

## What is DTMF and why is it so important?

DTMF technology enables control signals (e.g., number pad keystrokes, device identification or other numerical codes) to be sent over a voice channel. Elevator communication devices use **DTMF to indicate identification number and various conditions**, for example, a flat battery.

Incorrect DTMF transfer means communication errors and undesirable behaviour of the entire emergency communications system.



## What are the next steps?

### > Planning and systematic transition to modern IP technologies

Because this concerns major changes, the forthcoming **modifications to emergency communication must be considered more systematically**. Elevator companies can use an advanced and secure platform that will give them a complete overview of the status of serviced devices, prevent various error conditions and reduce the time needed for installation and servicing.

### > Replacement of incompatible devices - sufficiently in advance

Replacing incompatible devices with a new LTE gateway in the forthcoming years will be essential. This replacement will involve costs to acquire the devices as well as costs for configuration and installation by administrators and technicians. **Replacing devices at the last moment should be avoided** so that the new LTE gateways can be implemented in the simplest and quickest way possible.

### > Modernisation of dispatch centres

Existing dispatch centres at elevator companies are usually built on a traditional PBX connected to land lines (ISDN). The core networks of operators providing landlines today are built completely on IP technologies. Any conversions between VoIP (operator) and non-VoIP (customer) technologies pose a significant risk of distortion during DTMF transfer. **The ideal option is to build a communications solution for elevator dispatch centres based purely on VoIP technologies.**

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# 2N

The transition to 4G technology is already taking shape. Are you ready for it?

Many essential systems and devices used in elevator technology today use mobile networks for connectivity. Some of the biggest mobile carriers have already revealed their plans and timeframe for **complete transition to the newer 4G technology.**

This will be a **major technological change**, and elevator companies should be seriously thinking about adopting suitable measures.

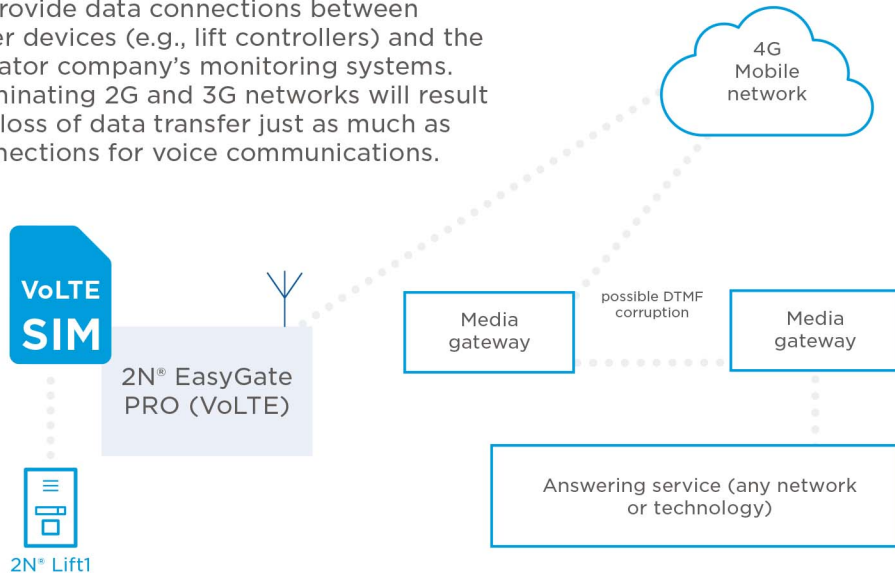


## How does it affect elevator technology?

Elevators equipped with emergency communication systems make use of **specialised equipment (gateways)** to connect analogue communications devices located inside elevator cabins to the digital mobile network. The mobile network then transfers calls from the elevator cabin through the land voice network to the elevator company's dispatch centre.

The majority of gateways used on the market today operate on either **2G (GSM) or 3G (UMTS) networks. When operators cease operating these networks**, elevator communications devices will lose their connections to dispatch centres and **thereby compromise the safety of passengers** who may be stuck in an elevator unable to call for help. This may also have legal consequences, because a non-functional communications device logically is unable to meet the requirements of EN 81-28 standard.

In many situations, gateways are also used to provide data connections between other devices (e.g., lift controllers) and the elevator company's monitoring systems. Terminating 2G and 3G networks will result in a loss of data transfer just as much as connections for voice communications.



## What is the solution?

For emergency elevator communication, we are mainly interested in voice transfer, which LTE (data only) is not ideal for. The options below are potential solutions.

### VoLTE

VoLTE (Voice over LTE) is a technology enabling voice **transfer directly over LTE networks**. This is a solution that mobile operators will use to replace voice services from older 2G and 3G networks.

#### ADVANTAGES

- first VoLTE gateways are already available

#### DISADVANTAGES

- modern codecs used in VoLTE do not deal with the issue of DTMF transfer, which is a crucial problem in elevator signalisation protocols (P100, CPC).
- each operator implements this technology differently, no roaming as of now
- voice sound quality is guaranteed only under the terms of the VoLTE network. However, elevator dispatch centres are also connected to other networks, and the essential convertors cause specific degradation of sound quality, particularly problems in DTMF transfer.

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## SIP over LTE

In this scenario, the LTE network is used as data transfer technology through which **voice is transferred using a SIP protocol**. A SIP client registered centrally to a VoIP provider is implemented in the LTE gateway.

#### ADVANTAGES

- deals with DTMF transfer issues
- a range of VoIP operators with affordable tariffs is available on the market
- compatibility with modern VoIP switchboards
- the level of development and coverage of LTE

#### DISADVANTAGES

- the need to prepare elevator dispatch centres (transition to VoIP technologies)
- the first devices will start appearing on the market in 2020

