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| DICENTIS Wireless Conference System |
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| en Architect’s & Engineer’s Specifications |



**About this Document**

**Purpose**

When preparing a specification, tender or quotation for a Bosch DICENTIS Wireless 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**

This Architect’s and Engineer’s Specifications contains the functional description specific for the

Bosch DICENTIS Wireless 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.

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# Document history

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# Introduction

The “wireless conference system” described in this specification (otherwise referred as the system) shall provide users and owners of venues with a versatile means of fulfilling conference requirements. These venues may include city councils, regional councils, historical buildings and boardrooms. The system shall conform to all relevant ISO and IEC standards. Scope of Specification

This specification shall give information on:

* The provision, installation and maintenance of the system.
* Camera control used for displaying active speakers and media on hall displays, and monitors.
* Configuration, i.e. the preparation and management functions ‑ used for controlling the system by means of a web interface.

# System summary

## System overview

The wireless conference system shall be easy to install and operate. It shall provide digital signal processing and transmission of all audio signals via an wireless IP Ethernet network based on the IEEE802.11n standard, and shall have low susceptibility to mobile phone interference. It shall be a versatile system that provides high-quality audio, whilst ensuring secure data transmission.

The system shall operate in the wireless 2.4 GHz and 5 GHz IEEE802.11n (license free) bands (UNII 1, 2 (extended) and 3) and shall be visible in the standard Wi-Fi IT infrastructure.

To prevent unauthorized access, the wireless conference system shall be encrypted using WPA2 encryption.

Advanced wireless management methods (such as dynamic & seamless frequency switching, zero audio interference with meetings without any audio interruptions and package error concealment) shall be used to protect the wireless conference system from interference from other external Wi-Fi networks and wireless equipment. It shall also be possible to exclude Wi-Fi channels from the automatic channel switching.

The wireless conference system shall provide a range of test functions to guarantee that all devices are in range independent of the selected Wi-Fi frequency.

It shall be possible to use the wireless conference system via a user-friendly web interface. The web interface shall assist in system configuration, meeting preparation, and management and monitoring. A license key shall be used to enable the use of additional features. The license key shall be returnable so that it can be transferred to another system without the intervention of the supplier.

Systems shall be expanded or reduced in size by adding or removing equipment.

The range of wireless conference system products shall include: central Wireless Access Point (WAP) and Wireless Devices, 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, 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 loss in signal quality or level during transmission. There shall be virtually no background noise, interference, crosstalk or distortion.

The system shall use a standard wireless network based on the IEEE802.11n standard to transport all digital signals: audio, data and control. The system shall be able to use standard CAT5e cables and Power over Ethernet (PoE) switches to supply the WAP.

The WAP shall have a built-in equalizer function for use with loudspeakers in Wireless Devices. It shall include built-in Digital Acoustic Feedback Suppression (DAFS).

The functions shall be controlled by means of a web interface

The wireless conference system shall provide four main functions for facilitating the progress of conferences. It shall:

1. Provide full facilities for sound management, including speech input by delegates, the 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.
2. Provide facilities for HD camera control. These shall include facilities for automatically switching camera outputs to individual Wireless Devices, hall displays or monitors.

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

## System functions

By use of purpose-built professional equipment, the wireless conference system in its most complete configuration shall be able to:

* Control participant’s microphones – automatic control or manual control by the chairperson, clerk and/or system operator shall be possible.
* Register a participant’s request-to-speak, and automatically handle the waiting list by means of a queuing procedure – the participants speaking and the participants in the waiting list shall be displayed on personal touch-screens, monitors, and/or on a hall display.
* Identify and display participants, the chairperson, and/or the system operator by name and/or by seat identification.
* Make certain facilities available to other external systems – these facilities shall be control of fixed and moveable cameras, webcast systems and other data, audio and video registration, and video display facilities.
* Configure and control a camera switching system for displaying the participants speaking. Participants shall be displayed on personal touch-screens, displays, hall displays, and monitors.
* Facilitate identification – A participant shall be able to register at a wireless device. During registration, the participant’s shall be given control to that device, which shall allow the participant to join the meeting. Participants shall be required to identify themselves by using a Near Field Communication (NFC) tag.
* Facilitate voting – during a voting session, participants shall be able to use the wireless device to vote.

