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## 2. CHANGE CONTROL INFORMATION

VERSION	DATE	EDITOR	REMARKS
1.0	17-Apr-18	Thomas Rupp	DF Application Guideline V1.0
1.1	09-May-18	Thomas Rupp	Changes to 6.1, 6.2, 6.3, 6.4, 6.5, 6.10
1.1	23-May-18	R. Schmidt	Board approval
1.1	06-June-18	R. Schmidt	Approved

## 3 SCOPE

The CAT-iq Application Guideline has been developed by the DECT Forum and forms the basis of the CAT-iq Application Test Suite. Together with conventional profile, audio and RF testing the latter will become part of CAT-iq 2.1 certification. Successful completion of the test suite will be a pre-requisite for certification. The CAT-iq Application Guide and Test Suite are essentially tools for PP and FP manufacturers. Following the recommendations of the Application Guideline will improve the usability of CAT-iq implementations and underpin the retail market for equipment manufacturers.

This guideline is the output of extensive testing using all available CAT-iq certified products. All recommendations in this document supply a reference to the relevant part of the ETSI specification for CAT-iq 2.0 which in turn is derived from the DECT Forum CAT-iq Feature Requirement Specification. The objective of the guideline and hence the test suite is to narrow down the scope for interpretation in feature implementation to ensure a consistent and improved user experience. The ensuing Test Suite will contain the tests necessary to guarantee that.

## 4 REFERENCES

- [1] ETSI TS 102 527-3 V1.6.1 (2014-01)
- [2] DECT Forum Test Plan Design Report anon 1V1 20170628.pdf
- [3] ETSI Drafting Rules (Verbal forms for the expression of provisions)

## 5 TERMS AND DEFINITIONS

### 5.1 Abbreviations

Abbreviations can be found in [1] chapter '3.3 Abbreviations'.

### 5.2 Symbols

Symbols can be found in [1] chapter '3.2 Symbols'.

### 5.3 Expressions

In the present document “shall”, “shall not”, “should”, “should not” are used and to be interpreted as described in the ETSI Drafting Rules [3]:

Verbal form	Equivalent expressions for use in exceptional cases
<b>shall</b>	is to is required to it is required that has to only ... is permitted it is necessary
<b>shall not</b>	is not allowed [permitted] [acceptable] [permissible] is required to be not is required that ... be not is not to be
<b>should</b>	it is recommended that ought to
<b>should not</b>	it is not recommended that ought not to

### 5.4 Best practise implementation

The verbal form of the terms “should” and “should not” will be used in the present document as “best practise” recommendations. Using “should” means that for achieving the best interoperability result the Application Guideline has to be followed for the device implementation. But it is not meant to be a hard requirement to pass the related test cases.

The verbal form of the terms “shall” and “shall not” are meant to be hard requirements. Not following these recommendations in the implementation will result in failing the related test cases.

## **5.5 Optional Requirements**

An optional requirement can or cannot be implemented by the manufacturer. If the feature is implemented and if it is declared to be implemented in the PICS (protocol implementation conformance statement) documentation, it will be part of the test in the test suite.



## 6 APPLICATION GUIDELINES

Application Guideline	CAT- iq 2.0 FP	CAT-iq 2.0 PP	CAT-iq 2.1 FP	CAT-iq 2.1 PP
1. Date and Time synchronization	Mandatory	Mandatory	Mandatory	Mandatory
2. Collision Handling: Simultaneous List Access	Mandatory	Mandatory	Mandatory	Mandatory
3. Call Waiting:	Mandatory	Mandatory	Mandatory	Mandatory
4. Multiple Calls:	Mandatory	Mandatory	Mandatory	Mandatory
5. Handset to Line Attachment (multiple Lines)	Optional	Mandatory	Optional	Mandatory
6. Call Forwarding	Mandatory	Mandatory	Mandatory	Mandatory
7. Event Notifications	Mandatory	Mandatory	Mandatory	Mandatory
8. Line selection	Optional	Mandatory	Optional	Mandatory
9. Implicit Call Intrusion	Optional	Optional	Mandatory	Mandatory
10. Explicit Call Intrusion	Optional	Optional	Optional	Optional
11. No Emission Mode:	Optional	Optional	Optional	Optional
12. Permanent and temporary CLIR	Optional	Optional	Mandatory	Mandatory

### 6.1 Date and Time Synchronisation

#### 6.1.1 Description

The date and time synchronisation feature allows to synchronize date and time on the DECT system. From FP to all registered PPs or from one registered PP to the FP.

#### 6.1.2 Requirement Designator

This feature is Mandatory for CAT-iq 2.0 PP and FP devices.

#### 6.1.3 Functional Requirements

#### 6.1.4 General Requirements

DECT System time is in full responsibility of the FP. The FP shall whenever possible use Internet Time Servers, or any other comparable reference time source to set and maintain a correct system time. In case there is no such time source available (time server down, no IP connection, ...), it shall be possible for the user to set the system time manually by PP UI or FP Web UI.

