

EMERGENCY ELEVATOR TWO-WAY COMMUNICATION SYSTEM (EE2CS)

Specifications

CSI MasterFormat Section 14 28 19

Cross-Reference: Section 27 51 23 (delete whichever does not match this project's spec organization)

Part 1 — General

1.0 Summary

- 1.1 An Emergency Elevator Two-Way Communication System (EE2CS) shall be installed for each elevator. The system shall consist of an Audio and Text SIP (VoIP) Elevator Audio Visual device (EAV) located behind the Car Operating Panel (COP) of each cab; a separate IP Camera Device (CD) providing live video of the cab interior; a Machine Room Device (MRD) in each elevator machine room; a Command Center (CC) for authorized personnel; an on-premises PBX and call-routing platform; and all supporting network, cabling, and power equipment required for a complete and operational system.
- 1.2 The system shall provide two-way audio communication, two-way text messaging, and one-way video monitoring between each elevator car and authorized personnel, complying with ASME A17.1-2019 / CSA B44:19 Section 2.27.1.1.3 (and ASME A17.1-2022 / CSA B44:22 where applicable) and IBC 2021 Section 3001.2.
- 1.3 The system shall operate fully on-premises, with all core functions—including call routing, dispatcher software, call and video recording, and configuration management—running on Owner-controlled hardware located inside the Owner's facility. No third-party cloud service shall be required for core functions. The system shall be capable of operation on closed network.
- 1.4 The system shall use a separate IP Camera Device positioned to provide an unobstructed view of the elevator cab floor. Owner's existing camera hardware may be reused when applicable, provided its RTSP feed is compatible with the elevator monitoring platform.
- 1.5 When the emergency push button is pressed in the elevator, the EAV shall place a call to the CC. Calls not answered within 45 seconds shall automatically route to a secondary destination. Call routing logic—including time-of-day routing (e.g., business hours to onsite security or concierge; after-hours to designated monitoring service) and escalation to PSAP/911—shall be fully programmable by the Owner.
- 1.6 For buildings with elevator travel exceeding 60 feet (18 m), an on-site CC shall be provided in accordance with ASME A17.1-2019.
- 1.7 The system shall continue to operate for a minimum of four (4) hours upon loss of normal building power, in accordance with ASME A17.1-2019.

2.0 Definitions

- 2.1 **EAV** Audible/Text Communication Device—All-in-one in-car device providing two-way audio, text messaging, and visual interface.
- 2.2 **CC**: Command Center—on-site or off-site location where authorized personnel receive and respond to elevator emergency calls. May include hardware video phone, dispatcher software, or both.
- 2.3 **CD**: Camera Device—IP camera providing live video of cab interior.
- 2.4 **ECPS**: Emergency Call Path Supervision—continuous, automated validation of the end-to-end signaling path from the elevator communication device through the gateway/PBX and network to the monitoring endpoint, using SIP registration monitoring, SIP OPTIONS polling, heartbeat supervision, or other approved periodic test transactions.
- 2.5 **MRD**: Machine Room Device—communication device located in the elevator machine room.
- 2.6 **NS**: Network Switch—managed PoE+ Ethernet switch.
- 2.7 **On-Premises**: Architecture in which all core functions operate on Owner-controlled hardware inside the Owner's facility, with no dependency on third-party cloud services for core function.
- 2.8 **PBX**: Private Branch Exchange—on-premises call routing platform.
- 2.9 **PoE**: Power over Ethernet (IEEE 802.3af / 802.3at).

2.10 **VMS:** Video Management System (e.g., Genetec, Milestone, Johnson Controls, Bosch, Hanwha, etc.).

3.0 Submittals

- 3.1 Submit manufacturer's product data sheets for each component.
- 3.2 Submit shop drawings showing system block diagram, wiring schematics, cable schedules, and component mounting locations.
- 3.3 Submit network and cybersecurity documentation including ports/protocols/services, encryption standards, and integration interfaces with Owner's existing systems.

