



Security Systems

en | Installation and User Instructions
Wireless coverage test kit

Important Safeguards

Before you use the DCN Wireless coverage test kit, you should read the Important Safety Instructions for the DCN wireless discussion system.

Disclaimers

Not applicable for this test kit.

Introduction

Function

These Installation and User Instructions provide the user with the necessary information for testing the coverage area for a DCN wireless discussion system.

The DCN wireless coverage test kit consists of standard and modified DCN wireless network components. A full description of all standard DCN wireless components is provided in the “DCN Wireless Installation and User Instructions”

Digital version

These Installation and User Instructions are also available as a digital document in the Adobe Portable Document Format (PDF). All references to pages, figures, tables, etc. in this digital document contain hyperlinks to the referenced locations.

Alerts

Four types of alerts are used in the Installation and User Instructions. The alert type is closely related to the effect that may be caused if it is not observed. These alerts from least severe to most severe are:

- **Note**
Alert containing additional information. Usually, not observing a note does not result in damage to the equipment or cause personal injuries.
- **Caution**
The equipment can be damaged if the alert is not observed.
- **Warning**
Persons can be (severely) injured, or the equipment can be seriously damaged, if the alert is not observed.
- **Danger**
Not observing the alert can result in death.

Signs

Cautions, Warnings, and Dangers signs

The signs used in combination with Caution, Warnings, and Dangers indicate the type of hazard present. See the following examples:



Caution, Warning, Danger

General sign for cautions, warnings and dangers.



Caution, Warning, Danger

Risk of electric shock.



Caution, Warning, Danger

Risk of electrostatic discharge.

Note signs

The signs used in combination with Notes provide extra information about the Note. See the following examples:



Note

General sign for notes.



Note

Refer to another information source.

Electro-static discharge

Electro-static discharge can damage electric components. You must take measures to prevent electro-static discharges when you touch PCBs (see figure 1).

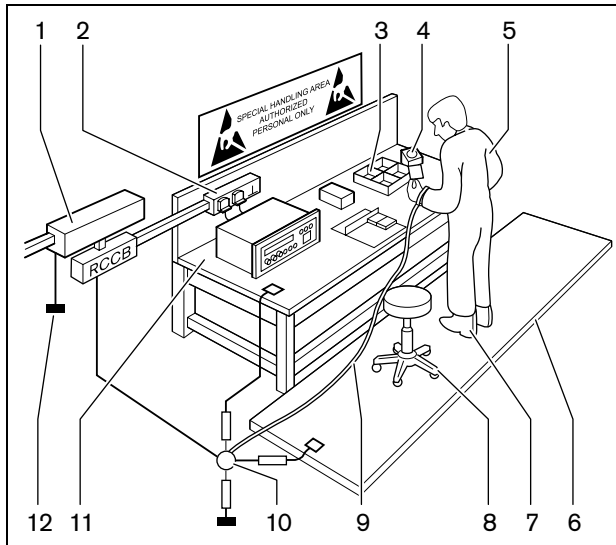


figure 1: ESD prevention

table 1: ESD prevention

No.	Description
1	Safety isolating transformer
2	Distribution supply box
3	Conductive compartment trays
4	Electro-static voltage sensor
5	Cotton overall
6	Conductive floor mat
7	Conductive boots/heel grounding protectors
8	Conductive stool
9	Strap (resistance 0.5 to 1.0 MΩ)
10	Common reference point
11	Conductive bench top
12	Supply ground

Conversion tables

In this manual, SI units are used to express lengths, masses, temperatures etc. These can be converted to non-metric units using the following information.

table 2: Conversion of units of length

1 in =	25.4 mm	1 mm =	0.03937 in
1 in =	2.54 cm	1 cm =	0.3937 in
1 ft =	0.3048 m	1 m =	3.281 ft
1 mi =	1.609 km	1 km =	0.622 mi

table 3: Conversion of units of mass

1 lb =	0.4536 kg	1 kg =	2.2046 lb
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table 4: Conversion of units of pressure

1 psi =	68.95 hPa	1 hPa =	0.0145 psi
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Note

1 hPa = 1 mbar.

table 5: Conversion of units of temperature

$$^{\circ}F = \frac{9}{5} \cdot ^{\circ}C + 32$$

$$^{\circ}C = \frac{5}{9} \cdot (^{\circ}F - 32)$$

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1 The Coverage test kit

1.1 Introduction

The DCN wireless coverage test kit is used to test the potential coverage area for a DCN wireless discussion system (see figure 1.1).