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.

The functionality of the participant's Wireless Devices shall be extendable by installing additional software modules without the need to upgrade the hardware.

## Compliance

The wireless conference system shall comply with all applicable regulations and standards for equipment of this type. 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 wireless conference system shall be an integrated modular configuration with some or all of the following system components:

* A control position comprising a Wireless Access Point and web interface.
* Participant positions with optional touch-screen displays showing meeting related data such as voting results
* Display facilities with monitors and hall displays.
* Interface facilities for external devices and systems such as video cameras, data and speech video and media recorders 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 that is controlled by a web interface and shall include up to 120 wireless devices.

The Wireless Device shall be free-standing (table-top units) and powered by a removable/chargeable battery.

## System operation

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

* **Technician level** that shall use one or more modes of operation to give automatic control over conference proceedings. These pre-set modes shall be selectable by using a web interface
* **Chairperson’s level** that shall use one or more modes of operation to give automatic control over conference proceedings. These pre-set modes shall be selectable by using a web interface.
* **Participant’s level** that shall use one or more automatic modes to give participants limited control in discussion proceedings.

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

## Wireless Devices

The functionality of the participant's Wireless Devices shall be extendable by installing additional software modules without the need to upgrade the hardware.

It shall be possible to remotely control the behavior of the Wireless Devices by using a user interface on a PC. The Wireless Devices shall be suitable for table-top use.

## First-line system maintenance

The wireless conference system design shall permit fast and effective fault finding and correction of problems by local personnel. This shall be supported by built-in self-diagnostic functions. Spare part kits and instructions shall be provided.

Pre-selected system status and information entered into the system shall not be lost in the event of a 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 wireless conference system in a basic configuration (without control from a web interface) shall provide the chairperson with a degree of control over conference proceedings and participants.

When managed using the web interface, the wireless conference system shall provide the operator with full management over conference proceedings and participants.

## Discussion management

Discussion management shall be used to determine:

* How the microphones of the conference system are switched on and off.
* How many microphones may be active at the same time.
* The microphone operation mode used to operate the system.

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 having to set any hardware switches.

The system shall support at least 25 devices in chairperson mode.

The dual use console shall be assignable by a software setting without having to set any hardware switches.

Selection and setting of the system microphone operating mode shall be under the control of the chairperson via the web interface. 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.
* Voice activation mode, the devices’ microphone are automatically enabled when speaking.
* Push-to-Talk, with up to twenty-five simultaneous speakers.

In open mode with automatic shift enabled, participants shall be able to use the microphone button on their Wireless Device to enable their microphone. When the maximum number of participants that can speak is reached, the next participant that enables his or her microphone shall be added to a waiting list. The microphone shall not be enabled until another participant disables his or her microphone or the chairperson disables a participant’s microphone. A white LED in the microphone button shall be lit to indicate when the maximum number of speakers is not reached.

In open mode without automatic shift enabled, participants shall not be able to use the microphone button on their Wireless Devices to immediately enable their microphones. The participants shall always be added to a waiting list instead. A participant’s microphone shall be enabled when the chairperson shifts the participant from the waiting list to the speaker list. When the maximum number of participants that can speak is reached, a shift action of the chairperson shall disable the microphone that was activated for the longest time.

In override mode (‘first-in, first out mode’) participants shall be able to use the microphone button on their Wireless Device to activate their microphone. When the maximum number of participants that can speak is reached, the next participant that activates his or her microphone shall automatically deactivate the microphone that was activated for the longest time. A white LED in the microphone button shall be lit to indicate when the maximum number of speakers is not reached.

In voice activation mode participants shall be able to enable their microphones with their voices. There shall be no limit on the maximum number of simultaneous speaking participants. Participants shall be able to mute their microphones with the microphone button on their contribution devices.

