



Global Call Country Dependent Parameters (CDP)

Configuration Guide

December 2003



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Revision History

This revision history summarizes the changes made in each published version of this document.

Document No.	Publication Date	Description of Revisions
05-1965-002	December 2003	<p>Global changes: Added two new parameters, CDP_FLAG_APPEND_F and CDP_SEND_ALERTING_ON_R2MF_COMPLETION, for the countries/protocols that use the <code>pdk_r2_io</code> protocol module. Also revised the description of the CDP_OVERLAP_SENDING_ENABLED parameter. These changes affect the following chapters: Argentina R2, Brazil R2, CCITT R2, Colombia R2, Finland R2, India R2, Israel R2, Korea R2, Malaysia R2, Morocco R2, Pakistan R2, Philippines R2, Singapore R2, Thailand R2, Venezuela R2, and Vietnam R2.</p> <p>Added a protocol limitation regarding the use of gc_DropCall() after gc_SetUpTransfer(). This change affects the following chapters: Alcatel 4400 Lineside E1, E1 CAS, Ericsson MD110 PBX Lineside, Lucent Lineside E1, Nortel Meridian Lineside E1, United States T1, and United States T1 FXS/LS. (PTR 30365)</p> <p>Belgium Lineside Bidirectional Protocol Parameter Configuration and Belgium Network Bidirectional Protocol Parameter Configuration chapters: New chapters.</p> <p>Brazil R2 Bidirectional Protocol Parameter Configuration chapter: Changed the default value for CAS_PULSE_DOUBLE_ANSWER parameter.</p> <p>Chile R2 Bidirectional Protocol Parameter Configuration chapter: New chapter.</p> <p>China R2 Bidirectional Protocol Parameter Configuration chapter: Revised the description of the CDP_DNIS_DIGITS_BEFORE_ANI parameter.</p> <p>E1 CAS Bidirectional Protocol Parameter Configuration and United States T1 Bidirectional Protocol Parameter Configuration chapters: Added new parameter, CDP_BlockOnLOOS.</p> <p>Added guideline for setting the CDP_IN_GetDigitTime parameter. (PTR 29357)</p> <p>MELCAS Network Bidirectional Protocol Parameter Configuration chapter: Changed the default value for CDP_DTMF_DIALING parameter.</p> <p>Saudi Arabia R2 Bidirectional Protocol Parameter Configuration chapter: New chapter.</p> <p>Sweden P7 Bidirectional Protocol Parameter Configuration and Sweden P7 PBX Bidirectional Protocol Parameter Configuration chapters: Changed the default value for CDP_Dial_Using_DTMF and CDP_DialToneEnabled parameters.</p> <p>United States T1 FXS/LS Bidirectional Protocol Parameter Configuration chapter: Added new parameter, CDP_DisconnectToneSup.</p>
05-1965-001	June 2003	<p>Initial version of document. Much of the information contained in this document was previously published in the <i>Global Call Country Dependent Parameters (CDP) Reference</i>, document number 05-0870-006.</p> <p>Note: Information about ICAPI protocols is not included in this document. Although still supported, the development of ICAPI protocols has been capped. For information about the CDP files used with ICAPI protocols, see the <i>Global Call Country Dependent Parameters (CDP) Reference</i>, document number 05-0870-006, which was provided with the Global Call Protocols Version 3.0 release. Documentation for the Version 3.0 release is available on the Intel Telecom Support Resources web site.</p>





About This Publication

The following topics provide information about this publication:

- [Purpose](#)
- [Intended Audience](#)
- [How to Use This Publication](#)
- [Related Information](#)

Purpose

This guide provides information about configuring the country dependent parameter (CDP) files included in the Global Call Protocols package. Configuration procedures are given, as well as descriptions of configuration files and configuration parameters.

Note: Information about ICAPI protocols is not included in this guide. Although still supported, the development of ICAPI protocols has been capped. For information about the CDP files used with ICAPI protocols, see the *Global Call Country Dependent Parameters (CDP) Reference*, document number 05-0870-006, which was provided with the Global Call Protocols Version 3.0 release. Documentation for the Version 3.0 release is available on the Intel Telecom Support Resources web site.

Intended Audience

This information is intended for users who use the Global Call Application Programming Interface (API) to develop applications using Analog, E1 CAS, or T1 robbed bit technologies.

How to Use This Publication

Refer to this publication after you have installed the Intel® Dialogic® system release software and the Global Call Protocols package.

[Chapter 1, “Configuration Overview”](#) and [Chapter 2, “Configuration Procedures”](#) provide introductory information and procedures for using Global Call protocols on DM3 and Springware boards, on a Linux or Windows system.

Note: *DM3 boards* is a collective name used in this publication to refer to products that are based on the Intel® Dialogic® DM3 mediastream architecture. For example, the Intel® NetStructure™ DM/V and DMT160TEC products are DM3 boards. *Springware boards* is a collective name for boards based on earlier-generation architecture.

The remaining chapters provide reference information about all protocol parameters. [Chapter 3, “Call Progress Analysis Parameters”](#) describes the parameters for configuring default call progress analysis operation in the protocol. These parameters can be used in any CDP file. Following this is a separate chapter for each protocol. The chapters are in alphabetical order by protocol name. The information in each chapter includes the protocol file set, any protocol limitations, and a description of each modifiable CDP parameter.

Note: Only the modifiable parameters in the CDP files are listed and described in this guide. The CDP files contain additional parameters that are set to the value required to meet the approval of the local PTT and should not be changed.

Related Information

See the following for more information:

- Release Notes for the Global Call Protocols package – describes the new features in the current release, provides installation instructions, and lists any known problems.
- Online Bookshelf for your Intel® Dialogic® system release – contains programming guides and reference information for developing Global Call applications. For example:
 - *Global Call API Programming Guide* – provides guidelines for developing applications using the Global Call API.
 - *Global Call API Library Reference* – provides a reference to all functions, events, data structures, and error codes in the Global Call API library.
 - *Global Call Analog Technology User’s Guide* and *Global Call E1/T1 CAS/R2 Technology User’s Guide* – provide information about using the Global Call API with specific technologies.
- Release Guide for your Intel® Dialogic® system release – provides information about the system release, system requirements, software and hardware features, supported hardware, and release documentation.
- Release Update for your Intel® Dialogic® system release (available on the Technical Support Web site only) – describes compatibility issues, restrictions and limitations, known problems, and late-breaking updates or corrections to the release documentation.
- <http://developer.intel.com/design/telecom/support> – Technical Support Web site, which contains developer support information, downloads, release documentation, technical notes, application notes, a user discussion forum, and more.

This chapter provides an overview of the configuration process and of the files associated with each protocol.

- [Major Configuration Steps](#) 13
- [Protocol File Naming Conventions](#) 13
- [Protocol File Directory Locations](#) 15

Note: Information about ICAPI protocols is not included in this guide. Although still supported, the development of ICAPI protocols has been capped. For information about the CDP files used with ICAPI protocols, see the *Global Call Country Dependent Parameters (CDP) Reference*, document number 05-0870-006, which was provided with the Global Call Protocols Version 3.0 release. Documentation for the Version 3.0 release is available on the Intel Telecom Support Resources web site.

1.1 Major Configuration Steps

The major configuration steps when using the Global Call Protocols package are:

1. Configuring the country dependent parameters in the CDP file
2. Downloading the protocol and CDP file

Detailed information about these configuration steps is given in [Chapter 2, “Configuration Procedures”](#).

Each protocol is contained in a separate, modular binary file. This modular design simplifies adapting applications for use in numerous countries. The protocol and parameters used at the application’s interface to the PTT must complement those used by the local CO.

User selectable options allow customization of the country dependent parameters to fit a particular application or configuration within a country, because switches within the same country may use the same protocol but may require different parameter values for local use. These parameters (for example, the number of DNIS digits, number of ANI digits, time-outs, and many others) are specified in the CDP file and may be modified at configuration time (that is, at any time before starting your application).

1.2 Protocol File Naming Conventions

When a protocol is installed on your system, several files are installed, including the protocol modules and country dependent parameter files. For most protocols, the files are named according to the conventions shown in Table 1.

Table 1. Protocol File Naming Conventions

File Name	Description
pdk_cc_tt_dd.cdp or pdk_cc_tt_ffff_dd.cdp	Country dependent parameter files
pdk_cc_tt_dd.qs or pdk_cc_tt_ffff_dd.qs pdk_cc_tt_dd.hot or pdk_cc_tt_ffff_dd.hot	DM3 protocol modules
pdk_cc_tt_dd.qs or pdk_cc_tt_ffff_dd.qs pdk_cc_tt_dd.arm.hot or pdk_cc_tt_ffff_dd.arm.hot	DM3 protocol modules for DMT160TEC boards
pdk_cc_tt_dd.psi or pdk_cc_tt_ffff_dd.psi	Springware protocol modules

In Table 1:

pdk

indicates the PDKRT call control library, i.e., the call control library for which the protocol is written.

cc

is a two-character ISO country code or regional code (for example, ar = Argentina, cn = China, na = North America, etc.), or sw for a switch-specific protocol. (cc is not always included in the protocol module name, for example, when the generic R2 protocol is used.)

tt

is a two-character protocol type. Examples of valid types are:

- e1 – a pulse, MF SOCOTEL, or other E1 protocol
- em – a T1 protocol using E&M signaling with support for DTMF digits only
- ls – a loop start protocol
- mf – a T1 protocol using E&M signaling with support for MF digits
- r2 – a protocol using R2MFC signaling

ffff

is optional and defines a special software or hardware feature supported by the protocol. For switch-specific protocols, this field provides additional information about the switch.

dd

is a direction indicator, normally io for inbound/outbound.

.cdp

is the file extension for country dependent parameter files.

.qs, .hot, and .arm.hot

are the file extensions for DM3 protocol modules.

.psi

is the file extension for Springware protocol modules.

1.3 Protocol File Directory Locations

The protocol files are located under the installation directories listed in Table 2. (The directory location environment variables shown in Table 2 are for Intel® Dialogic® System Release 6.x and later software.)

Table 2. Protocol File Directory Locations

File Type	Directory Location	
	Linux	Windows
Country dependent parameters (.cdp)	\$INTEL_DIALOGIC_CFG	%INTEL_DIALOGIC_CFG%
DM3 protocol modules (.qs, .hot, .arm.hot)	\$INTEL_DIALOGIC_CFG	%INTEL_DIALOGIC_CFG%
Springware protocol modules (.psi)	\$INTEL_DIALOGIC_FWL	%INTEL_DIALOGIC_FWL%



This chapter describes the configuration procedures needed when using the Global Call Protocols package.

- Assumptions and Prerequisites 17
- Order of Procedures 17
- Configuring Country Dependent Parameters 18
- Downloading the Protocol and CDP File on DM3 Boards 18
- Downloading the Protocol and CDP File on Springware Boards 21

2.1 Assumptions and Prerequisites

The following assumptions and prerequisites apply to the Global Call Protocols configuration procedures:

- The Intel® Dialogic® system release software has been installed and configured. See the Software Installation Guide for your system release and the Configuration Guide for your boards for applicable procedures.
- The .fcd and .pcd configuration files selected for DM3 boards support the use of DM3 PDK protocols. With Intel® Dialogic® System Release 5.x software, some of the .fcd/.pcd files have an embedded protocol. When these .fcd/.pcd files have been assigned to a board, the PDK protocols cannot be used with that board.
 Make sure that the .fcd/.pcd file names are the *mlx_qsx_cas* variety on T1 and *mlx_qsx_r2mf* variety on E1. For example, *ml2_qsa_cas.fcd* and *ml2_qsa_cas.pcd* support the use of DM3 PDK protocols, but *ml2_qsa_t1.fcd* and *ml2_qsa_t1.pcd* do not support the use of DM3 PDK protocols.
- The Global Call Protocols package has been installed. Check the Release Notes for your Global Call Protocols package to determine the Intel® Dialogic® system releases that it can be used with.

2.2 Order of Procedures

[Configuring Country Dependent Parameters](#) can be done at any time before starting your application.

[Downloading the Protocol and CDP File on DM3 Boards](#) and [Downloading the Protocol and CDP File on Springware Boards](#) should be done before starting the boards.

2.3 Configuring Country Dependent Parameters

The country dependent parameters (CDP) file can be modified from the command line using a text editor.

Note: If you want to preserve the default parameter values contained in the CDP file, make a backup copy of the file prior to editing it.

To edit a CDP file:

1. From the command prompt, go to the directory where the CDP files are located. (With Intel® Dialogic® System Release 6.x software, this is \$INTEL_DIALOGIC_CFG on Linux and %INTEL_DIALOGIC_CFG% on Windows.)
2. Using a text editor (for example, vi on Linux or WordPad on Windows), open the CDP file you want to modify.
3. Edit the CDP file as necessary. See the Parameter Configuration chapters in this guide for a description of the CDP file parameters for each protocol.

Note: Only the modifiable parameters in the CDP files are listed and described in this guide. The CDP files contain additional parameters that are set to the value required to meet the approval of the local PTT and should not be changed.

4. Save and close the CDP file.

If you have DM3 boards, continue with [Section 2.4, “Downloading the Protocol and CDP File on DM3 Boards”](#), on page 18. If you have Springware boards, continue with [Section 2.5, “Downloading the Protocol and CDP File on Springware Boards”](#), on page 21.

2.4 Downloading the Protocol and CDP File on DM3 Boards

To download the Global Call protocol modules and country dependent parameters to DM3 boards, you must create a file called *pdk.cfg*. This file specifies the protocol and the parameter settings downloaded to each board. The information is downloaded when you start the boards.

When using DMT160TEC boards, up to eight CDP files can be downloaded to a single board depending on the options used in the *pdk.cfg* file.

Perform either of the following procedures, depending on your operating system:

- [Downloading the Protocol and CDP File on a Linux System](#)
- [Downloading the Protocol and CDP File on a Windows System](#)

Note: On DM3 boards, the protocol is determined at board initialization time and not when a Global Call device is opened. For compatibility with Springware boards, the **gc_OpenEx()** protocol name field may be specified for DM3 boards, but it is not used.

2.4.1 Downloading the Protocol and CDP File on a Linux System

On Linux, the `dstart` utility will automatically download the protocol and country dependent parameters if the file `pdk.cfg` is present in the `$INTEL_DIALOGIC_CFG` directory.

Proceed as follows to set up the `pdk.cfg` file:

1. Stop the Dialogic Service if it is running.
2. From the command prompt, go to the `$INTEL_DIALOGIC_CFG` directory.
3. Using a text editor (for example, `vi`), create a file called `pdk.cfg`.
4. For each DM3 board to be configured, add a line to `pdk.cfg` in the following format:

```
board <n> [options] fcdfile <file> pcdfile <file> variant <file>
```

Note: For DMT160TEC boards, the following option must be included:

```
mlmfile dti16pdk.mlm.sym
```

The options can be abbreviated to their first letter, for example:

```
b <n> [options] f <file> p <file> v <file> m <file>
```

See [Table 3, “pdk.cfg File Options”](#), on page 20 for a description of all options.

5. Save and close the `pdk.cfg` file.

The configuration settings take effect when the system is started.

Note: To stop the system from automatically downloading the protocol and country dependent parameters when you start the system, remove `pdk.cfg` from the `$INTEL_DIALOGIC_CFG` directory.

2.4.2 Downloading the Protocol and CDP File on a Windows System

On Windows, a tool called PDKManager is used to download the Global Call protocol modules and country dependent parameters to DM3 boards. Starting the Intel® Dialogic® Configuration Manager (DCM) will automatically invoke PDKManager if the file `pdk.cfg` is present in the `%INTEL_DIALOGIC_CFG%` directory.

Proceed as follows to set up the `pdk.cfg` file and PDKManager:

1. Stop the Dialogic Service if it is running.
2. From the command prompt, go to the `%INTEL_DIALOGIC_CFG%` directory.
3. Using a text editor (for example, WordPad), create a file called `pdk.cfg`.
4. For each DM3 board to be configured, add a line to `pdk.cfg` in the following format:

```
board <n> [options] fcdfile <file> pcdfile <file> variant <file>
```

Note: For DMT160TEC boards, the following option must be included:

```
mlmfile dti16pdk.mlm.sym
```

The options can be abbreviated to their first letter, for example:

```
b <n> [options] f <file> p <file> v <file> m <file>
```

See [Table 3, “pdk.cfg File Options”](#), on page 20 for a description of all options.

5. Save and close the *pdk.cfg* file.

6. Type the following at the command line:

```
pdkmanagerregsetup add
```

The system responds with:

```
PDKManager key insertion succeeded.
```

The configuration settings take effect when you run DCM and start the boards.

Note: To stop PDKManager from automatically running whenever DCM is started, type the following at the command prompt: `pdkmanagerregsetup remove`

Table 3. pdk.cfg File Options

Option	Description
board <n>	<p>Required. Specifies the logical board ID for the board(s) to which the command applies. For multiple boards, n = {n1 n2 ... nx} For example, to download and assign the <i>pdk_ar_r2_io</i> protocol files to all lines on boards 1 and 3, type: <code>board {1 3} variant pdk_ar_r2_io.cdp</code></p>
line <n>	<p>Specifies the E1 or T1 line(s) to which the command applies. If this parameter is not specified, then all lines defined by the FCD file are used. For multiple lines, n = {n1 n2 ... nx} For example, to download and assign the <i>pdk_ar_r2_io</i> protocol files to lines 1 and 2 on board 1, type: <code>board 1 line {1 2} variant pdk_ar_r2_io.cdp</code></p>
chan <n>	<p>Specifies the channel(s) to which the command applies. If this parameter is not specified, then all channels defined by the FCD file are used. For multiple channels, n = {n1 n2 ... nx} For example, to download and assign the <i>pdk_ar_r2_io</i> protocol files to channels 1 and 2 on line 1 on board 2, type: <code>board 2 line 1 chan {1 2} variant pdk_ar_r2_io.cdp</code></p>
fcdfile <file>	<p>Required if the default FCD file, <i>qs_r2mf.fcd</i>, is not used. Determines line and channel configurations by parsing the FCD file.</p>
pcdfile <file>	<p>Required if the default PCD file, <i>qs_r2mf.pcd</i>, is not used. Specifies the .mlm file by parsing the PCD file.</p>

Table 3. `pdk.cfg` File Options (Continued)

Option	Description
variant <file>	Required. Specifies the CDP file used. Downloads and configures the protocol on the board(s) specified, and then assigns the variant to the lines and channels.
mlmfile <file>	Required for DMT160TEC boards, which must use <code>mlmfile dti16pdk.mlm.sym</code> Overrides the firmware file (.mlm) specified in the PCD file.

`pdk.cfg` File Examples

For all lines on board 1, use the specified .fcd/.pcd files and Argentina R2 protocol:

```
b 1 f ml1b_qs2_r2mf.fcd p ml1b_qs2_r2mf.pcd v pdk_ar_r2_io.cdp
```

For lines 1 and 2 on board 2, use the specified .fcd/.pcd files and Brazil R2 protocol:

```
b 2 l {1 2} f ml2_qs_r2mf.fcd p ml2_qs_r2mf.pcd v pdk_br_r2_io.cdp
```

For all lines on board 3 (a DMT160TEC board), use the specified .fcd/.pcd files and United States T1 protocol:

```
b 3 f 16xt_cas.fcd p 16xt_cas.pcd v pdk_us_mf_io.cdp
m dti16pdk.mlm.sym
```

2.5 Downloading the Protocol and CDP File on Springware Boards

With Springware boards, the protocol is determined when a Global Call device is opened with the `gc_OpenEx()` function. For information about using this function, see the *Global Call API Library Reference*. The protocol name to use in the `gc_OpenEx()` function is the root file name of the CDP file without the .cdp extension. See the Parameter Configuration chapters in this guide for the `gc_OpenEx()` protocol name for each protocol.

The only other step needed is to specify the Voice and Network Parameters (.prm) file when configuring the boards.

- On a Linux system, this is done with the **ParameterFile** parameter in the *dialogic.cfg* file.
- On a Windows system, this is done by selecting a country name on the Country tab in DCM.

See the Parameter Configuration chapters in this guide for the Voice and Network Parameters file name for each protocol.



Call Progress Analysis Parameters

This chapter describes the use of call progress analysis parameters in the CDP files, which allow you to configure default call progress analysis operation in the protocol.

Call progress analysis consists of pre-connect and post-connect information about the progress of a call. Pre-connect call progress determines the status of a call connection, such as busy, no answer, etc. Post-connect call analysis (also referred to as media detection) determines the destination party's media type, such as voice, answering machine, etc.

The *Global Call API Programming Guide*, *Global Call Analog Technology User's Guide*, and *Global Call E1/T1 CAS/R2 Technology User's Guide* describe ways to specify call progress analysis in the application. PDK protocols also allow you to configure default call analysis operation through the use of two protocol service layer (PSL) parameters in the protocol CDP file (the parameters beginning with "R4" are for Springware boards, and the parameters beginning with "DM3" are for DM3 boards):

```
/* Set to 0 to disable, 1 to enable, and 2 to allow app control */
R4 INTEGER_t PSL_MakeCall_CallProgress = 0
DM3 INTEGER_t PSL_CACallProgressOverride = 0

/* Set 1 to enable, 2 to allow app control */
R4 INTEGER_t PSL_MakeCall_MediaDetect = 2
DM3 INTEGER_t PSL_CAMediaDetectOverride = 2
```

These parameters can be added to any CDP file if they aren't already in the file. If they are already in the file, check their settings and modify them as needed.

The **PSL_MakeCall_CallProgress** and **PSL_CACallProgressOverride** parameters set up the default options for call progress. Possible values are:

- 0: Never use, always leave call progress turned off.
- 1: Always use, always leave call progress turned on. This setting is typically used with analog and T1 protocols.
- 2: Pass through, call progress is specified dynamically by the application. This setting is typically used with E1 protocols.

The **PSL_MakeCall_MediaDetect** and **PSL_CAMediaDetectOverride** parameters set up the default options for call analysis (media detection). Possible values are:

- 1: Always use, always leave media detection turned on. This setting is typically used with analog and T1 protocols.
- 2: Pass through, media detection is specified dynamically by the application. This setting is typically used with E1 protocols.



- Notes:*
1. If the call progress and/or media detect parameters are specified as pass-through values in the CDP file, the application defines call progress and/or media detection on a per call basis via the **gc_MakeCall()** or **gc_SetParm()** function.
 2. If the call progress and/or media detect parameters are **not** specified as pass-through values in the CDP file (that is, they are either enabled or disabled in the CDP file), any application setting requests (for example, the settings specified via the **gc_MakeCall()** or **gc_SetParm()** function) are ignored.

Alcatel 4400 Lineside E1 Bidirectional Protocol Parameter Configuration

This chapter discusses the capabilities and parameters of the Alcatel 4400 Lineside E1 Bidirectional protocol in the following topics:

- General Protocol Information 25
- Country Dependent Parameter Descriptions 26

4.1 General Protocol Information

The Alcatel 4400 Lineside E1 protocol is an OPS_FX protocol.

Protocol File Set

The files used with the Alcatel 4400 Lineside E1 protocol are listed and described in the following table.

File Type	File Name(s)	
	DM3	Springware
Protocol Module	pdk_sw_e1_fxs_io.qs and pdk_sw_e1_fxs_io.hot (or pdk_sw_e1_fxs_io.arm.hot for DMT160TEC boards)	pdk_sw_e1_fxs_io.psi
Voice and Network Parameters	Not applicable	fr_300.prm
Country Dependent Parameters	pdk_sw_e1_ac4400_io.cdp	pdk_sw_e1_ac4400_io.cdp
	gc_OpenEx() Protocol Name	
	Not applicable†	pdk_sw_e1_ac4400_io

†On DM3 boards, the protocol is determined at board initialization time and not when a Global Call device is opened. For compatibility, the **gc_OpenEx()** protocol name may be specified for DM3 boards, but it is not used.

Protocol Limitations

After a call is transferred with **gc_SetUpTransfer()**, you cannot issue a **gc_DropCall()** on the original call. You must drop the consultation call before the original call can be dropped. The behavior of the protocol is undefined if you try to drop the original call without dropping the consultation call first.

4.2 Country Dependent Parameter Descriptions

Note: A parameter can be inbound, outbound, or both inbound and outbound. An inbound parameter is used by the protocol when it is acting as inbound. An outbound parameter is used by the protocol when it is acting as outbound. A parameter that is both can be used by the protocol when it is acting as either inbound or outbound.

The modifiable parameters in the *pdk_sw_e1_ac4400_io.cdp* file are:

- CDP_BlindXferTime
- CDP_ConnectOnNoDialTone (Outbound)
- CDP_ConnectOnNoRingBack (Outbound)
- CDP_DelayInDialing (Outbound)
- CDP_DialToneWaitTime (Outbound)
- CDP_MinPBXHangupTime (Inbound)
- CDP_PBXDiscEnabled
- CDP_ProtocolStopsOffhook
- CDP_WaitDialToneEnabled (Outbound)

In addition, see [Chapter 3, “Call Progress Analysis Parameters”](#) for configuring default call progress operation in the protocol.

CDP_BlindXferTime

Description: After sending the address digits on a BlindTransfer request, the protocol waits for the time specified by this parameter before sending CAS_ONHOOK and switching back to IDLE state.

Values: Time in milliseconds. Default is 5000 (5 seconds).

CDP_ConnectOnNoDialTone (Outbound)

Description: Determines how the protocol should proceed when dial tone is not detected. If the parameter is enabled (set to 1), and no dial tone is detected, a local collision with an inbound call is assumed, and the call immediately transitions to Connected state.

Values:

- 0: Do not assume local collision and disconnect the call if no dial tone is detected.
- 1 [default]: Assume local collision and connect the perceived inbound call if no dial tone is detected.

CDP_ConnectOnNoRingBack (Outbound)

Description: Determines how the protocol should proceed when no ringback tone is detected. If the parameter is enabled (set to 1), and no ringback is detected, a remote collision with a remote outbound call is assumed, and the call immediately transitions to Connected state.

Values:

- 0: Do not assume remote collision and disconnect the call if no ringback is detected.
- 1 [default]: Assume remote collision and connect the call if no ringback is detected.

CDP_DelayInDialing (Outbound)

Description: Specifies the delay time in dialing when the parameter **CDP_WaitDialToneEnabled** is not enabled.

Values: Default is 40.

CDP_DialToneWaitTime (Outbound)

Description: Defines the time that the protocol waits for a dial tone before an outbound call can be made.

Values: Time in milliseconds. Default is 10000 (10 seconds).

Guidelines: This parameter is applicable only if the **CDP_WaitDialToneEnabled** parameter is set to 1. If the time defined by this parameter is exceeded before dial tone is detected, the action taken depends on the value of the **CDP_ConnectOnNoDialTone** parameter as follows:

- If the **CDP_ConnectOnNoDialTone** parameter is set to 1, a local collision is assumed and the incoming call is connected.
- If the **CDP_ConnectOnNoDialTone** parameter is set to 0, the call attempt fails and a disconnect event is forwarded with a reason of no dial tone.

CDP_MinPBXHangupTime (Inbound)

Description: Specifies the length of the ring cycle and is used to determine if the remote end (that is, the PBX) has dropped an incoming call. The timer is reset at the start of each ring cycle. If the timer expires without resetting, ringing has been acknowledged to stop indicating the PBX has dropped the call, as the caller has abandoned the call before it was answered.

