

# DIGITAL ACOUSTICS

## **IP7™ -SE8**

**IP Intercom/Amplifier**

**Reference Manual**



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# Table of Contents

<b>Overview</b> .....	<b>1</b>
<b>Specifications</b> .....	<b>2</b>
<b>IP7-SE8 Layout</b> .....	<b>3</b>
<b>LED Indicators</b> .....	<b>6</b>
<b>Connecting Power</b> .....	<b>7</b>
PoE .....	7
External Power .....	7
USB Power .....	7
<b>Connecting a Mic and Speaker</b> .....	<b>7</b>
Mic + and Mic - .....	7
Talk .....	8
<b>Connecting a Speaker / Transformer</b> .....	<b>8</b>
SPKR 8Ω+ and SPKR 8Ω- .....	8
Speaker Configurations .....	8
25/70V Speaker(s) with optional 25/70V transformer .....	8
8 Ohm Speaker(s) .....	10
<b>Connecting Line Out or Line In</b> .....	<b>11</b>
Line Out .....	11
Line In .....	11
<b>Connecting the Relay</b> .....	<b>12</b>
<b>Connecting the Sensor</b> .....	<b>12</b>
<b>Connecting an I2C Bus</b> .....	<b>12</b>
<b>Mounting Instructions</b> .....	<b>13</b>
Din Rail Mounting .....	13
Surface Mounting .....	13
<b>Setting Volume Levels</b> .....	<b>13</b>
<b>Configuring</b> .....	<b>14</b>
IP Configuration .....	14
Intercom Options .....	14
<b>Physical Dimensions</b> .....	<b>15</b>
<b>Environmental</b> .....	<b>15</b>
<b>Troubleshooting</b> .....	<b>16</b>
Reset to Factory Defaults .....	16
Connecting 1/8" (3.5mm) Audio Plug to the Pluggable connectors .....	16
Reducing electrical noise in audio .....	16
Viewing tech support info via the USB port .....	16
Low Level Flashing Utility .....	17
<b>Contacting Technical Support</b> .....	<b>17</b>
<b>Regulatory Notices</b> .....	<b>18</b>
<b>Index</b> .....	<b>19</b>

## Overview

The Digital Acoustics IP7-SE8 is an IP (Internet Protocol) amplifier that provides up to 8 watts of audio output. Additionally, the SE8 provides 2-way Intercom functionality, an output relay, sensor and 2-port network switch. Simply connect the module to a 10/100 Ethernet connection, configure its IP address information and communicate to a host server PC by voice.

Standard features include:

- Talk to/from an IP7-SE8 to host PC server
- Drive one or more speakers for paging applications
- High quality, clear transmit and playback audio
- Highly scalable and seamless expansion
- DIN rail or surface mount
- Fixed or DHCP compliant IP assignment
- Auto sensing power from 12VDC - 15VDC
- PoE (802.3af) standard
- Integrated 2-port switch
- Field upgradeable OS using internal Flash memory

