



SIP-Based Audio Distribution Over IP

*Architect's and Engineering's
Specification*

1. System Summary

The TERRACOM audio communication, messaging and intercommunication platform is a suite of products designed to transmit live audio paging, stored messaging, background music, 2-way intercommunications, control input/output triggers, and audio monitoring over TCP/IP. The TERRACOM range supports POE (Power over Ethernet), and/or can be powered locally with external 24VDC power supply. The network infrastructure of TERRACOM uses any existing network, and via a router will allow connection to the internet for transmission and control. The process of installation, maintenance and monitoring is simplified due to outstanding features included such as; priority management, backup management, event management, scheduler, volume control, acoustic echo cancellation, noise reduction, paging, intercom, music streaming, routing, logic control, monitoring etc..

A built-in browser interface allows simplified control and program mapping of the TERRACOM devices. The TERRACOM range of products will be your first choice when it comes to design and specification for audio distribution over IP networks, whether it be a standard commercial system or more complex application.

2. System Components

2.1 IP Audio Decoder —TERRA-EX

The TERRA-EX is an IP audio decoder with USB interface for flash storage of audio messages or music files. The TERRA-EX is equipped with a single RJ45 Ethernet port to allow communication to other TERRACOM devices or 3rd party networked audio controllers via TCP/IP without the need for additional servers. The TERRA-EX can decode streamed audio G7.11, G7.22, PCM, AAC (Shoutcast/Icecast) or MP3 formats. The TERRA-EX comes with 2 balanced line-level outputs, a single RS232 control input, 1 contact output and 3 contact inputs, making the TERRA-EX an ideal IP solution for any applications where you may need a simple balanced audio output with some I/O contacts & relays. Built-in browser software includes audio management, priority management, mapping, remote analog controls, control I/O mapping, audio file flash storage access (USB only) and scheduler.

2.2 IP Audio Decoder with Amplifier Built-In — TERRA-EXA

The TERRA-EXA is an IP audio decoder with 2 x 8W amplifier built-in. It amplifies the IP terminal for 8ohm speakers. The TERRA-EXA is equipped with a single RJ45 Ethernet port to allow communication to other TERRACOM devices or 3rd party networked audio controllers via TCP/IP without the need for additional servers.

The TERRA-EXA can decode streamed audio G7.11, G7.22, PCM, AAC (Shoutcast /Icecast), or MP3 formats. The TERRA-EXA decoder also provides a single programmable relay output, and 3 control input logic triggers. Built-in browser software includes audio management, priority management, mapping, remote analog controls and control I/O mapping.

2.3 IP Audio Encoder/Decoder —TERRA-IEX

The TERRA-IEX is a 2 channel audio over IP encoder/decoder which operates as an audio source, and streams its inputs in unicast or multicast. For example, a microphone can be connected to the mic input and be encoded in G.722. An optional SPDIF input can also be used as a source into audio streaming. The TERRA-IEX also comes with 2 balanced outputs for full duplex communication or for local outputs, and 3 contact inputs and 2 contact outputs.

By adding a USB memory stick, the playlists can be used as a backup of the decoded stream or as a source for the IP streaming. The volume and the channel selection can be modified by RAC remote source selector. Built-in browser software includes audio management, priority management, mapping, remote analog controls, control I/O mapping, audio file flash storage access (USB only) and scheduler.

2.4 Amplified IP Terminal —TERRA-AMP

The TERRA-AMP is an IP audio terminal with 2 x 15W amplifier built-in on two independent balanced outputs, USB flash memory interface for playlist backups or prerecorded announcement, 1 mic/line balanced input, 3 contact inputs and 2 contact outputs.

In many applications, the TERRA-AMP amplified IP terminal for 8-ohm speakers is a cost effective solution for commercial audio & public address systems. The mic & line inputs can be played locally or be used as a source for a network audio stream. A built-in browser interface allows simplified control and program mapping of the TERRA-AMP.

2.5 IP Terminal to Telecom Gateway —TERRA-FDX

The TERRA-FDX is specially designed for paging and/or a full duplex intercom system, as it offers the possibility of creating bidirectional IP links for high audio quality and data transmission. The streaming shall be full duplex for G.711, G.722, G.726, G.727, G.729, MP3 audio codec and AAC+ decoder. Thanks to the standard SIP protocol, calls can be made via IP phones (AVAYA, CISCO, 3COM...). A built-in browser interface allows simplified control and program mapping of the TERRA-FDX.

2.6 Full Duplex IP Terminal for Intercom —TERRA-FXO

The TERRA-FXO offers the possibility to create a link between the IP intercom and the telephone. It comes with 2 sets of telephone interfaces and DTMF management for receiving calls or broadcasting. A built-in browser interface allows simplified control and program mapping of the TERRA-FXO.

2.7 Wall-Mount Vandal-Proof SIP/IP Intercom Station —TERRA-DS

The TERRA-DS is a wall-mount SIP/IP intercom station with up to 4 buttons. It features high quality hands-free SIP/IP communication, and the contact inputs/outputs on TERRA-DS allow for electronic door/gates lock down. A built-in browser interface allows simplified control and program mapping of the TERRA-DS.

