

DTMF Map Configuration - Dial Plan

All Mediatrix Products

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Table of Contents

Basic Concepts	3
DTMF Maps	3
DTMF Maps Order	3
DTMF Map vs DTMF Map Transformation	4
DTMF Maps Syntax	4
DTMF Maps Special Characters	4
Basic Tasks	6
Configuring Endpoint-Specific DTMF Timers	6
Creating a DTMF Map that Applies to all Endpoints	6
Creating a DTMF Map that Applies to Specific Endpoints	7
Examples	8
Default DTMF Maps	8
Configuring a DTMF Map to Use a Timer to Make a Call	8
Configuring a DTMF Map to make a Call with an Extension	9
Configuring a DTMF Map to make an Internal (extension) or External Call	10
Configuring a DTMF Map to Force the Use of the # OR * to Dial a Number	10
Configuring a DTMF Map to Make a Call Outside the Country	11
Basic DTMF Transformations	12
Online Help	13
DGW Documentation	14
Copyright Notice	15

Basic Concepts

DTMF Maps

A DTMF map (also called digit map or dial map) allows you to compare the number users just dialed to a pattern string. Depending on the DTMF maps, the call can be accepted or rejected.

When a number is dialed, it is compared to the numbers of the DTMF maps:

- If the dialed number matches an entry of the **Allowed DTMF Map**, the call is accepted.
- If the dialed number matches an entry of the **Refused DTMF Map** table, then the call is refused and an error tone i.e. reorder tone, network congestion, or fast busy tone is played.
- If the dialed number matches no entry of either the **Allowed DTMF Map** or the **Refused DTMF Map**, the call is refused and an error tone i.e. reorder tone, network congestion, or fast busy tone is played.
- If the dialed number matches an entry of both the **Allowed DTMF Map** and the **Refused DTMF Map**, the call is refused and an error tone i.e. reorder tone, network congestion, or fast busy tone is played.

Note: The **Refused DTMF Map** table has precedence over the **Allowed DTMF Map** table.

DTMF Maps Order

The order in which the DTMF maps are used is very important. You must use specific DTMF maps first and then more generic ones. Otherwise you may end up with all calls being directed the same way. This is true when creating the DTMF maps in the **Allowed DTMF Map** table and in the **DTMF Map** field of this table.

For example, lets say

- all employees have a 3-digit extension all starting with 1, 2 or 3.
- All managers have an extension finishing with 9

When a 3-digit extension is dialed, the call should be directed to the colleague's extension. But, you also wish that all calls made to managers be redirected the management's assistant extension.

If you put the DTMF map for management calls first,

```
[1-3]x9  
[1-3]xx
```

calls made to a managers, will always be redirected to the Manager's assistant extension.

On the other hand, if you put the DTMF for extension redirections before the DTMF for management redirection,

```
[1-3]xx
[1-3]x9
```

managers will always directly receive their calls without going through the Manager's assistant extension.

DTMF Map vs DTMF Map Transformation

When creating DTMF maps to allow or refuse calls, the DTMF maps must be written and a transformation to be applied to the dialed number may be required.

The DTMF map is used to recognise the dialed numbers and the transformation modifies the dialed numbers before sending the call. A transformation is not mandatory, it depends if the dialed number must be changed or not before the call is made.

For example, when the dialed number is the extension of a colleague, no transformation is required. The DTMF map will recognise that the dialed numbers are the allowed extension of a colleague, and the call will be made with the dialed number.

However, in the example where calls made to management extensions are redirected to the management's assistant, a transformation is required. For example, if the DTMF is xx9 and the transformation 123, this means that whenever an extension finishing by 9 is dialed, the call is sent to extension 123.

