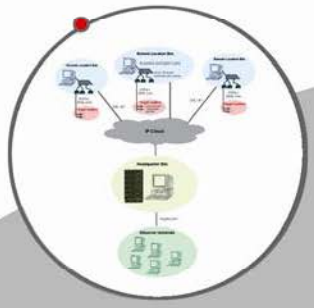
elaman
GERMAN SECURITY SOLUTIONS



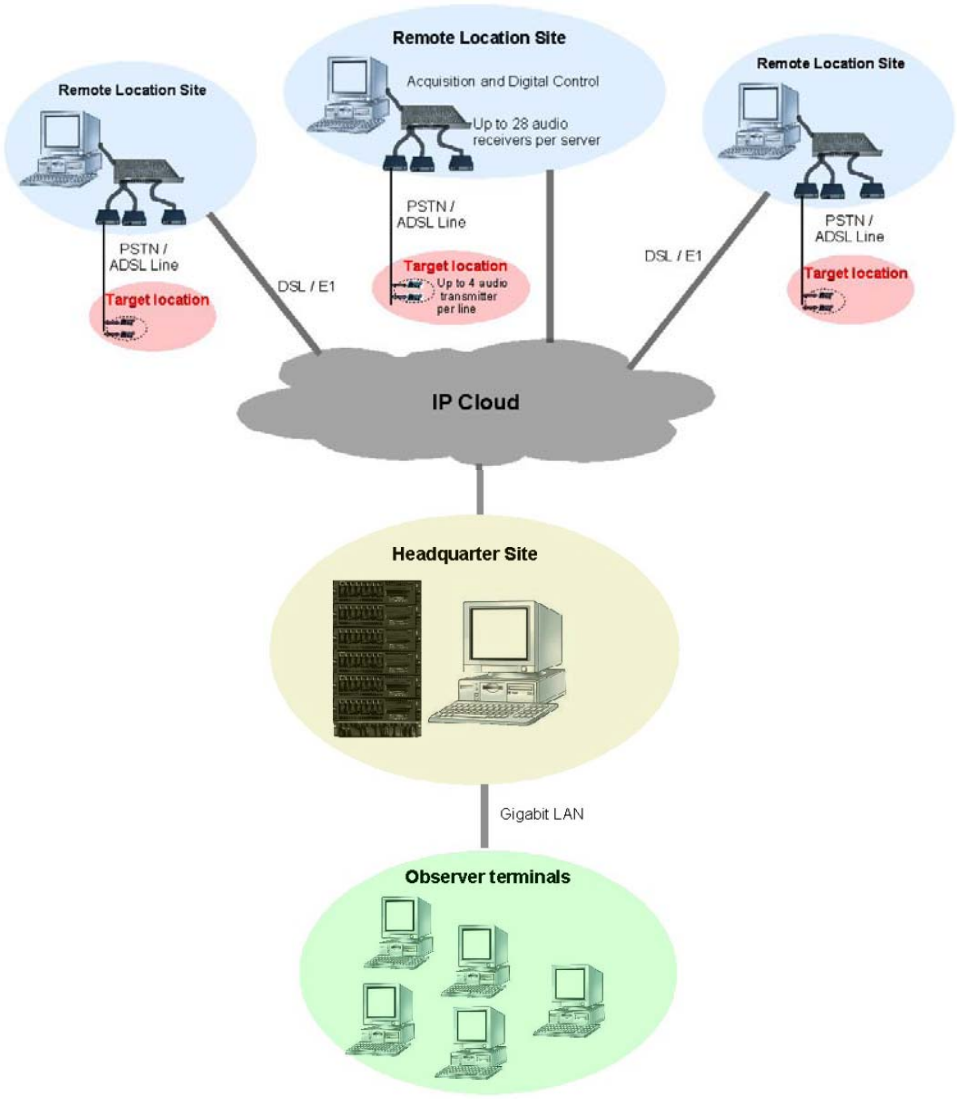
Audio Surveillance Network

GOVERNMENTAL SECURITY SOLUTIONS

Audio Surveillance Network

1 Product Description

Audio Surveillance Network (ASN) is a complete solution for law enforcement agencies to collect, transmit, store and analyze audio coming from distant targets at a centralized location. ASN consists of both hardware and software elements suitable for building a countrywide audio surveillance system, or to conduct standalone tactical operations. A typical ASN layout consists of various target locations, remote location sites, a central headquarters and a set of observer terminals.



Audio is captured form a target location by audio transmitters containing tiny microphones, and transferred to the remote location site over a telephone line. Usually, a remote location site exists near a location exchange. It contains a large bank of receivers to collect audio from various target locations. The received audio channels are digitized and stored in a remote location server.

The audio data is sent to the headquarters using a DSL or E1 link. The headquarters stores digital audio coming from a number of remote locations in a huge database. Observer terminals access the headquarters database using custom written audio surveillance software. An ActiveX based audio player offers audio analysis capability and on-line comment tag submission to the observers. ASN is the only system of its kind that offers real-time audio surveillance from a number of distant targets from beginning to end.