In Push-to-Talk (PTT) mode the participants shall be able to activate their microphones with the microphone button on their wireless devices. The microphone is activated as long as the microphone button is pushed. When the maximum number of open microphone is reached, the other participants shall not be able to activate their microphones.

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

Optionally, an authentic face-to-face meeting feeling shall be achieved by allowing the loudspeaker and microphone to be on at the same time.

Provision shall be made for up to 25 participants to be assigned priority status. The designated participants with priority status shall be able to speak at any time by activating their microphones. The priority status shall be indicated by a white LED in the Wireless Device.

The system shall have a feedback suppressor, echo cancellation, and at least parametric equalizers to ensure optimal speech amplification and intelligibility; the parametric equalizer shall be used for the Wireless Device loudspeakers and for the external sound reinforcement system.

### Chairperson

The chairperson shall have priority over participants.

A Wireless Device that is configured for a chairperson shall have a priority button, and a microphone button for speaking. The Wireless Device shall have a pluggable high-directive unobtrusive microphone or a pluggable long or short stem microphone, as well as a loudspeaker.

Additionally a Near Field Communication (NFC) reader shall be available.

The Wireless Device shall have an indicator above the priority and request-to-speak button. This indicator shall light red when the microphone is on.

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

The Wireless Device Extended shall have a full-color 4.3” capacitive touch screen, two physical volume rotary control, and two headphone connectors.

It shall be possible to:

* Monitor the name of the participant speaking.
* See the names of all participants waiting to speak.

The Wireless Device shall be free-standing.

### Participant

The Wireless Device shall have a mute button and a microphone button for speaking. The device shall have a pluggable high-directive unobtrusive microphone or a pluggable long or short stem microphone, as well as a loudspeaker.

Additionally an NFC reader shall be available.

The Wireless 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 a request-to-speak is accepted by the system; it shall light red when the microphone is on.

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 Wireless Device shall have a full-color 4.3” capacitive touch screen, two physical volume rotary control, and two headphone connectors.

It shall be possible to:

* Monitor the name of the participant speaking.
* See the names of all participants waiting to speak.
* Use the device in dual-use mode

The Wireless Device shall be free-standing.

## Vote processing and display

Electronic voting shall allow participants to cast their votes using buttons on the touch screen.

The votes shall be automatically totaled up by the system and presented on the touch screen of devices and on the web interface. The parliamentary voting shall be controlled using the web interface.

## Identification

It shall be possible at the choice of the system operator to pre-set the system so that participation in the conference and/or use of the voting function by participant are possible only after an authorized participant has satisfied authorization requirements. This shall be done by using the present button in the touch screen of the device, by presenting a NFC tag close to a built-in NFC reader.

It shall be possible for the names of participant to be assigned to their respective NFC tags by entry of their names in the web interface.

## Automatic camera control

It shall be possible to use an automatic camera control system to ensure that speaking participants are automatically displayed 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.

Camera system configuration shall only require configuration on web interfaces.

The system operator shall be able to override the automatic camera positions by using the embedded browser in the camera.

## Wireless Redundant WAP

To prevent disruption of a meeting because the Primary WAP is unavailable, it shall be possible to connect a Secondary (redundant) wireless access points via the web browser interface.

* Secondary WAP will automatically synchronize the system settings of the Primary WAP,
* The synchronization shall be wireless
* Secondary WAP shall take over the primary WAP commonly within one minute and function as a primary WAP
* Redundant WAP functionality shall be configurable via the web browser.
* LED indication shall show the WAP settings

## Connecting peripheral equipment

Provision shall be made for interconnection of the conference system with various external devices and systems, as required, via an application programming interface.

### External system connections

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

* An application for control of external equipment such as video cameras (via a SDI control matrix), video displays.
* One audio line (balanced) output for connection to a sound reinforcement system, audio mixers or to a voice logging system for audio registration of all spoken conference proceedings
* One audio line (balanced) input to allow connection of audio sources.
* 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 Wireless Device loudspeakers.

# System/Product overview

## Wireless Access Point (WAP)

The ‘Wireless Access Point’ (WAP) shall be used as a standalone central control device for wireless connection and control of the Wireless Devices.

