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Infrastructure of audiovisual services – Communication  
procedures

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**Gateway control protocol: User interface  
elements and actions packages**

ITU-T Recommendation H.248.3

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## **ITU-T Recommendation H.248.3**

### **Gateway control protocol: User interface elements and actions packages**

#### **Summary**

The packages in this Recommendation define a framework for specifying capabilities associated with user interface elements, such as text display, keys, dynamically labelled keys, indicators and alphanumeric input. In addition, specific extension packages for telephone keypads and telephone function keys are defined.

NOTE – This Recommendation has been renumbered. It was previously known as ITU-T Rec. H.248, Annex G.

#### **Source**

ITU-T Recommendation H.248.3 was prepared by ITU-T Study Group 16 (2001-2004) and approved under the WTSA Resolution 1 procedure on 17 November 2000.

## FOREWORD

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The World Telecommunication Standardization Assembly (WTSA), which meets every four years, establishes the topics for study by the ITU-T study groups which, in turn, produce Recommendations on these topics.

The approval of ITU-T Recommendations is covered by the procedure laid down in WTSA Resolution 1.

In some areas of information technology which fall within ITU-T's purview, the necessary standards are prepared on a collaborative basis with ISO and IEC.

## NOTE

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As of the date of approval of this Recommendation, ITU had received notice of intellectual property, protected by patents, which may be required to implement this Recommendation. However, implementors are cautioned that this may not represent the latest information and are therefore strongly urged to consult the TSB patent database.

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# ITU-T Recommendation H.248.3

## Gateway control protocol: User interface elements and actions packages

### 1 Scope

This Recommendation defines a package that extends the applicability of the H.248.1 Gateway Control Protocol. Specifically, the packages in ITU-T Rec. H.248.3 define a framework for specifying capabilities associated with user interface elements, such as text display, keys, dynamically labelled keys, indicators and alphanumeric input. In addition, specific extension packages for telephone keypads and telephone function keys are defined.

### 2 References

The following ITU-T Recommendations and other references contain provisions which, through reference in this text, constitute provisions of this Recommendation. At the time of publication, the editions indicated were valid. All Recommendations and other references are subject to revision; users of this Recommendation are therefore encouraged to investigate the possibility of applying the most recent edition of the Recommendations and other references listed below. A list of the currently valid ITU-T Recommendations is regularly published.

- ITU-T Recommendation H.248.1 (2002), *Gateway Control Protocol: Version 1*.
- ISO/IEC 10646-1:2000, *Information technology – Universal Multiple-Octet coded character set (UCS) – Part 1: Architecture and Basic Multilingual Plane*.

### 3 Display Package

PackageID: dis, 0x0014

Version: 1

Extends: None.

This package defines properties and signals associated with text display user interface elements. See Procedures for details of operation.

#### 3.1 Properties

##### *Number of rows*

PropertyID: nrows (0x0001)  
Description: Maximum number of rows on the display  
Type: integer  
Defined in: TerminationState.  
Characteristics: read only:

##### *Number of columns*

PropertyID: ncols (0x0002)  
Description: Maximum number of columns on the display  
Type: integer  
Defined in: TerminationState.  
Characteristics: read only:

### *Supported unicode code pages*

PropertyID: cdpgs (0x0003)

Description: a list of supported unicode pages

Type: list of enumerated type

Defined in: TerminationState.

Characteristics: read only:

Example: if the text display element supports U+2500 → U+25ff, U+2600 → U+26ff and U+2700 → U+27ff, this property would return "250, 258, 260, 268, 270" in cdpgs.

Unicode page U+0000 → U+00ff shall be supported in all implementations.

### *Cursor row position*

PropertyID: cr (0x0004)

Type: integer

Defined in: TerminationState.

Characteristics: read and write:

### *Cursor column position*

PropertyID: cc (0x0005)

Type: integer

Defined in: TerminationState.

Characteristics: read and write.

NOTE – Row and column numbering begin at 0. A display's origin is row 0, column 0. The origin is at the top left corner.

## **3.2 Events**

None.

## **3.3 Signals**

### *Display*

SignalID: di (0x0001)

Description: Display text.

Parameters

Row

ParameterID: r (0x0001)

Type: Integer

Insertion point row, relative to 0,0. Default is current cursor position.

Column

ParameterID: c (0x0002)

Type: Integer

Insertion point column, relative to 0,0. Default is current cursor position.

