
Samsung DCS Application Note

No. 2

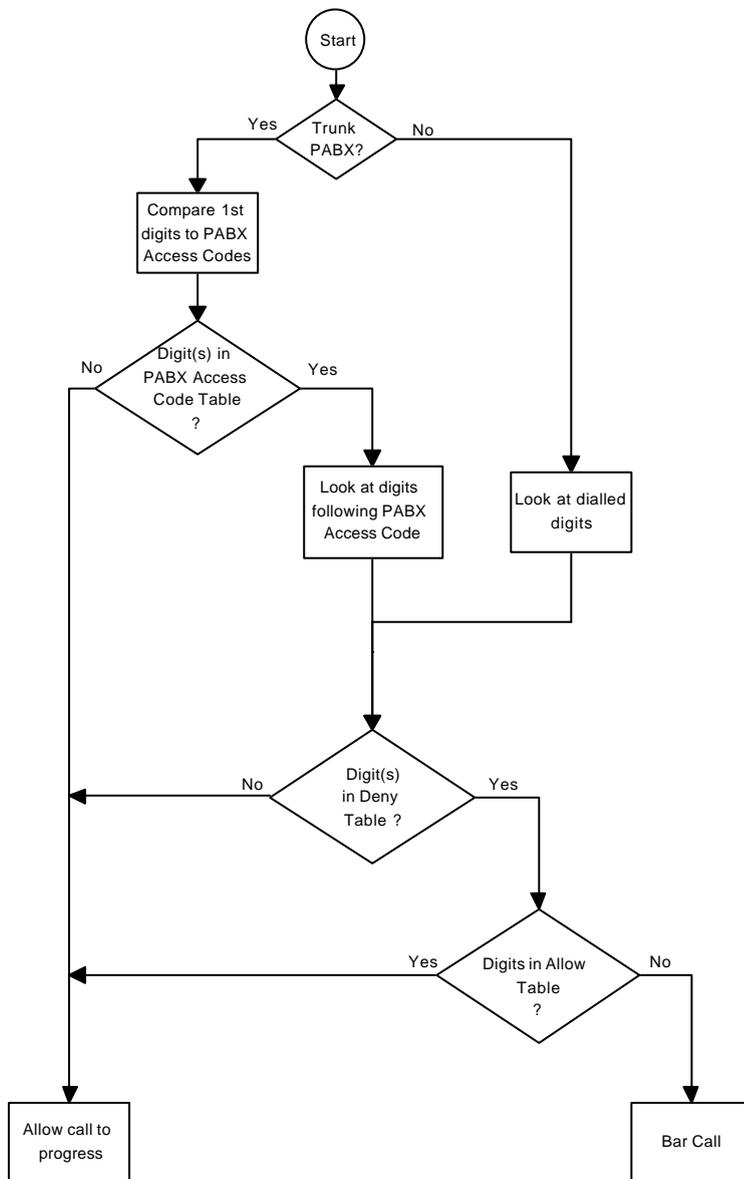
September 1996

Topic Toll Restriction

Introduction

Toll Restriction is the ability to control external trunk call destinations. The Samsung DCS supports a comprehensive Toll restriction system which can limit access to called destinations based on dialled digits or time of day. Restrictions can be placed on stations and or trunks.

The flowchart below shows how the Samsung DCS system performs toll restriction.



Flowchart Description

PABX Trunks

It can be seen from the flowchart that trunks programmed as PABX trunks (MMC 401) will only have toll barring applied if the user has accessed the external network via the PABX. The DCS determines if the external network has been accessed by comparing the initial digits dialled with those digits programmed in MMC 709. There is provision for five PABX codes in MMC 709.

CO Trunks

When a user dials out on a trunk designated as a CO trunk in MMC 401, the dialled digits are compared to the data programmed in the Toll Deny Table (MMC 702). If the digits do not match with the data programmed in the Toll Deny Table, the DCS allows the call to proceed.

If the dialled digits match the data programmed in the Toll Deny Table, the Toll Allowance Table is checked. If the digits dialled match the data in the Toll Allowance Table, the call is allowed to progress. If the digits in the Toll Allowance Table do not match the dialled digits, then the call is barred.

It is important to note that the Toll Allowance Table is used only if the first digit(s) dialled match the data in the Toll Deny Table.

Programming Associated with Toll Restriction

It should be noted the Samsung DCS system does not use a hierarchy order associated with Class of Restriction (COR). This means that each of the programmable Class Of Restriction categories are independent of each other. For example, COR B can be programmed to have less access than COR D but more access than COR F.

MMC 301- Assign Station COS

MMC 301 is used to program the Class of Service (COS) of stations. Each of the 30 available classes of Service is defined in MMC 701. COS is programmed for day operation and night operation. For example, the customer may request less privileges for a station(s) when the DCS is in night service.

MMC 701- Assign COS Contents

There are many sections to MMC 701 including the first data field which relates to Class of Restriction (COR). This application note only refers to the COR data field of MMC 701.

There are eight choices for Class of Restriction; A, B, C, D, E, F, G and H. Of the eight choices, only B, C, D, E, F and G can be defined by the technician.

Class of Restriction	Definition
A	No Toll Restrictions for COR A
B	Technician defined
C	Technician defined
D	Technician defined
E	Technician defined
F	Technician defined
G	Technician defined
H	No Outgoing Access for COR H

The technician can define the Classes of Restriction using the following MMCs:

MMC	Title
MMC 702	Toll Deny Table
MMC 703	Toll Allowance Table
MMC 704	Assign Wild Character

MMC 702 - Toll Deny Table

There are 200 locations in the MMC 702 Toll Deny Table. Each location consists of two fields.

