



Receiving Analog In-Band CPID with the Dialogic® 1000 Media Gateway Series



Executive Summary

A number of private branch exchange/key system unit (PBX/KSU) systems support the sending of call party identification (CPID) information to a destination analog station via in-band dual-tone multifunction (DTMF) digits. PBX/KSU systems refer to these types of analog stations as voice mail interface (VMI) ports. This application note discusses the way in which the Dialogic® 1000 Media Gateway Series work with DTMF/CPID digits.

Note: It is assumed that there is equipment (that is, a voice mail system) connected to the analog station that can receive and parse the DTMF digits in order to obtain the CPID information on an inbound call to the analog station.



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Introduction

The Dialogic® 1000 Media Gateway Series, formerly known as the Dialogic® PBX-IP Media Gateway (note that there are multiple gateways in the series, but DMG1000 is used to refer to them collectively for the sake of clarity throughout this application note), supports the receiving of DTMF/CPID digits on its analog station interface, provided the DTMF digits are sent by the PBX/KSU system *after* the inbound call to the DMG1000's analog line has been answered (taken off-hook) by the DMG1000. The DMG1000 will not detect DTMF digits sent by the PBX/KSU system to the DMG1000's analog line while the DMG1000's analog port is on-hook.

Each PBX/KSU system supporting this mode of in-band CPID has its own format representing the CPID as a packet of DTMF digits. The DMG1000's timing parameters are configurable, letting the user define the DTMF packet format used by the PBX/KSU system.

This application note now discusses configuration of both DTMF timing and CPID parsing to assist in the deployment of the DMG1000.

DTMF Timing

The DMG1000 uses timing parameters in order to distinguish between CPID DTMF digits and far-end call signaling DTMF digits. Figure 1 shows the stages of DTMF CPID timing on an inbound analog call.

In Figure 1, "T1" is the time between the DMG1000's analog line off-hook event and the receipt of the first CPID DTMF digit by the DMG1000. T1 is used to determine when the DMG1000 should stop looking for CPID DTMF digits from the PBX/KSU system, in case

the PBX/KSU system does not supply CPID DTMF digits on the call.

The T1 timeout is defined by the configurable parameter **telInbCpidStartMs "Initial Wait for In-Band CPID (msecs)"**. If T1 expires before the DMG1000 receives a DTMF digit, then the DMG1000 stops looking for CPID DTMF digits. All DTMF digits received after T1 expires are assumed to be DTMF signaling digits.

In Figure 1, "T2" is the maximum amount of time between the CPID DTMF digits received by the DMG1000. This parameter is used *only* if the initial CPID DTMF digit is received before the T1 time expires. T2 is used to determine the end of the CPID DTMF digit packet from the PBX/KSU system.

The T2 timeout is defined by the configurable parameter **telInbCpidEndMs "In-Band CPID Complete Timeout (msecs)"**. If T2 expires before the DMG1000 receives another DTMF digit from the PBX/KSU system, then the DMG1000 stops looking for CPID DTMF digits and parses the received DTMF packet. Any subsequent DTMF digits received by the DMG1000 are assumed to be DTMF signaling digits.

CPID Parsing

Once the DMG1000 has determined that the PBX/KSU system is not sending any more CPID DTMF digits, the DMG1000 parses the digits received in order to extract the CPID information.

There are a number of configurable parameters that define the manner in which the CPID information is encoded in the CPID DTMF digit packet; details of these parameters can be found in the user's guide (see For More Information).

