# Emergency Lift Communication DTMF and Mobile (GSM) Gateways

Jason Godwin, 2N Regional Sales Manager
Thursday 16 February 2023
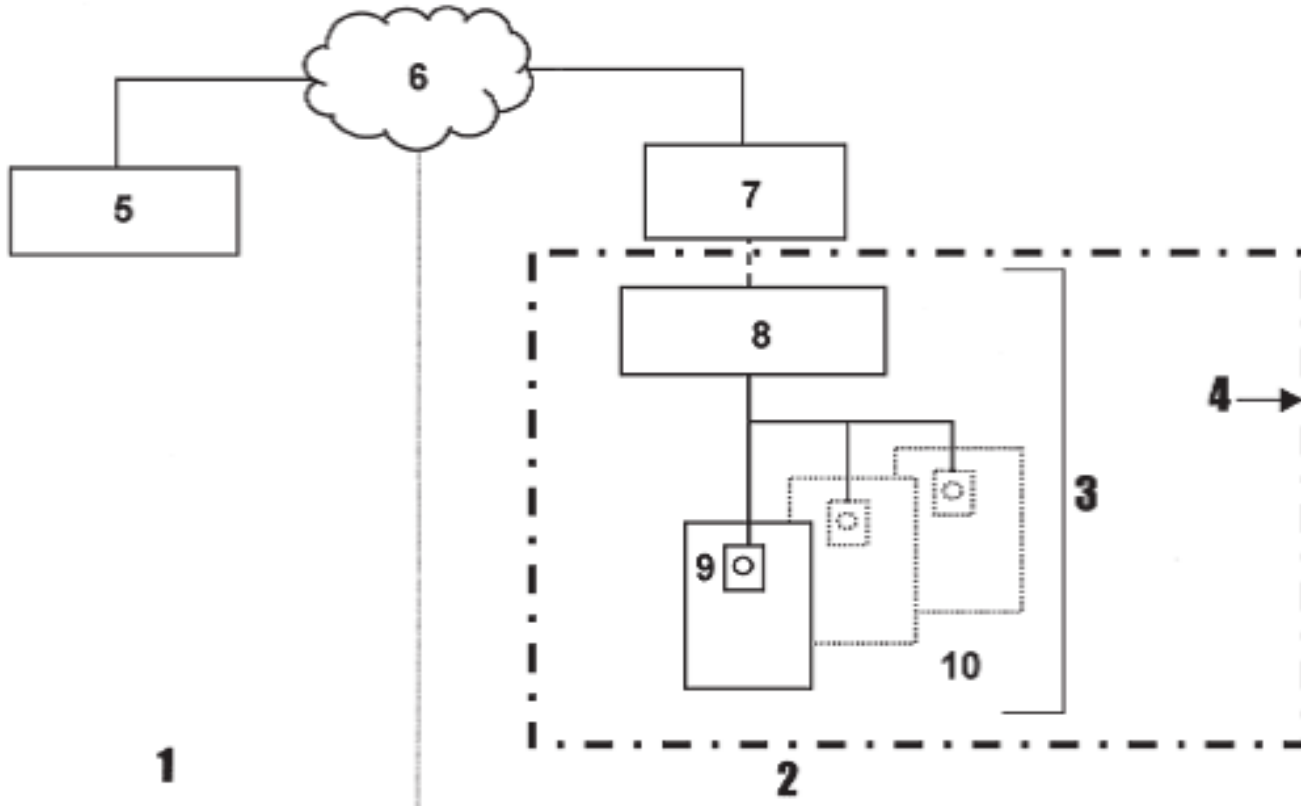
# Content

# Preamble - EN81:28 2019 - **What it covers**



1. rescue service
2. site
3. alarm system
4. **boundary of this standard**
5. **reception equipment**
6. **communication network**
7. **transmitter**
8. alarm equipment
9. alarm initiation device
10. lifts

# 1. Introduction

- Mobile (GSM) gateways provide an easy, cost-effective alternative to obsolete phone landlines and are being widely adopted in the lift industry

- The suitability and performance of GSM gateways in respect of DTMF is not great

- DTMF has been integrated into lift communications for the identification of lifts during a call,  communication-related alerts, as well as automating 3-day test calls and remote phone autodialler configuration