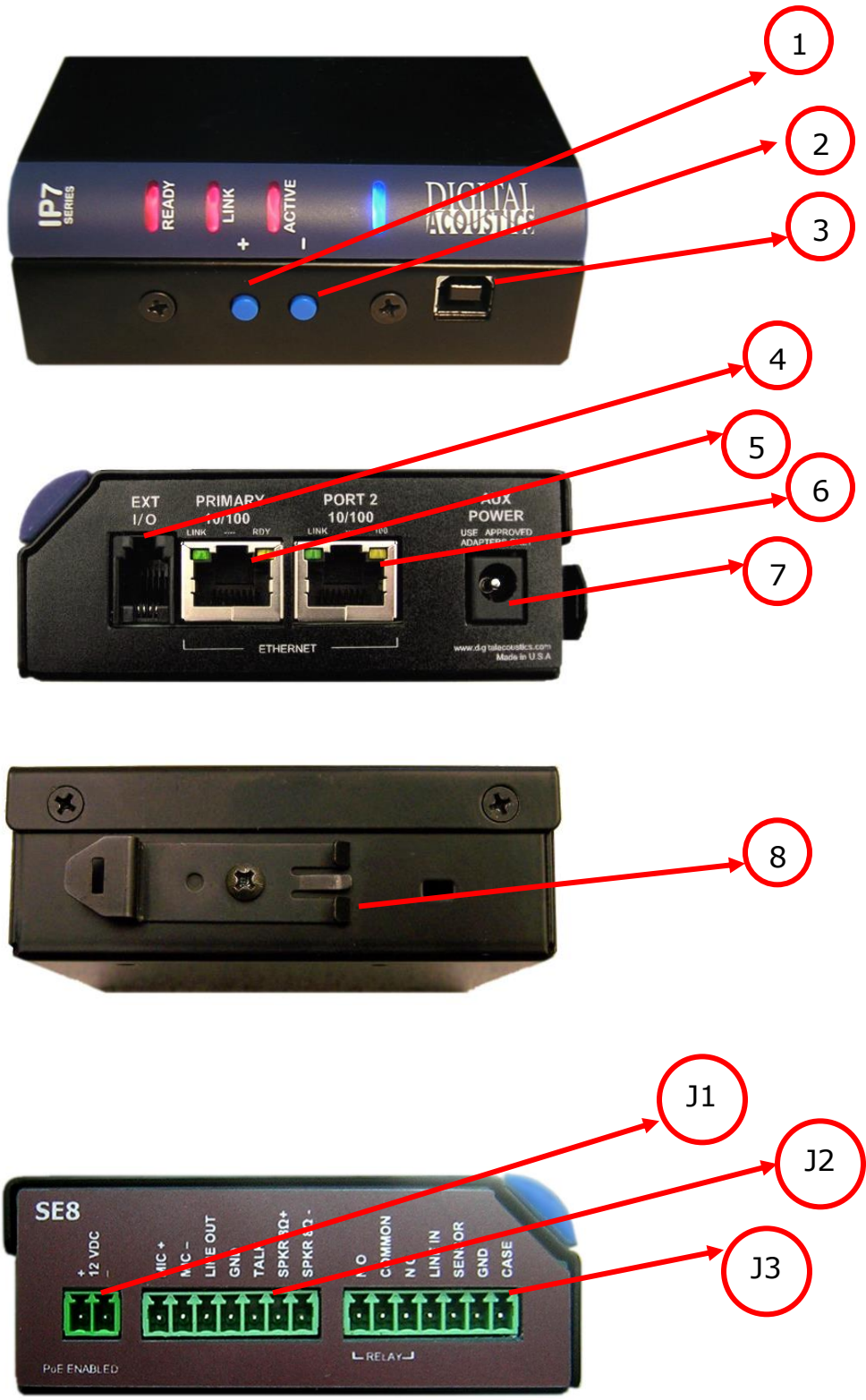


The IP7-SE8 must be configured using the TalkMaster software before being used. Please consult the configuration section of the software manual for details.

## Specifications

Items	Specification
Hardware Protocols	TCP, UDP, SIP, RTP, ICMP, IGMP Multicast
Network Interface	10/100 Ethernet (Auto detection, Auto MDIX)
Command protocols	Proprietary
Audio Rate	64kbs
Audio Resolution	G.711 (8-bit PCM and 16-bit uLaw)
Audio Sample Rate	8K (Voice band), 22K (Background Music)
Audio Frequency	90-4kHz (Voice band) , 90-11khz (Background Music)
Internal Amplifier	8 watts @ 8 Ohms
Humidity	10~90%
Power	External Power 12-15 VDC @ 15 watts nominal.
	PoE (802.3af) compliant (requires 15.4 watts from PSE). External Power overrides PoE power
Size	3.85. x 3.59 x 1.37 in
	98 mm x 91mm x 35mm

# IP7-SE8 Layout



## Connections and Controls

Refer to the preceding pictures.