2.8 Contact I/O IP Terminal —TERRA-IO

The TERRA-IO is a TERRACOM device without the audio inputs & outputs. It comes with either 8 contact inputs and 8 contact outputs or 4 contact inputs and 4 contact outputs which can be used in audio applications that may require multiple analogue I/O, such as industrial & home automation applications, or monitoring contact closures. The RS232 and RS485 interface can be used for IP tunneling between a PC and a device such as a sensor for tele-monitoring. A built-in browser interface allows simplified control and program mapping of the TERRA-IO.

2.9 IP-Based Intercom Microphone —TERRA-K

The TERRA-K is a multi-function IP-based microphone which is designed for full duplex intercom and paging (Unicast/Multicast/Broadcast) over LAN/WAN. The TERRA-K can be used with the TerraManager GUI-based console software to remotely operate the recording function and intercom. It's pre-chime and post-chime can be configured by a built-in browser interface.

2.10 IP Paging Console —PPM-IT5

The PPM-IT5 comes with a 5" TFT touch screen interface which allows call-paging, messages broadcasting, intercom with the TERRACOM devices, and DSP matrix parameter control. Thanks to powerful echo cancellation, the PPM-IT5 shall deliver clear sound for full duplex communication.

All the paging parameters needed for site operation can be programmed, such as assigning zones to different buttons, name of zones, group of zones, messages triggering or event control. There is a total of 168 keys over 14 pages for zone or group of zones selections. The pre-recorded messages and chime shall be stored into the PPM-IT5 console. A built-in browser interface allows simplified control and program mapping of the PPM-IT5. The device can also be used to control other 3rd party device over IP.

2.11 Volume & Source Selector —RAC

The RAC can be used to adjust the source settings remotely. The two sets of 5/8 step rotary knobs on the RAC can be programmed within the software. The RAC5/8 is available for US and EU type, and is powered by 24VDC. A built-in browser interface allows simplified control and program mapping of the RAC.

3. Web Browser Interface

The TERRACOM embeds a dedicated web interface that enables control of the TERRACOM devices through your favorite internet web browser. The control inputs, I/O control, audio matrix, scheduler, priority management, recording function, playlist management, account and password management, 3rd party control, volume control, log reports etc. can now be easily configured & monitored.

4. Integrated GUI Control Software — TerraManager

The TerraManager can be operated on a touch screen PC/Laptop, and provides an integrated GUI component to control the TERRACOM system. It can also be used with any 3rd party devices which support 3rd party control. The call-paging (Unicast/Multicast/Broadcast), IPS (Internet Paging Service) paging, full duplex intercom, music streaming, background music routing, play message, record, and event scheduler, device I/O monitoring, parameter presents and other control functions and device management can be easily controlled via TerraManager. Meanwhile, the TerraManager will monitor all of the zones, list the logs/faults, and display the status of the current paging sources.

5. Integrated Management Software— TerraServer

The TerraServer combines the integrated software and operation management together. There are two parts of the TerraServer. One is the back-end service (TerraServer Service), and the other is the front-end user interface (TerraServer Client), allowing multiple PCs/users to log on remotely. TerraServer also hosts Public Address & Evacuation requirements, which rest on a TCP/IP networking architecture. TerraServer shall provide streaming media, IPS (Internet Paging Service) paging, pre-arrange the audio files, remote store for chime, web page banners, themes, fonts and USB messages etc., play prerecorded messages, scheduler, priority announcements, multiple devices management & monitoring or routing music through the network from a central based server and/or operator unit. The TerraServer interfaces with the TERRACOM devices to provide extremely effective control.

6. Applications

6.1 Application-1: Public Address & Intercom — Background Music

The live announcements will be broadcast with a dedicated PPM-IT5 IP paging console, or microphone plugged into the TERRACOM device, such as TERRA-IEX, TERRA-AMP or TERRA-FDX. The selection of the announcement destination is done directly on the touch screen of PPM-IT5 console, or on a PC with a TerraServer client management software. The background music is stored on the TerraServer, or alternatively on another source such as a CD player connected to a TERRA-IEX.

For the output, the TERRA-EX shall be used as a terminal, or used the TERRA-EXA if you need amplified outputs. Additionally, you could use the outputs of the TERRA-IEX & TERRA-FDX if you need outputs at the same place as the inputs. The priority management is controlled by the TerraServer. The priority management is controlled by the TERRACOM devices themselves, if you are not using the TerraServer solution.

6.2 Application-2: Public Address — Voice Alarm

The TERRACOM range interfaces with the ATEİS Public Address & Voice Alarm systems such as the IDA8, offering a powerful solution for transport applications such as subways and tramways. In each station, the IP matrix of the IDA8 would handle the streaming. The TERRA-EX can also deliver a decoded audio stream, plus a serial link (RS233 or RS485) to control another standard matrix. The TERRA-FX0 is capable of linking to a traditional telephone system with the IP system.

6.3 Application-3: Background Music in Retail Shops

The TERRACOM range provides audio streaming over standard internet connections to any shops, restaurants and bars. This is achievable due to the balanced outputs and contact input for channel/volume selection via the TERRA-EX and/or TERRA-EXA.

6.4 Application-4: Advertising Management

The TERRACOM range offers the functionality to play selected music and advertisements in a variety of chosen locations. The TERRA-EX will download the selected messages during the night, store them on the USB flash memory and then detect them within the stream at the moment they are required. This unique way of advertising management will give the customer the impression that they are listening to your own playlist or radio station.

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