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| DCN multimedia |
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| en Architect’s &Engineer’sSpecifications |



**About this Document**

**Purpose**

When preparing a specification, tender or quotation for a Bosch DCN multimedia conference system, it may be necessary to supply a detailed functional description of all equipment supplied. The Architect’s and Engineer’s Specifications presented in this publication are intended to be used for these purposes, and may be copied and/or reproduced as required.

**Scope**

DCN multimedia can be coupled to other OMNEO based systems and IP networks. This Architect’s and Engineer’s Specifications only contains the functional description specific for the Bosch DCN multimedia conference system.

**Audience**

These Architect’s and Engineer’s Specifications meet the needs of contractors, consultants and other professionals involved in project management, or in designing, specifying and procuring conference systems.

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**Document Format**

The Architect’s and Engineer’s Specifications are available as a digital document in the Word format (.doc). All references to pages, figures, tables, etc. in this digital document contain hyperlinks to the referenced location.

**Special note: conference definition**

For the purpose of this specification, a conference is any gathering of participants where audio amplification is required.

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# Introduction

The conference control system that provides both the users and owners of assembly venues with a versatile means of fulfilling conference requirements. These may range from city councils, regional councils and board rooms.

The system conforms to all the relevant ISO and IEC standards.

# Scope of Specification

This specification shall cover the provision, installation and maintenance of the system that includes specified functions for participant’s participation. It shall also covers media sharing and camera control for displaying active speakers and media on the participant’s individual devices, hall displays and monitors. Furthermore it shall cover the provisions of an IP Ethernet network for advantaged coupling to OMNEO or Dante compatible audio systems and other types of media system and content management systems. Next to that this specification shall cover configuration, preparation and management software to control the systems by means of a PC.

# System summary

## System overview

The conference system shall provide digital signal processing and transmission of all audio signals via an IP Ethernet network. It shall be low susceptible for mobile phones. It shall provide versatility, high audio quality, data transmission security and simplicity of operation and installation. It shall be possible to use the conference system via a PC running user-friendly software. The software shall assist in system configuration, meeting preparation, management and monitoring. The software shall be protected for unauthorized copying by a license key. The license key shall be returnable so it can be moved to another system without the intervention of the supplier.

The conference system shall be a modular system. It shall be possible to connect elements of a system simply and quickly, using a daisy-chain, loop-through configuration. It shall also be possible to use a star configuration in which each device is individually connected to the system. Systems shall be expanded or reduced in size by adding or removing equipment. The conference system shall be suitable for situations for small, informal gatherings up to city councils, regional councils and board rooms.

The range of conference system products shall include central devices and PCs, application-specific software modules, information display systems and installation equipment. This range shall be complemented by external equipment such as video, displays, sound reinforcement amplifiers, HD cameras and accessories, loudspeakers and printers, all of which shall be fully compatible and easily integrated into the conference system.

Signal transmission and processing shall be by means of advanced digital-audio technology. This advanced digital-audio technology shall result in high-level audio performance (bandwidth up to 20 kHz) with no losses in signal quality or level during transmission. There shall be virtually no background noise, interference, crosstalk or distortion.

The system shall use a standard IP Ethernet network to transport all digital signals: audio, video, data and control. The system shall be able to use standard CAT5e cables and Power over Ethernet switches to supply the system devices.

The system shall support a daisy-chain or loop-trough configuration using an Ethernet compatible cable. It shall be possible to 'tap' these cables at any point to connect extra conference system equipment. It shall support redundant cabling. Power shall be supplied to all devices via these cables.

The central device shall have a built-in equalizer function for loudspeakers in contribution devices. It shall include acoustic feedback suppression. It shall have an included power supply to supply power to the conference devices. The central device shall support a standby mode which result zero power use of the conference devices. These functions shall be controlled by means of a user interface at a PC.

The conference system shall provide four main functions that facilitate the progress of conferences.

Firstly, the conference system shall provide full facilities for sound management, including speech input by delegates, chairperson and other participants, and the amplification and relaying of speech to all participants, under the control of the conference chairperson and/or the system operator.

Secondly, the conference system shall provide full multimedia functionality for each individual participant: internet access, document retrieval, presentation and media sharing

Thirdly, the conference system shall provide facilities for HD camera control. These shall include facilities for automatically switching camera outputs to individual conference devices, hall displays or monitors.

Fourthly, the conference system shall support OMNEO and Dante for advanced audio coupling to other audio systems.

All these functions shall be provided by the conference system. The system shall be simple and logical to operate by all personnel concerned as well as by participants, chairpersons and operators, and shall comply with accepted professional standards and practices for all the functions provided.