To guarantee a correct time and date on PP side, the procedures described in [1], chapter '7.4.20.2 PT Date and Time recovery' shall be applied.

### **6.1.5 Fixed Part**

The FP should be in control of the "Clock master" field and decide to set it whether to 'FP' or 'PP'. As long as the FP cannot get a valid time from a reference time source, the field shall be set to 'PP'. This allows any registered PP to set a valid system time. Once the FP does have access to a reference time source, the 'Clock master' field shall be set to 'FP'. In any case, date and time update should be performed to all PPs. As default, the FP shall set the "Clock master" field to read only.

### **6.1.6 Portable Part**

The PP shall provide the possibility to set time and date in the UI. If the 'Clock master' field is set to "FP" and read only, the PP shall dynamically hide or shade the setting in the UI.

### **6.1.7 Optional Requirements**

If the FP provides the functionality to have a user chosen system time instead of using a reference or network time, the FP shall provide a Web UI setting to overrule the time from a reference time source. In this case the 'Clock master' field shall be kept to 'PP' all the time and the field shall be set to 'editable'. These two options could be named "Network time" and "Manual time".

### **6.1.8 Defaults and Settings**

Default for Clock Master field = 'PP'

### **6.1.9 References**

[NG1.N.5] Date and Time synchronization [1]

## **6.2 Collision handling Simultaneous List Access**

### **6.2.1 Description**

Handling of collision scenarios when a FP allows several PP's to access the same list concurrently, without blocking devices or harming the list access data base.

### **6.2.2 Requirement Designator**

This feature is Mandatory for CAT-iq 2.0 PP and FP devices.

### **6.2.3 Functional Requirements**

[1], chapter '7.4.10.1 General considerations' describes in detail list access handling including multiple accesses with collision handling. The collision prevention strategy is to avoid that more than one PP can change the content of the same list entry. This is done by locking an entry after an edit entry command is done on the same entry ID.

## 6.2.4 General Requirements

Concurrent editing of the same entry shall be avoided. An edit attempt from a PP, to on an entry which is already being edited by another PP, shall be rejected.

## 6.2.5 Fixed Part

The FP shall reject an 'edit entry' command from a PP to an entry which is already edited with a negative acknowledgement with reject reason 'temporarily not possible' until the first editing PP has sent the corresponding "save entry" command or until the session is terminated.

Additionally, the FP shall temporarily prevent the "edit entry", "save entry" and "delete entry" commands for the entry from being used by other PPs, as well as the "delete list" command.

## 6.2.6 Portable Part

The PP shall react on rejecting an 'edit entry' command with reject reason 'temporarily not possible' with a well-chosen UI response, helping the user to understand that this feature is just temporarily not available.

## 6.2.7 Optional Requirements

None

## 6.2.8 Defaults and Settings

None

## 6.2.9 References

[1], NG1.N.16 List access service

# 6.3 Call Waiting

## 6.3.1 Description:

Call waiting is the ability to indicate an incoming call to the PP user during an established call.

## 6.3.2 Requirement Designator

This feature is Mandatory for CAT-iq 2.0 PP and FP devices.

## 6.3.3 Functional Requirements

The call waiting feature allows informing a PP user about an incoming call during an already ongoing conversation, no matter if the conversation or the incoming call is internal or external. The user shall be informed acoustically and have the choice to accept this call or actively reject it.

In case the DECT system provides the possibility to enable/disable the call waiting feature, enabling/disabling shall be a configuration option on FP side only. Enabling/Disabling configuration can be provided per PP and per Line. In case it is provided per PP, enabling/disabling has the same impact for internal and external calls on this PP. In case it is only provided per line, it will not be possible to disable call waiting on internal calls.

The call waiting feature is implicitly influenced by the multiple call setting, which is not transparent for the end user.

### **6.3.4 General Requirements**

If call waiting is disabled, the FP shall be responsible not to send the call waiting indication to concerned PPs.

### **6.3.5 Fixed Part**

In case call waiting is disabled, no call waiting indication shall be sent to affected PPs or PPs which are attached to call waiting disabled lines.

If the FP allows to set the DECT system into single call mode, it shall inform the user explicitly about the effect on the call waiting functionality in the WEB UI.

### **6.3.6 Portable Part**

It shall be possible to accept and reject a waiting call.

### **6.3.7 Optional Requirements**

If call waiting can explicitly be enabled/disabled in a DECT System, then it should be possible to configure call waiting per line and/or PP in the FP Web UI.

### **6.3.8 Defaults and Settings**

Call waiting enabled.

