CI Plus Implementation Guidelines V1.0.6 (2013-10)

CI Plus Implementation Guidelines

Contents

Foreword

This document supplements the CI Plus specification [1] and the CI Plus Device Interim License Agreement [2] and provides further information on the expected implementation of the CI Plus specification. This document is not intended to exhaustively cover the whole specification, instead it presents information on specific topics which have been identified as requiring further explanation or where implementation divergence or behavioural issues are observed.

1   Scope

This document provides guidelines for the implementation of version 1.3.1 of the CI Plus Specification.

2   References

2.1   Normative references

[1]   CI Plus Specification, Content Security Extensions to the Common Interface v1.3.1

[2]   CI Plus Device Interim License Agreement www.ci-plus.com

[3]   R206-001, Guidelines for Implementation and Use of the Common Interface for DVB Decoder Applications, Technical Committee CENELEC TC 206, 1998

3   Definitions, symbols and abbreviations

3.1   Definitions

For the purposes of the present document, the following terms and definitions apply:

CICAM: Common Interface Conditional Access Module.

Host: Any device that includes a CI Plus compliant CAM slot.

3.2   Abbreviations

For the purposes of the present document, the following abbreviations apply:

CAM   Conditional Access Module
FTA   Free-To-Air
ICT   Image Constraint Token
RCT   Redistribution Control Token
SD   Standard Definition
URI   Usage Rules Information
WSS   Widescreen Signalling

3.3   Use of Words

The word *shall* is used to indicate mandatory requirements strictly to be followed in order to conform to the specification and from which no deviation is permitted *(shall* equals *is required to)*.

The word *should* is used to indicate that among several possibilities one is recommended as particularly suitable, without mentioning or excluding others; or that a certain course of action is preferred but not necessarily required *(should* equals *is recommended that)*.

The word *may* is used to indicate a course of action permissible within the limits of the specification *(may* equals *is permitted to)*.

4   Analogue Outputs

4.1   URI Use cases and Analogue Outputs

This section provides a summary of the URI analogue output behaviour. The tables of this section replicate information from the CI Plus Device Interim License Agreement[2], Exhibit E, URI Mapping Table and are re-arranged to show the effect of each URI use case on the analogue outputs and the effect of the URI on analogue recording.

4.1.1   Broadcast Content URI

Table 4.1 shows the URI use cases associated with content, where the URI is delivered by the CICAM to the Host from the broadcaster. The table shows how the URI determines the copy protection applied to the analogue outputs for this content.

Table 4.1: Analogue Outputs for URI use cases from Broadcast Content

Analogue Output of Broadcast Content Received from the CICAM			
Use case		**Analogue Content Control**	**Analogue Output Record Status**
1	**FTA**	Content received with no CA protection. i.e. unscrambled. No URI associated with this content.	Analogue recording may be subject to other FTA signalling mechanism.
2,4,6,8,20,22,24,34	**Copy Freely**	Analogue output not restricted or resized.	Analogue recording may be made of this content from any analogue output.
3,5,7,9,21,23,25,35	**Copy Freely (ICT)**	Analogue output restricted or resized to SD only.	
36,37,38,39,40,41	**Copy Freely (RCT)**	Macrovision shall be applied. If this feature is not available then the video shall not be output.	Recording not possible.
18	**Copy Once**	WSS signalling shall be applied. If this is not possible then the video shall not be output.	This URI may be used by a service operator to allow analogue recordings to be made.
19	**Copy Once (ICT)**	Analogue output SD only. WSS signalling shall be applied. If this is not possible then the video shall not be output.	
10,11	**Copy No More**	WSS signalling shall be applied. If this is not possible then the video shall not be output.	No recording shall be made or be possible from analogue outputs as the WSS Generation bit (b13) restricts copying.
12,13,14,15,16,17		WSS signalling and Macrovision shall be applied. If either of these features is not available then the video shall not be output.	
26,27	**Copy Never**	WSS signalling shall be applied. If this is not possible then the video shall not be output.	
28,29,30,31,32,33		WSS signalling and Macrovision shall be applied. If either of these features is not available then the video shall not be output.	
90,91,92,93,94,95,96,97	**DoT**	Analogue outputs disabled	Recording not possible.

