

Network IP Intercom, Telephony and Paging for VoIP, IP, Internet and Ethernet Applications

Digital Acoustics LLC
Site Summary Draft












Q4 2005 Docv9221.23 -Total Pages 14

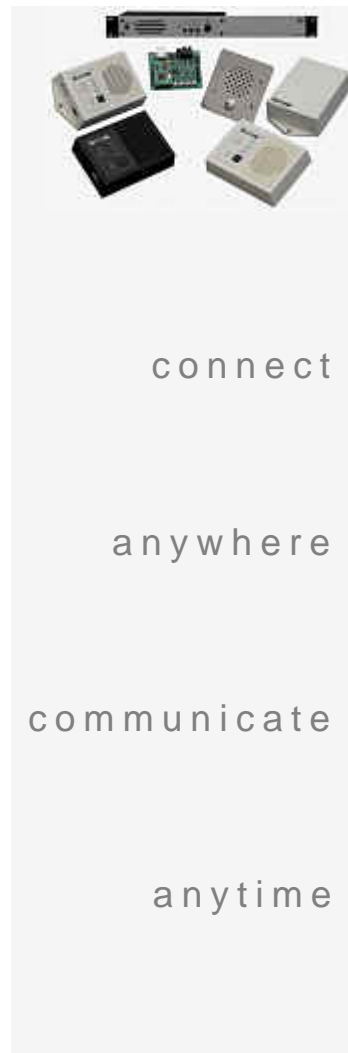
PREMIMINARY- DRAFT

ii3 IP Intercom™ Series

Quick-to-install, scalable, highly configurable
two-way intercoms connect over networks.

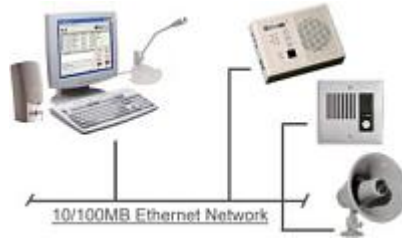
HIGHLIGHTS

-  High-quality audio over Ethernet wireless and fiber
-  Push-To-Talk (PTT) access for *instant* voice connections
-  Easily expands to hundreds of stations
-  Connects seamlessly over LANs and worldwide WANs
-  PC based and stand-alone operation
-  Remote listening, paging and transfer capability
-  Integrated door/gate access control relay
-  Patent pending *Digital Acoustics®* technology
-  Fast to deploy and easy to maintain
-  Available from stock, sold worldwide
-  Wide selection, including desktop, wall-mounts and OEM



→ **INSIGHTS**

Digital Acoustics' **Ethernet/IP Intercom** Solutions provide direct and instant two-way communication over local and worldwide TCP/IP Networks. Patent-pending IP Intercom technology provides voice-quality audio over local area (LAN) and wide area networks (WAN) with minimal bandwidth utilization. Implementations are easy to complete and cost-effective



All ii3 Intercoms are completely digital and 100% IP-based with endpoints individually addressed for two-way intercom communication and paging. Specialty microphone or speakers may be added to ii3 Products to provide customized solutions. Benefits include operating cost reductions from;

- simple installation and configuration,
- shared network infrastructure,
- lowered installation and implementation costs,
- integration into exiting networks including life safety or emergency systems,
- scalable integrations to 100's of intercoms- locally, regionally or globally,
- Network support for [PoE](#) and dual [RJ45](#) connections

Implementations include Security Integration, Education, Homeland Security, Defense, Transportation, Industrial and Commercial installations.










With over 20 years of communications solutions experience, Digital Acoustics' patent-pending technology insures intercoms are easy to connect and manage. Included *TalkMaster* software provides a simple, straightforward configuration process. Following setup, ii3 Intercoms automatically report to their assigned server. Multiple instances of TalkMaster may be operated on a network to address unique client demands.

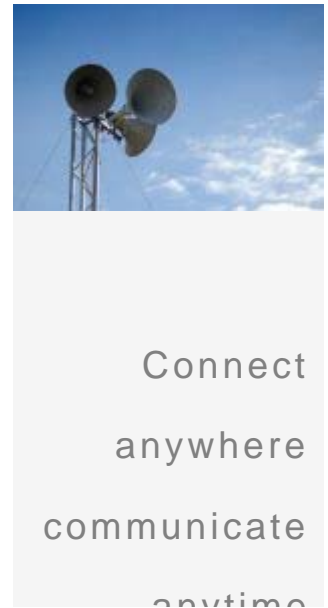
- [Hear](#) an actual intercom audio sample

