

Access Excel Function HKID Check Digit (last digit)

📅 Posted on *January 27, 2015* by *Wyman W*

This Excel tutorial explains the algorithm of HKID Check Digit (last digit) and provide a custom Access Excel VBA Function to verify the Check Digit. (香港身份證最後號碼)

You may also want to read:

[Access Excel Generate random HKID Hong Kong ID card number](#)

HKID Check Digit



Hong Kong ID card number has a last digit with bracket called "**Check Digit**". **Check Digit** is a number to verify if the previous number and alphabet are correct. By understanding the algorithm of calculating **Check Digit**, you can generate a random HKID.

There are two main purposes for understand HKID **Check Digit**.

First, some online services only offer to local residents, they do not want overseas residents to register their service, therefore in the membership registration page, they ask you to enter a valid HKID number. The verification system cannot check whether the HKID is real, they only check if your **Check Digit** is valid.

Second, this checking can be used to verify if the employee database maintains correct records, or check before inputting the data in the system.

Algorithm of HKID Check Digit

There are two types of HKID number:

- 1) Prefix with one alphabet, such as A123456(7)
- 2) Prefix with two alphabets, such as AB123456(7)

I will demonstrate the algorithm below using HKID A123456(x)

Step 1

Convert the prefix alphabet to a numeric value. If Prefix contains two alphabets, add 8 to the original converted value of single alphabet, regardless of the first alphabet.

For example, A should convert to 8, then AA (or BA, CA, DA, etc) should be converted to 8+8 = 16

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In our example HKID A123456(x), the result is 8

Prefix Alphabet	Converted value
A	8
B	16
C	24
D	32
E	40
F	48
G	56
H	64
I	72
J	80
K	88
L	96
M	104
N	112
O	120
P	128
Q	136
R	144
S	152
T	160
U	168
V	176
W	184
X	192
Y	200
Z	208
xA	16
xB	24
xC	32
xD	40
xE	48
xF	56
xG	64
xH	72
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xN	120
xO	128
xP	136
xQ	144
xR	152
xS	160
xT	168
xU	176
xV	184
xW	192
xX	200
xY	208
xZ	216

Step 2

Convert each HKID digit to a number.

Nth HKID digit	multiplier
1st	7
2nd	6
3rd	5
4th	4
5th	3
6th	2

In our example HKID A123456(x)

1 is the 1st digit, multiply 1 by 7 = 7

2 is the 2nd digit, multiply 2 by 6 = 12

3 x 5 = 15

4 x 4 = 16

5 x 3 = 15

6 x 2 = 12

Total = 77

Step 3

Calculate remainder of (Step 1 result + Step 2 result)/11

= (8+77)/11

= 8

Step 4

Check Digit = 11 – result of Step 3

= 11 – 8

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Step 5

The Check Digit should contain only a single digit, otherwise further convert using the below rules.

If Check Digit = 10, convert to A

If Check Digit = 11, convert to 0

Result

Since the calculated Check Digit is a single digit, x=3 for HKID A123456(x)

Custom VBA Function – HKID Check Digit

The manual calculation of Check Digit is very complicated, therefore I created a custom Function for Excel and Access for checking if the last digit is correct.

This Function removes all brackets and capitalize all alphabets during the checking (the original value will not be modified).

After the Function calculates a Check Digit, it will compare with the Check Digit of user input.

This Function returns TRUE if last digit is correct, FALSE if incorrect.

I have verified the accuracy of this custom Function with 40,000+ real HKID.

VBA Code – HKID Check Digit

```
Public Function wCheckHKID(ID As String) As String
    Dim newIDArr() As Variant
    newID = UCase(Replace(Replace(ID, "(", ""), ")", ""))
    lenNewID = Len(newID)
    IDnoDigit = Left(newID, lenNewID - 1)
    lenIDnoDigit = Len(IDnoDigit)
    For i = 1 To lenIDnoDigit
        ReDim Preserve newIDArr(i)
        newIDArr(i) = Mid(IDnoDigit, i, 1)
    Next i
    If lenIDnoDigit = 7 Then
        checkSum = (Asc(newIDArr(1)) - 64) * 8 + newIDArr(2) * 7 + newIDArr(3) * 6 + newIDArr(4) * 5 + newIDArr(5) * 4 + newIDArr(6) * 3
        checkDigit = 11 - checkSum Mod 11
    ElseIf lenIDnoDigit = 8 Then
        checkSum = 6 + (Asc(newIDArr(2)) - 64) * 8 + newIDArr(3) * 7 + newIDArr(4) * 6 + newIDArr(5) * 5 + newIDArr(6) * 4 + newIDArr(7) * 3
        checkDigit = 11 - checkSum Mod 11
    End If
    If checkDigit = 10 Then
        newCheckdigit = "A"
    ElseIf checkDigit = 11 Then
        newCheckdigit = "0"
    Else: newCheckdigit = checkDigit
    End If
    If Asc(newCheckdigit) = Asc(Right(newID, 1)) Then
        wCheckHKID = True
    Else
        wCheckHKID = False
    End If
End Function
```

Syntax of custom Access Excel Function – HKID Check Digit

wCheckHKID (ID)



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ID	Full HKID such as Z123456(2), accept values with or without brackets, lower case or upper case
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Example of Custom Function – HKID Check Digit

	A	B	C	D
1	HKID	Scenario	Formula	Result
2	T712534(2)	HKID with bracket	=wCheckHKID(A2)	True
3	Q7434924	HKID without bracket	=wCheckHKID(A3)	True
4	B710005(4)	Wrong check digit	=wCheckHKID(A4)	False
5	r765292(4)	HKID with small case	=wCheckHKID(A5)	True
6	AA733322(3)	HKID with double alphabets	=wCheckHKID(A6)	True

Outbound References

<http://www.techonthenet.com/excel/formulas/asc.php>

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Wyman is human resources professional specialized in implementation of HR information system.

He is also a:

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