The kit uses a modified Wireless Access Point (WAP) and a standard wireless discussion unit with voting buttons to measure the coverage area. The wireless access point is powered directly from an ac/dc adaptor (by using a standard optical network cable and a special adaptor block).

**Note**

The modified wireless access point can operate without a wireless central control unit.

After setting up the test kit, the user picks up the wireless discussion unit, and walks away from the wireless access point, while monitoring the strength of the wireless signal.

The LEDs around voting buttons 1 through 3 are used to indicate the strength of the wireless signal. When all three LEDs are lit, the wireless signal is excellent. As the user walks away from the wireless access point, the LEDs (one after another) will start to flicker and then go out. The minimum preferred signal is when LEDs 1 and 2 are still on (see table 3.6). This test is then repeated in several directions.

After completing the test, the user should complete a test form (enclosed at the back of this manual). The results of the test are then used for determining the system layout of a DCN wireless network.

1.2 Contents of the test kit

The DCN wireless coverage test kit consists of the following standard DCN and special test kit components (see figure 1.1):

Standard DCN wireless components

- 1 DCN-WDV-D Wireless discussion unit with voting
- 2 DCN-MICS Pluggable microphone, short stem
- 3 DCN-WLIION-D Battery pack
- 4 DCN Optical network cable (1/2 meter)

Special test kit component

- 5 DCN-WAP Modified Wireless Access Point
- 6 Power supply (including AC/DC adaptor)
- 7 Battery charging adaptor
- 8 WAP adaptor
- 9 Protective flight case, for storage and transportation (not shown in figure)

Accessories

The following DCN accessories may also be required:

- 10 LBB 3443 Lightweight stereo headphones
- 11 LBC1259/00 Universal floor stand (tripod)

