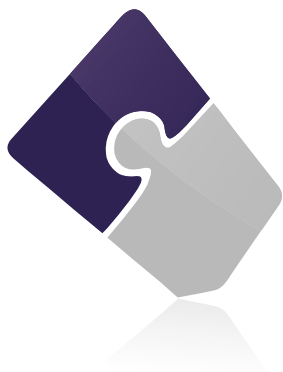# Amber™ Remote Hosting Interface

Description: Interface Specification for USSD over HTTP

Client: Pattern Matched Technologies™

System: Amber™ USSD Server

Document Approval

Position	Signature
Developer	
Quality Assurance	

Document History

Version	Author	Date	Change Details
1.0	PMT/RvG	2005-03-10	Document created
1.1	PMT/KA	2012-10-03	Updated to the PMT Template
2.1	PMT/AP	2013-02-08	Remove obsolete sections. Merge version 1.1 of this document with the 2.0 PDF versions. Include screen flow example.
3.0	PMT/OM	2013-11-05	Update to the new PMT Template,
3.1	PMT/AJ	2013-11-05	Added "Network" field to pass on from which MNO the request originated
4.0	PMT/AJ	2014-09-08	Added NI USSD interface
4.1	PMT/OM	2015-01-23	Updated to the new PMT Template
4.2	PMT/KA	2015-02-19	Document sign off amended Glossary link updated
4.3	PMT/KA	2016-04-12	Glossary Link Updated
4.4	PMT/DH	2017-04-18	Changed RESULT to CLOSE for 2.7 Summary
4.5	PMT/HBI	2017-07-21	Amended parameter breakdown for sections 2.2.3, 4.1.3 and 4.2.1 for new billing ticket format
4.5.1	PMT/HBI	2018-01-08	Removed NI USSD Interface and examples

Documentation Classification

Classification	Description
0	Open to Public – No restrictions
1	May be distributed to authorised third parties
2	For internal use only
3	Password protected – No unauthorised redistribution
4	For Director use only

Contents

1. Introduction

This document details the ARHI/USSD (Amber™ Remote Hosting Interface) that allows a third party to build USSD applications. This interface has been designed to reduce the complexity in building USSD applications.

1.1. Overview

ARHI/USSD Interface uses standard HTTP requests as transport. The application can be initiated from either the Mobile Phone or from the USSD Application.

Depending from where the USSD session is started you will be using either the Device Initiated HTTP interface (DIHI) or the Network Initiate HTTP Interface (NIHI).

2. Device Initiated HTTP interface

DIHI has the Gateway sending requests to an endpoint which hosts a service that handles USSD operations generated by the Mobile Phone and User.

Each USSD event is mapped to a single HTTP request made to the remote HTTP implementation.
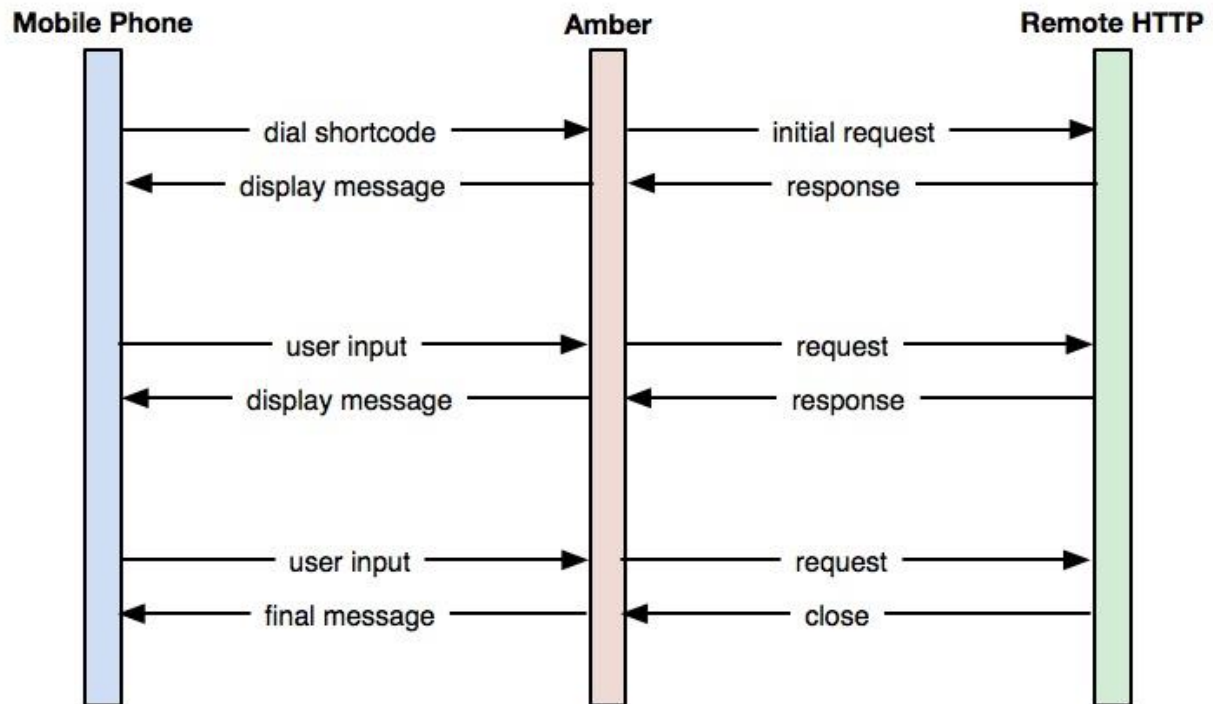
2.1. Implementation Guidelines