String

ParameterID: str (0x0003)

Type: String

Default is empty string (moves cursor position).



#### Attribute

ParameterID: a (0x0004)

Type: enumerated or list of enumerated

Possible values: plain (0x0001), blink (0x0002), invert (0x0003), underline (0x0004)

Default Value: Plain

#### *Clear Display*

SignalID: cld, 0x0002

Description:

This signal clears the entire display and resets the current cursor position to the origin (row 0, column 0).

Parameters:

None.

### **3.4 Statistics**

None.

### **3.5 Procedures**

Unicode is supported to provide for multiple languages. The Unicode Standard, Version 2.0 or ISO/IEC 10646-1:2000 [xxx] shall be the definitive standard intended when the term Unicode is used within the context of this Recommendation. All text display elements shall at least support the Unicode pages U+0000 → U+00ff as the basic character set. All text strings shall be encoded using UTF-8 as defined in ISO/IEC 10646 AM1 [xxx].

In the Display signal, text will be inserted beginning at the row and column given in the signal parameters, relative to 0,0. If no row and column parameters are given, the text will be inserted starting at the current cursor position. The current cursor position will always be advanced to the position immediately after the last character inserted.

Carriage return <Unicode U+000D> is supported in-string, and moves the text input to the beginning of the next line, clearing the remainder (if any) of the current line.

Text wrapping is not provided. A string will not word wrap to the next row. If a string cannot fit into the current row, it will be truncated without warning.

The attribute parameter applies to all characters contained in the current signal. If no attribute is provided, plain text will be displayed. For example, to turn on an attribute in the middle of a string, one would send a signal with a beginning sub-string of plain text, follow by a signal with the desired attribute(s) for the middle sub-string, and finishing with the signal containing the remaining sub-string of plain text.

## **4 Key Package**

PackageID: key, 0x0015

Version: 1

Extends: None.

This package defines the basic behaviour of key user interface elements. Specific key IDs are selected by name (keyid) from the list of keys. This package does not specify parameter values for keys.

Intended to be extended by other packages which have key behaviour.

#### **4.1 Properties**

None.

#### **4.2 Events**

##### *keydown*

EventID: kd (0x0001)

Detects key was pressed. If the key is already pressed when the keydown event is activated, the keydown event is reported as if keypress had just occurred.

EventDescriptor parameters:

None.

ObservedEventDescriptor parameters:

keyid (0x0001)

Type: Enumeration

Possible values: No values are specified in this package. Extensions to this package add possible values for keyid.

##### *keyup*

EventID: ku (0x0002)

Detects key up.

EventDescriptor parameters:

None.

ObservedEventDescriptor parameters:

keyid (0x0001)

Type: Enumeration

Possible values: No possible values are specified in this package. Extensions to this package would add possible values for keyid.

duration (0x0002)

Type: Integer

Units: milliseconds

Description: Key press duration (key down to key up).

#### **4.3 Signals**

None.

#### **4.4 Statistics**

None.

#### **4.5 Procedures**

None.

## 5 Keypad Package

PackageID: kp, 0x0016

Version: 1

Extends: key version 1

This package defines the keypad user interface element. The keypad package is used to represent a standard 10 digit key pad plus the '\*', '#', A, B, C, and D keys. Keypad may be used in conjunction with digit maps, similar to dtmf tone detection package.

Additional Keyid values, and mapping to DigitMap symbols (as described in 7.1.14/H.248.1):

Name	Description	DigitMap Symbol
k0 (0x0001)	Keypad digit 0	'0'
k1 (0x0002)	Keypad digit 1	'1'
k2 (0x0003)	Keypad digit 2	'2'
k3 (0x0004)	Keypad digit 3	'3'
k4 (0x0005)	Keypad digit 4	'4'
k5 (0x0006)	Keypad digit 5	'5'
k6 (0x0007)	Keypad digit 6	'6'
k7 (0x0008)	Keypad digit 7	'7'
k8 (0x0009)	Keypad digit 8	'8'
k9 (0x000a)	Keypad digit 9	'9'
ks (0x000b)	Keypad digit *	'E' or 'e'
ko (0x000c)	Keypad digit #	'F' or 'f'
kA (0x000d)	Keypad digit A	'A' or 'a'
kB (0x000e)	Keypad digit B	'B' or 'b'
kC (0x000f)	Keypad digit C	'C' or 'c'
kD (0x0010)	Keypad digit D	'D' or 'd'

### 5.1 Properties

None.

