**ASME A17.1/CSA B44 2019**

**SECTION 2.27.1: CAR EMERGENCY Communications**

The Commend Elevator solution is engineered to comply with the ASME-elevator intercom code governing the elevator emergency communications system. Specifically the new requirement (Rev.2019) that the emergency communications system operators have a way of two-way non-verbal communications with the elevator passengers(s) via text message displays for the hearing impaired.

1. The intercom stations installed in the elevators shall comply fully with the ADA.
2. The touchscreen intercom station used in the elevator cannot use a handset.
3. The intercom terminal shall include touchscreen display and be capable of hands-free bi-directional - audio communications.
4. The emergency intercom system Operating instructions must be displayed on the touchscreen of the intercom stations mounted in the elevator.
5. ALL intercom terminals shall share the following common features:
	1. **Type**
		1. Compact IP Indoor/Outdoor Intercom station with 5 or 10-inch touch display (TFT) - with high-resolution wide view angle video camera
		2. IP rating: IP65 (acc. EN 60529) IK rating: IK08 (acc. EN 62262)
		3. SIP device must support encrypted data-, video- and audio-transport via standard security protocols: HTTPS, SRTP, SIP via TLS.
	2. **Audio Features**
		1. Microphone: two digital MEMS microphones
		2. Loudspeaker: special membrane type for optimal sound quality, integrated class-D amplifier- 2.5 W
		3. Dynamic background noise cancellation.
		4. Audio bandwidth: up to 16 kHz
	3. **SIP**
		1. Audio codecs: Opus, G.722, G.711 a-law and G.711 u-law
		2. Protocols HTTPS, SRTP, SIP over TLS
	4. **IT Security**
		1. SIP via TLS
		2. SRTP
		3. IEEE 802.1X
		4. MJPEG via HTTPS
		5. HTTPS for accessing the web interface and interfaces
	5. **Display**
		1. 5” touch display (TFT), AR coated, resolution: 720 x 1280 pixel or: Display 10.1˝ touch display (IPS-TFT) resolution: 800 x 1280 pixels luminance: typ. 1000 cd/m2
	6. **Mounting Housing**
		1. Surface mount kit (surface mount box with tamper switch)
		2. Flush mount box (flush mount box with tamper switch)
	7. **Available Modules**
		1. Induction loop kit AFIL-USB- Induction loop amplifier module.
		2. USB output module EB1A- relay output (normally open contact).
		3. Expansion module EB3E2A-AUD -three inputs, two output relays and ports for direct connection of an external loudspeaker, external microphones, and handset. Line-in and line-out

The Emergency Communications System shall be controlled by an Intercom Server(s). The intercom server shall not require connection to ISP for normal operations.