The WAP shall have the following features:

Easy to use

* Truly wireless, no need for an additional Wi-Fi router for tablet control.
* Easy and intuitive web interface for system setup, configuration, control and licensing.
* Native support for camera control.
* Range test function to guarantee that all Wireless Devices are in range independent of the selected Wi-Fi frequency.
* Remote interfacing, using API to control microphones and 3rd party camera systems.

Zero Interference

* Seamless automatic wireless frequency channel switching; up to 38 channels in the 2.4/5 GHz band.
* Packet Loss Concealment to mask the effects of lost or discarded packets.
* Carrier management by excluding channels

Standard Wi-Fi

* Visibility in the IT infrastructure.
* Coexistence with other Wi-Fi networks.

System cameras

* For giving a clear visual overview of the proceedings.
* Up to six HD Conference Dome cameras can be connected to the system with native support.
* The camera presets can be configured in the web interface.
* SDI Connection for little video latency.

General

* Powering via either: Power supply adapter, Power over Ethernet (PoE), or DCN multimedia System Network Cable.
* Typical wireless coverage area range of 30 m x 30 m.
* Functionality is modular; expandable via licensing.
* Wireless redundant WAP functionality.

Web interface

The WAP shall support the following software functions, which shall be available through the web interface (Some functions shall be not supported when a tablet device is used).

Configuration

* User management shall give the possibility to create several users with user specific access to functionality.
* Line input/output and routing settings.
* 5‑band parametric equalizer.
* Camera control and HD-SDI switcher configuration.
* Wireless network SSID and WPA2 settings.
* Wired network host‑name setting (DHCP and zero‑config protocol based on Bonjour).
* Upload of custom logo, which shall be shown in the Wireless Device Extended.
* GUI language setting.
* Factory default.
* Device subscription, using standard WPS protocol.
* Seat naming including priority setting for the chairperson (up to 25 Wireless Devices can have priority).
* Dual‑use setting (shall require DCNM‑LSDU per DCNM‑WD/WDE).
* Camera preposition assignment to seats (shall require one DCNM‑LCC per DCNM‑WAP).
* Date and time settings. Automatic date and time synchronization through NTP server from the internet or supplied by the local DHCP server.
* Firmware upgrade of all devices and the WAP, using the wireless network (shall not be supported when using the web interface on a tablet).
* License activation (Shall be supported when using a laptop or PC).
* Logging with export functionality (Export is not supported when using the web interface on a tablet).

Preparation

* Discussion mode settings, open, override, voice and Push‑To‑Talk.
* Up to of 25 open microphones.
* Participant names.
* Participant identification by use of NFC tags (Shall require DCNM-LSID per seat).
* Identification on assigned seat or at any seat.
* Range test to guaranty device coverage in case of channel switching.

Management and monitoring

* Add/remove participant/seat to the waiting and/or speaking list.
* Shift from waiting list to speaker list.
* Monitor of battery life time and signal strength per seat.
* Power off all Wireless Devices.
* Voting control with subject, answer set, and results presentation.

Web interface general

* System information.
* Supports multiple languages.

Controls and Indicators

* 2x 3 LEDs on the front side showing the status of the WAP / system.
* Equalizer control.
* 3rd party control, API and voting.

Interconnections

* 1x Ethernet/PoE/DCN multimedia socket.
* 1x DC power supply adapter input socket.
* 2x 6.3 mm jack sockets for audio line input and audio line output external system connections.

External system connections

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

* An application programming web interface for control of external equipment such as video cameras (via a SDI control matrix), video displays.
* One audio line (balanced) output for connection to a sound reinforcement system, audio mixers or to a voice logging system for audio registration of all spoken conference proceedings.
* One audio line (balanced) input to allow connection of audio sources.
* 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 wireless device loudspeakers.