IP Paging Systems

ii3 Series IP Public Address and Paging ... 100% Network/ IP based

HIGHLIGHTS

-  Central software manages system with digital voice quality
-  Zones extend over networks and span the Internet
-  Supports 1000's of stations, without *head-end* hardware
-  Highly configurable zone template mapping
-  Distribute over 30 prerecorded announcements
-  Interface to analog overhead loudspeakers
-  Audio monitoring and intercom capability at any end-point
-  Fast to deploy, easy to maintain
-  Patent pending *Digital Acoustics®* technology



INSIGHTS

Digital Acoustics' **Ethernet/IP Paging** provides 100% IP-based audio delivery from endpoint-to-endpoint. System topology is completely configured by software, eliminating the need for hardware head-end switching.

The flexible ii3 series product family supports single speaker/zone and multi-zone deployment, 25/70v line amps and easily configurable Input/Output options. Sophisticated software provides seamless zone management, expansion capability and pre-recorded message management.



Network based paging and audio message delivery over LAN/WAN/VPN and the Internet is facilitated via Digital Acoustics' software platforms. Features provide multi-console capability, log-in security and patent-pending fail-forward and redundancy protection.

Audio Distribution Systems, PA, Paging ... the IP advantage

PA/IP (PA over IP) provides unique advantages over analog paging systems

- Proven cost saving over new single function wiring in deployment into existing buildings.
- Spans multiple facilities inter-city, regionally and globally, without head-end hardware.
- Scalable network topology facilitates expansion possibilities
- Incorporates system wide capability to add intercom, 2 way-audio (reentrant capability), and remote monitoring functions.
- Easily integrate into available networks including life safety or emergency systems.
- Perfect for Retailers, Government and School systems with complex inter-building distribution need.
- Provides network-based redundancy for emergency broadcasts, and employee evacuation systems.

Emergency Preparedness

- Provides supplemental reach to overhead paging, parking, inter-building and even individual desktop notification.
- Network based system provides integration path to meet needs and requirements for notifications to individuals with disabilities.
- Cost effective means for compliance to *Federal Emergency Decision and Notification Protocol* OPM/GSA/NIH and other interagency requirements.

The flexible ii3 series product family supports paging over 25/70v line amps, desktop paging microphones and handsets. Hardware endpoint supports powering over [PoE](#) and daisy-chaining connections via [dual-port RJ45](#) dual-port options and support for horns, weatherproof enclosures , ceiling panels, wall panels, desktop and vandal proof speakers

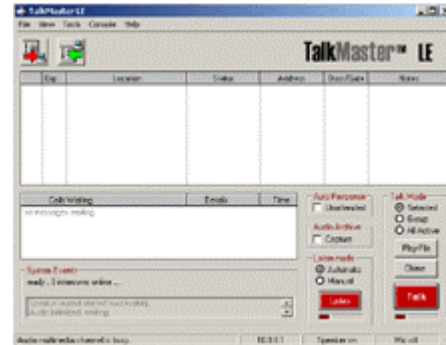
SPECIFICATIONS

- **Protocols** Network TCP/IP Clients/Server, UDP ; LAN 10/100
- **Addressing** Static or dynamically assigned IP
- **Audio** Voice-band packet coded PCM, G.711, custom coded with proprietary auto-latency adjust
- **Power** Integrated 2 Watt amplifier drives 4-16 ohm loads. External outputs for 25/70v paging amplifiers
- **Optional Interfaces** Door relays, sensors, Integrated network switches, Power over Ethernet (PoE)
- **LAN Connection** 10/100 Base-T, RJ45 for CAT5/CAT6. Supports wireless & fiber.



Choose from a powerful family of software products to configure Intercoms, manage communications and control paging....

- [→ TalkMaster-LE Single user](#) [→ DETAILS](#)
- [→ TalkMaster-EE Enterprise](#) [→ DETAILS](#)
- [→ iTalk/X Developer SDK](#) [→ DETAILS](#)



TalkMaster-LE Full featured support for Intercom and Paging

Manage ii3 Intercom system from any PC. Easily configure Intercoms, manage communications and archive audio files. TalkMaster LE software is included with the purchase of any ii3 IP Intercom and makes for a total monitoring solution.