## System functions

The conference system in its most complete configuration shall provide all of the following functions by means of purpose built professional equipment:

* controlling participants microphones either fully automatically or manually by the chairperson and/or system operator
* registering a participant’s request-to-speak, and automatic handling of the waiting list by means of a queuing procedure, with display of participants speaking and participants on the waiting list on personal touch-screens, monitors and/or a hall display
* identifying participants to other participants, chairperson and/or system operator by name and/or seat identification
* making certain facilities available to other external systems for special purposes like internet / intranet and content management system but also including sound-reinforcement systems, OMNEO compatible systems, Dante compatible systems, control of fixed and moveable cameras, webcasts systems and other data, audio and video registration, hard-copy printing, and video display facilities
* entering system parameters and participant database for pre-selection, control and display of system status and operating modes for all functions carried out by a system operator from a central control or remote position
* configuring and controlling a camera switching system to ensure that speaking participants are displayed personal touch-screen displays, on hall displays and monitors

All equipment shall be capable of being combined as required to reach the desired specification in terms of system size and/or functions, and shall be capable of later field extension by the addition of the required functions and extra devices.

Functionality on participant's conference device shall be extendable without changing hardware but by means of adding software.

## Compliance

The conference system shall comply with all applicable regulations and standards for equipment of this type, and especially IEC 60914 minimum requirements for congress equipment. In addition, the system shall comply with all applicable international, national and local regulations for the design, construction and installation of electrical equipment.

## System configuration

The conference system shall be an integrated modular configuration, with some or all of the following system components:

* a control position comprising a central audio processing device and a personal computer
* participant positions: with touch-screen displays, showing all meeting related data including real-time video of e.g. the speaking participant a presentation.
* display facilities with monitors, plasma and hall displays
* interface facilities for external devices and systems such as video cameras, printers, data and speech video and media recorders, internet / intranet, content management or document system and a sound reinforcement system
* remote control of certain conference system functions via third-party equipment.

## System installation and interconnection

Installation of the system shall be based on a modular concept, controlled by the PC up to 100 devices.

All wiring in the system shall be via a standard CAT 5e cable using PoE.

The wiring shall also be possible by using a special cable including power cores with purpose-designed connectors. The connectors shall have a pole configuration that is compatible to a RJ45 connector. It shall use series cabling (loop-through or series-connected branch topology and loop-back for cable redundancy) for interconnection of the contribution equipment. The contribution equipment shall be free standing (table-top units).

An additional power supply shall be available for dividing the network cabling, to assist installers in achieving an optimum network-line layout. The installation and interconnection procedure shall feature the following:

The central equipment shall be free-standing (table-top devices) or built into 19” racks.

## System operation

Operation and/or control of the system shall be possible at a number of different levels:

* Technician, using one or more modes of operation that give automatic control over conference proceedings. These pre-set modes are selected using a user interface at a PC.
* Chairperson, using one or more modes of operation that give automatic control over conference proceedings. These pre-set modes are selected using a conference device.
* Participants, using one or more automatic modes that give participants limited control in discussion proceedings.
* System operator(s), using a user interface on a PC(s).
* Either single or multi PC systems shall be supported.

Appropriate control facilities shall be provided for each of these levels.

## Conference device

There shall be a participant’s devices of which the facilities can be extended by adding additional software without changing the hardware. The behavior of the device can be remotely controlled using a user interface on a PC. Conference devices shall be suitable for table-top use.

## First-line system maintenance

The system design shall permit fast and effective fault location and correction by local personnel. This shall be supported by built-in self-diagnostic functions. Spare parts kits and instructions shall be provided.

Pre-selected system status and information entered into the system shall not be lost in the event of mains failure. In such a situation, the system shall automatically and immediately return to its last operating status when power is restored.

# Functional description of the system

The conference system in a basic configuration (without controlling from a PC) shall provide the chairperson with a high degree of control over conference proceedings and participants.

The conference system managed by an operator shall provide the operator with full management over conference proceedings and participants. Management of the conference system shall be via one or more PCs running a conference application. The software shall run on one or more PCs. The software application is modular, and the operator shall be able to configure and prepare the system according to the needs of the meeting. The software modules shall be protected for unauthorized copying by a license key.

## Discussion management

Discussion management shall cover the way in which conference system microphones are switched on and off, how many microphones may be simultaneously active, and under which microphone operation mode the system shall operate. Discussion management shall be carried out by the chairperson using the chairperson’s console. The chairperson’s console shall be assignable by a software setting without setting any hardware switches.