### **6.3.9 References**

[1], 7.4.3.5.2 Call waiting indication (external or internal)

[2], NG1.N.7 NG1.N.7 Common parallel call procedures (external or internal)

## **6.4 Multiple Calls**

### **6.4.1 Description**

Multiple Calls is the ability to make multiple simultaneous external calls on one line.

### **6.4.2 Requirement Designator**

This feature is Mandatory for CAT-iq 2.0 PP and FP devices.

### **6.4.3 Functional Requirements**

With VoIP lines, it is possible to have several simultaneous calls on the same line, with one PP or several PPs. With PSTN lines, it is only possible to have a double call on one PP (one connection active, the other one on hold).

If the "Multiple call" feature is implemented and used on a line, the line may be configured in "single call" mode, or in "multiple call" mode. If a VoIP Line is configured in "single call" mode, the behaviour of a PSTN

line is simulated. If a PSTN Line is used in an FP, the line must be configured in "single call" mode and it shall not be possible to change the setting to "multiple call" mode.

On a multiple call line, configured in Single Call Mode, only one call can be active at a time on the line. Other calls (second, or further) are on-hold and can only become active by replacing the existing one on the same PP.

As such, only one HS can participate in the above activity.

So alternatively, a multi call line, configured in Single Call Mode, could be thought of as "Single Handset Mode"

As such, when a line is in Single Call Mode, Call Waiting can only occur on the single PP with the active call.

There are 2 reasons to do so:

- 1) Can be used as a Network Provider feature to restrict the capability of a line, either to simulate a legacy PSTN line behaviour or to have more possibilities to differentiate the service levels for telephony.
- 2) Can be used by the end user to restrict his DECT system, that only one PP in his DECT system can have active calls at the same time.

In case it is used as Network Provider feature, it shall not be possible to change the setting by the user. In case it is used as end user feature, the setting should be changeable by the WEB UI of the FP with a clear description of the consequences to other features like call waiting, call intrusion, etc.

## 6.4.4 General Requirements

### 6.4.5 Fixed Part

If Multiple Call mode is just a Network provided setting, the WEB UI shall not provide the possibility to change the setting. In this case the 'Multiple calls mode' field shall be set to 'not editable'.

If Multiple Call mode is a user configurable setting, it shall be possible to change the setting in the WEB UI and the 'Multiple calls mode' field shall be set to 'editable'. However, the user shall be precisely informed about the full impact of the change in the behaviour of the DECT system in the WEB UI.

### 6.4.6 Portable Part

The PP should not provide the possibility to change the multiple call setting (octet Value in the Field 'Multiple calls mode').

In case it is supported anyway by the PP, the implementation shall provide a sufficient way to inform the user about the full impact of the change in behaviour of the DECT system. Additionally, the setting shall be hidden or shaded in case the 'Multiple calls mode' field is set to 'not editable'.

## 6.4.7 Optional Requirements

None

### 6.4.8 Defaults and Settings

Octet Value in the Field 'Multiple calls mode':

For PSTN line = "single call"

For VoIP line = "multiple call"

### 6.4.9 References

[1], NG1.N.15 Multiple calls

## 6.5 Handset to line attachment

### 6.5.1 Description

Handset to line attachment is the ability to attach and detach available lines in a DECT system to PPs in a multi-line environment.

### 6.5.2 Requirement Designator

This feature is Mandatory for CAT-iq 2.0 PP and FP devices.

### 6.5.3 Functional Requirements

If more than one line is available in a DECT system, the user shall have the possibility to choose for every registered PP, on which line it is ringing. This is done by attaching lines to a PP.

If the feature 'Multiple lines [NG1.N.14]' is not supported by the FP, or if there is just one single line available in the system, it shall not be possible to do any line attachments.

### 6.5.4 General Requirements

The line attachment feature is used to define on which PP an incoming call for a certain line is presented, but it will also be used to present the user the available lines to setup a call from a PP. A DECT System shall have the possibility to attach available lines to PPs from the WEB UI but also from the PP UIs.

In case a PP is being detached from a line, the FP shall check if there is still at least one PP or an FXS port (if FXS devices presence can be recognized trustfully) attached to this line and in case there isn't, the detaching request shall be rejected by the FP.

### 6.5.5 Fixed Part

In case a line will be added in a DECT System that already has registered PPs, the user can choose what lines to attach to what PPs or the new line shall automatically be attached to all registered PPs

In case a new PP is registered to a FP, the user can choose what lines to attach to this PP or all available lines shall be attached automatically to the new PP.

If the user can choose what lines to attach to what PPs, the default setting or pre-set shall be attaching all PPs or Lines.

### 6.5.6 Portable Part

If the field 'Attached handsets' of [1], chapter 7.4.11.4.3 DECT System Settings List' is set to 'not editable', the PP shall hide or shade the setting in the PP UI.

If the user can choose what lines to attach to what PPs, the default setting or pre-set shall be attaching all PPs or Lines.