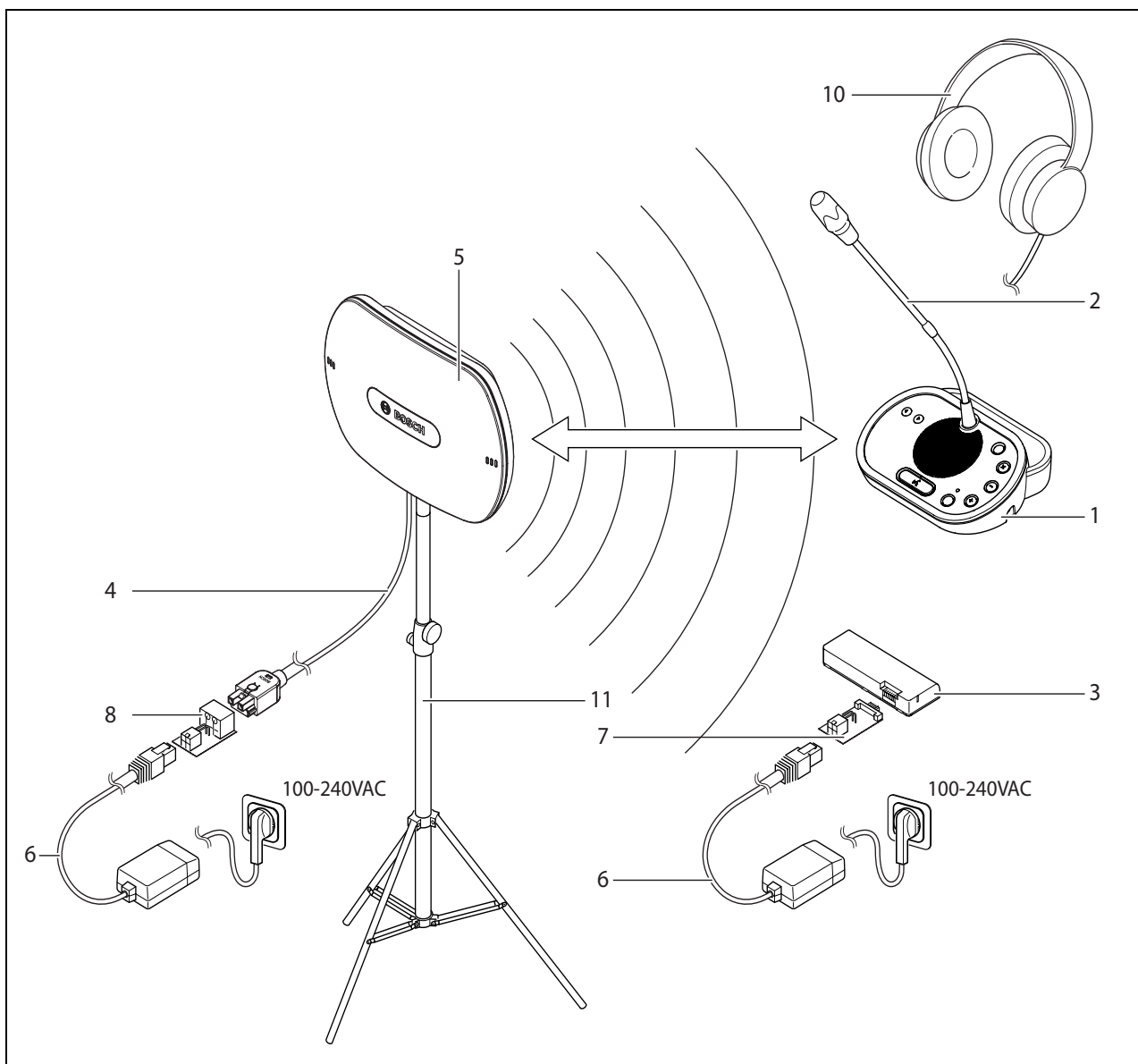


figure 1.1: DCN wireless coverage test kit components

2 Test requirements

2.1 General considerations

- Make sure the wireless access point is placed in a realistic position for the room being tested.
- Check if the room is going to change.

**Note**

Any later changes to the room, for example, the addition of furniture or the painting of walls and ceilings could affect the strength of the wireless signal.

2.2 Wireless networks

Wireless networks in general are based on the 802.11g specification for WiFi technology. Devices that comply with this specification operate in frequency bands between 2.4000 and 2.4835 GHz.

**Note**

Although the DCN wireless network operates on frequencies that are license-free worldwide, you must comply with the country specific regulations.

The DCN wireless network must operate in a different frequency band than any other adjacent wireless network (DCN wireless network, or computer network).

Before testing the wireless coverage area you must check if:

- there is another DCN wireless network in the close vicinity (see section 2.2.1).
- there is a computer network in the close vicinity (see section 2.2.2).

2.2.1 DCN network carriers

The DCN Wireless network can operate on any one of three non-overlapping wireless carriers (see figure 2.1).

If there is another DCN wireless network in the close vicinity, make sure the wireless access point is not set to the same frequency as the existing network (see section 3.2).

2.2.2 Wireless computer networks

Wireless computer networks are also based on the 802.11g specification for WiFi technology. 13 overlapping channels are available (see figure 2.2).

The DCN wireless network can cause interference on wireless computer networks, and vice versa. You must make sure the DCN wireless carrier does not overlap an WLAN channel.

**Note**

You can use a WiFi seeker to detect wireless computer networks.

Example

See figure 2.3. In the example, the WLAN channel is 3 (shown as gray shaded). WLAN channel 3 overlaps DCN wireless carriers 0 and 1 (also shown as gray shaded). Therefore, you should use DCN wireless carrier 2.