- EN 81:28 Clause 4.2.1 (Availability / reliability) requires that test calls are **"Using the same connection means used for an alarm"**

- Industry feedback suggests a significant amount of DTMF signals and calls are lost or distorted and this is a cause for concern and maybe a call to action
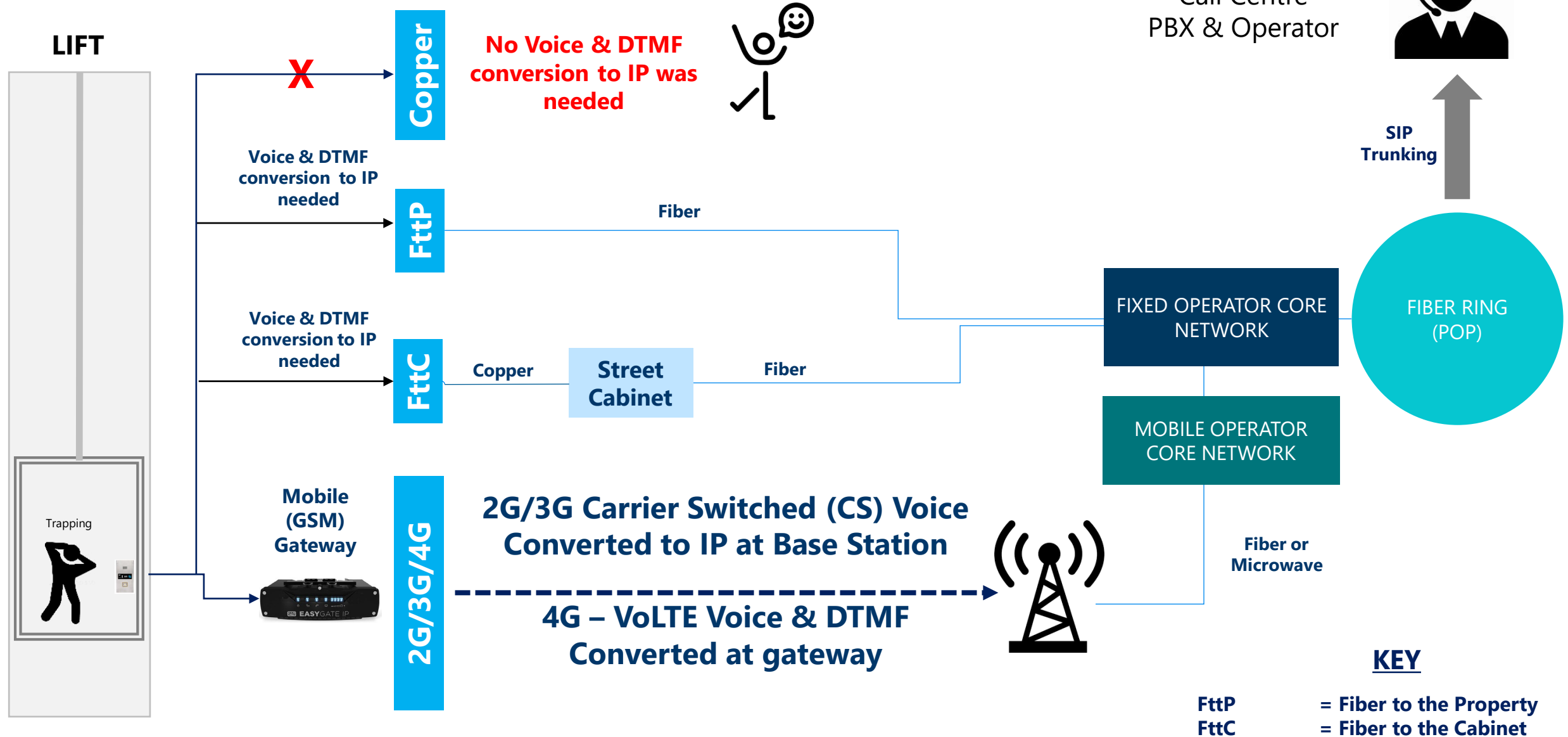
# 2. Industry feedback

