Hammerkop Message Definitions

Version 1.4

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### Serial Packet Format From HAMMERKOP to M-KOPA Unit

The packet contains binary data and is sent as a sequence tuples so unused parameters need not be included. Each tuple is made up of an identifier, length and data field.

The identifier and length fields will each be 1 byte. The Length field will indicate the number of bytes to follow in the data field.

Note the Length may be 0x00 in which case the data field will be absent.

The packet format is a sequence of tuples:

<PID><LENGTH><DATABYTES><PID><LENGTH><DATABYTES>

**PID**

The table below shows the possible identifiers, the length of data associated with each

|  |  |  |
| --- | --- | --- |
| Application Record | Identifier | Length of Data |
| App ID Record ID  App ID Request Enable  App ID Status  App ID Current Media  App ID Viewing Settings  App ID TV Error  App ID Message Displayed  App ID Serial Number | 0x21  0x51  0x52  0x53  0x54  0x55  0x56  0x59 | 0x02  0x00  0x01  0x06  0x02  0x0?  0x02  0x08 |

**LENGTH**

The LENGTH is one byte and identifies the number of data bytes following.

### Messages From Hammerkop To M-KOPA Unit

The interface between HAMMERKOP to M-KOPA Unit is via a Serial (RS232) datagram, the format of which is defined below.

Note that the TV should address these messages to 0000000000000001.

**APPPID\_REQUEST ENABLE**

|  |  |
| --- | --- |
| Byte | Description |
| 0  1 | App Id Request Enable  Length (0x00) |

When the TV is powered on by the M-KOPA Unit the M-KOPA Unit will send a message indicating whether the TV is enabled for operation or not. If this message is not received within INTERVAL\_TIMEOUT (default 10) seconds of the TV powering on then the TV will show the message “Connecting to M-KOPA unit” and it can send the Request Enable message to request an Enable status. This message can be repeated up to NUM\_RETRIES (default 3) times after timeout periods of INTERVAL\_TIMEOUT seconds. If the enable message has not been received after NUM\_RETRIES attempts then the TV should be locked and a message displayed on screen that says “M-KOPA Unit Not Found”.

### Messages From Hammerkop To M-KOPA Server

The interface between HAMMERKOP to M-KOPA Server is via a Serial (RS232) datagram that is received by the M-KOPA unit and then translated into the UDP datagram for transmission to the M-KOPA server, the format of which is defined below.

Note that the TV should address these messages to 0000000000000000.

**APPPID\_STATUS**

|  |  |
| --- | --- |
| Byte | Description |
| 0  1  2 | App Id Status  Length (0x01)  TV Status |

When the TV is powered on it will generate a message that indicates if it ready for use. If the TV encounters an event that results in the TV being locked the Status message will indicate what event has been encountered.

Status:

|  |  |
| --- | --- |
| Status | Identifier |
| ENABLED  DISABLED | 0  1 |

**APPPID\_CURRENT\_MEDIA**

|  |  |
| --- | --- |
| Byte | Description |
| 0  1  2  3  4-6  7 | App Id Current Media  Length (0x06)  Input Source  TV channel number (actual)  TV channel name  Media Player Type |

Each time the customer changes the media that they are viewing (e.g. broadcast TV, DVD, USB) or the channel that they are watching and that new media/channel has been stable for INTERVAL\_MEDIA (default 3) minutes the TV will generate a Current Media message to report what the new media/channel status is.

Input Source:

|  |  |
| --- | --- |
| Input Source | Identifier |
| ANTENNA  HDMI  AV  YPbPr  PC  MEDIA PLAYER | 0  1  2  3  4  5 |

TV channel number should be the actual number (not logical channel number). If the customer is watching a input source type other than ANTENNA the TV channel

TV channel name should be the first three characters of the channel name in ASCII format.

Media Player Type:

|  |  |
| --- | --- |
| Media Player Type | Identifier |
| PHOTO  MUSIC  MOVIE  TEXT  NONE | 0  1  2  3  4 |

**APPPID\_VIEWING\_SETTINGS**

|  |  |
| --- | --- |
| Byte | Description |
| 0  1  2  3 | App Id Viewing Settings  Length (0x02)  Volume  Brightness |

This message is generated to report the current use profile of the TV. It should be reported once per hour. The Volume will be a number between 0 and 100. The Brightness will be a number between 0 and 100.

