![Digital Acoustics logo]

IP7™-SS20

IP Paging Amplifier

Reference Manual

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Overview

The Digital Acoustics IP7-SS20 is an IP (Internet Protocol) amplifier that provide up to 20 watts of audio output. The SS20 is capable of driving one or more speakers attached to a 25/70V audio distribution line or an 8 ohm speaker.

Standard features include:

- Drive one or more speakers for paging applications

- High quality audio up to 20 watts

- Highly scalable and seamless expansion

- DIN rail or surface mount

- Fixed or DHCP compliant IP assignment

- Auto sensing power from 24-32 VAC/VDC

- Field upgradeable OS using internal Flash memory

The IP7-SS20 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	20 watts @ 8 Ohms
Humidity	10~90%
Power	External Power 24-32 VAC/VDC @ 50 watts nominal
Size	3.85. x 3.59 x 1.37 in 98 mm x 91mm x 35mm

IP7-SS20 Layout

1

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J1

J2
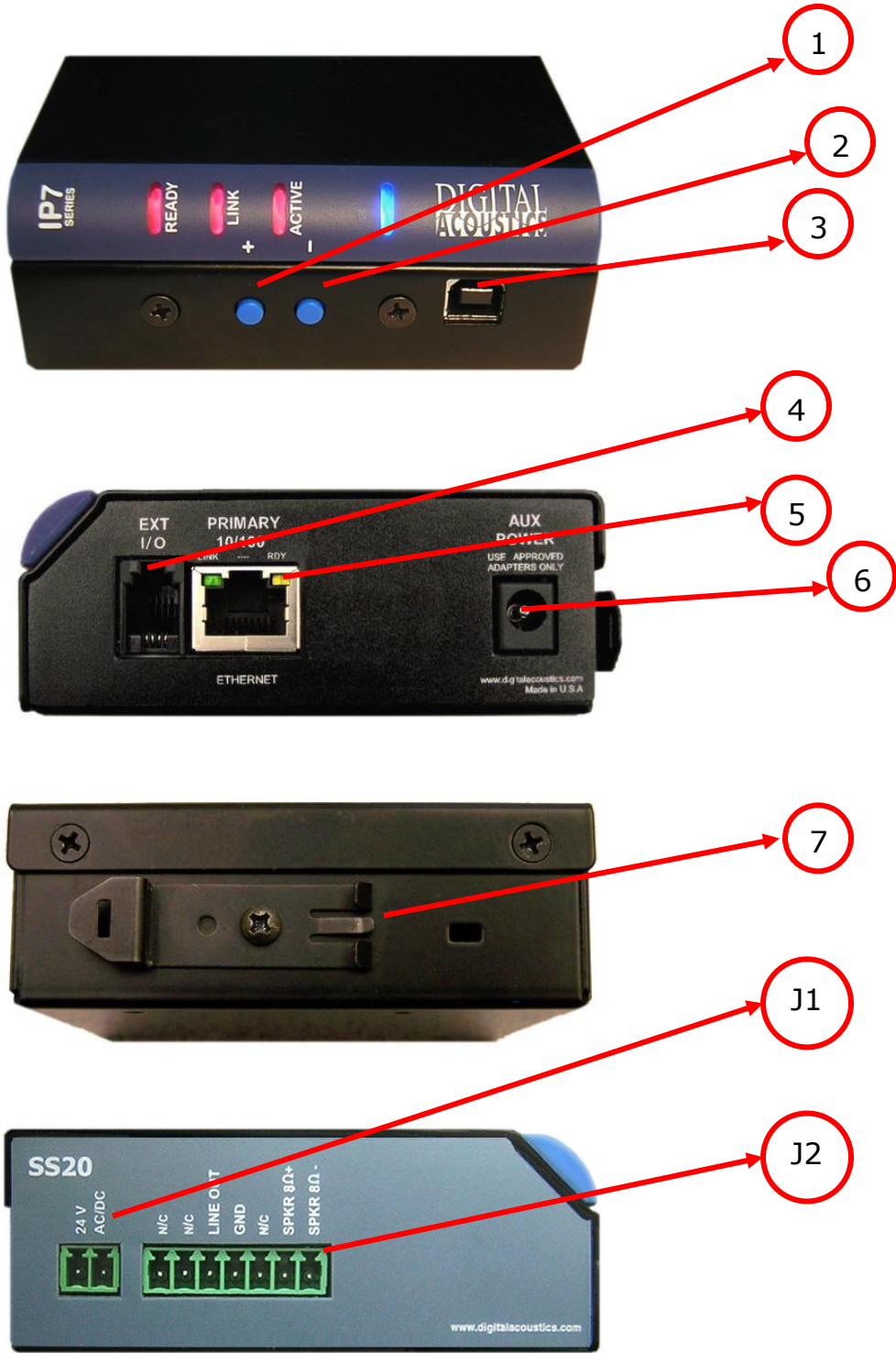
Connections and Controls

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	Aux Power	2.1mm power connector with center tip positive. 24-32 VAC/VDC **Warning**: 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