### 6.5.7 Optional Requirements

The FP can provide the configuration of an internal only telephony system setup. In such an internal only setup, the PPs and FXS port devices can just setup internal calls, but no external calls any more.

If this feature is supported, the FP shall allow to detach all devices from the lines and no check needs to be done any more to prevent detaching all PPs. The functionality shall be treated as a feature, meaning that the activation/deactivation option shall be provided by the WEB UI to control this feature. The detaching of all PPs from a line shall be handled by this setting in the background (without transparent user information).

In case internal only feature is activated, the FP shall set the field 'Attached handsets' of [1], chapter '7.4.11.4.3 DECT System Settings List' to not editable for the PP.

### 6.5.8 Defaults and Settings

None

### 6.5.9 References

[1], Multiple lines feature NG1.N.14

[2], 7.4.7.2 Terminal attachment and line settings

## 6.6 Call Forwarding (external calls)

### 6.6.1 Description

Call Forwarding is the ability to request a redirection of external incoming calls in the network.

### 6.6.2 Requirement Designator

This feature is Mandatory for CAT-iq 2.0 PP and FP devices.

### 6.6.3 Functional Requirements

In some networks, call forwarding can be activated and deactivated fully on protocol level, other networks still use the legacy method of setting up a call and sending a DTMF 'activation code' as prefix to the call forwarding number.

Both methods of initiating forwarding's will be described from now on as "Protocol Forwarding" and "Legacy Forwarding".

## 6.6.4 General Requirements

Whenever supported on network side the FP shall implement “Protocol Forwarding”. In case the FP is not designed for a specific network or if there is a chance that “Protocol Forwarding” will not work, “Legacy Forwarding” shall be implemented by default.

## 6.6.5 Fixed Part

### 6.6.5.1 Protocol Forwarding

With Protocol Forwarding the FP gets back the real forwarding status after activation or deactivation. It shall always represent this status in the corresponding Call Forwarding field and indicate any change of status with a list change indication.

To indicate PPs that Protocol Forwarding is used on FP side, the length fields of activation and deactivation codes of the corresponding forwarding type shall be set and kept to zero.

Call forwarding activation and deactivation codes shall not be configurable for the user.

### 6.6.5.2 Legacy Forwarding

In Legacy Forwarding the FP is activating or deactivating a forwarding on user request, but after activation or deactivation the FP does not know whether the request was successful or not. Anyway, the Value octet of the corresponding Call Forwarding field shall be kept to the value of the last activation request.

Call forwarding activation and deactivation codes shall be configurable in the FP UI.

## 6.6.6 Portable Part

The PP shall provide the option to configure forwarding numbers for every forwarding type (CFU, CFB, CFNA) on each line the PP is attached to. The number shall be editable and permanently stored in the corresponding ‘call forwarding’ field in the line settings list, independently of the call forwarding status. Activation and deactivation functionality shall be provided for all redirection types and each line the PP is attached to.

In case the call forwarding field holds activation and/or deactivation codes (length octets not 0), the PP knows that Legacy Forwarding is used. If the octet length is zero, Protocol Forwarding is used by the FP.

### 6.6.6.1 Protocol Forwarding

With Protocol Forwarding the call forwarding status for each line is well known in a DECT system and the PP can read the status in the Value octet in each call forwarding field.

The PP shall cache the status of the ‘value’ octet in the forwarding fields and provide the forwarding status as UI information to the user. The user shall be able to recognize easily if any call forwarding is activated on its attached lines. Any call forwarding status change, indicated by list change indication, shall be immediately indicated to the user.

In Protocol Forwarding a forwarding status is either on or off. This shall be considered in the PP UI concept.



### **6.6.6.2 Legacy Forwarding**

With Legacy Forwarding the real call forwarding status is unknown in a DECT system. Thus, the PP shall not use the Value octet of call forwarding field to indicate a forwarding status to the user.

In legacy forwarding a forwarding is not switched on and off, it is either activated or deactivated. This shall be considered in the PP UI concept. The UI should always provide both options concurrently: activation and deactivation.

## **6.6.7 Optional Requirements**

### **6.6.7.1 Protocol Forwarding**

None

### **6.6.7.2 Legacy Forwarding**

For open FP solutions which are not made to be used in just one dedicated network, the FP should provide a way for the user to set the codes or choose from an operator/country list in the WEB UI. By selecting the right Operator and/or Country, the activation/deactivation codes will be pre-set automatically by the FP.

## **6.6.8 Defaults and Settings**

### **6.6.9 Protocol Forwarding**

CFU, CFNA, CFB 'activation code length' and 'deactivation code length' octets shall be set to zero.

