control, PA and video monitoring systems.
- LAN port is used for the IP phone in the machine room used for local calls in the shaft.
- SIM card with a data plan ensures connectivity backup if the building network is down.

The cabin switch for 2N® LiftGate uses one pair in the travelling cable to receive data and power from the main unit. For critical devices in the cabin, such as the emergency dialler and typically either the camera or access control device, it provides two ports with PoE. For non-critical IoT devices, such as access control readers or IP speakers for public announcements, it provides two ports without PoE. These devices need to be powered from the cabin's power supply. The icing on the cake is the power outlet for the emergency light.

If more IoT devices are required in the cabin, there is always the option of plugging an ethernet switch to one of the ports on the cabin switch. In this case, their power supply must again be provided by the cabin infrastructure.



Benefiting from intelligent, connected elevators

When people talk about “smart living” or “smart buildings”, they usually think of modern technologies, remote 24/7 monitoring, data collection and analysis, and unified applications to control lights, doors, heating, etc. Even elevators can become far more than simply a means of moving people quickly and safely between floors. For a long time, however, the main challenge for integrators was getting connectivity to the cabin, not only for reliable emergency communications, but also for video surveillance, public address, and access control systems.

With 2N® LiftGate, this is no longer a problem, and you do not even have to invest in new elevator infrastructure. By using just two wires in the traveling cable, you can transform a regular elevator into a smart IP solution for the 21st century. Then, just install 2N® LiftIP emergency communicator, a 2N Access Unit reader, and an Axis IP camera into the cabin and start benefiting from the connected elevator. It can be managed and monitored remotely by an operator using 2N® Elevator Center.

This case study is not only relevant to large airports but every building which has an elevator, such as office or apartment blocks. Regardless whether you are managing an existing elevator or inventing a solution for the elevator in a newly built project, consider new technologies. With smart devices, you significantly increase operator efficiency, save time and money, reduce possible downtime, and ensure greater safety and convenience for passengers.



2N TELEKOMUNIKACE a.s., Modranska 621, 14301 Prague 4, CZ,
+420 261 301 500, sales@2n.cz, www.2n.cz

2021 © 2N Telekomunikace, a.s.