Connector	Connector / Control	Notes
1	+ Button	Volume up button
2	- Button	Volume down button
3	USB-B	Provides for low level firmware flashing as well as viewing technical support information. Will also power the unit for diagnostic purposes.

4	Ext I/O	I2C expansion bus interface that can be used for custom applications. Requires custom firmware from Digital Acoustics
5	Ethernet 10/100	10/100 Ethernet network interface. Supports auto negotiation and auto-MDIX
6	Port 2 10/100	Provides a 10/100 Ethernet network connection for another device. Supports auto negotiation and auto-MDIX
7	Aux Power	2.1mm power connector with center tip positive. 12VDC - 15VDC @ 15 watts. Overrides PoE power. <b>Warning:</b> Connecting power to both the 2.1mm Power jack and the J1-1 and J1-2 power connectors at the same time will damage the unit

8	DIN Rail Mounting Clip	Allows unit to be snapped on to standard 35mm DIN Rail stock
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There are three sets of pluggable DIN connectors (3.81mm centers) on the SE8:

### SE8 J1 Connector

Connector	Signal	Notes
J1-1	Power +	12VDC - 15VDC at 15 watts. Overrides PoE power. <b>Warning:</b> <i>Connecting power to both the 2.1mm power jack and the J1-1 and J1-2 power connectors at the same time will damage the unit</i>
J1-2	Power -	

### SE8 J2 Connector

Connector	Signal	Notes
J2-1	MIC +	Microphone Inputs. Pseudo differential (Actively Balanced differential).
J2-2	MIC -	
J2-3	Line Out	-10db with a 10k termination. Capable of driving head phones. Reference to J2-4
J2-4	GND	System Ground. Same as J3-6
J2-5	TALK	Talk or Call button. Initiates a call to the configured Server. Reference to J2-4
J2-6	SPKR 8Ω+	Floated differential output. Able to drive an 8 Ohm load @ 8 watts or a 600 Ohm load
J2-7	SPKR 8Ω-	

### SE8 J3 Connector

Connector	Signal	Notes
J3-1	NO	Isolated Dry Contact Relay output. Connect J3-2 and either J3-1 for NO (Normally Open) or J3-3 for NC (Normally Closed)
J3-2	COMMON	
J3-3	NC	
J3-4	LINE IN	Unbalanced. Reference to ground
J3-5	SENSOR	Door Sensor. Active when closed to ground or Active when open to ground. Reference to J3-6
J3-6	GND	System Ground. Same as J2-4
J3-7	CASE	Optional connection to earth ground



## LED Indicators

### *Intercom LEDs*

There are four LEDs present on the curved bezel on the front of the product.

- The blue LED indicates that the IP7-SE8 has powered up.
- The three red LEDs indicate status of the unit.

LED	Description
Ready	Indicates whether the unit has connected to a Server
Link	Indicates whether the unit has a valid network Connection
Active	Indicates whether audio is being transmitted or received

### *LED Status Table*

Description	Ready	Link	Activity
Normal operational mode. Intercom can communicate with its Server	On	On	Off
Playing Audio	On	On	Flashing
Playing Broadcast Audio	Fast Flash	On	Flashing
Sending Audio	On	On	On
Attempting to connect to make a connection or unit has not been configured	Flashing	On	
LAN connection is inactive. The RJ45 may be unplugged	Flashing	Off	
Unit has been detected by the Intercom Configuration Tool	Fast Flash	On	

### *LAN Connector LEDs*

On the **Ethernet 10/100** RJ-45 connector:

- The Green LED tracks to the Ready LED
- The Yellow LED tracks to the Link LED

On the **Port 2 10/100** RJ-45 connector

- The Green LED tracks to network transmit activity
- The Yellow LED tracks to network receive activity

## Connecting to an Ethernet Network

The **Ethernet 10/100** connector allows the unit to be attached to a 10/100 network. **Port 2 10/100** allows an additional IP device to be connected to the network without the need for an additional network drop. The second port is not PoE capable.