The first digit(s) in the dial string to be barred are entered in the first field of each location. Valid data includes digits "0" to "9", *, # and Wild Characters X, Y and Z. The maximum number of characters in the first field is twelve.

The second field is used to indicate which COR the first field relates to.

If a "1" is programmed for a COR in the second field, the first field applies to that COR. If a "0" is programmed in the second field for a COR, that COR is not barred for the data in the first field.

Example

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Deny (007) : B C D E F G
0055       : 0 0 1 1 1 1
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In this example, stations with COR B and C are not barred from dialling 0055 numbers but stations with COR D, E, F, and G are barred from dialling 0055 numbers.

Examples are given later in this Application Note using Wild Characters in MMC 702.

MMC 703 - Toll Allowance Table

There are 200 locations in the MMC 703 Toll Allowance Table. Each location consists of two fields.

As mentioned above, MMC 703 is only used if the first digit(s) in the dialled string are programmed in MMC 702. MMC 703 may be considered as “an exception to the MMC 702 rule”. The flowchart describes how the Samsung DCS uses MMC 702 and MMC 703.

The first field contains the digit(s) that are the exception and the second field indicates to the DCS which CORs the exception applies. This is a similar arrangement to MMC 702.

A “1” in the second field indicates which CORs have the exception applied. A “0” in the second field indicates that COR does not have the exception applied to it.

Please note that a Wild Character must be placed at the end of the Deny Table (MMC 702) to indicate there is an exception in MMC 703. Wild Characters are described in detail below.

Example

This example follows on from the example given for MMC 702. In this case, stations with COR D cannot generally dial “0055” numbers but can dial “0055 11235”.

MMC 702

Deny (007) :	B	C	D	E	F	G
0055Z :	0	0	1	1	1	1

The Wild Character Z is programmed after 0055 to indicate there is an exception programmed in MMC 703

MMC 703

Allow (001) :	B	C	D	E	F	G
005511235 :	0	0	1	0	0	0

A “0” is programmed for CORs B and C because they can dial all “0055” numbers. A “0” is programmed for CORs E, F and G because they are not permitted to dial any “0055” numbers.

MMC 704

:	0	1	2	3	4	5	6	7	8	9	*	#
Z:	1	1	1	1	1	1	1	1	1	1	1	1

“1”s are programmed for all digits to indicate that no digits may be dialled after “0055” except the number(s) in the Allowance Table - MMC 703.

MMC 704 - Assign Wild Character

Wild Characters are used to simplify programming for Toll Restriction. There are three Wild Characters - X, Y, and Z.

A wild character can be used in place of any digit after it has been defined in MMC 704.

MMC 704 has two fields for data. The first field indicates which Wild Character is being defined and the second field indicates to which digits the Wild Character applies.

Example

Wild Character X is used to represent all digits except digit "9".

:	0	1	2	3	4	5	6	7	8	9	*	#
X:	1	1	1	1	1	1	1	1	1	0	1	1

An application of Wild Character X defined above could be used in Melbourne or Sydney where the only allowed digits for a station with local access are numbers beginning with "9". If stations with COR D were only allowed to dial local numbers, the following programming could be used.

MMC 702

Deny (001) :	B	C	D	E	F	G	
X	:	1	1	1	0	0	0

An alternate method of achieving the same result would be:

MMC 702

Deny		B	C	D	E	F	G
0Y	:	0	0	1	1	1	1
1Y	:	0	0	1	1	1	1
2Y	:	0	0	1	1	1	1
3Y	:	0	0	1	1	1	1
4Y	:	0	0	1	1	1	1
5Y	:	0	0	1	1	1	1
6Y	:	0	0	1	1	1	1
7Y	:	0	0	1	1	1	1
8Y	:	0	0	1	1	1	1
*Y	:	0	0	1	1	1	1
#Y	:	0	0	1	1	1	1

The purpose of the Wild Character Y after each digit is to permit exceptions in MMC 703.

MMC 704

:	0	1	2	3	4	5	6	7	8	9	*	#
Y:	1	1	1	1	1	1	1	1	1	1	1	1

The example above demonstrates that using Wild Characters makes programming easier for the technician. Wild Characters are especially useful when Toll Restriction Tables are required for rural areas where the definition of a local call is far more complex than in the Capital cities.

Case Studies

Case Study No 1

A Melbourne Customer wishes stations to have outgoing access as described in the table below.

Digits	Use	COR A	COR B	COR C	COR D	COR E
		All	Aus	Vic	Local	000 only
000	Emergency	✓	✓	✓	✓	✓
9	Local	✓	✓	✓	✓	×
02	NSW	✓	✓	×	×	×
07	QLD	✓	✓	×	×	×
08	WA/SA/NT	✓	✓	×	×	×
1800	Free	✓	✓	✓	✓	×
013	Enquiry	✓	✓	✓	✓	×
5	Vic Country	✓	✓	✓	×	×
6	Tas	✓	✓	×	×	×
13	13 call	✓	✓	✓	✓	×
005511235	Recorded	✓	✓	×	×	×

This Case Study Assumes the DCS is being programmed from default data.

Use the following MMCs

301
701
702
703
704