Selection and setting of the system microphone operating mode shall be under the control of the chairperson via the conference device. A selection of operating modes shall be provided, including:

* open mode (automatic control with up to twenty five simultaneous speakers)
* override mode (‘first-in, first-out’), with up to twenty five simultaneous speakers

In open mode with automatic shift, participants can enable their microphones with the microphone button on their contribution devices. When the maximum number of participants speaking is reached, the next participant that enables his or her microphone is added to a waiting list. The microphone is not enabled until another participant disables his or her microphone or when the chairperson disables a microphone from a participant. A white LED at the microphone button shall indicate that the maximum number of speakers is not reached.

In open mode without automatic shift, participants cannot enable their microphones immediately with the microphone button on their contribution devices. The participant is always first added to a waiting list. The microphone is enabled when the chairperson shift the participant from the waiting list to the speaker list. When the maximum number of participants speaking is reached a shift action of the chairperson disables the microphone that was activated for the longest time.

In override mode (‘first-in, first out mode’) participants can activate their microphones with the microphone button on their contribution device. When the maximum number of participants speaking is reached, the next participant that activates his or her microphone automatically deactivates the microphone that was activated for the longest time. A white LED at the microphone button shall indicate that the maximum number of speakers is not reached.

It shall be possible to automatically switch off microphone automatically when they are not spoken into.

Provision shall be made for unlimited number of participants to be assigned priority status. The designated participant with priority status shall be able to speak at any desired time by activation of their microphones. The priority status shall be indicated by a white LED at the conference device. There shall be two priority modes: button operated and push to talk.

The system shall have a feedback suppressor, echo cancellation included to increase speech amplification and intelligibility. Additionally the system shall include at least two parametric equalizers and for the conference device loudspeakers and one for the external sound reinforcement system.

### Chairperson

Control of participants shall be in the hands of the chairperson, using the conference device which is configured to manage meetings. The chairperson can have priority over other participants.

The conference device in chairperson mode shall have a priority and a microphone button for speaking. The device shall incorporate a pluggable high directive unobtrusive microphone a two way loudspeaker.

The conference device shall have an indicator above the priority and request-to-speak button. This indicator shall light green when the chairperson is listed in the waiting list; it shall light red when the microphone is on. The microphone shall have an indicator that lights green when request-to-speak is accepted by the system; it shall light red when the microphone is on. An additional red LED indicator on the rear of the device shall also indicate that the microphone is active.

When a request-to-speak has been entered, green LEDs shall light to confirm that a request-to-speak has been accepted. A request-to-speak shall subsequently be cancelled by a second operation of the request-to-speak button. The green LEDs shall flash when the participant is first in the waiting list and shall be the next one to get the floor.

When the priority button is pressed a chime shall be audible and all microphone of speaking participants shall be muted while the priority button is being pressed. When the button is released all microphone shall be un-muted.

The conference device shall have a full color 7” capacitive touch screen, an onscreen channel selector and headphone volume control, a physical volume rotary control and a headphone connector. It shall be possible to connect an external condenser microphone (for example a headset). The touch screen shall be useable to inform the chairperson and to give the chairperson control over the discussion. It shall be possible to monitor the name and the participant speaking. It shall be possible to see the names of all participants waiting to speak.

It shall be possible to shift a waiting participant to the speakers list, to cancel all speakers and all waiting participants. It shall be possible to change the microphone mode and options from the touch screen.

The conference device shall be free standing.

### Participant

The conference device shall have a mute and a microphone button for speaking. The device shall incorporate a pluggable high-directive unobtrusive microphone a two way loudspeaker.

The conference device shall have an indicator above the mute and request-to-speak button. This indicator shall light green when the participant is listed in the waiting list; it shall light red when the microphone is on. The microphone shall have an indicator that lights green when request-to-speak is accepted by the system; it shall light red when the microphone is on. An additional red LED indicator on the rear of the device shall also indicate that the microphone is active.

When a request-to-speak has been entered, green LEDs shall light to confirm that a request-to-speak has been accepted. A request-to-speak shall subsequently be cancelled by a second operation of the request-to-speak button. The green LEDs shall flash when the participant is first in the waiting list and shall be the next one to get the floor.

When the mute button is pressed the microphone of the participant shall be muted. When the button is released the microphone shall be un-muted.

The conference device shall have a full color 7” capacitive touch screen, an onscreen channel selector and headphone volume control, a physical volume rotary control and a headphone connector. It shall be possible to connect an external condenser microphone (for example a headset). The touch screen shall be useable to inform the participant about the discussion. It shall be possible to monitor the name and the participant speaking. It shall be possible to see the names of all participants waiting to speak.

The conference device shall be free standing.

## Automatic camera control

It shall be possible to use an automatic camera control system to ensure that speaking participants are automatically displayed on all conference devices and on hall displays or monitors.

The system shall be controlled by the microphone activity of the devices.

The system shall allow camera control by means of fixed or moveable IP cameras with zoom lenses, pan and tilt heads and prepositions. Use of high-speed HD dome cameras shall be preferred. There shall be a low latency SDI video output stream for connecting additional monitors and audience displays. The system shall have an interface to control an external SDI video switcher.