- Plug a Cat5 cable into the RJ-45 connector labeled **Ethernet 10/100** and connect the other end to a 10/100 switch.
- To connect a second IP device to the network, plug a Cat5 cable in the RJ-45 connector labeled **Port 2 10/100**
- The **Ethernet 10/100** connector supports auto "MDIX" and can be plugged directly into a PC for diagnostic purposes.

## Connecting Power

The IP7-SE8 auto senses the power source and voltage. An external power source will always override PoE power.

### *PoE*

Plug a Cat5 cable from an 802.3af compatible switch or injector into the RJ-45 connector that is next to the 2.1mm Power Jack connector. 15.4 watts will be requested from PoE (802.3af compatible) Power Source Equipment (PSE).

### *External Power*

- The 2.1mm Power Jack (center tip positive) accepts 12VDC. The J1-1(+) and J1-2(-) connector accepts 12VDC - 15VDC
- **DO NOT** supply power to both the 2.1mm Power Jack and the J1-1 and J1-2

### *USB Power*

The USB connector can be used to power up the unit for diagnostics or low level firmware flashing. Plug a USB cable from a PC into the USB-B connector. The unit will power up, but will not be able to be used for audio operations.

## Connecting a Mic and Speaker

When wiring microphone connections, use a shielded twisted multi-conductor such as Belden 9462 or for long runs, Belden 5301.

### *Mic + and Mic -*

The IP7-SE8 can accept electret or dynamic microphones. A weather proof speaker can also be used as a microphone.

### **To connect an Electret Microphone**

- Connect J2-1 to the Mic + lead of the Electret Mic
- Connect J2-2 to the Mic - lead of the Electret Mic
- Connect a jumper between J2-2 and the J2-4 Ground

### **To connect a Dynamic Microphone**

- Connect J2-1 to the Mic + lead of the Dynamic Mic
- Connect J2-2 to the Mic - lead of the Dynamic Mic
- Connect J2-4 to the ground of the Dynamic Mic

### ***Talk***

The **Talk** connector is used to initiate a call and send audio. Once a call has been initiated to the Server, **Talk** is normally software controlled by the Server.

- Connect J2-5 and J2-6 to a normally open button or contact

### **Connecting a Speaker / Transformer**

#### ***SPKR 8Ω+ and SPKR 8Ω-***

The Speaker connectors are designed to drive an 8 Ohm load.

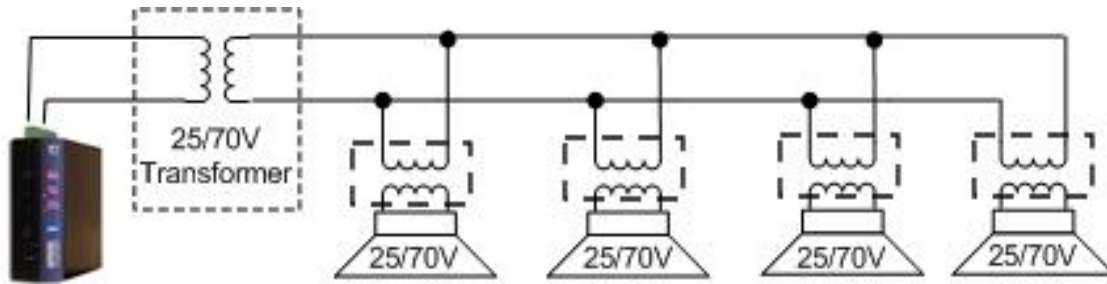
- Connect J2-6 and J2-7 to the speaker, transformer or amplifier (polarity independent)
- If the IP7-SE8 is connected to an audio amplifier, set the volume level on IP7-SE8 to 4 or less

#### ***Speaker Configurations***

The IP7-SE8 is designed to drive speakers attached to a 25/70V distribution line (requires optional 25/70V Transformer) or an 8 Ohm load. One or more speakers can be driven by a single IP7-SE8. If more than one speaker is connected to an IP7-SE8, all speakers will sound when audio is sent to that the IP7-SE8.

