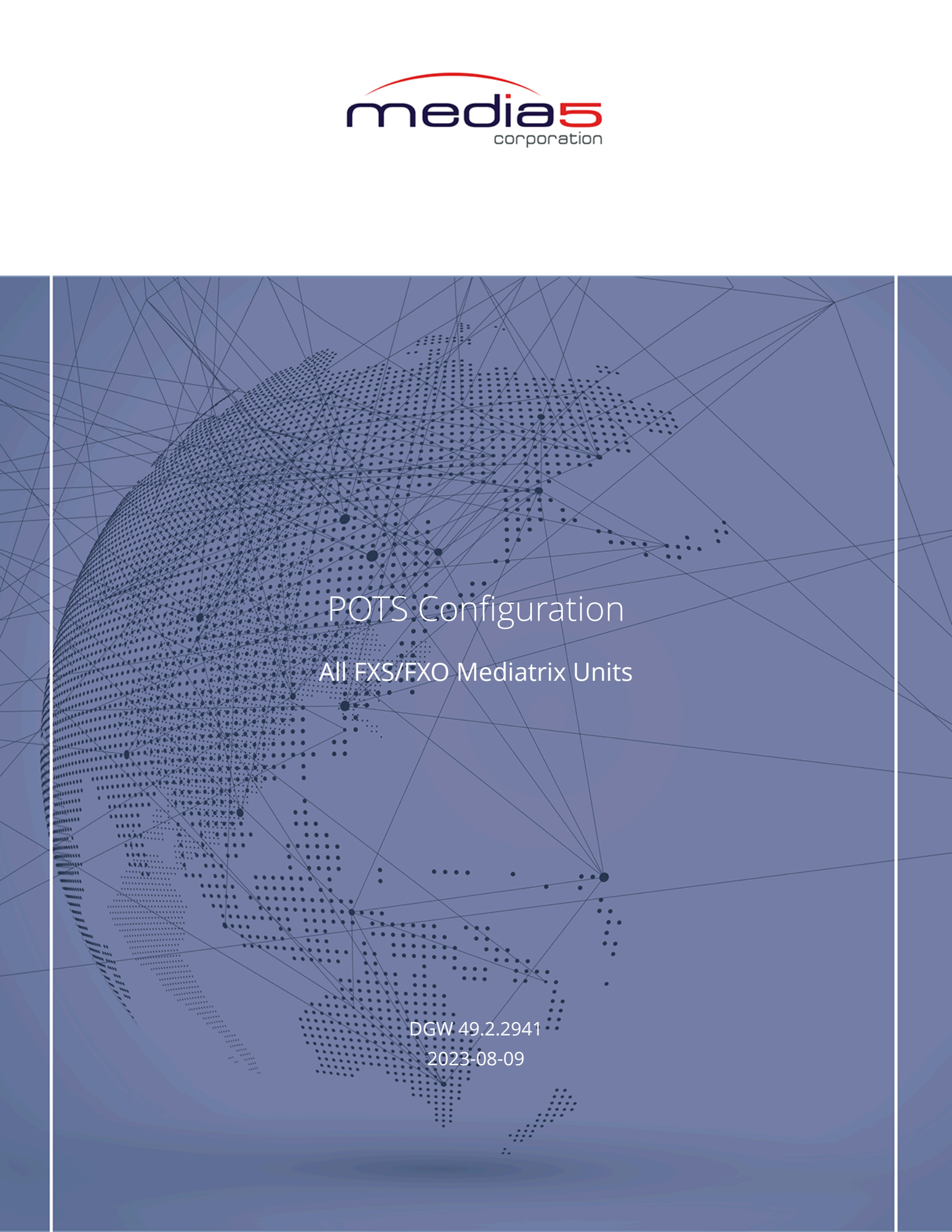


The background of the page is a dark blue gradient with a complex, abstract graphic. It consists of a dense network of thin, light blue lines connecting numerous small, dark blue dots. These dots are arranged in a way that suggests a global map, with higher concentrations of dots in the North Atlantic and Europe. The overall effect is a sense of interconnectedness and global reach.