### **6.6.10 Legacy Forwarding**

In case there are no specific codes to be used from network side, the following codes shall always be taken as default:

Call forwarding Unconditional (CFU): Activation: \*21\*, Deactivation: #21#

Call forwarding on No Answer (CFNA): Activation: \*61\*, Deactivation: #61#

Call forwarding on Busy subscriber (CFB): Activation: \*67\*, Deactivation: #67#

### **6.6.11 References**

[1], Call forwarding [NG1.N.18]

## **6.7 Event Notifications**

### **6.7.1 Description**

Event Notifications are the ability to indicate the PP missed calls and missed voice messages based on the generic event notification mechanism.

### **6.7.2 Requirement Designator**

This feature is Mandatory for CAT-iq 2.0 PP and FP devices.

### 6.7.3 Functional Requirements

Missed calls and stored voice messages in a message box shall be shown in the PP UI for each line the PP is attached to. As the PP can be attached to more than one line, it must be able to collect the message indications for every attached line and provide a solution to show the indications per line and/or a summary of the missed calls or voice messages in total.

This information shall be updated instantly whenever the status on the FP or the network side changes, but also when the PP is newly registered to an FP, when the PP restarts after reset or power cycle or when it gets back in range of the FP.

### 6.7.4 General Requirements

The FP shall be responsible to maintain the status of missed calls and voice messages and inform the PPs reliably by providing event notifications for both as specified in [1], chapter '7.4.1 Generic events notification'.

### 6.7.5 Fixed Part

In case voice message information is provided from network side, the FP shall keep a local cache of presence and count of available voice messages for every configured line. This local cache of status and count is needed to be able to resend message waiting- and missed call notifications any time a PP gets back in range, is new registered or power cycles (means every time a re-locate procedure is performed). In case of such a re-locate procedure from PPs, the local cache can be used to re-send voice message waiting- and missed call notifications for each attached line.

In case no reliable message count for new voice messages can be provided from network side, the field <Event multiplicity> in the information element <Events notification> shall be toggled with the values zero and one. One shall be used in case there are voice messages available, zero if there are no messages available.

The FP shall only send line related event notification to PPs which are attached to the specific line.

### 6.7.6 Portable Part

The PP has two options to provide the number of missing calls or voice messages. Either as single numbers for each attached line or as a summarized count of all attached lines. The PP shall at least implement one of the following options to provide this information the end user:

- 1) As a line related information on the same screen with line related counts of missing calls or voice messages
- 2) As summarized count of all summed up missed calls or voice messages

### 6.7.7 Optional Requirements

None

### 6.7.8 Defaults and Settings

None

### 6.7.9 References

[1] '7.4.1 Generic events notification'

## **6.8 Line Selection**

### **6.8.1 Description**

Line Selection is the ability to choose the line for an outgoing external call in a multi-line setup.

### **6.8.2 Requirement Designator**

The 'Multiple lines [NG1.N.14]' feature is Mandatory for CAT-iq 2.0 PPs.

The 'Multiple lines [NG1.N.14]' feature is Optional for CAT-iq 2.0 FPs. In case it is implemented, the implementation shall follow this guideline.

### **6.8.3 Functional Requirements**

The CAT-iq standard allows selecting the outgoing line for an external call by using the Multi Line and the Line Identification feature. As there is no possibility to set the preferred outgoing line as a system setting by the PP (not part of the DECT System Setting List), selecting the outgoing line by a PP can only be done by the call by call option during call setup.

Only the FP has the capability to define and hold a "default" outgoing line persistently which is valid system wide. Thus, a good way for an implementation of a line selection by the PP is to provide a feature in the UI to select the line temporary for the next call.

### **6.8.4 General Requirements**

In a Multi-Line setup, it shall be possible to set a default line for outgoing calls on the FP and it shall be possible to select a temporary outgoing line for the next call on the PP, which overrules the default line on the FP side.

### **6.8.5 Fixed Part**

If the feature 'Multiple lines [NG1.N.14]' is supported by the FP, the FP shall provide the possibility to choose a dedicated default line for outgoing calls for each attached from the WEB UI.

This default line shall be taken for every outgoing call from a PP, if the chosen line ID in the Call Setup is set to 'none' ('FP-managed line selection'). In case the PP chooses a valid line ID for the call setup which is not 'none', the FP shall setup the call with this line id instead of its default line ID ('PP-managed line selection').

### **6.8.6 Portable Part**

The PP shall provide the possibility to temporarily choose a line for the next outgoing call. It shall only be possible to choose lines which are attached to the PP. Choosing this temporary line is done with 'PP-managed line selection' [1]. It shall be visible for the user that the call will be made with a dedicated line and not with the FP default line. After a successful call setup with a temporary chosen line, all calls will be made again with line ID 'none' by using 'FP-manage line selection' [1].

If the PP is only attached to one single line, it shall hide or shade the functionality to choose a temporary line in the UI.

