

OVERVIEW

Direct Inward Dialing is a feature offered by telephone service providers for use with their customers' PBX systems. The telephone service provider allocates one or more trunk lines to the customer for connection to their PBX and allocates a range of telephone numbers to these trunks. The service provider routes all calls made to these numbers via these trunks. As these calls are presented to the PBX, the dialed destination number (DNIS) is transmitted, usually partially (usually the last three or four digits), the PBX can route the call directly to the desired telephone extension within the company without the need for an operator or auto attendant. The service allows direct inward call routing to each extension while maintaining only a limited number of subscriber lines to satisfy the average concurrent usage of the customer.

Direct Inward Dialing (DID)

Direct Inward Dialing receives a called party number from a public network, lets any extension station terminate the call by its number or provide another service. DID allows users to share a few lines by two or more called party numbers, and saves the cost of a public line.

When IPedge uses the DID feature, it is necessary to contract Direct Inward Dialing service (DDI) supplementary service in case of ISDN provided by the public network. A gateway is required to connect a PRI trunk to the IPedge system.

Generally, DID means the physical function to: receive an incoming call from the public network; relate the called party number to another extension number or service or; indicate an incoming call to an extension station.

DID Destinations are as follows:

1. Pooled Line button corresponding to called party number
2. Group CO button corresponding to called party number
3. Designated for every called party number and operation mode
 - Extension number (PDN, PhDN, pilot No., etc.)
 - LCR, trunk group access or other trunk originated access code + trunk number.
 - Voice Mail or other system resources

For SIP trunk, the "To" header field URI of a SIP is treated as a DID number and this is the DID termination. For example:
6285281234@myprovider.com

DID Port

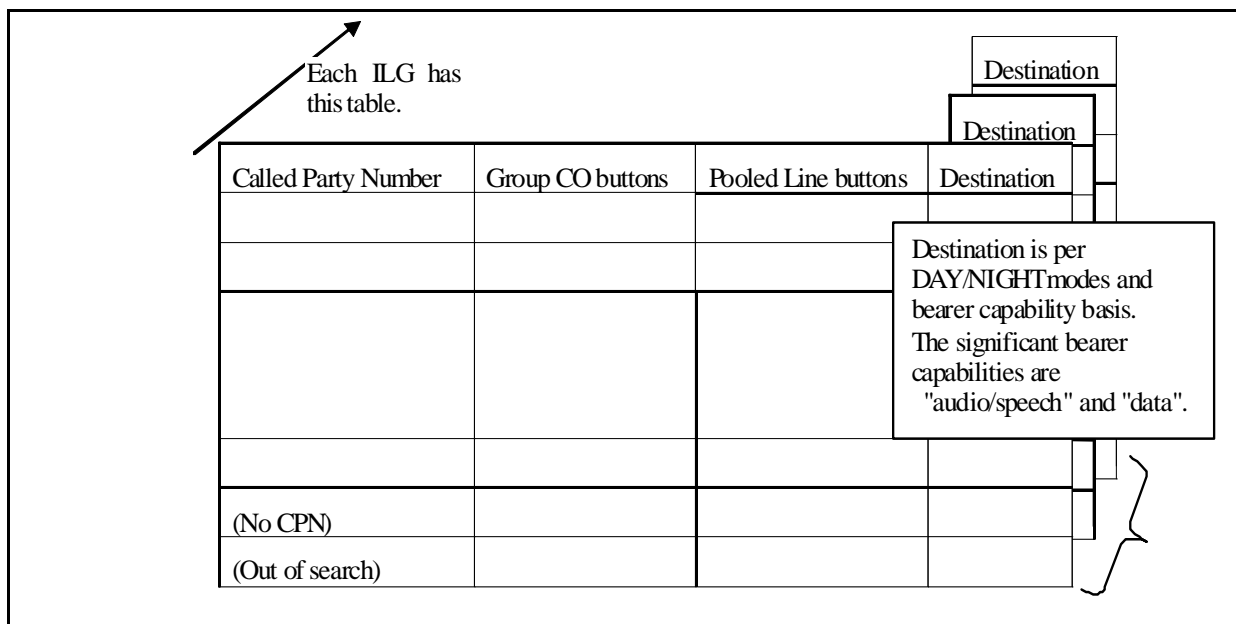
One of the above destinations (the first three) must be set as a destination. They can be set one at a time, however, only one can be set for each destination. For example, one port cannot be assigned to two group CO keys.