### 5.2 Events

#### *DigitMap Completion Event*

EventID: ce (0x0001)

Generated when a digit map completes as described in 7.1.14/H.248.1. Form of this event is identical to its definition in DTMF Detection Package (dd), E.6.2/H.248.1.

EventsDescriptor parameters:

Digit map processing is activated only if a digit map parameter is present, specifying a digit map by name or by value. Other parameters such as a KeepActive flag or embedded Events or Signals Descriptors may be present.

## *ObservedEventsDescriptor parameters*

### DigitString

ParameterID: ds (0x0001)

Type: String of digit map symbols (possibly empty) returned as a quotedString.

Possible values: a sequence of the characters "0" through "9", "A" through "F", and the long duration modifier "Z".

Description: the portion of the current dial string as described in 7.1.14/H.248.1 which matched part or all of an alternative event sequence specified in the digit map.

### Termination Method

ParameterID: meth (0x0003)

Type: enumeration

Possible values:

"UM" (0x0001) Unambiguous match

"PM" (0x0002) Partial match, completion by timer expiry or unmatched event

"FM" (0x0003) Full match, completion by timer expiry or unmatched event

Description: indicates the reason for generation of the event. See the procedures in 7.1.14/H.248.1.

## **5.3 Signals**

None.

## **5.4 Procedures**

None.

## **6 Label Key Package**

PackageID: labelkey, 0x0017

Version: 1

Extends: key version 1

This package defines the basic behaviour of labelled key user interface elements. Key labels may be used, for example, to provide information to the MGC regarding preconfigured telephone key assignments, allowing telephone moves and changes outside the initial administrative domain without requiring reconfiguration of keys. May also be used to provide static label information on the telephone user interface, identifying key function to the user without the need for manual labelling.

Specific keys are addressed by name (keyid) from the list of keys. This package does not specify parameter values for keys.

Intended to be extended by other packages which have key behaviour.

## 6.1 Properties

### Key List

Property ID: keylist (0x0001)  
Type: String, using the following format  
{keyid, label, label\_size}, ...}

#### Description:

Keylist property allows auditing and setting of keyid/label mapping. Label size is also given. This package defines syntax only; no specific keys are defined. See derived packages for the actual keyid lists.

Defined in: TerminationState

Characteristics: read and write

## 6.2 Events

None.

## 6.3 Signals

None.

## 6.4 Procedures

None.

## 7 Function Key Package

PackageID: kf, 0x0018

Version: 1

Extends: labelkey version 1

Common telephone function keys are defined in this package. This allows, for example, line keys and other function keys to be implemented without specific knowledge of the physical layout of the telephone.

Additional keyid values in keyup and keydown events and keylist property:

Name	Description
kh (0x0011)	Hookswitch
kl (0x0012)	Hold
kc (0x0013)	Conference
kt (0x0014)	Transfer
l001 - 1999 (0x0015-0x03fb)	Set of line keys
f001 - f999 (0x03fc-0x07e2)	Set of assignable function keys

### 7.1 Procedures

Function keys may have well known names (keyid) associated with function, for example "hookswitch", "hold", etc. These well know names identify the purpose of the particular key on the actual device. Function keys may also be assigned a label identifier by the MGC. This approach avoids assumptions and/or the requirement for application level knowledge of device-specific configuration of the physical resources to derive intended function of keys.

Function Keys can be corelated with physically associated Indicators using Function Key keyid and Indicator indid. If the IDs are identical, the MGC application can safely assume that the key and

indicator are physically (or otherwise) associated on the actual device. Again, this avoids assumptions and/or the requirement for application level knowledge of device-specific layout of the physical resources. See also the Indicator package (ind).

NOTE – The key sense of hookswitch (keyid = kh) is a special case. Key up indicates the hookswitch is depressed (i.e. handset is nominally on hook). Key down indicates the hookswitch is lifted (i.e. handset is nominally off hook). This allows for sensible use of the duration parameter in the keyup event which will normally give the duration the handset was off-hook.

## 8 Indicator Package

PackageID: ind, 0x0019

Version: 1

Extends: None

This package defines the basic behaviour of indicator user interface elements. Specific indicators are addressed by name (indid) from the list of indicators. Indicators may have well-known names (indid) associated with function, for example "message waiting", "hold", "line active", etc. This allows, for example, indicators to be implemented without specific knowledge of the physical layout of the telephone.