- Selective or master call to page all stations
- Master control and auto detection (integrated UDP polling)
- Remote door release and GPIO control
- Audio file playback (.WAV)
- Record, log and archive audio sessions
- Remote and local digital volume control
- Supports multiple console operation
- iTalk/X Active X Software Development Kit (SDK) for custom integration

- [→ NEWS](#) **TalkMaster LE 1.8 INCORPORATES EXTENDED PAGING CAPABILITIES!**
 - > **Build software-controlled paging groups,**
 - > **Selectable displays for intercom, paging or intercom/paging solutions**

Digital Acoustics ii3 Intercoms' are configured into systems using PC-based **TalkMaster LE** Console Software which is provided at no additional cost with all ii3Products. In point-to-multi-point systems, TalkMaster LE Console Software provides communication's management through a Graphic User Interface (GUI). TalkMaster's easy to understand and use GUI allows operators to address calls using Talk or Listen buttons, manage incoming intercom calls through the use of a call waiting queue, play pre-recorded .wav files and communicate to one, a group or all ii3 IP Intercoms or paging locations. Administrative options include the use of an on-board digital audio recorder (DAR) incorporating a GUI interface for the optional recording of conversations. A relay included on some ii3 Products adds additional functionality to the ii3 IP Product Series and TalkMaster LE.

Using TalkMaster LE, systems may be configured for point-to-point or point-to-multipoint communication. In point-to-point applications, two intercoms are configured for direct push-to-talk functionality without the need for a PC server. In point-to-multipoint applications, a PC operating TalkMaster provides intercom management for 1 to hundreds of ii3 Intercoms operating as 2-way intercoms or paging units. Because TalkMaster's intercom management is completely software-based, communications systems are completely scalable one endpoint at a time.

TalkMaster-EE Multi-User Enterprise Software

For sophisticated users and applications, TalkMaster EE provides flexibility in addressing the special needs of multi-site monitoring, corrections, high-security, and other complex installations

- Faster call response with rules-based call routing,
- Enhanced personnel utilization by consolidating monitoring operations,
- System Flexibility to address changing facility layouts,
- Configuration flexibility allows you to tailor your system to each unique environment,
- Secured administrator configuration and operator log-in.
- Digital Audio Recorder and Audit functions.

Manage 1,000's of intercom and paging end-points from multiple sites and consoles, regardless of geography. Utilize a powerful set of intercom call queue rules to establish site-specific call response hierarchies. No call goes unanswered.

Designed to manage intercom and public address operations over IP networks, **TalkMaster EE** provides for flexibility in the design, engineering, operation and maintenance of these systems. Configured with Digital Acoustics' ii3 IP Intercom and Paging Products, **TalkMaster EE** provides voice-quality sound (including QOS—Quality of Service) and low network bandwidth utilization, 80 kbps per session.

As a 100% IP-based solution, TalkMaster EE operates on available network infrastructure— there is no need to purchase proprietary network hardware. In addition to eliminating substantial initial acquisition cost for dedicated single-use hardware, this design minimizes future costs related to communication system relocation as command centers can be relocated wherever the network exists. Importantly, this solution provides organizations with the flexibility to add intercom or public address end-points one at a time. Because TalkMaster is software, there is no need for additional head-end chassis or cards.

TalkMaster EE manages 1,000's of ii3 IP Intercom or public address end-points from multiple TalkMaster EE Operator Consoles. As a software-based solution, TalkMaster EE supports a single location, multiple buildings or multiple sites— locally or globally.

Three key features of the TalkMaster EE Communication System are intercom queues, queue assignment, and rules-based management. Intercom queues are groups of intercoms established by the TalkMaster EE Administrator. One, or more, intercom queues are assigned to console operators for management. To assure service quality, TalkMaster EE incorporates a powerful set of rules-based queue management tools including calls in queue, time in queue and priority call queue. By applying these rules, the TalkMaster EE Administrator is able to establish call response hierarchies to organizational requirements.

TalkMaster EE Communication Management Software records every substantial aspect of an intercom call *transaction*; among the information gathered and available on the Administration Console Screen are:

- console operator and administrator sign-in and sign-off,
- call start/stop including source,
- recording of both audio paths, and
- intercom call station status

iTalk/X Developers API and Components

	Location	Status	IP Address	Intercom	Notes
<input type="checkbox"/>	Gate 12	Connected	192.168.0.172	1019BA	
<input type="checkbox"/>	Station 321	Connected	192.168.0.183	1019D3	Audio call listening...
<input checked="" type="checkbox"/>	Gate 20	Connected	192.168.0.100	101B02	

- Feature rich API control provides capabilities found in TalkMaster™
- Seamless integration into existing and custom Windows® applications
- Over 50 powerful high-level commands to operate and control the ii3 intercom family.
- Included sample code (VC, VB and IE) provided to facilitate integration

[→ DETAILS](#)

OEM System Integrator Solutions

Digital Acoustics ii3-M OEM module provides integrators and OEM's a complete solution to facilitate two-way audio communications and paging in embedded systems. II3-M modules offer full range of features found in the ii3 series of products.