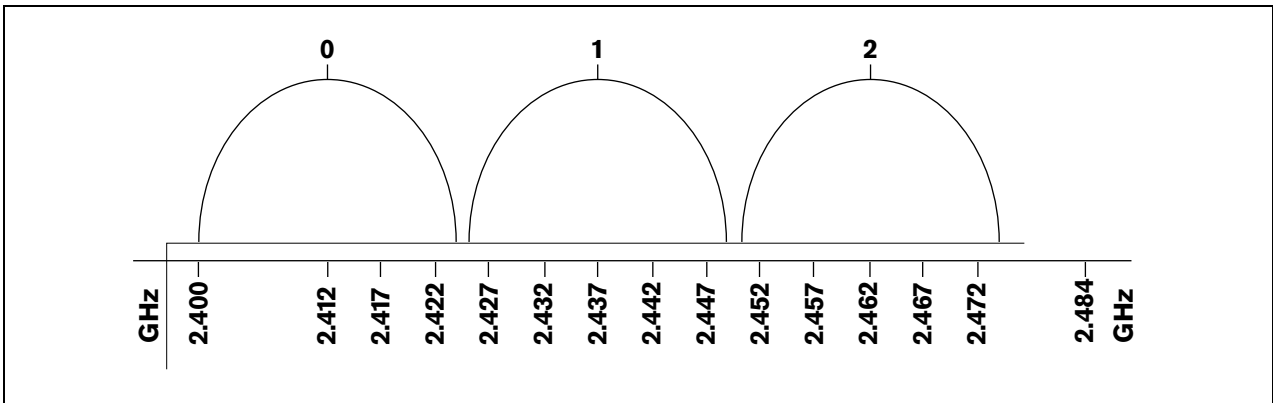


figure 2.1: DCN wireless carriers

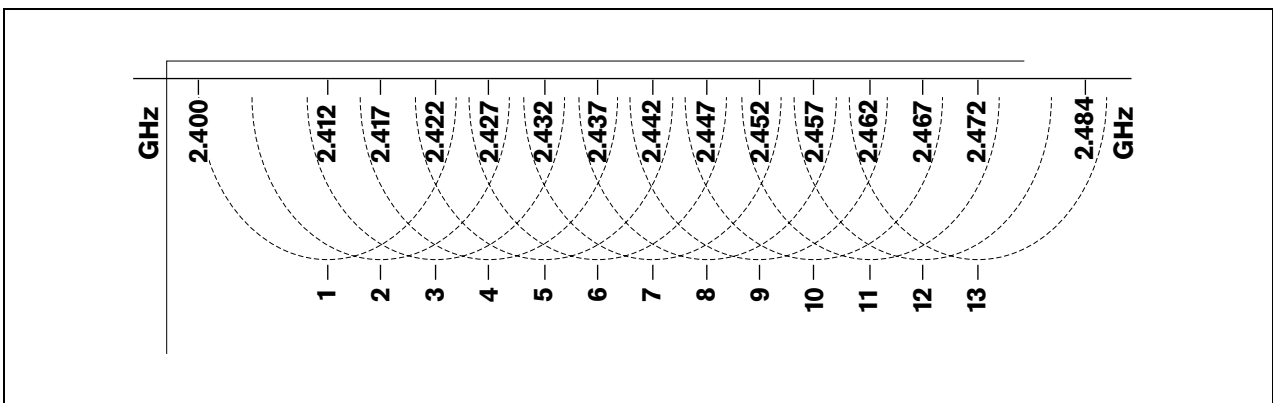


figure 2.2: WLAN channels

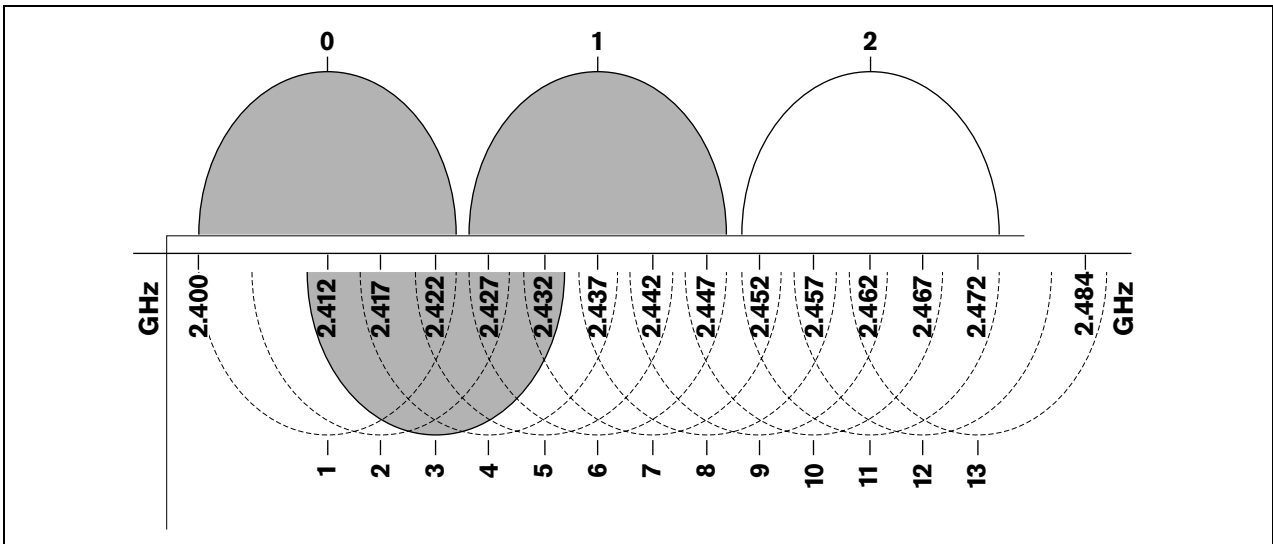


figure 2.3: Example of interference

3 Testing the coverage area

3.1 Charge battery

- 1 Connect the battery charging adaptor (see figure 3.1, no. 1) to the power supply (no. 2), and then insert the battery charging adaptor into the battery (no. 3).

