UNITED
headsets

Clave-series

System Guide

Technical Reference Document
Version 2.1

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Contents

1 About This Document

This document describes the configuration, management, operation and maintenance of the Clave Headset series which are part of the DECT system range. For customer specific modes, please refer to specific customer agreements.

1.1 Audience

This guide is intended for everyday users. Furthermore, network administrators, IT support and anyone who wishes to gain knowledge on the fundamental features of the Clave Headset series can also benefit from this material.

1.2 When should I read this guide?

Read this guide before you install the devices and before setting up the DECT connection. This manual will enable you to set up components in your network to communicate with each other and deploy a fully functional system.

1.3 Content summary

WHERE IS IT?	CONTENT	PURPOSE
CHAPTER 2	Package overview	Presents the package content and handling
CHAPTER 3	System overview	Provides an overview of how the Clave communicates in the system
CHAPTER 4	Clave wireless DECT headset overview	Provides information on the device specifications and hardware.
CHAPTER 5	Clave Base station overview	
CHAPTER 6	Clave DECT dongle overview	
CHAPTER 7	How to connect headset and base station	A guide on how to connect the two devices
CHAPTER 8	Clave Operations	Provides details on headset button controls and call controls and operations
CHAPTER 9	Clave Base user interface	Provides details on the display, icons, and overall user interface on the base
CHAPTER 10	Clave Base feature description	Presents general features.
CHAPTER 11	Clave DECT dongle features	
CHAPTER 12	Appendix A (Clave features)	Provides a descriptive list of the supported features
CHAPTER 13	Appendix B (Clave Base features)	
CHAPTER 14	Register devices on UH VoIP DECT system	Presents a step-by-step guide on how to register the Clave Base and Clave to the VoIP system
CHAPTER 15	Appendix C (EHS and DHSG API)	Provides details on EHS and DHSG API
CHAPTER 16	Appendix D Call Control Action and Call State Table between BT and DECT	Provides detail on Call Control Actions and Call States between BT and DECT

1.4 Limitations

Since the Clave series covers 3 different headsets, one of them (Clave Mono NC) will not be covered in detail in this document. However, in general, it follows the same specification as the Clave Duo NC. More details about the different headsets can be seen in the beginning of the document.

Furthermore, the paper is not intended as a comprehensive reference to details and specific steps on how to configure other vendor specific components/devices. For such a reference to vendor specific devices, please contact the respective vendor for documentation.

1.5 Abbreviations

For this document, the following abbreviations hold:

DECT: Digital Enhanced Cordless Telecommunications
MWI: Message Waiting Indicator
PCBA: PCB Assembled
MFB: Multi-Function Button
BT: Bluetooth™

1.6 References/Related Documentation

PC tool
VoIP System guide

1.7 Document History

REVISION	AUTHOR	ISSUE DATE	COMMENTS
1.0	HDJ	30-12-2021	New document
2.0	LIP	27-04-2023	Updated document to match software version 99.13
2.1	LIP	23-05-23	Updated document to match software version 99.16

1.8 What is new?

What new features have been added.

VERSION	Updated descriptions
1.0	New Document
2.0	Updated descriptions on 4.3. Physical buttons on headset. 7.3 Hybrid functionality 8. Clave Operations 9.4 Settings menu on Clave Base Updated operating conditions and charge stop temperature in 13. Appendix B 15. EHS & DHSG API 16. Appendix D: Call Control Action and Call State Table between BT and DECT
2.1	Updated description on 4.3 Updated 4.4.2 LED indication table. Updated section 5.1 Fixed nr of buttons in 8. Updated table in 8.1. Note added in 8.1.2

Updated battery status table in 9.1.4
Updated section 9.5.
Updated section 9.12.
Updated section 14.
Updated idle key events in 16. Appendix D.

1.9 Documentation Feedback

We always strive to produce the best and we also value your comments and suggestions about our documentation. If you have any comments about this guide, please enter them through the by sending an email to info@unitedheadsets.com. We will use your feedback to improve the documentation.

2 Package overview

Prior to opening, examine the shipping package for evidence of physical damage. If there is proof of mishandling prior to opening, you must report it to the relevant support center of the regional representative or operator.

2.1 Content

The headsets are sold both as a standalone product and together with the base in combined packaging. In general, every shipped headset unit box contains the below items. If sold together with the base, then the below add-ons will take part of the package. Make sure all relevant components are available in the package before proceeding to the next step.

- 1x Clave Headset
- 1x USB-C cable
- 1x 600mAH Li-polymer battery
- 1x 1-page A5 double side B/W print

+

- 1x Clave Base station (charger)
- 1x PSU fixed

Customer specific changes may occur.

NOTE: *Clave DECT Dongle is sold separately*

2.2 Damage inspection

The following steps are recommended to be followed for damage inspection:

1. Examine all relevant components for damage.
2. Make a “defective on arrival - DOA” report or RMA to the operator. Do not move the shipping carton until it has been examined by the operator. The operator/regional representative will initiate the necessary procedure to process this RMA. They will guide the network administrator on how to return the damaged package if necessary.
3. If no damage is found, then unwrap all the components and dispose of empty package/carton(s) in accordance with country specific environmental regulations.

3 System overview

The Wireless headset system consists of three main products. Clave Base, Clave DECT Headset(s) (refer to ***11. Appendix A*** for different models) and Clave DECT Dongle.

The high-end headsets support DECT and BT technology to establish connection with other devices. They are used with the Clave Base and desk phone / PC / laptop/ mobile phones. The selected microphone is balanced together with the headset filters to reduce the background noise to provide an ultimate understandable and clear speech. On the other hand, the receivers are balanced to the receiver housing and cushion, so the headset will provide the user an excellent stereo experience.

The figure below (*Fig. 1)* illustrates the high-level description of the system. It provides the basic understanding of the environment in which the device needs to interact. Both communication possibilities of the Clave are presented in the drawing below and further defined in the following sections.

Fig. 1 System overview

3.1 Soft client support

The Clave Base provides support for various soft clients and thus, it can be used with both PC Windows and MacOS. This means that, the base combined with one of the Clave Headsets, supports the audio and USB API of the applications, such as:

- Microsoft Teams
- Customer client support implemented in PC tool

Respectively, if the headset is used in standalone mode over a Bluetooth™ connection, the audio of the same applications (and more) will be supported. In addition to this, the devices can also be used as generic USB headsets for general audio.

3.2 Handover to VoIP multicell systems

The Clave Headset and Clave Base can be integrated together into VoIP multicell and dual cell systems. The headset base will register on behalf of itself and the headset. The two registrations are independent but will be linked logically as one unit on the VoIP system. The purpose of this integration is to hand over the user's calls to the VoIP system for the user to be flexible in terms of location *(Fig.2).*

Fig.2 Call Handover

3.3 Clave DECT Dongle

The Clave Headset can be used with the Clave DECT Dongle, which will serve as a base station. This is convenient for users who want to use the headset remotely, for example in home office or on the road where it is not possible to bring the base station *(Fig.3)*. The dongle is supported by both Windows and MacOS.

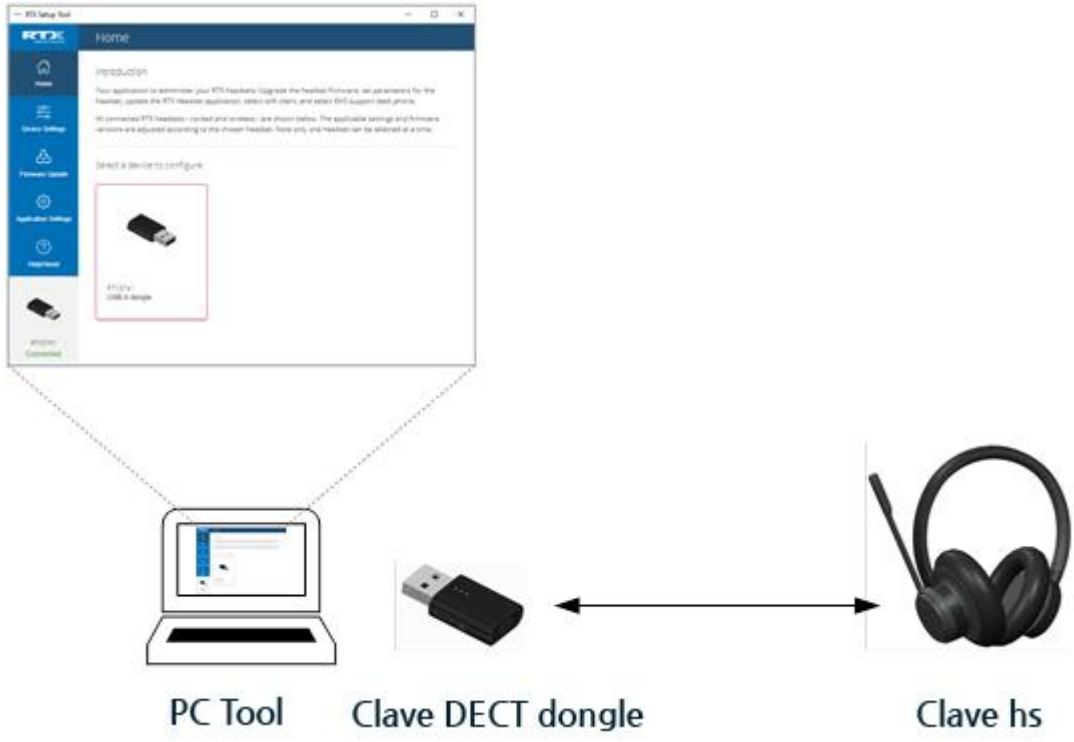


Fig.3 Headset connection via Clave DECT Dongle

Clave DECT also offers desk phone support *(Fig.4)*.