Using Digital Acoustics' patent-pending technology, Intercoms offer both audio transport and multiple GPIO ports via "Personality Modules".

HIGHLIGHTS

- Self contained Ethernet Intercom board
- Integrated RJ45 10/100
- Integrated Microphone with advanced AGC
- 3.5mm jacks for Mic In and Speaker Out
- 2x10 .1" Pin header array for additional connections
- Programmable interfaces for Push to Talk
- User defined indicators and signals
- Static IP assignment or automatic via DHCP
- Integrated diagnostics and network optimization
- 5 to 9 Volt DC power

ii3-M optional capabilities for all models include:

- **MX [Integrated 2 port switch](#)** provides a 2nd RJ45 LAN pass-thru to support additional intercom and upstream networked video and access control

- **PoE** Streamline wiring runs with the [Power-over Ethernet \(PoE\)](#) option. All ii3 intercoms with PoE capability directly power from network cabling supporting 802.3af

SPECIFICATIONS

- TCP/IP Server Windows® Multimedia compatible
- TCP/IP Clients Initiate automatic TCP/IP connection on power up
- DHCP Static or dynamically assigned IP address by DHCP server
- Audio Packet Type PCM
- Microphone Low noise amp. Dynamic gain 40db with AGC and compression

w h y i p (i n t e r n e t p r o t o c o l)
?

simple to use
connect anywhere
communicate anytime
limitless connections
limitless scalability
Digital Acoustics® technology



Overview

Digital Acoustics® IP audio and TCP/IP Network convergence facilitate cost effective paging and intercom implementations in Security Integration, Education, Homeland Security and Defense. Key benefits include;

- shared network infrastructure,
- lower installation and implementation costs,
- seamless integration into existing networks including legacy analog wiring,
- simple installation and configuration,
- scalable to 100's of intercoms and paging stations -- locally, regionally or globally,
- remote control and simple end-point expansion in intercom systems
- software based zone management in paging systems

With over 20 years of communications solution experience, Digital Acoustics' patent-pending technology provides audio intercoms and paging management diverse fields such as;

Educational	Audio Integrations for K-12 and 13+, Campus Tech Support Solutions
Commercial	POS Monitoring, Building Access and Team Communication
Parking	Revenue management, intercom & paging
Correctional	Intercom & paging-- Surveillance and command center monitoring
Homeland Security	Perimeter & Surveillance Monitoring. Local, regional and nationwide audio links across multiple C&C consoles
Municipal/Utility	Monitoring, Access and Communication (intercom & Paging)
Military	Data Gathering, Perimeter, Surveillance, Large Voice
Transportation	Air, Rail, Terminals and Ports
Broadcasting	Worldwide IFB and transmission facility communication

Migration to "IP" Network based audio to support these industries simplifies a wide range of problems associated with traditional and legacy 'analog' systems;

Simple Comparison- Intercom/Paging capability - Digital vs. Analog

	Analog	Digital "IP"
Large system operation without central 'head end'	No	Yes
Intercom connection distances	Fixed	Unlimited
System stations and end-point expansion	Hardware dependent	Unlimited
Communications span buildings, cities , globally	Hardware dependent	Yes
Digital quality voice, immune from interference	No	Yes
Cost effective recording and audio archiving	No	Yes
Unlimited Paging Zones, software controlled setup	No	Yes

Products, Resources

Companies providing Digital IP Intercoms and Paging Solutions

Company	Headquarters
Digital Acoustics®	Chicago - U.S.A.
Aiphone Corporation **	Washington - U.S.A.
Barix AG	Zurich - Switzerland
Commend GMBH	Salzburg - Austria
GridConnect **	Naperville IL- U.S.A.
Visentry **	Paramus NJ- U.S.A.
** companies integrating Digital Acoustics® technology	

Learning Online

CSO Online ...*"smart CSOs are, in fact, going to use voice over IP—and similar forthcoming technologies—to their benefit "* [full article](#)

VoipNEWS.com [website](#)

PowerOverEthernet.com [website](#)

Terms and Glossary

ANI: Automatic Number Identification

DHCP: Dynamic Host Configuration Protocol

FTP: File Transfer Protocol

IP: Internet Protocol

IP PABX: IP Private Automatic Branch Exchange

IP PBX: IP-based Private Branch Exchange

IoIP: Intercoms Over Internet Protocol

MVTS: MERA VoIP Transit Softswitch

MGSP: Media Gateway Control Protocol

NAT: Network Address Translation

PBX: Private Branch eXchange

PSTN: Public Switched Telephone Network

QoS: Quality of Service

RAS: Registration, Admission, and Status protocol.