POTS Configuration

All FXS/FXO Mediatrix Units

DGW 49.2.2941

2023-08-09

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Basic Concepts

Caller ID Information

The caller ID is a generic name for the service provided by telephone utilities that supply information such as the telephone number or the name of the calling party to the called subscriber at the start of a call.

In typical caller ID systems, the coded calling number information is sent from the central exchange to the called telephone. This information can be shown on a display of the subscriber telephone set. In this case, the caller ID information is usually displayed before the subscriber decides to answer the incoming call. If the line is connected to a computer, caller information can be used to search in databases and additional services can be offered.

In call waiting, the caller ID service supplies information about a second incoming caller to a subscriber already busy with a phone call. However, caller ID on call waiting is not supported by all caller ID-capable telephone displays.

The following basic caller ID features are supported:

- Date and Time
- Calling Line Identity
- Calling Party Name
- Visual Indicator (MWI)

Caller ID Generation

Caller ID information is sent depending on the application and country-specific requirements: Caller ID generation using DTMF signalling and Caller ID generation using Frequency Shift Keying (FSK)

Note: The DGW Application does not support ASCII special characters higher than 127.

Caller ID generation can be done by:

- DTMF signalling performed during or before ringing, depending on the country settings or endpoint configuration. The Mediatrix unit provides the calling line identity according to the following standards:
 - Europe: ETSI 300 659-1 January 2001 (Annex B):
 - Access and Terminals (AT)
 - Analogue access to the Public Switched Telephone Network (PSTN)
 - Subscriber line protocol over the local loop for display (and related) services
 - Part 1: On-hook data transmission
 - Country-specific custom DTMF variations:
 - Telebras DTMF (Brasil and Argentina)
 - TDK DTMF (Denmark)
- Frequency Shift Keying (FSK). Different countries use different standards to send caller ID information. The Mediatrix unit is compatible with the following widely used standards:
 - ETSI 300 659-1
- Continuous phase binary FSK modulation is used for coding that is compatible with:
 - BELL 202
 - ITU-T V.23

Note: The displayed caller ID for all countries may be up to 20 digits for numbers and 50 digits for names. The DGW application does not support ASCII special characters higher than 127.

Caller ID Transmission

For most countries, the caller ID is transmitted after the first ring.

One notable exception is the UK, where Caller ID is sent after the dual tone alerting state tone on an inverted polarity line.

Other modes of transmission can be configured with the **Caller ID Transmission** parameter (under **POTS/Config/General Configuration**).

Flash Hook

Flash hook can be described as quickly depressing and releasing the plunger or the actual handset-cradle to create a signal indicating a change in the current telephone session.

The flash hook is used to trigger:

- call waiting

- second call
- call on hold
- conferences

A flash hook is detected when the hook switch is pressed for a shorter time than would be required to be interpreted as a hang-up. Using the flash button that is present on many standard telephone handsets can also trigger a flash hook.

Note: As a best practice, the Flash button should be used to avoid terminating the call by accidentally pushing the plunger for too long.

Country Override Flash Hook Detection Range

This is the range in which the hook switch must remain pressed to perform a flash hook.

When selecting a country (under **Telephony/Misc/Country Selection**), each country has a default minimum and maximum time value within which pressing and releasing the plunger is actually considered a flash hook. However, these values can be overridden and customised with the **Country Override Flash Hook Detection Range** (under **POTS/FXS Configuration/Country Customisation**).

The range consists of :

- The minimal delay and maximal delay, in ms, separated by a "-".
- The minimal value allowed is 10 ms.
- The maximum value allowed is 1200 ms.
- The space character is not allowed.

FXO Force End-of-Call

The forced end-of-call service regroups all features permitting the unit to terminate a call. This can be required in a telephony network where the FXO loop current drops are not always detected.

The call termination can be triggered in three cases:

- On call failure: This feature is set by setting the **Force End of Call On Call Failure** parameter to **Enable**. When a call failure happens, the call is terminated after the timeout configured with the **Call Failure Timeout (sec)** parameter has elapsed and an error tone is played.
- On silence detection: A call is ended when silence is detected for a delay higher than the value configured by in the **Silence Detection Timeout (sec)** parameter (Refer to the [FXO Silence Detection](#) (p.7)). The mode is set with the **Force End Of Call On Silence Detection Mode** parameter.
- On tone detection: A call is ended when a selected tone is detected. The tone for this purpose depends on the detection mode specified by the **Force End Of Call On Tone Detection Mode**

parameter which can be country specific (not available in all countries) or a custom tone. (Refer to [FXO Tone Detection](#) (p.7)).