2 System Elements

The Following system elements have been developed to build an ASN.

Target Location

- Xad Audio Transmitter (XTL-ATx)

Remote Location Site

- Xad Audio Receiver (XKL-ARx)
- Xad Audio Acquisition Platform (XRL-ACQ)
- Xad Remote Location Server (XRL-SER)
- Xad Remote Location Software (XRL-SW)

Headquarters

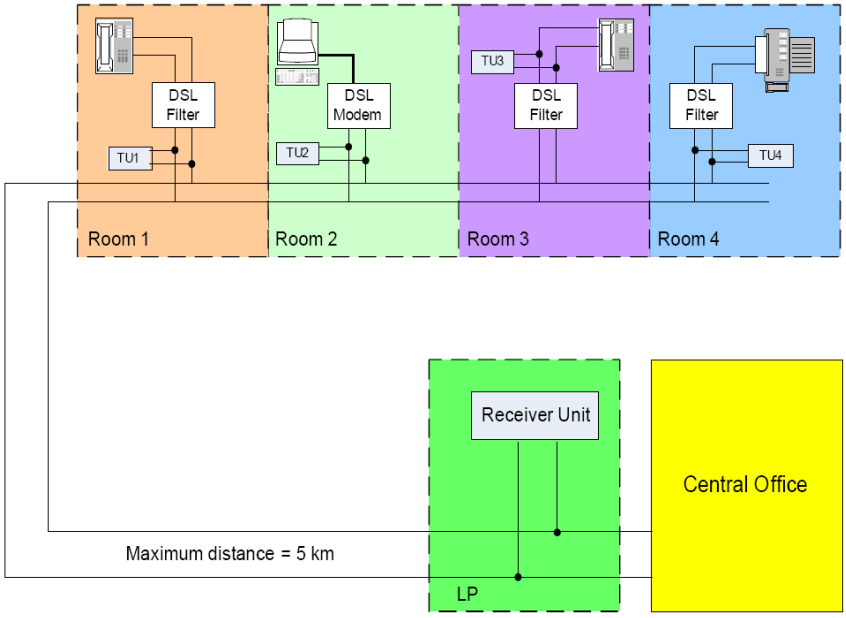
- Xad Headquarter server (XHQ-SER)
- Xad Headquarter Software (XHQ-SW)

2.1 AUDIO TRANSMITTERS (XRL-ATx)

Audio is collected from the target location using Audio Transmitters (XTL-ATx). Each transmitter contains a high gain, sensitive microphone, which is installed on the target line irrespective of the location and polarity. The installation does not interfere with the normal operation of telephone equipment. XTL-ATx comes in two versions – XRL-ATP works with standard POTS, while XRL-ATA is designed for ADSL enabled telephone lines. For major operations, up to four XRL-ATx units can be deployed per target. A user can remotely activate the desired XRL-ATx leaving the others in standby mode.

Each XRL-ATx has built-in intelligence to sense the line status and start-stop its operation independent of the user intervention. Salient features of an XRL-ATx are listed below:

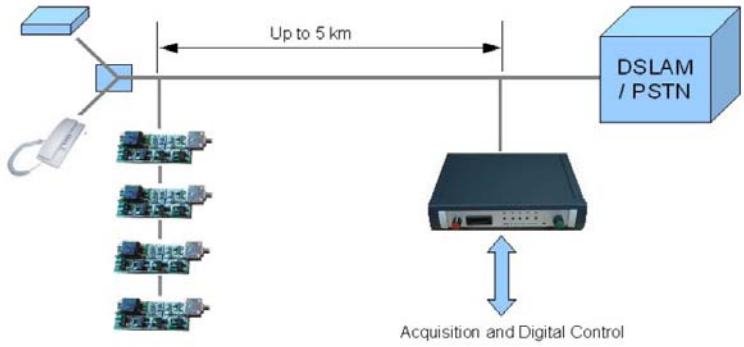
- Small size 16 x 9 mm
- Low current consumption (active 4mA, standby 4µA
- High gain microphone 48 dB
- Polarity free installation
- Seamless operations on PSTN and ADSL enabled lines
- Automatic start-stop and mute functions
- Choice of 4 transmitters per line



2.2 Audio Receiver (XRLS-ARx)

Audio Receiver (XRLS-ARx) is a very low noise state-of-the-art receiver to extract clear audio signals from noisy telephone lines at a distance of 5 Km from the target location. XRLS-ARx outputs receive audio to the headquarters and phono sockets. There are manual control buttons on the XRLS-ARx to switch between multi-transmitter installations or mute all, if required. XRLS-ARx also provides a digital interface which is used to control XRLS-ARx from the headquarters' software. Main features of XRLS-ARx are listed below:

- Transparent operations on PSTN and ADSL enabled lines
- Standalone and network operation
- Automatic voltage control
- Manual button control for standalone operations
- Digital control interface
- Logic circuitry to control up to 4 audio transmitters
- Built-in digital voltmeter
- Audio Vu-meter
- Automatic volume control
- Phono socket
- Headphone socket



2.3 Audio Acquisition Platform (XRLS-ACQ)

The Audio Acquisition Platform (XRLS-ACQ) is a 1U height 19 inch rack mount unit. It consists of a custom built PCB to acquire, digitize and transfer 28 audio channels to a Remote Location Server (XRLS-SER).