#### ***25/70V Speaker(s) with optional 25/70V transformer***

The SE8 can drive one or more 25/70V Speakers or Horns when equipped with an optional 25/70V transformer. This is the recommended installation method when driving multiple speakers.



Please note the following guidelines:

- Each speaker must have its own 25/70V transformer
- Do not mix Speakers tapped for 25V with a 70V distribution line or speakers tapped for 70V with a 25V distribution line
- All speakers must be wired in parallel.
- Speakers should be installed within 3000 feet (900 meters) of the SE8 using 12 gauge wire
- The total wattage available from the SE8 must be reduced by 30% to account for transformer and line loss
- The total wattage of the selected speaker taps cannot exceed the wattage available from the IP7
- Maintain the same wiring polarity between speakers

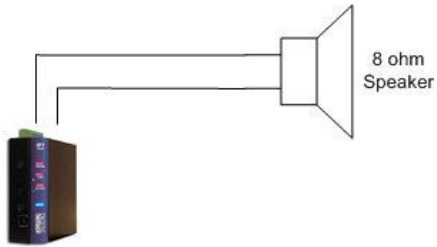
To use the optional transformer:

- Mount the transformer next to the IP Amplifier
- Connect the J2-6 (SPKR 8Ω+) and J2-7 (SPKR 8Ω-) from the IP Amplifier to the 8 Ohm side of the transformer
- Connect the 10 watt taps from the other side of the transformer to the wire leading to the speaker(s)
- Refer to the instructions included with the transformer for additional information

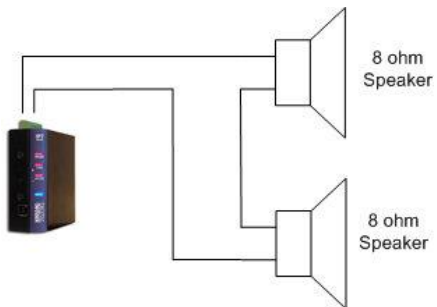
## 8 Ohm Speaker(s)

The following configurations are supported for driving 8 Ohm speakers. If you plan on driving more than one speaker, consider using 25/70V Speaker(s) with optional 25/70V transformer as described in the next section.

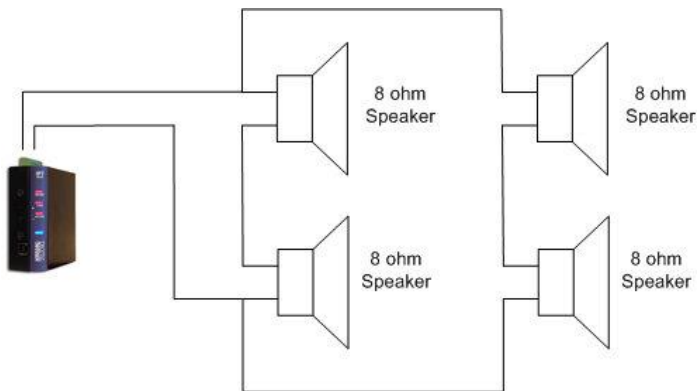
- A single 8 Ohm speaker



- Two 8 Ohm speakers must be wired in series



- Four 8 Ohm speakers must be wired in series-parallel



Please note the following guidelines:

- Speakers should be installed within 200 feet (60 meters) of the SE8 using 18 gauge wire
- The total watts available from the SE8 are distributed equally among the speakers.

## **Connecting Line Out or Line In**

### ***Line Out***

The **Line Out** connector is designed to drive a 600 Ohm unbalanced load at -10db. This is capable of driving headphones or a multimedia speaker.

- Connect J2-3 to the + side of the output source
- Connect J2-4 to the - side of the output source
- Cable length should not exceed 6ft (2 meters)
- Use 22 awg shielded/stranded cable

### ***Line In***

The **Line In** connector is provides a standard unbalanced signal. The Intercom must be set to enable Line In instead of the Microphone via the software configuration software.