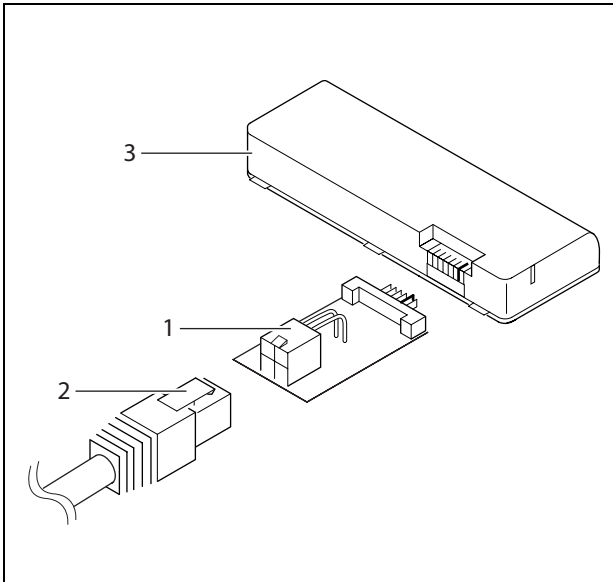


figure 3.1: Battery charging connections

- 2 Attach the correct power plug for your country (see figure 3.2), and then plug the power supply into the mains. The battery will start to charge.

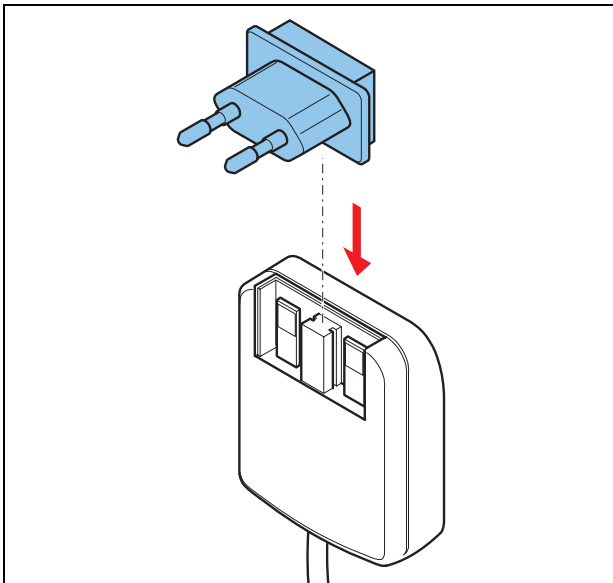


figure 3.2: Attaching power plug to power supply

- 3 Charge the battery as required (see table 3.1).

table 3.1: Capacity LEDs

No. LEDs on	Battery capacity in hours (plus minus 20%)
5	18 - 20
4	13 - 18
3	8 - 13
2	3 - 8
1	< 3



Note

The LEDs on the battery, show the capacity of the battery pack. The higher the capacity, the more LEDs will be lit.

3.2 Set up wireless access point

- 1 Remove the wireless access point from the case, and set the DIP switches (see figure 3.3, no.1) on the side of the unit (no. 2). See table 3.2 for correct settings.

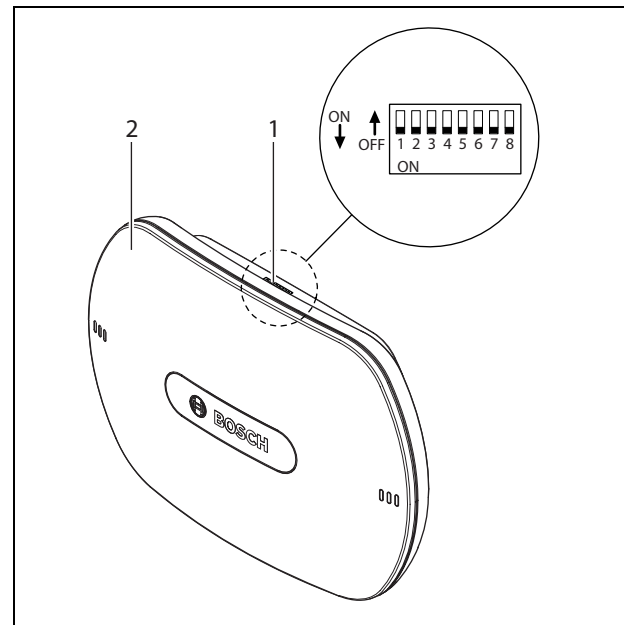


figure 3.3: Position of the WAP DIP switches

table 3.2: Function of the DIP switches

DIP switch	Function	Position during test
1	Sets the carrier to 0, 1, or 2	Depends on the required carrier (see table 3.3)
2	Sets the carrier to 0, 1, or 2	Depends on the required carrier (see table 3.3)
3	Reserved for other purposes	Must be set to Off
4	Reserved for other purposes	Must be set to Off
5	Sets the coverage test mode to On or Off	Must be set to On
6	Sets the coverage power to high, medium, or low	Depends on the room (see table 3.4)
7	Sets the coverage power to high, medium, or low	Depends on the room (see table 3.4)
8	Reserved for other purposes	Must be set to Off

table 3.3: Carrier settings

DIP switch 1	DIP switch 2	Carrier
Off	Off	Carrier 0
On	Off	Carrier 1
Off	On	Carrier 2
On	On	Modem off (not applicable)

table 3.4: Coverage power settings

DIP switch 6	DIP switch 7	Coverage power
Off	Off	High
On	Off	Medium
Off	On	Low
On	On	Spare (do not use)

**Note**

If the position of the DIP switches is changed during operation, the WAP must be restarted.