4.1.2   Recorded Content URI

Considering playback of content that has been recorded by the Host, the content has a URI associated with it and this URI determines how the Host shall present this content on the analogue outputs. Table 4.2 shows how the URI determines the content signalling on any analogue output.

Table 4.2: Analogue Outputs for URI use cases from Recorded Content

Analogue Output of Host Recorded Content			
Use case		Analogue Content Control	Analogue Output Record Status
1	FTA	Content received with no CA protection. i.e. unscrambled. No URI associated with this content.	Analogue recording may be subject to other FTA signalling mechanism.
2,4,6,8,34	Copy Freely	Analogue output not restricted or resized.	Analogue recording may be made of this content from any analogue output.
3,5,7,9,35	Copy Freely (ICT)	Analogue output restricted or resized to SD only.	
36, 37,38,39,40,41	Copy Freely (RCT)	Macrovision shall be applied. If this feature is not available then the video shall not be output.	Recording not possible
18,19	Copy Once	WSS signalling shall be applied. If this is not possible then the video shall not be output.	No further recording shall be made or be possible from analogue outputs as the WSS Generation bit (b13) restricts copying.
20,21,22,23,24,25		WSS signalling and Macrovision shall be applied. If either of these features is not available then the video shall not be output.	
26,27	Copy Never	WSS signalling shall be applied. If this is not possible then the video shall not be output.	No recording shall be made or be possible from analogue outputs as the WSS Generation bit (b13) restricts copying.
28,29,30,31,32,33		WSS signalling and Macrovision shall be applied. If either of these features is not available then the video shall not be output.	
90,91,92,93,94,95,96,97	DoT	Analogue outputs disabled	Recording not possible.

4.1.3   Copy No More Content

It is not valid for an operator to broadcast "Copy No More" content, this does not mean that this type of content and URI will not be encountered by a Host. Where a CICAM has the capability to record content then if content was originally recorded as "Copy Once" the CICAM shall output a URI on playback to indicate "Copy No More".

4.1.4   Time-shifting and External Recording

When a recording device has the capability to convert time-shifted content from the time shift buffer to a persistent recording then special care shall be taken with "Copy Once" content. The Host shall avoid the situation where the content is recorded externally and the time-shift content is converted into a persistent recording, thereby allowing two copies of content to be made which is marked as Copy Once.

There are two approaches that may be adopted by the receiver to avoid illegal multiple copies. The receiver may output the content as "Copy Once" content and disable the transformation of time-shift content into a persistent recording. Alternatively the content may be output as "Copy No More" and allow the time-shift to be converted into a persistent recording.

4.1.5   Content Move

A CI Plus Host may implement a "Content Move" function. This function allows "Copy Once" content to be "moved" to another device. When this function is implemented the content shall be output as "Copy Once" and the content within the Host shall be permanently deleted.

4.1.6   WSS

Receivers that support analogue video output are strongly advised to fully support all signalling states of the WSS bits and to set them appropriately for each URI use case. Partial support for analogue output signalling is not recommended as this results in unexpected behaviour of the receiver and is a cause for customer complaints.

4.1.7   S/PDIF

Receivers that support S/PDIF digital audio output are strongly advised to fully support all signalling states of the SCMS bits and to set them appropriately for each URI use case. Partial support, where the receiver has to disable S/PDIF output for unsupported URI uses cases, has proved to have a very negative effect with consumers and results in the surround sound system being disabled on some programmes as the URI changes.

4.2   High Definition (HD) Analogue Output

This section clarifies the 31st August 2012 requirement that CI Plus licensed Hosts shall not output any portion of the video component of Controlled Content to the high definition analogue component outputs. Refer to the CI Plus Interim Device License Agreement, Annex C §2.3.