7	DIN Rail Mounting Clip	Allows unit to be snapped on to standard 35mm DIN Rail stock

There are two sets of pluggable DIN connectors (3.81mm centers) on the SS20:

SS20 J1 Connector

Connector	Signal	Notes
J1-1	Power +	24 -32 VAC/VDC. **Warning:** *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*
J1-2	Power -	

SS20 J2 Connector

Connector	Signal	Notes
J2-1	nc	No Connection
J2-2	nc	No Connection
J2-3	Line Out	-10db with a 10k termination. Suitable for driving headphones. Reference to J2-4
J2-4	GND	System Ground
J2-5	nc	No Connection
J2-6	SPKR 8Ω+	Floated differential output. Able to drive an 8 Ohm load @ 20 watts
J2-7	SPKR 8Ω-	

LED Indicators

LEDs

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

- The blue LED indicates that the IP7-SS20 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 when audio is being received

LED Status Table

Description	Ready	Link	Activity
Normal operational mode. Unit can communicate with its Server	On	On	Off
Playing Audio	On	On	Flashing
Playing Broadcast Audio	Fast Flash	On	Flashing
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 Talkmaster 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

Connecting to an Ethernet Network

The **Ethernet 10/100** connector allows the unit to be attached to a 10/100 network.

- Plug a Cat5 cable into the RJ-45 connector labeled **Ethernet 10/100** and connect the other end to a 10/100 switch.
- The **Ethernet 10/100** connector supports auto "MDIX" and can be plugged directly into a PC for diagnostic purposes.

Connecting Power

The IP7-SS20 auto senses the power source and voltage.

External Power

- The 2.1mm Power Jack (center tip positive) accepts 24-32 VAC/VDC
- The J1-1(+) and J1-2(-) connector accepts 24-32 VAC/VDC
- **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 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-SS20 is connected to an amplifier, set the volume level on IP7-SS20 to 4 or less

Speaker Configurations

The IP7-SS20 is designed to drive speakers attached to a 25/70V distribution line (requires optional 25/70V Transformer) or an 8 Ohm. One or more speakers can be driven by a single IP7-SS20. If more that one speaker is connected to an IP7-SS20, all speakers will sound when audio is sent to that SS20.

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

The SS20 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.
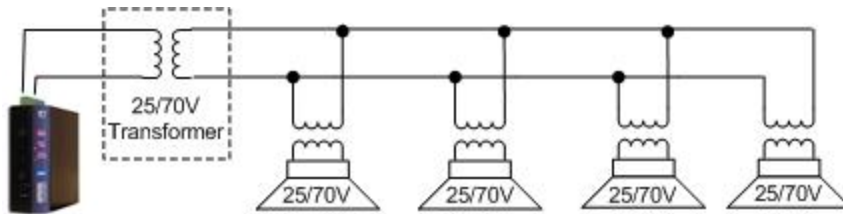
Please note the following guidelines:

- 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 14 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 20 watt taps from the other side of the transformer to the wires leading to the speaker(s)
- Refer to the instructions included with the transformer for additional information
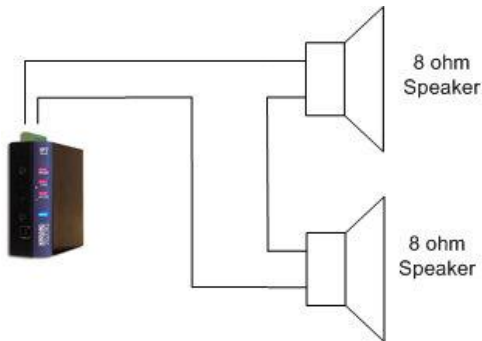
8 Ohm Speaker(s)

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 previous section.
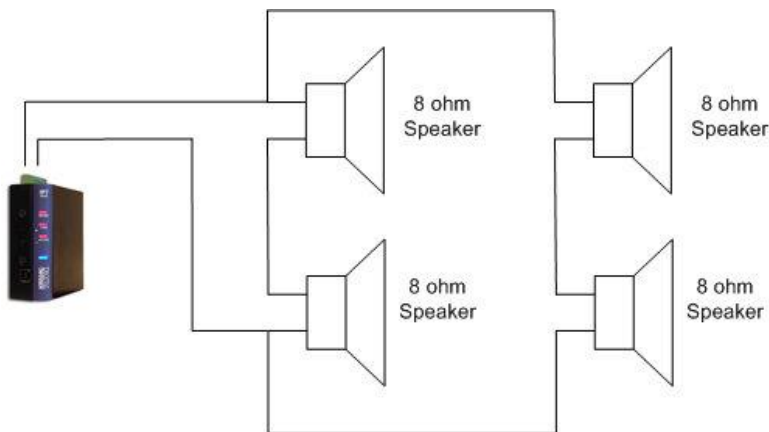
- A single 8 Ohm speaker
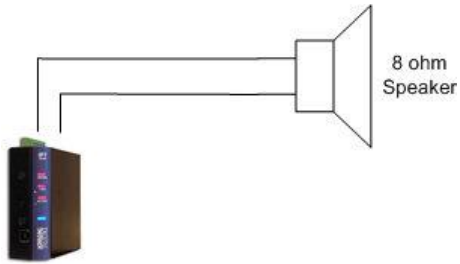
- Two 8 Ohm speakers must be wired in series