ACQ uses four 8-bit analog to digital converters to digitize the audio channels. The digital audio samples are buffered before sending them to XRLS-SER using a USB 2.0 interface. Main features of the XRLS-ACQ platform are listed below:

- 19 inch rack mountable casing
- Parallel A/D conversion of 28 analog audio channels
- 64KB buffer memory to ensure data continuity
- High speed data transfer using USB2 interface
- Integrated interface for audio and transmitter control using RJ45 ports
- Acquisition status display

2.4 Xad Remote Location Server (XRLS-SER)

The Remote Location Server (XRLS-SER) is a powerful machine built with 64 bit AMD 2.0GHz dual core processor and Linux operating system. The industrial PC casing with front and rear fan support provides ruggedness to operate in extreme temperatures expected at a remote location site. The remote location server is lockable at the front providing extra security to the system.

2.5 Remote Location Server Software (XRLS-SW)

The remote location server software (XRLS-SW) runs on XRLS-SER and controls the main functionality of a remote location site. It is written in C++ under a Linux operating system. For security reasons, a user interface has not been built in the remote location software. The remote location operator uses a console window to execute commands for each task. Main features of XRLS-SW are listed below:

- Command line interface for added security and reliability
- Security database installation without user interaction
- Built under Linux for easy integration, faster speed and stability
- Database storage for systematic archiving of audio streams
- Automatic audio acquisition and uploading according to the headquarters' schedule
- Thread based real-time audio encoding and uploading
- Local audio offload option for emergency
- Segmentation of audio streams into packets for quick transmission
- Synchronized time stamping of audio data cross the ASN
- Lossless compression of audio data for integrity and completeness
- Remote control of attached audio devices from the HQ software
- Password protection, activity logging and secure reporting to HQ software
- Memory management and automatic deletion of contents
- Separate audio device set-up and local testing utility

Transmission Hardware

The requirement for transmission hardware (E1 routers, DSL and related components) may differ in each case. Depending upon the requirement, we can specify the transmission hardware to be used in an ASN.

2.6 Headquarter Servers (XHQ-SER)

The HQ is the main control center of the ASN. It is connected to remote location sites in a star network topology. The XHQ-SER comprises two database servers, a storage server, and an application server. The database servers are similar in specification to XRLS servers. The storage configuration is tailored according to the requirements. To build redundancy, the database servers are connected to the storage server in cluster configuration. The application server is an apache based server, which hosts web-based HQ server software. It allows the observer terminal to access the huge audio database.

2.7 Headquarter Server Software (XHQ-SW)

The headquarter server software (XHQ-SW) provides the main control of the ASN. XHQ-SW software is accessed by the Microsoft Internet Explorer through a Web-based environment. The complex system information remains hidden behind a user friendly graphical user interface (GUI). All the software pages are interconnected. A user can navigate across them using a dynamic menu bar. The menu items vary according to the user access privileges.

The main features of the XHQ-SF are listed below:

- Secure login feature with individual access rights
- Personalized home page portal for each user
- Easy and dynamic remote location site creation
- Site and target location based user access
- Hierarchical user and group management structure
- Entity based access rights and on the fly user creation
- Automatic information update across the network
- Time, tag and target based audio content search
- ActiveX based audio player with audio range control
- Custom audio play list with forward/backward audio search options
- Real-time audio access and analyze feature
- Observer comment tagging and retrieval
- Audio save option for privileged users
- Automatic e-mail feature within the groups
- Audio transmitter control for each remote location site
- Network site status reporting
- Advanced audio download scheduler for target locations
- Activity log and reporting

2.8 Observer Terminals (OT)

Observer Terminals are standard PCs connected to the HQ server in an intra net configuration. They access XHQ-SW to access and listen to audio records stored in the HQ database. ASN setup does not require an installation of the client software. Updates are automatically reflected to the observer terminals when XHQ-SW is updated on the headquarter application server.

GOVERNMENTAL SECURITY SOLUTIONS




If you would like further Information about ELAMAN,
or would like to discuss a specific requirement or project, please contact us at:

Elaman GmbH
German Security Solutions
Seitzstr. 23
80538 Munich
Germany

Tel: +49-89-24 20 91 80
Fax: +49-89-24 20 91 81
info@elaman.de
www.elaman.de