All previously mentioned parameters are available under **POTS/FXO Configuration/ FXO Force End of Call**.

FXO Silence Detection

Silence detection allows the Mediatrix unit to close a line when no voice activity or silence is detected for a specified amount of time.

When silence is detected on the inbound and/or outbound media for an amount of time specified in the **Force End Of Call On Silence Detection Mode** parameter (under **POTS/FXO Configuration/FXO Force End of Call**), the call is terminated. This feature is useful to free resources in the event of an IP network failure that prevents the end of a call to be detected or when the end of call tone was not detected.

Note: The silence detection feature could inadvertently disconnect a communication when one party puts the other on hold more than 5 minutes (default value timeout). Using the hold tone feature prevents the detection of silence when the call is put on hold by the IP peer. Refer to the [DGW Configuration Guide - Tone Customisation](#) document published on the [Media5 Documentation Portal](#).

The current implementation of silence detection relies on the power of the media signal. A silence is detected if the power level of the media signal is lower than -60 dBm. This feature forcefully terminates a call that stayed silent for some time.

FXO Tone Detection

The FXO Tone Detection feature is used to resolve scenarios in which the far-end disconnection tone cannot be detected.

For a custom tone, the following parameters can be configured:

- **Tone Detection Custom Frequency**
- **Tone Detection Custom Cadence**
- **Detection Custom Repetition**

which are all located under **POTS/FXO Configuration/FXO Force End of Call**.

If a custom tone is defined, the ring pattern can have up to four on/off pairs in the format of on1,off1,on2,off2,on3,off3,on4,off4 where:

- on is a numerical value representing the time, in milliseconds, during which the tone can be detected
- off is a numerical value representing the time, in milliseconds, during which the tone cannot be detected
- the on and off values can range from 0 to 32,767 ms.

- Specifying more than 4 pairs will only use the first 4 pairs (eight first values).
- If less than 4 pairs are specified, 0 values will be added as necessary.
- The first zero (0) found in the string signals the end of the cadence (i.e. "200, 0, 300, 400" is the same as "200").
- If it starts with a value of zero (0) , the ring pattern is invalid.

In some cases, the detection of a tone with a complex cadence containing multiple frequencies is required, such as for the special information tone (SIT). However, since the detection of only one custom frequency can be configured in DGW, the custom frequency used to detect the complex cadence will need to be one of the frequencies found in the tone.

FXS Country Override Loop Current

When a remote end-user goes on-hook, the Mediatrix unit signals the far end disconnect by performing a current loop drop (< 1 mA) on the analog line.

This current loop drop is typically used for disconnect supervision on analog lines. If the **Line Supervision Mode** parameter (under **POTS/FXS Configuration**) is set to **DropOnDisconnect** then the Mediatrix unit signals the far end disconnect by performing a current loop drop on the analog line. By default, the Mediatrix unit maintains a current drop for 1000 ms,, then a busy tone is generated to indicate the user to hang up. The current loop drop duration can be configured with the **Power Drop on Disconnect Duration** parameter (under **POTS/FXS Configuration**). (For more details, refer to the **FXS Line Supervision Mode** parameter in the [DGW Configuration Guide - Reference guide](#) published on the [Media5 Documentation Portal](#)).

When an FXS analog line goes off hook, it causes current to flow by closing the loop. The **Country Selection** parameter (**Telephony/Misc/Country**) allows the selection of predefined country settings for the tone profiles, ring patterns, and other parameters such as input and output gains. The value of the loop current for each country is by default 30 mA but can be overridden to a value ranging from 20 mA to 32 mA with the **Country Override Loop Current** parameter (under **POTS/FXS Configuration/Country Customisation**) provided the **Override Country Configuration** parameter is enabled (under **POTS/FXS Configuration/Country Customisation**).

Note: The actual measured current may be different from the one set, as it varies depending on the DC impedance. The default value is 30 mA. When a value higher than 32 mA is used, the unit will limit the current to 32 mA.