DTMF Maps Syntax

The permitted DTMF map syntax is taken from the core MGCP specification, RFC 2705, section 3.4:

```
DigitMap = DigitString / '(' DigitStringList ')'
DigitStringList = DigitString 0* ( '|' DigitString )
DigitString = 1*(DigitStringElement)
DigitStringElement = DigitPosition ['.']
DigitPosition = DigitMapLetter / DigitMapRange
DigitMapLetter = DIGIT / '#' / '*' / 'A' / 'B' / 'C' / 'D' / 'T'
DigitMapRange = 'x' / '[' 1*DigitLetter ']'
DigitLetter ::= *((DIGIT '-' DIGIT) / DigitMapLetter)
```

DTMF Maps Special Characters

DTMF maps use specific characters and digits in a particular syntax

Character	Use
Digits (0, 1, 2... 9)	Indicates specific digits in a telephone number expression.
T	The Timer indicates that if users have not dialed a digit for the time defined, it is likely that they have finished dialing and the SIP Server can make the call.
x	Matches any digit, excluding “#” and “*”.
	Indicates a choice of matching expressions (OR). Note: Enclose the DTMF map in parenthesis when using the “ ” option.
.	Matches an arbitrary number of occurrences of the preceding digit, including 0.
[	Indicates the start of a range of characters.
]	Indicates the end of a range of characters.

Basic Tasks

Configuring Endpoint-Specific DTMF Timers

Steps

- 1) Go to **Telephony/DTMF Maps**.
- 2) In the **General Configuration** table, click **Edit Endpoints**.
- 3) In the **Endpoint Specific** table, for each Endpoint to configure, from the **Override** selection list, choose **Enable**.
- 4) For each enabled endpoint, complete the timeout fields as required.
- 5) Click **Apply**

Result

Each enabled endpoint will use the endpoint-specific timeout.

Creating a DTMF Map that Applies to all Endpoints

Steps

- 1) Go to **Telephony/DTMF Maps**.
- 2) From the **DTMF Map** selection list, choose:
 - a) if you wish to create DTMF maps that accept calls
 - b) **Refused** if you wish to create DTMF maps that refuse calls
- 3) In the **Allowed DTMF Map** or **Refused DTMF Map** table, from the **Enable** selection list, choose, **Enable**.
- 4) From the **Apply to** selection list, choose **Unit**.

Note: the **Transformation** field is not required if you are not changing the dialed number before making the call. For example, when the dialed number is the extension of a colleague. However, if the dialed number must be transformed, for example to add a 0 at the beginning of the dialed number, then a transformation is required. Refer to [Basic DTMF Transformations](#) (p.12)

- 5) Complete all the other fields, as required.

- 6) Click **Apply**

Creating a DTMF Map that Applies to Specific Endpoints

Steps

- 1) Go to **Telephony/DTMF Maps**.
- 2) From the **DTMF Map** selection list, choose:
 - a) **Allowed** if you wish to create DTMF maps that accept calls
 - b) **Refused** if you wish to create DTMF maps that refuse calls
- 3) In the **Allowed DTMF Map** or **Refused DTMF Map** table, from the **Enable** selection list, choose, **Enable**.
- 4) From the **Apply to** selection list, choose **Endpoint**.
- 5) From the **Suggestion** selection list, choose the endpoints for which you wish to associate a DTMF map.
- 6) Complete all the other fields, as required.

Note: the **Transformation** field is not required if you are not changing the dialed number before making the call. For example, when the dialed number is the extension of a colleague. However, if the dialed number must be transformed, for example to add a 0 at the beginning of the dialed number, then a transformation is required. Refer to [Basic DTMF Transformations](#) (p.12)

- 7) Click **Apply**

Examples

Default DTMF Maps

Two default DTMF maps are configured in a unit that is set up with the factory settings.

Allowed DTMF Map								
Index	Enable	Apply To	Endpoints	Suggestions	DTMF Map	Transformation	Target	Emergency
1	Enable	Unit		--- Suggestion ---	x.#	x{#}		Disable
2	Enable	Unit		--- Suggestion ---	x.T	x		Disable
3	Enable	Unit		--- Suggestion ---	x.T	x		Disable
4	Enable	Unit		--- Suggestion ---	x.T	x		Disable
5	Enable	Unit		--- Suggestion ---	x.T	x		Disable
6	Enable	Unit		--- Suggestion ---	x.T	x		Disable
7	Enable	Unit		--- Suggestion ---	x.T	x		Disable
8	Enable	Unit		--- Suggestion ---	x.T	x		Disable
9	Enable	Unit		--- Suggestion ---	x.T	x		Disable
10	Enable	Unit		--- Suggestion ---	x.T	x		Disable

- x.# indicates to dial, right away, a number that finishes by a #. The transformation indicates to not dial the #.
- x.T indicates to dial the number if not digit is dialed after 3 seconds.