- 2 Connect the WAP adaptor (see figure 3.4, no. 1) to the power supply (no 2), and then insert the WAP adaptor into the connector of the optical network cable (no. 3). See figure 3.4.
- 3 Connect the other end of the optical network cable to the WAP.

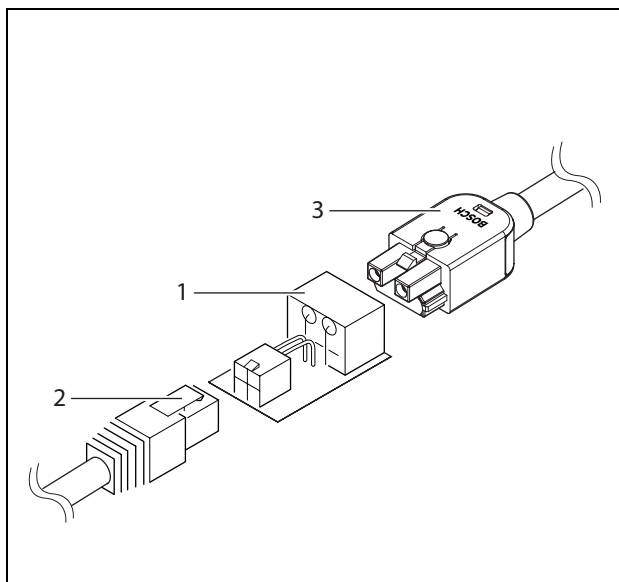


figure 3.4: Connect WAP to power supply

- 4 Plug the power supply into the mains (see figure 3.2). The WAP will power up (the middle LED B should be red. The two outer LEDs A and C should be off).
- 5 Place the wireless access point in a realistic position for the room to be tested.
If necessary, you can attach the wireless access point to an LBC1259/00 Universal floor stand (tripod) (see figure 3.5).

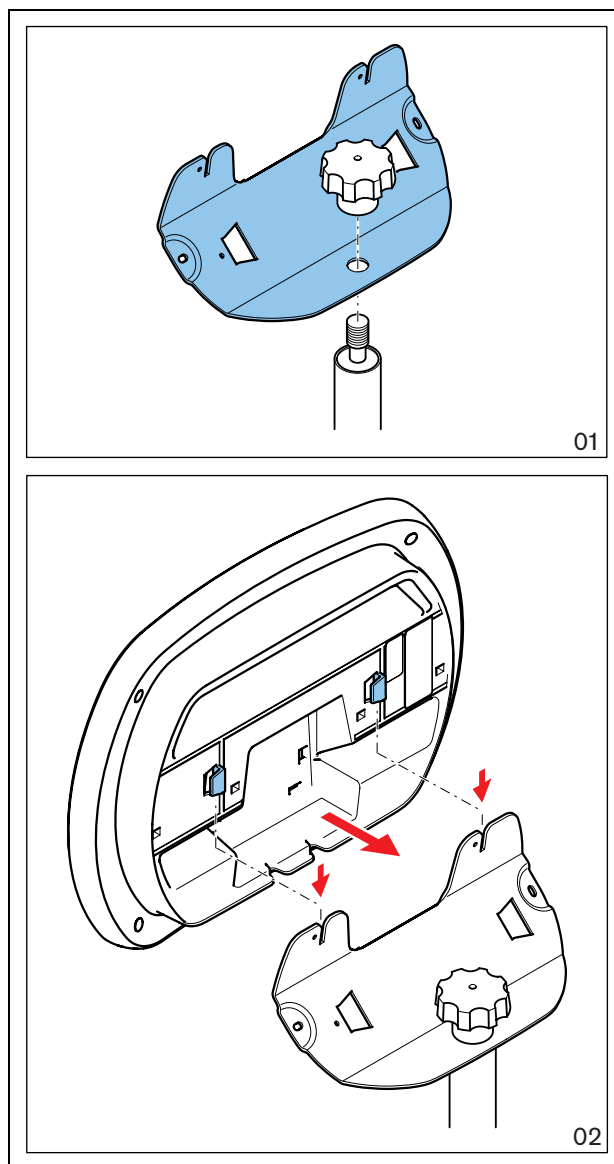


figure 3.5: Attaching the LBC1259/00 floor-stand

3.3 Set up wireless discussion unit

- 1 Remove the wireless discussion unit from the case, and make sure that both configuration switches at the back of the unit are set to 1 (single delegate mode). See figure 3.6, no. 2.