- 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 SS20 using 18 gauge wire
- The total watts available from the SS20 are distributed equally among the speakers.

Connecting 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

Connecting an I2C Bus

The IP7-SS20 can support an optional I2C bus via the RJ-10 connecter. 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-SS20 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-SS20 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-SS20s DIN clip catches the top of the rail
- Press in at the bottom of the IP7-SS20 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-SS20 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-SS20 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.
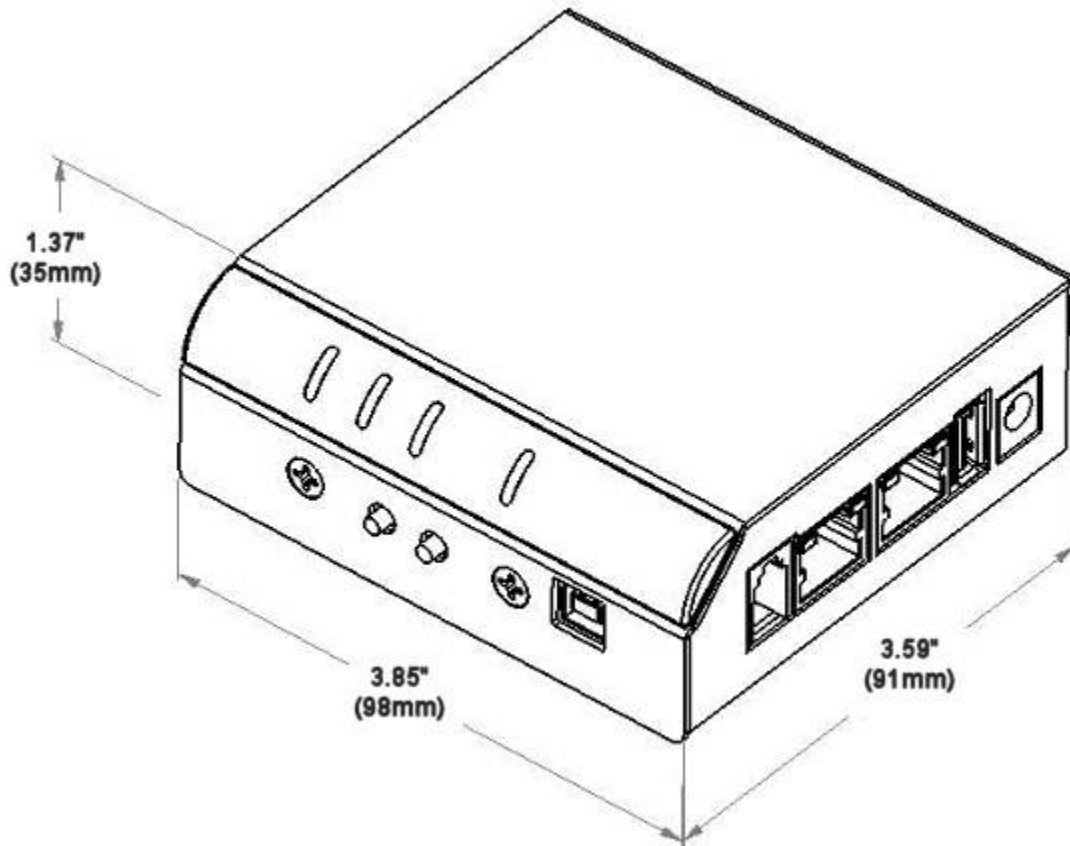
Software Configuration

IP Address

Refer to the software manuals for instructions on setting the IP address information for the IP7-SS20

Options

Refer to the software manuals for instructions on setting the "Remote Listen Disable" option in the IP7-SS20:

Physical Dimensions

The IP7-SS20 dimensions are as follows:

1.37"
(35mm)

3.85"
(98mm)

3.59"
(91mm)

Environmental

The IP7-SS20 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-SS20.

Reset to Factory Defaults

The IP Address information and all 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 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 left unconnected

Reducing electrical noise in audio

Improper wiring can cause noisy audio when transmitting microphone audio from the SS20. 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-SS20 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

Email support:

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

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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

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