**APPPID\_TV\_ERROR**

|  |  |
| --- | --- |
| Byte | Description |
| 0  1  2  3-? | App Id TV Error  Length (0x0?)  TV Error  Software Version |

This message allows the TV to record errors that are experienced during operation for remote troubleshooting and performance tracking. Additional errors can be defined by TopTech

Errors:

|  |  |
| --- | --- |
| Error | Identifier |
| DECRYPTION FAILURE  NO\_ENABLE\_MSG\_RETURNED  NO\_SIGNAL\_RECEIVED  DEFAULT\_KEYS\_CANNOT\_BE \_OVERWRITTEN  SERIAL\_NUMBER\_CANNOT\_BE\_OVERWRITTEN  DESTINATION MISMATCH | 0  1  2  3  4  5 |

**APPPID\_MESSAGE\_DISPLAYED**

|  |  |
| --- | --- |
| Byte | Description |
| 0  1  2  3 | App Id Message Displayed  Length (0x02)  Message on/off  Message Index |

The Message Displayed is returned in response to a message display update message received from the M-KOPA unit. Message on/off indicates if a message is current displayed on screen (0 for no message current displayed, 1 for a message current displayed). If a message is displayed then the index indicates which message is currently on screen.

|  |  |
| --- | --- |
| Messages | Identifier |
| No Message  “Connect to M-KOPA Control Unit”  “No credit – Please Top Up”  “Top Up Soon” | 0  1  2  3  4  5  6 |

**APPPID\_SERIAL\_NUMBER**

|  |  |
| --- | --- |
| Byte | Description |
| 0  1  2-9 | App Id Serial Number  Length (0x08)  Serial Number |

The Serial Number function returns the Serial Number stored in the non-volatile memory. This message should always be un-encrypted.

### Messages From M-KOPA Unit To HAMMERKOP

The interface between M-KOPA Unit To HAMMERKOP is via a Serial (RS232) datagram, the format of which is defined below.

The packet format is a sequence of tuples:

<PID><LENGTH><DATABYTES><PID><LENGTH><DATABYTES>

**PID**

The table below shows the possible identifiers, the length of data associated with each

|  |  |  |  |
| --- | --- | --- | --- |
| Application Record | Identifier | | Length of Data |
| App ID Enable | | 0x56 | 0x02 |

**LENGTH**

The LENGTH is one byte and identifies the number of data bytes following.

**APPPID\_ENABLE**

|  |  |
| --- | --- |
| Byte | Description |
| 0  1  2 | App Id Enable  Length (0x01)  Enable State |

When the TV is powered on by the M-KOPA unit this message will automatically be sent to the TV to enable or disable operation.

|  |  |
| --- | --- |
| Enable State | Identifier |
| DISABLED  ENABLED | 0  1 |

When the TV receives the enabled state it should allow access to all media and channels.

If the TV receives the disabled state then it should block access to all media and display the message on screen “No Credit – Please Top Up”.

If decryption fails on the Enable message then the TV should block access to all media and display the message on screen “Connect to M-KOPA unit”.

### Messages From M-KOPA Server To HAMMERKOP

The interface between M-KOPA Server To HAMMERKOP is via UDP datagram transmitted to the M-KOPA unit that will be translated into a Serial (RS232) datagram for transmission to HAMMERKOP, the format of which is defined below.

Note that the source address of these messages will be 0000000000000000.

The packet format is a sequence of tuples:

<PID><LENGTH><DATABYTES><PID><LENGTH><DATABYTES>

**PID**

The table below shows the possible identifiers, the length of data associated with each

|  |  |  |  |
| --- | --- | --- | --- |
| Application Record | Identifier | | Length of Data |
| App ID Display Message  App ID Setting Update  App ID Message Update  App ID Set Default Keys  App ID Set Serial Number  App ID Get Serial Number  App ID USB Unlock | | 0x57  0x58  0x59  0x63  0x64  0x65  0x66 | 0x03  Variable  Variable  0x10  0x08  0x01  0x02 |

**LENGTH**

The LENGTH is one byte and identifies the number of data bytes following.