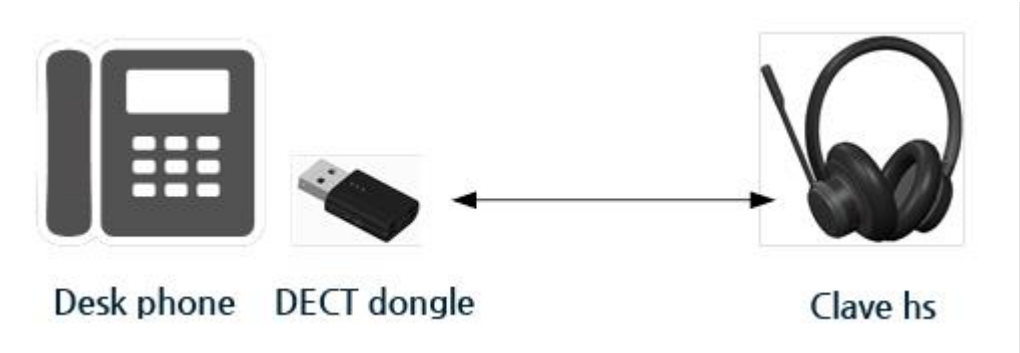


Fig.4 Headset connection to Desk phone

NOTE: *United Headsets will provide USB API. The customer is responsible for implementing it on relevant phones.*

It is also possible to connect a Desk phone to an existing UH DECT system using the Clave DECT Dongle *(Fig.5)*

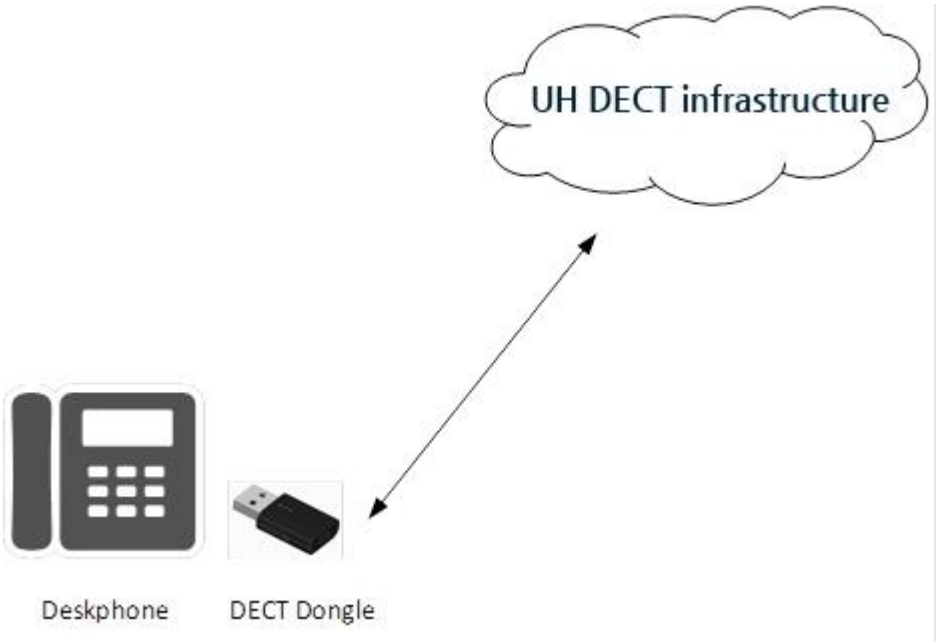


Fig.5 Connect Desk phone to the UH DECT network.

NOTE: *UH will provide USB API. The customer is responsible for implementing it on relevant phones.*

4 Clave wireless DECT headset overview

The Clave series are wireless DECT + Bluetooth™ headsets. As mentioned before, the headset connects to the DECT base, which act as a charger for the headset, via the DECT wireless technology. It can also connect via Bluetooth™ to supported devices, such as mobile phones and Bluetooth™ compatible desk phones.

A Busy-light indicator on the headband is used to indicate that the user is busy. The headset also features Environmental Noise Cancellation (ENC) to suppress unwanted environmental noise for the microphone input and Active Noise Cancellation (ANC) to suppress the noise towards the user. The headset offers DSP assisted echo cancelling. The length of the headband is adjustable to suit the head-shape of different users and the tilting angle of the boom can be adjusted to fit the position of the mouth of different people.

The DECT base/charger connects to the PC/laptop. It can access Microsoft Teams and a defined range of soft call clients from external vendors, as well as a defined range of desk phones via EHS interface. Call control can be managed via the base, attached desk phones, soft call clients on the PC or via the buttons on the left earcup of the headset. A conferencing feature allows up to 4 headsets to connect to the same base - users may be added / removed from the conferencing call on the fly.

The primary application of the Clave is within call centers and office environments allowing the user to access the internet/VoIP calls and music playback via the PC/BT.

4.1 Type of Clave Headsets

The headset auto-configures the DECT setup when connecting to the base, thus no country specific variants exist. As mentioned earlier, the Clave series covers 3 different headsets: (For more detailed features overview, refer to *11. Appendix A*)

Model	Product	Country Variant
Clave Mono NC	DECT Mono high-end Headset	World wide (Taiwan, EMEA, Brazil & Uruguay, LATAM, Argentina, Chile, USA, Canada)
Clave Duo NC	DECT Stereo High-end Headset	World wide (Taiwan, EMEA, Brazil & Uruguay, LATAM, Argentina, Chile, USA, Canada)
Clave Duo ANC	DECT Stereo High-end Headset ANC	World wide (Taiwan, EMEA, Brazil & Uruguay, LATAM, Argentina, Chile, USA, Canada)

4.2 Headsets overview

The following section aims to provide an overview of the headsets, including the available buttons and LED's.

All models have an LED on the boom arm indicating if the user is busy *(Fig.6)*.

Fig.6 Headset boom arm LED

Headset can be adjusted on both sides of the headband for a perfect fit *(Fig.7)*.

Fig.7 Headband adjustability

The headset has 7 different control buttons *(Fig.8).*

Fig.8 Buttons and user interface.

The images below represent the styling of the headsets from the Clave series *(Fig.9)*. The product is available in 3 different colors - grey, black and white. The cushions of the headsets are removable and replaceable to improve the comfort of the users.

There are two types of ear cushions - on-ear and over-the-ear *(Fig.9).* Clave Duo ANC supports both types of ear cushions. A sensor in the headset detects which type of cushion is used and adapts the audio tuning accordingly to get the optimal noise reduction. The other two devices (Clave Mono NC and Clave Duo NC) only support the on-ear cushion solution.

Fig.9 Styles and ear Cushions

4.3 Physical buttons

The headset is operated using the buttons on the earcup with boom arm. The ANC button is located on the opposite earcup, as ANC is not available for Mono headsets *(Fig.8)*

The following table represents the functions of the buttons seen on the figures above

INPUT	FUNCTIONS
POWER SLIDER	Power the headset on and off
SCROLL WHEEL WITH AN INTEGRATED KEY	Increase volume Decrease volume
MULTI-FUNCTION BUTTON	Answer call End call Reject call Trigger AI voice assistant Microsoft Teams button Hold/Swap/Retrieve Call Leave conference during call
MUTE KEY	Toggle mute Play/Pause music Skip to next track (double click) Announce battery level (press and hold)
DECT KEY	Enter DECT pairing mode Toggle between Base and Dongle (On-the-Go kit) Reset settings (press and hold) De-register 2nd headset during Idle
BT KEY	Toggle Bluetooth™ Enter Bluetooth™ pairing mode
ANC KEY	Toggle ANC

For more details on the Clave headset controls refer to 8.1. Controls.

4.4 LED overview

The headset has a single tricolor LED on the tip of the boom-arm, which is a combination of 3 LEDs - red, green, and blue. All visual indications are disabled if “eco mode” is enabled.

4.4.1 LED patterns

The LED supports 3 different kinds of patterns. The definitions of each pattern can be seen in the table below:

LED PATTERN	DEFINITION
BLINK	ON-OFF
BREATHING	One color that slowly becomes brighter until it reaches full brightness and then dimmers until fully dimmed. It is a repeated cycle.
ALTERNATING	Alternating between two colors

4.4.2 LED indication

The table below presents the LED indication depending on the status of the headset.

FUNCTION	STATUS	LED COLOR	PATTERN
SYSTEM	Reset setting started	White	Blink 3 times
BLUETOOTH REGISTRATION	Registration, In progress	Blue, red	Alternating
	Registration, Success	Green	Blink 3 times
	Registration, Failed	Red	Blink 3 times
DECT REGISTRATION	Registration, In progress	Blue, red	Alternating
	Registration, Success	Green	Blink 3 times
	Registration, Failed	Red	Blink 3 times
BATTERY STATUS	No battery*	Cyan	Blink
	Fully charged*	Green	ON
	Charging	Green	Breathing
	Low	Red	Blink
BUSY MODE	Busy enabled or call active	Red	Breathing
	Microphone muted	Red	ON
TEAMS NOTIFICATIONS	Meeting, voicemails or missed calls	Purple	Breathing

** If headset is turned off during charging the LED is off as well.*

4.5 Battery

The headsets use 600mAH Li-polymer battery, which is easily replaceable after removing the battery lid, as illustrated on the image below *(Fig. 10).,*

NOTE: *Make sure to remove the plastic foil protecting the battery upon powering your new headset.*

Fig.10 Battery lid removed.

The Clave can be charged in 2 ways. One of the options is placing the headset in the cradle of the base, which displays the charging status. Another way to charge the device can be with the use of a USB cable, where the status will be shown on the boom-arm LED. For more details about the battery LED indications, please refer to the previous section ***4.4.2 LED indication***. The battery performance can be seen in the summary table of features in section ***12. Appendix B.***

5 Clave Base station overview

The Clave Base device is an EHS/USB wireless base station which provides USB connectivity to PC/laptop/desktop phone and DECT connectivity to Clave Headsets. It is designed as a Plug & Play solution, meaning that no additional driver installations are needed.

The figure below (*Fig. 11)* illustrates the high-level description of the communication possibilities of the device. The Clave Base is connected to a host (PC or desktop phone) with USB interface. It acts as a DECT base station for the Clave Headset.

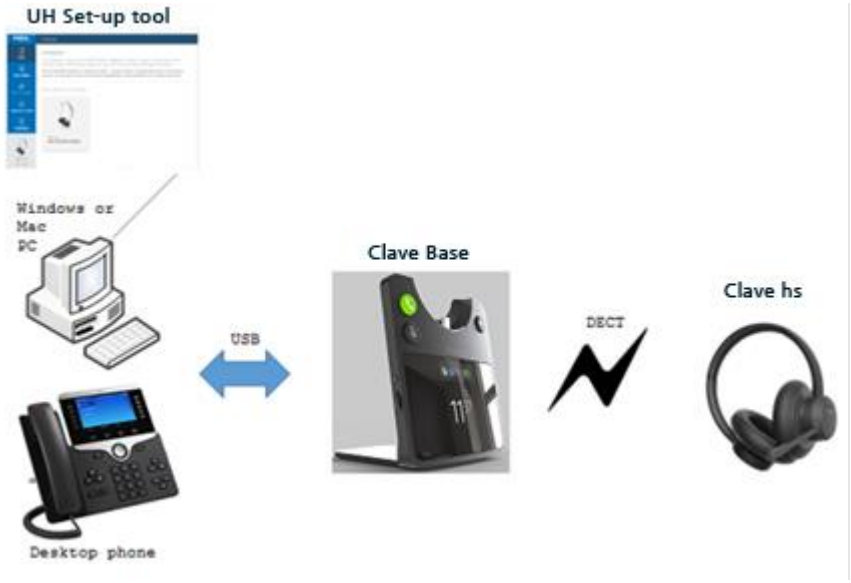


Fig. 11 Device connections

The Clave Base serves as a base and charger for the Clave series headsets. The primary application is within call centers and office environments allowing the user to access internet/VoIP calls, music playback via the PC/mobile phone, and desk phone connectivity.