The Wireless Access Point (WAP) shall have the following Technical Specifications:

Electrical

Supply voltage (PSU) 100‑240 Vac 50‑60 Hz in

48 Vdc out

PoE 802.3af, 802.3at - type 1 mode A (endspan), mode B (midspan)

DCNM system supply 48 Vdc

Power consumption 10 W

Frequency response 80 Hz - 20 kHz

THD at nominal level <0.1 %

Dynamic range >98 dBA

Signal‑to‑noise ratio >96 dBA

Ethernet 1000Base‑T IEEE 802.3ab

Audio inputs

Jack nominal -18 dBV

Jack maximum +18 dBV

Audio outputs

Jack nominal -18 dBV

Jack maximum +20 dBV

Radio

WIFI standard IEEE 802.11n

Frequency Range 2.4 GHz and 5 GHz

(ISM license free)

Mechanical

Mounting Ceiling, Wall or Tripod floor stand, using included bracket

Dimensions (H x W x D) 285 x 202 x 65 mm

with bracket (11.2 x 8.0 x 2.6 in)

Weight:

- with bracket 958 g (2.11 lb)

- without bracket 725 g (1.60 lb)

Color Light grey (RAL 000 7500)

Environmental

Operating temperature 5 ºC to +45 ºC

(41 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-WAP DICENTIS Wireless Access Point.

## Wireless Device

The ‘Wireless Device’ shall enable participants to take part in a discussion by speaking into a microphone, (when it is activated) and listening to proceedings via the built-in loudspeaker or connected headphones.

The Wireless Device shall have the following features and benefits:

General

* Possible‑to‑speak indicator.
* Request‑to‑speak indication in microphone.
* Single‑use, dual-use or chairperson can be configured via the web interface.
* Audio mute button.
* Operating in the 2.4 GHz and 5 GHz (UNII1, 2 (extended) and 3) (license free) band.

Speech intelligibility

* Maximum speech intelligibility shall be guaranteed at all times.
* The Wireless Device shall be connected to the Wireless Access Point.
* The Wireless Device shall produce crystal‑clear sound due to a very high signal‑to‑noise ratio and smart frequency selection.
* The loudspeaker and microphone can be active at the same time for a face‑to‑face meeting experience. To prevent acoustic feedback, a feedback suppressor is built‑in.

Zero Interference

* Based on standard Wi-Fi.
* Seamless automatic frequency channel switching.
* Wi-Fi coverage area range test.

Packet Loss Concealment Security

Wireless communication means extra security considerations. The DICENTIS Wireless Conference System and Wireless Devices shall have secure connectivity using WPA2 to prevent eavesdropping and unauthorized access. Encryption shall ensure the information within the system remains confidential.

Microphones

A socket shall be provided to connect the pluggable microphone (DCNM‑HDMIC, DCNM‑MICS or DCNM‑MICL, all to be ordered separately). See 5.4

Headphones and loudspeakers

The Wireless Devices shall accommodate two headphone connections and controls (on the left and right hand side), so the speaker can be heard clearly even with excessive background noise.

Battery maintenance

Simple battery maintenance is essential in a wireless system. A unique feature of Bosch's Wireless Devices shall be the separate rechargeable Battery Pack (DCNM-WLIION). The lithium‑ion Battery Pack shall be removed and replaced in a matter of seconds, providing maximum flexibility in recharge scheduling.

Smart battery management via web interface control (battery status and usage counting time).

Controls and Indicators

* Top side:
* 4.3 inch capacitive display with touch screen (DCNM-WDE only).
* Microphone with a red or green indicator:  
  - Red shall indicate microphone is active.  
  - Green shall indicate request-to-speak.
* LED bar above buttons with a red or green indicator:  
  - Microphone on state (Red).  
  - Request‑to‑speak (Green).
* Indicators in the buttons showing:  
  - Microphone on state (Red).  
  - Possible‑to‑speak (White).  
  - Request‑to‑speak (Green).
* Left and right-hand side:
* Headphone rotary volume controls.
* Rear side:
* Yellow out‑of‑range of Wireless Access Point LED indicator.
* Red battery low LED indicator.
* Under base side:
* Recessed, so called ‘De‑init,’ switch shall disconnect the connected Wireless Device with the Wireless Access Point.

Interconnections

* Socket for pluggable microphone.
* Two 3.5 mm (0.14 in) headphone sockets stereo jack type.