- Ensure **Line In** has been enabled in the Intercom's Software Configuration program
- Connect J3-4 to the + side of the input source
- Connect J3-6 to the - side of the input source

## Connecting the Relay

The **Relay** connector provides a dry contact output from the IP7-SE8 suitable for activating equipment such as electronic door strikes, strobe lights or CCTV cameras. Normally Open (N/O) or Normally Closed (N/C) can be chosen. The **Relay** is rated at 250 VAC / 30VDC @ 60W / 1500 VAC Isolation.

- J3-1 is N/O
- J3-2 is Common
- J3-3 is N/C
- Ensure **Relay** has been properly configured in the Intercom's Software Configuration program

## Connecting the Sensor

The IP7-SE8 supports an input **Sensor** that can be used for a variety of applications. The Sensor can be defined as Active Closed or Active Open via software. Digital Acoustics' TalkMaster™ Software provides functionality for monitoring the status (open or closed) of a door via the **Sensor**.

- Connect J3-5 and J3-6 to a door sensor or device that can provide a contact closure
- Ensure **Sensor** has been configured to be Active Closed (Sensor closed to Ground) or Active Open (Sensor open to ground) in the Intercom's Software Configuration program

## Connecting an I2C Bus

The IP7-SE8 can support an optional I2C bus via the RJ-10 connector. Buttons, relays and LEDs can be added to the I2C bus, BUT REQUIRE CUSTOM FIRMWARE AND SOFTWARE. Please contact Digital Acoustics for additional information.

## Mounting Instructions

The IP7-SE8 can be installed on a DIN Rail or surface mounted.

### *Din Rail Mounting*

To DIN rail mount:

- Cut a piece of 35mm DIN rail (not supplied) to the desired length and secure it to the wall
- Place the IP7-SE8 onto the DIN rail by tilting the top of the unit (J1, J2, J3 connectors facing up with Volume buttons and USB-B connector facing forward) back towards the DIN Rail until the IP7-SE8s DIN clip catches the top of the rail
- Press in at the bottom of the IP7-SE8 to snap it in place

### *Surface Mounting*

To surface mount:

- Attach the detachable surface mount plate to the back of the unit using the provided screws. The two mounting holes of the surface mount plate should be above the J1, J2, and J3 connectors
- Attach two (2) #8 pan head screws 2 inches (52 mm) apart and screw in to within ¼"
- Place the mounting holes of the IP7-SE8 over the #8 screws
- Attach one (1) #8 screw to the remaining hole at the bottom of the mounting plate



## Setting Volume Levels

The IP7-SE8 supports seven volume levels for an attached speaker.

- Press the "+" or "-" button one time to increase or decrease the speaker volume
- If no audio is playing, a high frequency beep is heard when the volume "+" is pressed and a low frequency beep is heard when the volume "-" is pressed
- Pressing the "-" or "+" button seven times sets the unit at its lowest or highest setting.
- Refer to the software manuals for setting the volume via software.



## **Configuring**

### ***IP Configuration***

Refer to the software manuals for instructions on setting the IP address information for the IP7-SE8

### ***Intercom Options***

Refer to the software manuals for instructions on setting the following Intercom options in the IP7-SE8:

#### **Dry Contact Relay**

Activate **Door Open** via Operator control from the software

Activate on Push-to-Talk (PTT)

Activate on Mic, Speaker or Mic and Speaker

#### **Sensor**

Active Closed (Door)