1. The Intercom Server shall have the following features.
	1. The intercom server shall be a Linux (Debian) OS based hardware platform.
	2. The intercom server software shall support a maximum of four virtual machine instances.
	3. Up to 32 calls (audio) between SIP subscribers per virtual machine instance
	4. Up to 128 SIP audio connections per virtual master machine.
	5. Caller Identification:
		1. a calling line
		2. b connected line
		3. c calling name
	6. Call waiting
	7. Call hold
	8. Multiple subscriber number
	9. Direct dial-in
	10. Call forwarding
	11. Call deflection
	12. Call transfer
2. The intercom server shall support the following types of devices:
	1. Manufacturer’s SIP terminals
	2. Third party SIP telephones
	3. Third party SIP based telephones shall be able to function as intercom terminals.
	4. VoIP
		1. VoIP connectivity via SIP trunk
		2. VoIP connectivity to PSTN via SIP gateways.
		3. VoIP to IP-PBX servers and service providers.
	5. Intercom system Client Stations
		1. Soft-client software for Windows-based PC’s
		2. App for Android smart phone and tablets
		3. App for IOS-based smart phones and tablets.
3. The intercom server shall be networkable via LAN or WAN with other virtual and hardware servers.
	1. VoIP
	2. SIP-C
	3. SIP trunk
4. Communications interface:
	1. Gigabit
	2. Ethernet X2 (optional)
5. The intercom server must support video codec: H.264/MPEG-4 AVC
6. Firewall
	1. The server shall have the ability to control, allow or block selected traffic.
7. IT -Security
	1. The following device configurations shall be available for IT-Security hardening:
		1. SIP over TLS (SIPS)
		2. Transport Layer Security (TLS/SSL) SRTP (Secure Real-Time Transport Protocol)
		3. X.509 certificates
		4. HTTPS for configuration through web interface
		5. IP Secure Connector
		6. Receiving and sending remote control GET command via TLS
		7. SNMP traps
		8. IPv4 and IPv6 for SIP client/trunk connections with/without encrypted data
		9. audio transport via TLS UDP, TCP, TLS, ICX over IP,
		10. SIP, SIPS, RTP, SRTP
		11. ICX over IP, RTP, SIP over TLS and (S)RTP
		12. Logging functionality including SIP messages indication via SIP Trace and activity entries indication.
		13. Brute-force attack prevention for web interface login
8. It is required that the manufacturer of the Elevator emergency Communications System complies to and is certified by one of the following standards:
	1. ISO 27001
	2. IEC 62443-4-1
9. The Emergency Communications System Operation
	1. Pressing the emergency CALL BUTTON shall initiate a bi-directional audio/video call request to the authorized system operator(s)
		1. The emergency intercom call request to the system operator must include the elevator’s location and number. This can be as an imbedded display text field on the operator video workstation monitor or intercom master station’s display. Pre-recorded audio messages containing the calling elevator’s location may also be used.
	2. The intercom audio and video calls once established may only be disconnected by an authorized system operator.
	3. The video camera must be mounted as to show the entire floor of the elevator for the system operator to verify if there are any occupants in the elevator.
	4. The system operator must have the ability to call up a video stream from any elevator without having to initiate an audio call. The elevator video Identification shall appear on the Intercom workstation activation icon. Elevator calling identifications shall not require audio broadcasts of elevator ID numbers for re-call.
	5. The touchscreen on the intercom station in the elevator must be capable of displaying the current call status.
	6. Once the call is answered, the operator/authorized user must have the ability to communicate with and obtain responses from trapped passenger(s), including a passenger(s) who cannot verbally communicate or hear messages via Text messages sent to the touchscreen display of the intercom station in the elevator. These messages may indicate when help is on the way.
	7. The system operator may send custom text messages to the elevator’s touchscreen display via a free text field visible to the elevator occupants.
	8. The system shall have the ability to launch the text messaging capability directly from a user interface based on the call location via a link. There shall be no need to type in any code or site location based on the incoming call.
	9. The elevator occupants will have the ability to respond to questions asked by the system operator by pressing either a “yes” or “no” icon displayed on the touchscreen of the intercom station in the elevator.
	10. All messages sent from the system operator to the touchscreen display in the elevator and responses sent from the entrapped person in the elevator car must remain visible until a new message or question is sent to the elevator intercom station display by the system operator or the emergency call is reset by the system operator/authorized user.
	11. If system automatic call time-outs are configured for the emergency communications system, The intercom system operator will have the ability to extend any system disconnect time.
		1. If a timed call termination by the intercom server is about to be executed to the elevator call in progress an audio warning message must be played at least 20 seconds before the call time out is to occur, this will allow for the system operator to extend the call timer if necessary.
	12. The elevator emergency calls shall not be transmitted to an automated answering system.
	13. All emergency intercom calls are to be received by the appropriate system operator/authorized or first responder master stations, these may include P.C., cell phone or mobile tablet devices running approved intercom softclient software. The calls shall be answered by trained authorized personnel available 24 hours a day 7 days a week.
	14. All emergency communications calls to the master control desk stations must identify the caller information that includes the building location and elevator number to be displayed on the master station or workstation displays.