**"When receiving DTMF from a mobile solution we see characters being dropped and/or corrupted."**

Darren Fahy, Technical Architect
Thames Valley Controls, UK

**"Up to 20% of emergency and technical calls are impacted by distortion from the DTMF transmission protocols used by lift alarm manufacturers. "**

Thibault Beaucornu, Sales Director
Sérénité 24h24, France

# 3. Landline obsolescence



Lift
Call Centre
PBX & Operator

**LIFT**

**Copper** — **No Voice & DTMF conversion to IP was needed**

**Voice & DTMF conversion to IP needed**

**FttP** — Fiber

**Voice & DTMF conversion to IP needed**

**FttC** — Copper — **Street Cabinet** — Fiber

FIXED OPERATOR CORE NETWORK

FIBER RING (POP)

**SIP Trunking**

MOBILE OPERATOR CORE NETWORK

**Mobile (GSM) Gateway**

Trapping

**2G/3G/4G**

**2G/3G Carrier Switched (CS) Voice Converted to IP at Base Station**

**4G – VoLTE Voice & DTMF Converted at gateway**

Fiber or Microwave

**KEY**

FttP = Fiber to the Property
FttC = Fiber to the Cabinet

# 4. Key Issues

- 2G will be switched off (operators saying end of 2025) so no more CS voice from gateway

- VoLTE (a form of VoIP) will then remain only option unless data calling is utilised

- Often calls (inc. DTMF) pass through multiple operators, creating and compounding problems

- Test calls using DTMF are **NOT** using same channel **(means)** as voice, if going via a data

- VoLTE, although VoIP, requires a **voice plan** from a mobile operator

- Data requires a **data plan** from a mobile operator

# 5. DTMF: Proprietary solution

DTMF can be digitalised by the gateway and sent **separate to a voice call** (CS or VoLTE) then a server decodes and logs the DTMF call. However the use of different connections requires **separate configuration parameters** on the gateway plus there's inherent difficulty to combine it back to the voice call for the call centre needs (e.g. Lift ID).

## EN81:28 Conformity:

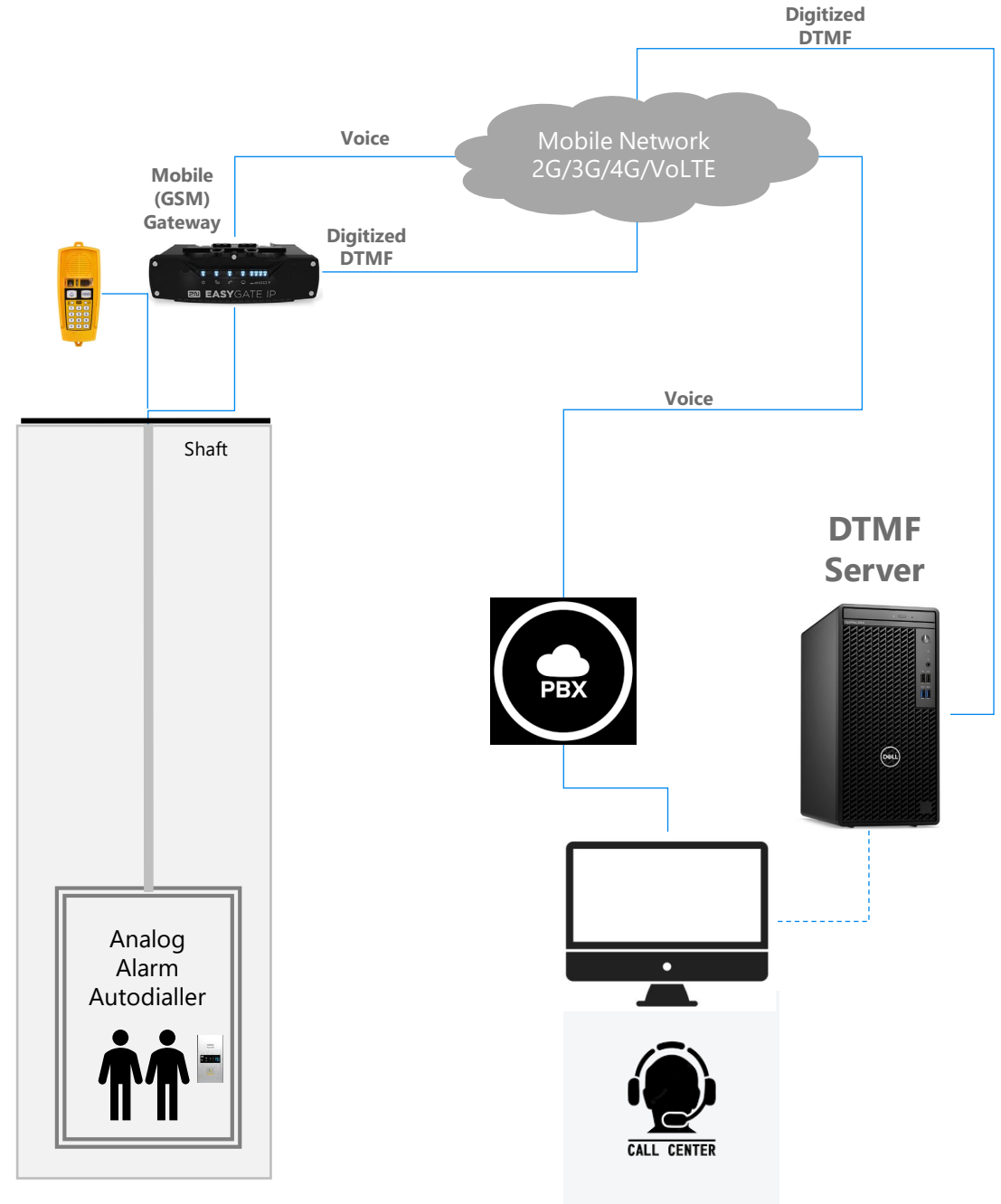| | |
|---|---|
| Connection means for emergency alarm voice calls | **Voice Call** |
| Connection means for DTMF strings and separate DTMF test calls | **Data** |
| Same connection means for test calls as used for an alarm (EN 81 28:2018 Clause 4.2.1 ) | **No** |