4.0 Construction Equipment

- 4.1 The EAV shall be a 7-inch capacitive touchscreen SIP phone with full-duplex HD audio, acoustic echo cancellation, PoE per IEEE 802.3af, three alarm inputs and one alarm output, IP66 ingress protection, IK10 impact protection. Operating temperature: -10 °C to 50 °C.
- 4.2 The CD shall be a separate IP camera supporting RTSP streaming, PoE powered, and a minimum resolution of 2 megapixels (1080p). Owner-furnished existing IP cameras may be reused where present and compatible. Corner-mount installation is preferred to provide an unobstructed view of the entire cab floor. An EAV-integrated camera shall not be accepted as a substitute for the separate CD.
- 4.3 The Machine Room Device (MRD) shall be a wall-mounted, IP66-rated hardware SIP 2.0 video telephone with an 8-inch capacitive touchscreen, sixteen independently configurable SIP lines/accounts, a 2-megapixel camera with physical privacy shutter, dual microphones with noise suppression, full-duplex handset and hands-free audio, and acoustic echo cancellation. The MRD shall support dual Gigabit Ethernet ports, IEEE 802.3at PoE+ power, and dual status-indicator LEDs. It shall register directly with the project PBX and support placing and receiving PSTN calls through the PBX. The MRD shall also directly dial the associated elevator cab Emergency Audio-Visual (EAV) device to provide two-way communication with maintenance personnel and permit operational testing of the EAV without initiating an emergency call.
- 4.4 The Command Center (CC) endpoint shall include a hardware SIP 2.0 video telephone equipped with an 8-inch capacitive touchscreen, sixteen independently configurable SIP lines/accounts, a 2-megapixel camera with physical privacy shutter, dual microphones with noise suppression, full-duplex audio, and acoustic echo cancellation. The telephone shall support dual Gigabit Ethernet ports, and IEEE 802.3at PoE+ power. It shall register directly with the project PBX and support placing and receiving calls from elevator EAV devices and the PSTN.
- 4.5 The on-premises PBX shall be Linux-based with hardware AES encryption, minimum 3,000 SIP endpoints, minimum 450 concurrent calls, eight (8) FXS and eight (8) FXO analog ports for legacy integration, three (3) Gigabit Ethernet ports with PoE+, full API for third-party integration, and SNMP v1, v2c, and v3 support.
- 4.6 The Emergency Call Path Supervision (ECPS) function shall continuously and automatically validate the end-to-end signaling call path from each elevator communication device through the gateway/PBX and network to the monitoring endpoint. Supervision shall use SIP OPTIONS polling, SIP registration monitoring, heartbeat polling, or other approved periodic test transactions and shall not require simulated voice calls. The polling interval shall be configurable by the Owner from 30 to 60 seconds. Loss of the supervised path shall provide deterministic fault detection, identify the affected elevator communication path, generate an alarm, and activate the relay contact connected to the Designated Fixture (DF) annunciator at the designated landing in the vicinity of the fire recall switch. Alarm restoration shall occur automatically after the supervised path is re-established.
- 4.7 The system shall meet the following minimum cybersecurity requirements: 256-bit AES encrypted configuration files; SRTP for media transport; TLS 1.2 or later for signaling and management; HTTPS for web interfaces; IEEE 802.1x port-based network access control; secure boot; unique random

administrator passwords (no default credentials). The system shall be capable of operation on an air-gapped network.

- 4.8 All networked components shall run an enterprise-grade Linux operating system. Consumer-grade single-board computer platforms (Raspberry Pi or equivalent hobbyist hardware) shall not be acceptable.
- 4.9 The system shall include the manufacturer's on-premises device configuration and maintenance platform for device discovery, centralized configuration, status monitoring, configuration backup and restoration, firmware management, and replacement-device provisioning. Core device-management functions shall not require a third-party cloud service.

5.0 Mounting

- 5.1 The EAV shall be flush-mounted in or behind the Car Operating Panel, positioned for ADA-accessible interaction.
- 5.2 The CD shall be corner mounted where practical to provide unobstructed view of the entire cab floor.
- 5.3 The MRD shall be wall- or flush-mounted in a restricted-access area of the machine room, not more than 6 ft 6 in. (2 m) above the floor.
- 5.4 The 2U PBX shall be installed in a 19-inch equipment rack in the building IT room or designated communications room.
- 5.5 Hardware CC endpoints shall be installed at locations designated by the Owner (security desk, concierge desk, designated landing, etc.). For buildings over 60 ft (18 m) travel, an on-site CC endpoint shall be provided.

6.0 Electrical

- 6.1 Power backup shall maintain operation of the complete EE2CS for a minimum of four (4) hours upon loss of normal building power. Backup power may be provided by Owner's existing building UPS feeding the network switch (PoE ride-through to EAV/CD/MRD), a dedicated manufacturer-supplied UPS, or integrated battery backup at the PBX, at the Owner's option.
- 6.2 All PoE-powered components shall comply with IEEE 802.3af or 802.3at.
- 6.3 Cabling shall include: 120 VAC for UPS-protected equipment; 22 AWG twisted shielded pair in the traveling cable where applicable; one (1) Cat6 cable in the elevator traveling cable for camera connection (or Ethernet extender pair where Cat6 is not available in the traveling cable); two (2) 18 AWG twisted shielded pairs in the traveling cable for EAV analog/legacy backup where required; and Cat6 cabling between the IT room, machine rooms, and CC location.
- 6.4 All installation shall comply with state and local electrical codes.

7.0 Communications

- 7.1 The EAV shall be activated when the emergency push button is pressed in the elevator car.
- 7.2 The EAV shall include a location identifier in its outgoing call. Not fewer than five (5) pre-programmed destinations shall be supported, with automatic failover from one destination to the next.
- 7.3 Communication shall be two-way audio, two-way text messaging, and one-way video from the CD to the CC.
- 7.4 Authorized personnel at the CC shall be able to send pre-defined and custom text messages to the EAV. Passenger response shall be supported via Yes/No controls on the EAV or via integrated COP buttons.
- 7.5 Upon dispatch of assistance, the CC shall send a "Help is on the way" message to the EAV.
- 7.6 Once a call has been initiated, it shall be terminable only by the called party (CC), not by the cab occupant.
- 7.7 Video from each CD shall be streamed via RTSP and shall be viewable concurrently within the Owner's existing VMS (Genetec, Milestone, Johnson Controls, Bosch, Hanwha, or equivalent).
- 7.8 Where elevator travel exceeds 60 ft (18 m), the on-site CC shall have the ability to override communications with any off-site monitoring service.

- 7.9 Once a call has been initiated, it shall be terminable only by the called party (CC), not by the cab occupant.

8.0 Warranty

- 8.1 The complete Emergency Elevator Two-Way Communication System shall be warranted by the manufacturer for a period of not less than three (3) years from the date of substantial completion or first beneficial use, whichever is later, including all hardware components, embedded software, and firmware updates.

9.0 Manufacturer

The manufacturer shall be:

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