### 6.8.7 Optional Requirements

Additionally, to the temporary line selection on PP side, the PP UI can also provide the functionality of a static line selection. Static line selection must always be overruled by temporary line selections or calls from call lists.

### 6.8.8 Defaults and Settings

PP Line ID shall be set to 'none' as default for outgoing calls.

### 6.8.9 References

[1], chapter '7.4.5 Line identification'

[2], Multiple lines [NG1.N.14]

[3], Line identification [NG1.N.12]

## 6.9 Implicit Call Intrusion

### 6.9.1 Description

This feature mimics the behaviour of a PSTN line with multiple phones connected. Thus, this will only work with a real PSTN line or a VoIP line, configured as legacy PSTN mode. It can also be seen as a simple way of setting up a 3PTY conference on PSTN lines.

Implicit Call Intrusion allows a PP user to take part in an already ongoing call between another PP and an external partner. An intrusion shall always be indicated clearly to the intruding PP, but as well to the users already in the established call, as an acoustic indication.

### 6.9.2 Requirement Designator

Call intrusion is Optional for CAT-iq 2.0 PP and FP devices.

In case it is implemented, the implementation shall follow this guideline. For the PP, either 'Explicit Call Intrusion' or 'Implicit Call Intrusion' or both shall be supported. The FP shall support both intrusion types.

### 6.9.3 Functional Requirements

#### 6.9.4 General Requirements

In VoIP DECT systems it is quite common that a PP user can only setup a call with a destination number involved. This is different from legacy PSTN DECT systems, where it was more common to setup a call without a number and getting a dial tone from the network first. As implicit call intrusion mimics the behaviour of a PSTN line usage, the PP shall also be able to setup a call without a number if the feature implicit call intrusion is supported.

#### 6.9.5 Fixed Part

None

### 6.9.6 Portable Part

The UI shall provide a way to setup a call without a number to simplify using this feature (mimic PSTN DECT phone PP behaviour). It is quite common to do this by long pressing the 'off-hook' button or pressing the loudspeaker key if available. Also providing a separate 'key' or menu function to initiate a call setup with no number, named as dedicated 'intrusion' function, is a feasible option.

The PP shall provide a UI setting to set the 'Value' octet in the 'intrusion call' field of the Line Settings List for each line the PP is attached to. In case the feature is not supported by the FP, the PP shall hide or shade the setting in the UI.

### 6.9.7 Optional Requirements

In case call intrusion is not allowed as such in the network, the FP shall initialize the 'intrusion call' field with intrusion disabled and it shall not allow to change this setting.

### 6.9.8 Defaults and Settings

None

### 6.9.9 References

[1], 7.4.3.8 Intrusion call (from PP to FP)

## 6.10 Explicit Call Intrusion

### 6.10.1 Description

Explicit Call Intrusion is the ability to intrude with a PP into an explicit chosen external call. (or an internal call for handset intrusion) Handset intrusion is both external and Internal.

### 6.10.2 Requirement Designator

Call intrusion is Optional for CAT-iq 2.0 PP and FP devices.

In case it is implemented, the implementation shall follow this guideline. For the PP, either 'Explicit Call Intrusion' or 'Implicit Call Intrusion' or both shall be supported. The FP shall support both intrusion types.

### 6.10.3 Functional Requirements

If this feature is supported, the PP UI shall provide a way to intrude into an ongoing call in the DECT system. The PP shall provide at least one of the 2 intrusion types, that means either 'handset intrusion' or 'line intrusion' or both. The FP shall support both.

### 6.10.4 General Requirements

If supported, 'Handset intrusion' and/or 'line intrusion' shall always be possible, when the FP capability bit a32 of the "Extended higher layer capabilities (part 2)" is set (EN 300 175-5 [5], clause F.3).

Intrusions into calls related to an external line can be switched on and off when changing the 'Value' octet in the 'intrusion call' field of the Line Settings List. Since this is a line related configuration, it shall only affect

‘line intrusions’ and ‘handset intrusions’ where external lines are involved, but it shall not have an effect on ‘handset intrusions’ to internal calls only.

## **6.10.5 Fixed Part**

### **6.10.5.1 Handset Intrusion**

In case of ‘handset intrusion’ the FP shall perform the following checks when a PP is requesting an intrusion:

- Intrusion is enabled by the “Extended higher layer capabilities (part 2)”.
- The requested handset is involved in only 1 active voice call, meaning it is not in a conference call, not on-hold and also does not have a held connection in addition to its active connection.
- Line intrusion on the requested line is enabled in the ‘intrusion call’ field of the line settings list

If all above criteria are fulfilled, the FP shall allow the intruding PP to participate in the call by establishing a conference call, otherwise it shall use the “Busy system or line notification” procedure of [1], clause 7.4.8.3 for releasing the call of the requesting handset.

In case of a wildcard ‘handset intrusion’ ([1] “7.4.3.8.2 explicit intrusion call”) the FP shall check if there is only one active voice call in the system, as additional criteria to the above criteria.