Values: Time in milliseconds. Default is 5000 (5 seconds).

Guidelines: The value of this parameter is typically set to 6 seconds, which corresponds to the complete ring cycle (2 seconds on and 4 seconds of silence).

CDP_PBXDiscEnabled

Description: Determines if the remote PBX can initiate call disconnection via CAS line signaling.

Values:

- 0: Disable call disconnect supervision, since it is not supported by the PBX.
- 1 [default]: Enable call disconnect supervision provided by the PBX.

CDP_ProtocolStopsOffhook

Description: Determines the state of the hook switch signaling (on-hook or off-hook) when the protocol stops after `gc_Close()`.

Note: This parameter has no effect on DM3 boards, because the protocol is not stopped until the board is stopped.

Values:

- 0 [default]: Set the hook switch state to on-hook.
- 1: Set the hook switch state to off-hook.

CDP_WaitDialToneEnabled (Outbound)

Description: Determines if the protocol should wait for a dial tone before dialing. Note that this parameter does **not** apply to supervised transfers (consultation calls), in which case the dial tone is not verified.

Values:

- 0 [default]: Do not wait for dial tone before dialing.
- 1: Have the FXS wait for dial tone before dialing.



Alcatel VPS 4x00 Lineside Bidirectional Protocol Parameter Configuration

This chapter discusses the capabilities and parameters of the Alcatel VPS 4x00 Lineside Bidirectional protocol in the following topics:

- General Protocol Information 29
- Country Dependent Parameter Descriptions 30

5.1 General Protocol Information

Protocol File Set

The files used with the Alcatel VPS 4x00 Lineside protocol are listed and described in the following table.

File Type	File Name(s)	
	DM3	Springware
Protocol Module	pdk_sw_vps_4x00_io.qs and pdk_sw_vps_4x00_io.hot (or pdk_sw_vps_4x00_io.arm.hot for DMT160TEC boards)	pdk_sw_vps_4x00_io.psi
Voice and Network Parameters	Not applicable	r2_300.prm
Country Dependent Parameters	pdk_sw_vps_4x00_io.cdp	pdk_sw_vps_4x00_io.cdp
	gc_OpenEx () Protocol Name	
	Not applicable†	pdk_sw_vps_4x00_io

†On DM3 boards, the protocol is determined at board initialization time and not when a Global Call device is opened. For compatibility, the **gc_OpenEx()** protocol name may be specified for DM3 boards, but it is not used.

Protocol Limitations

None.

5.2 Country Dependent Parameter Descriptions

Note: A parameter can be inbound, outbound, or both inbound and outbound. An inbound parameter is used by the protocol when it is acting as inbound. An outbound parameter is used by the protocol when it is acting as outbound. A parameter that is both can be used by the protocol when it is acting as either inbound or outbound.

The modifiable parameters in the *pdk_sw_vps_4x00_io.cdp* file are:

- [CDP_BlindXferTime](#)
- [CDP_MinPBXHangupTime \(Inbound\)](#)
- [CDP_OnhookTime \(Outbound\)](#)
- [CDP_PBXDiscEnabled](#)
- [CDP_PreDialingWaitMode](#)
- [CDP_PreDialingWaitTime](#)
- [CDP_ProtocolStartsOnHook](#)
- [CDP_ProtocolStopsOffhook](#)

In addition, see [Chapter 3, “Call Progress Analysis Parameters”](#) for configuring default call progress operation in the protocol.

CDP_BlindXferTime

Description: After sending the address digits on a BlindTransfer request, the protocol waits for the time specified by this parameter before sending CAS_ONHOOK and switching back to IDLE state.

Values: Time in milliseconds. Default is 5000 (5 seconds).

CDP_MinPBXHangupTime (Inbound)

Description: Specifies the length of the ring cycle and is used to determine if the remote end (that is, the PBX) has dropped an incoming call. The timer is reset at the start of each ring cycle. If the timer expires without resetting, ringing has been acknowledged to stop indicating the PBX has dropped the call, as the caller has abandoned the call before it was answered.

Values: Time in milliseconds. Default is 5000 (5 seconds).

Guidelines: The value of this parameter is typically set to 6 seconds, which corresponds to the complete ring cycle (2 seconds on and 4 seconds of silence).

CDP_OnhookTime (Outbound)

Description: If FXS is outbound only and starts in the off-hook state, it remains in the off-hook state until it receives a MakeCall. This parameter specifies the time during which FXS should remain on-hook before processing the MakeCall.

Values: Time in milliseconds. Default is 500 (0.5 seconds).

CDP_PBXDiscEnabled

Description: Determines if the remote PBX can initiate call disconnection via CAS line signaling.

Values:

- 0: Disable call disconnect supervision, since it is not supported by the PBX.
- 1 [default]: Enable call disconnect supervision provided by the PBX.

CDP_PreDialingWaitMode

Description: Specifies the behavior of the FXS prior to dialing.

Values:

- 0: Wait for **CDP_PreDialingWaitTime** specified timer.
- 1 [default]: Wait for start dialing DTMF code from PBX.

CDP_PreDialingWaitTime

Description: If **CDP_PreDialingWaitMode** is set to 0, the FXS will wait this specified time prior to dialing.

Values: Time in milliseconds. Default is 500 (0.5 seconds).

CDP_ProtocolStartsOnHook

Description: Specifies the signal sent on the line in following two conditions:

- When the protocol starts in the in-service outbound channel state
- When alarm is released and channel state requested is in-service outbound

Values:

- 0: Send CAS_OFFHOOK signal on the line.
- 1 [default]: Send CAS_ONHOOK signal on the line.

CDP_ProtocolStopsOffhook

Description: Determines the state of the hook switch signaling (on-hook or off-hook) when the protocol stops after **gc_Close()**.

Note: This parameter has no effect on DM3 boards, because the protocol is not stopped until the board is stopped.

Values:

- 0 [default]: Set the hook switch state to on-hook.
- 1: Set the hook switch state to off-hook.



Argentina R2 Bidirectional Protocol Parameter Configuration

This chapter discusses the capabilities and parameters of the Argentina R2 Bidirectional protocol in the following topics:

- General Protocol Information 33
- Country Dependent Parameter Descriptions 33

6.1 General Protocol Information

Protocol File Set

The files used with the Argentina R2 protocol are listed and described in the following table.

File Type	File Name(s)	
	DM3	Springware
Protocol Module	pdk_r2_io.qs and pdk_r2_io.hot (or pdk_r2_io.arm.hot for DMT160TEC boards)	pdk_r2_io.psi
Voice and Network Parameters	Not applicable	ar_300.prm
Country Dependent Parameters	pdk_ar_r2_io.cdp	pdk_ar_r2_io.cdp
	gc_OpenEx() Protocol Name	
	Not applicable†	pdk_ar_r2_io

†On DM3 boards, the protocol is determined at board initialization time and not when a Global Call device is opened. For compatibility, the **gc_OpenEx()** protocol name may be specified for DM3 boards, but it is not used.

Protocol Limitations

If a DropCall is attempted in the ACCEPTED state, the protocol will answer the call by sending out the ANSWER pattern before dropping the call, as forced release is not supported in this protocol.

6.2 Country Dependent Parameter Descriptions

Note: A parameter can be inbound, outbound, or both inbound and outbound. An inbound parameter is used by the protocol when it is acting as inbound. An outbound parameter is used by the protocol when it is acting as outbound. A parameter that is both can be used by the protocol when it is acting as either inbound or outbound.

The modifiable parameters in the *pdk_ar_r2_io.cdp* file are:

- CDP_ANI_ENABLED (Inbound)
- CDP_ANI_MaxDigits (Inbound)
- CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED
- CDP_ANI_WITHAC_FACILITY_ENABLED (Outbound)
- CDP_AreaCode
- CDP_CallingPartyCategory (Outbound)
- CDP_ConnectType (Outbound)
- CDP_DNIS_MaxDigits (Inbound)
- CDP_Drop_Using_ProgressTones_After_AcceptCall (Inbound)
- CDP_FLAG_APPEND_F (Outbound)
- CDP_GrpB_Tone (Inbound)
- CDP_IMMEDIATE_ACCEPTSTATE (Inbound)
- CDP_IS_ANIAVAILABILITY_CHECK_NEEDED
- CDP_IS_CALLING_LINE_IDENTIFICATION_PERMITTED (Outbound)
- CDP_NO_OF_DNIS_BEFORE_CAT (Inbound)
- CDP_NUM_OF_AC_DIGITS (Inbound)
- CDP_NUM_OF_ANI_DIGITS (Inbound)
- CDP_NUM_OF_DNIS_DIGITS (Inbound)
- CDP_OVERLAP_SENDING_ENABLED (Outbound)
- CDP_REJECT_WITH_A3B4 (Inbound)
- CDP_SEND_ALERTING_ON_R2MF_COMPLETION (Inbound)
- CDP_SEND_BLOCK_AT_START_OR_REMOTE_BLOCK
- CDP_TrunkPrefixNumber

In addition, see Chapter 3, “Call Progress Analysis Parameters” for configuring default call progress operation in the protocol.

CDP_ANI_ENABLED (Inbound)

Description: Enables or disables the reception of automatic number identification (ANI) digits.

Values:

- 0: Disable the reception of ANI digits.
- 1 [default]: Enable the reception of ANI digits.

Guidelines: If this parameter is set to a value other than 0 or 1, the behavior of the protocol is not predictable.

For DM3, if ANI is disabled, you also have to remove **feature_ANI** from the **SYS_FEATURES** parameter in the *.cdp* file. The **SYS_FEATURES** parameter looks like this:

```
All CHARSTRING_t SYS_FEATURES = "feature_outbound,feature_inbound,feature_DNIS,
feature_Billing,feature_ANI,feature_CAT,feature_MoreDNIS"
```

CDP_ANI_MaxDigits (Inbound)

Description: Specifies the maximum number of ANI digits that can be received when using this protocol.

Values: Default is 16.

Guidelines: If this parameter value is set to 0, the behavior of the protocol is not predictable.

CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED

Description: Specifies whether ANI is to be requested (inbound) or sent (outbound) with the area code.

Values:

- 0 [default]: Request (inbound) or send (outbound) ANI digits without area code.
- 1: Request (inbound) or send (outbound) area code with ANI digits.

CDP_ANI_WITHAC_FACILITY_ENABLED (Outbound)

Description: Specifies whether ANI digits and area code are sent to the inbound side. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values:

- 0 [default]: The requested information denied tone is sent to the inbound side.
- 1: ANI digits with area code are sent to the inbound side.

CDP_AreaCode

Description: Specifies the area code of the local exchange where the subscriber is connected. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values: Default is 987.

CDP_CallingPartyCategory (Outbound)

Description: Specifies the category of the calling subscriber.

Values:

- 1 [default]: Subscriber without priority
- 2: Subscriber with priority
- 3: Maintenance equipment
- 4: Coin box or subscriber with charge metering
- 5: Telephone operator
- 6: Data transmission
- 11: C. P. T. P.
- 12: Special line
- 13: Mobile user
- 14: Virtual private network line
- 15: Special line

CDP_ConnectType (Outbound)

Description: Specifies the mode for outbound connect detection. Two types of connection events can be detected: the cas_answer received signaling bit pattern and the media type detection used when post-connect call analysis is enabled. The application has options as to when the call is considered connected, as set by this parameter. The application also has options as to whether call analysis continues after the call has been connected when cas_answer is received first.

Values:

- 0 [default]: The protocol transitions to the connected state only when cas_answer is received. If cas_answer is received first, call analysis is stopped. If call analysis is received first, the result is sent to the application via a GCEV_MEDIADETECTED event, but the protocol does not transition to the connected state until cas_answer is received.
- 1: The protocol transitions to the connected state when the first event (either cas_answer or call analysis) is received. If cas_answer is received first, call analysis still continues and the result is sent to the application via a GCEV_MEDIADETECTED event. If call analysis is received first, the subsequent cas_answer is ignored.
- 2: The protocol transitions to the connected state when the first event (either cas_answer or call analysis) is received. If cas_answer is received first, call analysis is stopped. If call analysis is received first, the subsequent cas_answer is ignored.
- 3: The protocol transitions to the connected state only when call analysis is received. If call analysis is received first, the subsequent cas_answer is ignored. If cas_answer is received first, it is ignored.

CDP_DNIS_MaxDigits (Inbound)

Description: Specifies the maximum number of dialed number identification service (DNIS) digits that can be received when using this protocol.

Values: Default is 16.

Guidelines: If this parameter value is set to 0, the behavior of the protocol is not predictable.

CDP_Drop_Using_ProgressTones_After_AcceptCall (Inbound)

Description: Specifies the call progress tone to be sent for dropping a call, when doing a `gc_DropCall()` after a `gc_AcceptCall()`.

Values:

- 0 [default]: The protocol sends the Answer Line signal, waits for the time specified by `CDP_TimeToRecognizeAnswer`, and then sends a Clear Backward line signal for call disconnection. In this case, the call will be charged for the remote calling subscriber, even though the call is not successful.
- 1: The protocol sends the appropriate call progress tone depending on the `gc_DropCall()` cause to the remote end, and waits for a Clear Forward Line signal for call disconnection.

CDP_FLAG_APPEND_F (Outbound)

Description: When the remote end asks for the next DNIS digit through Group A backward tone, and the protocol does not have any more DNIS available to be sent, this parameter specifies whether to send the I-15 tone or to remain silent and prepare for A3 or A4 pulse from the remote end.

Values:

- 0 [default]: No tone will be sent to the remote end. In this case, A3 or A4 pulse is expected to be received from the remote end. In a case of overlapped sending (see description of `CDP_OVERLAP_SENDING_ENABLED` parameter), the remote end may also send A1 to request more information.
- 1: 'f' (I-15) will be sent to the remote end, indicating the end of information.

CDP_GrpB_Tone (Inbound)

Description: Determines whether the sender should be charged after receiving the tone. The tone is sent from the inbound end on receipt of Category for Group II. After this tone, the sequence of R2MF tone exchange is over and the call is connected. This is the last R2MF tone in establishment of a call.

Values:

- 6 [default]: Chargeable (B-6)
- 7: Not chargeable (B-7)

CDP_IMMEDIATE_ACCEPTSTATE (Inbound)

Description: Specifies when the protocol transitions a call to the Accepted state.

Values:

- 0 [default]: The protocol should wait for the number of rings specified in `gc_AcceptCall()` to expire before transitioning to the Accepted state.
- 1: The protocol should transition a call to the Accepted state immediately upon receipt of `gc_AcceptCall()` and before the specified number of rings have been generated.

Guidelines: This parameter is ignored if the value of the `gc_AcceptCall()` rings parameter is 0.

CDP_IS_ANIAVAILABILITY_CHECK_NEEDED

Description: Determines whether the status of ANI availability is checked before ANI digits are exchanged. At the inbound side, this parameter specifies whether ANI availability at the outbound side has to be verified or if ANI digits can be requested directly. At the outbound side, ANI digits are passed directly or the inbound side is informed of the availability (status) first.

Values:

- 0 [default]: The status of ANI availability is not checked before ANI digits are exchanged. ANI digits can be requested directly without knowing the status of the outbound side.
- 1: The status of ANI availability is checked before ANI digits are exchanged. The inbound side requests the status of ANI availability. If ANI digits are available, the inbound side requests the ANI digits. The outbound side sends the status of ANI availability and then waits for the inbound request.

CDP_IS_CALLING_LINE_IDENTIFICATION_PERMITTED (Outbound)

Description: Specifies whether Calling Line Identification is enabled. This parameter is used to enable CLIP and CLIR conditions.

Values:

- 0: Calling Line Identification Rejected (CLIR). The requested information denied tone is sent to the inbound side.
- 1 [default]: Calling Line Identification Permitted (CLIP). ANI digits are sent to the inbound side.

CDP_NO_OF_DNIS_BEFORE_CAT (Inbound)

Description: Determines the number of DNIS digits that are to be received before any category information is received. If this parameter is set to non-zero, the following sequence of events occurs:

1. Partial DNIS digits are received.
2. Category digits are received.
3. The remaining DNIS digits are received.
4. ANI digits are received (if **CDP_ANI_ENABLED** is 1).
5. Category digits are received again.

Values:

- 0 [default]: Indicates that category must be received after all DNIS digits are received.
- Non-zero: Specifies the number of DNIS digits received before category information is received.

Guidelines: The behavior of the protocol will not be predictable, unless the following occurs:

- If this parameter is set to non-zero, **CDP_ANI_ENABLED** must be set to 1.
- If this parameter is set to non-zero, its value should be the minimum of **CDP_NUM_OF_DNIS_DIGITS** (if non-zero), **CDP_DNIS_MaxDigits**, and the actual DNIS digits to be received.

CDP_NUM_OF_AC_DIGITS (Inbound)

Description: Specifies the number of area code digits of the local exchange from where it received the call. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values: Default is 3.

CDP_NUM_OF_ANI_DIGITS (Inbound)

Description: Specifies the expected number of ANI digits to be received.

Values:

- 0 [default]: ANI collection is terminated by I-15 (end of dialing).
- Non-zero: Specifies the number of ANI digits expected. This number should always be less than **CDP_ANI_MaxDigits**.

CDP_NUM_OF_DNIS_DIGITS (Inbound)

Description: Specifies the expected number of DNIS digits to be received.

Values:

- 0: DNIS collection is terminated by I-15 (end of dialing).
- Non-zero [default is 4]: Specifies the number of DNIS digits expected. This number should always be less than **CDP_DNIS_MaxDigits**.

CDP_OVERLAP_SENDING_ENABLED (Outbound)

Description: Enables or disables the overlap sending feature.

Values:

- 0: Disables overlap sending. 'f' will be appended to DNIS digits received with **gc_MakeCall()** (if **CDP_FLAG_APPEND_F** is true), indicating the end of information.
- 1 [default]: Enables overlap sending. The remote end can request more DNIS information, in which case a **REQMOREINFO** event will be generated. **gc_SendMoreInfo()** with Null information will either cause 'f' to be sent to the remote end or will remain silent (depending on the value of **CDP_FLAG_APPEND_F**), thus indicating to the remote end that no more DNIS digits are available.

CDP_REJECT_WITH_A3B4 (Inbound)

Description: Determines the method for rejecting a call when an R2MF tone error is received during call setup.

Values:

- 0 [default]: Call is rejected with a direct group A tone (A-10), which is a spare tone that may be used to indicate congestion.
- 1: Call is rejected with an A3-B4 tone combination, which means that the inbound (local) end sends an A-3 tone (send category and change over to group B tones). Then, the category is received and in response, a B-4 tone is sent to reject the call.

CDP_SEND_ALERTING_ON_R2MF_COMPLETION (Inbound)

Description: Controls when the protocol will send a GCEV_ALERTING event to the application.

Values:

- 0 [default]: GCEV_ALERTING is sent after receiving a ringback tone.
- 1: GCEV_ALERTING is sent after completion of the R2MF sequence (after receiving the last Group B tone).

CDP_SEND_BLOCK_AT_START_OR_REMOTE_BLOCK

Description: Specifies the bit pattern to be sent on the line at protocol open time and when the remote line goes BLOCKED.

Values:

- 0 [default]: If the protocol is used either as outbound only or as bidirectional.
- 1: If the protocol is used as inbound only.

CDP_TrunkPrefixNumber

Description: Specifies the trunk number used to dial to local exchange. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values: Default is 9.



Belgium Lineside Bidirectional Protocol Parameter Configuration

7

This chapter discusses the capabilities and parameters of the Belgium Lineside Bidirectional protocol in the following topics:

- General Protocol Information 41
- Country Dependent Parameter Descriptions 41

7.1 General Protocol Information

Protocol File Set

The files used with the Belgium Lineside protocol are listed and described in the following table.

File Type	File Name(s)	
	DM3	Springware
Protocol Module	pdk_be_r2_io.qs and pdk_be_r2_io.hot (or pdk_be_r2_io.arm.hot for DMT160TEC boards)	pdk_be_r2_io.psi
Voice and Network Parameters	Not applicable	be_300.prm
Country Dependent Parameters	pdk_be_ls_io.cdp	pdk_be_ls_io.cdp
	gc_OpenEx() Protocol Name	
	Not applicable†	pdk_be_ls_io

†On DM3 boards, the protocol is determined at board initialization time and not when a Global Call device is opened. For compatibility, the **gc_OpenEx()** protocol name may be specified for DM3 boards, but it is not used.

Protocol Limitations

If a DropCall is attempted in the ACCEPTED state, the protocol will answer the call by sending out the ANSWER pattern before dropping the call, as forced release is not supported in this protocol.

7.2 Country Dependent Parameter Descriptions

Note: A parameter can be inbound, outbound, or both inbound and outbound. An inbound parameter is used by the protocol when it is acting as inbound. An outbound parameter is used by the protocol when it is acting as outbound. A parameter that is both can be used by the protocol when it is acting as either inbound or outbound.

The modifiable parameters in the *pdk_be_ls_io.cdp* file are:

- CDP_ANI_ENABLED (Inbound)
- CDP_ANI_MaxDigits (Inbound)
- CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED
- CDP_ANI_WITHAC_FACILITY_ENABLED (Outbound)
- CDP_AreaCode
- CDP_CallingPartyCategory (Outbound)
- CDP_ConnectType (Outbound)
- CDP_DIALTONE_ENABLED
- CDP_DIGITS_DIALING_TYPE (Outbound)
- CDP_DIGITS_RECEIVING_TYPE (Inbound)
- CDP_DNIS_MaxDigits (Inbound)
- CDP_Drop_Using_ProgressTones_After_AcceptCall (Inbound)
- CDP_GrpB_Tone (Inbound)
- CDP_IMMEDIATE_ACCEPTSTATE (Inbound)
- CDP_IS_ANIAVAILABILITY_CHECK_NEEDED
- CDP_IS_CALLING_LINE_IDENTIFICATION_PERMITTED (Outbound)
- CDP_NO_OF_DNIS_BEFORE_CAT (Inbound)
- CDP_NUM_OF_AC_DIGITS (Inbound)
- CDP_NUM_OF_ANI_DIGITS (Inbound)
- CDP_NUM_OF_DNIS_DIGITS (Inbound)
- CDP_OVERLAP_SENDING_ENABLED (Outbound)
- CDP_REJECT_WITH_A3B4 (Inbound)
- CDP_SEND_BLOCK_AT_START_OR_REMOTE_BLOCK
- CDP_send_GrpA_AddrCmpltCharge_tone (Inbound)
- CDP_Term_Tone_String (Inbound)
- CDP_TrunkPrefixNumber

In addition, see [Chapter 3, “Call Progress Analysis Parameters”](#) for configuring default call progress operation in the protocol.

CDP_ANI_ENABLED (Inbound)

Description: Enables or disables the reception of automatic number identification (ANI) digits.

Values:

- 0 [default]: Disable the reception of ANI digits.
- 1: Enable the reception of ANI digits.

Guidelines: If this parameter is set to a value other than 0 or 1, the behavior of the protocol is not predictable.

CDP_ANI_MaxDigits (Inbound)

Description: Specifies the maximum number of ANI digits that can be received when using this protocol.

Values: Default is 16.

Guidelines: If this parameter value is set to 0, the behavior of the protocol is not predictable.

CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED

Description: Specifies whether ANI is to be requested (inbound) or sent (outbound) with the area code.

Values:

- 0 [default]: Request (inbound) or send (outbound) ANI digits without area code.
- 1: Request (inbound) or send (outbound) area code with ANI digits.

CDP_ANI_WITHAC_FACILITY_ENABLED (Outbound)

Description: Specifies whether ANI digits and area code are sent to the inbound side. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values:

- 0 [default]: The requested information denied tone is sent to the inbound side.
- 1: ANI digits with area code are sent to the inbound side.

CDP_AreaCode

Description: Specifies the area code of the local exchange where the subscriber is connected. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values: Default is 987.

CDP_CallingPartyCategory (Outbound)

Description: Specifies the category of the calling subscriber.

Values:

- 1 [default]: Subscriber without priority
- 2: Subscriber with priority
- 3: Maintenance equipment
- 4: Coin box
- 5: National operator
- 6: Data transmission
- 7: International subscriber without priority
- 8: International data transmission
- 9: International subscriber with priority
- 10: International forward transfer

CDP_ConnectType (Outbound)

Description: Specifies the mode for outbound connect detection. Two types of connection events can be detected: the cas_answer received signaling bit pattern and the media type detection used when post-connect call analysis is enabled. The application has options as to when the call is considered connected, as set by this parameter. The application also has options as to whether call analysis continues after the call has been connected when cas_answer is received first.

Values:

- 0 [default]: The protocol transitions to the connected state only when cas_answer is received. If cas_answer is received first, call analysis is stopped. If call analysis is received first, the result is sent to the application via a GCEV_MEDIADETECTED event, but the protocol does not transition to the connected state until cas_answer is received.
- 1: The protocol transitions to the connected state when the first event (either cas_answer or call analysis) is received. If cas_answer is received first, call analysis still continues and the result is sent to the application via a GCEV_MEDIADETECTED event. If call analysis is received first, the subsequent cas_answer is ignored.
- 2: The protocol transitions to the connected state when the first event (either cas_answer or call analysis) is received. If cas_answer is received first, call analysis is stopped. If call analysis is received first, the subsequent cas_answer is ignored.
- 3: The protocol transitions to the connected state only when call analysis is received. If call analysis is received first, the subsequent cas_answer is ignored. If cas_answer is received first, it is ignored.

CDP_DIALTONE_ENABLED

Description: When inbound, determines whether the protocol sends dial tone before receiving DTMF tones. This parameter is ignored if CDP_DIGITS_RECEIVING_TYPE is set to 0.

When outbound, determines whether the protocol waits for dial tone before sending DTMF tones. This parameter is ignored if CDP_DIGITS_DIALING_TYPE is set to 0.

Values:

- 0: When inbound, the protocol does not send dial tone before receiving DTMF tones. When outbound, the protocol does not wait for dial tone; it dials DTMF immediately after receiving Seizeack.
- 1 [default]: When inbound, the protocol sends dial tone before receiving DTMF tones. When outbound, the protocol waits for dial tone before sending DTMF tones.

CDP_DIGITS_DIALING_TYPE (Outbound)

Description: Determines the digit type for outbound DNIS digits.

Values:

- 0: The protocol exchanges address information using R2MF tones.
- 1 [default]: The protocol sends DNIS digits as DTMF tones.
- 2: The protocol sends DNIS digits as MF tones.

CDP_DIGITS_RECEIVING_TYPE (Inbound)

Description: Determines the digit type for inbound DNIS digits.

Values:

- 0 [default]: The protocol exchanges address information using R2MF tones.
- 1: The protocol receives DNIS digits as DTMF tones.
- 2: The protocol receives DNIS digits as MF tones.

CDP_DNIS_MaxDigits (Inbound)

Description: Specifies the maximum number of dialed number identification service (DNIS) digits that can be received when using this protocol.

Values: Default is 16.

Guidelines: If this parameter value is set to 0, the behavior of the protocol is not predictable.

CDP_Drop_Using_ProgressTones_After_AcceptCall (Inbound)

Description: Specifies the call progress tone to be sent for dropping a call, when doing a `gc_DropCall()` after a `gc_AcceptCall()`.