The system shall include a H264 video switcher to switch H264 streams of all connected camera to the conference devices.

It shall be possible to display the names of speaking participants embedded in the video streams.

Camera system configuration shall only require configuration on the PC.

The system operator shall be able to override the automatic camera positions by using the conference management application or via the embedded browser in the camera.

## Document retrieval and Media sharing

The conference device shall provide access to internet and content management systems for document retrieval functionality. All standard documents like MS word, PowerPoint, Excel and PDF shall be supported. In addition the conference devices shall support playing of video and audio files. The system shall also provide functionally to share a presentation from a PC to all conference devices.

## Connecting peripheral equipment

Provision shall be made for interconnection of the conference system with various external devices and systems as required.

### External system connections

Additional facilities shall be provided for the connection of external system equipment. These facilities shall comprise at least:

* a PC-driven interface for control of external equipment such as video cameras (via a SDI control matrix), video displays
* two audio line (balanced and unbalanced) outputs for connection to a sound reinforcement system, audio mixers and/or to a voice logging system for audio registration of all spoken conference proceedings
* two audio line (balanced and unbalanced) inputs to allow connection of audio sources.
* coupling to OMNEO and Dante compatible devices to allow versatile audio distribution and contribution over long distances
* use of a telephone coupler for connection to a remote participant or Conference system
* insertion of an external sound processing device such as an additional graphic equalizer in the audio path of the conference device loud-speakers

# Contribution equipment

## Conference device

The conference device shall be optimized for local and regional councils and shall be ideal when multimedia content is required. The device shall be easily plugged into, or removed from, the system cabling, which shall enable the system to be set up quickly and efficiently. The device shall be free-standing or fixed using mounting screws. The device shall be connected in a simple daisy chain configuration. Alternatively, the devices shall be connected in star configuration where each device is connected to the system with an individual CAT 5e cable. The device shall support a neat and clean system installation for TV coverage. Storage and transport shall be simplified by sturdy suitcases.

The device shall have the following Features and Benefits

* Full color 7” capacitive‑touch graphical display including:
* Agenda and meeting data browsing.
* Internet browsing.
* Live video (e.g. showing the current speaker).
* Meeting management for the chair person.
* Headphones volume control.
* Possibility for adding 3rd party android app.
* Functionality can be increased by adding software.
* Document retrieval:
* MSWord (.doc, .docx).
* Excel (.xls, .xlsx).
* PowerPoint (.ppt, .pptx, .pps, .ppsx).
* Portable Document Format (.pdf).
* Rich Text Format (.rtf).
* Plain text (.txt).
* Images codecs: .jpg .gif .png .bmp .webp
* Audio codecs:
* AAC (.aac,.3gp, .mp4, .m4a, .ts).
* Flac (.flac).
* Mp3 (.mp3).
* Midi (.mid).
* Vorbis (.oog).
* PCM (.wav).
* Video codecs
* H263 (.3gp, .mp4).
* H264 (.3gp, .mp4).
* MPEG4 (.3gp).
* vp8 (.webm).
* Pluggable microphone.
* Built‑in 3M pixel camera for future use.
* Built‑in two‑way loudspeaker.
* Microphone on/off button or request‑to‑speak button.
* Microphone mute or chairperson priority button.
* Indicators showing: microphone on state, request‑to‑speak and possible‑to‑speak.

The device shall have the following interconnections

* Socket for pluggable microphone.
* 2x RJ45 compatible connection for system communication and power.
* 3.5 mm stereo jack for headphones, external microphone or headset microphone.
* Hot plug‑and‑play.
* Provision to attach a magnetic name card holder.

The device shall have the following Technical Specifications

General

Screen size 7 inches, 1024 x 600 pixels

Screen type capacitive multi touch

Operating system Android

Electrical

Supply voltage 48 Vdc IEEE 802.3 at Type 2

Power consumption

Max. 12.5 W

Frequency response 100 Hz – 20 kHz
(-3 dB at nominal level)

THD at nominal level < 0.01 %

Dynamic range 96 dB (14‑110 dBSPL)

Signal-to-noise ratio 66 dB with respect to nominal level

headroom 30 dB

Audio inputs

Nominal mic. 80 dB according IEC60914

Maximum mic. 110 dB according IEC60914

External mic. nom. -38 dBv

External mic. max. input -25 dBv

Audio outputs

LSP nom. 72 dB SPL @ 0.5 m

LSP max. 90 dB SPL

Headphone nom. -3 dBv

Headphone max. 0 dBv

Mechanical

Mounting Tabletop

Dimensions (HxWxD) 75 x 312 x 175 mm

 (2.95 X 12.28 x 6.89 in)

