SENATOR™

Conference, Presentation,

Meeting, Congress,

Distance and Web Conference

System

Architect's and Engineering's

Specification

System Summary

1.1 System Introduction

The system shall be a fully networked and digital DSP driven system, consisting of the following devices:

- Conference Processor: System DSP processor (optional AEC-Card: To be installed into the processor for distance and web-conferencing).
- Amplifier Unit: 6 channel networked and digital amplifier; 6x 60W on 4ohm; DSP on board.
- Microphone Junction Box: Mic junction box with either CAT, Fiber Optic or both connections. It shall connect up to 4 delegate units. The power shall be either provided via the microphone net-loop cables (6x microphone junction box can be powered by the internal power supply) or an external PSU.
- Multi-Usable Desktop Microphone Base: Delegate unit with two buttons, speaker and the connections for headset and peripheral device.
- Desktop Chairman Microphone Base: Chairman unit with 5“ TFT touch screen for full system control and dialer.
- Gooseneck Microphones: Condenser microphones in 4 different lengths (26cm/40cm/48cm/60cm).
- CDM-Net-Loop Cables: The system cables for power, audio and control data supply to the microphone junction box and further to the delegate units.
- System Software: The system software for programming and control.

1.2 System Overview

A single conference processor shall connect up to 504 microphones and 64 amplifier units. An entire system shall be able to cascade 32 processors and connect up to 16,128 microphones. The system is designed as a redundant loop network topology, using the Xavnet™ audio network, to comply to the highest safety demands. Spying is not possible if the system is connected with this proprietary 64 channel audio network.

Thanks to the high speed Xavnet™ audio network, all parameters of each delegate unit shall be stored in the processor and be recalled when the microphone is turned on. The system shall support 5 conference modes (FIFS, FIFO, Priority, Delegate Request, Chairman mode), and have various DSP function such a 8 band PEQ, AGC, FBX, Feedback Suppressor, Gain, Hi/Lo Pass, Mix-Minus Auto Calibration, Voice Activated Gate, Delay, Standard Mixer, Volume, Priority and various types of Mixers.

An optional AEC-Card shall be installed into the processor, allowing for distance conferencing using the high speed RAPIDO™ AEC algorithm. The system shall provide conference recording via the USB port on the front of the processor, and offer up to 6 channels of simultaneous translation without the need to purchase extra translation hardware.

With its high speed and redundant Xavnet™ 64 channel audio network, the direct implementation of AEC into the conference processor and the amplifier, plus the Auto-Mix-Minus Calibration, the system is the best choice if the audio quality needs to be perfect in every room with every seating setup.

1. System Component

2.1 Conference Processor

A Single conference processor shall connect up to 63 mic junction boxes via CAT5 cable (100m between devices) or via Fiber Optic connection in multi mode (2000m between devices) or single mode (20km between devices). Each mic junction box shall connect up to 4 delegate units, and connect up to 252 delegate units for the system. A second CDM-Card slot shall be able to equip in the processor, making a single processor connect and process up to 504 delegate units. A separate conference processor card slot shall allow to connect up to 32 processors with a maximum capacity of up to 16,128 delegate units using a single network.

Each processor shall provide the DSP function for each connected delegate unit including 5 Band PEQ, Voice Gate, Mixer, Gain-sharing Auto-Mixer, HPF, FBX, AEC (for Mic to Speaker in the delegate unit). And the settings of all parameters for each connected delegate unit shall be stored and only recalled when the talk button is pushed. The NOM (Number of Open Mics) of the conference processor is 8.

With the optional AEC-Card installed in the processor, the Ethernet port shall be used as a VoIP port with SIP protocol to connect to VoIP SIP Server (WAN) or to any VoIP PBX on a LAN. This is an industry first that the system eliminates the need for a very expensive AEC Audio DSP hardware and the needs to be integrated and cabled correctly with a standard conference system.

The processor shall come with 3 audio inputs and 3 audio outputs. 1 In/Output shall be equipped with an XLR connector and allow to connect to a microphone (including phantom power). This In/Output shall also be in the audio path, which shall be connected to the AEC DSP block. A stereo I/O on RCA connectors shall connect to a BGM music player, the outputs can be used for connecting to a recording unit, or to any mixer. The RS232 connection on the processor shall provide 3rd party control or PTZ camera control via Pelco or Visca protocol.

2.2 Amplifier Unit

The digital 6 channel amplifier unit shall be equipped with 60W per channel on 4Ohms, and connect to the processor via standard CAT5/6 cable with a distance up to 100m. The audio signal of the amplifier shall stay in the digital domain, so no need of AD/DA conversion as with most of the conference systems on the market. The amplifier shall also contain various DSP power including Gain-Sharing Auto Mixer, 5 Band PEQ, FBX and Delay for every output channel.

The industry first functionality of Auto-Mix-Minus calibration shall be achieved by using the amplifier. This Auto-Mix-Minus calibration will automatically adjust the suitable parameters to prevent the feedback of the system for every room. This shall not only help for the first setup or installation of the system, but also help in an everyday use when the seating layout in the room has changed.