4.2.1   Analogue Video Component Outputs

For analogue component video outputs then no portion of any Controlled Content may be output on the HD Analogue Component terminal; meaning explicitly the phono jacks for YUV/YPbPr. Figure Figure 4.1 shows the connectors that are typically used on a Host for analogue component output, the figure is an illustrive example of one type of connector and manufacturers may choose to use other types of physical connectors for this output type. Uncontrolled content may continue to be output on the analogue component terminals.

Figure 4.1: A Typical Host Receiver Analogue Component Outputs

Table 4.3 shows how the URI determines the content signalling on any analogue component output and applies to any content resolution including both SD and HD.

Table 4.3: Analogue Component Output for URI use cases

Analogue Video Component Output			
Use case		Analogue Content Control	Analogue Component Output
1	FTA	Content received with no CA protection. i.e. unscrambled. No URI associated with this content.	Analogue video output is allowed.
2,4,6,8	Copy Freely	Analogue output not restricted or resized.	Analogue video output is allowed (subject to restrictions)
3,5,7,9	Copy Freely (ICT)	Analogue output restricted or resized to SD only.	
10,11,12,13,14,15,16,17	Copy No More	Controlled content.	Analogue video output shall be disabled.
18,19,20,21,22,23,24,25	Copy Once		
26,27,28,29,30,31,32,33	Copy Never		
34,35,36,37,38,39,40,41	Copy Freely (RCT)		
90,91,92,93,94,95,96,97	DoT		

4.2.2   Analogue Video SCART Outputs

Controlled content may be output on the SCART as previously defined in section 4.1 and is not affected by the 31st August 2012 "High Definition Component Output" sunset.

5   APDU Guidelines

This section provides some further clarification on the implementation of APDU messages.

5.1   Host Language

The Host_language APDU message sent by the Host to the CICAM provides information as to the Host preferred operational language in which information should ideally be displayed by the CICAM. The language is conveyed as a 24-bit ISO 639/2 value. The Host may send the CICAM either a ISO/639-2/B or ISO 639-2/T value. The CICAM is required to interpret both types of encoding for all languages natively supported by the CICAM. Table 5.1 shows some examples of the language codes for given languages.

Table 5.1: Example ISO/639-2 Language Codes

Language	ISO 639-2/T	ISO 639-2/B
Dutch	nld	dut
English	eng	eng
French	fra	fre
German	deu	ger
Modern Greek	ell	gre

5.2   Low Speed Communication

5.2.1   Maximum number of concurrent connections

A CICAM may ask a Host to open additional Low Speed Communication sessions for concurrent communication over two or more IP connections. Depending on the Host capabilities, the Host may accept or refuse such additional connections. The refusal may manifest itself to the CICAM as an error on opening a new session on the LSC resource or as comms_reply (Connect_Ack) with a non-specific error (as per appendix E.14.1).

The new session error typically occurs when the Host has insufficient memory available for buffering a new connection. The comms_reply error occurs when the Host is not able to setup a connection for the requested application–level protocol.

The CICAM must be robust and handle both error situations. The CICAM should manage the Host's maximum number of concurrent connections by closing connections that are not in use or by requesting a smaller buffer size by sending a comms_cmd (Set_Params).