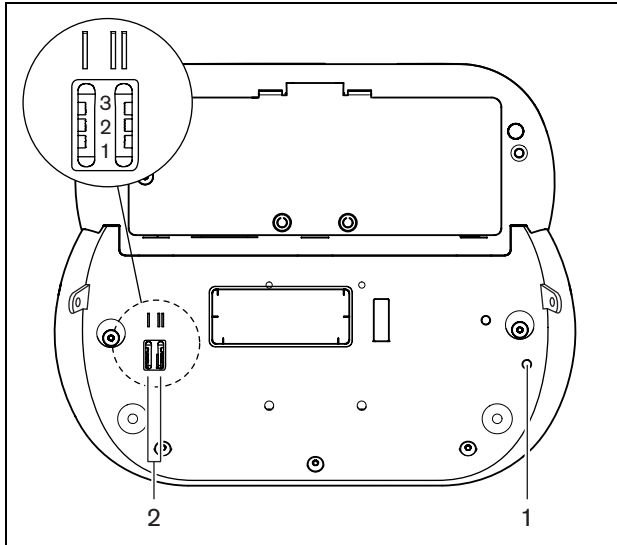


figure 3.6: Bottom view of wireless discussion unit

- 2 Insert the battery pack into the wireless discussion unit (see figure 3.7).



Note

Do not push the de-init button with a sharp object.

- 3 (Optional) Erase any subscription of the wireless discussion unit as follows:
 - Push and hold the de-init button of the wireless discussion unit (see figure 3.6, no. 1), and then
 - Push the microphone button of the wireless discussion unit until the LED around the microphone button turns yellow, after which the unit switches off.
- 4 Push the microphone button to (re)start the wireless discussion unit. All LEDs should come on for 2 seconds. The LED around the microphone button of the wireless discussion unit should turn green for 2 seconds (see table 3.5). The unit is now switched on and subscribed to the WAP. The microphone can now be activated or deactivated by pressing the microphone button.

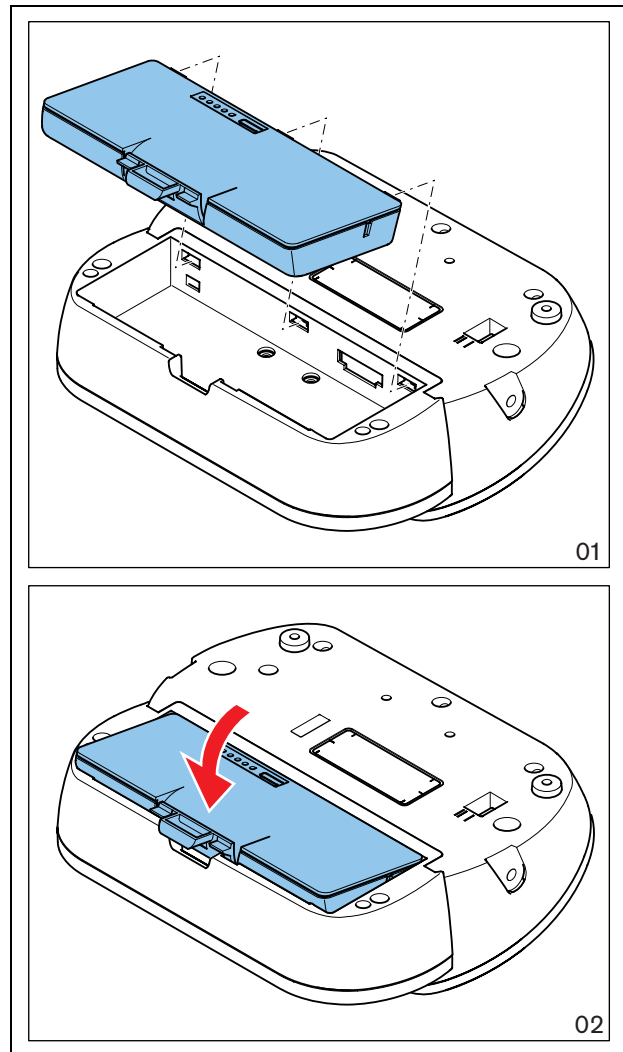


figure 3.7: Inserting the battery pack

table 3.5: Explanation of microphone button LED

LED color	Seconds	Meaning
Green	2	<ul style="list-style-type: none"> The wireless discussion unit has a subscription. The wireless discussion unit is activated.
Flashes red and yellow	5	<ul style="list-style-type: none"> The wireless discussion unit cannot find a wireless network. The wireless discussion unit is deactivated.
Flashes red and green	5	<ul style="list-style-type: none"> The wireless discussion unit cannot find a wireless network that is in Subscription mode. The wireless discussion unit is deactivated.

