



**FEDERAL SIGNAL**  
Safety and Security Systems



**Federal Signal E1 EX**

**Explosion-Proof  
Digital Intercom Station**

**ATEX and IECEx  
Certified**



*Handset Model E1-HND-EX shown*

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***Installation and  
Maintenance Instructions***

25500090

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## Limited Warranty

This product is subject to and covered by a limited warranty, a copy of which can be found at [www.fedsig.com/SSG-Warranty](http://www.fedsig.com/SSG-Warranty). A copy of this limited warranty can also be obtained by written request to Federal Signal Corporation, 2645 Federal Signal Drive, University Park, IL 60484, email to [info@fedsig.com](mailto:info@fedsig.com) or call +1 708-534-3400.

This limited warranty is in lieu of all other warranties, express or implied, contractual or statutory, including, but not limited to the warranty of merchantability, warranty of fitness for a particular purpose and any warranty against failure of its essential purpose.



**FEDERAL SIGNAL**  
Safety and Security Systems

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**Safety Messages to Installers and Users**

**▲ WARNING**

It is important to follow all instructions shipped with this product. This device is to be installed by trained personnel who are thoroughly familiar with the country's electric codes and will follow these guidelines as well as local codes.

The selection of mounting location for the device, its controls, and the routing of the wiring is to be accomplished under the direction of the facilities engineer and the safety engineer. In Listed below are some other important safety instructions and precautions you should follow:

Read and understand all instructions before installing or operating this equipment.

- Disconnect the intercom from the power supply before any installation or maintenance is performed.
- Power is only to be provided from the Central Control. This intercom is not for stand-alone use.
- After installation, test the unit to ensure that it is operating properly.
- After testing is complete, provide a copy of these instructions to all operating personnel.
- This equipment is suitable for use in ATEX Zone 1 applications.
- Establish a procedure to routinely check the intercom installation for integrity and proper operation.
- The product nameplate, which may contain cautionary or other information of importance to maintenance personnel, should not be obscured in any way.

Failure to follow all safety precautions and instructions may result in property damage, serious injury, or death.

### **Overview of the Federal Signal E1 EX**

Federal Signal's E1 EX Intercom Stations provide safe and efficient two-way voice communications. The E1 EX is ATEX and IECEx certified for use in areas requiring explosion-proof equipment. The E1 EX station provides instantaneous high-speed connections and clear, crisp, digital voice quality. Each station offers single-button all call, priority emergency paging, group paging, speed dial, conference calling, and relay output.

The E1 EX station keypad is designed to provide tactile and audible feedback via an external powered speaker for positive activation.

Any station can call any one or more stations in an ECHO Digital Intercom System. With the headset or gooseneck microphone options, each is capable of hands-free voice communication. Because the ECHO Digital Central Exchange provides 30 channels of simultaneous communication, calls are processed and connected immediately without dial tone or delay.

Each E1 EX station comprises of a stainless steel enclosure containing a printed circuit board assembly providing communications and safety functions. A relay output module is provided as a standard feature. The relay operates when the intercom is in Ring Mode and can be configured to operate during active Emergency Priority Pages. A single normally-open contact is provided, which is rated at 3 A at 240 Vac.

Each station may be programmed for four levels of privacy for receiving calls: non-private, semi-private, full privacy, and do-not-disturb. The volume for voice and ring levels is easily adjusted on the keypad.

The E1 EX Intercom stations must be powered from an ECHO Central Control. The data/power is supplied from the Central Control line cards. For full operational details of the ECHO system, refer to the instructions provided with the Central Control.



## Certifications

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**Table 1 Product specifications**

|                               |  |
|-------------------------------|--|
| Operating voltage             | 24 Vdc nominal (line driven from ECHO control) |
| Current idle                  | 25 mA  |
| Current connected             | 100 mA max.                                    |
| Handset microphone type       | Dynamic  |
| Handset material              | Moulded polyurethane anti-static               |
| Handset cord                  | Polyurethane                                   |
| Stubby microphone type        | Dynamic  |
| Stubby microphone sensitivity | -54 dBA  |
| Stubby microphone enclosure   | Stainless steel                                |
| Audio output                  | 2.7 V <sub>RMS</sub> , 1 k $\Omega$ load       |
| Volume control via keypad     | 30 dBA in 10 steps                             |
| Line attenuation              | 24 dBA at KBps Max                             |
| Loop resistance               | 170 $\Omega$ max.                              |
| Distance                      | 1.2 miles 2.0 kms max.                         |
| Cable                         | One twisted pair, non-shielded                 |
| Cable entries                 | 3 x M20  |
| Operating temperature range   | -40°C to +65°C                                 |
| Termination                   | DIN rail mount tensioned clamp terminals       |
| Relay switching capacity      | 3 A at 240 Vac                                 |
| Net weight                    | 11.4 kg  |
| Shipping weight               | 13.6 kg  |
| Shipping dimensions           | 524 x 359 x 346 mm                             |