5.2.2   comms_cmd Modification

The comms_cmd() APDU are related to the Set_Params command as described in CI Plus Specification v1.3.1, section 14.1.1. This section clarifies the Set Params behaviour required. The Set_Params command shall be sent after a comms_cmd (connect_on_channel) before any transfer is initiated as per R206-001:1998[3], as shown below:

CICAM	Commands	Host
A session with the low speed communication resource is requested	(... open_session ...) ⬅➡	If there is free resource then a session is granted.
Request for a connection on a channel.	comms_cmd (Connect_on_Channel) ➡	Attempt to connect on the channel.
	comms_reply (Connect_Ack) ⬅	Connection completes with status.
Configure the reception parameters and buffer size.	comms_cmd (Set_Params) ➡	
	comms_reply (Set_Params_Ack) ⬅	The communication parameters are set up.
After a connection is successfully established on the channel, the CICAM issues Get_Next_Buffer with comms_phase_id set to 15, to indicate to the Host that Buffers 0 to 15 may be filled .	comms_cmd (Get_Next_Buffer, comms_phase_id = 15) ➡	The Host receives data on the channel.
	comms_rcv (comms_phase_id = 0, data) ⬅	The Host sends the received buffer using the Comms Rcv object with comms_phase_id set to 0.

5.2.3   Connect_On_Channel retry_count and Timeout

The comms_cmd (Connect_on_Channel) parameters are defined as follows:

retry_count: The number of times that the connection should retry before failing the connection. If the field value is zero (0) then any failed connection shall not be retried. At most the Host attempts to establish the connection **retry_count**+1 times.

timeout: This is the timeout in seconds in which a connection attempt is aborted if no positive indication of the state of the connection is received within the timeout time. A timeout value of zero (0) means wait indefinitely. Where a non-zero retry_count is specified and a connection fails then the Host shall wait for **timeout** seconds to elapse before attempting to re-connect.

Example:

Consider the example where the comms_cmd (Connect_on_Channel) parameters are defined `retry_count = 2` and `timeout = 5`.

The Host behaviour when a connection cannot be established with these values is defined as

follows:

Try to connect
wait 5s
Failed; try to connect again, (first retry)
wait 5s
Failed; try to connect again, (second retry)
wait 5s (if the connection fails immediately and does not timeout then do not wait before sending a response to the CICAM)
Failed; send FAIL to CICAM

5.3   Content Control Resource v1

5.3.1   URI version advertisement

A Host should advertise URI v1 only when Content Control v1 is selected by the CICAM. The Content Control v1 resource allows the URI version to be negotiated however it is strongly recommended that the `uri_versions` field is set to "1" (indicating URIv1 only) in all exchanges between the Host and the CICAM.

There are known interoperability issues in the field with CI Plus v1.2 CICAMs which have implemented the Control Content resource version v1 which fail if the `uri_versions` field is set with any value other than "1".

5.4   Operator Profile

5.4.1   operator_info() profile name length recommendation

It is recommended that the length of the **operator_info::profile_name** field is restricted to a maximum of 24 displayable characters, including spaces, as receivers may not be able to display excess characters. Hosts should minimally display the first 8 characters of the profile name. Where the receiver is unable to display the whole string then the end of the string should be truncated ideally showing a character marker to indicate truncation i.e. using the Horizontal Ellipsis character (...).

Operators are advised to differentiate string names in the first few characters to better manage the possibility of name truncation by the Host.

5.5   Host Control v2

5.5.1 tune_request response time

When a CICAM requests the Host to tune to a service using a tune() or tune_broadcast_req() APDU then the Host should handle the request and respond to the CICAM as quickly as possible. To improve the user experience then it is recommended that the Host responds to the CICAM with a tune_reply() APDU within a maximum of 10 seconds. A tune operation is not always guaranteed to succeed and if the Host has not completed a successful tune within 10 seconds then it should send a failure response in the tune_reply() APDU.

6   PIN Management

6.1   Introduction

Modules supporting a PIN capability 'CA services with caching' or 'FTA and CA services with caching' may be susceptible to the occurrence of a race condition when either in 'Unattended recording' or 'Watch & Buffer' operating_mode. The race condition, if not properly handled by the module, may cause the Host to display content for a short period that should have been blanked.