Values:

- 0 [default]: The protocol sends the Answer Line signal, waits for the time specified by `CDP_TimeToRecognizeAnswer`, and then sends a Clear Backward Line signal for call disconnection. In this case, the call will be charged for the remote calling subscriber, even though the call is not successful.
- 1: The protocol sends the appropriate call progress tone depending on the `gc_DropCall()` cause to the remote end, and waits for a Clear Forward Line signal for call disconnection.

CDP_GrpB_Tone (Inbound)

Description: Determines whether the sender should be charged after receiving the tone. The tone is sent from the inbound end on receipt of Category for Group II. After this tone, the sequence of R2MF tone exchange is over and the call is connected. This is the last R2MF tone in establishment of a call.

Values:

- 1: Subscriber line free, charge, called party release control
- 6: Subscriber line free, charge
- 7 [default]: Subscriber line free, no charge

CDP_IMMEDIATE_ACCEPTSTATE (Inbound)

Description: Specifies when the protocol transitions a call to the Accepted state.

Values:

- 0 [default]: The protocol should wait for the number of rings specified in `gc_AcceptCall()` to expire before transitioning to the Accepted state.
- 1: The protocol should transition a call to the Accepted state immediately upon receipt of `gc_AcceptCall()` and before the specified number of rings have been generated.

Guidelines: This parameter is ignored if the value of the `gc_AcceptCall()` rings parameter is 0.

CDP_IS_ANIAVAILABILITY_CHECK_NEEDED

Description: Determines whether the status of ANI availability is checked before ANI digits are exchanged. At the inbound side, this parameter specifies whether ANI availability at the outbound side has to be verified or if ANI digits can be requested directly. At the outbound side, ANI digits are passed directly or the inbound side is informed of the availability (status) first.

Values:

- 0 [default]: The status of ANI availability is not checked before ANI digits are exchanged. ANI digits can be requested directly without knowing the status of the outbound side.
- 1: The status of ANI availability is checked before ANI digits are exchanged. The inbound side requests the status of ANI availability. If ANI digits are available, the inbound side requests the ANI digits. The outbound side sends the status of ANI availability and then waits for the inbound request.

CDP_IS_CALLING_LINE_IDENTIFICATION_PERMITTED (Outbound)

Description: Specifies whether Calling Line Identification is enabled. This parameter is used to enable CLIP and CLIR conditions.

Values:

- 0 [default]: Calling Line Identification Rejected (CLIR). The requested information denied tone is sent to the inbound side.
- 1: Calling Line Identification Permitted (CLIP). ANI digits are sent to the inbound side.

CDP_NO_OF_DNIS_BEFORE_CAT (Inbound)

Description: Determines the number of DNIS digits that are to be received before any category information is received. If this parameter is set to non-zero, the following sequence of events occurs:

1. Partial DNIS digits are received.
2. Category digits are received.
3. The remaining DNIS digits are received.
4. ANI digits are received (if **CDP_ANI_ENABLED** is 1).
5. Category digits are received again.

Values:

- 0 [default]: Indicates that category must be received after all DNIS digits are received.
- Non-zero: Specifies the number of DNIS digits received before category information is received.

Guidelines: The behavior of the protocol will not be predictable, unless the following occurs:

- If this parameter is set to non-zero, **CDP_ANI_ENABLED** must be set to 1.
- If this parameter is set to non-zero, its value should be the minimum of **CDP_NUM_OF_DNIS_DIGITS** (if non-zero), **CDP_DNIS_MaxDigits**, and the actual DNIS digits to be received.

CDP_NUM_OF_AC_DIGITS (Inbound)

Description: Specifies the number of area code digits of the local exchange from where it received the call. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values: Default is 3.

CDP_NUM_OF_ANI_DIGITS (Inbound)

Description: Specifies the expected number of ANI digits to be received.

Values:

- 0 [default]: ANI collection is terminated by I-15 (end of dialing).
- Non-zero: Specifies the number of ANI digits expected. This number should always be less than **CDP_ANI_MaxDigits**.

CDP_NUM_OF_DNIS_DIGITS (Inbound)

Description: Specifies the expected number of DNIS digits to be received.

Values:

- 0: DNIS collection is terminated by I-15 (end of dialing).
- Non-zero [default is 4]: Specifies the number of DNIS digits expected. This number should always be less than **CDP_DNIS_MaxDigits**.

CDP_OVERLAP_SENDING_ENABLED (Outbound)

Description: Enables or disables the overlap sending feature.

Values:

- 0 [default]: Disables overlap sending. 'f' will be appended to DNIS digits received with **gc_MakeCall()**, indicating the end of information.
- 1: Enables overlap sending. The remote end can request more DNIS information, in which case a REQMOREINFO event will be generated. **gc_SendMoreInfo()** with Null information will cause 'f' to be sent to the remote end, indicating that no more DNIS digits are available.

CDP_REJECT_WITH_A3B4 (Inbound)

Description: Determines the method for rejecting a call when an R2MF tone error is received during call setup.

Values:

- 0 [default]: Call is rejected with a direct group A tone (A-10), which is a spare tone that may be used to indicate congestion.
- 1: Call is rejected with an A3-B4 tone combination, which means that the inbound (local) end sends an A-3 tone (send category and change over to group B tones). Then, the category is received and in response, a B-4 tone is sent to reject the call.

CDP_SEND_BLOCK_AT_START_OR_REMOTE_BLOCK

Description: Specifies the bit pattern to be sent on the line at protocol open time and when the remote line goes BLOCKED.

Values:

- 0 [default]: If the protocol is used either as outbound only or as bidirectional.
- 1: If the protocol is used as inbound only.

CDP_send_GrpA_AddrCmpltCharge_tone (Inbound)

Description: Specifies how the protocol informs the calling user that exchange of R2MF tones is completed and to start charging.

Values:

- 0: The protocol sends the **CDP_GrpA_AddrCmpltChgGpB** tone, receives Category, and then sends **CDP_GrpB_Tone** to indicate whether the sender should be charged.
- 1 [default]: The protocol sends the **CDP_GrpA_AddrCmpltCharge** tone when the call is accepted or answered by the application in the Offered state.

CDP_Term_Tone_String (Inbound)

Description: Specifies the characters used to identify the termination of the dialed string. This parameter is ignored if **CDP_DIGITS_RECEIVING_TYPE** is set to 0.

Values: Default is “#*”

CDP_TrunkPrefixNumber

Description: Specifies the trunk number used to dial to local exchange. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values: Default is 9.





Belgium Network Bidirectional Protocol Parameter Configuration

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This chapter discusses the capabilities and parameters of the Belgium Network Bidirectional protocol in the following topics:

- General Protocol Information 51
- Country Dependent Parameter Descriptions 51

8.1 General Protocol Information

Protocol File Set

The files used with the Belgium Network protocol are listed and described in the following table.

File Type	File Name(s)	
	DM3	Springware
Protocol Module	pdk_be_r2_io.qs and pdk_be_r2_io.hot (or pdk_be_r2_io.arm.hot for DMT160TEC boards)	pdk_be_r2_io.psi
Voice and Network Parameters	Not applicable	be_300.prm
Country Dependent Parameters	pdk_be_co_io.cdp	pdk_be_co_io.cdp
	gc_OpenEx() Protocol Name	
	Not applicable†	pdk_be_co_io

†On DM3 boards, the protocol is determined at board initialization time and not when a Global Call device is opened. For compatibility, the **gc_OpenEx()** protocol name may be specified for DM3 boards, but it is not used.

Protocol Limitations

If a DropCall is attempted in the ACCEPTED state, the protocol will answer the call by sending out the ANSWER pattern before dropping the call, as forced release is not supported in this protocol.

8.2 Country Dependent Parameter Descriptions

Note: A parameter can be inbound, outbound, or both inbound and outbound. An inbound parameter is used by the protocol when it is acting as inbound. An outbound parameter is used by the protocol when it is acting as outbound. A parameter that is both can be used by the protocol when it is acting as either inbound or outbound.

The modifiable parameters in the *pdk_be_co_io.cdp* file are:

- CDP_ANI_ENABLED (Inbound)
- CDP_ANI_MaxDigits (Inbound)
- CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED
- CDP_ANI_WITHAC_FACILITY_ENABLED (Outbound)
- CDP_AreaCode
- CDP_CallingPartyCategory (Outbound)
- CDP_ConnectType (Outbound)
- CDP_DIALTONE_ENABLED
- CDP_DIGITS_DIALING_TYPE (Outbound)
- CDP_DIGITS_RECEIVING_TYPE (Inbound)
- CDP_DNIS_MaxDigits (Inbound)
- CDP_Drop_Using_ProgressTones_After_AcceptCall (Inbound)
- CDP_GrpB_Tone (Inbound)
- CDP_IMMEDIATE_ACCEPTSTATE (Inbound)
- CDP_IS_ANIAVAILABILITY_CHECK_NEEDED
- CDP_IS_CALLING_LINE_IDENTIFICATION_PERMITTED (Outbound)
- CDP_NO_OF_DNIS_BEFORE_CAT (Inbound)
- CDP_NUM_OF_AC_DIGITS (Inbound)
- CDP_NUM_OF_ANI_DIGITS (Inbound)
- CDP_NUM_OF_DNIS_DIGITS (Inbound)
- CDP_OVERLAP_SENDING_ENABLED (Outbound)
- CDP_REJECT_WITH_A3B4 (Inbound)
- CDP_SEND_BLOCK_AT_START_OR_REMOTE_BLOCK
- CDP_send_GrpA_AddrCmpltCharge_tone (Inbound)
- CDP_Term_Tone_String (Inbound)
- CDP_TrunkPrefixNumber

In addition, see [Chapter 3, “Call Progress Analysis Parameters”](#) for configuring default call progress operation in the protocol.

CDP_ANI_ENABLED (Inbound)

Description: Enables or disables the reception of automatic number identification (ANI) digits.

Values:

- 0 [default]: Disable the reception of ANI digits.
- 1: Enable the reception of ANI digits.

Guidelines: If this parameter is set to a value other than 0 or 1, the behavior of the protocol is not predictable.

CDP_ANI_MaxDigits (Inbound)

Description: Specifies the maximum number of ANI digits that can be received when using this protocol.

Values: Default is 16.

Guidelines: If this parameter value is set to 0, the behavior of the protocol is not predictable.

CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED

Description: Specifies whether ANI is to be requested (inbound) or sent (outbound) with the area code.

Values:

- 0 [default]: Request (inbound) or send (outbound) ANI digits without area code.
- 1: Request (inbound) or send (outbound) area code with ANI digits.

CDP_ANI_WITHAC_FACILITY_ENABLED (Outbound)

Description: Specifies whether ANI digits and area code are sent to the inbound side. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values:

- 0 [default]: The requested information denied tone is sent to the inbound side.
- 1: ANI digits with area code are sent to the inbound side.

CDP_AreaCode

Description: Specifies the area code of the local exchange where the subscriber is connected. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values: Default is 987.

CDP_CallingPartyCategory (Outbound)

Description: Specifies the category of the calling subscriber.

Values:

- 1 [default]: Subscriber without priority
- 2: Subscriber with priority
- 3: Maintenance equipment
- 4: Coin box
- 5: National operator
- 6: Data transmission
- 7: International subscriber without priority
- 8: International data transmission
- 9: International subscriber with priority
- 10: International forward transfer

CDP_ConnectType (Outbound)

Description: Specifies the mode for outbound connect detection. Two types of connection events can be detected: the cas_answer received signaling bit pattern and the media type detection used when post-connect call analysis is enabled. The application has options as to when the call is considered connected, as set by this parameter. The application also has options as to whether call analysis continues after the call has been connected when cas_answer is received first.

Values:

- 0 [default]: The protocol transitions to the connected state only when cas_answer is received. If cas_answer is received first, call analysis is stopped. If call analysis is received first, the result is sent to the application via a GCEV_MEDIADETECTED event, but the protocol does not transition to the connected state until cas_answer is received.
- 1: The protocol transitions to the connected state when the first event (either cas_answer or call analysis) is received. If cas_answer is received first, call analysis still continues and the result is sent to the application via a GCEV_MEDIADETECTED event. If call analysis is received first, the subsequent cas_answer is ignored.
- 2: The protocol transitions to the connected state when the first event (either cas_answer or call analysis) is received. If cas_answer is received first, call analysis is stopped. If call analysis is received first, the subsequent cas_answer is ignored.
- 3: The protocol transitions to the connected state only when call analysis is received. If call analysis is received first, the subsequent cas_answer is ignored. If cas_answer is received first, it is ignored.

CDP_DIALTONE_ENABLED

Description: When inbound, determines whether the protocol sends dial tone before receiving DTMF tones. This parameter is ignored if CDP_DIGITS_RECEIVING_TYPE is set to 0.

When outbound, determines whether the protocol waits for dial tone before sending DTMF tones. This parameter is ignored if CDP_DIGITS_DIALING_TYPE is set to 0.

Values:

- 0: When inbound, the protocol does not send dial tone before receiving DTMF tones. When outbound, the protocol does not wait for dial tone; it dials DTMF immediately after receiving Seizeack.
- 1 [default]: When inbound, the protocol sends dial tone before receiving DTMF tones. When outbound, the protocol waits for dial tone before sending DTMF tones.

CDP_DIGITS_DIALING_TYPE (Outbound)

Description: Determines the digit type for outbound DNIS digits.

Values:

- 0 [default]: The protocol exchanges address information using R2MF tones.
- 1: The protocol sends DNIS digits as DTMF tones.
- 2: The protocol sends DNIS digits as MF tones.

CDP_DIGITS_RECEIVING_TYPE (Inbound)

Description: Determines the digit type for inbound DNIS digits.

Values:

- 0: The protocol exchanges address information using R2MF tones.
- 1 [default]: The protocol receives DNIS digits as DTMF tones.
- 2: The protocol receives DNIS digits as MF tones.

CDP_DNIS_MaxDigits (Inbound)

Description: Specifies the maximum number of dialed number identification service (DNIS) digits that can be received when using this protocol.

Values: Default is 16.

Guidelines: If this parameter value is set to 0, the behavior of the protocol is not predictable.

CDP_Drop_Using_ProgressTones_After_AcceptCall (Inbound)

Description: Specifies the call progress tone to be sent for dropping a call, when doing a `gc_DropCall()` after a `gc_AcceptCall()`.

Values:

- 0 [default]: The protocol sends the Answer Line signal, waits for the time specified by `CDP_TimeToRecognizeAnswer`, and then sends a Clear Backward Line signal for call disconnection. In this case, the call will be charged for the remote calling subscriber, even though the call is not successful.
- 1: The protocol sends the appropriate call progress tone depending on the `gc_DropCall()` cause to the remote end, and waits for a Clear Forward Line signal for call disconnection.

CDP_GrpB_Tone (Inbound)

Description: Determines whether the sender should be charged after receiving the tone. The tone is sent from the inbound end on receipt of Category for Group II. After this tone, the sequence of R2MF tone exchange is over and the call is connected. This is the last R2MF tone in establishment of a call.

Values:

- 1: Subscriber line free, charge, called party release control
- 6: Subscriber line free, charge
- 7 [default]: Subscriber line free, no charge

CDP_IMMEDIATE_ACCEPTSTATE (Inbound)

Description: Specifies when the protocol transitions a call to the Accepted state.

Values:

- 0 [default]: The protocol should wait for the number of rings specified in `gc_AcceptCall()` to expire before transitioning to the Accepted state.
- 1: The protocol should transition a call to the Accepted state immediately upon receipt of `gc_AcceptCall()` and before the specified number of rings have been generated.

Guidelines: This parameter is ignored if the value of the `gc_AcceptCall()` rings parameter is 0.

CDP_IS_ANIAVAILABILITY_CHECK_NEEDED

Description: Determines whether the status of ANI availability is checked before ANI digits are exchanged. At the inbound side, this parameter specifies whether ANI availability at the outbound side has to be verified or if ANI digits can be requested directly. At the outbound side, ANI digits are passed directly or the inbound side is informed of the availability (status) first.

Values:

- 0 [default]: The status of ANI availability is not checked before ANI digits are exchanged. ANI digits can be requested directly without knowing the status of the outbound side.
- 1: The status of ANI availability is checked before ANI digits are exchanged. The inbound side requests the status of ANI availability. If ANI digits are available, the inbound side requests the ANI digits. The outbound side sends the status of ANI availability and then waits for the inbound request.

CDP_IS_CALLING_LINE_IDENTIFICATION_PERMITTED (Outbound)

Description: Specifies whether Calling Line Identification is enabled. This parameter is used to enable CLIP and CLIR conditions.

Values:

- 0 [default]: Calling Line Identification Rejected (CLIR). The requested information denied tone is sent to the inbound side.
- 1: Calling Line Identification Permitted (CLIP). ANI digits are sent to the inbound side.

CDP_NO_OF_DNIS_BEFORE_CAT (Inbound)

Description: Determines the number of DNIS digits that are to be received before any category information is received. If this parameter is set to non-zero, the following sequence of events occurs:

1. Partial DNIS digits are received.
2. Category digits are received.
3. The remaining DNIS digits are received.
4. ANI digits are received (if **CDP_ANI_ENABLED** is 1).
5. Category digits are received again.

Values:

- 0 [default]: Indicates that category must be received after all DNIS digits are received.
- Non-zero: Specifies the number of DNIS digits received before category information is received.

Guidelines: The behavior of the protocol will not be predictable, unless the following occurs:

- If this parameter is set to non-zero, **CDP_ANI_ENABLED** must be set to 1.
- If this parameter is set to non-zero, its value should be the minimum of **CDP_NUM_OF_DNIS_DIGITS** (if non-zero), **CDP_DNIS_MaxDigits**, and the actual DNIS digits to be received.

CDP_NUM_OF_AC_DIGITS (Inbound)

Description: Specifies the number of area code digits of the local exchange from where it received the call. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values: Default is 3.

CDP_NUM_OF_ANI_DIGITS (Inbound)

Description: Specifies the expected number of ANI digits to be received.

Values:

- 0 [default]: ANI collection is terminated by I-15 (end of dialing).
- Non-zero: Specifies the number of ANI digits expected. This number should always be less than **CDP_ANI_MaxDigits**.

CDP_NUM_OF_DNIS_DIGITS (Inbound)

Description: Specifies the expected number of DNIS digits to be received.

Values:

- 0: DNIS collection is terminated by I-15 (end of dialing).
- Non-zero [default is 4]: Specifies the number of DNIS digits expected. This number should always be less than **CDP_DNIS_MaxDigits**.

CDP_OVERLAP_SENDING_ENABLED (Outbound)

Description: Enables or disables the overlap sending feature.

Values:

- 0 [default]: Disables overlap sending. 'f' will be appended to DNIS digits received with **gc_MakeCall()**, indicating the end of information.
- 1: Enables overlap sending. The remote end can request more DNIS information, in which case a REQMOREINFO event will be generated. **gc_SendMoreInfo()** with Null information will cause 'f' to be sent to the remote end, indicating that no more DNIS digits are available.

CDP_REJECT_WITH_A3B4 (Inbound)

Description: Determines the method for rejecting a call when an R2MF tone error is received during call setup.

Values:

- 0 [default]: Call is rejected with a direct group A tone (A-10), which is a spare tone that may be used to indicate congestion.
- 1: Call is rejected with an A3-B4 tone combination, which means that the inbound (local) end sends an A-3 tone (send category and change over to group B tones). Then, the category is received and in response, a B-4 tone is sent to reject the call.

CDP_SEND_BLOCK_AT_START_OR_REMOTE_BLOCK

Description: Specifies the bit pattern to be sent on the line at protocol open time and when the remote line goes BLOCKED.

Values:

- 0 [default]: If the protocol is used either as outbound only or as bidirectional.
- 1: If the protocol is used as inbound only.

CDP_send_GrpA_AddrCmpltCharge_tone (Inbound)

Description: Specifies how the protocol informs the calling user that exchange of R2MF tones is completed and to start charging.

Values:

- 0: The protocol sends the **CDP_GrpA_AddrCmpltChgGpB** tone, receives Category, and then sends **CDP_GrpB_Tone** to indicate whether the sender should be charged.
- 1 [default]: The protocol sends the **CDP_GrpA_AddrCmpltCharge** tone when the call is accepted or answered by the application in the Offered state.

CDP_Term_Tone_String (Inbound)

Description: Specifies the characters used to identify the termination of the dialed string. This parameter is ignored if **CDP_DIGITS_RECEIVING_TYPE** is set to 0.

Values: Default is “#*”

CDP_TrunkPrefixNumber

Description: Specifies the trunk number used to dial to local exchange. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values: Default is 9.



Brazil R2 Bidirectional Protocol Parameter Configuration

This chapter discusses the capabilities and parameters of the Brazil R2 Bidirectional protocol in the following topics:

- General Protocol Information 61
- Country Dependent Parameter Descriptions 61

9.1 General Protocol Information

Protocol File Set

The files used with the Brazil R2 protocol are listed and described in the following table.

File Type	File Name(s)	
	DM3	Springware
Protocol Module	pdk_r2_io.qs and pdk_r2_io.hot (or pdk_r2_io.arm.hot for DMT160TEC boards)	pdk_r2_io.psi
Voice and Network Parameters	Not applicable	br_300.prm
Country Dependent Parameters	pdk_br_r2_io.cdp	pdk_br_r2_io.cdp
	gc_OpenEx() Protocol Name	
	Not applicable†	pdk_br_r2_io

†On DM3 boards, the protocol is determined at board initialization time and not when a Global Call device is opened. For compatibility, the **gc_OpenEx()** protocol name may be specified for DM3 boards, but it is not used.

Protocol Limitations

If a DropCall is attempted in the ACCEPTED state, the protocol will answer the call by sending out the ANSWER pattern before dropping the call, as forced release is not supported in this protocol.

9.2 Country Dependent Parameter Descriptions

Note: A parameter can be inbound, outbound, or both inbound and outbound. An inbound parameter is used by the protocol when it is acting as inbound. An outbound parameter is used by the protocol when it is acting as outbound. A parameter that is both can be used by the protocol when it is acting as either inbound or outbound.

The modifiable parameters in the *pdk_br_r2_io.cdp* file are:

- CAS_PULSE_DOUBLE_ANSWER (Inbound)
- CDP_ANI_ENABLED (Inbound)
- CDP_ANI_MaxDigits (Inbound)
- CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED
- CDP_ANI_WITHAC_FACILITY_ENABLED (Outbound)
- CDP_AreaCode
- CDP_CallingPartyCategory (Outbound)
- CDP_ConnectType (Outbound)
- CDP_DNIS_MaxDigits (Inbound)
- CDP_DOUBLE_ANSWER_FLAG (Inbound)
- CDP_Drop_Using_ProgressTones_After_AcceptCall (Inbound)
- CDP_FLAG_APPEND_F (Outbound)
- CDP_GrpB_Tone (Inbound)
- CDP_IMMEDIATE_ACCEPTSTATE (Inbound)
- CDP_IS_ANIAVAILABILITY_CHECK_NEEDED
- CDP_IS_CALLING_LINE_IDENTIFICATION_PERMITTED (Outbound)
- CDP_NO_OF_DNIS_BEFORE_CAT (Inbound)
- CDP_NUM_OF_AC_DIGITS (Inbound)
- CDP_NUM_OF_ANI_DIGITS (Inbound)
- CDP_NUM_OF_DNIS_DIGITS (Inbound)
- CDP_OVERLAP_SENDING_ENABLED (Outbound)
- CDP_REANSWER_TIMEOUT (Outbound)
- CDP_RECV_CALL_EVENT_SENT_WITH_FIRST_ANSWER (Inbound)
- CDP_REJECT_WITH_A3B4 (Inbound)
- CDP_SEND_ALERTING_ON_R2MF_COMPLETION (Inbound)
- CDP_SEND_BLOCK_AT_START_OR_REMOTE_BLOCK
- CDP_TrunkPrefixNumber

In addition, see Chapter 3, “Call Progress Analysis Parameters” for configuring default call progress operation in the protocol.

CAS_PULSE_DOUBLE_ANSWER (Inbound)

Description: Specifies the double answer signal. When answering a call, the double answer signal is sent to the CO to block collect calls. This parameter is valid only if **CDP_DOUBLE_ANSWER_FLAG** is set to 1.

Values: Default is 0101, 1101, 0, 0, 0, 0, 1800, 2000, 2200.

Guidelines: The default double answer signal comprises the following:

- An initial answer signal with signaling bits AB = 01 for 1000 msec (signaling bits ABCD = 0101).
- A backward clear signal (signaling bits AB = 11) for 2000 msec (signaling bits ABCD = 1101).
- A return to answer state with signaling bits AB = 01 (signaling bits ABCD = 0101).

The eighth argument of this parameter is the time between the two answers. The seventh and ninth arguments should be set to approximately 90% and 110%, respectively, of argument number 8.

CDP_ANI_ENABLED (Inbound)

Description: Enables or disables the reception of automatic number identification (ANI) digits.

Values:

- 0: Disable the reception of ANI digits.
- 1 [default]: Enable the reception of ANI digits.

Guidelines: If this parameter is set to a value other than 0 or 1, the behavior of the protocol is not predictable.

For DM3, if ANI is disabled, you also have to remove **feature_ANI** from the **SYS_FEATURES** parameter in the *.cdp* file. The **SYS_FEATURES** parameter looks like this:

```
All CHARSTRING_t SYS_FEATURES = "feature_outbound,feature_inbound,feature_DNIS,
feature_Billing,feature_ANI,feature_CAT,feature_MoreDNIS"
```

CDP_ANI_MaxDigits (Inbound)

Description: Specifies the maximum number of ANI digits that can be received when using this protocol.

Values: Default is 16.

Guidelines: If this parameter value is set to 0, the behavior of the protocol is not predictable.

CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED

Description: Specifies whether ANI is to be requested (inbound) or sent (outbound) with the area code.

Values:

- 0 [default]: Request (inbound) or send (outbound) ANI digits without area code.
- 1: Request (inbound) or send (outbound) area code with ANI digits.

CDP_ANI_WITHAC_FACILITY_ENABLED (Outbound)

Description: Specifies whether ANI digits and area code are sent to the inbound side. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values:

- 0 [default]: The requested information denied tone is sent to the inbound side.
- 1: ANI digits with area code are sent to the inbound side.

CDP_AreaCode

Description: Specifies the area code of the local exchange where the subscriber is connected. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values: Default is 987.

CDP_CallingPartyCategory (Outbound)

Description: Specifies the category of the calling subscriber.

Values:

- 1 [default]: General subscriber
- 2: Subscriber with priority
- 3: Maintenance equipment
- 4: Local public telephone
- 5: Telephone operator
- 6: Equipment of data transmission
- 7: Intercity public telephone
- 11: Subscriber with transference facility

CDP_ConnectType (Outbound)

Description: Specifies the mode for outbound connect detection. Two types of connection events can be detected: the `cas_answer` received signaling bit pattern and the media type detection used when post-connect call analysis is enabled. The application has options as to when the call is considered connected, as set by this parameter. The application also has options as to whether call analysis continues after the call has been connected when `cas_answer` is received first.