## **Certifications**

|                  |   |
|------------------|---|
| Models           | E1-SM-EX, E1-GM1-EX, E1-GM2-EX,<br>E1-GM3-EX, E1-HND-EX, E1-JS-EX   |
| Certificate nos. | ATEX Cert No.: Demko 13 ATEX 1213079X<br>IECEX Cert No.: IECEX UL 13.0028X  |
| ATEX coding      |  II 2 G  |
| Protection       | Ex db ib IIB T4 Gb ( $-40^{\circ}\text{C} \leq T_a \leq +65^{\circ}\text{C}$ )<br>Ex db [ib Gb] IIB T4 Gb (for Model E1-JS-EX)      |
| Standards        | EN IEC 60079-0: 2018, EN 60079-1: 2014,<br>EN 60079-11:2012<br>IEC 60079-0: 7th Ed., IEC 60079-1: 7th Ed.,<br>IEC 60079-11: 6th Ed. |
| I.S. ratings     | Um = 250 V (Additionally, for Model E1-JS-EX,<br>refer to control drawing 850000218A.)  |
| UKCA Cert no     | UL22UKEX2630X                                      |

## **Special Conditions for Safe Use**

- This device uses M20 x 1.5 cable entries.
- All cable entry devices and blanking elements shall be certified in the type of explosion protection flameproof enclosure “d” suitable for the conditions of use and correctly installed.
- Unused apertures shall be closed with suitable blanking elements.
- For ambient temperatures below  $-10^{\circ}\text{C}$  and above  $+60^{\circ}\text{C}$ , use field wiring suitable for both minimum and maximum ambient temperature.
- All conduit runs must have a properly certified sealing fitting connected within 2 inches (51 mm) of the enclosure.

### **WARNING**

***EXPLOSION HAZARD: Do not open when an explosive atmosphere may be present.***

## **Unpacking the Product**

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### **⚠ WARNING**

**EXPLOSION HAZARD: Do not open when energized.**

- Flamepath joint differs from Table 2 of EN 60079-1. The Adalet XCEX S6393 060804 enclosure has a joint width of 37 mm, the maximum allowable gap of 0.038 mm. The distance “l” of 22.6 mm is measured from the edge of the O-ring groove to the edge of the cover bolt per Figures 3 and 5 of EN 60079-1.

### **Unpacking the Product**

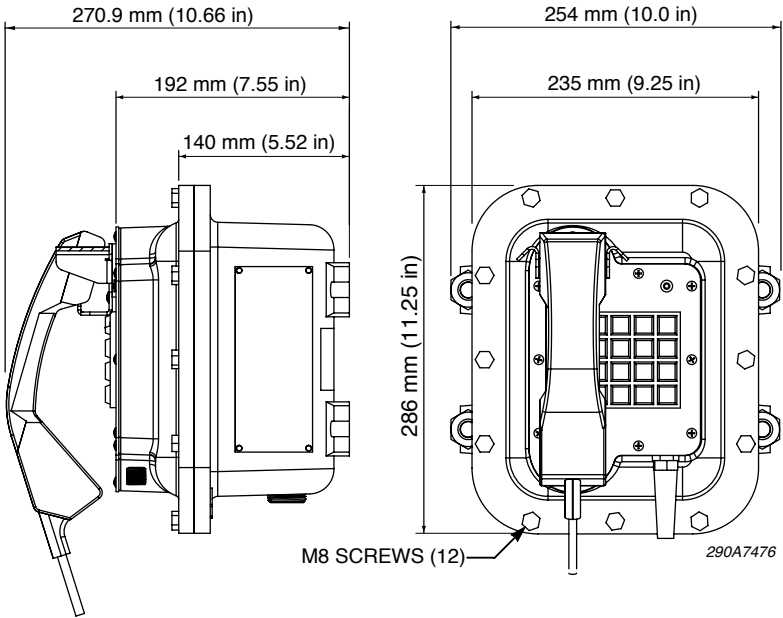
After unpacking the product, examine it for damage that may have occurred in transit. If it has been damaged, do not attempt to install or operate it. File a claim immediately with the carrier, stating the extent of the damage. Carefully check all envelopes, shipping labels, and tags before removing or discarding them. If any parts are missing, please call Federal Signal Customer Support at 800-548-7229 or 708-534-3400.



## Mounting and Wiring the Federal Signal E1 EX

Federal Signal E1 EX intercoms are designed for mounting on a flat horizontal or vertical surface. Four installer-supplied M10 bolts are required. For mounting dimensions, see Figure 1.