### **6.10.5.2 Line Intrusion**

In case of ‘line intrusion’ the FP shall perform the following checks when a PP is requesting an intrusion:

- Intrusion is enabled by the “Extended higher layer capabilities (part 2)”
- The requested handset is involved in only 1 active voice call, meaning it is not in a conference call, not on-hold and also does not have a held connection in addition to its active connection.
- Line intrusion on the requested line is enabled in the ‘intrusion call’ field of the line settings list

If all above criteria are fulfilled, the FP shall allow the intruding PP to participate in the call by establishing a conference call, otherwise is shall send busy tone to the PP and release its call setup.

## **6.10.6 Portable Part**

The PP UI shall provide an easy way to select between ‘line intrusion’ and ‘handset intrusion’, in case both intrusion types are supported. In case of ‘line intrusion’, all lines the PP is attached to shall be presented as choice. In case of a ‘handset intrusion’ it shall be possible to perform an intrusion based on the wildcard procedure ([1] “7.4.3.8.2 explicit intrusion call”). If the FP cannot perform a wildcard intrusion because there is more than just one intrusion possibility, the content of the Internal Names List shall be presented to choose a specific PP for the intrusion procedure.

The PP shall provide an UI setting to set the ‘Value’ octet in the ‘intrusion call’ field of the Line Settings List for all lines the PP is attached to. In case the feature is not supported by the FP, the PP shall hide or shade the setting in the UI setting.

## **6.10.7 Optional Requirements**

None

## 6.10.8 Defaults and Settings

None

## 6.10.9 References

[1], 7.4.3.8 Intrusion call (from PP to FP)

## 6.11 No Emission Mode

### 6.11.1 Description

No Emission Mode is the ability to deactivate all radio transmissions in a DECT FP when it does not handle any connection.

### 6.11.2 Requirement Designator

The feature is just Optional for CAT-iq 2.0 FPs and PPs. In case it is implemented, the implementation shall follow this guideline.

### 6.11.3 Functional Requirements

No emission mode can have the status enabled, where the DECT system will enter the no emission mode if all criterions are fulfilled. It can also be disabled, meaning that even if all criterions are fulfilled, the FP shall not enter no emission mode.

If no emission mode is enabled, it can have two states:

“active” -> meaning that the FP has initiated the no emission sequence and FP and all PPs are in active no emission state

“not active” -> meaning that FP is sending out the dummy bearer and PPs are synchronised to the FP dummy, which is the normal passive state in a DECT system

### 6.11.4 General Requirements

No emission status enabled/disabled is controlled by the field ‘Emission mode’ in the DECT System Setting List.

### 6.11.5 Fixed Part

If no emission mode is not supported by the FP, the FP shall indicate this to the PP with the absence of the field ‘Emission mode’ in the DECT system settings list.

If no emission mode is supported by the FP, the field ‘Emission mode’ shall be content of the DECT Setting List and marked as editable.

### 6.11.6 Portable Part

If no emission mode is supported by the PP, it shall provide a setting to activate/deactivate it by changing the ‘Emission mode’ field entry in the DECT System Settings List. Additionally, a visual indication in the UI

status display shall inform the user about the state of the no emission mode which can be “active” (all PPs and FP have entered no emission state) and “not active”.

If the field ‘Emission mode’ is not available in the DECT System Setting List, the PP shall hide or shade the configuration of the no emission mode in the UI.

#### **6.11.7 Optional Requirements**

If no emission mode is supported by the FP and the FP provides a WEB UI access, it should be possible to enable or disable the feature.

#### **6.11.8 Defaults and Settings**

None

#### **6.11.9 References**

[1] NG1.M.5

### **6.12 Permanent and temporary CLIR**

#### **6.12.1 Description**

Permanent CLIR and temporary CLIR are the ability to suppress the outgoing number (calling party number) at the called party side.

#### **6.12.2 Requirement Designator**

The feature is just Optional for CAT-iq 2.0 FPs and PPs. In case it is implemented, the implementation shall follow this guideline.

#### **6.12.3 Functional Requirements**

The user shall have the possibility to suppress his number permanently. Permanent CLIR is a line dependent feature.

Additionally, it shall be possible to use CLIR on a call by call base.

#### **6.12.4 General Requirements**

None

#### **6.12.5 Fixed Part**

In case it is not possible for the FP to activate CLIR on network side, it shall indicate this to the PP by rejecting a change of the Value Octet in the Permanent CLIR field.

If the activation state of CLIR is known by the FP (e.g. due to reliable network feedback), it shall represent the state in the Value octet of the Permanent CLIR field. If the status is unknown, it shall always set the value field corresponding the last activation or deactivation request from the user.