Weight max. 1.85 kg (4.078 lb)

Color Traffic black RAL 9017

 Pearl light grey RAL 9022

Environmental

Operating temperature 0 ºC to +35 ºC

 (32 ºF to +113 ºF)

Storage temperature -20 ºC to +70 ºC

 (-4 ºF to +158 ºF)

Relative humidity < 95 %, > 5%

The product shall be or similar to:

DCNM-MMD DCN multimedia Multimedia device

### Pluggable high directive microphone

The pluggable high directive microphone shall be an innovative, stylish and ergonomically designed high directive microphone that shall give the user the possibility to view the meeting room without obstructions. The high directive microphone shall contain two precisely positioned capsules giving it a high directive response which makes it possible to have a larger speaking distance then normal even in noisy conditions. The microphone shall have low noise and low susceptibility to interference from mobile phones.

The microphone shall have the following Features and Benefits

* Discrete microphone for user convenience
* High directive response
* Low susceptible for mobile phones
* Ultra low noise
* Freedom of movement

The microphone shall have the following Controls and Indicators

* Red or green illuminator. Red indicates microphone is active, green indicates request-to-speak accepted

The microphone shall have the following Interconnections

* Connector to plug and fasten the microphone

The microphone shall have the following Technical Specifications

Electrical

Bandwidth 100 – 15 kHz according IEC60914

Dynamic range > 96dB

Mechanical

Dimensions (H x W x D)

 108 x 21.5 x 60 mm (4.25 X 0.85 x 2.36 in)

Weight max.0.035 kg (0.077 lb)

Color Traffic black RAL 9017

 Pearl light grey RAL 9022

Environmental

Operating temperature 0 ºC to +45 ºC

 (32 ºF to +113 ºF)

Storage temperature -20 ºC to +70 ºC

 (-4 ºF to +158 ºF)

Relative humidity < 95 %, > 5%

The product shall be or similar to:

DCNM-HDMIC DCN multimedia High Directive Microphone

# Headphones

## Lightweight Stereo Headphones

Lightweight stereo headphones shall offer high quality sound reproduction.

The product shall have the following Features and Benefits

* Replaceable ear pads
* Separate available solid washable ear pads

The product shall have the following Interconnections

* 1 .3 m (51.2 in) cable terminated with 3.5 mm (0.14 in) angled stereo jack plug

The product shall have the following Technical Specifications

Electrical

Impedance 32 ohm per earpiece

Audio frequency response 50 Hz to 20 kHz (-10 dB)

Power handling capacity 50 mW

Sensitivity (1 kHz) 98 dB SPL/earpiece at

 1 mW/earpiece

Mechanical

Weight max. 70 g (0.16 lb)

Finish Charcoal (PH 10736)

 with silver

The product shall be or similar to:

LBB 3443/00 Lightweight Stereo Headphones

LBB 3443/50 Set of 100 pairs of replacement ear pads

HDP-LWSP Set of 50 pairs solid ear pads

## Under-the-Chin Stereo Headphones

The product shall have the following Features and Benefits

* Ergonomic design for use under the chin
* Replaceable ear tips

The product shall have the following Interconnections

* 1 .2 m (47.3 in) cable terminated with 3.5 mm (0.14 in) angled stereo jack plug

The product shall have the following Technical Specifications

Electrical

Impedance 150 ohm per earpiece

Audio frequency response50 Hz to 5 kHz (-10 dB)

Power handling capacity 60 mW

Sensitivity (1 kHz) 107 dB SPL/earpiece at

 1 mW/earpiece

Mechanical

Weight max. 33 g (0.07 lb)

Finish Black

The product shall be or similar to:

LBB 3441/10 Under-the-Chin Stereo Headphones

LBB 3441/50 Set of 1.000 replacement ear tips

## Single Earphone

The product shall have the following Features and Benefits

* Ergonomic design for use under the chin
* Replaceable ear tips

The product shall have the following Interconnections

* 1 .2 m (47.2 in) cable terminated with 3.5 mm (0.14 in) stereo jack plug

The product shall have the following Technical Specifications

Electrical

Impedance 32 ohm

Audio frequency response 100 Hz to 5 kHz (-10 dB)

Power handling capacity 5 mW

Sensitivity (1 kHz) 114 dB SPL/earpiece at 1

 mW/earpiece

Mechanical

Weight max. 25 g (0.06 lb)

Finish Dark gray

The product shall be or similar to:

LBB 3442/00 Single Earphone

## High Quality Dynamic Headphones

This high quality dynamic microphone shall be a durable dynamic headphones offering high-quality sound reproduction.