RTCP: Real-time Transport Control Protocol

RTP: Real-time Transport Protocol

SIP: SIP Session Initiation Protocol

SKYPE P2P Encrypted Voice Protocol System

SNMP: Simple Network Management Protocol

TCP/IP: Transmission Control Protocol/Internet Protocol

VoIP: Voice Over Internet Protocol

VPN: Virtual Private Network

802.11b International standard for wireless networking that operates in the 2.4 GHz frequency range (2.4 GHz to 2.4835 GHz) and provides a throughput of up to 11 Mb. **802.11g** is similar to 802.11b, but this standard provides a throughput of up to 54 Mbps

CAT5 (Category 5 ethernet cable) - A widely used EIA/TIA Ethernet cable standard. CAT5 cables contain 4 twisted pairs of copper wire and support 100 Mbps Fast Ethernet. CAT5 cable runs are limited to a maximum recommended length of 100m (328 feet). **CAT5e** supports short-run Gigabit Ethernet (1000 Mbps)

Client - Any computer connected to a network that requests services (files, print capability) from another member of the network

DHCP - A utility that enables a server to dynamically assign IP addresses from a predefined list and limit their time of use so that they can be reassigned

Server - A network device that provides its resources to other devices on a network

Ethernet - An IEEE standard network protocol that specifies how data is placed on and retrieved from a common transmission medium

IP - (Internet Protocol) The method by which data is sent from one computer to another using the internet

IP address - The unique set of numbers allocated to your computer to identify it on a network. This number may be fixed/static, or dynamic.

ISP - (Internet Service Provider) a company that enables you to access the internet

VoIP: (Voice Over Internet Protocol) The use of the Internet Protocol (IP) for transmitting voice communications. VoIP delivers digitized audio in packet form and can be used to transmit over intranets, extranets, and the Internet.

LAN (Local-Area Network) A computer network that spans a relatively small area. Most LANs are confined to a single building or group of buildings. However, one LAN can be connected to other LANs over any distance via telephone lines and radio waves. A system of LANs connected in this way is called a WAN.

MAC (Media Access Control) Address - The unique address that a manufacturer assigns to each networking device.

NAT- Network Address Translation) A router that allows you to keep a set of IP addresses for internal use and another set for external use. This increases security by limiting what IP addresses the outside world has access to and allows the same internal IP addresses to be used on different networks.

Multicast A media (packet) stream that is copied and sent to multiple authorized SUBSCRIBERS (network addresses). Multicast addresses are group addresses.

PA/IP (Public Address Over IP) System distributed Paging and Audio over TCP/IP networks, bypassing traditional analog switching and wiring runs.

PLC (Powerline Carrier Communications) Powerline carrier that uses the existing power cabling found in homes and commercial buildings to connect devices. Speeds range from 60 kbps to over 10 Mbps.

Port. The virtual connection point through which a computer uses a specific application on a server.

RJ-11 Six-conductor modular jack used with four-wire cabling. Most common phone jack in the world and is used commonly on phones, modems, and fax machines.

RJ-45 Eight-pin connector used to attach data transmission devices to standard telephone wiring. Commonly used in 10Base-T connections.

Router - A networking device that connects multiple networks together, such as a local network and the Internet.

Skype a protocol for encrypted pc-pc voice communication. Skype is based on P2P technology incorporated by iTalk2u and other systems.

Switch - 1. Device that is the central point of connection for computers and other devices in a network, so data can be shared at full transmission speeds.

TCP/IP (Transmission control protocol/Internet protocol)-Protocols developed by the U.S. military to allow computers to talk to each other over long distance networks. IP is responsible for moving packets of data between nodes. TCP is responsible for verifying delivery from client to server. TCP/IP forms the basis of the Internet, and is built into every common modern operating system.

VoIP: (Voice Over Internet Protocol) The use of the Internet Protocol (IP) for transmitting voice communications. VoIP delivers digitized audio in packet form and can be used to transmit over intranets, extranets, and the Internet.

UDP (User Datagram Protocol) - A network protocol for transmitting data that does not require acknowledgement from the recipient of the data that is sent. UDP can carry IP and VoIP signalling.

WAN (Wide-Area Network) Private network facilities, usually offered by public telephone companies but increasingly available from alternative access providers (sometimes called CAPs), that link business networks.

- END -