Basic FXS Tasks

Selecting the Detection/Generation Method of the Caller ID

Steps

- 1) Go to **POTS/Config**.
- 2) In the **General Configuration** table, complete the fields are required.
- 3) Click **Apply**.

Configuring FXS Parameters

Steps

- 1) Go to **POTS/FXS Configuration**.
- 2) In the **FXS Configuration** table, complete the fields as required.
- 3) Click **Apply**.

Result

FXS Configuration		
Line Supervision Mode:	DropOnDisconnect	
Disconnect Delay:	0	
Auto Cancel Timeout:	0	
Inband Ringback:	Disable	
Shutdown Behavior:	Disabled Tone	
Power Drop On Disconnect Duration:	1000	
Service Activation:	Flash Hook	
SIP Message Alerting:	Disable	

Overriding FXS Default Country Parameters

Steps

- 1) Go to **POTS/FXS Configuration**.
- 2) In the **Country Customisation** table, complete the fields as required.
- 3) Click **Apply**.

Result

Country Customisation		
Override Country Configuration:	Enable	
Country Override Loop Current:	30	
Country Override Flash Hook Detection Range:	100-1200	

Basic FXO Tasks

Configuring FXO Dialing Parameters

Steps

- 1) Go to **POTS/FXO Configuration**.
- 2) In the **FXO Dialing Configuration** table, complete the fields as required.
- 3) Click **Apply**.

Result

FXO Dialing Configuration		
Pre Dial Delay (ms):	0	
Dial Tone Detection Mode:	CountryTone	
Dial Tone Detection Timeout (ms):		

Configuring FXO Answering Configuration

Steps

- 1) Go to **POTS/FXO Configuration**.
- 2) In the **FXO Answering Configuration** table, for each endpoint, complete the fields as required.

Note: Available endpoints vary depending on the configuration of the unit,

- 3) Click **Apply**.

Result

FXO Answering Configuration				
ID	Wait Before Answering Delay (ms)	Answering On Caller Id Detection	Wait For Callee To Answer	
Slot4/FXO1	8000	Enable ▾	Disable ▾	
Slot4/FXO2	8000	Enable ▾	Disable ▾	
Slot4/FXO3	8000	Enable ▾	Disable ▾	
Slot4/FXO4	8000	Enable ▾	Disable ▾	

Configuring the FXO Incoming Call Behavior

Steps

- 1) Go to **POTS/FXO Configuration**.
- 2) In the **FXO Incoming Call Behavior** table, for each endpoint, complete the fields as required.

Note: Available endpoints vary depending on the configuration of the unit,

- 3) Click **Apply**.

Result

For example

FXO Incoming Call Behavior		
ID	Not Allowed Behavior	
Slot4/FXO1	Play Congestion Tone ▾	
Slot4/FXO2	Do Not Answer ▾	
Slot4/FXO3	Play Congestion Tone ▾	
Slot4/FXO4	Play Congestion Tone ▾	

Configuring FXO Line Verification

Steps

- 1) Go to **POTS/FXO Configuration**.
- 2) In the **FXO Line Verification** table, for each endpoint, complete the fields as required.
- 3) Click **Apply**.

Result

For example

FXO Line Verification	
Link State Verification:	Enable ▾
Link State Verification Timeout (ms):	5000

Configuring FXO Force End of Call

Steps

- 1) Go to **POTS/FXO Configuration**.
- 2) In the **FXO Force End of Call** table, complete the fields as required.
- 3) Click **Apply**.

Result

For example

FXO Force End Of Call	
Force End Of Call On Call Failure:	Enable ▾
Call Failure Timeout (sec):	30
Force End of Call On Silence Detection Mode:	Disable ▾
Silence Detection Timeout (sec):	300
Force End Of Call On Tone Detection Mode:	Custom Tone ▾
Tone Detection Custom Frequency:	350
Tone Detection Custom Cadence:	
Detection Custom Repetition:	3 x

Configuring the Dial Tone Detection

Information

It allows the Mediatrix unit to wait for a dial tone before initiating the dialing sequence. If no dial tone is detected, the line is considered busy.

Steps

- 1) Go to **POTS/FXO Configuration**.