Values:

- 0 [default]: The protocol transitions to the connected state only when `cas_answer` is received. If `cas_answer` is received first, call analysis is stopped. If call analysis is received first, the result is sent to the application via a `GCEV_MEDIADETECTED` event, but the protocol does not transition to the connected state until `cas_answer` is received.
- 1: The protocol transitions to the connected state when the first event (either `cas_answer` or call analysis) is received. If `cas_answer` is received first, call analysis still continues and the

result is sent to the application via a GCEV_MEDIADETECTED event. If call analysis is received first, the subsequent cas_answer is ignored.

- 2: The protocol transitions to the connected state when the first event (either cas_answer or call analysis) is received. If cas_answer is received first, call analysis is stopped. If call analysis is received first, the subsequent cas_answer is ignored.
- 3: The protocol transitions to the connected state only when call analysis is received. If call analysis is received first, the subsequent cas_answer is ignored. If cas_answer is received first, it is ignored.

CDP_DNIS_MaxDigits (Inbound)

Description: Specifies the maximum number of dialed number identification service (DNIS) digits that can be received when using this protocol.

Values: Default is 16.

Guidelines: If this parameter value is set to 0, the behavior of the protocol is not predictable.

CDP_DOUBLE_ANSWER_FLAG (Inbound)

Description: Specifies whether to enable the double answer feature that is used to block collect calls.

Values:

- 0 [default]: Disable double answer feature.
- 1: Enable double answer feature.

CDP_Drop_Using_ProgressTones_After_AcceptCall (Inbound)

Description: Specifies the call progress tone to be sent for dropping a call, when doing a gc_DropCall() after a gc_AcceptCall().

Values:

- 0 [default]: The protocol sends the Answer Line signal, waits for the time specified by CDP_TimeToRecognizeAnswer, and then sends a Clear Backward line signal for call disconnection. In this case, the call will be charged for the remote calling subscriber, even though the call is not successful.
- 1: The protocol sends the appropriate call progress tone depending on the gc_DropCall() cause to the remote end, and waits for a Clear Forward Line signal for call disconnection.

CDP_FLAG_APPEND_F (Outbound)

Description: When the remote end asks for the next DNIS digit through Group A backward tone, and the protocol does not have any more DNIS available to be sent, this parameter specifies

whether to send the I-15 tone or to remain silent and prepare for A3 or A4 pulse from the remote end.

Values:

- 0 [default]: No tone will be sent to the remote end. In this case, A3 or A4 pulse is expected to be received from the remote end. In a case of overlapped sending (see description of **CDP_OVERLAP_SENDING_ENABLED** parameter), the remote end may also send A1 to request more information.
- 1: 'f' (I-15) will be sent to the remote end, indicating the end of information.

CDP_GrpB_Tone (Inbound)

Description: Determines whether the sender should be charged after receiving the tone. The tone is sent from the inbound end on receipt of Category for Group II. After this tone, the sequence of R2MF tone exchange is over and the call is connected. This is the last R2MF tone in establishment of a call.

Values:

- 1 [default]: Chargeable (B-1)
- 5: Not chargeable (B-5)
- 6: Chargeable, but the clearing of the call is under called party control

CDP_IMMEDIATE_ACCEPTSTATE (Inbound)

Description: Specifies when the protocol transitions a call to the Accepted state.

Values:

- 0 [default]: The protocol should wait for the number of rings specified in **gc_AcceptCall()** to expire before transitioning to the Accepted state.
- 1: The protocol should transition a call to the Accepted state immediately upon receipt of **gc_AcceptCall()** and before the specified number of rings have been generated.

Guidelines: This parameter is ignored if the value of the **gc_AcceptCall()** rings parameter is 0.

CDP_IS_ANIAVAILABILITY_CHECK_NEEDED

Description: Determines whether the status of ANI availability is checked before ANI digits are exchanged. At the inbound side, this parameter specifies whether ANI availability at the outbound side has to be verified or if ANI digits can be requested directly. At the outbound side, ANI digits are passed directly or the inbound side is informed of the availability (status) first.

Values:

- 0 [default]: The status of ANI availability is not checked before ANI digits are exchanged. ANI digits can be requested directly without knowing the status of the outbound side.
- 1: The status of ANI availability is checked before ANI digits are exchanged. The inbound side requests the status of ANI availability. If ANI digits are available, the inbound side requests the ANI digits. The outbound side sends the status of ANI availability and then waits for the inbound request.

CDP_IS_CALLING_LINE_IDENTIFICATION_PERMITTED (Outbound)

Description: Specifies whether Calling Line Identification is enabled. This parameter is used to enable CLIP and CLIR conditions.

Values:

- 0: Calling Line Identification Rejected (CLIR). The requested information denied tone is sent to the inbound side.
- 1 [default]: Calling Line Identification Permitted (CLIP). ANI digits are sent to the inbound side.

CDP_NO_OF_DNIS_BEFORE_CAT (Inbound)

Description: Determines the number of DNIS digits that are to be received before any category information is received. If this parameter is set to non-zero, the following sequence of events occurs:

1. Partial DNIS digits are received.
2. Category digits are received.
3. The remaining DNIS digits are received.
4. ANI digits are received (if **CDP_ANI_ENABLED** is 1).
5. Category digits are received again.

Values:

- 0 [default]: Indicates that category must be received after all DNIS digits are received.
- Non-zero: Specifies the number of DNIS digits received before category information is received.

Guidelines: The behavior of the protocol will not be predictable, unless the following occurs:

- If this parameter is set to non-zero, **CDP_ANI_ENABLED** must be set to 1.
- If this parameter is set to non-zero, its value should be the minimum of **CDP_NUM_OF_DNIS_DIGITS** (if non-zero), **CDP_DNIS_MaxDigits**, and the actual DNIS digits to be received.

CDP_NUM_OF_AC_DIGITS (Inbound)

Description: Specifies the number of area code digits of the local exchange from where it received the call. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values: Default is 3.

CDP_NUM_OF_ANI_DIGITS (Inbound)

Description: Specifies the expected number of ANI digits to be received.

Values:

- 0: ANI collection is terminated by I-15 (end of dialing).
- Non-zero [default is 4]: Specifies the number of ANI digits expected. This number should always be less than **CDP_ANI_MaxDigits**.

CDP_NUM_OF_DNIS_DIGITS (Inbound)

Description: Specifies the expected number of DNIS digits to be received.

Values:

- 0: DNIS collection is terminated by I-15 (end of dialing).
- Non-zero [default is 2]: Specifies the number of DNIS digits expected. This number should always be less than **CDP_DNIS_MaxDigits**.

CDP_OVERLAP_SENDING_ENABLED (Outbound)

Description: Enables or disables the overlap sending feature.

Values:

- 0: Disables overlap sending. 'f' will be appended to DNIS digits received with **gc_MakeCall()** (if **CDP_FLAG_APPEND_F** is true), indicating the end of information.
- 1 [default]: Enables overlap sending. The remote end can request more DNIS information, in which case a **REQMOREINFO** event will be generated. **gc_SendMoreInfo()** with Null information will either cause 'f' to be sent to the remote end or will remain silent (depending on the value of **CDP_FLAG_APPEND_F**), thus indicating to the remote end that no more DNIS digits are available.

CDP_REANSWER_TIMEOUT (Outbound)

Description: Defines the amount of time the protocol should wait before sending a **DISCONNECTED** event to the application. This prevents the outbound side from getting disconnected when a double answer signal is received from the remote end in the connected state. For information about the double answer signal, see the **CAS_PULSE_DOUBLE_ANSWER** parameter.

Values:

- 0 [default]: Do not wait to report a **DISCONNECTED** event to the application when a remote **DISCONNECT** signal (**CAS_CLEARBWD**) line signal is received.
- Non-zero: Wait for the specified amount of time when receiving a **DISCONNECT** signal (**CAS_CLEARBWD**) before sending the **DISCONNECTED** event to the application. In the Connected state, receiving a **DISCONNECT** signal (**CAS_CLEARBWD**) from the remote end does not cause a transition to the Disconnected state immediately. If, during this period, the Answer (**CAS_ANSWER**) signal is received, no **DISCONNECTED** event is reported to the application and the protocol remains in the Connected state only.

Guidelines: A typical value should be slightly more than 2000 milliseconds, for example, 2500 milliseconds.

CDP_RECV_CALL_EVENT_SENT_WITH_FIRST_ANSWER (Inbound)

Description: Specifies if the call state is changed to CONNECTED after first or second answer. This parameter is valid only if **CDP_DOUBLE_ANSWER_FLAG** is set to 1.

Values:

- 0: Change the call state to the CONNECTED state after the second answer.
- 1 [default]: Change the call state to the CONNECTED state after the first answer.

CDP_REJECT_WITH_A3B4 (Inbound)

Description: Determines the method for rejecting a call when an R2MF tone error is received during call setup.

Values:

- 0 [default]: Call is rejected with a direct group A tone (A-10), which is a spare tone that may be used to indicate congestion.
- 1: Call is rejected with an A3-B4 tone combination, which means that the inbound (local) end sends an A-3 tone (send category and change over to group B tones). Then, the category is received and in response, a B-4 tone is sent to reject the call.

CDP_SEND_ALERTING_ON_R2MF_COMPLETION (Inbound)

Description: Controls when the protocol will send a GCEV_ALERTING event to the application.

Values:

- 0: GCEV_ALERTING is sent after receiving a ringback tone.
- 1 [default]: GCEV_ALERTING is sent after completion of the R2MF sequence (after receiving the last Group B tone).

CDP_SEND_BLOCK_AT_START_OR_REMOTE_BLOCK

Description: Specifies the bit pattern to be sent on the line at protocol open time and when the remote line goes BLOCKED.

Values:

- 0 [default]: If the protocol is used either as outbound only or as bidirectional.
- 1: If the protocol is used as inbound only.

CDP_TrunkPrefixNumber

Description: Specifies the trunk number used to dial to local exchange. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values: Default is 9.





CCITT R2 Bidirectional Protocol Parameter Configuration 10

This chapter discusses the capabilities and parameters of the CCITT R2 Bidirectional protocol in the following topics:

- General Protocol Information 71
- Country Dependent Parameter Descriptions 71

10.1 General Protocol Information

Protocol File Set

The files used with the CCITT R2 protocol are listed and described in the following table.

File Type	File Name(s)	
	DM3	Springware
Protocol Module	pdk_r2_io.qs and pdk_r2_io.hot (or pdk_r2_io.arm.hot for DMT160TEC boards)	pdk_r2_io.psi
Voice and Network Parameters	Not applicable	r2_300.prm
Country Dependent Parameters	pdk_ccitt_r2_io.cdp	pdk_ccitt_r2_io.cdp
	gc_OpenEx() Protocol Name	
	Not applicable†	pdk_ccitt_r2_io

†On DM3 boards, the protocol is determined at board initialization time and not when a Global Call device is opened. For compatibility, the **gc_OpenEx()** protocol name may be specified for DM3 boards, but it is not used.

Protocol Limitations

If a DropCall is attempted in the ACCEPTED state, the protocol will answer the call by sending out the ANSWER pattern before dropping the call, as forced release is not supported in this protocol.

10.2 Country Dependent Parameter Descriptions

Note: A parameter can be inbound, outbound, or both inbound and outbound. An inbound parameter is used by the protocol when it is acting as inbound. An outbound parameter is used by the protocol when it is acting as outbound. A parameter that is both can be used by the protocol when it is acting as either inbound or outbound.

The modifiable parameters in the *pdk_ccitt_r2_io.cdp* file are:

- CDP_ANI_ENABLED (Inbound)
- CDP_ANI_MaxDigits (Inbound)
- CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED
- CDP_ANI_WITHAC_FACILITY_ENABLED (Outbound)
- CDP_AreaCode
- CDP_CallingPartyCategory (Outbound)
- CDP_ConnectType (Outbound)
- CDP_DNIS_MaxDigits (Inbound)
- CDP_Drop_Using_ProgressTones_After_AcceptCall (Inbound)
- CDP_FLAG_APPEND_F (Outbound)
- CDP_GrpB_Tone (Inbound)
- CDP_IMMEDIATE_ACCEPTSTATE (Inbound)
- CDP_IS_ANIAVAILABILITY_CHECK_NEEDED
- CDP_IS_CALLING_LINE_IDENTIFICATION_PERMITTED (Outbound)
- CDP_NO_OF_DNIS_BEFORE_CAT (Inbound)
- CDP_NUM_OF_AC_DIGITS (Inbound)
- CDP_NUM_OF_ANI_DIGITS (Inbound)
- CDP_NUM_OF_DNIS_DIGITS (Inbound)
- CDP_OVERLAP_SENDING_ENABLED (Outbound)
- CDP_REJECT_WITH_A3B4 (Inbound)
- CDP_SEND_ALERTING_ON_R2MF_COMPLETION (Inbound)
- CDP_SEND_BLOCK_AT_START_OR_REMOTE_BLOCK
- CDP_TrunkPrefixNumber

In addition, see Chapter 3, “Call Progress Analysis Parameters” for configuring default call progress operation in the protocol.

CDP_ANI_ENABLED (Inbound)

Description: Enables or disables the reception of automatic number identification (ANI) digits.

Values:

- 0: Disable the reception of ANI digits.
- 1 [default]: Enable the reception of ANI digits.

Guidelines: If this parameter is set to a value other than 0 or 1, the behavior of the protocol is not predictable.

For DM3, if ANI is disabled, you also have to remove **feature_ANI** from the **SYS_FEATURES** parameter in the *.cdp* file. The **SYS_FEATURES** parameter looks like this:

```
All CHARSTRING_t SYS_FEATURES = "feature_outbound,feature_inbound,feature_DNIS,
feature_Billing,feature_ANI,feature_CAT,feature_MoreDNIS"
```

CDP_ANI_MaxDigits (Inbound)

Description: Specifies the maximum number of ANI digits that can be received when using this protocol.

Values: Default is 16.

Guidelines: If this parameter value is set to 0, the behavior of the protocol is not predictable.

CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED

Description: Specifies whether ANI is to be requested (inbound) or sent (outbound) with the area code.

Values:

- 0 [default]: Request (inbound) or send (outbound) ANI digits without area code.
- 1: Request (inbound) or send (outbound) area code with ANI digits.

CDP_ANI_WITHAC_FACILITY_ENABLED (Outbound)

Description: Specifies whether ANI digits and area code are sent to the inbound side. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values:

- 0 [default]: The requested information denied tone is sent to the inbound side.
- 1: ANI digits with area code are sent to the inbound side.

CDP_AreaCode

Description: Specifies the area code of the local exchange where the subscriber is connected. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values: Default is 987.

CDP_CallingPartyCategory (Outbound)

Description: Specifies the category of the calling subscriber.

Values:

- 1 [default]: II-1, subscriber without priority
- 2: II-2, subscriber with priority
- 3: II-3, maintenance equipment
- 4: II-4, spare
- 5: II-5, operator
- 6: II-6, data transmission
- 7: II-7, subscriber (or operator without forward transfer facility)
- 8: II-8, data transmission
- 9: II-9, subscriber with priority
- A: II-10, operator with forward transfer facility

CDP_ConnectType (Outbound)

Description: Specifies the mode for outbound connect detection. Two types of connection events can be detected: the cas_answer received signaling bit pattern and the media type detection used when post-connect call analysis is enabled. The application has options as to when the call is considered connected, as set by this parameter. The application also has options as to whether call analysis continues after the call has been connected when cas_answer is received first.

Values:

- 0 [default]: The protocol transitions to the connected state only when cas_answer is received. If cas_answer is received first, call analysis is stopped. If call analysis is received first, the result is sent to the application via a GCEV_MEDIADETECTED event, but the protocol does not transition to the connected state until cas_answer is received.
- 1: The protocol transitions to the connected state when the first event (either cas_answer or call analysis) is received. If cas_answer is received first, call analysis still continues and the result is sent to the application via a GCEV_MEDIADETECTED event. If call analysis is received first, the subsequent cas_answer is ignored.
- 2: The protocol transitions to the connected state when the first event (either cas_answer or call analysis) is received. If cas_answer is received first, call analysis is stopped. If call analysis is received first, the subsequent cas_answer is ignored.
- 3: The protocol transitions to the connected state only when call analysis is received. If call analysis is received first, the subsequent cas_answer is ignored. If cas_answer is received first, it is ignored.

CDP_DNIS_MaxDigits (Inbound)

Description: Specifies the maximum number of dialed number identification service (DNIS) digits that can be received when using this protocol.

Values: Default is 16.

Guidelines: If this parameter value is set to 0, the behavior of the protocol is not predictable.

CDP_Drop_Using_ProgressTones_After_AcceptCall (Inbound)

Description: Specifies the call progress tone to be sent for dropping a call, when doing a `gc_DropCall()` after a `gc_AcceptCall()`.

Values:

- 0 [default]: The protocol sends the Answer Line signal, waits for the time specified by `CDP_TimeToRecognizeAnswer`, and then sends a Clear Backward line signal for call disconnection. In this case, the call will be charged for the remote calling subscriber, even though the call is not successful.
- 1: The protocol sends the appropriate call progress tone depending on the `gc_DropCall()` cause to the remote end, and waits for a Clear Forward Line signal for call disconnection.

CDP_FLAG_APPEND_F (Outbound)

Description: When the remote end asks for the next DNIS digit through Group A backward tone, and the protocol does not have any more DNIS available to be sent, this parameter specifies whether to send the I-15 tone or to remain silent and prepare for A3 or A4 pulse from the remote end.

Values:

- 0 [default]: No tone will be sent to the remote end. In this case, A3 or A4 pulse is expected to be received from the remote end. In a case of overlapped sending (see description of `CDP_OVERLAP_SENDING_ENABLED` parameter), the remote end may also send A1 to request more information.
- 1: 'f' (I-15) will be sent to the remote end, indicating the end of information.

CDP_GrpB_Tone (Inbound)

Description: Determines whether the sender should be charged after receiving the tone. The tone is sent from the inbound end on receipt of Category for Group II. After this tone, the sequence of R2MF tone exchange is over and the call is connected. This is the last R2MF tone in establishment of a call.

Values:

- 6 [default]: Subscriber's line free, charge
- 7: Subscriber's line free, no charge

CDP_IMMEDIATE_ACCEPTSTATE (Inbound)

Description: Specifies when the protocol transitions a call to the Accepted state.

Values:

- 0 [default]: The protocol should wait for the number of rings specified in `gc_AcceptCall()` to expire before transitioning to the Accepted state.
- 1: The protocol should transition a call to the Accepted state immediately upon receipt of `gc_AcceptCall()` and before the specified number of rings have been generated.

Guidelines: This parameter is ignored if the value of the `gc_AcceptCall()` rings parameter is 0.

CDP_IS_ANIAVAILABILITY_CHECK_NEEDED

Description: Determines whether the status of ANI availability is checked before ANI digits are exchanged. At the inbound side, this parameter specifies whether ANI availability at the outbound side has to be verified or if ANI digits can be requested directly. At the outbound side, ANI digits are passed directly or the inbound side is informed of the availability (status) first.

Values:

- 0 [default]: The status of ANI availability is not checked before ANI digits are exchanged. ANI digits can be requested directly without knowing the status of the outbound side.
- 1: The status of ANI availability is checked before ANI digits are exchanged. The inbound side requests the status of ANI availability. If ANI digits are available, the inbound side requests the ANI digits. The outbound side sends the status of ANI availability and then waits for the inbound request.

CDP_IS_CALLING_LINE_IDENTIFICATION_PERMITTED (Outbound)

Description: Specifies whether Calling Line Identification is enabled. This parameter is used to enable CLIP and CLIR conditions.

Values:

- 0: Calling Line Identification Rejected (CLIR). The requested information denied tone is sent to the inbound side.
- 1 [default]: Calling Line Identification Permitted (CLIP). ANI digits are sent to the inbound side.

CDP_NO_OF_DNIS_BEFORE_CAT (Inbound)

Description: Determines the number of DNIS digits that are to be received before any category information is received. If this parameter is set to non-zero, the following sequence of events occurs:

1. Partial DNIS digits are received.
2. Category digits are received.
3. The remaining DNIS digits are received.
4. ANI digits are received (if **CDP_ANI_ENABLED** is 1).
5. Category digits are received again.

Values:

- 0 [default]: Indicates that category must be received after all DNIS digits are received.
- Non-zero: Specifies the number of DNIS digits received before category information is received.

Guidelines: The behavior of the protocol will not be predictable, unless the following occurs:

- If this parameter is set to non-zero, **CDP_ANI_ENABLED** must be set to 1.
- If this parameter is set to non-zero, its value should be the minimum of **CDP_NUM_OF_DNIS_DIGITS** (if non-zero), **CDP_DNIS_MaxDigits**, and the actual DNIS digits to be received.

CDP_NUM_OF_AC_DIGITS (Inbound)

Description: Specifies the number of area code digits of the local exchange from where it received the call. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values: Default is 0.

CDP_NUM_OF_ANI_DIGITS (Inbound)

Description: Specifies the expected number of ANI digits to be received.

Values:

- 0 [default]: ANI collection is terminated by I-15 (end of dialing).
- Non-zero: Specifies the number of ANI digits expected. This number should always be less than **CDP_ANI_MaxDigits**.

CDP_NUM_OF_DNIS_DIGITS (Inbound)

Description: Specifies the expected number of DNIS digits to be received.

Values:

- 0: DNIS collection is terminated by I-15 (end of dialing).
- Non-zero [default is 4]: Specifies the number of DNIS digits expected. This number should always be less than **CDP_DNIS_MaxDigits**.

CDP_OVERLAP_SENDING_ENABLED (Outbound)

Description: Enables or disables the overlap sending feature.

Values:

- 0: Disables overlap sending. 'f' will be appended to DNIS digits received with **gc_MakeCall()** (if **CDP_FLAG_APPEND_F** is true), indicating the end of information.
- 1 [default]: Enables overlap sending. The remote end can request more DNIS information, in which case a **REQMOREINFO** event will be generated. **gc_SendMoreInfo()** with Null information will either cause 'f' to be sent to the remote end or will remain silent (depending on the value of **CDP_FLAG_APPEND_F**), thus indicating to the remote end that no more DNIS digits are available.

CDP_REJECT_WITH_A3B4 (Inbound)

Description: Determines the method for rejecting a call when an R2MF tone error is received during call setup.

Values:

- 0 [default]: Call is rejected with a direct group A tone (A-10), which is a spare tone that may be used to indicate congestion.
- 1: Call is rejected with an A3-B4 tone combination, which means that the inbound (local) end sends an A-3 tone (send category and change over to group B tones). Then, the category is received and in response, a B-4 tone is sent to reject the call.

CDP_SEND_ALERTING_ON_R2MF_COMPLETION (Inbound)

Description: Controls when the protocol will send a GCEV_ALERTING event to the application.

Values:

- 0: GCEV_ALERTING is sent after receiving a ringback tone.
- 1 [default]: GCEV_ALERTING is sent after completion of the R2MF sequence (after receiving the last Group B tone).

CDP_SEND_BLOCK_AT_START_OR_REMOTE_BLOCK

Description: Specifies the bit pattern to be sent on the line at protocol open time and when the remote line goes BLOCKED.

Values:

- 0 [default]: If the protocol is used either as outbound only or as bidirectional.
- 1: If the protocol is used as inbound only.

CDP_TrunkPrefixNumber

Description: Specifies the trunk number used to dial to local exchange. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values: Default is 9.



Chile R2 Bidirectional Protocol Parameter Configuration

11

This chapter discusses the capabilities and parameters of the Chile R2 Bidirectional protocol in the following topics:

- General Protocol Information 79
- Country Dependent Parameter Descriptions 79

11.1 General Protocol Information

Protocol File Set

The files used with the Chile R2 protocol are listed and described in the following table.

File Type	File Name(s)	
	DM3	Springware
Protocol Module	pdk_r2_io.qs and pdk_r2_io.hot (or pdk_r2_io.arm.hot for DMT160TEC boards)	pdk_r2_io.psi
Voice and Network Parameters	Not applicable	cl_300.prm
Country Dependent Parameters	pdk_cl_r2_io.cdp	pdk_cl_r2_io.cdp
	gc_OpenEx() Protocol Name	
	Not applicable†	pdk_cl_r2_io

†On DM3 boards, the protocol is determined at board initialization time and not when a Global Call device is opened. For compatibility, the **gc_OpenEx()** protocol name may be specified for DM3 boards, but it is not used.

Protocol Limitations

If a DropCall is attempted in the ACCEPTED state, the protocol will answer the call by sending out the ANSWER pattern before dropping the call, as forced release is not supported in this protocol.

11.2 Country Dependent Parameter Descriptions

Note: A parameter can be inbound, outbound, or both inbound and outbound. An inbound parameter is used by the protocol when it is acting as inbound. An outbound parameter is used by the protocol when it is acting as outbound. A parameter that is both can be used by the protocol when it is acting as either inbound or outbound.

The modifiable parameters in the *pdk_cl_r2_io.cdp* file are:

- CDP_ANI_ENABLED (Inbound)
- CDP_ANI_MaxDigits (Inbound)
- CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED
- CDP_ANI_WITHAC_FACILITY_ENABLED (Outbound)
- CDP_AreaCode
- CDP_CallingPartyCategory (Outbound)
- CDP_ConnectType (Outbound)
- CDP_DNIS_MaxDigits (Inbound)
- CDP_Drop_Using_ProgressTones_After_AcceptCall (Inbound)
- CDP_FLAG_APPEND_F (Outbound)
- CDP_GrpB_Tone (Inbound)
- CDP_IMMEDIATE_ACCEPTSTATE (Inbound)
- CDP_IS_ANIAVAILABILITY_CHECK_NEEDED
- CDP_IS_CALLING_LINE_IDENTIFICATION_PERMITTED (Outbound)
- CDP_NO_OF_DNIS_BEFORE_CAT (Inbound)
- CDP_NUM_OF_AC_DIGITS (Inbound)
- CDP_NUM_OF_ANI_DIGITS (Inbound)
- CDP_NUM_OF_DNIS_DIGITS (Inbound)
- CDP_OVERLAP_SENDING_ENABLED (Outbound)
- CDP_REJECT_WITH_A3B4 (Inbound)
- CDP_SEND_ALERTING_ON_R2MF_COMPLETION (Inbound)
- CDP_SEND_BLOCK_AT_START_OR_REMOTE_BLOCK
- CDP_TrunkPrefixNumber

In addition, see [Chapter 3, “Call Progress Analysis Parameters”](#) for configuring default call progress operation in the protocol.

CDP_ANI_ENABLED (Inbound)

Description: Enables or disables the reception of automatic number identification (ANI) digits.

Values:

- 0: Disable the reception of ANI digits.
- 1 [default]: Enable the reception of ANI digits.

Guidelines: If this parameter is set to a value other than 0 or 1, the behavior of the protocol is not predictable.

For DM3, if ANI is disabled, you also have to remove **feature_ANI** from the **SYS_FEATURES** parameter in the *.cdp* file. The **SYS_FEATURES** parameter looks like this:

```
All CHARSTRING_t SYS_FEATURES = "feature_outbound,feature_inbound,feature_DNIS,  
feature_Billing,feature_ANI,feature_CAT,feature_MoreDNIS"
```

CDP_ANI_MaxDigits (Inbound)

Description: Specifies the maximum number of ANI digits that can be received when using this protocol.

Values: Default is 16.

Guidelines: If this parameter value is set to 0, the behavior of the protocol is not predictable.

CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED

Description: Specifies whether ANI is to be requested (inbound) or sent (outbound) with the area code.

Values:

- 0 [default]: Request (inbound) or send (outbound) ANI digits without area code.
- 1: Request (inbound) or send (outbound) area code with ANI digits.

CDP_ANI_WITHAC_FACILITY_ENABLED (Outbound)

Description: Specifies whether ANI digits and area code are sent to the inbound side. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values:

- 0 [default]: The requested information denied tone is sent to the inbound side.
- 1: ANI digits with area code are sent to the inbound side.

CDP_AreaCode

Description: Specifies the area code of the local exchange where the subscriber is connected. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values: Default is 987.

CDP_CallingPartyCategory (Outbound)

Description: Specifies the category of the calling subscriber.

Values:

- 1 [default]: Subscriber without priority
- 2: Subscriber with priority
- 3: Maintenance equipment
- 4: Subscriber with long distance
- 5: Telephone operator
- 6: Data transmission
- 11: Non-identifiable subscriber

CDP_ConnectType (Outbound)

Description: Specifies the mode for outbound connect detection. Two types of connection events can be detected: the cas_answer received signaling bit pattern and the media type detection used when post-connect call analysis is enabled. The application has options as to when the call is considered connected, as set by this parameter. The application also has options as to whether call analysis continues after the call has been connected when cas_answer is received first.

Values:

- 0 [default]: The protocol transitions to the connected state only when cas_answer is received. If cas_answer is received first, call analysis is stopped. If call analysis is received first, the result is sent to the application via a GCEV_MEDIADETECTED event, but the protocol does not transition to the connected state until cas_answer is received.
- 1: The protocol transitions to the connected state when the first event (either cas_answer or call analysis) is received. If cas_answer is received first, call analysis still continues and the result is sent to the application via a GCEV_MEDIADETECTED event. If call analysis is received first, the subsequent cas_answer is ignored.
- 2: The protocol transitions to the connected state when the first event (either cas_answer or call analysis) is received. If cas_answer is received first, call analysis is stopped. If call analysis is received first, the subsequent cas_answer is ignored.
- 3: The protocol transitions to the connected state only when call analysis is received. If call analysis is received first, the subsequent cas_answer is ignored. If cas_answer is received first, it is ignored.

CDP_DNIS_MaxDigits (Inbound)

Description: Specifies the maximum number of dialed number identification service (DNIS) digits that can be received when using this protocol.

Values: Default is 16.

Guidelines: If this parameter value is set to 0, the behavior of the protocol is not predictable.

CDP_Drop_Using_ProgressTones_After_AcceptCall (Inbound)

Description: Specifies the call progress tone to be sent for dropping a call, when doing a gc_DropCall() after a gc_AcceptCall().

Values:

- 0 [default]: The protocol sends the Answer Line signal, waits for the time specified by **CDP_TimeToRecognizeAnswer**, and then sends a Clear Backward line signal for call disconnection. In this case, the call will be charged for the remote calling subscriber, even though the call is not successful.
- 1: The protocol sends the appropriate call progress tone depending on the **gc_DropCall()** cause to the remote end, and waits for a Clear Forward Line signal for call disconnection.

CDP_FLAG_APPEND_F (Outbound)

Description: When the remote end asks for the next DNIS digit through Group A backward tone, and the protocol does not have any more DNIS available to be sent, this parameter specifies whether to send the I-15 tone or to remain silent and prepare for A3 or A4 pulse from the remote end.

Values:

- 0 [default]: No tone will be sent to the remote end. In this case, A3 or A4 pulse is expected to be received from the remote end. In a case of overlapped sending (see description of **CDP_OVERLAP_SENDING_ENABLED** parameter), the remote end may also send A1 to request more information.
- 1: 'f' (I-15) will be sent to the remote end, indicating the end of information.

CDP_GrpB_Tone (Inbound)

Description: Determines whether the sender should be charged after receiving the tone. The tone is sent from the inbound end on receipt of Category for Group II. After this tone, the sequence of R2MF tone exchange is over and the call is connected. This is the last R2MF tone in establishment of a call.

Values:

- 6 [default]: Line free, chargeable
- 7: Line free, not chargeable

CDP_IMMEDIATE_ACCEPTSTATE (Inbound)

Description: Specifies when the protocol transitions a call to the Accepted state.

Values:

- 0 [default]: The protocol should wait for the number of rings specified in **gc_AcceptCall()** to expire before transitioning to the Accepted state.
- 1: The protocol should transition a call to the Accepted state immediately upon receipt of **gc_AcceptCall()** and before the specified number of rings have been generated.

Guidelines: This parameter is ignored if the value of the **gc_AcceptCall()** rings parameter is 0.

CDP_IS_ANIAVAILABILITY_CHECK_NEEDED

Description: Determines whether the status of ANI availability is checked before ANI digits are exchanged. At the inbound side, this parameter specifies whether ANI availability at the outbound side has to be verified or if ANI digits can be requested directly. At the outbound side, ANI digits are passed directly or the inbound side is informed of the availability (status) first.

Values:

- 0 [default]: The status of ANI availability is not checked before ANI digits are exchanged. ANI digits can be requested directly without knowing the status of the outbound side.
- 1: The status of ANI availability is checked before ANI digits are exchanged. The inbound side requests the status of ANI availability. If ANI digits are available, the inbound side requests the ANI digits. The outbound side sends the status of ANI availability and then waits for the inbound request.

CDP_IS_CALLING_LINE_IDENTIFICATION_PERMITTED (Outbound)

Description: Specifies whether Calling Line Identification is enabled. This parameter is used to enable CLIP and CLIR conditions.

Values:

- 0: Calling Line Identification Rejected (CLIR). The requested information denied tone is sent to the inbound side.
- 1 [default]: Calling Line Identification Permitted (CLIP). ANI digits are sent to the inbound side.

CDP_NO_OF_DNIS_BEFORE_CAT (Inbound)

Description: Determines the number of DNIS digits that are to be received before any category information is received. If this parameter is set to non-zero, the following sequence of events occurs:

1. Partial DNIS digits are received.
2. Category digits are received.
3. The remaining DNIS digits are received.
4. ANI digits are received (if **CDP_ANI_ENABLED** is 1).
5. Category digits are received again.

Values:

- 0 [default]: Indicates that category must be received after all DNIS digits are received.
- Non-zero: Specifies the number of DNIS digits received before category information is received.

Guidelines: The behavior of the protocol will not be predictable, unless the following occurs:

- If this parameter is set to non-zero, **CDP_ANI_ENABLED** must be set to 1.

- If this parameter is set to non-zero, its value should be the minimum of **CDP_NUM_OF_DNIS_DIGITS** (if non-zero), **CDP_DNIS_MaxDigits**, and the actual DNIS digits to be received.

CDP_NUM_OF_AC_DIGITS (Inbound)

Description: Specifies the number of area code digits of the local exchange from where it received the call. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values: Default is 3.

CDP_NUM_OF_ANI_DIGITS (Inbound)

Description: Specifies the expected number of ANI digits to be received.

Values:

- 0: ANI collection is terminated by I-15 (end of dialing).
- Non-zero [default is 4]: Specifies the number of ANI digits expected. This number should always be less than **CDP_ANI_MaxDigits**.

CDP_NUM_OF_DNIS_DIGITS (Inbound)

Description: Specifies the expected number of DNIS digits to be received.

Values:

- 0: DNIS collection is terminated by I-15 (end of dialing).
- Non-zero [default is 4]: Specifies the number of DNIS digits expected. This number should always be less than **CDP_DNIS_MaxDigits**.

CDP_OVERLAP_SENDING_ENABLED (Outbound)

Description: Enables or disables the overlap sending feature.

Values:

- 0 [default]: Disables overlap sending. 'f' will be appended to DNIS digits received with **gc_MakeCall()** (if **CDP_FLAG_APPEND_F** is true), indicating the end of information.
- 1: Enables overlap sending. The remote end can request more DNIS information, in which case a **REQMOREINFO** event will be generated. **gc_SendMoreInfo()** with Null information will either cause 'f' to be sent to the remote end or will remain silent (depending on the value of **CDP_FLAG_APPEND_F**), thus indicating to the remote end that no more DNIS digits are available.

CDP_REJECT_WITH_A3B4 (Inbound)

Description: Determines the method for rejecting a call when an R2MF tone error is received during call setup.

Values:

- 0 [default]: Call is rejected with a direct group A tone (A-10), which is a spare tone that may be used to indicate congestion.
- 1: Call is rejected with an A3-B4 tone combination, which means that the inbound (local) end sends an A-3 tone (send category and change over to group B tones). Then, the category is received and in response, a B-4 tone is sent to reject the call.

CDP_SEND_ALERTING_ON_R2MF_COMPLETION (Inbound)

Description: Controls when the protocol will send a GCEV_ALERTING event to the application.

Values:

- 0: GCEV_ALERTING is sent after receiving a ringback tone.
- 1 [default]: GCEV_ALERTING is sent after completion of the R2MF sequence (after receiving the last Group B tone).

CDP_SEND_BLOCK_AT_START_OR_REMOTE_BLOCK

Description: Specifies the bit pattern to be sent on the line at protocol open time and when the remote line goes BLOCKED.

Values:

- 0 [default]: If the protocol is used either as outbound only or as bidirectional.
- 1: If the protocol is used as inbound only.

CDP_TrunkPrefixNumber

Description: Specifies the trunk number used to dial to local exchange. This parameter is valid only if CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED is enabled.

Values: Default is 9.



China R2 Bidirectional Protocol Parameter Configuration

12

This chapter discusses the capabilities and parameters of the China R2 Bidirectional protocol in the following topics:

- General Protocol Information 87
- Country Dependent Parameter Descriptions 88

12.1 General Protocol Information

Protocol File Set

The files used with the China R2 protocol are listed and described in the following table.

File Type	File Name(s)	
	DM3	Springware
Protocol Module	pdk_cn_r2_io.qs and pdk_cn_r2_io.hot (or pdk_cn_r2_io.arm.hot for DMT160TEC boards)	pdk_cn_r2_io.psi
Voice and Network Parameters	Not applicable	cn_300.prm
Country Dependent Parameters	pdk_cn_r2_io.cdp	pdk_cn_r2_io.cdp
	gc_OpenEx() Protocol Name	
	Not applicable†	pdk_cn_r2_io

†On DM3 boards, the protocol is determined at board initialization time and not when a Global Call device is opened. For compatibility, the **gc_OpenEx()** protocol name may be specified for DM3 boards, but it is not used.

Protocol Limitations

From the Accepted state, the protocol used in this country does not support a forced release of the line; that is, issuing a **gc_DropCall()** function after a **gc_AcceptCall()** function. If a forced release is attempted, the function will fail and an error is returned. To recover, the application should issue a **gc_AnswerCall()** function followed by **gc_DropCall()** and **gc_ReleaseCall()** functions. However, anytime a GCEV_DISCONNECTED event is received in the Accepted state, the **gc_DropCall()** function can be issued.

12.2 Country Dependent Parameter Descriptions

Note: A parameter can be inbound, outbound, or both inbound and outbound. An inbound parameter is used by the protocol when it is acting as inbound. An outbound parameter is used by the protocol when it is acting as outbound. A parameter that is both can be used by the protocol when it is acting as either inbound or outbound.

The modifiable parameters in the *pdk_cn_r2_io.cdp* file are:

- CDP_ANI_ENABLED
- CDP_ANI_MaxDigits
- CDP_CallingPartyCategory_KA
- CDP_CallingPartyCategory_KD
- CDP_DNIS_DIGITS_BEFORE_ANI
- CDP_DNIS_ENABLED
- CDP_DNIS_MaxDigits
- CDP_GrpB_Tone
- CDP_IMMEDIATE_ACCEPTSTATE (Inbound)
- CDP_NO_ANI_CAT_KA_ENABLED
- CDP_NUM_OF_DNIS_DIGITS
- CDP_SEND_BLOCK_AT_START_OR_REMOTE_BLOCK

In addition, see Chapter 3, “Call Progress Analysis Parameters” for configuring default call progress operation in the protocol.

CDP_ANI_ENABLED

Description: Enables or disables the reception of automatic number identification (ANI) digits.

Values:

- 0: Disable the reception of ANI digits.
- 1 [default]: Enable the reception of ANI digits.

Guidelines: If this parameter is set to a value other than 0 or 1, the behavior of the protocol is not predictable.

For DM3, if ANI is disabled, you also have to remove **feature_ANI** from the **SYS_FEATURES** parameter in the *.cdp* file. The **SYS_FEATURES** parameter looks like this:

```
All CHARSTRING_t SYS_FEATURES = "feature_outbound,feature_inbound,feature_DNIS,  
feature_ANI,feature_CAT,feature_MoreDNIS"
```

CDP_ANI_MaxDigits

Description: Specifies the maximum number of ANI digits that can be received when using this protocol.

Values: Default is 16.

Guidelines: If this parameter value is set to 0, the behavior of the protocol is not predictable.

CDP_CallingPartyCategory_KA

Description: Specifies the category of the calling subscriber.

Values: Table 4 shows some typical values. Default is 3.

Table 4. CDP_CallingPartyCategory_KA Values for China

Value	KA (Switch Step by Step)	KA (Switch Crossbar/Electronic)
1	Regular, fixed delay	Voice/fax/data fixed delay
2	Regular, immediate	Voice/fax/data immediate
3 [default]	Regular, business	Voice/fax/data business
4	Priority 1	Voice/fax/data priority 1
5	Free	Free
6	Small PBX	Small PBX
7	Priority 1, fixed delay	Voice/fax/data priority 1, fixed delay
8	Priority 2, fixed delay	Voice/fax/data priority 2, fixed delay
9	Privileged local	Voice/fax/data priority 1, business
10	Non-privileged local	Free

CDP_CallingPartyCategory_KD

Description: Specifies the category of the calling subscriber.

Values: Some typical values are:

- 1 [default]: Long distance operator, semi-automatic
- 2: Long distance, automatic switching
- 3: Local exchange, voice
- 4: Local exchange, fax and data
- 5: Semi-automatic, verify calling ID
- 6: Test

CDP_DNIS_DIGITS_BEFORE_ANI

Description: Determines the number of dialed number identification service (DNIS) digits that are to be received before any ANI digits are received. If this parameter is set to non-zero, the following sequence of events occurs:

1. Partial DNIS digits are received.
2. Category digit(s) are received.
3. ANI digits are received.
4. The remaining DNIS digits are received.
5. Category digits are received again.

Values:

- 0 [default]: Indicates that ANI digits must be received after all DNIS digits are received.
- Non-zero: Specifies the number of DNIS digits received before ANI digits.

Guidelines: The behavior of the protocol will not be predictable, unless the following occurs:

- If this parameter is set to non-zero, **CDP_ANI_ENABLED** must be set to 1.
- If this parameter is set to non-zero, its value should be the minimum of **CDP_NUM_OF_DNIS_DIGITS** (if non-zero), **CDP_DNIS_MaxDigits**, and the actual DNIS digits to be received.

CDP_DNIS_ENABLED

Description: Enables or disables the reception of DNIS digits.

Values:

- 0: Disable the reception of DNIS digits.
- 1 [default]: Enable the reception of DNIS digits.

Guidelines: Even if this parameter is set to 0, the first forward tone received will be the first DNIS digit only.

For DM3, if DNIS is disabled, you also have to remove **feature_DNIS** from the **SYS_FEATURES** parameter in the *.cdp* file. The **SYS_FEATURES** parameter looks like this:

```
All CHARSTRING_t SYS_FEATURES = "feature_outbound,feature_inbound,feature_DNIS,
feature_ANI,feature_CAT,feature_MoreDNIS"
```

CDP_DNIS_MaxDigits

Description: Specifies the maximum number of DNIS digits that can be received when using this protocol.

Values: Default is 16.

Guidelines: If this parameter value is set to 0, the behavior of the protocol is not predictable.

CDP_GrpB_Tone

Description: Determines whether the sender should be charged after receiving the tone. The tone is sent on receipt of Category for Group II. After this tone, the sequence of R2MF tone exchange is over and the call is connected. This is the last R2MF tone in establishment of a call.

Values:

- 0: Not chargeable
- 1 [default]: Chargeable

CDP_IMMEDIATE_ACCEPTSTATE (Inbound)

Description: Specifies when the protocol transitions a call to the Accepted state.

Values:

- 0 [default]: The protocol should wait for the number of rings specified in **gc_AcceptCall()** to expire before transitioning to the Accepted state.
- 1: The protocol should transition a call to the Accepted state immediately upon receipt of **gc_AcceptCall()** and before the specified number of rings have been generated.

Guidelines: This parameter is ignored if the value of the **gc_AcceptCall()** rings parameter is 0.

CDP_NO_ANI_CAT_KA_ENABLED

Description: If there are no ANI digits (that is, **CDP_ANI_ENABLED = 0**), then Cat_KA can be requested by sending an A-6 tone before Cat_KD is sent in response to an A-3 tone (change over to Group B).

Values:

- 0 [default]: If ANI is enabled.
- 1: If ANI is not enabled.

Guidelines: The behavior of the protocol is not predictable if this parameter is set to a value other than 0 or 1.

CDP_NUM_OF_DNIS_DIGITS

Description: Specifies the expected number of DNIS digits to be received.

Values:

- 0: DNIS collection is terminated by I-15 (end of dialing).
- Non-zero [default is 4]: Specifies the number of DNIS digits expected. This number should always be less than **CDP_DNIS_MaxDigits**.

CDP_SEND_BLOCK_AT_START_OR_REMOTE_BLOCK

Description: Specifies the bit pattern to be sent on the line at protocol open time and when the remote line goes BLOCKED.

Values:

- 0 [default]: If the protocol is used either as outbound only or as bidirectional.
- 1: If the protocol is used as inbound only.

Colombia R2 Bidirectional Protocol Parameter Configuration

This chapter discusses the capabilities and parameters of the Colombia R2 Bidirectional protocol in the following topics:

- General Protocol Information 93
- Country Dependent Parameter Descriptions 93

13.1 General Protocol Information

Protocol File Set

The files used with the Colombia R2 protocol are listed and described in the following table.

File Type	File Name(s)	
	DM3	Springware
Protocol Module	pdk_r2_io.qs and pdk_r2_io.hot (or pdk_r2_io.arm.hot for DMT160TEC boards)	pdk_r2_io.psi
Voice and Network Parameters	Not applicable	r2_300.prm
Country Dependent Parameters	pdk_co_r2_io.cdp	pdk_co_r2_io.cdp
	gc_OpenEx() Protocol Name	
	Not applicable†	pdk_co_r2_io

†On DM3 boards, the protocol is determined at board initialization time and not when a Global Call device is opened. For compatibility, the **gc_OpenEx()** protocol name may be specified for DM3 boards, but it is not used.

Protocol Limitations

If a DropCall is attempted in the ACCEPTED state, the protocol will answer the call by sending out the ANSWER pattern before dropping the call, as forced release is not supported in this protocol.

13.2 Country Dependent Parameter Descriptions

Note: A parameter can be inbound, outbound, or both inbound and outbound. An inbound parameter is used by the protocol when it is acting as inbound. An outbound parameter is used by the protocol when it is acting as outbound. A parameter that is both can be used by the protocol when it is acting as either inbound or outbound.

The modifiable parameters in the *pdk_co_r2_io.cdp* file are:

- CDP_ANI_ENABLED (Inbound)
- CDP_ANI_MaxDigits (Inbound)
- CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED
- CDP_ANI_WITHAC_FACILITY_ENABLED (Outbound)
- CDP_AreaCode
- CDP_CallingPartyCategory (Outbound)
- CDP_ConnectType (Outbound)
- CDP_DNIS_MaxDigits (Inbound)
- CDP_Drop_Using_ProgressTones_After_AcceptCall (Inbound)
- CDP_FLAG_APPEND_F (Outbound)
- CDP_GrpB_Tone (Inbound)
- CDP_IMMEDIATE_ACCEPTSTATE (Inbound)
- CDP_IS_ANIAVAILABILITY_CHECK_NEEDED
- CDP_IS_CALLING_LINE_IDENTIFICATION_PERMITTED (Outbound)
- CDP_NO_OF_DNIS_BEFORE_CAT (Inbound)
- CDP_NUM_OF_AC_DIGITS (Inbound)
- CDP_NUM_OF_ANI_DIGITS (Inbound)
- CDP_NUM_OF_DNIS_DIGITS (Inbound)
- CDP_OVERLAP_SENDING_ENABLED (Outbound)
- CDP_REJECT_WITH_A3B4 (Inbound)
- CDP_SEND_ALERTING_ON_R2MF_COMPLETION (Inbound)
- CDP_SEND_BLOCK_AT_START_OR_REMOTE_BLOCK
- CDP_TrunkPrefixNumber

In addition, see Chapter 3, “Call Progress Analysis Parameters” for configuring default call progress operation in the protocol.

CDP_ANI_ENABLED (Inbound)

Description: Enables or disables the reception of automatic number identification (ANI) digits.

Values:

- 0: Disable the reception of ANI digits.
- 1 [default]: Enable the reception of ANI digits.

Guidelines: If this parameter is set to a value other than 0 or 1, the behavior of the protocol is not predictable.

For DM3, if ANI is disabled, you also have to remove **feature_ANI** from the **SYS_FEATURES** parameter in the *.cdp* file. The **SYS_FEATURES** parameter looks like this:

```
All CHARSTRING_t SYS_FEATURES = "feature_outbound,feature_inbound,feature_DNIS,
feature_Billing,feature_ANI,feature_CAT,feature_MoreDNIS"
```

CDP_ANI_MaxDigits (Inbound)

Description: Specifies the maximum number of ANI digits that can be received when using this protocol.

Values: Default is 16.

Guidelines: If this parameter value is set to 0, the behavior of the protocol is not predictable.

CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED

Description: Specifies whether ANI is to be requested (inbound) or sent (outbound) with the area code.

Values:

- 0 [default]: Request (inbound) or send (outbound) ANI digits without area code.
- 1: Request (inbound) or send (outbound) area code with ANI digits.

CDP_ANI_WITHAC_FACILITY_ENABLED (Outbound)

Description: Specifies whether ANI digits and area code are sent to the inbound side. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values:

- 0 [default]: The requested information denied tone is sent to the inbound side.
- 1: ANI digits with area code are sent to the inbound side.

CDP_AreaCode

Description: Specifies the area code of the local exchange where the subscriber is connected. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values: Default is 987.

CDP_CallingPartyCategory (Outbound)

Description: Specifies the category of the calling subscriber (one of the Group II forward signals).

Values:

- 1: National long distance
- 2 [default]: Subscriber without priority
- 3: Pay phone or kiosk
- 4: Immediate billing information (kiosk)
- 5: Available
- 6: Available
- 7: Available
- 8: Available
- 9: Available
- 10: Available

CDP_ConnectType (Outbound)

Description: Specifies the mode for outbound connect detection. Two types of connection events can be detected: the cas_answer received signaling bit pattern and the media type detection used when post-connect call analysis is enabled. The application has options as to when the call is considered connected, as set by this parameter. The application also has options as to whether call analysis continues after the call has been connected when cas_answer is received first.

Values:

- 0 [default]: The protocol transitions to the connected state only when cas_answer is received. If cas_answer is received first, call analysis is stopped. If call analysis is received first, the result is sent to the application via a GCEV_MEDIADETECTED event, but the protocol does not transition to the connected state until cas_answer is received.
- 1: The protocol transitions to the connected state when the first event (either cas_answer or call analysis) is received. If cas_answer is received first, call analysis still continues and the result is sent to the application via a GCEV_MEDIADETECTED event. If call analysis is received first, the subsequent cas_answer is ignored.
- 2: The protocol transitions to the connected state when the first event (either cas_answer or call analysis) is received. If cas_answer is received first, call analysis is stopped. If call analysis is received first, the subsequent cas_answer is ignored.
- 3: The protocol transitions to the connected state only when call analysis is received. If call analysis is received first, the subsequent cas_answer is ignored. If cas_answer is received first, it is ignored.

CDP_DNIS_MaxDigits (Inbound)

Description: Specifies the maximum number of dialed number identification service (DNIS) digits that can be received when using this protocol.

Values: Default is 16.

Guidelines: If this parameter value is set to 0, the behavior of the protocol is not predictable.

CDP_Drop_Using_ProgressTones_After_AcceptCall (Inbound)

Description: Specifies the call progress tone to be sent for dropping a call, when doing a `gc_DropCall()` after a `gc_AcceptCall()`.

Values:

- 0 [default]: The protocol sends the Answer Line signal, waits for the time specified by `CDP_TimeToRecognizeAnswer`, and then sends a Clear Backward line signal for call disconnection. In this case, the call will be charged for the remote calling subscriber, even though the call is not successful.
- 1: The protocol sends the appropriate call progress tone depending on the `gc_DropCall()` cause to the remote end, and waits for a Clear Forward Line signal for call disconnection.

CDP_FLAG_APPEND_F (Outbound)

Description: When the remote end asks for the next DNIS digit through Group A backward tone, and the protocol does not have any more DNIS available to be sent, this parameter specifies whether to send the I-15 tone or to remain silent and prepare for A3 or A4 pulse from the remote end.

Values:

- 0 [default]: No tone will be sent to the remote end. In this case, A3 or A4 pulse is expected to be received from the remote end. In a case of overlapped sending (see description of `CDP_OVERLAP_SENDING_ENABLED` parameter), the remote end may also send A1 to request more information.
- 1: 'f' (I-15) will be sent to the remote end, indicating the end of information.

CDP_GrpB_Tone (Inbound)

Description: Determines whether the sender should be charged after receiving the tone. The tone is sent from the inbound end on receipt of Category for Group II. After this tone, the sequence of R2MF tone exchange is over and the call is connected. This is the last R2MF tone in establishment of a call.

Values:

- 1 [default]: Chargeable (B-1)
- 5: Not chargeable (B-5)

CDP_IMMEDIATE_ACCEPTSTATE (Inbound)

Description: Specifies when the protocol transitions a call to the Accepted state.

Values:

- 0 [default]: The protocol should wait for the number of rings specified in `gc_AcceptCall()` to expire before transitioning to the Accepted state.
- 1: The protocol should transition a call to the Accepted state immediately upon receipt of `gc_AcceptCall()` and before the specified number of rings have been generated.

Guidelines: This parameter is ignored if the value of the `gc_AcceptCall()` rings parameter is 0.

CDP_IS_ANIAVAILABILITY_CHECK_NEEDED

Description: Determines whether the status of ANI availability is checked before ANI digits are exchanged. At the inbound side, this parameter specifies whether ANI availability at the outbound side has to be verified or if ANI digits can be requested directly. At the outbound side, ANI digits are passed directly or the inbound side is informed of the availability (status) first.

Values:

- 0 [default]: The status of ANI availability is not checked before ANI digits are exchanged. ANI digits can be requested directly without knowing the status of the outbound side.
- 1: The status of ANI availability is checked before ANI digits are exchanged. The inbound side requests the status of ANI availability. If ANI digits are available, the inbound side requests the ANI digits. The outbound side sends the status of ANI availability and then waits for the inbound request.

CDP_IS_CALLING_LINE_IDENTIFICATION_PERMITTED (Outbound)

Description: Specifies whether Calling Line Identification is enabled. This parameter is used to enable CLIP and CLIR conditions.