If the destination cannot be determined as one of the three (i.e., no data is stored for a called party number), one of the following is performed for every incoming line group.

- Terminate at the destination set in the **DID Intercept > Not Determined** for the ILG
- If no destination is set in the DID Intercept the IPedge system will refuse the incoming call by a call disconnect, signal with ROT, or an indication of appropriate reason.

A 'No DID Intercept' value can be assigned to the DID ILG. In the case that a DID call is received with no destination number, the call can be routed to the destination assigned as the intercept. This can be used in the case of ISDN, when there is a call with no destination number sent from the provider.

The diagram below shows a typical analysis table of called party numbers to store destinations.



When no called party number is entered (including the case with no entry of called party number) or a called party number is entered but the corresponding destination is not determined, it should be handled as an undefined called party number (out of search).

When no undefined called party number is entered or it is entered but the corresponding destination is not determined, the call is refused by a call disconnect signal with ROT or indication of appropriate reason.

Wild Card A wild card can be used as a digit. For example, 100? (? = wild card) as a called party number matches any of ten numbers from 1000 ~ 1009. The wild card can be used at any position in the string and can appear at more than one digit column in a string.

Moreover, a number with a wild card at a particular column can coexist with another number with a real digit at the same column. In this case, the number with real digits is checked first and, if it does not match with the given number, then the number with the wild card is tested. For example,

suppose that 1010, 1020, and 10?0 are listed as called party numbers in the table. When 1010 or 1020 are given, they will match with the individual entries in the table. When 1030 or 1040 are given, they will match with 10?0 because the wild card allows for it.

Up to eight (8) numbers with wild card(s) can be set in the table per an incoming line group. A number with a wild card will not overlap another number with a wild card. For example, ??34 and 12?? cannot coexist in the table because it may cause confusion.

Even when using wild cards in programming, all of the actual dialed digits of the DID number display on the telephone LCD and are sent on the OAI and/or IPedge link when a call is received.

Call Termination to External
Paging Device

The IPedge system treats paging as a SIP station, the Feature code of the paging group is set as the DID destination. When a call is presented, it will ring the devices assigned to the paging group and may be picked up from another telephone or device.

Direct Inward Dialing (DID)

This feature allows external callers to dial directly to individual extensions or groups of telephones without intervention by an operator, IVR, or auto attendant. Each incoming DID number can be routed individually to an extension or other resources, such as pooled or group line button, night bell, voice mail box, or back out over the public or private telephone network. DID routing assignments can change automatically when the system switches between the Day and Night Modes.

The DID format used in IPedge must follow specific entry rule and exclude any formatting:

- 1-949-583-3000 should be entered as: 19495833000
- +011-23-4567-8901 should be entered as: 0112345678901

DID numbers can vary between 1~15 digits in length for each DID line group on systems running IPedge R.1.6 and later software. Earlier systems support 1~7 digits. Each DID number may be assigned to 1 of 15 possible music-on-hold sources.

Direct Inward Dialing (DID) No user operation is required.