The product shall have the following Features and Benefits

* Replaceable ear pads

The product shall have the following Interconnections

* 1 .2 m (47.2 in) cable terminated with 3.5 mm (0.14 in) stereo jack plug

The product shall have the following Technical Specifications

Electrical

Impedance 720 ohm per earpiece

Audio frequency response 250 Hz to 13 kHz (-10 dB)

Power handling capacity 200 mW

Sensitivity (1 kHz) 96 dB SPL/earpiece at

 1 mW/earpiece

Mechanical

Weight max. 25 g (0.06 lb)

Finish Dark gray

The product shall be or similar to:

LBB 3015/04 High Quality Dynamic Headphones

LBB 9095/50 Set of 25 pairs of replacement ear pads

## Induction Loop Neckband

The induction loop neckband shall be suitable for use with the receivers.

The induction loop neckband shall have the following physical and electrical characteristics:

|  |
| --- |
| Connection 0.9 m (3 ft) cable with 3.5 mm  (0.14 in) gold-plated jack plug  |
| Impedance 28 ohms at 1 kHz |
| Magnetic Field 100 mA/m 15 cm (6 in) aboveStrength loop at 85 µW 1kHz input (IEC60118-4) 85 μW at 1 kHz input (IEC 60118-4) |
| Weight max. 45 g (0.10 lb) |
| Finish Charcoal with silver |

The induction loop neckband shall be o similar to:

HDP-ILN Induction Loop Neckband.

# Control Equipment

## Central device

The central device shall be responsible for routing and processing the audio and supplies power to the conference devices. It shall include an intelligent adaptive acoustic feedback suppressor, echo cancellation and two 5‑band parametric equalizers for optimal speech intelligibility; one for the conference devices loudspeakers and one for the sound reinforcement system.

Next to that it shall have two analogue audio inputs; one for inserting external audio signals into the system to be mixed with the floor signal from the conference devices and one to be used for Insertion-mode (to connect external audio equipment between the output and the input of the central control device) or mix‑minus-mode shall be provided for connecting the system to another (video) conferencing system.

It shall also have two audio outputs; one to connect an external sound reinforcement system and one to be used to connect to recorder system or using Insertion-mode (to connect external audio equipment between the output and the input of the central control device) or using mix‑minus-mode for connecting the system to (video) conferencing equipment.

It shall have a built‑in Ethernet switch to connect all devices in the system together into a network, and shall support loop‑through connection and cable redundancy. The central device shall have no user controls and shall be fully remotely controllable.

The product shall have the following Features and Benefits

* Zero configuration
* Fully compatible to the Ethernet (IEEE802.3) and OMNEO standard
* Supports loop‑through connection with cable redundancy
* Acoustic feedback suppression, echo cancellation and equalizer
* Standby mode to be environment friendly

The product shall have the following Controls and Indicators

* Mains switch on the rear to power on the central device.
* Ground‑lift switch.
* Led on the front to show: green (power on), amber (standby), blinking (no connection to the system).
* Led on the rear to show: green (power availability on each powered socket), red (overload per powered socket).
* Ethernet led’s yellow and amber for each socket.
* Independent powered sockets; a short circuit on one socket does no influence the other sockets.
* Supports hot plug and play.

The product shall have the following Interconnections

* 2 three‑pole XLR balanced audio line inputs with galvanic separation
* 4 RCA unbalanced audio line inputs
* 2 three‑pole XLR balanced audio line outputs with galvanic separation
* 4 RCA unbalanced audio line outputs
* Mains power supply auto ranging input.
* 1 socket with Ethernet without power, compatible with RJ45.
* Minimal 3 sockets with Ethernet with high power supply compatible with RJ45 to power at least 10 conference devices each socket.
* 1 socket with Ethernet with constant low power supply, compatible with RJ45 for remote switching from standby to operational state by use off a conference device.

The product shall have the following Technical Specifications

**Electrical**

Supply voltage 100/240 Vac 50-60 Hz

Power consumption max. 530 W

System supply max.

on Ethernet connections 48 VDC

Frequency response 30Hz – 20 kHz

THD at nominal level < 0.1 %

Dynamic range > 95 dB

Signal–to-noise ratio > 95 dB

Headroom 30 dB

Audio input 1

XLR nominal input -18 dBv (+6/- 18dB)

XLR maximum input +18 dBv

Cinch nominal input -30 dBv (+6/- 18dB)

Cinch maximum input +6 dBv

Audio input 2

XLR nominal input +2 dBv (+6/- 18dB)

XLR maximum input +18 dBv

Cinch nominal input -10 dBv (+6/- 18dB)

Cinch maximum input +6 dBv

Audio outputs

XLR nominal output -18 dBv (+8/- 24 dB)

XLR maximum output +20 dBv

Cinch nominal output -30 dBv (+8/- 24 dB)