6.2   Unattended Recording

Consider the following scenario: the user has programmed [1] an unattended recording of a Pay TV event with an EMI = '01' for which parental control has to be enforced starting from the very first second of the recording. The module implements PIN capability 'CA services with caching'. The CICAM PIN stored by the Host for use with the record_start message is valid.
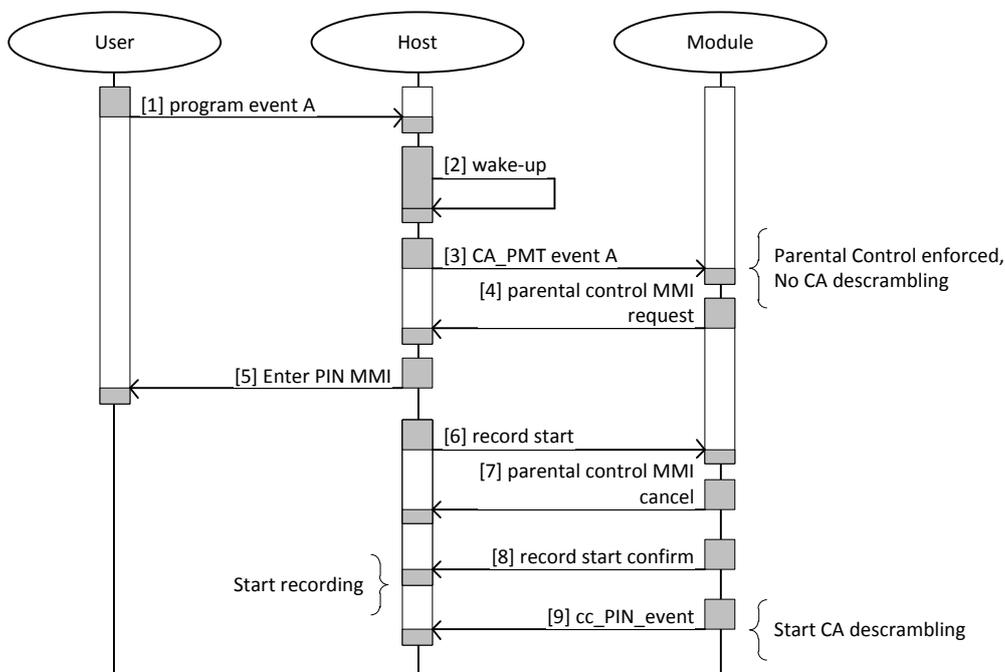

Figure 6.1: Unattended Recording race condition

When the Host wakes up to start recording the event [2], it first sends the CA_PMT [3] to the module and thereafter the record_start message [6] (including the CICAM PIN and the operating_mode). The race condition occurs when the module receives the CA_PMT and directly enforces parental control by sending a parental control MMI request [4][5] before it has received the record_start message [6]. This is depicted in the sequence diagram shown in Figure 6.1. The module enforces parental control by 1) not starting the descrambling of the PTV content and 2) initiating an MMI session to request the user to enter the CICAM PIN [4][5]. When the module receives the record_start message it is informed of the operating_mode and shall execute the following steps:

1.   Cancel the MMI_req previously initiated [7].

2. Send the confirmation on the record_start message to the host [8].

3. Set the pin_event_time_utc field of the cc_PIN_event message to the time the parental rating change was detected.

4. Send the cc_PIN_event message to the host [9].

5. Start CA descrambling the Pay TV event.

The Host may start recording (writing to storage) after it receives the confirmation on the record_start message. It is possible that the module will start CA descrambling at a later moment in time i.e. after the record start confirmation [8] has been sent, the Host shall be able to cope with this.

The received PIN event [9] must be associated with the start of the recording to prevent one or more frames being visible before parental control is enforced on playback.

6.3   Watch & Buffer

Consider the following scenario: the user changes from a FTA service A to a Pay TV service B with EMI = '01' for which parental control has to be enforced starting from the very first second of the recording. The module implements PIN capability 'CA services with caching'. The CICAM PIN stored by the host for use with the record_start message is valid.