**Figure 1 Dimensions**



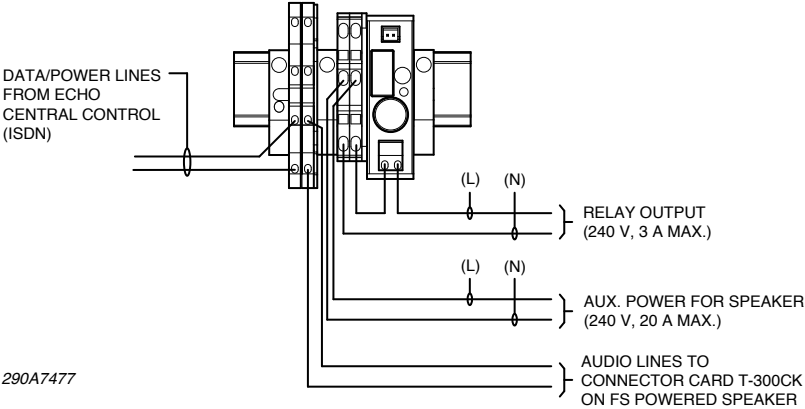
To install the E1 EX intercom:

1. Access to internal wiring: See Figure 1. Remove the twelve M8 stainless steel screws securing the cover to the enclosure and carefully open the hinged cover.

# Mounting and Wiring the Federal Signal E1 EX

- 2. Conduit entrances: See Figure 2. The E1 EX has three conduit/cable entrances for field wiring. Entries can be used for the connection of data/power from the Central Control, external loudspeaker connections, or relay output connection.

Figure 2 Wiring diagram



**NOTE:** The internal grounding terminal shall be used as the grounding equipment means. The external terminal is only a supplemental bonding connection where local authorities permit or require such a connection.

- 3. Terminals: For field wiring, the E1 EX has a series of DIN rail terminal blocks with these connections (see Figure 2):
  - ✓ Relay output: 18-12 AWG (0.75 – 4 mm<sup>2</sup>), tightening torque 0.4 N•m (3.4 in-lb), 240 Vac, 3.0 A max.
  - ✓ Audio/ISDN: 26-12 AWG (0.25 – 4 mm<sup>2</sup>), Cu conductors only
- 4. Upon completion of the field wiring, secure the cover to the enclosure with the M8 screws to 23 N•m (17 ft-lb) to ensure weather- and dust-tightness and hazardous location ratings.

### **Safety Messages to Maintenance Personnel**

#### **⚠ WARNING**

Listed below are some important safety instructions and precautions you should follow:

- Read and understand all instructions before maintaining or operating this system.
- Any maintenance to the unit must be performed by properly trained personnel.
- Any maintenance to the intercom must be done with the power turned off.
- Never alter the unit in any manner. Safety in hazardous locations may be endangered if additional openings or other alterations are made in units specifically designed for use in these locations.
- The nameplate, which may contain cautionary or other information of importance to maintenance personnel, should NOT be obscured in any way. Ensure that the nameplate remains readable when the housing's exterior is painted.
- After performing any maintenance, test the intercom system to ensure that it operates properly.

Failure to follow all safety precautions and instructions may result in property damage, serious injury, or death.

### **Ordering Replacement Parts**

Due to certification, certain component parts are not available for field replacement. Intercoms with this type of damage must be either replaced entirely or returned to Federal Signal for service. For spare parts availability and part numbers, please call Federal Signal Customer Support at 800-548-7229 or 708-534-3400.

## ***Getting Technical Support***

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### **Getting Technical Support**

For technical support, please contact:

Federal Signal Corporation

Phone: 1-800-524-3021 or 1-708-534-4790

Email: [TechSupport@fedsig.com](mailto:TechSupport@fedsig.com)

[www.fedsig.com](http://www.fedsig.com)

### **Getting Repair Service**

The Federal Signal factory provides technical assistance with any problems that cannot be handled locally.

Any units returned to Federal Signal for service, inspection, or repair must be accompanied by a Return Material Authorization (RMA) number. Obtain an RMA number from a local Distributor or Manufacturer's Representative or contact our Customer Support team at 800-548-7229 or 708-534-3400 or email at [iordersup@fedsig.com](mailto:iordersup@fedsig.com). Provide a brief explanation of the service requested or the nature of the malfunction.

Address all communications and shipments to the following:

Federal Signal Corporation  
Service Department  
2645 Federal Signal Dr.  
University Park, IL 60484-3167

Defective products that are returned within the warranty period will be repaired or replaced at Federal Signal's sole discretion. Defective products do not include those products with lamp failure. Circumstances other than those listed above will be addressed on a case-by-case basis.