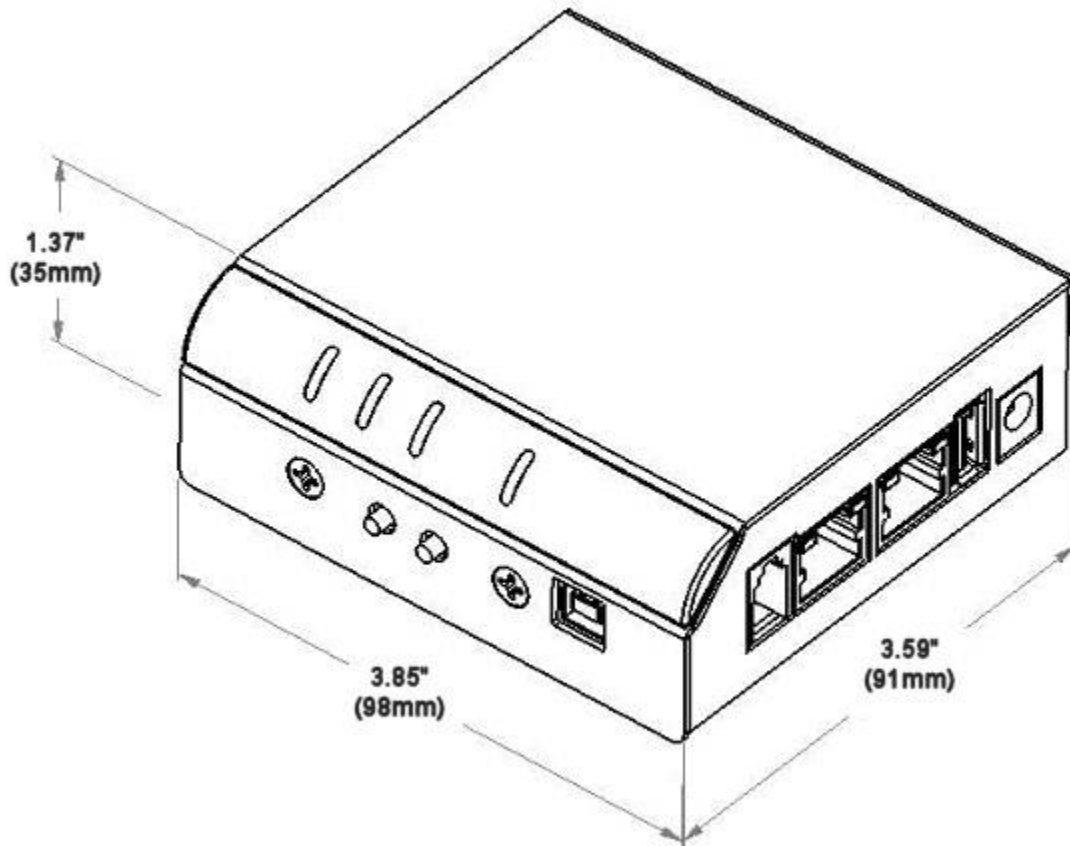
Active Open (Door)

Active Closed (Custom)

Active Open (Custom)

## Physical Dimensions

The IP7-SE8 dimensions are as follows:



## Environmental

The IP7-SE8 is designed to operate indoors or in a weather proof box that has a NEMA4 or IP66 rating.

## **Troubleshooting**

Always refer the LED Indicator table when troubleshooting the IP7-SE8.

### ***Reset to Factory Defaults***

The IP Address information and all Intercom options can be reset to factory defaults by the following procedure:

- Unplug the Power
- Press and hold the "Vol +" and "Vol -" buttons
- Power the unit
- Wait till the unit plays a 3 tone beep (about 5 seconds)
- Release the "Vol +" and "Vol -" buttons
- Refer to the software manuals for instructions on setting the IP address information

### ***Connecting 1/8" (3.5mm) Audio Plug to the Pluggable connectors***

To connect a Mic, Line In or Line Out to the pluggable connectors via a 1/8" audio connector, the audio plug should be wired as follows:

- The Tip should be wired to positive
- The Sleeve should be wired to minus or ground
- On stereo plugs, the Ring should be unconnected

### ***Reducing electrical noise in audio***

Improper wiring can cause noisy audio when transmitting microphone audio from the SE8. To minimize the possibility of this:

- Locate the unit at least one meter away from transformers, stepper motors or other noise producing equipment
- Use shielded twisted multi-conductor cable for audio and follow the grounding recommendations
- Do not run audio cable in the same conduit with AC power
- Attached J3-7 to an earth ground

### ***Viewing tech support info via the USB port***

If requested by Digital Acoustics Support, a USB cable can be attached to the IP7-SE8 to capture additional information.