Cinch maximum output +8 dBv

Mechanical

Mounting Tabletop or mounted in a 19”

 rack

Dimensions (H x W x D) 88 x 483 x 350 mm

 (with brackets, without feet)

 92 x 440 x 350 mm

 (without brackets, with feet)

Weight max. 7.62 kg

Color Traffic black RAL9017

 Pearl light grey RAL9022

Environmental

Operating temperature 0 ºC to +45 ºC

 (-32 ºF to +113 ºF)

Storage temperature -20 ºC to +70 ºC

 (-4 ºF to +158 ºF)

Relative humidity < 96 %, > 5 %

The product shall be or similar to:

DCNM-APS DCN multimedia Audio Powering Switch

## Powering device

The Powering device shall be used in combination with a central device to supply extra power to the network. The built‑in Ethernet switch shall connect all devices in the system together into a network and shall support loop‑trough connection and cable redundancy cable redundancy. The powering switch shall have no user controls and shall be fully remotely controllable.

The product shall have the following Features and Benefits

* Zero configuration
* Fully compatible to the Ethernet (IEEE802.3) and OMNEO standard
* Supports loop‑through connection with cable redundancy
* Standby mode to be environment friendly

The product shall have the following Controls and Indicators

* Mains switch on the rear to power on the powering device.
* Led on the front to show: green (power on), amber (standby), blinking (no connection to the system).
* Led on the rear to show: green (power availability on each powered socket), red (overload per powered socket).
* Ethernet led’s yellow and amber for each socket.
* Independent powered sockets; a short circuit on one socket does no influence the other sockets.
* Supports hot plug and play.

The product shall have the following Interconnections

* Mains power supply auto ranging input.
* 1 socket with Ethernet without power, compatible with RJ45.
* 3 sockets with Ethernet with high power supply, compatible with RJ45to power at least 10 conference devices.
* 1 socket with Ethernet with constant low power supply, compatible with RJ45 for remote switching from standby to operational state by use off a conference device.

The product shall have the following Technical Specifications

Electrical

Supply voltage 100/240 Vac 50-60 Hz

Power consumption max. 530 W

System supply max.

on Ethernet connections 48 VDC

Mechanical

Mounting Tabletop or mounted in a 19”

 rack

Dimensions (H x W x D) 88 x 483 x 350 mm

 (with brackets, without feet)

 92 x 440 x 350 mm

 (without brackets, with feet)

Weight max. 7.4 kg

Color Traffic black RAL9017

 Pearl light grey RAL9022

Environmental

Operating temperature 0 ºC to +45 ºC

 (-32 ºF to +113 ºF)

Storage temperature -20 ºC to +70 ºC

 (-4 ºF to +158 ºF)

Relative humidity < 96 %, > 5 %

The product shall be or similar to:

DCNM-PS DCN multimedia Powering Switch

# Cameras

## HD – Dome Camera

The HD Dome camera shall be an extremely compact and easy to install PTZ camera with an industry standard HD-SDI output for superb HD quality video. The camera shall provide complete network-based control of all dome functionality including pan/tilt/zoom operation, presets as well as web-based configuration of all dome settings.

The product shall have the following Features and Benefits

* HD 1080p and 720p resolutions
* 160x zoom (10x optical, 16x digital)
* Industry standard HD-SDI output
* Control and configuration via Ethernet
* Screen line option for displaying delegate names up to 16 characters

Despite its compact design, the HD Dome shall deliver state-of-the-art technology and features that are rare to most compact PTZ cameras. It shall have variable pan and tilt speeds and Auto Pivot to ensure optimal camera control and viewing at all zoom levels. It shall incorporate high-performance 160x (10x optical/16x digital) zoom autofocus camera and the latest digital imaging technology with excellent sensitivity and resolution. It shall have 99 user-defined presets.

The HD Dome PTZ camera shall have a 1/2.5-inch progressive scan CMOS sensor. With up to 1080p resolution and sensitivity to below 1.0 lux. Pan and tilt preset repeatability shall be accurate to within ±0.1 degrees to ensure that the correct scene is captured every time. The HD Dome shall deliver variable pan/tilt speeds from a crawl speed of only 1 degree per second up to an ultra-quick 120 degrees per second. The dome shall be capable of pan speeds of 360 degrees per second and tilt speeds of 100 degrees per second between prepositions. The HD Dome shall provide a tilt range of 0 to 94 degrees, and a pan range of up to 360 degrees continuous rotation.

It shall contain Auto Scaling (proportional zoom) and Auto Pivot (automatically rotates and flips the camera) features to ensure optimal control.