The DIHI service should generally conform to the following guidelines:

1. The processing for each request must generally take no more than 1000s and certainly no more than 5000ms.
2. Response messages must be less than 160 characters.
3. In the event of the DIHI service is not responding within these maximum response times, the server will send a TIMEOUT event to the service. These should generally be considered as indicating some problem with the service.

2.2. Overview

Each DIHI USSD application on the Amber™ Gateway can be configured to operate in one of two modes:

1. HTTP GET mode
2. HTTP POST mode

The GET mode is the simplest to implement on the Remote side as the parsing of parameters is already catered for by most HTTP implementations.

The specific mode is configured per application on the Amber™ server.

2.2.1. HTTP GET

The Amber™ Server will request the Remote HTTP implementation to process USSD sessions using HTTP GET requests. These will have the following general form:

```
<URL>?MSISDN=<MSISDN>&OPERATION=<OPERATION>&VALUE=<VALUE>&NETWORK=<NETWORK>&TICKET=<TICKET>
```

2.2.2. HTTP POST

The Amber™ Server will request the Remote HTTP implementation to process USSD sessions using HTTP POST requests. The body of these requests will have the following general XML form:

```
<USSD MSISDN="MSISDN" OPERATION="OPERATION" VALUE="VALUE" NETWORK="NETWORK"
TICKET="TICKET" />
```

2.2.3. Parameter Breakdown

Field	Type	Description
MSISDN	MSISDN/M	The MSISDN of the mobile phone in short international format e.g 27821234567
Operation	ENUM/M	One of: ➢ **REQUEST** A USSD Request from a Mobile Phone ➢ **RESULT** A USSD Result as entered on a Mobile Phone ➢ **ERROR** The USSD dialogue ended abnormally ➢ **TIMEOUT** The Remote HTTP interface did not respond within the timeout
Value	STR/M	A parameter dependent on the operation. Details operation parameter breakdowns.
Network	ENUM/M	This is the MNO in which the request originated, and will be one of the following: ➢ **vodacom** ➢ **mtn** ➢ **8ta** ➢ **cellc**
Ticket	STR/M	Max length: 35. The value of the billing ticket generate by the Gateway for this operation.

2.3. Request Operation

2.3.1. Purpose

This message indicates that the user has requested a specific USSD service. The VALUE parameter indicates the exact short code dialed on the user's phone. The OPERATION parameter will always have the value "REQUEST". The Remote Application must always respond with either a USSD Request or a USSD Close.

2.3.2. Parameter Breakdown

Field	Type	Description
Operation	STR/M	**REQUEST**
Value	STR/M	The short code dialled by the user e.g. ***120*123#**

2.4. Result Operation

2.4.1. Purpose

This HTTP request indicates that a user has responded to a USSD Request for the Remote Application. The VALUE parameter will contain the text as entered by the user of the mobile phone while the OPERATION parameter will always contain the string "RESULT". The Remote Application must always respond with either a USSD Request or a USSD Close.