- Attach a USB cable to the USB-B connector on the unit.
- Attach the other end of the cable to a PC running Windows®.

- If an "Install Hardware" prompt is displayed, insert the TM CD that came with the product and install the USB Virtual Com port.
- Open the Windows Device Manager to determine the virtual Serial port that has been assigned
- Open the Windows® Hyperterm program (or similar terminal emulation program) and set the properties to select the new Serial port with settings of 115kbs, 8,N,1, no flow control and ANSI Terminal
- Press the Enter key
- Provide the requested info to Digital Acoustics Tech support

### ***Low Level Flashing Utility***

If a power is removed from the unit while the firmware is being updated from the network, the unit may require a low level flash.

- Install the Low Level Flashing Utility from Technical Support
- Remove the four screws (two on the front and two on the back)
- Open the case by pulling up on the side opposite the Volume buttons till the top pops off
- Connect the USB cable (this will power the unit up)
- Position the unit with the Vol "+" and Vol "-" buttons facing you
- Bend a paper clip or piece of wire and insert into the two holes to the right of the Vol "+" and Vol "-" buttons
- Power cycle the unit by removing and reinserting the USB cable
- Run the Low Level Flashing Utility and specify the file name of the firmware
- Repower the unit

### **Contacting Technical Support**

Information online at [www.digitalacoustics.com](http://www.digitalacoustics.com)

***Email support:***

[esupport@digitalacoustics.com](mailto:esupport@digitalacoustics.com)

## Regulatory Notices

### **Federal Communication Commission Class A Notice**

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to **Part 15** of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

In compliance with FCC regulations, the following information is provided on the device or devices covered in this document.

- Product Name: IP7 Series
- Model number: SS20,Sx8,STx
- Company name: Digital Acoustics LLC  
37 Sherwood Terrace  
Lake Bluff, IL 60044  
847-604-9246

### **IC Notice (Canada Only)**

This Class A digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe A est conforme à la norme **NMB-003** du Canada.



*NOTE: Industry Canada regulations provide that changes or modifications not expressly approved by Digital Acoustics, LLC could void your authority to operate this equipment*

### **CE Notice**

Marking by the symbol **CE** indicates compliance of this equipment to the EMC (Electromagnetic Compatibility) directive of the European Community. Such marking is indicative that this equipment meets or exceeds at least an **EN 55022:2006**

**Class A** device

### **VCCI Compliance**

Class A

### **AS/NZS CISPR22:2006 Compliance**

Class A

### **CNS 13438 Compliance**

Class A

## Index

- Button .....	4, 13	<b>Line Out</b> connector.....	11
+ Button .....	4, 13	MIC - .....	5
Aux Power .....	4	MIC + .....	5
CASE .....	5	NC .....	5
Common .....	5	NO .....	5
DIN rail mount.....	13	Normally Closed.....	5
DIN Rail Mounting Clip .....	4	Normally Open.....	5
Dynamic Microphone.....	8	PoE .....	7
Earth ground .....	5	Port 2 10/100 .....	4
Electret Microphone .....	8	Power .....	5
Ethernet 10/100.....	4	Power - .....	5
Ext I/O.....	4	<b>Relay</b> connector .....	12
External Power.....	7	SENSOR.....	5
GND .....	5	SPKR 8Ω- .....	5
Ground .....	5	SPKR 8Ω+ .....	5
Intercom Options .....	14	Surface mount.....	13
IP Configuration .....	14	TALK .....	5
LED .....	6	Talk connector .....	8
LED Status .....	6	USB Power .....	7
LINE IN.....	5	USB-B.....	4
<b>Line In</b> connector .....	11	Volume .....	13
Line Out .....	5		



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