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AWSOM WELL HEAD UNIT – SMS MESSAGE FORMAT

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SMS Message Format

SMS Message Format

1. Executive Summary

For the EXCEL Spreadsheet Automation to identify the variables from the received SMS, the format must be consistent. This document details the Format of these Messages

2. Background

This document is one of a series of documents that outline the operation, use and integration aspects of *A Well System for Ongoing Maintenance* (AWSOM). The AWSOM system consists of four units, the AWSOM:

a) Well Head Unit,

b) Base Station

c) EXCEL Spreadsheet (with Visual Basic Automation)

d) Web Site

The above units, together with an associated PC/Workstation, are linked to form *A Well System for Ongoing Maintenance* (AWSOM).

3. Message Formats

The EXCEL Spreadsheet will attempt to identify each type of Message format so that it can be processed.

a. Unrecognised Format

If the Message Format cannot be recognised, then it is assumed to be a marketing message from the Network Provider and is deleted without any processing.

b. UK 'EE' Pay-As-You-Go Balance SMS

The start of the Message is stored and compared to the incoming Message and if a match is found, then the Message is shown so that the END USER can read the message. The EE Server sends two consecutive SMS' to provide this information. It is assumed that after finding the first SMS then the second SMS is in the next available Message Store.

c. UK 'EE' Pay-Monthly Balance SMS

The start of the Message is stored and compared to the incoming Message and if a match is found, then the Message is shown so that the END USER can read the message. The EE Server sends three consecutive SMS' to provide this information. It is assumed that after finding the first SMS then the second and third SMS' are in the next two available Message Stores.

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d. First Message Format

This Message's unique characteristic is that it contains five "=" signs.

Two separate parts of the SMS are processed. First the Date, Time and Mobile Phone Number of the SMS is recovered from the Network Server, Viz:

Data Derived from the SMS Header	
Description	**Example**
The date the SMS was sent (2 digits for the year; 2 digits for the month & 2 digits for the day; all separated by a "/")	27/04/2018
The time the SMS was sent	12:00:00
Originating Mobile Telephone Number	+447#########

The second part of the "Human Readable Interpretation (HRI)" is broken down into variables that are entered into the EXCEL Spreadsheet. There is the inherent limit of 161 characters in a SMS.

The EXCEL Spreadsheet Automation identifies two delimiting characters, one before and one after such that the information between then is then stored in a Variable that is then entered into one or more Worksheets.

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Data Derived from the SMS' Text Description	Example	Length	Sub-Total
Preamble and delimitator	AWSOM#	6	6
Well's identity	9999	4	10
Delimitator (Space)	" "	1	11
Preamble	"MxTmp"	5	16
Delimitator (space & = & space)	" = "	3	19
Maximum Temperature reading (will be two significant digits and two decimal place)	70.90	4	23
Delimitator (colon & Carriage Return)	":" & CR	2	25
Preamble and delimitator ("Ni-Battery = ")	"Ni-Battery = "	12	37
The current value of the NiMH Battery reading (will be one significant digit and two decimal place)	5.72	4	41
Delimitator (space & "Volts (" & percentage charged & ")"& colon & Carriage Return)	" Volts (56%):" & CR	13	54
Preamble and delimitator ("PUMP-COUNT = ")	"PUMP-COUNT = "	12	66
The value of the 'counter' up to six digits in length (rolls over back to 1 when a million has been counted)	999999	6	72
Delimitator (colon & Carriage Return)	":" & CR	2	73
Preamble and delimitator ("Work-day = ")	"Work-day = "	11	84
The number of days since the phone's memory was cleared (max number of 999 days)	900	3	87
Delimitator (colon & Carriage Return)	":" & CR	2	89
Preamble and delimitator ("Powered-time = ")	"Powered-time = "	15	104
The number of time that the Arduino has run through its main loop (up to four digits) (rolls over back to 1 when a 10,000 has been counted)	9999	4	108
Data Terminator (":" & Carriage Return)	":" & CR	2	110

e. Second and Subsequent Message Formats

These Message Formats are currently undefined and are therefore not used.

4. Recommendations

It is recommended that this document is used to ensure that any SMS generated by various versions of the Arduino Sketches are consistent with the First Message Format.

If a departure from this Standard is required, then please advise the "Code Engineer" so that the Message Format can be defined, and the necessary EXCEL Automation Coding can be updated.

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5. Modules; Calls and Functions

This was a large Project and as such was broken down into manageable portions to be coded. If it was required to return a value, then a function was coded; else a sub-routine was coded. To assist in reading the code, the Hungarian Protocol has been implemented; sub-routines are prefix with “sub” and functions with “fun”.

These manageable portions are then incorporated into other sub-routines and functions and so on.

Call / Function	**Description**	**Storage Location**
subConnectToArduino()	This is the main routine that reads the Data from the Base Station and then processes that data	basLibrary
subBalance1()	This sub-routine processes a balance reply message from a 'pay-as-you-go' SIM Card. The data is two SMS’ long, so the data is concatenated. A maximum of 255 characters can be displayed.	basLibrary
subBalance2()	This sub-routine processes a balance reply message from a 'pay-monthly' SIM Card. The data is three SMS’ long, so the data is concatenated. A maximum of 255 characters can be displayed.	basLibrary
subRedundancy1()	This sub-routine processes the First Message Format SMS. This routine parses the variables from the read message. These variables are: MobileNumber Well#ID strYear strMonth strDay strTime DateTime MaxTemp NIMH PumpCount WorkDay PowerLoop The unique criteria for confirming this type of message is that it contains five "="signs.	basLibrary
subRedundancy2()	Place holder to parse the Second Message Format	basLibrary
subRedundancy3()	Place holder to parse the Third Message Format	basLibrary

6. Compliance

a. There are some issues with the BAUD Rate for the USB Serial COM Port. The “Code Engineer” needs to review the situation.
b. The “Systems Engineer” has changed the unique identifier from the Mobile Phone Number to the Well #ID and the “Code Engineer” has yet to make the change over.

7. Conclusions

It is necessary to have a consistent Message Format so that the EXCEL Spreadsheet Automation can consistently decode the SMS.

This document provides a mechanism for achieving this activity.

8. Glossary

- **Global Constant**
  A constant value that is available to be used by any sub-routine. It is defined in the “declarations” section of a Spreadsheet/Workbook Visual Basic Module.
- **Global Variable**
  A variable value that is available to be used by any sub-routine. It is defined in the “declarations” section of a Spreadsheet/Workbook Visual Basic Module.
- **Return Value**
  For a sub-routine to perform as a ‘Function’ it must return a value when it finishes its “function”.
- **“Human Readable Interpretation (HRI)”**
  This form of data is where extra information is inserted to make the date more readable to Human Beings.