When the user changes channel from service A to service B [1], it sends the CA_PMT [2] of service B to the module and thereafter the record_start message [5] (including the CICAM PIN and the operating_mode). The race condition occurs when the module receives the CA_PMT and directly enforces parental control by sending a parental control MMI request [3][4] before it has received the record_start message [6]. See the sequence diagram in Figure 6.2.

The module enforces parental control by 1) not starting the descrambling of the PTV content and 2) initiating an MMI session to request the user to enter the CICAM PIN [3][4]. When the module receives the record_start message [5] it knows the operating_mode and:

1. Sends the confirmation on the record_start message to the host [6].

2. Sets the pin_event_time_utc field of the cc_PIN_event message to the time the parental rating change was detected.

3. Sends the cc_PIN_event message to the host [7].

4. Starts CA descrambling of service B at time *t*.

The module must start the CA descrambling of service at time *t* with *t* defined as the time the cc_PIN_event is sent with an offset of 1 second. This offset should provide the Host with enough time to start blanking the AV. This implies that the buffering (writing to storage) of service B is not started until the time the record_start confirmation is received by the Host and is recommended that it is delayed further until the CA descrambling by the module is started.
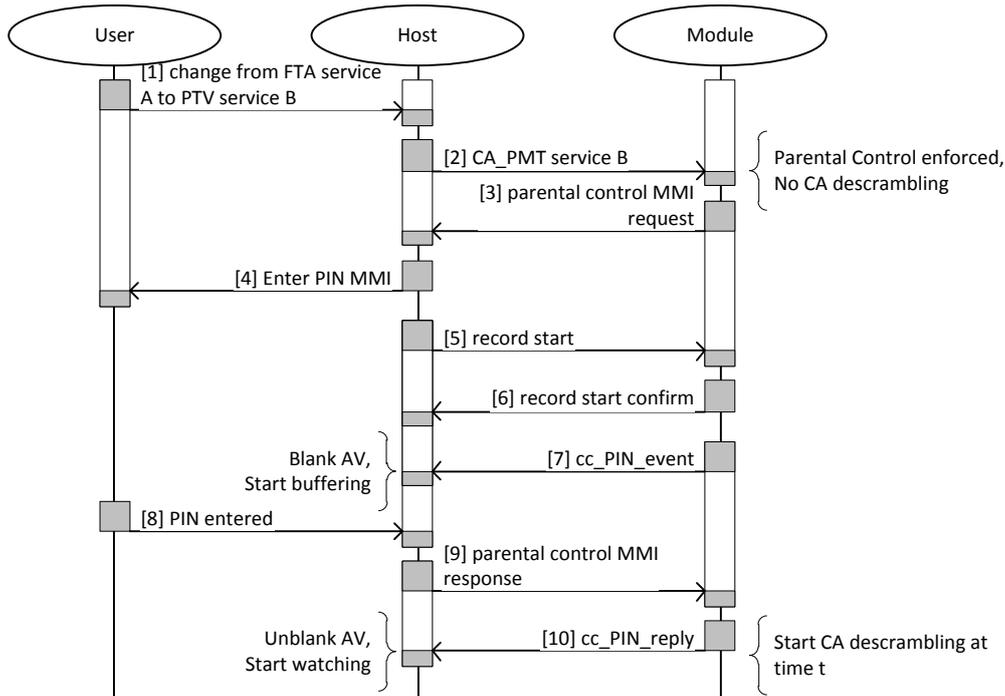
Figure 6.2: Watch & Buffer race condition

6.4   Application

CA Controlled Content in operating mode 'Unattended Recording' or 'Watch & Buffer' for Modules with PIN capability '3' or '4'.

7   CI Plus Application Level MMI

This section provides some further clarifications on the CI Plus Application Level MMI

7.1   Resident Programs

7.1.1   Test Input Mask

Refer to CI Plus Specification V1.3.1, section 12.8.1.1

The Resident Program Test Input Mask (TIM) is formally defined in ETSI ES 202 184 and is reproduced in this section for clarification until formally published, reference should be made to the actual specification. In the following specification extract then the Key Values Table examples have been corrected to match the actual key values.