### 6.12.6 Portable Part

The PP UI shall provide a configuration option to set and re-set the permanent CLIR feature by changing the Value octet of the Permanent CLIR field. The feature shall only be configurable for lines the changing PP is attached to.

The PP shall also support UI controlled temporary CLIR as specified in [1], '7.4.12.3 Temporary CLIR mode (call by call)'. The 'CLIR invocation' code shall be configurable in the PP UI.

### 6.12.7 Optional Requirements

None

### 6.12.8 Defaults and Settings

Network dependent activation and deactivation codes, if codes are needed for activation/deactivation.

### 6.12.9 References

[1], NG1.N.17 Calling line identity restriction

[2], 7.4.12.3 Temporary CLIR mode (call by call)

## 7 ANNEX A: GOAL OF DESCRIPTION / MOTIVATION

This chapter provides a list of improvements for each feature as a result of the cross test. The target of the Application Guideline is that it will cover all below listed issues. The list also helps to understand the background of the chosen specification approach.

### 7.1 Date and Time Synchronization

- An FT shall always use proper and reliable time source
- If there is no reliable time source available in a system or the user wants his very own system time, he shall be able to set "his/hers own" time with the PP
- PPs which re-locate due to power cycle, back in range or a registration process shall always get the system time right after the re-locate procedure
- The FP only controls the clock master bit (as direct consequence of the above requirements)

### 7.2 Collision handling Simultaneous List Access

- Prevent the FP from corrupt data in its list storage or data base (protect data integrity)
- Define handling of "blocked" lists for PPs and FP and let the user know that the list it is just temporarily not accessible

### 7.3 Call Waiting

- Try to simplify the very complex feature that a user is able to understand and differentiate that call waiting can applied/activated per line, per PP, internal or external
- Reduce complexity and improve usability by focusing the configuration of the call waiting feature to the FP only where an easily understandable user description can be provided thanks to the powerful WEB UI

- Consolidate the huge variety of different behaviours to a reduced subset of implementations

## **7.4 Multiple Calls**

- The Multiple Call setting has a huge impact on many features in CAT-iq and has been confusing the manufactures and product managers since the beginning. There is no compelling reason why a user should be able to change it. Either there really is a PSTN line the FP is connected to or the network provider wants to provide (mimics) the functionality of a PSTN line due to service related reasons.
- As a consequence of the above, prevent miss configuration of DECT systems by allowing to change the setting only on FP side, if it is a feature provided by the system or network supplier.

## **7.5 Handset to line attachment**

- This feature is not supported in many PPs and if, the implementations are pretty different.
- The description aims to harmonize the way the feature should be implemented and presented to CAT-iq users
- Prevent to have external incoming calls which “die” in the FP because no PP is ringing any more in case of misconfiguration

## **7.6 Call Forwarding (external calls)**

- In case of activation/deactivation based forwarding's, there is no good solution provided by the CAT-iq/DECT standard to support the feature because the network cannot provide feedback whether an activation procedure has worked or not. Thus, the feature will be separated into a “good” solution (protocol based) and a “poor” solution (with activation codes). The two solutions shall be specified separately to get the best out of both.
- For legacy (activation/deactivation code based) forwarding's default codes shall be required at FT side, as they are a “pseudo standard” at least within Europe.

## **7.7 Event Notifications**

- Try to get the same behaviour of missed call and voice message notification handling and having the same view (numbers) on PP displays
- Prevent notification issues and missed notifications after re-locate procedures due to power cycle, registration and getting back in RF range

## **7.8 Line Selection**

- This feature is not supported in many PPs and if, the implementation is done quite differently between PP suppliers.
- Find a way to harmonize the feature implementation and presentation to CAT-iq users without heavy restrictions on implementation freedom
- Prevent bad implementation approaches on FP side as seen in the interop tests

## **7.9 Implicit Call Intrusion**

- Mimics the behaviour of PSTN Line and should only be used on real PSTN FP lines which are in fact not very relevant any more in VoIP based home gateways.
- Provide a way to setup a call on the PP without the need to dial a number just for easier usage of the implicit call intrusion feature

### **7.10 Explicit Call Intrusion**

- Solve the problem with 'handset intrusion' which is independent from the list access setting for intrusion call
- Define a common way to use this feature on PPs as there are not (or not many) implementations available yet

### **7.11 No Emission Mode**

- Unify the way NEMO is indicated and configured by the user (enabled / disable / active / not active)

### **7.12 Permanent and temporary CLIR**

- If CLIR is not supported on a protocol base by the network but only an activation/deactivation code base, there simply is no good solution in CAT-iq/DECT to support this feature because the network can provide no feedback about the real activation status.
- Provide a feedback to the PP if the FP knows that CLIR is not supported

In case the FP has a reliable way to request the real state of the CLIR feature in the network, it shall provide this to the end user. If not, the status shall not be presented to the user because there is a good chance that the presentation could be