Digitized DTMF

Voice

Mobile Network 2G/3G/4G/VoLTE

Mobile (GSM) Gateway

EASYGATE IP

Digitized DTMF

Shaft

Voice

DTMF Server

PBX

Analog Alarm Autodialler

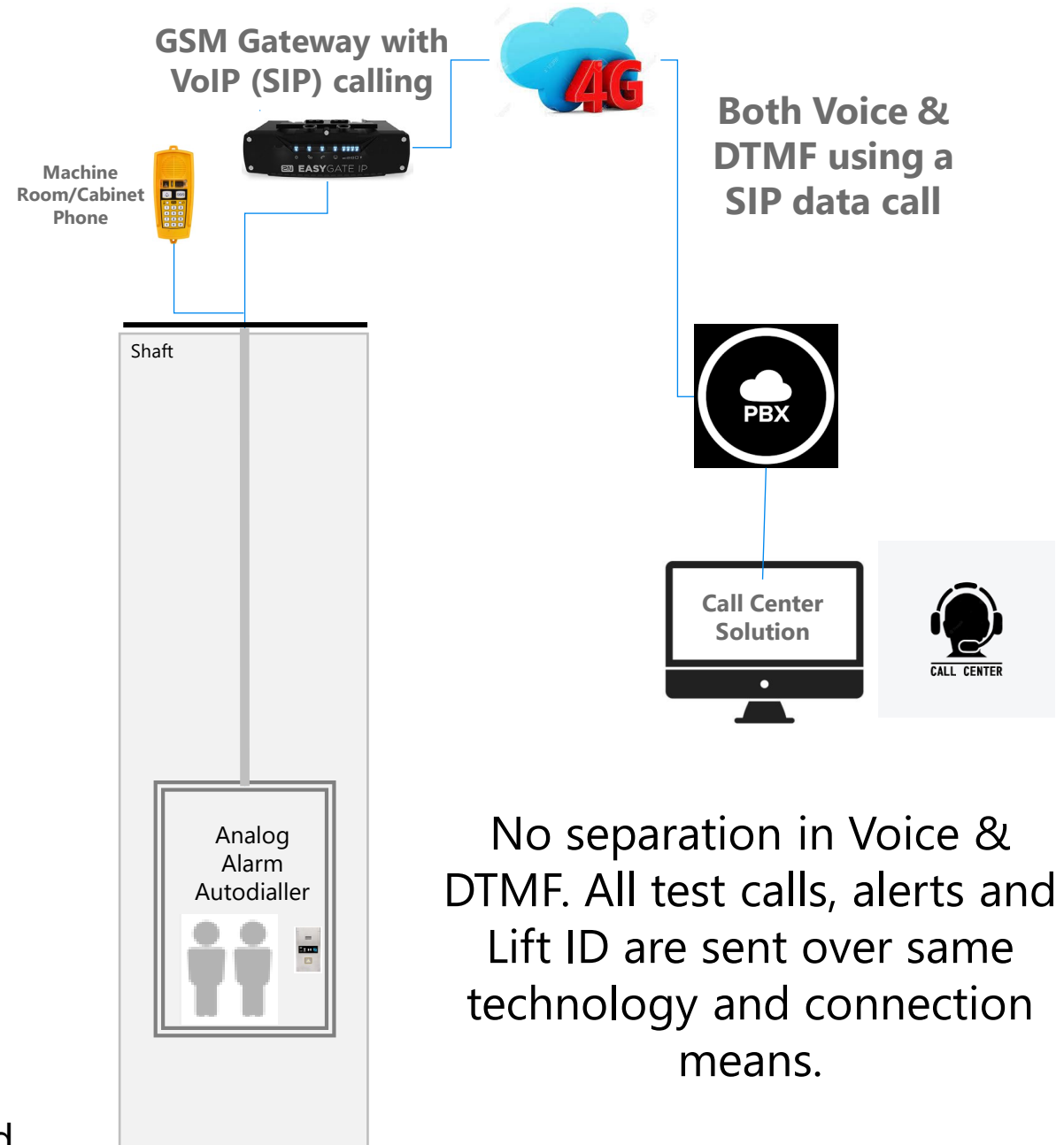CALL CENTER

# 6. DTMF: Open solution

Digitalizing DTMF is the best option, but the voice call **must also be digitalized** at the same endpoint (gateway) to comply with the standard. The solution is to send voice and DTMF over data-calling using an open, secure, end-to-end **protocol known as SIP**. That will allow DTMF to be utilized for many years to come.

## Conformity:

| | |
|---|---|
| Connection means for emergency alarm voice calls | **Data** |
| Connection means for DTMF strings and separate DTMF test calls | **Data** |
| Same connection means for test calls as used for an alarm (EN 81 28:2018 Clause 4.2.1 ) | **Yes** |

## Benefits:

Clear voice, excellent DTMF and only a data SIM needed

**GSM Gateway with VoIP (SIP) calling**

**4G**

**Both Voice & DTMF using a SIP data call**

Machine Room/Cabinet Phone

EASYGATE IP

Shaft

PBX

Call Center Solution

CALL CENTER

Analog Alarm Autodialler

No separation in Voice & DTMF. All test calls, alerts and Lift ID are sent over same technology and connection means.

# 7. What is SIP



- Session Initiation Protocol (SIP) is a very robust signaling protocol that supports unified communications, voice calls (including DTMF), video conferencing, instant messaging, and media distribution.

- SIP is proven, trusted and used by us all every day.

- Think of it as a quality-assured, communication VPN between two points.

# 8. Recommendation

To avoid confusion and an untidy changeover in 2025 with the possible health and safety consequences that might arise - could the CIBSE Lifts Group make a request to the BSI Lift Committee to produce a British Standards Development Draft (DD) in a similar style and process to the creation of DD265:2008 to provide guidance and recommendations?

This would not affect the integrity of  BS EN81-28 which deals solely with the requirement for remote alarms for lifts and not the means to communicate between the end points of lift and rescue centre.

Such a DD would receive the scrutiny of the whole lift community through BSI's procedure for public comment.

# 9. Final thought - Lifts without DTMF

Adoption of the recommendation would open the door to removing the use of DTMF entirely in years to come because as SIP gains traction and acceptance, the P100/CPC DTMF signaling protocol used by DTMF today, could be replicated with simpler SIP INFO header messaging as the medium.

Such a move would provide a reliable, open technological platform (SIP) that is guaranteed to facilitate 100% accurate transmission of relevant lift information and 3-day test calls for decades to come thereby taking full advantage of SIP and removing DTMF considerations forever.