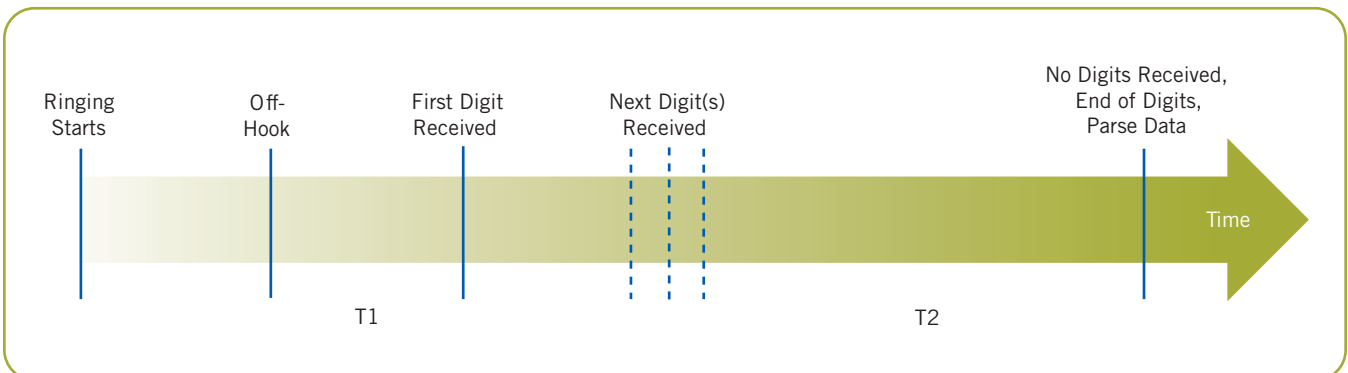


Figure 1. Dual-tone Multi-frequency Timing

First, a CPID DTMF digit packet from the PBX/KSU system must be composed of data fields separated by a delimiter character or string. As an example, if a PBX/KSU system uses the “#” character as a delimiter, then a CPID DTMF packet may look like this:

```
335#135#01
```

where

- 335 is the calling party
- 135 is the called party
- 01 is the call forwarding reason code

Second, for this PBX/KSU system, the parameters would be configured as:

```
# telDelimiter "In-Band Signaling Field Delimiter String"
0 telCallingField "Calling Party Field Number"
1 telCalledField "Called Party Field Number"
2 telReasonField "Reason Code Field Number"
```

The `telCallingField`, `telCalledField`, and `telReasonField` parameters define the location of the specified data in the packet as a *0-based field index*. In this example:

- `telCallingField` is “0” since the calling party information is in the data field before the first “#” delimiter character
- `telCalledField` is “1” since the called party information is in the data field after the first “#” delimiter character
- `telReasonField` is “2” since the reason code is after the second “#” delimiter character

If a particular PBX/KSU system does not support one of the fields, then the parameter can be set to 99. For example, if the PBX/KSU system does not send a reason field, then the programmer can set `telReasonField` to 99.

Third, the call reason code sent by the PBX/KSU system must be converted into an actual call reason code. This is specified by the configurable parameters:

- `telCallReasonCode` "Call Reason Code"
- `telCallReasonOrigin` "Call Reason Origin"
- `telCallReason` "Call Reason"

The DMG1000 supports up to 10 call reason code definitions. The `telCallReasonCodeX` (where X represents definitions 0 through 9) contains the reason code sent by the PBX/KSU system (“01” in the preceding example). The `telCallReasonOriginX` parameter specifies the call origin (“Internal” or “External”) that corresponds to the reason code. The `telCallReasonX` parameter specifies the call reason (“Busy”, “No Answer”, “Direct”, “Forward All”) defined by the reason code.

Therefore, each call reason code supported by the PBX/KSU system in a CPID DTMF digit packet must be added to the DMG1000 configuration. In this way, the DMG1000 converts the reason code into its corresponding call reason and call origin.

Acronyms

CPID	Call party identification
DMG1000	Dialogic® 1000 Media Gateway Series
DTMF	Dual-tone multifunction
IP	Internet protocol
KSU	Key system unit
PBX	Private branch exchange
VMI	Voice mail interface ports

For More Information

Datasheet

Dialogic® 1000 Media Gateway Series Data Sheet

http://www.dialogic.com/products/gateways/docs/7135_1000_Media_Gateway_ds.pdf

User's Guide

Dialogic® 1000 and 2000 Media Gateway Series User's Guide

<http://www.dialogic.com/manuals/mediagateway/UsersGuide.pdf>

To learn more, visit our site on the World Wide Web at <http://www.dialogic.com>.

Dialogic Corporation

9800 Cavendish Blvd., 5th floor
Montreal, Quebec
CANADA H4M 2V9

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