Intended to be possible to extend by other packages which have indicator behaviour.

### 8.1 Properties

#### *Indicator List*

Property ID: indlist (0x0001)

Type: String, using the following format  
{indid, label, label\_size}, ...}

Description:

Indicator List property allows auditing and setting of indid/label mapping. Label size is also given. This package defines syntax only; no specific indicators are defined. See derived packages for the actual indid lists.

Defined in: TerminationState.

Characteristics: read and write.

### 8.2 Events

None.

### 8.3 Signals

#### *SetIndicator*

SignalID: is (0x0001)

Set indicator state.

Parameters:

Indid (0x0001)

Type: Enumeration.

Possible values:

Name	Description
il (0x0001)	Hold
ic (0x0002)	Conference
l001-l999 (0x0003-0x03f9)	Set of line indicators
f001-f999 (0x03fa-0x07e0)	Set of assignable function indicators
ir (0x07e1)	Ringer/Alerter indication
im (0x07e2)	Message waiting indicator

state (0x0002)

Type: Enumeration.

Possible values: On (0x0001), off (0x0002), blink (0x0003), fast\_blink (0x0004), slow\_blink (0x0005).

Default is off.

### 8.4 Statistics

None.

### 8.5 Procedures

Indicators can be co-related with physically associated Function Keys using Indicator indid and Function Key keyid. If the IDs are identical, the MGC application can safely assume that the key and indicator are physically (or otherwise) associated on the actual device. This avoids assumptions and/or the requirement for application level knowledge of device-specific layout of the physical resources. See also the Function Keys package (kf).

## 9 Soft Key Package

PackageID: ks, 0x001a

Version: 1

Extends: labelkey version 1

Softkeys are a combination of a function key and a display user interface element, sharing some behaviour of each. Softkeys are intended to be dynamically updated by the MGC, based on the current state and context of the application controlling the MG. Since the display aspect and the key aspect are explicitly bound together, this avoids assumptions and/or the requirement for application level knowledge of device-specific layout of the physical resources.

See Procedures for details.

## 9.1 Properties

### *Number of softkeys*

PropertyID: nskeys (0x0001)  
PropertyType: Integer  
Characteristics: read only  
Defined in: TerminationState  
Description: Maximum number of individual soft keys.

### *Display size*

PropertyID: sz (0x0002)  
Type: Integer  
Characteristics: read only  
Defined in: TerminationState  
Description: Maximum number of characters that can be displayed in each softkey.

### *Supported unicode code pages*

PropertyID: cdpgs (0x0003)  
Description: a list of supported unicode pages  
Type: list of enumerated type  
Defined in: TerminationState.  
Characteristics: read only

## 9.2 Signals

### *SetDisplay*

SignalID: sd (0x0001)  
Description: Set softkey dynamic display content.  
Parameters:  
    keyid  
        Parameter ID: k (0x0001)  
        Type: Enumeration  
        Possible values: sk1-sk999 (0x0001-0x03e7)  
    displayContent  
        Parameter ID: d (0x0002)  
        Type: String

## 9.3 Procedures

The display aspect is a subset of the Display (dis) package. Unicode is supported to provide for multiple languages [see ISO/IEC 10646-1], and all SoftKey elements shall at least support the Unicode pages U+0000 → U+00ff as the basic character set. All text strings shall be encoded using UTF-8. If a string cannot fit into the display area, it will be truncated without warning.

The key aspect, including Events and labelling, derives directly from Label Key and Key packages. Softkey identifiers (keyid) are indexed 1, 2...N. N (nskeys) is the maximum number of softkeys supported by the MG implementation. Refer to the Label Key (labelkey) and Key (key) packages for further details.



## **10 Ancillary Input Package**

PackageID: anci, 0x001b

Version: 1

Extends: none

The ancillary input package is used to enter user alphanumeric information such as text input or scan data, which is forwarded to the MGC for processing. The information is presented as a Unicode character encoded in UTF-8 format [see ISO/IEC 10646-1].

### **10.1 Properties**

None.

### **10.2 Events**

*Character input*

EventID: ch (0x0001)

Description: A character has been input.

EventDescriptor parameters:

None.

ObservedEventDescriptor parameters:

id (0x0001)

Type: Character (UTF-8 character)

### **10.3 Signals**

None.

### **10.4 Statistics**

None.

### **10.5 Procedures**

None.





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