2.4.2. Parameter Breakdown

Field	Type	Description
Operation	STR/M	RESULT
Value	STR/M	The string entered by the user on the mobile phone

2.5. Error Operation

2.5.1. Purpose

This HTTP request indicates that the dialogue with a user has been terminated.

The Server sends this request to the Remote Implementation in the event that any of the following user side errors occur:

1. The user cancelled the session from the phone (USERABORT)
2. A user session timeout occurred at both the upstream network provider or in the Amber™ platform (USERTIMEOUT)
3. The upstream network provider terminated the session abnormally (USERERROR)

Once the server has sent this message, the dialogue is considered terminated. Any information included in the body of this message is ignored.

2.5.2. Parameter Breakdown

Field	Type	Description
Operation	STR/M	**ERROR**
Value	STR/M	**USERABORT** or **USERERROR** or **USERTIMEOUT**

2.6. Timeout Operation

2.6.1. Purpose

This HTTP request indicates the Remote Implementation failed to send a response within the configured timeout.

The server sends this request to the Remote Implementation to indicate that the remote side did not respond in the timeout period. This scenario can occur for one of the following reasons:

1. The TCP/IP connection between the server and Remote Implementation is disconnected
2. The Remote Implementation returned an HTTP Error (Any return code other than HTTP/200)
3. The Remote Implementation took too much time processing the request

2.6.2. Parameter Breakdown

Field	Type	Description
Operation	STR/M	**TIMEOUT**
Value	STR/M	**TIMEOUT**

2.7. USSD Operation Responses

This section details the possible responses that the Remote Implementation can return to the Amber™ Server as the response to either a USSD **REQUEST** or **CLOSE.** The Remote Implementation must return the structures specified below in the body of the HTTP response.

2.7.1. Request

The Remote Implementation can request input from the User by sending the following XML fragment as the body of the HTTP response:

```
<USSD OPERATION="REQUEST">
<TEXT>Please enter a value</TEXT>
</USSD>
```

2.7.2. Close

The Remote Implementation can terminate the session with the user by sending the following XML fragment as the body of the HTTP response:

```
<USSD OPERATION="CLOSE">
<TEXT>Thank you for using this service</TEXT>
</USSD>
```

3. Example DIHI USSD Session Screen Flow

Below is an example of a DIHI USSD session, with the XML responses returned to the device. Please note that newlines are specified with a newline character (\n), as per the Unix convention.

Lines specified using a carriage return character and a newline character (\r\n) are not supported.

3.1.1. Request From Amber™

```
MSISDN = 27820002222
OPERATION = REQUEST
VALUE = *120*123#
NETWORK = vodacom
TICKET = 218651008
```

3.1.2. Response From Remote HTTP Service

```
<USSD OPERATION="REQUEST">
<TEXT>Welcome 27820002222

You dialed "*120*123#". Please choose an option:

1) What is my mobile number?

0) Main Menu
9) Exit
</TEXT>
</USSD>
```

3.1.3. Request From Amber™

```
MSISDN = 27820002222
OPERATION = RESULT
VALUE = 1
NETWORK = vodacom
TICKET = 218651008
```

3.1.4. Response From Remote HTTP Service

```
<USSD OPERATION="REQUEST">
<TEXT>Your mobile number is 27820002222

0) Main Menu
9) Exit
</TEXT>
</USSD>
```

3.1.5. Request From Amber™

```
MSISDN = 27820002222
OPERATION = RESULT
VALUE = 0
NETWORK = vodacom
TICKET = 218651008
```

3.1.6. Response From Remote HTTP Service

```
<USSD OPERATION="REQUEST">
<TEXT>Welcome 27820002222
You dialed "*120*123#". Please choose an option:

1) What is my mobile number?

0) Main Menu
9) Exit
</TEXT>
</USSD>
```

3.1.7. Request From Amber™

```
MSISDN = 27820002222
OPERATION = RESULT
VALUE = 9
NETWORK = vodacom
TICKET = 218651008
```

3.1.8. Response From Remote HTTP Service

```
<USSD OPERATION="CLOSE">
<TEXT>Goodbye!</TEXT>
</USSD>
```

4. Glossary

For a full Glossary on Standard terms used, please refer to the following link.

http://www.patternmatched.com/glossary