5.1 Base station overview

The base includes a 2.4-inch 240x320 TFT display for status and configuration. Furthermore, it has 3 keys for call control handling (hook off, hook on and mute), a clickable scroll-wheel and a back key for easy menu navigation *(Fig. 12)*.

Fig. 12 Clave Base front view

Further details on the functionality of the keys can be seen on the table below:

INPUT	FUNCTIONALITY
HOOK OFF	Answer call (short press) Swap between calls (short press) Swap between lines (double press) Hold/Retrieve call (short press) Hold active call and accept incoming call (long press)
HOOK ON	End call Reject call
MUTE	Toggle mute
BACK KEY	Return to the parent menu of the current submenu Leave the settings menu Toggle music control "pop up"
SCROLL WHEEL	Open the settings menu Select an item in the settings menu Scroll to the next item in the settings menu Scroll to the previous item in the settings menu Adjust earphone volume

The base station provides both EHS and DHSG connectivity on the back side of the unit. For further details on the EHS/DHSG see 9.2 and Chapter 15: Appendix C.

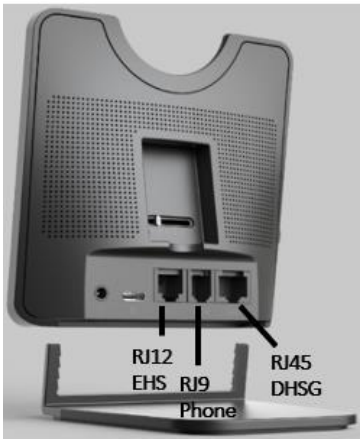


Fig.12 Clave Base back view

5.2 Spare battery charging

The base also includes a separate charger for a spare battery. The battery is placed on the back of the base, as shown below (*Fig. 13)*.

Fig.13 Spare battery charging.

6 Clave DECT Dongle overview

The Clave DECT is a USB type A dongle with slide switch that can establish a wireless connection with the UH headsets from the Clave series. The dongle supports dual mode, meaning that it can be used either as a Fixed part (FP), or Portable part (PP).

- Base / FP mode:
  - Acts as a DECT base for the Clave Headsets

- Headset / PP mode:
  - Enables DECT access for a USB desktop phone on the UH VoIP system

Since the DECT dongle can run one mode at a time, you can switch between the two functionalities by using the slider switch.

The device is designed to be easy to use with a desk phone/PC/laptop with very good sound quality. Since the device uses DECT technology, it can remember 4 registrations - one primary and three secondaries. The audio can be directed to the headset, depending on the user's choice. When the headset is connected via the Clave DECT Dongle to a PC, the user may access calls from Soft Call Clients, such as Microsoft Teams. Support for other call clients is available and requires that the PC Setup tool is installed on the used laptop/PC.

6.1 Clave DECT Dongle overview

The Clave DECT Dongle has one button, one slider switch and 3 LED's *(Fig. 14)*

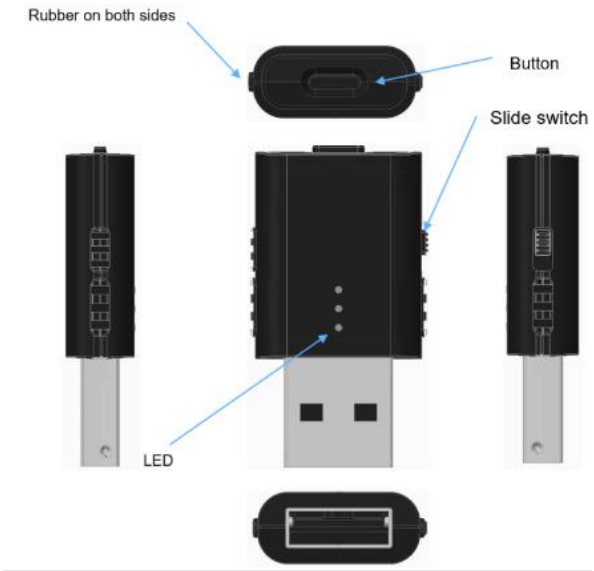


Fig. 14 Dongle overview

6.2 Dual functionality

The Clave DECT is a dual-mode device in a shared hardware. This means that the user can switch between the functionalities by using the slider switch. Firmware updates and configuration are managed via the PC Setup tool. The table below presents the differences between the 2 modes.

DIFFERENT MODES	FUNCTIONALITY
Base Station (Fixed Part)	Acts as DECT base for the Clave Headsets; Slider is placed at the bottom (towards the USB connector); It is possible to verify the current setting of the Clave DECT Dongle in the PC Tool;
Headset (Portable Part)	Enables DECT access for a USB desktop phone on the UH VoIP System; Slider is placed at the top; It is possible to verify the current setting of the Clave DECT Dongle in the PC Tool;

6.3 LED Patterns

The LED support different kinds of patterns, such as fast blink, slow blink, normal blink and breathing:

LED PATTERN	DEFINITION
BLINK	ON/OFF
BREATHING	OFF-ON-OFF slowly

6.4 LED Indication

The following table shows the LED indication for different status of the DECT dongle.

FUNCTION	STATUS	LED	PATTERN
SYSTEM	Dongle reset started	Red, Blue and Green	Blink 3 times
DECT CONNECTION	Registration, In progress	Blue	Blink alternately
	Registration, Success	Blue and Green	Blink 3 times
	Registration, Failed	Blue and Red	Blink 3 times
	Master headset registered	Blue	ON
	Master headset lost link	Red	ON
	Ringing	Green	Blink
CALL	Talk or Hold	Green	ON
	Conference or intrusion call	Green	Breathing

6.5 Key Configuration / User Interface

The button on the Clave DECT Dongle is used for registration and deregistration of the headsets. All setup is done using the PC Setup tool. Furthermore, all call-related controls are managed via the headset controls and/or desk phone/PC. The call is initiated from the Soft Call Client running on the PC/laptop.

6.6 Factory Reset

To reset your dongle, press the button for 15 seconds or until all 3 LED (red, blue, green) turn on and then off. Then release the button and your device will proceed to reset its settings.

7 How to connect headset and base station

The following steps serve as a guideline for the process of registering the Clave Headsets to the Clave Base. Registration mode is enabled by inserting the headset into the base cradle *(Fig. 15)*. The headset can be registered as both primary and secondary. When the headset is locked as secondary on another Clave Base or on an Clave DECT dongle, the user may return the headset to use its primary state by inserting the headset into the cradle of the primary base.

Step 1 Insert the headset into the base cradle.
Step 2 The headset identifies itself to the base.
Step 3 The base decides if the headset can register.

a. If the headset is allowed to register it plays back the “Registering” voice prompt once
    i. The headset starts the “Registration, in progress” LED pattern.
    ii. The base displays a visible notification that cradle registration is initiated.
    iii. The headset plays back the “Registration succeeded” voice prompt once.
    iv. The headset displays the “Registration, success” LED pattern.
    v. The base displays a visible notification that cradle registration succeeded.

b. If the headset is not allowed to register it plays back the “Registration failed” voice prompt once
    i. The headset displays the “Registration, failure” LED pattern.
    ii. The base displays a visible notification that cradle registration failed.

Fig. 15 DECT registration and charging.

7.1 Bluetooth™ registration

The headset is registered to a Bluetooth™ device by holding the BT button for 2 seconds *(Fig. 16)*. This will enable pairing mode for the headset which then allows it to be discovered by other Bluetooth™ devices. The Clave can store up to 4 paired BT devices' information and remain connected to 2 of them at the same time. In case of reaching the limit and pairing a new device after the 4 existing ones, the oldest device information will be overwritten by the new agent.

Major mobile platforms are supported, such as iOS and Android.

Fig. 16 BT connection

7.2 Connect Clave Headset to PC/Laptop using Clave DECT Dongle

Step 1 Press the FP dongle button more than 3s to enter pairing mode. The Blue LED is blinking.

Step 2 Press Clave DECT button more than 3s and release to enter pairing mode. The LED flashes blue/red alternately.

Step 3 When registration is successful, the FP dongle blue LED will become static and Clave green LED will blink 3 times.

7.2.1 Deregister Clave Headset from Clave DECT Dongle

To deregister a registered headset from the dongle simply press and hold the button on the dongle for 10 seconds. Blue LED will start blinking, indicating that the dongle is in registration mode.

7.3 Hybrid functionality

The Clave Headset, Clave Base and Clave DECT Dongle are designed to work together with consideration of the modern hybrid office. The Headset can be registered to both Base and Dongle and that allows the user to be more flexible and use the headset together with the dongle on the go. We can switch between the two registrations with a single click of the DECT button.

8 Clave Operations

The Clave Headset is equipped with 6 buttons (7 in the models with ANC available), that helps the user to operate the device. A short description of the buttons has been provided in 4.3. Physical buttons. In this chapter user can learn more specific details about the use of the button controls.

8.1 Controls

Each button on the headset supports multiple actions, depending on the timing we press a button for. Table below shows the different timings for the button events.

EVENT	TIMING
Press	Less than 2 seconds
Double Press	2 x Press less than 500 ms apart
Long Press	More than 2 seconds, but less than 10 seconds
Prolong Press	Hold for more than 10 seconds

When in Idle the controls are as follows:

BUTTON	PRESS	DOUBLE PRESS	LONG PRESS	PROLONG PRESS	SCROLL
Multi-Function	Voice assistant	Redial	Activates MS Teams action		
Scroll wheel					Adjust volume
Mute	Play/Pause	Next track	Battery level		
DECT	De-register secondary headset		DECT pairing	Reset settings	
BT	Toggle BT on/off		BT pairing		

NOTE: *Voice assistant and Redial functions only work when there is Bluetooth™ connection available and depending on the target application*

NOTE: *When adjusting the volume via scroll wheel: if there is music playing that will adjust the music volume, if it is in idle with no music playing that will adjust the ringtone volume accompanied by a beep tone, for user's convenience.*

8.1.1 Incoming call

When an incoming call is present, that can be accepted by single pressing the Multi-Function Button or rejected by double pressing it.