The amplifier shall come with a digital input and a digital output, and it is possible to daisy chain up to 64 amplifiers to a single processor. The ID of each amplifier shall be set via DIP switches.

2.3 Microphone Junction Box

The microphone junction box shall connect to the CDM-Net-Loop card installed in the conference processor. With the two connection ports on the two sides of the mic junction box, the redundant network loop, using the Xavnet protocol, shall be used for the highest safety demands in case of cable disconnection. The 4 mini XLR connections on the rear side of the mic junction box are used to connect up to 4 delegate units, and up to 63 mic junction boxes can be connected via the CDM-Net-Loop to a single conference processor.

The cable connection of the mic junction box shall use either CAT5 (up to 300m between units), Fiber Optic (multi mode and single mode, up to 2km or 20km between units) or even with one of each per side, allowing flexible system setup and distance capability among several rooms. The mic junction box shall be either powered via the CDM-Net-Loop cables (audio, data and power) or be powered with an external PSU and then connected via standard CAT5/6 cables (up to 100m) for the data and audio.

2.4 Multi-Usable Desktop Microphone Base

The multi-usable desktop microphone base shall come with two buttons and status LEDs for speaking or

function selection, and a XLR connection to connect to the gooseneck microphones, the mic is available in different lengths (26cm/40cm/48cm/60cm), 3rd party microphones will also be supported.

The microphone base contains a built-in loudspeaker for smaller applications with no external amplification. The volume setting for this loudspeaker shall be done with the volume pot at the right side of the unit. At the same side, there are 3 mini jack connectors, one is a microphone input, the second a line output, the third is for peripheral devices such as the votepad (future use). The two status LEDs placed over the Talk and the Function buttons will indicate the status of the microphone.

The system software shall allow the microphone base to be programmed and switched from the standard "Delegate mode" into an "Interpreter mode", making it as an ease of use and cost effective interpreter station. In this case, either the internal loudspeaker and microphone can be used for the interpreter (sitting in a different room) or the mini jack connections can be used to connect to a 3rd party headset; therefore, the interpreter can sit in the same room and listen to the floor channel while translating into another language.

2.5 Desktop Chairman Microphone Base

The desktop chairman microphone base shall come with 5" LCD touch screen, a built-in loudspeaker, a XLR connection for the gooseneck microphones, the microphones are available in different lengths (26 cm/40 cm/48 cm/60 cm), and the unit shall also come with the connection for an external headset. The chairman microphone shall allow for the full system control, and the capability of volumes changes, settings, paging and dialing if used in a distance or web-conference.

The chairman microphone shall be equipped with a mini USB connector placed at the right side of the unit, allowing for an easy-to-setup web-conferencing system with the use of the optional AEC-Card installed in the processor for a direct connection to any PC/Laptop. This unique feature allows the conference system to become either a distance conferencing or a web/video conferencing system at the same time. The chairman microphone offers a dedicated paging button, allowing for preselected zone paging. The dialer section on the chairman microphone has either a speed dial page or a numeric page to either recall preprogrammed connections via SIP Server (WAN) and direct to VoIP Phones or VoIP PBX systems, or to directly dial any number needed to make a distance conference connection.

The chairman microphone shall be capable to start the Auto-Mix-Minus calibration with the push of one button. Once the system is cabled and programmed, it will work as a stand-alone system and all necessary adjustments can be made. The chairman microphone also offers 2 mini jack connectors to connect any 3rd party headsets to the system.

Other functions such as the selection of the conference modes, the selection of the GUI language, start/stop the USB recording function and all other system relevant parameters or levels shall be adjusted via the chairman microphone.

For special applications like court rooms or legislative installations, where a page call needs to be done to a side room, a preselected zone paging function can be easily programmed.

2.6 Gooseneck Microphone

The gooseneck microphones are specially designed to achieve a perfect voice reproduction while using them in conjunction with the delegate units of the system. Their polar pattern is a cardioid shape and shall use a high definition unidirectional electret condenser capsule. The microphones are available in 4 different lengths (26cm/40cm/48cm/60cm).
The red colored LED ring on each microphone shall be illuminated to give a status information about each delegate unit. When the delegate unit is in "Talk" mode, the LED ring will be fully illuminated. When the delegate unit is in "Speech Request" mode, the LED ring shall flash. When the delegate unit is in "Hold to Talk" mode, the LED ring shall flash twice every 10 seconds.

2.7 CDM-Net-Loop Cables

The CDM-net-loop cables are available in different lengths from 1m up to 50m. They are special made cables which offer power and CAT cable in a single cable including all necessary connectors to be connected to the Audio, Data and Power connections of the CDM-Net-Loop cards in the processor and to the mic junction boxes.

2. System Software

The system software is a PC/Laptop based software which shall be compatible with Windows XP/Vista/Win7/Win8 or above. The software shall allow to program and control the entire system configuration and any DSP parameter adjustment. System setup with auto network deploy shall be configured using Drag & Drop function on software. The software shall provide 5 different conferencing modes (FIFS, FIFO, Priority, Request RQ and Chairman Mode). The software will come free of charge.