Values:

- 0: Calling Line Identification Rejected (CLIR). The requested information denied tone is sent to the inbound side.
- 1 [default]: Calling Line Identification Permitted (CLIP). ANI digits are sent to the inbound side.

CDP_NO_OF_DNIS_BEFORE_CAT (Inbound)

Description: Determines the number of DNIS digits that are to be received before any category information is received. If this parameter is set to non-zero, the following sequence of events occurs:

1. Partial DNIS digits are received.
2. Category digits are received.
3. The remaining DNIS digits are received.
4. ANI digits are received (if **CDP_ANI_ENABLED** is 1).
5. Category digits are received again.

Values:

- 0 [default]: Indicates that category must be received after all DNIS digits are received.
- Non-zero: Specifies the number of DNIS digits received before category information is received.

Guidelines: The behavior of the protocol will not be predictable, unless the following occurs:

- If this parameter is set to non-zero, **CDP_ANI_ENABLED** must be set to 1.
- If this parameter is set to non-zero, its value should be the minimum of **CDP_NUM_OF_DNIS_DIGITS** (if non-zero), **CDP_DNIS_MaxDigits**, and the actual DNIS digits to be received.

CDP_NUM_OF_AC_DIGITS (Inbound)

Description: Specifies the number of area code digits of the local exchange from where it received the call. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values: Default is 3.

CDP_NUM_OF_ANI_DIGITS (Inbound)

Description: Specifies the expected number of ANI digits to be received.

Values:

- 0: ANI collection is terminated by I-15 (end of dialing).
- Non-zero [default is 7]: Specifies the number of ANI digits expected. This number should always be less than **CDP_ANI_MaxDigits**.

CDP_NUM_OF_DNIS_DIGITS (Inbound)

Description: Specifies the expected number of DNIS digits to be received.

Values:

- 0: DNIS collection is terminated by I-15 (end of dialing).
- Non-zero [default is 7]: Specifies the number of DNIS digits expected. This number should always be less than **CDP_DNIS_MaxDigits**.

CDP_OVERLAP_SENDING_ENABLED (Outbound)

Description: Enables or disables the overlap sending feature.

Values:

- 0: Disables overlap sending. 'f' will be appended to DNIS digits received with **gc_MakeCall()** (if **CDP_FLAG_APPEND_F** is true), indicating the end of information.
- 1 [default]: Enables overlap sending. The remote end can request more DNIS information, in which case a **REQMOREINFO** event will be generated. **gc_SendMoreInfo()** with Null information will either cause 'f' to be sent to the remote end or will remain silent (depending on the value of **CDP_FLAG_APPEND_F**), thus indicating to the remote end that no more DNIS digits are available.

CDP_REJECT_WITH_A3B4 (Inbound)

Description: Determines the method for rejecting a call when an R2MF tone error is received during call setup.

Values:

- 0 [default]: Call is rejected with a direct group A tone (A-10), which is a spare tone that may be used to indicate congestion.
- 1: Call is rejected with an A3-B4 tone combination, which means the inbound (local) end sends an A-3 tone (send category and change over to group B tones). Then, the category is received and in response, a B-4 tone is sent to reject the call.

CDP_SEND_ALERTING_ON_R2MF_COMPLETION (Inbound)

Description: Controls when the protocol will send a GCEV_ALERTING event to the application.

Values:

- 0: GCEV_ALERTING is sent after receiving a ringback tone.
- 1 [default]: GCEV_ALERTING is sent after completion of the R2MF sequence (after receiving the last Group B tone).

CDP_SEND_BLOCK_AT_START_OR_REMOTE_BLOCK

Description: Specifies the bit pattern to be sent on the line at protocol open time and when the remote line goes BLOCKED.

Values:

- 0 [default]: If the protocol is used either as outbound only or as bidirectional.
- 1: If the protocol is used as inbound only.

CDP_TrunkPrefixNumber

Description: Specifies the trunk number used to dial to local exchange. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values: Default is 9.

Direct Signaling Protocol Parameter Configuration

This chapter discusses the capabilities and parameters of the Direct Signaling protocol in the following topics:

- General Protocol Information 101
- Country Dependent Parameter Descriptions 102
- Using Global Call Functions to Generate and Detect Patterns 103

14.1 General Protocol Information

The Direct Signaling protocol is not a call control protocol; it is used strictly to give applications access to the signaling patterns on the line, as a means to allow the application to implement its own protocols. The protocol allows the application to generate and detect signaling patterns, as defined in the CDP file, giving the application direct control over the signaling patterns on the line.

Applications can call the **gc_Extension()** function to generate up to 11 distinct CAS patterns, and through the GCEV_EXTENSION event, be notified when one of the patterns is detected by the protocol. The detection of each pattern can be enabled or disabled through the CDP parameters in the *pdk_dir_sig.cdp* file. The protocol is fully capable of handling alarm conditions, and when an alarm is received, the protocol will stop generating and detecting patterns. Applications can also stop generation and detection of patterns through the use of the **gc_SetChanState()** function; by setting the channel out of service, the protocol will cease to generate or detect patterns.

Protocol File Set

The files used with the Direct Signaling protocol are listed and described in the following table.

File Type	Filename(s)	
	DM3†	Springware
Protocol Module	pdk_dir_sig.qs and pdk_dir_sig.hot (or pdk_dir_sig.arm.hot for DMT160TEC boards)	
Voice and Network Parameters	Not applicable	
Country Dependent Parameters	pdk_dir_sig.cdp	
<p>NOTE: This protocol is supported on DM3 boards only. †Support on DM3 boards requires Intel® Dialogic® System Release 6.0 for PCI or later. ‡On DM3 boards, the protocol is determined at board initialization time and not when a Global Call device is opened. For compatibility, the gc_OpenEx() protocol name may be specified for DM3 boards, but it is not used.</p>		

File Type	Filename(s)	
	DM3†	Springware
	gc_OpenEx() Protocol Name	
	Not applicable‡	

NOTE: This protocol is supported on DM3 boards only.
†Support on DM3 boards requires Intel® Dialogic® System Release 6.0 for PCI or later.
‡On DM3 boards, the protocol is determined at board initialization time and not when a Global Call device is opened. For compatibility, the **gc_OpenEx()** protocol name may be specified for DM3 boards, but it is not used.

Protocol Limitations

You cannot use the standard Global Call API call control functions with this protocol; the protocol does not provide call control capabilities. Any command besides **gc_ResetLineDev()**, **gc_SetChanState()**, and **gc_Extension()** will be ignored. **gc_ResetLineDev()** has no effect with the protocol and is provided only for application compatibility. **gc_SetChanState()** will stop (OutOfService) and resume (InService) the capabilities of this protocol (generation/detection of patterns). **gc_Extension()** is what the application uses to access the functionality of this protocol. For additional information about these and other Global Call API functions and events, see the *Global Call API Library Reference*.

Additional Protocol Information

The application should include *dm3cc_parm.h* when using this protocol.

14.2 Country Dependent Parameter Descriptions

The modifiable parameters in the *pdk_dir_sig.cdp* file are:

- CDP_DETECT_PAT1 through CDP_DETECT_PAT11
- SYS_LineTypeT1

CDP_DETECT_PAT1 through CDP_DETECT_PAT11

Description: The protocol provides eight TRANS (transition) CAS patterns and three PULSE CAS patterns. TRANS patterns range from ID 1 to 8, and PULSE patterns range from ID 9 to 11. The **CDP_DETECT_PAT1** through **CDP_DETECT_PAT11** patterns enable or disable detection of each pattern.

Values:

- 0: Disable detection of the pattern.
- 1 [default] : Enable detection of the pattern.

SYS_LineTypeT1

Description: Specifies whether the protocol is to be used on a T1 trunk.

Values: By default, the **SYS_LineTypeT1** parameter is commented out in the *pdk_dir_sig.cdp* file as follows:

```
/* DM3 INTEGER_t SYS_LineTypeT1 = 1 */
```

Uncomment the line if the protocol is to be used on a T1 trunk.

14.3 Using Global Call Functions to Generate and Detect Patterns

This section provides code examples that illustrate how to use this protocol.

Generating a Signaling Pattern

The `gc_Extension()` function should be called to generate a signaling pattern. For this feature, the `gc_Extension()` function should use `GCTGT_GCLIB_CHAN` as target type, the Global Call device handle for the line device as the target ID, and `DM3CC_EXID_BIT_PATTERN` as the extension ID. Inside the `GC_PARM_BLK`, the application specifies the pattern ID that the protocol should generate, with `setID = CCSET_BIT_PATTERN`, `parmID = CCPARM_INTPARM1`, `size = sizeof(int)`, and `value = <pattern ID, as defined in the CDP file, 1 - 11>`.

The following example shows how to generate pattern #1:

```
#include "gclib.h"
#include "dm3cc_parm.h"

void main( void ) {
    LINEDEV devh;
    GC_PARM_BLK pblkp = NULL;

    gc_Start( NULL );
    gc_OpenEx( &devh, ":N_dtiB1T1:V_dxxxB1C1:P_dm3", 0, NULL );

    /* wait for UNBLOCKED event */

    gc_util_insert_parm_val( &pblkp, CCSET_BIT_PATTERN, CCPARM_INTPARM1,
        sizeof( int ), 1 );
    gc_Extension( GCTGT_GCLIB_CHAN, devh, DM3CC_EXID_BIT_PATTERN, pblkp, NULL,
        EV_ASYNC );

    /* wait for GCEV_EXTENSIONCPLT event */

    gc_Close( devh );
    gc_Stop( );
}
```

Enabling the GCEV_EXTENSION Event for Pattern Detection

To enable detection of a pattern, you must first enable the detection in the CDP file by setting the appropriate `CDP_DETECT_PAT` parameter to 1. Within the application, the `GCEV_EXTENSION` event, used to inform the application whenever a pattern is detected, should also be enabled. The `gc_SetConfigData()` function is used to do this. The target type should be `GCTGT_CCLIB_CHAN`, the target ID the Global Call device handle, and the update condition should always be set to `GCUPDATE_IMMEDIATE`. Inside the `GC_PARM_BLK`, the application should indicate that the `GCEV_EXTENSION` event should be enabled, with `setID = CCSET_EXTENSIONEVT_MSK`, `parmID = GCACT_ADDMSK`, `size = sizeof(long)`, and `value = EXTENSIONEVT_BIT_PATTERN`.

The following example shows how to enable the GCEV_EXTENSION event:

```
#include "gclib.h"
#include "dm3cc_parm.h"

void main( void ) {
    LINEDEV devh;
    GC_PARM_BLK_P pblkp = NULL;

    gc_Start( NULL );
    gc_OpenEx( &devh, ":N_dtiB1T1:V_dxxxB1C1:P_dm3", 0, NULL );

    /* wait for UNBLOCKED event */

    gc_util_insert_parm_val( &pblkp, CCSET_EXTENSIONEVT_MSK, GCACT_ADDMSK,
        sizeof( long ), EXTENSIONEVT_BIT_PATTERN );
    gc_SetConfigData( GCTGT_CCLIB_CHAN, devh, pblkp, 0, GCUPDATE_IMMEDIATE,
        &req_id, EV_ASYNC );

    /* wait for GCEV_EXTENSION event */

    gc_Close( devh );
    gc_Stop( );
}
```

Retrieving the Event Data

Whenever a pattern is detected, a GCEV_EXTENSION event will be sent to the application. The extevtdatap of the METAEVENT structure contains the data associated with the event, which will inform the application which pattern was detected by the protocol.

The following example shows how to retrieve this information:

```
#include <iostream.h>
#include "gclib.h"
#include "dm3cc_parm.h"

void main( void ) {
    LINEDEV devh;
    GC_PARM_BLK_P pblkp = NULL;
    METAEVENT gc_event;
    GC_PARM_DATA_P parm_p = NULL;

    gc_Start( NULL );
    gc_OpenEx( &devh, ":N_dtiB1T1:V_dxxxB1C1:P_dm3", 0, NULL );

    /* wait for UNBLOCKED event */

    gc_util_insert_parm_val( &pblkp, CCSET_EXTENSIONEVT_MSK, GCACT_ADDMSK,
        sizeof( long ), EXTENSIONEVT_BIT_PATTERN );
    gc_SetConfigData( GCTGT_CCLIB_CHAN, devh, pblkp, 0, GCUPDATE_IMMEDIATE,
        &req_id, EV_ASYNC );

    /* wait for GCEV_EXTENSION event */

    gc_GetMetaEvent( &gc_event );

    parm_p = gc_util_next_parm(
        &( ( EXTENSIONEVTBLK * ) gc_event.extevtdatap )->parmblk, NULL );
    cout << "Pattern Detected. Pattern ID = " <<
        * ( ( int * ) parm_p->value_buf ) << endl;
```

```
gc_Close( devh );  
gc_Stop( );  
}
```

Setting the Initial Bit Pattern

In addition to using the protocol, the user also has the ability to set the initial bit pattern that is sent on the line when the board is downloaded. To do this, add or change the following parameter in the CHP section in the .config file for the firmware:

```
[CHP]  
SetParm=0x1316,0xfd ! Initial Bit Pattern on the line - should be 0xF<pattern>, where  
<pattern> is the ABCD bit values. The default is 0xfd -> ABCD=1101 (blocking pattern for E1)
```

This allows the application to know what the initial bit pattern is whenever the board is downloaded.





E1 CAS Bidirectional Protocol Parameter Configuration

15

This chapter discusses the capabilities and parameters of the E1 CAS Bidirectional protocol in the following topics:

- General Protocol Information 107
- Country Dependent Parameter Descriptions 107

15.1 General Protocol Information

Protocol File Set

The files used with the E1 CAS protocol are listed and described in the following table.

File Type	Filename(s)	
	DM3	Springware
Protocol Module	pdk_us_mf_io.qs and pdk_us_mf_io.hot (or pdk_us_mf_io.arm.hot for DMT160TEC boards)	pdk_us_mf_io.psi
Voice and Network Parameters	Not applicable	r2_300.prm
Country Dependent Parameters	pdk_e1_cas_io.cdp	pdk_e1_cas_io.cdp
	gc_OpenEx () Protocol Name	
	Not applicable†	pdk_e1_cas_io

†On DM3 boards, the protocol is determined at board initialization time and not when a Global Call device is opened. For compatibility, the **gc_OpenEx ()** protocol name may be specified for DM3 boards, but it is not used.

Protocol Limitations

After a call is transferred with **gc_SetUpTransfer ()**, you cannot issue a **gc_DropCall ()** on the original call. You must drop the consultation call before the original call can be dropped. The behavior of the protocol is undefined if you try to drop the original call without dropping the consultation call first.

15.2 Country Dependent Parameter Descriptions

The modifiable parameters in the *pdk_e1_cas_io.cdp* file are:

- CDP_BLIND_XFER_DIALTONE_TIMEOUT

- CDP_BLIND_XFER_POST_TIME
- CDP_BLIND_XFER_PRE_TIME
- CDP_BlockOnLOOS
- CDP_FORCED_RELEASE_ENABLED
- CDP_HOOKFLASH_ON_XFER
- CDP_HOOKFLASH_ON_XFER_DROP
- CDP_IN_ACCEPTBEFORERING
- CDP_IN_ANI_DigitType
- CDP_IN_ANI_Enabled
- CDP_IN_ANI_KP_Needed
- CDP_IN_ANI_MaxDigits
- CDP_IN_ANI_ST_Needed
- CDP_IN_ANI_Type_Pre
- CDP_IN_ANI_WINK_Needed
- CDP_IN_ANIKPDigit
- CDP_IN_ANISTDigit
- CDP_IN_DialTone_Needed
- CDP_IN_DNIS_BeforeANI
- CDP_IN_DNIS_DigitType
- CDP_IN_DNIS_Enabled
- CDP_IN_DNIS_KP_Needed
- CDP_IN_DNIS_MaxDigits
- CDP_IN_DNIS_ST_Needed
- CDP_IN_DNIS_WINK_Needed
- CDP_IN_DNISKPDigit
- CDP_IN_DNISSTDigit
- CDP_IN_EnableRingBack
- CDP_IN_GetDigitTime
- CDP_IN_WinkStart
- CDP_MIN_CallLength
- CDP_Min_HangupTime
- CDP_OUT_ANI_DigitType
- CDP_OUT_ANI_Enabled
- CDP_OUT_ANI_KP_Needed
- CDP_OUT_ANI_ST_Needed
- CDP_OUT_ANI_Type_Pre
- CDP_OUT_ANI_WINK_Needed
- CDP_OUT_ANIKPDigit

- CDP_OUT_ANISDigit
- CDP_OUT_ANISString
- CDP_OUT_ConnectType
- CDP_OUT_DialTone_Needed
- CDP_OUT_DialTone_Timeout
- CDP_OUT_DNIS_BeforeANI
- CDP_OUT_DNIS_DigitType
- CDP_OUT_DNIS_Enabled
- CDP_OUT_DNIS_KP_Needed
- CDP_OUT_DNIS_ST_Needed
- CDP_OUT_DNIS_WINK_Needed
- CDP_OUT_DNISKPDigit
- CDP_OUT_DNISSTDigit
- CDP_OUT_EnableRingBack
- CDP_OUT_SeizeAck_Timeout
- CDP_OUT_SeizeDelay
- CDP_OUT_Send_Alerting_After_Dialing
- CDP_OUT_WinkStart
- CDP_SETUP_XFER_CPA
- CDP_SETUP_XFER_DIALTONE_TIMEOUT
- CDP_USE_DEFAULTANI
- CDP_Xfer_DigitType

In addition, see [Chapter 3, “Call Progress Analysis Parameters”](#) for configuring default call progress operation in the protocol.

CDP_BLIND_XFER_DIALTONE_TIMEOUT

Description: Defines the maximum time-out to wait for dial tone during a blind transfer.

Values:

- Time in milliseconds. Default is 5000 (5 seconds).
- 0: Disables waiting for dial tone during a blind transfer.

CDP_BLIND_XFER_POST_TIME

Description: Specifies the time between blind transfer dialing and hangup.

Values: Time in milliseconds. Default is 1000 (1 second).

CDP_BLIND_XFER_PRE_TIME

Description: Specifies the time between blind transfer hookflash and dialing.

Values: Time in milliseconds. Default is 0.

CDP_BlockOnLOOS

Description: Allows the protocol to send out CAS_BLOCKING to block the line whenever a channel is set out-of-service (by the application calling the `gc_SetChanState()` function).

Note: The ability to block the line is not supported on all switches.

Values:

- 0 [default]: Do not send blocking pattern when a channel is set out-of-service.
- 1: Send blocking pattern when a channel is set out-of-service.

CDP_FORCED_RELEASE_ENABLED

Description: Enables the protocol to support “forced release” of incoming calls from the Accepted state. The protocol specification does not support forced release of incoming calls from the Accepted state. However, support for forcing release of incoming calls is supported in this implementation for flexibility with Global Call applications, which are permitted to call `gc_DropCall()` from the Accepted state. In this scenario, the call will be answered transparently without notification of the application and then immediately disconnected, i.e., a “forced release” of the line. Note that in doing this, additional implications exist and must be considered, i.e., billing, etc.

Values:

- 0: Does not support forced release. No implicit answer will be performed transparently in this scenario, and only a CAS hangup (idle) signal will be generated.
- 1 [default]: Supports forced release.

CDP_HOOKFLASH_ON_XFER

Description: Determines if a hookflash is sent by the protocol when a supervised and blind transfer is requested.

Values:

- 0: Do not send hookflash.
- 1 [default]: Send the hookflash.

CDP_HOOKFLASH_ON_XFER_DROP

Description: Determines if a hookflash is sent by the protocol if a supervised transfer request is aborted via a `gc_DropCall()` function.

Values:

- 0: Do not send hookflash.
- 1 [default]: Send the hookflash.

CDP_IN_ACCEPTBEFORERING

Description: Determines if an accept event should be sent before sending ringback tones.

Values:

- 0: Send the accept event after sending ringback tones.
- 1 [default]: Send the accept event before sending ringback tones.

CDP_IN_ANI_DigitType

Description: Determines the digit type for inbound automatic number identification (ANI) digits.

Values:

- 1 [default]: DTMF digits.
- 2: MF digits.

CDP_IN_ANI_Enabled

Description: Enables ANI collection. The ANI digits are terminated either by **CDP_IN_ANISTDigit** if **CDP_IN_ANI_ST_Needed** is set to 1, or by the maximum number of digits set by **CDP_IN_ANI_MaxDigits**.

Values:

- 0: ANI collection not enabled.
- 1 [default]: ANI collection enabled.

Guidelines: For DM3, if ANI is disabled, you also have to remove **feature_ANI** from the **SYS_FEATURES** parameter in the *.cdp* file. The **SYS_FEATURES** parameter looks like this:

```
All CHARSTRING_t SYS_FEATURES = "feature_outbound,feature_inbound,feature_DNIS,  
feature_ANI,feature_transfer"
```

CDP_IN_ANI_KP_Needed

Description: Specifies whether the ANI prefix digit is used.

Values:

- 0: ANI prefix digit is not needed.
- 1 [default]: ANI prefix digit is needed.

CDP_IN_ANI_MaxDigits

Description: Specifies the maximum number of ANI digits expected. ANI collection terminates if this value is reached.

Values: Default is 12 ANI digits.

CDP_IN_ANI_ST_Needed

Description: Specifies whether ANI digits are terminated by **CDP_IN_ANISTDigit**.

Values:

- 0: No termination digit added; ANI digits are terminated by the maximum number of digits set by **CDP_IN_ANI_MaxDigits**.
- 1 [default]: Termination digit added; ANI digits are terminated by the value set by **CDP_IN_ANISTDigit**.

CDP_IN_ANI_Type_Pre

Description: Specifies whether ANI digits are expected before generating the answer signal.

Values:

- 0: Do not expect ANI digits before the answer signal.
- 1 [default]: Expect ANI digits before the answer signal.

CDP_IN_ANI_WINK_Needed

Description: Specifies if a CAS_WINK signaling pattern should be generated immediately after the reception of the ANI digits.

Values:

- 0 [default]: Do not generate the CAS_WINK signaling pattern after ANI.
- 1: Generate the CAS_WINK signaling pattern after ANI.

CDP_IN_ANIKP_Digit

Description: Specifies the ANI prefix digit. This parameter has no effect if **CDP_IN_ANI_KP_Needed** is set to 0.

Values: Default is *.

CDP_IN_ANIST_Digit

Description: Specifies the ANI ST digit. This parameter has no effect if **CDP_IN_ANI_ST_Needed** is set to 0.

Values: Default is *.

CDP_IN_DialTone_Needed

Description: Specifies whether a dial tone should be generated after receiving a CAS_SEIZE to notify the CO that it can begin dialing.

Values:

- 0 [default]: Do not generate a dial tone.
- 1: Generate a dial tone.

CDP_IN_DNIS_BeforeANI

Description: Specifies whether dialed number identification service (DNIS) digits are received before ANI digits. This parameter is applicable only if **CDP_IN_DNIS_Enabled** is set to 1.

Values:

- 0 [default]: Receive the ANI digits before the DNIS digits.
- 1: Receive the DNIS digits before the ANI digits.

CDP_IN_DNIS_DigitType

Description: Determines the digit type for inbound DNIS digits.

Values:

- 1 [default]: DTMF digits.
- 2: MF digits.

CDP_IN_DNIS_Enabled

Description: Enables DNIS collection. The DNIS digits are terminated either by **CDP_IN_DNISSTDigit** if **CDP_IN_DNIS_ST_Needed** is set to 1, or by the maximum number of digits set by **CDP_IN_DNIS_MaxDigits**.

Values:

- 0: DNIS collection not enabled.
- 1 [default]: DNIS collection enabled.

Guidelines: For DM3, if DNIS is disabled, you also have to remove **feature_DNIS** from the **SYS_FEATURES** parameter in the *.cdp* file. The **SYS_FEATURES** parameter looks like this:

```
All CHARSTRING_t SYS_FEATURES = "feature_outbound,feature_inbound,feature_DNIS,  
feature_ANI,feature_transfer"
```

CDP_IN_DNIS_KP_Needed

Description: Specifies whether the DNIS prefix digit is used.

Values:

- 0 [default]: DNIS prefix digit is not needed.
- 1: DNIS prefix digit is needed.

CDP_IN_DNIS_MaxDigits

Description: Defines the maximum number of DNIS digits.

Values: Default is 12 DNIS digits.

CDP_IN_DNIS_ST_NEEDED

Description: Specifies whether DNIS digits are terminated by **CDP_IN_DNISSTDigit**.

Values:

- 0: No termination digit added; DNIS digits are terminated by the maximum number of digits set by **CDP_IN_DNIS_MaxDigits**.
- 1 [default]: Termination digit added; DNIS digits are terminated by the value set by **CDP_IN_DNISSTDigit**.

CDP_IN_DNIS_WINK_NEEDED

Description: Specifies whether a CAS_WINK signaling pattern should be generated immediately after the reception of the DNIS digits.

Values:

- 0 [default]: Do not generate the CAS_WINK signaling pattern after DNIS.
- 1: Generate the CAS_WINK signaling pattern after DNIS.

CDP_IN_DNISKPDigit

Description: Specifies the DNIS prefix digit. This parameter has no effect if **CDP_IN_DNIS_KP_NEEDED** is set to 0.

Values: Default is *.

CDP_IN_DNISSTDigit

Description: Specifies the DNIS ST digit. This parameter has no effect if **CDP_IN_DNIS_ST_NEEDED** is set to 0.

Values: Default is *.

CDP_IN_EnableRingBack

Description: Specifies whether a ringback should be generated before answering a call. The number of rings generated is determined by the value passed by the **gc_AcceptCall()** or **gc_AnswerCall()** function.

Values:

- 0 [default]: Do not generate a ringback.
- 1: Generate a ringback.

CDP_IN_GetDigitTime

Description: Specifies the total time the protocol will wait for the digit collection process to complete (for both DNIS and ANI).

Values: Time in milliseconds. Default is 10000 (10 seconds).

Guidelines: The value of **CDP_IN_GetDigitTime** must be greater than the values of the **PSL_TONE_RECEIVEDIGITS_FIRSTDIGIT_TO** and **PSL_TONE_RECEIVEDIGITS_INTERDIGIT_TO** parameters.

CDP_IN_WinkStart

Description: Specifies whether to generate a seizure acknowledgment CAS_WINK after receiving a CAS_SEIZE.

Values:

- 0: Immediate start.
- 1 [default]: Wink start.

CDP_MIN_CallLength

Description: Specifies the minimum length of time that an inbound or outbound call can be connected.

Values: Time in milliseconds. Default is 300 milliseconds.

CDP_Min_HangupTime

Description: Controls the amount of time after hangup during which the protocol will ignore any signaling transitions. It is primarily used to prevent a race condition where, after an outbound channel hangs up after the call has been delivered but before a call is connected, the remote inbound channel might answer anyway, and the ensuing transition can be interpreted as a CAS_SEIZE.

Values: Time in milliseconds. Default is 0.

Guidelines: This parameter is needed only if CAS_ANSWER and CAS_SEIZE transitions are the same, and usually only useful when running the protocol back to back, as most live switches would not attempt to answer a call that has been disconnected.

CDP_OUT_ANI_DigitType

Description: Determines the digit type for outbound ANI digits.