For the Technical Specifications of the Wireless Device, see 5.3 Wireless Device Extended, which includes the Technical Specifications for both devices.

The product shall be or similar to: DCNM-WD DICENTIS Wireless Device.

## Wireless Device Extended

The ‘Wireless Device Extended’ shall be the same as the Wireless Device but shall have the following additional features:

* Extended functionality by installing licenses
* 4.3” capacitive touch screen:
  + Add custom logo in screen.
  + Speaker list.
  + Request list.
  + Identification functionality.
  + Future upgradable functionality.
  + Camera control.
  + Voting.
  + Logon identification.
  + Multiple languages.
* Built‑in Near Field Communication (NFC) contactless tag reader.

The product shall be or similar to: DCNM-WDE DICENTIS Wireless Device Extended.

The Wireless Device and the Wireless Device Extended shall have the following Technical Specifications:

Electrical

Supply voltage (battery pack) 7.5 Vdc

Power consumption 4.5 W

Operating time DCNM-WD > 24 hours (20% speech, 80% listening)

Operating time DCNM-WDE > > 20 hours (20% speech, 80% listening)

Frequency response 100 Hz – 20 kHz

(-3 dB at nominal level)

THD at nominal level < 0.1 %

Dynamic range > 90 dB

Signal‑to‑noise ratio > 90 dB

Headphone load impedance > 32 ohm <1k ohm

Headphone output power 15 mW

Radio

WIFI standard IEEE 802.11n

Frequency Range 2.4 GHz and 5 GHz (ISM license free)

Audio inputs

Nominal microphone input 80 dB SPL according IEC60914

Maximum microphone input 110 dB SPL according IEC60914

Audio outputs

Loudspeaker nominal output 72 dB SPL at 0.5 m

Loudspeaker maximum output 80 dB SPL

Headphone nominal output 0 dBV

Headphone maximum output 3 dBV

General

Screen size (DCNM-WDE only) 4.3 inch

Screen type (DCNM-WDE only) Capacitive multi- touch

Supported contactless NFC Tag According to:

(DCNM-WDE only) ISO/IEC14443 Type A (from 106 kbps to 848 kbps. MIFARE 106kbps)

Mechanical

Mounting Tabletop

Dimensions (H x W x D) 72 x 259 x139mm

without microphone (2.8 x 10.2 x 5.5 in)

Weight:

DCNM-WD 590 g (1.30 Lb)

DCNM-WD + Battery Pack 1051 g (2.32 lb)

DCNM-WDE 670 g (1.47 lb)

DCNM-WDE + Battery Pack 1131 g (2.49 lb)

Color (top and base) Traffic black (RAL 9017)

Environmental

Operating temperature 5 ºC to +45 ºC

(41 ºF to +113 ºF)

Storage temperature -20 ºC to +70 ºC

(-4 ºF to +158 ºF)

Relative humidity < 95 %, > 5%

## Additional products

It shall be possible to order the following additional products separately:

### Pluggable high-directive microphone

The ‘pluggable high-directive microphone’ shall be a stylish high-directive microphone that shall give the user a clear view of the meeting room, due to its unobtrusive design. The high-directive microphone shall contain two precisely positioned capsules to give it a high-directive response. This shall make it possible to have a larger speaking distance than normal from the microphone, even in noisy conditions.

The microphone shall have the following features and benefits:

* Discrete microphone for user convenience.
* High-directive response.
* Ultra-low noise.
* Low susceptibility to interference from mobile phones.
* Integrated connector with locking device so that the microphone can be quickly connected and removed from the Wireless Device. Hot swap of microphones shall be possible.

The microphone shall have the following controls and indicators:

* Red or green illuminator. Red shall indicate that the microphone is active; green shall indicate that the request-to-speak is accepted.

The microphone shall have the following Technical Specifications:

Electrical

Bandwidth 100 Hz – 15 kHz

according IEC60914

Dynamic range > 96 dB

Mechanical

Dimensions (H x W x D)

108 x 21.5 x 60 mm

(4.25 X 0.85 x 2.36 in)

Weight 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.