If the headset was cradled on the base when the incoming call was announced, picking the headset up from cradle will automatically answer the call.

8.1.2 Secondary call

When a second incoming call is present during a call, the user can put the first one on hold and answer the second by long pressing the Multi -Function Button. That will be followed by an audio prompt announcing, "Call accepted. Call on hold" and put the first call on hold. If there is a secondary headset

registered to the same base/dongle and participating in the first call, it will follow with the primary headset to the second incoming call. User can swap the two calls (from primary headset) by long pressing the Multi -Function Button, which will be followed by the voice prompt “Call swapped”.

Long pressing the Multi-Function Button will end the first call and accept the second. That will be followed by the announcement “Call retrieved”.

User can reject the secondary call by double pressing the Multi-Function button.

NOTE: *In case of two calls established via BT and USB-DECT link refer to Chapter 16 Appendix D.*

8.1.3 Microsoft Teams integration

The Multi-Function button has integrated functionalities to respond to Microsoft Teams upon long pressing it at Idle state.

Depending on the scenario long pressing the MS Teams button will trigger activating different actions in Teams:

- When there is *no notification* from Teams present long pressing the multi-function button will *bring MS Teams to the foreground*.
- If there is *a missed call notification*, long pressing the multi-function button will *open MS Teams missed calls list*
- In case of *voicemail notification*, the button will *open the MS Teams voicemail list*
- If there is a *meeting alert* present, it will *open the MS Teams meeting*.

Additionally, the LED on the microphone also reacts with a purple blink upon notifications, missed call, voicemail, or meeting alert in MS Teams.

If the headset comes out of range during a MS Teams meeting, the base will put the call on hold automatically. It will also automatically resume the call when the headset is available again.

8.1.4 Terminating call

To end an active call from the headset, the user has to simply press the multi-function button or place the headset in cradle onto the Clave Base station.

9 Clave Base user interface

As mentioned in ***5. Clave Base station overview***, the Clave Base supports a 2.4-inch 240x320 TFT display which has a user-friendly interface (UI). The UI is designed to be operated at an arms distance, meaning that the status bar is large and visible *(Fig. 17)*.

Fig. 17 Status bar

The idle screen is represented by 2 UI panels *(Fig. 17)*. The first, referred to as *Top area*, contains a status bar panel which displays icons, such as signal level, battery status, etc. The second area, referred to as the *Main area*, lists items, such as current time, Music control and other available icons. Both idle screens/areas are further described in the following sections.

9.1 Top area items

The icons are placed at the top area in the status bar panel. The following sections aim to introduce you to the available icons present in this area.

9.1.1 Signal level

The "Signal level" icon displays the primary headset's connection status. The status may vary depending on the signal strength (see the table below).

ICON	DESCRIPTION
	Headset registered, excellent signal (> -50 dBm)
	Headset registered, good signal (> -65 dBm)
	Headset registered, fail signal (> -80 dBm)
	Headset registered poor signal (<= -80 dBm)

	Headset not registered or out or range, no signal

9.1.2 VoIP

This icon is visible only if the Clave Base is registered to the VoIP system. The table below presents the available status icons when connected to the VoIP system.

ICON	DESCRIPTION
	The system is registered to a VoIP system but not locked
	The system is registered to a VoIP system and locked.
	The system is registered to a VoIP system and connection is also used (Roaming)

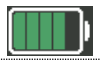
9.1.3 PC-USB status

When the Clave Base is connected to a PC via USB, an icon will be displayed in the status bar panel.

ICON	DESCRIPTION
	USB is connected, but no calls
	USB is connected and there is an ongoing USB call

9.1.4 Battery status

The battery status of the connected primary headset is displayed via a battery icon. Depending on the available remaining power, the icon changes its color. The table below further describes the available states.

ICON	DESCRIPTION
	The battery is fully charged (level 90 - 100%)
	The battery is charged at 70 - 89 %
	The battery is charged at 50 - 69 %

	The battery is charged at 31 - 49 %
	The battery is charged 11 - 30 %
	Low battery (level <= 10%). Icon is blinking when under 3%.
	No battery in primary headset

9.1.5 Other icons

The following table lists other icons displayed in the status bar panel.

ICON	DESCRIPTION
	Desktop phone connection status icon: - displayed when EHS line is active (off-hook) - blinking when EHS line is ringing. - No icon is displayed when EHS line is idle.

9.2 Main area items

The following sections present the available items displayed on the Main area.

9.2.1 Music control

The UI of the device provides a music control option to the user. The functionality includes adjusting the volume, playing/pausing/skipping tracks, etc. The control buttons appear automatically when streaming music and can be shown/hidden by pressing the “back” key.

ICON	DESCRIPTION
	The following control buttons appear below the idle clock on the screen while streaming music

9.2.2 Other icons

ICON	DESCRIPTION
	Super Wideband
	Eco mode
	Upcoming Microsoft Teams meeting
	Microsoft teams missed call

9.3 DECT registration status interface

The following screenshots represent the interface during a DECT registration *(Fig. 18)*.

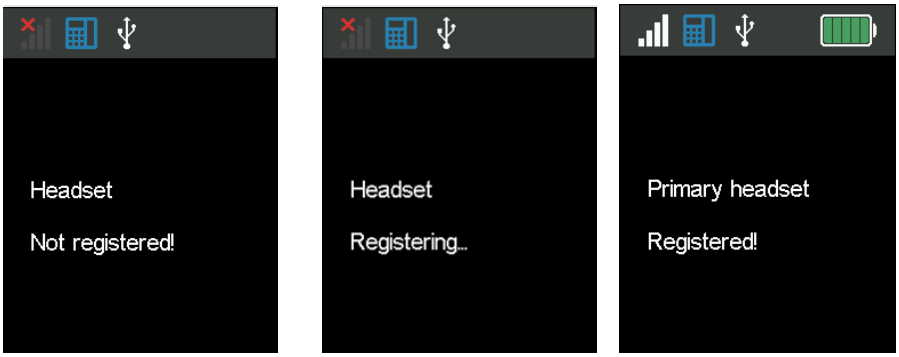


Fig. 18 DECT status registration

9.4 Settings Menu

Upon pressing the Scroll Wheel Key, the user gets access to the Settings Menu. That menu allows the user to change configuration settings like language, audio settings and the audio prompts, as well as handle registrations and reset the device.

After pressing the Scroll Wheel, on the screen can be seen the list of menu items. The menu item user is currently able to choose is viewed inside a white rectangle frame and is in bold letters and in some cases, there is also shown the current value chosen underneath that. There is a scroll bar on the right side of the screen that shows how far in the menu we are.

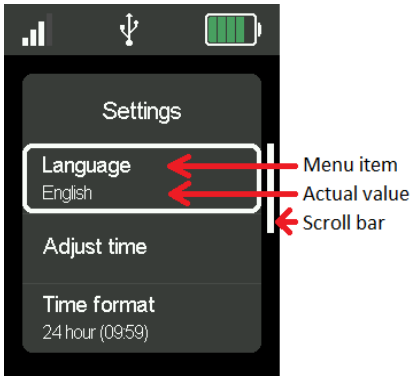


Fig. 19 View of the Settings Menu

Example of when there are multiple choices available is shown in the picture below.

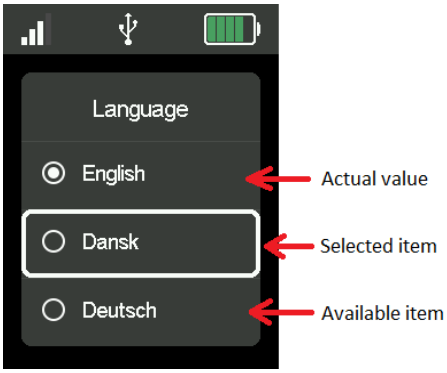


Fig.20 Multiple choices in the Settings Menu

The units in the Settings Menu available are explained in detail in the following sections.

9.4.1 General

The settings that this menu allows to configure are shown in the table below.

MENU ITEM	DEFAULT VALUE	DESCRIPTION
Base language	English	Allows the user to choose the language on the base station.
Power mode	Normal	User can choose power mode. There are 3 options available: Normal, Eco and Super Wideband
Time format	24 Hour (HH:MM)	The time format can be set AM/PM, 24Hour(H:MM) or 24 Hour (HH:MM)
Secondary auto deregister	On	Can be on or off. When active and secondary headset is present in a conference call, the base will automatically deregister the secondary headset as soon as the conference call has ended.
Power level	3	Allows the user to set power level of the base. Can be se to adaptive or between values from 1(maximum power) to 6(minimum power). NOTE: If the user is in an area with a lot of interference user can set the power level to 1 (max power) but that will contribute to the noise. The adaptive setting lets the base to adaptively choose the power level, but that will consume more energy. In an area with no other DECT devices present and/or other sources of interference using power level 6 (min power) will save energy.

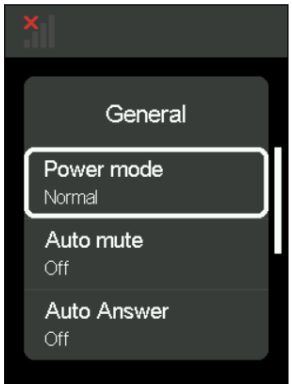


Fig.21 General settings

9.4.2 Audio

This menu lets the user control the audio settings of both the base and the headset.

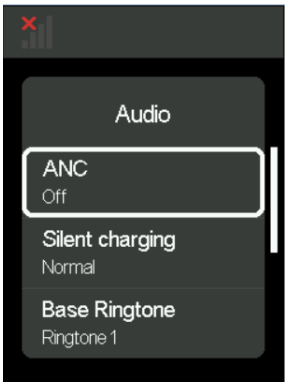


Fig.22 Audio Settings

MENU ITEM	DEFAULT VALUE	DESCRIPTION
ANC	Off	Shows and allows user to change the current value of the ANC on the headset. Note: Can also be changed from the ANC button on some headset models. If user changes it from the button if actively changes in the settings menu.
Silent charging	Normal	That setting allows the user to choose whether there will be ringtone sound in the headset while it is charging/placed in cradle.
Base ringtone	Ringtone 1	User can choose the ringtone sound that will announce from the base when there is an incoming call and headset is in cradle and charging. There are 5 different sounds to choose from.
BS ringtone volume	3	Allows the user to set the volume on the base's ringtone.
Headset ringtone	Ringtone 1	User can choose the ringtone sound that will announce in the headset when there is an incoming call, and the headset is not in cradle. There are 5 different sounds to choose from.
HS ringtone volume	2	Allows the user to change the ringtone volume on the paired headset device.