**APPPID\_DISPLAY\_MESSAGE**

|  |  |
| --- | --- |
| Byte | Description |
| 0  1  2  3  4 | App Id Display Message  Length (0x03)  Message on/off  Message Index  Message location |

The Display Message requests that the TV turn on or off a message on the screen. Message on/off is 0 if the message is to be cleared from the screen and 1 if the message is to be displayed. If a message is to be displayed then the index indicates which message should be put on screen.

|  |  |
| --- | --- |
| Messages | Identifier |
| No Message  “Connect to M-KOPA Control Unit”  “No credit – Please Top Up”  “Top Up Soon” | 0  1  2  3  4  5  6 |

**The Message location sets the position that** message is to be displayed. Instruction/Guide indicates that the message is to be displayed across the bottom of the screen and dialog indicates that the message is to be displayed in a box that will ‘float’ in the middle of the screen.

|  |  |
| --- | --- |
| Message Location | Identifier |
| Instruction/Guide  Dialog | 0  1 |

**APPPID\_SETTINGS\_UPDATE**

|  |  |
| --- | --- |
| Byte | Description |
| 0  1  2  3  4 - N | App Id Settings Update  Length (Variable)  Location to be updated  Length of data to update  Data to update |

Allows for an update to the settings stored in non-volatile memory. For example, this allows an update to the values of INTERVAL\_TIMEOUT, NUM\_RETRIES, and INTERVAL\_MEDIA.

**APPPID\_MESSAGE\_UPDATE**

|  |  |
| --- | --- |
| Byte | Description |
| 0  1  2  3  4  5-N | App Id Message Update  Length (Variable)  Message on/off  Message location  Message String Length  Message String (max 25 bytes) |

The Message Update requests that the TV display a new message string on the screen. Message on/off is 0 if the message is to be cleared from the screen and 1 if the message is to be displayed.

**The Message location sets the position that** message is to be displayed. Instruction/Guide indicates that the message is to be displayed across the bottom of the screen and dialog indicates that the message is to be displayed in a box that will ‘float’ in the middle of the screen.

The Message String is up to 25 ASCII encoded bytes that are to be displayed on screen. Note that a 0 length string indicates the Message String should be cleared.

**APPPID\_SET\_DEFAULT\_KEY**

|  |  |
| --- | --- |
| Byte | Description |
| 0  1  2-17  18-33 | App Id Set Default Keys  Length (0x020)  Default Master Key  Default Data Key |

The Set Default Key function writes the default master key and the default data key to non-volatile memory. If the default keys are not all zeros when this function is called the “DEFAULT\_KEYS\_CANNOT\_BE \_OVERWRITTEN” error is returned. When the default keys and Serial number have both been stored in memory (non-zero) encryption is enabled and is used on all incoming messages.

**APPPID\_SET\_SERIAL\_NUMBER**

|  |  |
| --- | --- |
| Byte | Description |
| 0  1  2-9 | App Id Set Serial Number  Length (0x08)  Serial Number |

The Set Serial Number function writes the Serial number to non-volatile memory. If the Serial Number is not all zeros when this function is called the “SERIAL NUMBER\_CANNOT\_BE \_OVERWRITTEN” error is returned. When the default keys and Serial number have both been stored in memory (non-zero) encryption is enabled and is used on all incoming messages.

**APPPID\_GET\_SERIAL\_NUMBER**

|  |  |
| --- | --- |
| Byte | Description |
| 0  1 | App Id Get Serial Number  Length (0x00) |

The Get Serial Number function requests that the Hammerkop unit returns the Serial Number that has been assigned to it.

**APPPID\_USB\_UNLOCK**

|  |  |
| --- | --- |
| Byte | Description |
| 0  1  2-3 | App Id USB Unlock  Length (0x02)  Time to Unlock |

The USB Unlock function allows programming on the USB input for the amount of seconds specified by time to unlock.