START DRAFT TEXT COPY - ETSI ES_202184v020301pDRAFT[20120815]

11.16.2.3   TestInputMask New Resident Program

Synopsis: Allows an application to determine if a specific value of Input Event Mask is supported by the receiver.

Arguments: TIM(mask, result)

Table 11.672

In/out / in-out	Type	Name	Comment

input	**GenericOctetString**	Mask	The input mask to be tested. If the mask is an empty OctetString then result is true if the receiver supports *inputMaskExtension,*
output	**GenericBoolean** (shall provide an IndirectReference to a BooleanVariable)	result	If the receiver can provide all the requested keys defined in the mask to the application then the result is true, otherwise result is false.

11.16.2.4   Key values table

The following table defines for all key functions the UserInput EventData value they will generate and the bit in the InputEventMask that will enable the key to be processed by MHEG.
Byte 0 is the first byte in the bitmask OctetString, so the value 0:0x01 describes the LSB of the first byte.

Table 11.68

Function Name	UserInput EventData	InputEvent Mask Bit
Up	1	0:0x01
Down	2	0:0x02
Left	3	0:0x04
Right	4	0:0x08
0	5	0:0x10
1	6	0:0x10
2	7	0:0x10
3	8	0:0x10
4	9	0:0x10
5	10	0:0x10
6	11	0:0x10
7	12	0:0x10
8	13	0:0x10
9	14	0:0x10
Select	15	0:0x20
Cancel	16	0:0x40
Help	17	0:0x80
Red	100	1:0x01
Green	101	1:0x02
Yellow	102	1:0x04
Blue	103	1:0x08
Text	104	1:0x10
Info	105	1:0x20
Stop	120	1:0x40
Play	121	1:0x80
Pause	122	2:0x01
Skip Forward	123	2:0x02
Skip Back	124	2:0x04
Fast Forward	125	2:0x08
Rewind	126	2:0x10
Guide	300	2:0x20
Play/Pause	127	2:0x40

EXAMPLE: The bitmask value for the current Input Register 3 is: Text + Cancel + Red + Green + Yellow + Blue, which is 1:0x10 + 0:0x40 + 1:0x01 + 1:0x02 + 1:0x04 + 1:0x08 = 0:0x40 + 1:0x1F.

In MHEG text format this is '=40=1F'.
To create a bitmask that provides register 3 and the Guide key the value would be '=40=1F=20'.
If you wanted to handle only the Guide key then the first 2 bytes are empty, but must be added. So this would be '=00=00=20'.

7.1.2   High Definition Graphics Model

Refer to CI Plus Specification V1.3.1, section 12.4.5.

A Host capable of receiving HD video then the **HDExtension(N)** or **HDE(N)** is a mandatory part of the MHEG engine profile for CI Plus v1.3 and shall be present. **HDE()** shall be implemented as per the ETSI EN 202184 specification.

This requirement means that on a Host capable of decoding and presenting HD resolution video then:

HDE(N=0) shall return "true" if the receiver supports HD video.
HDE(N=1) shall return "true" if the receiver supports HD video and HD graphics; it shall return "false" if the receiver supports HD video but does not support HD graphics.

The CI Plus Specification V1.3.1 does not mandate that the Host supports a HD graphics plane, this may be optionally implemented, but when it is present then it shall be implemented according to EN 202184. There is no requirement for a SD only Host (i.e. a Host that is not capable of decoding and presenting HD resolution video) to support HDE().

Annex A:
CI Plus Specification v1.3.1 Known Errata

This Annex describes known significant errata in the CI Plus Specification V1.3.1.