9.4.3 Audio Prompt

This menu allows the user to configure the audio prompts that announce different events in the headset. The options in it are shown on the screenshot and described in more detail in the table below.

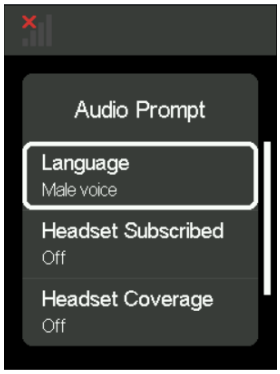


Fig.23 Audio Prompt

MENU ITEM	DEFAULT VALUE	DESCRIPTION
Language	Female voice	User can choose between male and female voice prompt.
Headset Subscribed	On	Allows the user to turn on/off the audio prompt that announces when headset is subscribed to base.
Headset Coverage	Off	Allows the user to turn on/off the audio prompt that announces if headset is out of base's coverage.
Announce conference member	Off	User can turn on/off the audio prompt that informs whenever a member has joined/left the conference.

9.4.4 Registrations

This menu allows the user to register/deregister a headset to the Clave Base. For more details on the registration process see ***7. How to connect headset and base.***

9.4.5 Adjust time

Allows the user to adjust the time shown on Idle screen. There are 2 options to choose from: user can either Sync with Setup Tool or adjust time manually when unmarking the "SetupTool Sync" in the little checkbox. In that case an hour and minutes count appear in the bottom part of the screen and with the help of the Scroll Wheel user can navigate through and adjust the time. When scrolling down to edit either hour or minutes, user can choose the unit it wants to change by pressing on the Scroll Wheel Key. Arrows up and down will appear over and under the number and with the help of the Scroll Wheel user can change the value and press the Scroll Wheel Key again to confirm its choice after.

9.4.6 VoIP System

From this menu item user can register the base to a VoIP system. Refer to ***13. Register devices on UH VoIP system*** for more detail on VoIP registration.

9.4.7 Reset User Setting

This menu item allows the user to clear all configurations to their initial values. When chosen the user can either confirm and reset all user settings or with the help of the Scroll Wheel Key - cancel. If there is a

headset registered to the base, it will send the command further to the headset and reset all user settings for the headset as well.

9.4.8 Factory Reset

Allows the user to perform factory reset and return the base to its initial state and clear the cache memory. If there is a headset registered to the base it will send the command further to the headset and perform factory reset for it too.

> ***NOTE:*** *Reset user settings returns all configurations to their initial state. That is also what happens when we perform Factory reset, but Factory reset will delete all current registrations as well.*

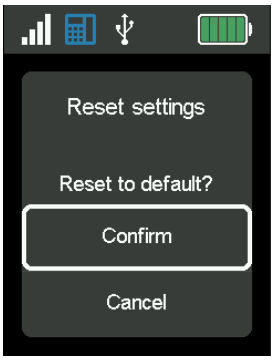


Fig.24 Factory Reset

9.5 Call activity on base

To have call activity on the base, a master headset must be registered and locked to the base. If the master headset loses connection during call activity, all the calls will be put on hold until connection is restored. If the link fails to restore in a couple of seconds, all calls will be terminated.

9.6 Incoming call

The base will notify the user with visible and audible indication whether an incoming call is from EHS or USB line (*Fig.25)*. If both lines are in idle state and an incoming call is received to one of the lines, the base rings and displays the call. However, if there are two simultaneous incoming calls from two different lines, the active control is made by the first incoming call (the first that came is served first). The second incoming call cannot be accepted by the base until the first incoming call has been answered or ended, or the line is swapped manually by the user. This means that in case of having one of the lines occupied (in active call), the new incoming call will be displayed as waiting in a queue.

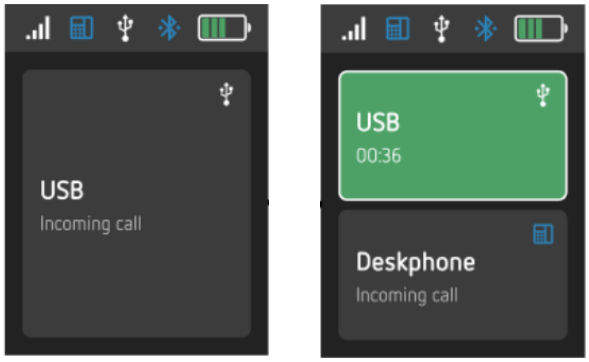


Fig.25 Incoming call

9.7 Active call

When a call is active, the base displays the active call, and the audio path is connected between the far-end party and Clave Headset *(Fig.26)*. It is not possible to have more than one active call on a single line at the same time.

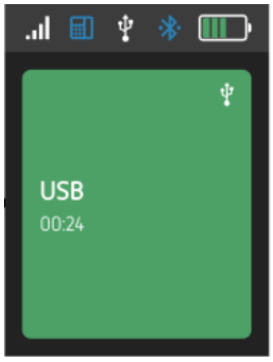


Fig.26 Active call

9.8 On-hold call

When a call is put on-hold, the base displays a hold call status and the audio path is disconnected between the far-end party and the Clave Headset *(Fig.27)*. It is not possible to set EHS active call on-hold by the base.

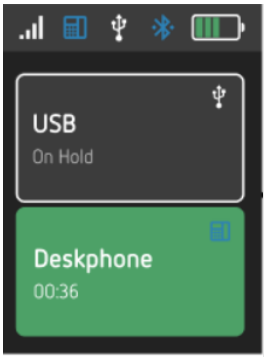


Fig.27 Two calls, one on hold

9.9 Multiple calls

There is more than one call existing in a single line *(Fig.28)*.

> ***NOTE:*** *EHS and DHSG lines do not support multiple call. That is because there is only one available path for the audio track. If we are using for example DHSG line with a desk phone and there are multiple calls on the desk phone, user has to toggle/control those via the desk phone interface. For more details on the EHS and DHSG connections refer to* ***10.2 EHS interface*** *and* ***15. Appendix C: EHS and DHSG API.***

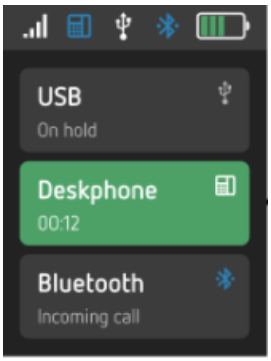


Fig.28 Multiple calls

9.10 Multiple line

There is more than one call existing on different lines *(Fig.29).*

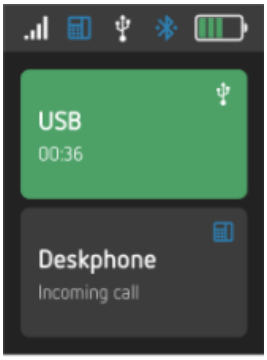


Fig.29 Multiple line

9.11 Active & Inactive line

When a line is active, the base displays it in a green-colored field and enables the audio path to be connected via that line *(Figure 23).* It is not possible to have more than one active line at the same time.

When a line is inactive, the base displays it in a grey-colored field and disconnects the audio path via that line. It is not possible to have manual call control of the base when the line is inactive.

9.12 Call termination

All calls will be terminated when the master headset loses link or is placed on the cradle *(Fig.24).* That is in case, if it is not possible to put them on hold because connection cannot be restored in the matter of couple of seconds.

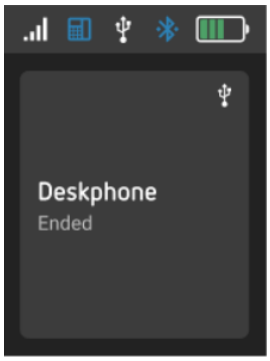


Fig.30 Call ended in Single call.

9.13 Line swapping

In the case of two calls being established in two different lines, one of them is being the active call in the active line. To make the line swapping simpler, active line is swapped automatically depending on call activities change. It can be one of the following scenarios:

- User makes an outgoing call by softphone or desktop phone.
- User retrieves USB held call by softphone.
- User swaps USB call by softphone.
- User accepts an incoming call.
- Call from first active line is ended and other call exists in second inactive line.

The user can also swap the line from the base manually by double clicking the hook-off key or by selecting the line via the UI. When a line is swapped successfully, between two different lines, a visible indication is shown on the base.

9.14 Microphone muting

Microphone muting control is separated into two muting statuses *(Fig.25)*. Each line has its own microphone muting control. When the line is switched, the related microphone muting control will also be switched.

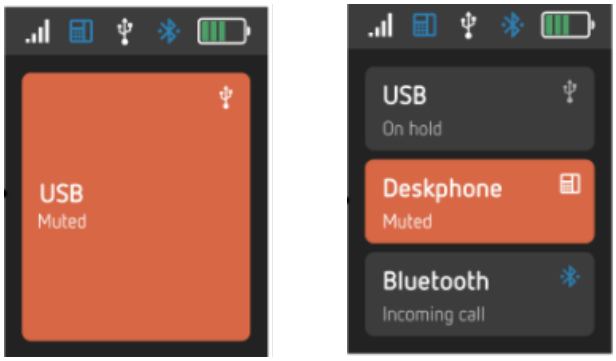


Fig.31 Single vs multi line

9.15 Volume control

Similar to the microphone, the volume control is also divided into two volume statuses *(Fig.26)*. This means that each line has its own volume control. When the line is switched, the related volume control will also be switched.

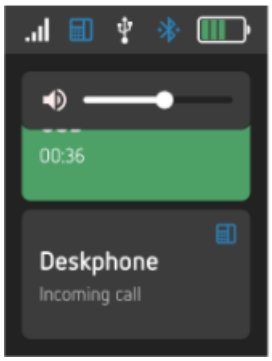


Fig.32 Volume control during a call

10 Clave Base feature description

This section aims to introduce you to the available features on the Clave Base. Some of the features will be briefly described through the sections below, whereas the main highlights will be presented via a table with function descriptions (please refer to ***12. Appendix B*** for more details)

10.1 Soft client support

As previously mentioned, the base has support for various soft clients (refer to ***3.1 Soft client support***)

10.2 EHS interface

The Clave Base supports EHS phones. The base is prepared to be compatible with various EHS standards. This is done by having a slider switch that enables 6 separate HW configurations for the audio routing. The PC Setup tool is used to configure the optimal settings for the SW configuration. (Please refer to ***15. Appendix C EHS and DHSG API*** for details.)