3.4 Test the coverage area

3.4.1 Introduction

The wireless coverage area is tested by walking away from the wireless access point with the wireless discussion unit in your hand, while monitoring the strength of the wireless signal.

The LEDs around voting buttons 1 through 3 are used to indicate the strength of the wireless signal (see table 3.6).

table 3.6: Strength of wireless signal

LEDs lit	Wireless signal
1, 2 and 3	Excellent
1 and 2 (3 blinking)	Very good
1 and 2	Good (minimum preferred signal)
1 (2 blinking)	Okay, but signal is not optimal
1	Poor
1 blinking	Almost out of range
None	Out of range



Note

The position of the wireless access point will affect the range of the wireless signal. If the signal is insufficient or the range is incorrect, try moving the wireless access point to another location. Remember though that the position of the wireless access point simulates the actual position once the wireless system has been installed. Therefore, the wireless access point must be placed in a realistic position.

The LEDs at the back of the wireless discussion unit (see figure 3.8, no. 1) show the status of the unit.

- If the yellow LED is on, the wireless discussion unit is out of range.
- If the red LED flashes, the battery pack of the wireless discussion unit will be empty within 1 hour.

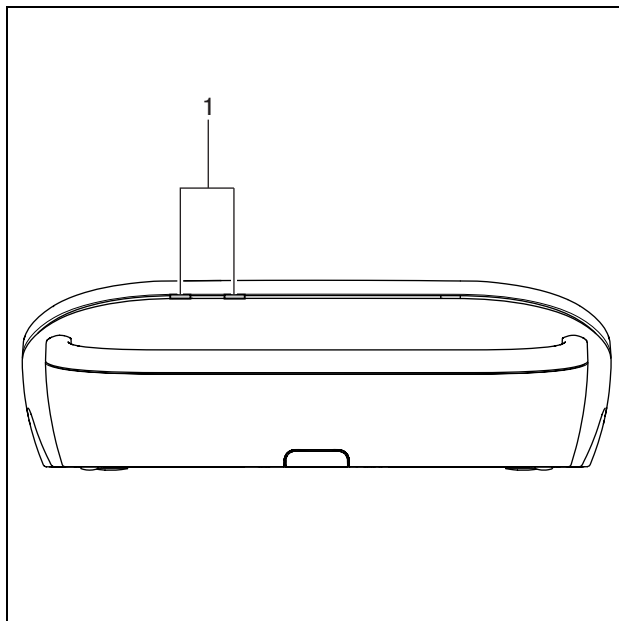


figure 3.8: Rear view of the wireless discussion unit

3.4.2 Coverage test

- 1 Before starting the test, make sure:
 - all test considerations have been checked.
 - the wireless coverage test kit is correctly set up.
 - the LEDs around voting buttons 1 through 3 on the wireless discussion unit are lit.
- 2 Walk away from the DCN-WAP and observe the status of the LEDs around the voting buttons (see table 3.6).
- 3 Use table 3.6 to determine the signal strength for your system.
- 4 Repeat the test, by walking away from the wireless access point in several directions.
- 5 Record the test results (see section 4, “Record test results”).

3.4.3 Optional test

As optional tests, you can:

- speak into the microphone and listen to the quality of the signal through the speaker.
- connect the lightweight stereo headphones (LBB 3443), and listen to the quality of the signal through the headphones.
- subscribe a second wireless discussion unit, and repeat the coverage test.

4 Record test results

4.1 Introduction

Photocopy the form on the last page, and use it to record the results of the wireless coverage test (see section 3.4).

Make sure you clearly indicate:

- the carrier setting (0, 1, or 2)
(see table 3.2)
- the coverage power setting (high, medium, or low)
(see table 3.2).
- the size and shape of the room (use the grid to make a small sketch).
- the position of the wireless access point.
- the status of the LEDs at indicated locations.
(see table 3.6).

Pay particular attention to the “Changes” field. Don’t forget to ask the customer if any changes are planned for the building in the near future: additional networks, changes to the interior etc.

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