### Pluggable short/long stem microphone

The pluggable short/long stem microphones with adjustable stem, respectively 310 mm, 480 mm (12.2 in, 18.9 in), shall be ergonomically designed microphones that can be positioned to suit the user. The microphones shall have a unidirectional response that shall provide optimum performance, even in noisy conditions or in acoustical challenging rooms.

The microphones shall have the following features and benefits:

* Built‑in plop and windshield.
* Adjustable stem (suitable for situations where people want to speak standing upright).
* Low susceptibility to interference from mobile phones.
* Integrated connector with locking device so that microphone can be quickly connected and removed from the Wireless Device. Hot swap of microphones shall be possible.

The microphones shall have the following controls and indicators:

* Red or green illuminator. Red shall indicate that the microphone is active; green shall indicate that the request-to-speak is accepted.

The microphones shall have the following Technical Specifications:

**Pluggable short stem microphone:**

Electrical

Bandwidth 125 Hz – 15 kHz

according IEC60914

Dynamic range > 100 dB

Nominal input 85 dB SPL

Maximum input 115 dB SPL

Equivalent noise 15 dB SPL

Mechanical

Mounting Plug and fasten into conference device

Length 310 mm (12.21 in)

(without connector)

Connector 77.15 x 60.47 mm (3.40 x 2.38 in)

Weight 91 g (0.20 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%

**Pluggable long stem microphone:**

Electrical

Bandwidth 125 Hz – 15 kHz

according IEC60914

Dynamic range > 100 dB

Nominal input 85 dB SPL

Maximum input 115 dB SPL

Equivalent noise 15 dB SPL

Mechanical

Mounting Plug and fasten into conference device

Length 480 mm (19.90 in)

(without connector)

Connector 77.15 x 60.47 mm (3.40 x 2.38 in)

Weight 108 g (0.24 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 products shall be or similar to:

* DCNM-MICS ‑ DCN multimedia Short Stem Microphone.
* DCNM-MICL ‑ DCN multimedia Long Stem Microphone.

### Battery Pack

The ‘Battery Pack’ shall be a removable, rechargeable lithium-ion Battery Pack. It shall have the following hours of use when fully charged:

* Wireless Devices - up to 24 hours.
* Wireless Device Extended - up to 20 hours.

The Battery pack shall be fully rechargeable within three hours. It shall have a microprocessor for controlling the charging current and to prevent current overload. To test the remaining battery capacity/time, each battery pack shall have a charge capacity LED and a push-to-test button.

The Battery Pack shall have the following Technical Specifications:

Electrical

Nominal output Voltage 7.5 VDC

Capacity 12800 mAh

Mechanical

Dimensions (H x W x D) 99.9 x 136.5 x 22 mm  
 (3.93 x 5.37 x 0.87 in)

Weight 460 g (1 lb)

Color Charcoal

Environmental

Operating temperature 5 ºC to +45 ºC

(41 ºF to +113 ºF)

Advised storage -5 ºC to +35 ºC

temperature (23 ºF to +95 ºF)

Relative humidity < 75 %, > 5%

The product shall be or similar to: DCNM-WLIION DICENTIS Battery Pack.

### Charger for five Batteries

The ‘Charger’ for five ‘Batteries’ shall include charging status indicators per Battery Pack.

It shall be possible to loop-through the mains power supply of 2 to maximum five Chargers (the maximum number of loop-through Chargers is depending on the country mains supply voltage) so that up to 25 Battery Packs can be charged at the same time. A mains power supply, loop-through socket and mounting bracket shall be included with the product.

The Charger for five ‘Batteries shall have the following Technical Specifications:

Electrical

Supply Voltage 100-240 Vac +/- 10 %

50/60 Hz

Maximum power 300 W

Consumption

Mechanical

Dimensions (H x W x D) 340 x 195 x 82 mm

(13.4 x 7.6 x 3.2 in)

Weight 460 gram (1.0 lb)

(without batteries)

Color Traffic black (RAL 9017)

Environmental

Operating temperature 5 ºC to +45 ºC

(41 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-WCH05 DICENTIS Charger for 5 batteries.