10.3 Ringer configuration

The Clave Base has a built-in ringer for audible alerts for the user. The audio settings of the ringer can be configured via the PC Setup tool or the base menu. The ringer may be muted by selecting “Silent mode” in the PC Setup Tool.

11 Clave DECT Dongle features

The RX3741 DECT dongle has many of the same features as the Clave Base station.

11.1 Conference

The Clave DECT Dongle supports internal conference which allows up to three additional headsets to listen-in on and participate in calls controlled by the primary headset of the Clave DECT Dongle.

The secondary headsets can register on the Clave DECT Dongle before or during the call and will have their microphones muted by default when joining. (Refer to ***7. How to connect headset and base station***)

The secondary headset user can unmute the microphone and can then participate actively in the conference call.

The secondary headsets cannot terminate the conference call because the call is controlled by the primary headset, but they can actively leave the call.

A secondary headset is deregistered from the dongle when:

- The headset actively leaves the conference call by long pressing the Multi-Function button
- The conference call is terminated by either the primary headset or the far end (depends on the same setting as above)
- The headset registers back as primary on its own dongle by short pressing the DECT button when idle (not in call)

11.2 Soft Client Support

The Clave DECT Dongle combined with one of the four UH headsets supports the audio and USB API of the following applications:

- Skype for Business (aka Lync)
- MS Teams
- Other call clients can be supported
    - require PC tool to be running
    - or UH USB HID API to be supported by call client

12 Appendix A (Clave Features)

The features of the above-mentioned headsets are summarized and listed in the table below:

FEATURES	Clave Mono NC	Clave Duo NC	Clave Duo ANC
FOLD FLAT DESIGN	Yes, 2-way		
EAR CUP			
EAR PADS MATERIAL	Fabric and PU Leather		
EAR PADS ATTACHMENT	Detachable		
OVER THE EAR	No	Yes	Yes
ON EAR	Yes	Yes	Yes
EAR CUP MOVEMENT	2-axis		
FLEXIBLE BOOM	Bendable		
BOOM MOVEMENT	270° rotation		
HEADB& MATERIAL	Plastic and silicone		
HEADB& RACHET	30mm ± 2mm		
RATCHET MARKING INDICATION (ON HEAD SIDE)	No		
BUSY LIGHT	Integrated on boom arm multi-color LED		
PROXIMITY SENSOR (AUTO HOOK OFF)	Yes		
NOISE CANCELLATION			
ENC	Yes - DSP assisted		
ANC	No	No	Yes - DSP assisted
ECHO CANCELLING	Yes - DSP assisted		
NO. OF MICROPHONES	2	2	6
NO. OF RECEIVERS	1	2	2
NO. OF BUTTONS	5	6	6
SCROLL WHEEL FOR VOLUME CONTROL	Yes		
SUPPORT FOR VOICE PROMPTS	Yes		
VOICE PROMPT LANGUAGE	Configurable via PC Tool		
ENGLISH	Included		
CALL CONTROL			
VOL+	Scroll wheel up		
VOL-	Scroll wheel down		

MFB	Answer/end call, etc
DECT	Yes
CONFERENCE CALLS (SUPERVISOR)	4 users
BLUETOOTH	Yes, BT4.2
ADAPTIVE POWER CONTROL (DECT)	Yes
H&OVER TO VOIP MULTICELL SYSTEMS	Yes
FIRMWARE UPDATE SUPPORT	Via PC Tool
CALL STATUS LED	Integrated on boom arm multi-color LED
NARROW B& AUDIO	G726, BV16
WIDE B& AUDIO	CELT, G.722, BV32
SUPER WIDE B&	Yes
ACOUSTIC SHOCK PROTECTION	Yes
USB-C CONNECTOR	Yes

13 Appendix B (Clave Base features)

The table below presents a summary of the features available in the headsets that are controlled by the base station.

INPUT	FUNCTIONS
DECT FREQUENCY B&S:	1880 - 1895 MHz (Taiwan) 1880 - 1900 MHz (EMEA) 1910 - 1920 MHz (Brazil & Uruguay) 1910 - 1930 MHz (LATAM, Argentina, Chile) 1920 - 1930 MHz (USA, Canada)
NARROWB& AUDIO:	G.726, BV16
WIDEB& AUDIO (HD):	G.722, BV32
MUSIC	128 kbit/s CELT
LED INDICATOR	
STATUS LED	Tri color
VISIBILITY	Mic boom tip
HARDWARE FEATURES	
BATTERY TYPE	Lithium Polymer, replaceable
BATTERY CAPACITY	600 mAh
MICROPHONES	2 for talk (ENC) and 4 for ANC
HEADSET INTERFACE	USB to connect to the Clave Base
CHARGING TERMINALS	Using USB
OPERATING CONDITIONS	0°C to +45°C (Guaranteed ambient temperature range)
BATTERY PERFORMANCE	
TALK TIME DECT	Up to 20 hours
TALK TIME BT	Up to 10 hours
ST&BY TIME DECT ONLY:	Up to 100 hours
ST&BY TIME DECT+BT:	Up to 75 hours
CHARGE TIME (0% - 90%)	3 hours
QUICK CHARGE	25% in 30 minutes
CHARGE STOP TEMPERATURE	0°C to +60°C (Battery cell temperature charging cutoff)
AUDIO FEATURES	
EARPIECE VOLUME	See volume table
COVERAGE WARNING	On/Off
LANGUAGE	
SUPPORTED:	English (Voice prompts)

CALL FEATURES	
CALL WAITING	Yes
HOLD / RETRIEVE	Yes
NO. OF SIMULTANEOUS CALLS	2, only one on hold
CALL CONFERENCE	Yes
CALL SWAP	Yes

DECT	
OUTPUT POWER	250 mW 140 mW (Uruguay, Canada, US, Malaysia, Jordan) 22 dBm (Chile, Australia)
SENSITIVITY	-92 dBm
ANTENNA	2 for fast antenna diversity
RANGE (MAX)	200m outdoor
SECURITY	Class C
ST&ARD DECT INTERFACE	Yes
H&OVER TO VOIP MULTICELL SYSTEMS	Yes

SOFTWARE UPDATE	
DOWNLOADABLE	Yes
AIR-INTERFACE	Yes

BLUETOOTH	
NO. OF PAIRINGS	4
BT VERSION	4.2 Classic
FREQUENCY	2401 MHz - 2480 MHz
SENSITIVITY	Better than -92 dBm @ DH1, measured at antenna
OUTPUT POWER	Class 2, 2,5mW (4dBm)
RANGE	10 meters in free line of sight measured outsight
ANTENNA	The antenna performance should be designed to have a return loss of < -5dB in the relevant frequency band
SIMULTANEOUS CONNECTIONS	2

PROFILES	
- A2DP	1.2 Advanced Audio Distribution Profile
- HSP	1.2 Headset Profile
- HFP	1.6 Handsfree Profile
- DIP	1.3 Device ID Profile
- AVRCP	1.4 Audio/Video Remote Control Profile

CODEC	
- SBC	For stereo streaming of music
- MSBC	For wideband audio
- CVSD	For narrowband audio
AUDIO CODEC	BV16 G.726 BV32 G.722 CELT48
CLASS OF DEVICE	0x200404 Headset device 0x200418 Headphones
BLUETOOTH DEVICE ADDRESS	The address is stored in non-volatile memory
BLUETOOTH DEVICE NAME	The product shall use the name "XXXXXXXX" *
ENCRYPTION	Default 128-bit encryption
PAIRING MODE	Discoverable only by user request and limited time 1 minute
AUTOMATIC CONNECT	An already paired Bluetooth™ device will automatically connect to the headset.
OTHERS	
HAC COMPLIANT	Yes

13.1.1 Base features

REQUIREMENTS	DESCRIPTIONS
DISPLAY	
SIZE	2.4" 240x320 TFT
BUTTONS	Scroll wheel (with an embedded key) Four keys
HARDWARE FEATURES	
SPEAKER	Yes
HEADSET INTERFACE	USB C
CHARGING TERMINALS	USB C
OPERATING CONDITIONS	0°C to +45°C (Guaranteed ambient temperature range)
SPARE BATTERY CHARGER	Yes
BATTERY PERFORMANCE	
CHARGE STOP TEMPERATURE	+10°C to +45°C (Battery cell temperature charging cutoff)
CALL FEATURES	
CALL WAITING	Yes
HOLD / RETRIEVE	Yes

NO. OF SIMULTANEOUS CALLS	2, only one on hold
CALL CONFERENCE	Yes
CALL SWAP	Yes
DECT	
OUTPUT POWER	250 mW 140 mW (Uruguay, Canada, US, Malaysia, Jordan) 22 dBm (Chile, Australia)
SENSITIVITY	-92 dBm
ANTENNA	2 for fast antenna diversity
RANGE	200m outdoor
SECURITY	Class C
SOFTWARE UPDATE	
DOWNLOADABLE	Yes
AIR-INTERFACE	Yes
UPDATE SUPPORT	PC Setup tool

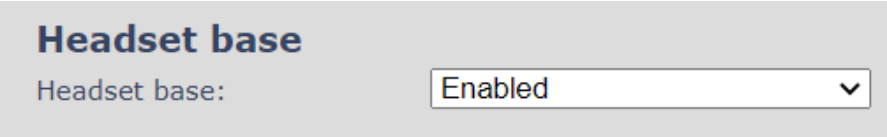
14 Register devices on UH VoIP DECT system

The following section provides a step-by-step guide on how to register the Clave Base station and Clave Headsets to the UH DECT system.