Configuring a DTMF Map to Use a Timer to Make a Call

Before you start

This should always be the last DTMF map of the **Allowed DTMF Map** table.

Steps

- 1) Go to **Telephony/DTMF Maps**.
- 2) Make sure the **DTMF Map** selection list, is set to **Allowed**.
- 3) In the **Allowed DTMF Map** table, from the **Enable** selection list, choose, **Enable**.
- 4) From the **Apply to** selection list, choose **Endpoint**.

- 5) From the **Suggestion** selection list, choose the endpoint for which you wish to associate a DTMF.
- 6) in the **DTMF Map** field enter [2-9]xxxxxxT.

Note: xT indicates that the number will be dialed after the delay set for the timer, (T)

Note: When making the actual call and dialing the number, the Mediatrix unit automatically removes the "T" found at the end of a dialed number, if there is one (after a match). This character is for indication purposes only; no transformation is required to remove it.

- 7) Click **Apply**

Result

The call will be made if the first number is either 2 to 9 and that it has 7 digits, and no digits have been dialed for the time set in the timer.

Allowed DTMF Map									
Index	Enable	Apply To	Endpoints	Suggestions	DTMF Map	Transformation	Target	Emergency	
1	Enable	Endpoint	Slot1/E1T1	--- Suggestion ---	[2-9]xxxxxxT			Disable	

Configuring a DTMF Map to make a Call with an Extension

Steps

- 1) Go to **Telephony/DTMF Maps**.
- 2) Make sure the **DTMF Map** selection list, is set to **Allowed**.
- 3) In the **Allowed DTMF Map** table, from the **Enable** selection list, choose, **Enable**.
- 4) From the **Apply to** selection list, choose **Endpoint**.
- 5) From the **Suggestion** selection list, choose the endpoints for which you wish to associate a DTMF map.
- 6) in the **DTMF Map** field enter [2-4]xx
- 7) Click **Apply**

Result

When a 3-digit extension starting by either 2, 3, or 4 is made from the specified endpoint, the call is made. However, if the dialed number begins with anything else than 2, 3, or 4, the call is not made and you get a busy signal.

Allowed DTMF Map								
Index	Enable	Apply To	Endpoints	Suggestions	DTMF Map	Transformation	Target	Emergency
1	Enable	Endpoint	Slot1/E1T1	--- Suggestion ---	[2-4]xx			Disable

Configuring a DTMF Map to make an Internal (extension) or External Call

Steps

- 1) Go to **Telephony/DTMF Maps**.
- 2) Make sure the **DTMF Map** selection list, is set to **Allowed**.
- 3) In the **Allowed DTMF Map** table, from the **Enable** selection list, choose, **Enable**.
- 4) From the **Apply to** selection list, choose **Endpoint**.
- 5) From the **Suggestion** selection list, choose the endpoint for which you wish to associate a DTMF.
- 6) in the **DTMF Map** field enter **(([2-4]xx | 9[2-9]xxxxxx))**.

Note: The DTMF map is enclosed in parentheses when using the "|" option.

- 7) Click **Apply**

Result

The call is made if the number begins with 2, 3, or 4 and the number has 3 digits, or if the number begins with 9, the number has 7 digits and the second digit is any digit between 2 and 9.

Allowed DTMF Map								
Index	Enable	Apply To	Endpoints	Suggestions	DTMF Map	Transformation	Target	Emergency
1	Enable	Endpoint	Slot1/E1T1	--- Suggestion ---	(([2-4]xx 9[2-9]xxxxxx))			Disable

Configuring a DTMF Map to Force the Use of the # OR * to Dial a Number

Steps

- 1) Go to **Telephony/DTMF Maps**.
- 2) Make sure the **DTMF Map** selection list, is set to **Allowed**.
- 3) In the **Allowed DTMF Map** table, from the **Enable** selection list, choose, **Enable**.
- 4) From the **Apply to** selection list, choose **Endpoint**.
- 5) From the **Suggestion** selection list, choose the endpoint for which you wish to associate a DTMF.

- 6) in the **DTMF Map** field enter (xxxxxxx#|xxxxxxx*).