Values:

- 1 [default]: DTMF digits.
- 2: MF digits.

CDP_OUT_ANI_Enabled

Description: Enables ANI generation.

Values:

- 0: ANI collection not enabled.
- 1 [default]: ANI collection enabled.

CDP_OUT_ANI_KP_Needed

Description: Specifies whether the ANI prefix digit is used.

Values:

- 0: ANI prefix digit is not needed.
- 1 [default]: ANI prefix digit is needed.

CDP_OUT_ANI_ST_Needed

Description: Specifies whether ANI digits are terminated by CDP_OUT_ANISTDigit.

Values:

- 0: No termination digit added.
- 1 [default]: Termination digit added.

CDP_OUT_ANI_Type_Pre

Description: Specifies whether ANI digits will be generated before the reception of an answer signal.

Values:

- 0: Do not generate ANI digits before the answer signal.
- 1 [default]: Generate ANI digits before the answer signal.

CDP_OUT_ANI_WINK_Needed

Description: Specifies whether a CAS_WINK signaling pattern should be received immediately after the generation of the ANI digits.

Values:

- 0 [default]: A CAS_WINK signaling pattern does not have to be received.
- 1: A CAS_WINK signaling pattern must be received.

CDP_OUT_ANIKPDigit

Description: Specifies the ANI prefix digit. This parameter has no effect if CDP_OUT_ANI_KP_Needed is set to 0.

Values: Default is *.

CDP_OUT_ANISTDigit

Description: Specifies the ANI ST digit. This parameter has no effect if CDP_OUT_ANI_ST_Needed is set to 0.

Values: Default is *.

CDP_OUT_ANIString

Description: Specifies the string used as the ANI digits if **CDP_OUT_ANI_Enabled** is set to 1.

Values: Default is 5678.

CDP_OUT_ConnectType

Description: Specifies the mode for outbound connection detection. Two types of connection events can be detected: the cas_answer received signaling bit pattern and the media type detection used when post-connect call analysis is enabled. The application has options as to when the call is considered connected, as set by this parameter. The application also has options as to whether call analysis continues after the call has been connected when cas_answer is received first.

Values:

- 0 [default]: The protocol transitions to the connected state only when cas_answer is received. If cas_answer is received first, call analysis is stopped. If call analysis is received first, the result is sent to the application via a GCEV_MEDIADETECTED event, but the protocol does not transition to the connected state until cas_answer is received.
- 1: The protocol transitions to the connected state when the first event (either cas_answer or call analysis) is received. If cas_answer is received first, call analysis still continues and the result is sent to the application via a GCEV_MEDIADETECTED event. If call analysis is received first, the subsequent cas_answer is ignored.
- 2: The protocol transitions to the connected state when the first event (either cas_answer or call analysis) is received. If cas_answer is received first, call analysis is stopped. If call analysis is received first, the subsequent cas_answer is ignored.
- 3: The protocol transitions to the connected state only when call analysis is received. If call analysis is received first, the subsequent cas_answer is ignored. If cas_answer is received first, it is ignored.

CDP_OUT_DialTone_Needed

Description: Specifies whether a dial tone must be received after generating a CAS_SEIZE.

Values:

- 0 [default]: Do not receive a dial tone.
- 1: Receive a dial tone.

CDP_OUT_DialTone_Timeout

Description: Defines the time-out while waiting for a dial tone after a line seizure. This parameter is not used if **CDP_OUT_WinkStart** is set to 0.

Values: Time in milliseconds. Default is 5000 (5 seconds).

CDP_OUT_DNIS_BeforeANI

Description: Specifies whether DNIS digits are sent before ANI digits. This parameter is applicable only if **CDP_OUT_DNIS_Enabled** is set to 1.

Values:

- 0 [default]: Send the ANI digits before the DNIS digits.
- 1: Send the DNIS digits before the ANI digits.

CDP_OUT_DNIS_DigitType

Description: Determines the digit type for outbound DNIS digits.

Values:

- 1 [default]: DTMF digits.
- 2: MF digits.

CDP_OUT_DNIS_Enabled

Description: Enables DNIS.

Values:

- 0: DNIS not enabled.
- 1 [default]: DNIS enabled.

CDP_OUT_DNIS_KP_Needed

Description: Specifies whether the DNIS prefix digit is used.

Values:

- 0 [default]: DNIS prefix digit is not needed.
- 1: DNIS prefix digit is needed.

CDP_OUT_DNIS_ST_Needed

Description: Specifies whether DNIS digits are terminated by **CDP_OUT_DNISSTDigit**.

Values:

- 0: No termination digit added.
- 1 [default]: Termination digit added.

CDP_OUT_DNIS_WINK_Needed

Description: Specifies whether a CAS_WINK signaling pattern should be received immediately after sending the DNIS digits.

Values:

- 0 [default]: The reception of a CAS_WINK signaling pattern is not required.
- 1: The reception of a CAS_WINK signaling pattern is required.

CDP_OUT_DNISKPDigit

Description: Specifies the DNIS prefix digit. This parameter has no effect if **CDP_OUT_DNIS_KP_Needed** is set to 0.

Values: Default is *.

CDP_OUT_DNISSTDigit

Description: Specifies the DNIS ST digit. This parameter has no effect if **CDP_OUT_DNIS_ST_Needed** is set to 0.

Values: Default is *.

CDP_OUT_EnableRingBack

Description: Specifies whether a ringback must be received before a call is answered. The number of rings is determined by the value passed by the **gc_AcceptCall()** or **gc_AnswerCall()** function.

Values:

- 0 [default]: Do not receive a ringback.
- 1: Receive a ringback.

CDP_OUT_SeizeAck_Timeout

Description: Specifies the time-out while waiting for a CAS_WINK after a line seizure.

Values: Time in milliseconds. Default is 5000 (5 seconds).

CDP_OUT_SeizeDelay

Description: Specifies the desired delay between a makecall and a line seize attempt.

Values: Time in milliseconds. Default is 1000 (1 second).

CDP_OUT_Send_Alerting_After_Dialing

Description: Determines when the protocol sends a GCEV_ALERTING event to the application.

Values:

- 0 [default]: GCEV_ALERTING is sent when ringback is detected.
- 1: If call progress analysis is disabled, GCEV_ALERTING is sent after dialing is completed. If call progress analysis is enabled, GCEV_ALERTING is sent after dialing is initiated.

CDP_OUT_WinkStart

Description: Specifies whether a CAS_WINK seizure acknowledgment must be received following the generation of a seize request.

Values:

- 0: Immediate start, that is, no wink required.
- 1 [default]: Wink start, that is, wink required.

CDP_SETUP_XFER_CPA

Description: Enables call progress analysis during supervised transfer.

Values:

- 0: Call progress analysis disabled during supervised transfer.
- 1 [default]: Call progress analysis enabled during supervised transfer.

CDP_SETUP_XFER_DIALTONE_TIMEOUT

Description: Defines the maximum time-out to wait for dial tone during a supervised transfer.

Values:

- Time in milliseconds. Default is 5000 (5 seconds).
- 0: Disables waiting for dial tone during a supervised transfer.

CDP_USE_DEFAULTANI

Description: Once **CDP_OUT_ANI_Enabled** is set, specifies whether to use **CDP_OUT_ANIString** for the ANI. Otherwise, the number set by the application is used.

Values:

- 0 [default]: The number set by the application is used for ANI.
- 1: Use **CDP_OUT_ANIString** for the ANI.

CDP_Xfer_DigitType

Description: Determines the digit type for transfers.

Values:

- 1 [default]: DTMF digits.
- 2: MF digits.



Ericsson MD110 PBX Lineside E1 Bidirectional Protocol Parameter Configuration 16

This chapter discusses the capabilities and parameters of the Ericsson MD110 PBX Lineside E1 Bidirectional protocol in the following topics:

- [General Protocol Information](#) 121
- [Country Dependent Parameter Descriptions](#) 122

16.1 General Protocol Information

Protocol File Set

The files used with the Ericsson MD110 PBX Lineside E1 protocol are listed and described in the following table.

File Type	Filename(s)	
	DM3	Springware
Protocol Module	pdk_sw_e1_fxs_io.qs and pdk_sw_e1_fxs_io.hot (or pdk_sw_e1_fxs_io.arm.hot for DMT160TEC boards)	pdk_sw_e1_fxs_io.psi
Voice and Network Parameters	Not applicable	r2_300.prm
Country Dependent Parameters	pdk_sw_e1_ermx_io.cdp	pdk_sw_e1_ermx_io.cdp
	gc_OpenEx() Protocol Name	
	Not applicable†	pdk_sw_e1_ermx_io

†On DM3 boards, the protocol is determined at board initialization time and not when a Global Call device is opened. For compatibility, the **gc_OpenEx()** protocol name may be specified for DM3 boards, but it is not used.

Protocol Limitations

After a call is transferred with **gc_SetUpTransfer()**, you cannot issue a **gc_DropCall()** on the original call. You must drop the consultation call before the original call can be dropped. The behavior of the protocol is undefined if you try to drop the original call without dropping the consultation call first.

16.2 Country Dependent Parameter Descriptions

Note: A parameter can be inbound, outbound, or both inbound and outbound. An inbound parameter is used by the protocol when it is acting as inbound. An outbound parameter is used by the protocol when it is acting as outbound. A parameter that is both can be used by the protocol when it is acting as either inbound or outbound.

The modifiable parameters in the *pdk_sw_e1_ermx_io.cdp* file are:

- CDP_BlindXferTime
- CDP_ConnectOnNoDialTone (Outbound)
- CDP_ConnectOnNoRingBack (Outbound)
- CDP_DelayInDialling (Outbound)
- CDP_DialToneWaitTime (Outbound)
- CDP_MinPBXHangupTime (Inbound)
- CDP_PBXDiscEnabled
- CDP_ProtocolStopsOffhook
- CDP_WaitDialToneEnabled (Outbound)

In addition, see [Chapter 3, “Call Progress Analysis Parameters”](#) for configuring default call progress operation in the protocol.

CDP_BlindXferTime

Description: After sending the address digits on a BlindTransfer request, the protocol waits for the time specified by this parameter before sending CAS_ONHOOK and switching back to IDLE state.

Values: Time in milliseconds. Default is 5000 (5 seconds).

CDP_ConnectOnNoDialTone (Outbound)

Description: Determines how the protocol should proceed when dial tone is not detected. If the parameter is enabled (set to 1), and no dial tone is detected, a local collision with an inbound call is assumed, and the call immediately transitions to Connected state.

Values:

- 0: Do not assume local collision and disconnect the call if no dial tone is detected.
- 1 [default]: Assume local collision and connect the perceived inbound call if no dial tone is detected.

Guidelines: This parameter is applicable only if the **CDP_WaitDialToneEnabled** parameter is set to 1.



CDP_ConnectOnNoRingBack (Outbound)

Description: Determines how the protocol should proceed when no ringback tone is detected. If the parameter is enabled (set to 1), and no ringback is detected, a remote collision with a remote outbound call is assumed, and the call immediately transitions to Connected state.

Values:

- 0 [default]: Do not assume remote collision and disconnect the call if no ringback is detected.
- 1: Assume remote collision and connect the call if no ringback is detected.

CDP_DelayInDialling (Outbound)

Description: Specifies the delay time in dialing when the parameter **CDP_WaitDialToneEnabled** is not enabled.

Values: Default is 100.

CDP_DialToneWaitTime (Outbound)

Description: Defines the time that the protocol waits for a dial tone before an outbound call can be made.

Values: Time in milliseconds. Default is 5000 (5 seconds).

Guidelines: This parameter is applicable only if the **CDP_WaitDialToneEnabled** parameter is set to 1. If the time defined by this parameter is exceeded before dial tone is detected, the action taken depends on the value of the **CDP_ConnectOnNoDialTone** parameter as follows:

- If the **CDP_ConnectOnNoDialTone** parameter is set to 1, a local collision is assumed and the incoming call is connected.
- If the **CDP_ConnectOnNoDialTone** parameter is set to 0, the call attempt fails and a disconnect event is forwarded with a reason of no dial tone.

CDP_MinPBXHangupTime (Inbound)

Description: Specifies the length of the ring cycle and is used to determine if the remote end has dropped an incoming call. The timer is reset at the start of each ring cycle. If the timer expires without resetting, ringing has been acknowledged to stop indicating the call was dropped, as the caller has abandoned the call before it was answered.

Values: Time in milliseconds. Default is 5000 (5 seconds).

CDP_PBXDiscEnabled

Description: Determines if the remote PBX can initiate call disconnection via CAS line signaling.

Values:

- 0: Disable call disconnect supervision, since it is not supported by the PBX.
- 1 [default]: Enable call disconnect supervision provided by the PBX.

CDP_ProtocolStopsOffhook

Description: Determines the state of the hook switch signaling (on-hook or off-hook) when the protocol stops after `gc_Close()`.

Note: This parameter has no effect on DM3 boards, because the protocol is not stopped until the board is stopped.

Values:

- 0 [default]: Set the hook switch state to on-hook.
- 1: Set the hook switch state to off-hook.

CDP_WaitDialToneEnabled (Outbound)

Description: Determines if the protocol should wait for a dial tone before dialing. Note that this parameter does **not** apply to supervised transfers (consultation calls), in which case the dial tone is not verified.

Values:

- 0 [default]: Do not wait for dial tone before dialing.
- 1: Wait for dial tone before dialing.



Finland R2 Bidirectional Protocol 17 Parameter Configuration

This chapter discusses the capabilities and parameters of the Finland R2 Bidirectional protocol in the following topics:

- General Protocol Information 125
- Country Dependent Parameter Descriptions 125

17.1 General Protocol Information

Protocol File Set

The files used with the Finland R2 protocol are listed and described in the following table.

File Type	File Name(s)	
	DM3	Springware
Protocol Module	pdk_r2_io.qs and pdk_r2_io.hot (or pdk_r2_io.arm.hot for DMT160TEC boards)	pdk_r2_io.psi
Voice and Network Parameters	Not applicable	fi_300.prm
Country Dependent Parameters	pdk_fi_r2_io.cdp	pdk_fi_r2_io.cdp
	gc_OpenEx() Protocol Name	
	Not applicable†	pdk_fi_r2_io

†On DM3 boards, the protocol is determined at board initialization time and not when a Global Call device is opened. For compatibility, the **gc_OpenEx()** protocol name may be specified for DM3 boards, but it is not used.

Protocol Limitations

If a DropCall is attempted in the ACCEPTED state, the protocol will answer the call by sending out the ANSWER pattern before dropping the call, as forced release is not supported in this protocol.

17.2 Country Dependent Parameter Descriptions

Note: A parameter can be inbound, outbound, or both inbound and outbound. An inbound parameter is used by the protocol when it is acting as inbound. An outbound parameter is used by the protocol when it is acting as outbound. A parameter that is both can be used by the protocol when it is acting as either inbound or outbound.

The modifiable parameters in the *pdk_fi_r2_io.cdp* file are:

- CDP_ANI_ENABLED (Inbound)
- CDP_ANI_MaxDigits (Inbound)
- CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED
- CDP_ANI_WITHAC_FACILITY_ENABLED (Outbound)
- CDP_AreaCode
- CDP_CallingPartyCategory (Outbound)
- CDP_ConnectType (Outbound)
- CDP_DNIS_MaxDigits (Inbound)
- CDP_Drop_Using_ProgressTones_After_AcceptCall (Inbound)
- CDP_FLAG_APPEND_F (Outbound)
- CDP_GrpB_Tone (Inbound)
- CDP_IMMEDIATE_ACCEPTSTATE (Inbound)
- CDP_IS_ANIAVAILABILITY_CHECK_NEEDED
- CDP_IS_CALLING_LINE_IDENTIFICATION_PERMITTED (Outbound)
- CDP_NO_OF_DNIS_BEFORE_CAT (Inbound)
- CDP_NUM_OF_AC_DIGITS (Inbound)
- CDP_NUM_OF_ANI_DIGITS (Inbound)
- CDP_NUM_OF_DNIS_DIGITS (Inbound)
- CDP_OVERLAP_SENDING_ENABLED (Outbound)
- CDP_REJECT_WITH_A3B4 (Inbound)
- CDP_SEND_ALERTING_ON_R2MF_COMPLETION (Inbound)
- CDP_SEND_BLOCK_AT_START_OR_REMOTE_BLOCK
- CDP_TrunkPrefixNumber

In addition, see [Chapter 3, “Call Progress Analysis Parameters”](#) for configuring default call progress operation in the protocol.

CDP_ANI_ENABLED (Inbound)

Description: Enables or disables the reception of automatic number identification (ANI) digits.

Values:

- 0: Disable the reception of ANI digits.
- 1 [default]: Enable the reception of ANI digits.

Guidelines: If this parameter is set to a value other than 0 or 1, the behavior of the protocol is not predictable.

For DM3, if ANI is disabled, you also have to remove **feature_ANI** from the **SYS_FEATURES** parameter in the *.cdp* file. The **SYS_FEATURES** parameter looks like this:

```
All CHARSTRING_t SYS_FEATURES = "feature_outbound,feature_inbound,feature_DNIS,
feature_Billing,feature_ANI,feature_CAT,feature_MoreDNIS"
```

CDP_ANI_MaxDigits (Inbound)

Description: Specifies the maximum number of ANI digits that can be received when using this protocol.

Values: Default is 16.

Guidelines: If this parameter value is set to 0, the behavior of the protocol is not predictable.

CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED

Description: Specifies whether ANI is to be requested (inbound) or sent (outbound) with the area code.

Values:

- 0: Request (inbound) or send (outbound) ANI digits without area code.
- 1 [default]: Request (inbound) or send (outbound) area code with ANI digits.

CDP_ANI_WITHAC_FACILITY_ENABLED (Outbound)

Description: Specifies whether ANI digits and area code are sent to the inbound side. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values:

- 0 [default]: The requested information denied tone is sent to the inbound side (same as Calling Line Identification Rejected (CLIR)).
- 1: ANI digits with area code (ANIWTHAC) are sent to the inbound side (same as Calling Line Identification Permitted (CLIP)).

CDP_AreaCode

Description: Specifies the area code of the local exchange where the subscriber is connected. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values: Default is 987.

CDP_CallingPartyCategory (Outbound)

Description: Specifies the category of the calling subscriber.

Values:

- 1 [default]: Ordinary subscriber
- 2: Subscriber with priority
- 3: Test equipment
- 4: Pay phone
- 5: Telephone operator
- 6: Data subscriber
- 11: Redirect call
- 13: Digital connectivity required

CDP_ConnectType (Outbound)

Description: Specifies the mode for outbound connect detection. Two types of connection events can be detected: the cas_answer received signaling bit pattern and the media type detection used when post-connect call analysis is enabled. The application has options as to when the call is considered connected, as set by this parameter. The application also has options as to whether call analysis continues after the call has been connected when cas_answer is received first.

Values:

- 0 [default]: The protocol transitions to the connected state only when cas_answer is received. If cas_answer is received first, call analysis is stopped. If call analysis is received first, the result is sent to the application via a GCEV_MEDIADETECTED event, but the protocol does not transition to the connected state until cas_answer is received.
- 1: The protocol transitions to the connected state when the first event (either cas_answer or call analysis) is received. If cas_answer is received first, call analysis still continues and the result is sent to the application via a GCEV_MEDIADETECTED event. If call analysis is received first, the subsequent cas_answer is ignored.
- 2: The protocol transitions to the connected state when the first event (either cas_answer or call analysis) is received. If cas_answer is received first, call analysis is stopped. If call analysis is received first, the subsequent cas_answer is ignored.
- 3: The protocol transitions to the connected state only when call analysis is received. If call analysis is received first, the subsequent cas_answer is ignored. If cas_answer is received first, it is ignored.

CDP_DNIS_MaxDigits (Inbound)

Description: Specifies the maximum number of dialed number identification service (DNIS) digits that can be received when using this protocol.

Values: Default is 16.

Guidelines: If this parameter value is set to 0, the behavior of the protocol is not predictable.

CDP_Drop_Using_ProgressTones_After_AcceptCall (Inbound)

Description: Specifies the call progress tone to be sent for dropping a call, when doing a gc_DropCall() after a gc_AcceptCall().

Values:

- 0 [default]: The protocol sends the Answer Line signal, waits for the time specified by CDP_TimeToRecognizeAnswer, and then sends a Clear Backward line signal for call disconnection. In this case, the call will be charged for the remote calling subscriber, even though the call is not successful.
- 1: The protocol sends the appropriate call progress tone depending on the gc_DropCall() cause to the remote end, and waits for a Clear Forward Line signal for call disconnection.

CDP_FLAG_APPEND_F (Outbound)

Description: When the remote end asks for the next DNIS digit through Group A backward tone, and the protocol does not have any more DNIS available to be sent, this parameter specifies

whether to send the I-15 tone or to remain silent and prepare for A3 or A4 pulse from the remote end.

Values:

- 0 [default]: No tone will be sent to the remote end. In this case, A3 or A4 pulse is expected to be received from the remote end. In a case of overlapped sending (see description of **CDP_OVERLAP_SENDING_ENABLED** parameter), the remote end may also send A1 to request more information.
- 1: 'f' (I-15) will be sent to the remote end, indicating the end of information.

CDP_GrpB_Tone (Inbound)

Description: Determines whether the sender should be charged after receiving the tone. The tone is sent from the inbound end on receipt of Category for Group II. After this tone, the sequence of R2MF tone exchange is over and the call is connected. This is the last R2MF tone in establishment of a call.

Values:

- 1: Line free, chargeable malicious call identification
- 6 [default]: Line free, chargeable (B-6)

CDP_IMMEDIATE_ACCEPTSTATE (Inbound)

Description: Specifies when the protocol transitions a call to the Accepted state.

Values:

- 0 [default]: The protocol should wait for the number of rings specified in **gc_AcceptCall()** to expire before transitioning to the Accepted state.
- 1: The protocol should transition a call to the Accepted state immediately upon receipt of **gc_AcceptCall()** and before the specified number of rings have been generated.

Guidelines: This parameter is ignored if the value of the **gc_AcceptCall()** rings parameter is 0.

CDP_IS_ANIAVAILABILITY_CHECK_NEEDED

Description: Determines whether the status of ANI availability is checked before ANI digits are exchanged. At the inbound side, this parameter specifies whether ANI availability at the outbound side has to be verified or if ANI digits can be requested directly. At the outbound side, ANI digits are passed directly or the inbound side is informed of the availability (status) first.

Values:

- 0 [default]: The status of ANI availability is not checked before ANI digits are exchanged. ANI digits can be requested directly without knowing the status of the outbound side.
- 1: The status of ANI availability is checked before ANI digits are exchanged. The inbound side requests the status of ANI availability. If ANI digits are available, the inbound side requests the ANI digits. The outbound side sends the status of ANI availability and then waits for the inbound request.

CDP_IS_CALLING_LINE_IDENTIFICATION_PERMITTED (Outbound)

Description: Specifies whether Calling Line Identification is enabled. This parameter is used to enable CLIP and CLIR conditions.

Values:

- 0: Calling Line Identification Rejected (CLIR). The requested information denied tone is sent to the inbound side.
- 1 [default]: Calling Line Identification Permitted (CLIP). ANI digits are sent to the inbound side.

CDP_NO_OF_DNIS_BEFORE_CAT (Inbound)

Description: Determines the number of DNIS digits that are to be received before any category information is received. If this parameter is set to non-zero, the following sequence of events occurs:

1. Partial DNIS digits are received.
2. Category digits are received.
3. The remaining DNIS digits are received.
4. ANI digits are received (if **CDP_ANI_ENABLED** is 1).
5. Category digits are received again.

Values:

- 0 [default]: Indicates that category must be received after all DNIS digits are received.
- Non-zero: Specifies the number of DNIS digits received before category information is received.

Guidelines: The behavior of the protocol will not be predictable, unless the following occurs:

- If this parameter is set to non-zero, **CDP_ANI_ENABLED** must be set to 1.
- If this parameter is set to non-zero, its value should be the minimum of **CDP_NUM_OF_DNIS_DIGITS** (if non-zero), **CDP_DNIS_MaxDigits**, and the actual DNIS digits to be received.

CDP_NUM_OF_AC_DIGITS (Inbound)

Description: Specifies the number of area code digits of the local exchange from where it received the call. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values: Default is 3.

CDP_NUM_OF_ANI_DIGITS (Inbound)

Description: Specifies the expected number of ANI digits to be received.

Values:

- 0: ANI collection is terminated by -15 (end of dialing).
- Non-zero [default is 4]: Specifies the number of ANI digits expected. This number should always be less than **CDP_ANI_MaxDigits**.

CDP_NUM_OF_DNIS_DIGITS (Inbound)

Description: Specifies the expected number of DNIS digits to be received.

Values:

- 0: DNIS collection is terminated by I-15 (end of dialing).
- Non-zero [default is 2]: Specifies the number of DNIS digits expected. This number should always be less than **CDP_DNIS_MaxDigits**.

CDP_OVERLAP_SENDING_ENABLED (Outbound)

Description: Enables or disables the overlap sending feature.

Values:

- 0: Disables overlap sending. 'f' will be appended to DNIS digits received with **gc_MakeCall()** (if **CDP_FLAG_APPEND_F** is true), indicating the end of information.
- 1 [default]: Enables overlap sending. The remote end can request more DNIS information, in which case a REQMOREINFO event will be generated. **gc_SendMoreInfo()** with Null information will either cause 'f' to be sent to the remote end or will remain silent (depending on the value of **CDP_FLAG_APPEND_F**), thus indicating to the remote end that no more DNIS digits are available.

CDP_REJECT_WITH_A3B4 (Inbound)

Description: Determines the method for rejecting a call when an R2MF tone error is received during call setup.

Values:

- 0 [default]: Call is rejected with a direct group A tone (A-10), which is a spare tone that may be used to indicate congestion.
- 1: Call is rejected with an A3-B4 tone combination, which means the inbound (local) end sends an A-3 tone (send category and change over to group B tones). Then, the category is received and in response, a B-4 tone is sent to reject the call.

CDP_SEND_ALERTING_ON_R2MF_COMPLETION (Inbound)

Description: Controls when the protocol will send a GCEV_ALERTING event to the application.

Values:

- 0: GCEV_ALERTING is sent after receiving a ringback tone.
- 1 [default]: GCEV_ALERTING is sent after completion of the R2MF sequence (after receiving the last Group B tone).

CDP_SEND_BLOCK_AT_START_OR_REMOTE_BLOCK

Description: Specifies the bit pattern to be sent on the line at protocol open time and when the remote line goes BLOCKED.

Values:

- 0 [default]: If the protocol is used either as outbound only or as bidirectional.
- 1: If the protocol is used as inbound only.

CDP_TrunkPrefixNumber

Description: Specifies the trunk number used to dial to local exchange. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values: Default is 9.

Hong Kong DTMF Bidirectional Protocol Parameter Configuration

This chapter discusses the capabilities and parameters of the Hong Kong DTMF Bidirectional protocol in the following topics:

- General Protocol Information 133
- Country Dependent Parameter Descriptions 133

18.1 General Protocol Information

Protocol File Set

The files used with the Hong Kong DTMF protocol are listed and described in the following table.