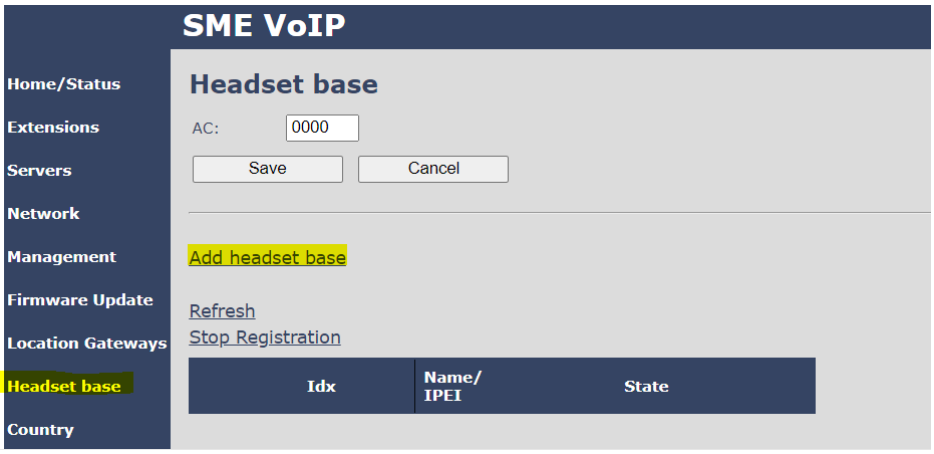
IMPORTANT: Both the Clave Base and the Clave Headsets can be SIP registered to the VoIP System. However, depending on which device is SIP registered, the headset has a different behavior. If a headset base is registered to a SIP account (see step **3**), then the related headsets can be used in multiple environments - both in VoIP System and normal network. This means that a user can receive VoIP calls and at the same time use the headset for various PC applications, such as listening to music or talking via a softphone (Microsoft Teams). Moreover, these functionalities are available while moving around the VoIP system. However, if a headset is SIP registered as a standalone device (without the headset base), then it can be used only for VoIP calls on the system. (All the other functionalities should still be available via Bluetooth™ to either a phone or PC.)

14.1 Register Clave Base

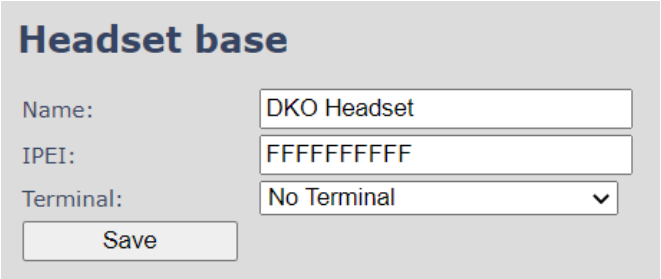
Step 1 Enter the **Management** page of an UH DECT Base station and enable the *Headset base* setting. By doing so, a new menu on the left-handed navigation panel will be added (Headset base)



Step 2 Navigate to the **Headset base** page and select the **Add headset base** option.



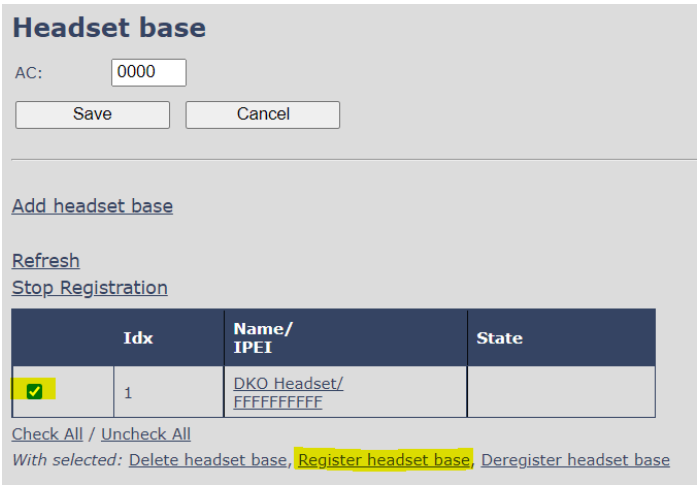
Step 3 A separate editor menu will open for configuration. Fill in the fields and press **Save.** The available settings are explained in the table below.



PARAMETER	DEFAULT VALUES	DESCRIPTION
NAME	Empty	The name displayed on the headset base overview page
IPEI	FFFFFFFFFF	The IPEI of the headset base. In general, this must not be changed manually. If IPEI is left at FFFFFFFFFF, any headset base can register at this index. Else, only the headset base with the specified IPEI number can register to the VoIP system
TERMINAL	No Terminal	This setting enables the administrator to assign a SIP account to the headset base. The following options are available: **No Terminal:** No SIP account assigned. **Terminal Idx x:** An available extension/SIP account slot which can be assigned to the headset base. **New Terminal:** Creates a new terminal/extension slot on the *Extensions* page with the IPEI of the headset base. The administrator needs to edit the extension details in order to SIP register the headset base. ***NOTE:*** *By SIP registering the Clave Base, the user can use the headset both for VoIP calls and for other PC applications (such as music, softphones, etc.)*

Step 4 Mark the newly added headset base and select **Register headset base** to enable the registration mode.

NOTE: *The Access code (AC), used as an authentication method by the headset base, is placed on top of the page and can be configured by the administrator.*



Step 5 On the headset base, enter the menu via the scroller (left-hand side) and scroll down to **VoIP System**

Step 6 Enter the **VoIP system** menu and select **Register**

Step 7 Enter the **Access code (AC)**

NOTE: *By default, the AC is **0000**. You can change the AC code on the VoIP base (See step **4**)*

Step 8 The headset base will start the registration process. After a while, it will be registered to the VoIP system.

14.2 Register Clave Headsets

The registration of the Clave Headsets to the VoIP system is done via the **Extensions** page. The procedure is the same as registering an UH DECT handset. Therefore, please refer to the ***VoIP System guide*** and follow the steps for ***enabling registration mode*** for the VoIP bases. As soon as you have enabled it, follow the steps below to register the headset.

IMPORTANT: Due to technical limitations, the Clave Headsets must be free of Clave Base registration before registering to the VoIP system. This means that the headsets must not be present on the Clave Base when registering to the VoIP system.

NOTE: *If a headset is registered to the VoIP system and at the same time you register it to an Clave Base, the connection to the Clave Base will not be stable enough. Therefore, if you wish to have a headset registered both to the VoIP system and to the Clave Base, we recommend registering the Clave Base to the VoIP system (refer to* ***13.1 Register Clave Base****). By doing so, the headset will both support the DECT and other networks.*

NOTE: *When using the headset in standalone mode in the VoIP system, it is recommended to charge the device via the USB-C cable attached to an adaptor. Else, if connected to the Clave Base or to a PC, the headset connection might not be stable enough.*

Step 1 Power on the headset via the power slider

Step 2 Activate the DECT registration on the headset by long pressing the DECT button on the headset until the voice prompt announces “Registering”

Step 3 After a while, the headset will register to the VoIP base.

15 Appendix C: EHS and DHSG API

15.1 EHS Interface

15.1.1 EHS

The EHS connector is compatible with the EA40 standard but is designed so that it may support other standards in future. The pins are as follow:

Pin no.	Direction	Description
1	In/out	Bidirectional IO/SPI DI. Used for SDO in EA40. Connected to pin 8 in DHSG connector.
2	In	Input IO/SPI CLK. Used for SCLK in EA40.
3	In	Input IO/SPI CS. Used for CS in EA40.
4	Out	Output IO/SPI DO. Used for SDI in EA40. Connected to pin 1 in DHSG connector.
5	PWR	Power input
6	GND	Ground

15.1.2 Phone

Input for audio signal. The pins can be configured using the slider on the button of the base. The table below shows that in detail.

Pin no.	Slider position	A	B	C	D	E	F
	1	SPK+	SPK-	SPK-	MIC-	SPK-	MIC-
	2	MIC-	MIC+	MIC-	SPK-	SPK+	SPK+
	3	MIC+	MIC-	MIC+	SPK+	MIC-	SPK-
	4	SPK-	SPK+	SPK+	MIC+	MIC+	MIC+

15.1.3 DHSG

The DHSG connector follows the pinout described in the official DHSG standard [DHSG_SPEC]. Other pin configurations have been seen and to support these, a special cable is needed. The pins are as follow:

Pin no.	Direction	DESCRIPTION
1	Out	Output IO/SPI DO. Used for Data RX in DHSG. Connected to pin 4 in EHS connector.
2	GND	Ground
3	AUDIO	The audio signals can be configured using the slider as shown in table below.
4	AUDIO	The audio signals can be configured using the slider as shown in table below.
5	AUDIO	The audio signals can be configured using the slider as shown in table below.
6	AUDIO	The audio signals can be configured using the slider as shown in table below.

7	PWR	5V DC input supply
8	In/out	Bidirectional IO/SPI DI. Used for Data TX in DHSG. Connected to pin 1 in EHS connector.

Using relays, the audio path can be configured to use either the PHONE connector or pin 3-6 in DHSG connector.

The audio pins can be configured using the same slider mentioned in PHONE interface:

Pin no.	Slider position	A	B	C	D	E	F
	1	SPK-	SPK+	SPK+	MIC+	MIC+	MIC+
	2	MIC+	MIC-	MIC+	SPK+	MIC-	SPK-
	3	MIC-	MIC+	MIC-	SPK-	SPK+	SPK+
	4	SPK+	SPK-	SPK-	MIC-	SPK-	MIC-

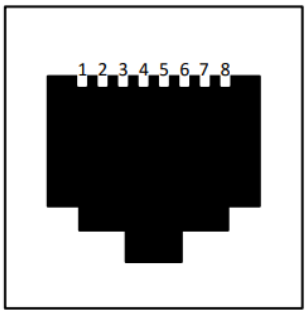
15.2 EHS Standards

15.2.1 DHSG

This section only gives a very brief overview of the DHSG standard.