- 2) In the **FXO Dialing Configuration** table, from the **Dial Tone Detection Mode** drop box, select **CountryTone**.

Note: Not all PBX manufacturers produce the country dial tone on the extension line. If this is the case, make sure the **Dial Tone Detection Mode** is disabled, otherwise the Mediatrix unit will not output dialed digits.

Note: Not all PSTN switches produce the country dial tone on the PSTN line. If this is the case, make sure the **Dial Tone Detection Mode** is disabled, otherwise the Mediatrix unit will not output dialed digits.

- 3) Click **Apply**.

Result

FXO Dialing Configuration		
Pre Dial Delay (ms):	0	
Dial Tone Detection Mode:	CountryTone	
Dial Tone Detection Timeout (ms):		

Configuring the Answering Delay

Steps

- 1) Go to **POTS/FXO Configuration**.
- 2) In the **FXO Answering Configuration** table, complete the fields as required.

Note: If the PBX does not pass the caller ID to the Mediatrix unit, you can reduce the **Wait Before Answering Delay** to **2500** to reduce the time before the Mediatrix unit goes off-hook upon ring detection.

- 3) Click **Apply**.

Configuring the Far End Disconnect Parameters

Information

Steps

- 1) Go to **POTS/FXO Configuration**.
- 2) In the **FXO Force End of Call** table, from the **Force End Of Call On Tone Detection Mode** drop box, select **Custom Tone**.

- 3) Set the **Tone Detection Custom Frequency** field to **350**.

Note: Verify with your PBX supplier what tone (exact frequency and cadence) the PBX produces on the extension when the far end is disconnected.

- 4) Complete the other fields as required.
- 5) Click **Apply**.

Result

FXO Force End Of Call	
Force End Of Call On Call Failure:	Enable ▾
Call Failure Timeout (sec):	30
Force End of Call On Silence Detection Mode:	Disable ▾
Silence Detection Timeout (sec):	300
Force End Of Call On Tone Detection Mode:	Custom Tone ▾
Tone Detection Custom Frequency:	350
Tone Detection Custom Cadence:	
Detection Custom Repetition:	3 x

Disabling Dial Tone Detection

Information

Disabling dial tone detection allows the Mediatrix unit to wait for a dial tone before initiating the dialing sequence. If no dial tone is detected or correctly recognised, the line is considered busy.

Steps

- 1) Go to **POTS/FXO Configuration**.
- 2) In the **FXO Dialing Configuration** table, from the **Dial Tone Detection Mode** dropbox, select **Disable**.
- 3) Click **Apply**.

Result

FXO Dialing Configuration	
Pre Dial Delay (ms):	0
Dial Tone Detection Mode:	Disable ▾
Dial Tone Detection Timeout (ms):	3000

Advanced POTS Parameters

Although the services can be configured in great part in the Web browser, some aspects of the configuration can only be completed with the configuration parameters by :

- using a MIB browser
- using the CLI
- creating a configuration script containing the configuration parameters

For more details, refer to the [DGW Configuration Guide - Reference Guide](#) published on the [Media5 Documentation Portal](#).

For FXS

- specify the Calling Party Name of the caller ID (CLIP) :
Pots.FxsCallerIdPrivateCallingPartyName
- to override a set of services that are activated during an emergency call:
Pots.FxsEmergencyCallOverride
- To set the period before the phone starts to ring in the event where the originator of an emergency call hangs-up before the emergency call center disconnects the call:
Pots.FxsEmergencyRingTimeout
- To customise a distinctive ringID: **Pots.FxsDistinctiveRingId**
- To customise a distinctive ring pattern: **Pots.FxsDistinctivePattern**

For FXO

- To override the FXO Custom Basic Parameters:
Pots.FxoCustomBasicParameters.OverrideDefaultCountryParameters and
Pots.FxoCustomBasicParameters.Impedance

FXS Distinctive Ring

The FXS endpoints support four distinctive ringing for basic incoming calls.

To use the distinctive ringing with the Mediatrix unit, the received SIP INVITE message must contain the Alert-Info header field with the proper Call Property value.