Note: The DTMF map is enclosed in parentheses when using the “|” option.

- 7) In the **Transformation** field, enter (x{#}|x{*})

- 8) Click **Apply**

Result

The “#” or “*” character in the **DTMF Map** field indicates that users must dial the “#” or “*” character at the end of their number to indicate it is completed. The **Transformation** field indicates that the # or * must be removed to send the call.

Allowed DTMF Map									
Index	Enable	Apply To	Endpoints	Suggestions	DTMF Map	Transformation	Target	Emergency	
1	Enable	Endpoint	Slot1/E1T1	--- Suggestion ---	(xxxxxxx# xxxxxxx*)	(x{#} x{*})		Disable	

Configuring a DTMF Map to Make a Call Outside the Country

Steps

- 1) Go to **Telephony/DTMF Maps**.
- 2) Make sure the **DTMF Map** selection list, is set to **Allowed**.
- 3) In the **Allowed DTMF Map** table, from the **Enable** selection list, choose, **Enable**.
- 4) From the **Apply to** selection list, choose **Endpoint**.
- 5) From the **Suggestion** selection list, choose the endpoint for which you wish to associate a DTMF map.
- 6) in the **DTMF Map** field enter (0T|00T).

Note: The DTMF map is enclosed in parentheses when using the “|” option.

Note: When making the actual call and dialing the number, the Mediatrix unit automatically removes the “T” found at the end of a dialed number, if there is one (after a match). This character is for indication purposes only; no transformation is required to remove it.

- 7) Click **Apply**

Result

The call will be made if the dialed number starts with 0, or 00.

Allowed DTMF Map								
Index	Enable	Apply To	Endpoints	Suggestions	DTMF Map	Transformation	Target	Emergency
1	Enable	Endpoint	Slot1/E1T1	--- Suggestion ---	(0T 00T)			Disable

Basic DTMF Transformations

DTMF Transformations will modify the dialed number. For example, let's say that the dialed number is 18195551111#.

Action	Transformation	Result
Add the prefix "0" to the dialed number	0x	018195551111#
Remove the suffix "#" from the dialed number	x{#}	018195551111
Remove the first four DTMFs from the dialed number	(4)x	5551111#
Remove the international code and termination and replace the area code by another one	(1){819}514x{#}	5145551111
Replace the signalled DTMFs by a extension "123"	123	123

Online Help

If you are not familiar with the meaning of the fields and buttons, click **Show Help**, located at the upper right corner of the Web page. When activated, the fields and buttons that offer online help will change to green and if you hover over them, the description will be displayed.

DGW Documentation

Mediatrix devices are supplied with an exhaustive set of documentation.

Mediatrix user documentation is available on the [Media5 Documentation Portal](#).

Several types of documents were created to clearly present the information you are looking for. Our documentation includes:

- **Release notes:** Generated at each GA release, this document includes the known and solved issues of the software. It also outlines the changes and the new features the release includes.
- **Configuration notes:** These documents are created to facilitate the configuration of a specific use case. They address a configuration aspect we consider that most users will need to perform. However, in some cases, a configuration note is created after receiving a question from a customer. They provide standard step-by-step procedures detailing the values of the parameters to use. They provide a means of validation and present some conceptual information. The configuration notes are specifically created to guide the user through an aspect of the configuration.
- **Technical bulletins:** These documents are created to facilitate the configuration of a specific technical action, such as performing a firmware upgrade.
- **Hardware installation guide:** They provide the detailed procedure on how to safely and adequately install the unit. It provides information on card installation, cable connections, and how to access for the first time the Management interface.
- **User guide:** The user guide explains how to customise to your needs the configuration of the unit. Although this document is task oriented, it provides conceptual information to help the user understand the purpose and impact of each task. The User Guide will provide information such as where and how TR-069 can be configured in the Management Interface, how to set firewalls, or how to use the CLI to configure parameters that are not available in the Management Interface.
- **Reference guide:** This exhaustive document has been created for advanced users. It includes a description of all the parameters used by all the services of the Mediatrix units. You will find, for example, scripts to configure a specific parameter, notification messages sent by a service, or an action description used to create Rulesets. This document includes reference information such as a dictionary, and it does not include any step-by-step procedures.

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