DHSG uses an 8-pin RJ45 connector with pinouts as follow:

Pin no.	Description
1	Data Rx (Headset to phone)
2	GND
3	MIC-
4	SPK
5	SPK
6	MIC+
7	5V DC
8	Data Tx (Phone to headset)



15.2.1.1 DHSG Codes

The following DHSG codes are supported in Clave Base:

Code	Signal	Hex ID
Code 1	1 2 3 4 5 6 7 8	3B
Code 2	1 2 3 4 5 6 7 8	5D
Code 3	1 2 3 4 5 6 7 8	6E

15.2.1.2 DHSG Commands

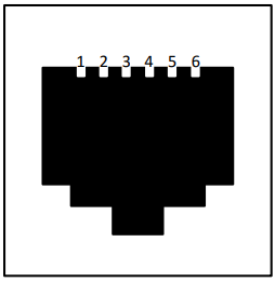
The following commands are supported:

Phone to headset	
Code 1	Tonruf (Incoming alerting call, ringing on)
Code 2	Gespräch ein (Answer call, hook off)
Code 3	Gespräch aus (End call, hook on)
Headset to phone	
Code 1	Handapparat aufgelegt (Hook on)
Code 2	Handapparat abgenommen (Hook off)

15.2.2 EA40

This section gives an overview of EA40 standard. EA40 uses a 6-pin RJ12 connector with pinouts as follow:

Pin no.	Description
1	GND
2	5V
3	SDO
4	CS
5	CLK
6	SDI



16 Appendix D: Call Control Action and Call State Table between BT & DECT

#	Call State		Call Control Action						
	DECT	BT	BT key	DECT Active			BT Active		
				Multi-Function key			Multi-Function key		
			Short press	Short press	Long press	Double press	Short press	Long press	Double press
1	IDLE	IDLE	---	---	DECT: Teams button	DECT: Teams redial	---	---	---
2	RINGING	IDLE	---	DECT: Accept	---	DECT: Reject	---	---	---
3	HOLD	IDLE	---	---	DECT: Retrieve	---	---	---	---
4	HOLD & RINGING	IDLE	---	DECT: Accept	---	DECT: Reject	---	---	---
5	HOOK-OFF	IDLE	---	DECT: End	DECT: Hold	---	---	---	---
6	HOOK-OFF & RINGING	IDLE	---	DECT: Hold & accept	DECT: End & accept	DECT: Reject	---	---	---
7	HOOK-OFF & HOLD	IDLE	---	DECT: End	DECT: Swap Call	---	---	---	---
8	HOOK-OFF, HOLD & RINGING	IDLE	---	DECT: Hold & accept	DECT: End & accept	DECT: Reject	---	---	---
9	IDLE	RINGING	---	---	---	---	BT: Accept	---	BT: Reject
10	RINGING	RINGING	Toggle link BT/DECT	DECT: Accept, BT: Accept	---	DECT: Reject, BT: Reject	DECT: Accept, BT: Accept	---	DECT: Reject, BT: Reject
11	HOLD	RINGING	Toggle link BT/DECT	BT: Accept	DECT: Retrieve	BT: Reject	BT: Accept	---	BT: Reject
12	HOLD & RINGING	RINGING	Toggle link BT/DECT	DECT: Accept, BT: Accept	---	DECT: Reject, BT: Reject	DECT: Accept, BT: Accept	---	DECT: Reject, BT: Reject
13	HOOK-OFF	RINGING	Toggle link BT/DECT	BT: Accept	DECT: Hold	BT: Reject	BT: Accept	---	BT: Reject
14	HOOK-OFF & RINGING	RINGING	Toggle link BT/DECT	DECT: Hold & accept BT: Accept	DECT: End & accept	DECT: Reject, BT: Reject	DECT: Hold & accept BT: Accept	---	DECT: Reject, BT: Reject
15	HOOK-OFF & HOLD	RINGING	Toggle link BT/DECT	BT: Accept	DECT: Swap Call	BT: Reject	BT: Accept	---	BT: Reject
16	HOOK-OFF, HOLD & RINGING	RINGING	Toggle link BT/DECT	DECT: Hold & accept BT: Accept	DECT: End & accept	DECT: Reject, BT: Reject	DECT: Hold & accept BT: Accept	---	DECT: Reject, BT: Reject
17	IDLE	HOOK-OFF	---	---	---	---	BT: End	BT: Hold	---

18	RINGING	HOOK-OFF	Toggle link BT/DECT	DECT: Accept	---	DECT: Reject	DECT: Accept	BT: Hold	DECT: Reject
19	HOLD	HOOK-OFF	Toggle link BT/DECT	---	DECT: Retrieve	---	BT: End	BT: Hold	---
20	HOLD & RINGING	HOOK-OFF	Toggle link BT/DECT	DECT: Accept	---	DECT: Reject	DECT: Accept	BT: Hold	DECT: Reject
21	HOOK-OFF	HOOK-OFF	Toggle link BT/DECT	DECT: End	DECT: Hold	---	BT: End	BT: Hold	---
22	HOOK-OFF & RINGING	HOOK-OFF	Toggle link BT/DECT	DECT: Hold & accept	DECT: End & accept	DECT: Reject	DECT: Hold & accept	BT: Hold	DECT: Reject
23	HOOK-OFF & HOLD	HOOK-OFF	Toggle link BT/DECT	DECT: End	DECT: Swap Call	---	BT: End	BT: Hold	---
24	HOOK-OFF, HOLD & RINGING	HOOK-OFF	Toggle link BT/DECT	DECT: Hold & accept	DECT: End & accept	DECT: Reject	DECT: Hold & accept	BT: Hold	DECT: Reject
25	IDLE	HOLD	---	---	---	---	BT: End	BT: Retrieve	---
27	HOLD	HOLD	Toggle link BT/DECT	---	DECT: Retrieve	---	BT: End	BT: Retrieve	---
28	HOLD & RINGING	HOLD	Toggle link BT/DECT	DECT: Accept	---	DECT: Reject	DECT: Accept	BT: Retrieve	DECT: Reject
29	HOOK-OFF	HOLD	Toggle link BT/DECT	DECT: End	DECT: Hold	---	BT: End	BT: Retrieve	---
30	HOOK-OFF & RINGING	HOLD	Toggle link BT/DECT	DECT: Hold & accept	DECT: End & accept	DECT: Reject	DECT: Hold & accept	BT: Retrieve	DECT: Reject
31	HOOK-OFF & HOLD	HOLD	Toggle link BT/DECT	DECT: End	DECT: Swap Call	---	BT: End	BT: Retrieve	---
32	HOOK-OFF, HOLD & RINGING	HOLD	Toggle link BT/DECT	DECT: Hold & accept	DECT: End & accept	DECT: Reject	DECT: Hold & accept	BT: Retrieve	DECT: Reject
33	IDLE	HOLD & RINGING	---	---	---	---	BT: Accept	---	BT: Reject
34	RINGING	HOLD & RINGING	Toggle link BT/DECT	DECT: Accept, BT: Accept	---	DECT: Reject, BT: Reject	DECT: Accept BT: Accept	---	DECT: Reject, BT: Reject
35	HOLD	HOLD & RINGING	Toggle link BT/DECT	BT: Accept	DECT: Retrieve	BT: Reject	BT: Accept	---	BT: Reject
36	HOLD & RINGING	HOLD & RINGING	Toggle link BT/DECT	DECT: Accept BT: Accept	---	DECT: Reject BT: Reject	DECT: Accept BT: Accept	---	DECT: Reject BT: Reject
37	HOOK-OFF	HOLD & RINGING	Toggle link BT/DECT	BT: Accept	DECT: Hold	BT: Reject	BT: Accept	---	BT: Reject
38	HOOK-OFF & RINGING	HOLD & RINGING	Toggle link BT/DECT	DECT: Hold & accept BT: Accept	DECT: End & accept	DECT: Reject BT: Reject	DECT: Hold & accept BT: Accept	---	DECT: Reject BT: Reject
39	HOOK-OFF & HOLD	HOLD & RINGING	Toggle link BT/DECT	BT: Accept	DECT: Swap Call	BT: Reject	BT: Accept	---	BT: Reject

40	HOOK-OFF, HOLD & RINGING	HOLD & RINGING	Toggle link BT/DECT	DECT: Hold & accept BT: Accept	DECT: End & accept	DECT: Reject BT: Reject	DECT: Hold & accept BT: Accept	---	DECT: Reject BT: Reject
41	IDLE	HOOK-OFF & RINGING	---	---	---	---	BT: Hold & accept	BT: End & accept	BT: Reject
42	RINGING	HOOK-OFF & RINGING	Toggle link BT/DECT	DECT: Accept, BT: Hold & accept	---	DECT: Reject BT: Reject	DECT: Accept, BT: Hold & accept	BT: End & accept	DECT: Reject BT: Reject
43	HOLD	HOOK-OFF & RINGING	Toggle link BT/DECT	BT: Hold & accept	Retrieve	BT: Reject	BT: Hold & accept	BT: End & accept	BT: Reject
44	HOLD & RINGING	HOOK-OFF & RINGING	Toggle link BT/DECT	DECT: Accept, BT: Hold & accept	---	DECT: Reject BT: Reject	DECT: Accept, BT: Hold & accept	BT: End & accept	DECT: Reject BT: Reject
45	HOOK-OFF	HOOK-OFF & RINGING	Toggle link BT/DECT	BT: Hold & accept	DECT: Hold	BT: Reject	BT: Hold & accept	BT: End & accept	BT: Reject
46	HOOK-OFF & RINGING	HOOK-OFF & RINGING	Toggle link BT/DECT	DECT: Hold & accept, BT: Hold & accept	DECT: End & accept	DECT: Reject BT: Reject	DECT: Hold & accept, BT: Hold & accept	BT: End & accept	DECT: Reject BT: Reject
47	HOOK-OFF & HOLD	HOOK-OFF & RINGING	Toggle link BT/DECT	BT: Hold & accept	DECT: Swap Call	BT: Reject	BT: Hold & accept	BT: End & accept	BT: Reject
48	HOOK-OFF, HOLD & RINGING	HOOK-OFF & RINGING	Toggle link BT/DECT	DECT: Hold & accept, BT: Hold & accept	DECT: End & accept	DECT: Reject BT: Reject	DECT: Hold & accept, BT: Hold & accept	BT: End & accept	DECT: Reject BT: Reject
49	IDLE	HOOK-OFF & HOLD	---	---	---	---	BT: End	BT: Swap call	---
50	RINGING	HOOK-OFF & HOLD	Toggle link BT/DECT	DECT: Accept	---	DECT: Reject	DECT: Accept	BT: Swap call	DECT: Reject
51	HOLD	HOOK-OFF & HOLD	Toggle link BT/DECT	---	DECT: Retrieve	---	BT: End	BT: Swap call	---
52	HOLD & RINGING	HOOK-OFF & HOLD	Toggle link BT/DECT	DECT: Accept	---	DECT: Reject	DECT: Accept	BT: Swap call	DECT: Reject
53	HOOK-OFF	HOOK-OFF & HOLD	Toggle link BT/DECT	DECT: End	DECT: Hold	---	BT: End	BT: Swap call	---
54	HOOK-OFF & RINGING	HOOK-OFF & HOLD	Toggle link BT/DECT	DECT: Hold & accept	DECT: End & accept	DECT: Reject	DECT: Hold & accept	BT: Swap call	DECT: Reject
55	HOOK-OFF & HOLD	HOOK-OFF & HOLD	Toggle link BT/DECT	DECT: End	DECT: Swap Call	---	BT: End	BT: Swap call	---