PROGRAMMING

Advanced Configuration	<ol style="list-style-type: none"> 1. Click on Trunk > Trunk Group. 2. Click on New and go to step 3, or check the ILG to be modified and skip to step 4. 3. Select Incoming. 4. Select Show Advanced Configuration. 5. Set the CO Service Type, and the number of DID digits to expect. 6. Click on Save icon.
DID Intercept	<ol style="list-style-type: none"> 1. Click on Trunk > DID. 2. Select the ILG Group from the dropdown. 3. Enter the DID number and program Tenant Number, MOH Source, Audio Day1, Day2, and Night Destinations (Usually Dialing Digits) Audio Destination Digits (the station, phantom, VM pilot, etc., where the call is to be terminated), and any voice mail data or display name to be associated with this DID number. <p>Note: Do not use any dashes or parentheses for the DID number.</p> <ol style="list-style-type: none"> 4. Click on Save icon.
Optional: Program DID Intercept.	<ol style="list-style-type: none"> 1. Click on Trunk > DID Intercept. 2. Check the ILG No Data or Not Determined Type of intercept. 3. Click on Edit icon. 4. Enter MOH Source, Audio Day1, Day 2, and Night Destinations (Usually Dialing Digits) Audio Destination Digits (the station, phantom, voice mail pilot, etc where the call is to be terminated), and any voice mail data or display name to be associated with this DID number. 5. Click on Save icon. <p>Note: A separate destination can be assigned for: Undetermined (Digits received don't match system programming) Calls where no DID digits are received.</p>
Complement of DID Number	<p>This parameter is available on systems running R1.6 and later software. The Incoming Line Group (Trunk) parameter, Complement of DID Number, allows two modes of DID routing. The possible values are:</p> <ul style="list-style-type: none"> • Disabled (default) - The system routes DID calls in the same manner as R1.5 and earlier systems. • Enabled - The system routes DID calls using least significant digit matching. The system looks for a routing match starting with the first digits or the digits on the right side of the number. <p>Examples with Complement of DID Number set to Enabled:</p>

If there is a single match the call will route to the defined destination. If the DID definition setting is 9495833500 and 5833500 is received the call will route to the destination.

If there are multiple matching destinations the call will be treated as 'No DID destination set.' If the DID definition settings include 9495833500 and 7145833500 when 5833500 is received there are multiple possible destinations. This call will be 'no destination set'.

CAPACITY

Up to eight (8) entries with wild card(s) are allowed per an incoming line group. Up to sixty-four (64) entries with wild card(s) are allowed per a system.

The Listed Directory Number is a maximum of 15 digits in length. The number will be the same length within an incoming line group.

The total number of destinations for DID numbers depends on DID digit length.

DID Digits	No. of Destinations	Comment
6 Digits or less	3000	1000 sets. These are used for DAY1/ DAY2/ NIGHT.
15 Digits	1500	500 sets. These are used for DAY1/ DAY2/ NIGHT.

AVAILABILITY

Station/Line	Descriptions
IPT	Can be the destination
Soft IPT	Can be the destination
IP Attendant	Can be the destination
SIP compliant station	Can be the destination
SLT (via FXS gateway)	Can be the destination
Paging Device (SIP Station Device)	Can be the destination
SIP trunk	Treating the incoming call from SIP trunk as ISDN DID incoming call
ISDN trunk (via FXO gateway)	Treating the incoming call from SIP trunk converted by the gateway as ISDN DID incoming call.
T1 trunk (via FXO gateway)	Treating the incoming call from SIP trunk converted by the gateway as ISDN DID incoming call.
Voice Mail - SIP	Can be the destination

RESTRICTION

If the paging device answers automatically another station cannot pick up a call terminating on the external paging device when it is set as a DID destination.

HARDWARE

No additional hardware is necessary for this feature.

FEATURE INTERACTION

Audible Tone	<p>Audible tones for a DID incoming call, per the country, are provided if the incoming call from the remote node is a DID call.</p> <p>The Tone provided by the system to DID lines is selected out of “for Hong Kong,” “for Malaysia,” and “for other regions” by Region Code.</p>
Automatic Camp On	The Automatic Camp On feature is applied if conditions are satisfied when the destination determined by the DID feature is busy.
Basic Survivability	The Basic Survivability feature applies if the IPT answers a DID terminating call.
Caller Identification	The originator’s URI and caller name is shown when the incoming call terminates from the SIP trunk.
Calling Number Identification	<p>For the SIP trunk origination using GCO groups or Pooled Line Button groups assigning a DID number converted from SIP URI, the assigned URI is notified to the public trunk.</p> <p>The Destination URI assigned to the PDN is stored in From header and notified to the public trunk when the destination station PDN’s URI originates the outgoing call by using the PDN. The Destination URI assigned to the PhDN is stored in From header and notified to the public trunk when the PhDN with the destination URI is used to originate the outgoing call. The Destination URI assigned to the GCO or Pool button is used when the call is originated by using these buttons, or when the default URI specified by OLG is stored in From header if GCO or Pool button does not have a destination URI.</p>
Criterion of Busy	The Criterion of Busy feature is applied when the DID destination is either DN or PhDN.
Day/Night Modes	It is possible to switch the DID destination using Day/ Night mode.
Do Not Disturb (DND)	A DID termination is rejected if PDN or the owner of PhDN activates Do Not Disturb. If the destination has call forward external call, call forward busy/don’t answer, or call forward busy then the call may be forwarded.
Group CO Button	Group CO buttons corresponding to the DID number can be set as the DID destination.