A.1   Section 14.1.4 – Host Flow Control

The sequence steps accompanying Figure 14.2 contain an incorrect value for step 5 the return value should be 12 not 0. The correct text is:

5)   The Host sends to the CICAM a comms_reply with comms_reply_id = Send_Ack and return_value = **12** to acknowledge the transmission of the set of buffers from comms_phase_id = 2 to comms_phase_id = 12.

A.2   Section 14.7.5.3 – Operator Status APDU

The **nit_version** field text second paragraph suggests that the nit_version field cannot assume a value of zero. Replacement text is:

nit_version: This 5-bit field is only interpreted in the context of a non-zero profile and is set to the current version number of the NIT delivered by the CICAM. The Host shall monitor this field and shall respond to any change in the same manner as a NIT table update in a conventional broadcast network.

When profile_type is 0 then the field shall be zero and shall not be interpreted by the Host

A.3   Section N.1.2 – CICAM NIT

Within Table N.2 the private_data_specifier_descriptor is mandatory to broadcast if required not optional, the required text is:

NIT Descriptor	Tag Value	Loop	Actual	Other	Notes
private_data_specifier_descriptor	0x5f	1st/2nd	**Mb/Mr**	N/A	The CI Plus private data specifier value shall be recognised by all Hosts and shall precede any CI Plus private descriptors.

A.4   Section 5.7.5.3 – rl_copy_control_info example

Within Section 5.7.5.3, rl_copy_conrol_info the values provided in the example for the rl_copy_control_info value 0xf0 are incorrectly attributed as 237 days, the value should be 238 days. The example should read as follows:

If the CICAM receives rl_copy_control_info from the network which is for a higher URI version than the Host can support, the CICAM shall use the highest rl_copy_control_info value capable for the matching URI version.

For Example:

Network rl_copy_control_info = 0xf0 (**238** days)

Host with URIv2 rl_copy_control_info = 0xf0 (**238** days)

Host with URIv1 rl_copy_control_info = 0x3f (61 days)

A.5   Section 11.3.4.6 – Record Stop Protocol

Within Section 11.2.4.6, Table 11.49 at Step 1 *request_datatype_nbr = 0* is incorrect and should be *request_datatype_nbr = 1*. The correction to the table is shown below:

Table 11.49: Record Stop Protocol

Step	Action	APDU	Content		
1	Host informs CICAM recording has stopped.	cc_sac_data_req	send_datatype_nbr=1		
			i	datatype_id	datatype_len
			0	26 (program_number)	16 bits
			request_datatype_nbr=1~~0~~		
			i	datatype_id	
			0	42 (record_stop_status)	
2	CICAM sends a acknowledgement to the Host	cc_sac_data_cnf	send_datatype_nbr=1		
			i	datatype_id	datatype_len
			0	42 (record_stop_status) (see note 3)	8 bits
Notes:					
1:	Refer to Annex H for an overview of the parameters involved.				
2:	All SAC messages are encrypted and authenticated.				
3:	Table 11.17 defines the allowed values of this field.				

History

Document history			
Version	**Who**	**Date**	**Milestone**
1.0.0	LLP	14-Jan-2011	First Publication
1.0.1	LLP	19-Dec-2011	Host language codes
1.0.2	LLP	11-Apr-2012	Updated two parental control related race-conditions that require specific CICAM behaviour.
1.0.3	LLP	30-May-2012	URIv2 with CCv1 resource.
1.0.4	LLP	24-Oct-2012	Added Application MMI qualifications. Added MHEG HD and Text Input qualifications. Approved for publication at v1.0.4 by the CI Plus Technical Group on 2012-11-27.
1.0.5	LLP	21-Jan-2013	Added LSC set_params behaviour. Added recommendation on Operator Profile name length. Added Annex A with known specification errata. Approved for publication at v1.0.5 by the CI Plus Technical Group on 2013-02-07
1.0.6	LLP	14-Oct-2013	Corrected retention time example (A.4) Corrected Record Stop Protocol (A.5) Clarification of HD Controlled Content (4.2) Host Control v2 response time (5.5)