The following is an example of an Alert-Info via SIP INVITE:

```
Alert-Info: <http://127.0.0.1/Bellcore-dr2>
```

The custom distinctive ring configuration allows the administrator to modify the ring pattern. These parameters can only be configured by the CLI or SNMP. Refer to the [Advanced POTS Parameters](#) . section.

The ring pattern can have up to three on/off pairs in the format of on1,off1,on2,off2,on3,off3 where:

- **on** is a numerical value representing the time, in milliseconds, during which ring tone will be active on the phone.
- **off** is a numerical values representing the time, in milliseconds, during which the phone will not ring.

For instance, **2000, 1000, 2000, 0** or **2000, 1000, 2000** is a cadence in which the frequency plays for 2 seconds, stops for 1 second, and plays for 2 more seconds.

Typically the ring pattern follows these rules:

- It can have up three pairs of "on,off". If less than 3 pairs are specified, **0** values will be added as necessary. Specifying more than six will only use the six first values.
- If it starts with a value of zero (0) , the ring pattern is invalid.
- The first zero (0) found in the string signals the end of the cadence (i.e. "200, 0, 300" is the same as "200").

Examples of FXO Tone Detection

Configuring the Detection of an 8 second 425 Hz Continuous Tone

Steps

- 1) Go to **POTS/FXO Configuration**.
- 2) In the **FXO Force End of Call** table, from the **Force End Of Call On Tone Detection Mode** selection list, choose **Custom Tone**.
- 3) In the **Tone Detection Custom Frequency** field, enter 425.
- 4) In the **Tone Detection Custom Cadence** field, insert 8000,0 or 8000.
- 5) Click **Apply**.

Result

When a 425 Hz tone is played for 8 seconds, it will be detected.

FXO Force End Of Call		
Force End Of Call On Call Failure:	Disable	
Call Failure Timeout (sec):	30	
Force End of Call On Silence Detection Mode:	Disable	
Silence Detection Timeout (sec):	300	
Force End Of Call On Tone Detection Mode:	Custom Tone	
Tone Detection Custom Frequency:	425	
Tone Detection Custom Cadence:	8000,0	
Detection Custom Repetition:		

Configuring an On/Off British Reorder Tone

Steps

- 1) Go to **POTS/FXO Configuration**.
- 2) In the **FXO Force End of Call** table, from the **Force End Of Call On Tone Detection Mode** selection list, choose **Custom Tone**.
- 3) In the **Tone Detection Custom Frequency** field, enter 400.
- 4) In the **Tone Detection Custom Cadence** field, enter 400, 350, 225, 525 .
- 5) Click **Apply**.

Result

When a 400 Hz tone is played with a cadence of 0.4 seconds on, 0.35 seconds off, 0.225 seconds on, 0.525 seconds off, the tone will be detected.

FXO Force End Of Call	
Force End Of Call On Call Failure:	Disable
Call Failure Timeout (sec):	30
Force End of Call On Silence Detection Mode:	Disable
Silence Detection Timeout (sec):	300
Force End Of Call On Tone Detection Mode:	Custom Tone
Tone Detection Custom Frequency:	400
Tone Detection Custom Cadence:	400,350,225,525
Detection Custom Repetition:	

Configuring the Detection of the Special Information Tone (SIT)

Steps

- 1) Go to **POTS/FXO Configuration**.
- 2) In the **FXO Force End of Call** table, from the **Force End Of Call On Tone Detection Mode** selection list, choose **Custom Tone**.
- 3) In the **Tone Detection Custom Frequency** field, enter 950.
- 4) In the **Tone Detection Custom Cadence** field, enter 330,660 .
- 5) Click **Apply**.

Result

When a SIT tone is played with a cadence of 950Hz/330ms, 1440Hz/330ms, 1800Hz/330ms, 950Hz/330ms, 1440Hz/330ms, 1800Hz/330ms etc. the tone will be detected.

FXO Force End Of Call	
Force End Of Call On Call Failure:	Disable
Call Failure Timeout (sec):	30
Force End of Call On Silence Detection Mode:	Disable
Silence Detection Timeout (sec):	300
Force End Of Call On Tone Detection Mode:	Custom Tone
Tone Detection Custom Frequency:	950
Tone Detection Custom Cadence:	330,660
Detection Custom Repetition:	

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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