Group Paging/Emergency Page	<p>A DID incoming call terminates and a paged call disconnects on the station if the DID destination is a paged station during a paging call. If there is no other paged station, the paging call disconnects and the paging party hears Reorder Tone.</p> <p>It is possible to set a group paging feature access code as the DID destination, but the originator hears Busy Tone while terminating and the paging call fails.</p>
Jumping LED	Jumping LED feature applies when the DID destination is the station.
Least Cost Routing (LCR)	<p>It is possible to set an LCR access code + the external number as the DID destination.</p> <p>MDT is sent with referring Prog 535 FB 1 when the destination is the trunk and the system cannot confirm the originating terminal.</p>
Make Busy	Reorder Tone is returned to the PSTN if the DID destination is in make busy mode.
Multiple Calling	<p>The Multiple Calling group can be assigned to a DID destination.</p> <p>The Pool and GCO buttons' LED indicate as called if the Multiple Calling Pilot DN is assigned to a DID destination.</p>
Music On Hold	The music source can be specified per DID number.
Network DN Table	A Network DN can be specified as the destination.
Outgoing Call	It is possible to originate an outgoing call to the external number following the Outgoing Line Group access code as the DID destination.
PC Attendant	<p>Terminating calls on Attendant group are treated as the type of incoming line group calls for the Attendant group (if Attendant group is set as the DID destination and is in Attended mode). The terminating calls are forwarded to the Alternative Destination when Attendant group is in either Position Busy mode or Position Busy Pending mode.</p> <p>Terminating calls on Attendant individual DN are treated as the type of incoming individual call for Attendant individual DN (if Attendant individual DN is set as DND destination and is in Attended mode). The terminating calls are treated as individual calls when Attendant is in either Position Busy mode or Position Busy Pending mode because it is regarded as an ordinal IPT. In this case, the calls are not handled by Attendant.</p>

Pooled Line Button	The Pool buttons corresponding to the DID number can be set as the DID destination.
Pop Speed Dial	<p>Content displayed on the LCD is determined by the result of comparison between the CLI No. and the System/Station Speed Dial Number.</p> <p>The Speed Dial Name or CLI No. display is determined by the Programming set up for the station.</p>
Private Networking Over IP	<p>If an incoming call from a private network via IPedge Net made by another node is a DID call then IPedge provides audible tones, to DID lines, selected out of regions by Region Code.</p> <p>The Network directory number and network feature access code indicating the attendant at the remote node can be set as the DID call destination. A DID call cannot be terminated by specifying the group CO button or Pooled Line button at a remote node or external paging device.</p> <p>When DID call terminates to an extension at a remote node via IPedge Net, the information related to the DID call (destination number, etc.) is notified to the remote node together with the information stating the DID call. The destination number is converted to the domestic complete number beginning with area code. In order to make it a completed number, the prefix is added per the incoming line group at the incoming gateway node.</p> <p>When a DID call terminates to an extension at a remote node via non-IPedge Net, the call cannot be determined as DID and is handled basically the same as an internal call at the terminating node.</p>
SIP Trunking	The URI user name of To header, received during SIP trunk termination, is treated as a DID number.
Station CO Line Access	The Station CO Line Access feature is applied originate to the public trunk if the incoming call by the Direct Inward Dialing (DID) feature terminates with the public trunk as the destination.
Tandem CO Line Connection	It is possible to establish a Tandem CO Line connection by specifying the external number as the DID destination.
Toll Restriction Override by System Speed Dial	The special Class Of Service is applied per the system setting even if System Speed Dial is set as the DID destination.
Toll Restriction	Toll Restriction is applied per the system setting even when the external number is set as the DID destination.

Tone First/ Voice First The terminating call by DID is always a Tone First call not a Voice First call.