The product shall be or similar to:

|  |  |  |
| --- | --- | --- |
|  | VCD-811-IWT | VCD-811-ICT |
| Camera type | Surface mount | Surface mount |
| Video standard | HD-SDI SMPTE 292M | HD-SDI SMPTE 292M |
| Power | 24 Vac/50 Hz | 24 Vac/50 Hz |
| Bubble | Tinted | Tinted |
| Housing | White | Charcoal |

# Software

## System Server Software

The system server software shall be a platform that controls the entire system. Basic functions are included where others can be added depending on the functionality required.

The software shall be a server client solution and protected by a license. The server shall be a set of Windows services and the individual services shall not have user interfaces and are running at the background to control and monitor the system. The server software shall be able to run autonomic with any user intervention.

An application to control and setup the system shall be available which can run on several client PCs. The application shall have a user interface for system state and diagnostics.

Application

The Application shall acts as a PC user interface, to configure the system and to manage and prepare meetings.

The complete software shall be able to run on one PC but also on several PCs.

The software shall contain user management to assign functionality to different users and/or PCs.

The software shall have the following functions:

* Devices are automatically discovered and can be automatic or manual assigned to a seat.
* Setup chairperson seat.
* User management.
* Setup volumes of conference device loudspeakers and sound reinforcement output.
* Enable/disable Acoustic feedback suppression.
* 5‑band parametric room equalization.
* User definable priority and summon tones.

The software shall run on Windows 7 home premium 64 bits or better.

The product shall be or similar to:

DCNM-LSYS DCN multimedia System Server Software

## Meeting preparation and management

Meeting Preparation and Management shall cover the following functions:

Prepare

The prepare function shall give the possibility to prepare meetings and agendas. While preparing the agenda for each topic, basic discussion settings shall be definable. A complete set of discussion settings shall be selectable from a template.

Manage

The manage function shall give the possibility to manage the meeting by an operator or chairperson. It shall be possible to activate and open a meeting. Activating a meeting shall force the conference devices to automatically show the meeting topic of the activated meeting. It shall be possible to open a meeting and/or agenda automatically.

The following function shall be available:

Prepare meeting

* Prepare meeting.
* Prepare agenda’s.
* Prepare discussion templates with links to multimedia content like documents.

Manage meeting

* Activate, deactivate, open and close meetings.
* Open and close agenda topics.
* Initiate summon chime.
* Manage discussion:
	+ Grant speech, Cancel speakers, Cancel requests, Shift requests.
* Change basic discussion setting:
	+ Microphone mode: Open and Override.
	+ Number of open microphones.
	+ Enable/Disable automatic microphone off after inactivity of 30 seconds.
	+ Priority options.

The product shall be or similar to:

DCNM-LSYS DCN multimedia System Server Software

## Camera control

It shall be possible to interface with Onvif compliant IP cameras. It shall select fixed or pre‑positioned cameras to be activated to display the current active speaker in a meeting.

The system shall be controlled by the microphone activity of the conference system. When none of the microphone is activated, an overview camera shall be automatically activated. The camera image shall be shown on the Conference device and on the client PC together with the information of the speaking participant.

Configuration shall be easy and all cameras shall be automatically discovered.

The product shall be or similar to:

DCNM-LCC DCN multimedia Camera Control.

## Participant information

Participant information shall enable the possibility to compile a comprehensive database of information relating to participants. It shall be possible during the meeting preparation stage, to assign participants to a meeting. It shall be possible to define a speaker list of participants for each individual agenda topic.

A considerable amount of data shall be specifiable for each participant. All specific information like: person’s first name, middle name, last name, title, region and country, shall be reusable and does not need to be re‑entered for every meeting.

At meeting preparation it shall be possible to grant or deny authorization to individual participants in a specific meeting for discussion, meeting management and priority.

The product shall be or similar to:

DCNM-LPD DCN multimedia Participant Database.

## Media Sharing

Media Sharing shall make it possible to share the display of a remote presentation computer to all displays of the conference devices. The chairperson or meeting manager shall be able to activate the presentation mode using the PC Application or using a conference device. When the presentation mode is activated the screen of a remote presentation computer shall be streamed via the network to all conference devices.

The product shall be or similar to:

DCNM-LMS DCN multimedia Media Sharing Control.

# Installation Equipment

## Network cables

The product shall be or similar to:

DCNM-CB250 DCN multimedia System Inst. Cable 250m

DCNM-CB2 DCN multimedia System Network Cable 2m

DCNM-CB5 DCN multimedia System Network Cable 5 m

DCNM-CB10 DCN multimedia System Network Cable 10m

DCNM-CB25 DCN multimedia System Network Cable 25 m

## Connectors

Connector shall be used to terminate the custom length system network installation cable.

The product shall be or similar to:

DCNM-CBCON DCN multimedia System Connectors (50pcs)

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