### Transport case for wireless system and 10 devices

The ‘Transport case’ shall be able to store and protect:

* one WAP.
* one PSU.
* ten Wireless Devices.
* ten high‑directive microphones.
* ten short or long stem microphones.
* two battery chargers.

The Transport case shall have:

* specially molded packing, on the inside, to accommodate the components.
* a handle on the top and sides.
* a retractable handle and roller wheels for ease of transportation.
* trigger release latches.
* two metal‑reinforced holes for locking the transport case with padlocks.

The Transport case shall have the following Technical Specifications:

Mechanical

Dimensions (H x W x D) 318 x 801 x 529 mm

(12.52 x 31.54 x 20.83 in)

Weight 11 kg (24.25 lb)

(without equipment)

Color (case exterior) Black

The product shall be or similar to: DCNM‑WTCD Transport case wireless sys, 10x DCNM-WD.

# 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 70 g (0.16 lb)

Color 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.

## Lightweight Neckband Headphone

This product shall have the following features and benefits:

* Lightweight with high quality sound reproduction.
* Replaceable ear-pads.
* Right-angled stereo gold-plated jack plug.

The product shall have the following interconnections

* 1.3 m (4.25 ft) cable terminated with gold-plated 3.5 mm (0.14 in) right‑angled stereo gold‑plated jack plug.

Electrical

Impedance 32 ohm per earpiece

Audio frequency response 20 Hz to 20 kHz (±3 dB)

Power handling capacity 30 mW

Sensitivity (1 kHz) 111 dB SPL/earpiece at

1 mW/earpiece

Mechanical

Weight 56 g (0.12 lb)

Color Charcoal (PH 10736)

with silver

The product shall be or similar to:

* **HDP‑LWN Lightweight Neckband Headphone.**
* HDP-LWNEP Earpads for neckband headphone (50 pairs).

## 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 response 50 Hz to 5 kHz (-10 dB)

Power handling capacity 60 mW

Sensitivity (1 kHz) 107 dB SPL/earpiece at

1 mW/earpiece

Mechanical

Weight 33 g (0.07 lb)

Color 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.

## 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) above  Strength loop at 85 µW 1kHz input  (IEC60118-4)  85 μW at 1 kHz input (IEC 60118-4) |
| Weight 45 g (0.10 lb) |
| Color Charcoal with silver |

The induction loop neckband shall be to similar to:

HDP-ILN Induction Loop Neckband.

# 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

## Identification at seat

The DCN multimedia Identification at Seat license shall extend the Wireless Devices Extended with identification functionality. Participants shall use a NFC token to identify themselves, which shall prevent unauthorized use of the system.

It shall be possible to assign dedicated seats to participants or let them sit where they please. When dedicated seats are assigned to participants, it shall be possible to use the login screen to welcome participants and help them find their seats. The names of participants shall be correctly displayed in speaker lists and with the camera image.

The product shall be or similar to:

DCNM-LSID ‑ DCN multimedia Identification at Seat.

## Voting at seat

The Voting at Seat license shall enable a secure voting feature that is optimized for councils and parliaments.

During a voting session, it shall be possible to use each licensed Wireless Device Extended to cast a vote for a answer set. The answer set shall be selectable in the web interface.

The product shall be or similar to:

DCNM-LSVT ‑ DCN multimedia Voting at Seat.

## Camera control

The “Camera Control” software module shall enable the conference system to be interfaced with Bosch Onvif compliant IP cameras. It shall enable fixed or prepositioned cameras to be activated during a meeting, so that the current active speaker is displayed on the conference device or hall displays. Switchers shall be supported.

The product shall be or similar to:

DCNM-LCC ‑ DCN multimedia Camera Control.

## Dual Use at Seat

The Dual Use at Seat license shall extend the Wireless Device with dual-use functionality. If the DCNM-LSID and/or DCNM-LSVT licenses are activated, two copies of these licenses shall also be required for each dual-use

Wireless Device.

The product shall be or similar to:

DCNM-LSDU ‑ DCN multimedia Dual Use at Seat.

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