File Type	File Name(s)	
	DM3	Springware
Protocol Module	pdk_hk_dtmf_io.qs and pdk_hk_dtmf_io.hot (or pdk_hk_dtmf_io.arm.hot for DMT160TEC boards)	pdk_hk_dtmf_io.psi
Voice and Network Parameters	Not applicable	r2_300.prm
Country Dependent Parameters	pdk_hk_dtmf_io.cdp	pdk_hk_dtmf_io.cdp
	gc_OpenEx() Protocol Name	
	Not applicable†	pdk_hk_dtmf_io

†On DM3 boards, the protocol is determined at board initialization time and not when a Global Call device is opened. For compatibility, the **gc_OpenEx()** protocol name may be specified for DM3 boards, but it is not used.

Protocol Limitations

None.

18.2 Country Dependent Parameter Descriptions

The modifiable parameters in the *pdk_hk_dtmf_io.cdp* file are:

- CDP_ProtocolReset_Timeout
- CDP_R2CallScenario
- CDP_SEIZEACK_TIMEOUT

In addition, see [Chapter 3, “Call Progress Analysis Parameters”](#) for configuring default call progress operation in the protocol.

CDP_ProtocolReset_Timeout

Description: Defines the maximum time-out in milliseconds for input remotely or from the environment if a protocol reset is active. On expiration of this time-out, the application returns to the initial state.

Values: Time in milliseconds. Default is 5000 (5 seconds).

CDP_R2CallScenario

Description: Specifies the R2 call scenario.

Values:

- 0: Line signaling without Delay Dial, DNIS, ANI
- 1: Delay Dial Method with DNIS (HKTA2017)
- 2 [default]: Delay Dial Method with DNIS, ANI (HKTA2018)

Guidelines: For DM3, if ANI or DNIS is disabled, you also have to remove **feature_ANI** and/or **feature_DNIS** from the **SYS_FEATURES** parameter in the *.cdp* file. The **SYS_FEATURES** parameter looks like this:

```
All CHARSTRING_t SYS_FEATURES = "feature_outbound,feature_inbound,feature_DNIS,  
feature_ANI,feature_CAT"
```

CDP_SEIZEACK_TIMEOUT

Description: Defines the maximum time-out in milliseconds for a CAS_ANSWER signal once the line is seized by sending a CAS_SEIZE. The remote end is expected to acknowledge the CAS_SEIZE event during this interval. If not, the outgoing call is considered to have failed.

Values: Time in milliseconds. Default is 10000 (10 seconds).



India R2 Bidirectional Protocol Parameter Configuration

19

This chapter discusses the capabilities and parameters of the India R2 Bidirectional protocol in the following topics:

- General Protocol Information 135
- Country Dependent Parameter Descriptions 135

19.1 General Protocol Information

Protocol File Set

The files used with the India R2 protocol are listed and described in the following table.

File Type	File Name(s)	
	DM3	Springware
Protocol Module	pdk_r2_io.qs and pdk_r2_io.hot (or pdk_r2_io.arm.hot for DMT160TEC boards)	pdk_r2_io.psi
Voice and Network Parameters	Not applicable	in_300.prm
Country Dependent Parameters	pdk_in_r2_io.cdp	pdk_in_r2_io.cdp
	gc_OpenEx() Protocol Name	
	Not applicable†	pdk_in_r2_io

†On DM3 boards, the protocol is determined at board initialization time and not when a Global Call device is opened. For compatibility, the **gc_OpenEx()** protocol name may be specified for DM3 boards, but it is not used.

Protocol Limitations

If a DropCall is attempted in the ACCEPTED state, the protocol will answer the call by sending out the ANSWER pattern before dropping the call, as forced release is not supported in this protocol.

19.2 Country Dependent Parameter Descriptions

Note: A parameter can be inbound, outbound, or both inbound and outbound. An inbound parameter is used by the protocol when it is acting as inbound. An outbound parameter is used by the protocol when it is acting as outbound. A parameter that is both can be used by the protocol when it is acting as either inbound or outbound.

The modifiable parameters in the *pdk_in_r2_io.cdp* file are:

- CDP_ANI_ENABLED (Inbound)
- CDP_ANI_MaxDigits (Inbound)
- CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED
- CDP_ANI_WITHAC_FACILITY_ENABLED (Outbound)
- CDP_AreaCode
- CDP_CallingPartyCategory (Outbound)
- CDP_ConnectType (Outbound)
- CDP_DNIS_MaxDigits (Inbound)
- CDP_Drop_Using_ProgressTones_After_AcceptCall (Inbound)
- CDP_FLAG_APPEND_F (Outbound)
- CDP_GrpB_Tone (Inbound)
- CDP_IMMEDIATE_ACCEPTSTATE (Inbound)
- CDP_IS_ANIAVAILABILITY_CHECK_NEEDED
- CDP_IS_CALLING_LINE_IDENTIFICATION_PERMITTED (Outbound)
- CDP_NO_OF_DNIS_BEFORE_CAT (Inbound)
- CDP_NUM_OF_AC_DIGITS (Inbound)
- CDP_NUM_OF_ANI_DIGITS (Inbound)
- CDP_NUM_OF_DNIS_DIGITS (Inbound)
- CDP_OVERLAP_SENDING_ENABLED (Outbound)
- CDP_REJECT_WITH_A3B4 (Inbound)
- CDP_SEND_ALERTING_ON_R2MF_COMPLETION (Inbound)
- CDP_SEND_BLOCK_AT_START_OR_REMOTE_BLOCK
- CDP_TrunkPrefixNumber

In addition, see Chapter 3, “Call Progress Analysis Parameters” for configuring default call progress operation in the protocol.

CDP_ANI_ENABLED (Inbound)

Description: Enables or disables the reception of automatic number identification (ANI) digits.

Values:

- 0: Disable the reception of ANI digits.
- 1 [default]: Enable the reception of ANI digits.

Guidelines: If this parameter is set to a value other than 0 or 1, the behavior of the protocol is not predictable.

For DM3, if ANI is disabled, you also have to remove **feature_ANI** from the **SYS_FEATURES** parameter in the *.cdp* file. The **SYS_FEATURES** parameter looks like this:

```
All CHARSTRING_t SYS_FEATURES = "feature_outbound,feature_inbound,feature_DNIS,
feature_Billing,feature_ANI,feature_CAT,feature_MoreDNIS"
```

CDP_ANI_MaxDigits (Inbound)

Description: Specifies the maximum number of ANI digits that can be received when using this protocol.

Values: Default is 16.

Guidelines: If this parameter value is set to 0, the behavior of the protocol is not predictable.

CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED

Description: Specifies whether ANI is to be requested (inbound) or sent (outbound) with the area code.

Values:

- 0 [default]: Request (inbound) or send (outbound) ANI digits without area code.
- 1: Request (inbound) or send (outbound) area code with ANI digits.

CDP_ANI_WITHAC_FACILITY_ENABLED (Outbound)

Description: Specifies whether ANI digits and area code are sent to the inbound side. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values:

- 0 [default]: The requested information denied tone is sent to the inbound side (same as Calling Line Identification Rejected (CLIR)).
- 1: ANI digits with area code (ANIWITHAC) are sent to the inbound side (same as Calling Line Identification Permitted (CLIP)).

CDP_AreaCode

Description: Specifies the area code of the local exchange where the subscriber is connected. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values: Default is 987.

CDP_CallingPartyCategory (Outbound)

Description: Specifies the category of the calling subscriber.

Values:

- 1 [default]: Ordinary subscriber
- 2: Subscriber with priority
- 3: Maintenance equipment calls (may be used in the future)
- 4: STD (Subscriber's trunk dialing - equivalent to long distance call, may be used in the future)
- 5: Coin box (may be used in the future)
- 6: Telephone operator

CDP_ConnectType (Outbound)

Description: Specifies the mode for outbound connect detection. Two types of connection events can be detected: the cas_answer received signaling bit pattern and the media type detection used when post-connect call analysis is enabled. The application has options as to when the call is considered connected, as set by this parameter. The application also has options as to whether call analysis continues after the call has been connected when cas_answer is received first.

Values:

- 0 [default]: The protocol transitions to the connected state only when cas_answer is received. If cas_answer is received first, call analysis is stopped. If call analysis is received first, the result is sent to the application via a GCEV_MEDIADETECTED event, but the protocol does not transition to the connected state until cas_answer is received.
- 1: The protocol transitions to the connected state when the first event (either cas_answer or call analysis) is received. If cas_answer is received first, call analysis still continues and the result is sent to the application via a GCEV_MEDIADETECTED event. If call analysis is received first, the subsequent cas_answer is ignored.
- 2: The protocol transitions to the connected state when the first event (either cas_answer or call analysis) is received. If cas_answer is received first, call analysis is stopped. If call analysis is received first, the subsequent cas_answer is ignored.
- 3: The protocol transitions to the connected state only when call analysis is received. If call analysis is received first, the subsequent cas_answer is ignored. If cas_answer is received first, it is ignored.

CDP_DNIS_MaxDigits (Inbound)

Description: Specifies the maximum number of dialed number identification service (DNIS) digits that can be received when using this protocol.

Values: Default is 16.

Guidelines: If this parameter value is set to 0, the behavior of the protocol is not predictable.

CDP_Drop_Using_ProgressTones_After_AcceptCall (Inbound)

Description: Specifies the call progress tone to be sent for dropping a call, when doing a gc_DropCall() after a gc_AcceptCall().

Values:

- 0 [default]: The protocol sends the Answer Line signal, waits for the time specified by CDP_TimeToRecognizeAnswer, and then sends a Clear Backward line signal for call disconnection. In this case, the call will be charged for the remote calling subscriber, even though the call is not successful.
- 1: The protocol sends the appropriate call progress tone depending on the gc_DropCall() cause to the remote end, and waits for a Clear Forward Line signal for call disconnection.

CDP_FLAG_APPEND_F (Outbound)

Description: When the remote end asks for the next DNIS digit through Group A backward tone, and the protocol does not have any more DNIS available to be sent, this parameter specifies

whether to send the I-15 tone or to remain silent and prepare for A3 or A4 pulse from the remote end.

Values:

- 0 [default]: No tone will be sent to the remote end. In this case, A3 or A4 pulse is expected to be received from the remote end. In a case of overlapped sending (see description of **CDP_OVERLAP_SENDING_ENABLED** parameter), the remote end may also send A1 to request more information.
- 1: 'f' (I-15) will be sent to the remote end, indicating the end of information.

CDP_GrpB_Tone (Inbound)

Description: Determines whether the sender should be charged after receiving the tone. The tone is sent from the inbound end on receipt of Category for Group II. After this tone, the sequence of R2MF tone exchange is over and the call is connected. This is the last R2MF tone in the establishment of a call.

Values:

- 6 [default]: Line free, chargeable (B-6)
- 7: Line free, not chargeable

CDP_IMMEDIATE_ACCEPTSTATE (Inbound)

Description: Specifies when the protocol transitions a call to the Accepted state.

Values:

- 0 [default]: The protocol should wait for the number of rings specified in **gc_AcceptCall()** to expire before transitioning to the Accepted state.
- 1: The protocol should transition a call to the Accepted state immediately upon receipt of **gc_AcceptCall()** and before the specified number of rings have been generated.

Guidelines: This parameter is ignored if the value of the **gc_AcceptCall()** rings parameter is 0.

CDP_IS_ANIAVAILABILITY_CHECK_NEEDED

Description: Determines whether the status of ANI availability is checked before ANI digits are exchanged. At the inbound side, this parameter specifies whether ANI availability at the outbound side has to be verified or if ANI digits can be requested directly. At the outbound side, ANI digits are passed directly or the inbound side is informed of the availability (status) first.

Values:

- 0: The status of ANI availability is not checked before ANI digits are exchanged. ANI digits can be requested directly without knowing the status of the outbound side.
- 1 [default]: The status of ANI availability is checked before ANI digits are exchanged. The inbound side requests the status of ANI availability. If ANI digits are available, the inbound side requests the ANI digits. The outbound side sends the status of ANI availability and then waits for the inbound request.

CDP_IS_CALLING_LINE_IDENTIFICATION_PERMITTED (Outbound)

Description: Specifies whether Calling Line Identification is enabled. This parameter is used to enable CLIP and CLIR conditions.

Values:

- 0: Calling Line Identification Rejected (CLIR). The requested information denied tone is sent to the inbound side.
- 1 [default]: Calling Line Identification Permitted (CLIP). ANI digits are sent to the inbound side.

CDP_NO_OF_DNIS_BEFORE_CAT (Inbound)

Description: Determines the number of DNIS digits that are to be received before any category information is received. If this parameter is set to non-zero, the following sequence of events occurs:

1. Partial DNIS digits are received.
2. Category digits are received.
3. The remaining DNIS digits are received.
4. ANI digits are received (if **CDP_ANI_ENABLED** is 1).
5. Category digits are received again.

Values:

- 0: Indicates that category must be received after all DNIS digits are received.
- Non-zero [default is 1]: Specifies the number of DNIS digits received before category information is received.

Guidelines: The behavior of the protocol will not be predictable, unless the following occurs:

- If this parameter is set to non-zero, **CDP_ANI_ENABLED** must be set to 1.
- If this parameter is set to non-zero, its value should be the minimum of **CDP_NUM_OF_DNIS_DIGITS** (if non-zero), **CDP_DNIS_MaxDigits**, and the actual DNIS digits to be received.

CDP_NUM_OF_AC_DIGITS (Inbound)

Description: Specifies the number of area code digits of the local exchange from where it received the call. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values: Default is 3.

CDP_NUM_OF_ANI_DIGITS (Inbound)

Description: Specifies the expected number of ANI digits to be received.

Values:

- 0: ANI collection is terminated by I-15 (end of dialing).
- Non-zero [default is 7]: Specifies the number of ANI digits expected. This number should always be less than **CDP_ANI_MaxDigits**.

CDP_NUM_OF_DNIS_DIGITS (Inbound)

Description: Specifies the expected number of DNIS digits to be received.

Values:

- 0: DNIS collection is terminated by I-15 (end of dialing).
- Non-zero [default is 2]: Specifies the number of DNIS digits expected. This number should always be less than **CDP_DNIS_MaxDigits**.

CDP_OVERLAP_SENDING_ENABLED (Outbound)

Description: Enables or disables the overlap sending feature.

Values:

- 0: Disables overlap sending. 'f' will be appended to DNIS digits received with **gc_MakeCall()** (if **CDP_FLAG_APPEND_F** is true), indicating the end of information.
- 1 [default]: Enables overlap sending. The remote end can request more DNIS information, in which case a REQMOREINFO event will be generated. **gc_SendMoreInfo()** with Null information will either cause 'f' to be sent to the remote end or will remain silent (depending on the value of **CDP_FLAG_APPEND_F**), thus indicating to the remote end that no more DNIS digits are available.

CDP_REJECT_WITH_A3B4 (Inbound)

Description: Determines the method for rejecting a call when an R2MF tone error is received during call setup.

Values:

- 0 [default]: Call is rejected with a direct group A tone (A-10), which is a spare tone that may be used to indicate congestion.
- 1: Call is rejected with an A3-B4 tone combination, which means the inbound (local) end sends an A-3 tone (send category and change over to group B tones). Then, the category is received and in response, a B-4 tone is sent to reject the call.

CDP_SEND_ALERTING_ON_R2MF_COMPLETION (Inbound)

Description: Controls when the protocol will send a GCEV_ALERTING event to the application.

Values:

- 0: GCEV_ALERTING is sent after receiving a ringback tone.
- 1 [default]: GCEV_ALERTING is sent after completion of the R2MF sequence (after receiving the last Group B tone).

CDP_SEND_BLOCK_AT_START_OR_REMOTE_BLOCK

Description: Specifies the bit pattern to be sent on the line at protocol open time and when the remote line goes BLOCKED.

Values:

- 0 [default]: If the protocol is used either as outbound only or as bidirectional.
- 1: If the protocol is used as inbound only.

CDP_TrunkPrefixNumber

Description: Specifies the trunk number used to dial to local exchange. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values: Default is 9.

Indonesia E&M Bidirectional Protocol Parameter Configuration

This chapter discusses the capabilities and parameters of the Indonesia E&M Bidirectional protocol in the following topics:

- General Protocol Information 143
- Country Dependent Parameter Descriptions 143

20.1 General Protocol Information

Protocol File Set

The files used with the Indonesia E&M protocol are listed and described in the following table.

File Type	File Name(s)	
	DM3	Springware
Protocol Module	pdk_id_em_io.qs and pdk_id_em_io.hot (or pdk_id_em_io.arm.hot for DMT160TEC boards)	pdk_id_em_io.psi
Voice and Network Parameters	Not applicable	id_300.prm
Country Dependent Parameters	pdk_id_em_io.cdp	pdk_id_em_io.cdp
	gc_OpenEx() Protocol Name	
	Not applicable†	pdk_id_em_io

†On DM3 boards, the protocol is determined at board initialization time and not when a Global Call device is opened. For compatibility, the **gc_OpenEx()** protocol name may be specified for DM3 boards, but it is not used.

Protocol Limitations

None.

20.2 Country Dependent Parameter Descriptions

The modifiable parameters in the *pdk_id_em_io.cdp* file are:

- cdp_NANI
- cdp_NDNIS1
- cdp_NDNIS2
- CDP_ProtocolReset_Timeout

- [CDP_R2CallScenario](#)
- [CDP_SEIZEACK_TIMEOUT](#)

In addition, see [Chapter 3, “Call Progress Analysis Parameters”](#) for configuring default call progress operation in the protocol.

[cdp_NANI](#)

Description: Specifies the number of automatic number identification (ANI) digits.

Values: Default is 7 ANI digits.

[cdp_NDNIS1](#)

Description: Specifies the number of dialed number identification service (DNIS) digits received in the first of two sessions. The total number of DNIS (NDNIS) can possibly be received in two sessions, that is, $NDNIS = NDNIS1 + NDNIS2$, where $NDNIS1$ is the number of DNIS received in the first session, and $NDNIS2$ is the number of DNIS received in the second session. Three R2 call scenarios are possible, depending on the value set for

CDP_R2CallScenario:

- Call Scenario 1: DNIS and CAT (category) are received, where $NDNIS = NDNIS1$.
- Call Scenario 2: DNIS, CAT, ANI, and CAT are received, where $NDNIS = NDNIS1$.
- Call Scenario 3: DNIS1, CAT, ANI, DNIS2, and CAT are received, where $NDNIS1$ is a fixed number (such as 1, 2, ...).

Values: Default is 4 DNIS digits.

[cdp_NDNIS2](#)

Description: Specifies the number of DNIS digits received in the second of two sessions. The total number of DNIS (NDNIS) can possibly be received in two sessions, that is, $NDNIS = NDNIS1 + NDNIS2$, where $NDNIS1$ is the number of DNIS received in the first session, and $NDNIS2$ is the number of DNIS received in the second session. Three R2 call scenarios are possible, depending on the value set for **CDP_R2CallScenario:**

- Call Scenario 1: DNIS and CAT (category) are received, $NDNIS2 = 0$.
- Call Scenario 2: DNIS, CAT, ANI, and CAT are received, $NDNIS2 = 0$.
- Call Scenario 3: DNIS1, CAT, ANI, DNIS2, and CAT are received, where $NDNIS2$ is a fixed known number or variable length.

Values: Default is 2 DNIS digits.

[CDP_ProtocolReset_Timeout](#)

Description: Defines the maximum time-out in milliseconds for input remotely or from the environment if a protocol reset is active. On expiration of this time-out, the application returns to the initial state.

Values: Time in milliseconds. Default is 5000 (5 seconds).

CDP_R2CallScenario

Description: Specifies the R2 call scenario.

Values:

- 0: Line signaling only (that is, ITU-T Q.421 + Q.422)
- 1: DNIS+CAT
- 2 [default]: DNIS+CAT+ANI+CAT
- 3: DNIS1+CAT+ANI+DNIS2+CAT

Guidelines: For outbound only R2 protocol, call scenarios 1, 2, and 3 are automatically handled. So any value greater than or equal to 1 will enable R2 one signaling.

For DM3, if ANI or DNIS is disabled, you also have to remove **feature_ANI** and/or **feature_DNIS** from the **SYS_FEATURES** parameter in the *.cdp* file. The **SYS_FEATURES** parameter looks like this:

```
All CHARSTRING_t SYS_FEATURES = "feature_outbound,feature_inbound,feature_DNIS,  
feature_ANI,feature_CAT"
```

CDP_SEIZEACK_TIMEOUT

Description: Defines the maximum time-out in milliseconds for a CAS_SEIZEACK event once the line is seized by sending a CAS_SEIZE. The remote end is expected to acknowledge the CAS_SEIZE event during this interval. If not, the outgoing call is considered to have failed.

Values: Time in milliseconds. Default is 5000 (5 seconds).





Israel R2 Bidirectional Protocol Parameter Configuration

21

This chapter discusses the capabilities and parameters of the Israel R2 Bidirectional protocol in the following topics:

- General Protocol Information 147
- Country Dependent Parameter Descriptions 147

21.1 General Protocol Information

Protocol File Set

The files used with the Israel R2 protocol are listed and described in the following table.

File Type	File Name(s)	
	DM3	Springware
Protocol Module	pdk_r2_io.qs and pdk_r2_io.hot (or pdk_r2_io.arm.hot for DMT160TEC boards)	pdk_r2_io.psi
Voice and Network Parameters	Not applicable	r2_300.prm
Country Dependent Parameters	pdk_il_r2_io.cdp	pdk_il_r2_io.cdp
	gc_OpenEx() Protocol Name	
	Not applicable†	pdk_il_r2_io

†On DM3 boards, the protocol is determined at board initialization time and not when a Global Call device is opened. For compatibility, the **gc_OpenEx()** protocol name may be specified for DM3 boards, but it is not used.

Protocol Limitations

If a DropCall is attempted in the ACCEPTED state, the protocol will answer the call by sending out the ANSWER pattern before dropping the call, as forced release is not supported in this protocol.

21.2 Country Dependent Parameter Descriptions

Note: A parameter can be inbound, outbound, or both inbound and outbound. An inbound parameter is used by the protocol when it is acting as inbound. An outbound parameter is used by the protocol when it is acting as outbound. A parameter that is both can be used by the protocol when it is acting as either inbound or outbound.

The modifiable parameters in the *pdk_il_r2_io.cdp* file are:

- CDP_ANI_ENABLED (Inbound)
- CDP_ANI_MaxDigits (Inbound)
- CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED
- CDP_ANI_WITHAC_FACILITY_ENABLED (Outbound)
- CDP_AreaCode
- CDP_CallingPartyCategory (Outbound)
- CDP_ConnectType (Outbound)
- CDP_DNIS_MaxDigits (Inbound)
- CDP_Drop_Using_ProgressTones_After_AcceptCall (Inbound)
- CDP_FLAG_APPEND_F (Outbound)
- CDP_GrpB_Tone (Inbound)
- CDP_IMMEDIATE_ACCEPTSTATE (Inbound)
- CDP_IS_ANIAVAILABILITY_CHECK_NEEDED
- CDP_IS_CALLING_LINE_IDENTIFICATION_PERMITTED (Outbound)
- CDP_NO_OF_DNIS_BEFORE_CAT (Inbound)
- CDP_NUM_OF_AC_DIGITS (Inbound)
- CDP_NUM_OF_ANI_DIGITS (Inbound)
- CDP_NUM_OF_DNIS_DIGITS (Inbound)
- CDP_OVERLAP_SENDING_ENABLED (Outbound)
- CDP_REJECT_WITH_A3B4 (Inbound)
- CDP_SEND_ALERTING_ON_R2MF_COMPLETION (Inbound)
- CDP_SEND_BLOCK_AT_START_OR_REMOTE_BLOCK
- CDP_TrunkPrefixNumber

In addition, see Chapter 3, “Call Progress Analysis Parameters” for configuring default call progress operation in the protocol.

CDP_ANI_ENABLED (Inbound)

Description: Enables or disables the reception of automatic number identification (ANI) digits.

Values:

- 0: Disable the reception of ANI digits.
- 1 [default]: Enable the reception of ANI digits.

Guidelines: If this parameter is set to a value other than 0 or 1, the behavior of the protocol is not predictable.

For DM3, if ANI is disabled, you also have to remove **feature_ANI** from the **SYS_FEATURES** parameter in the *.cdp* file. The **SYS_FEATURES** parameter looks like this:

```
All CHARSTRING_t SYS_FEATURES = "feature_outbound,feature_inbound,feature_DNIS,
feature_Billing,feature_ANI,feature_CAT,feature_MoreDNIS"
```

CDP_ANI_MaxDigits (Inbound)

Description: Specifies the maximum number of ANI digits that can be received when using this protocol.

Values: Default is 16.

Guidelines: If this parameter value is set to 0, the behavior of the protocol is not predictable.

CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED

Description: Specifies whether ANI is to be requested (inbound) or sent (outbound) with the area code.

Values:

- 0 [default]: Request (inbound) or send (outbound) ANI digits without area code.
- 1: Request (inbound) or send (outbound) area code with ANI digits.

CDP_ANI_WITHAC_FACILITY_ENABLED (Outbound)

Description: Specifies whether ANI digits and area code are sent to the inbound side. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values:

- 0 [default]: The requested information denied tone is sent to the inbound side (same as Calling Line Identification Rejected (CLIR)).
- 1: ANI digits with area code (ANIWITHAC) are sent to the inbound side (same as Calling Line Identification Permitted (CLIP)).

CDP_AreaCode

Description: Specifies the area code of the local exchange where the subscriber is connected. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values: Default is 987.

CDP_CallingPartyCategory (Outbound)

Description: Specifies the category of the calling subscriber (one of the Group II forward signals).

Values:

- 1 [default]: Subscriber without priority
- 2: Subscriber with priority
- 3: Maintenance equipment
- 5: Telephone operator
- 6: Data subscriber
- 11: Subscriber with CNDB
- 12: VIS subscriber

CDP_ConnectType (Outbound)

Description: Specifies the mode for outbound connect detection. Two types of connection events can be detected: the `cas_answer` received signaling bit pattern and the media type detection used when post-connect call analysis is enabled. The application has options as to when the call is considered connected, as set by this parameter. The application also has options as to whether call analysis continues after the call has been connected when `cas_answer` is received first.

Values:

- 0 [default]: The protocol transitions to the connected state only when `cas_answer` is received. If `cas_answer` is received first, call analysis is stopped. If call analysis is received first, the result is sent to the application via a `GCEV_MEDIADETECTED` event, but the protocol does not transition to the connected state until `cas_answer` is received.
- 1: The protocol transitions to the connected state when the first event (either `cas_answer` or call analysis) is received. If `cas_answer` is received first, call analysis still continues and the result is sent to the application via a `GCEV_MEDIADETECTED` event. If call analysis is received first, the subsequent `cas_answer` is ignored.
- 2: The protocol transitions to the connected state when the first event (either `cas_answer` or call analysis) is received. If `cas_answer` is received first, call analysis is stopped. If call analysis is received first, the subsequent `cas_answer` is ignored.
- 3: The protocol transitions to the connected state only when call analysis is received. If call analysis is received first, the subsequent `cas_answer` is ignored. If `cas_answer` is received first, it is ignored.

CDP_DNIS_MaxDigits (Inbound)

Description: Specifies the maximum number of dialed number identification service (DNIS) digits that can be received when using this protocol.

Values: Default is 16.

Guidelines: If this parameter value is set to 0, the behavior of the protocol is not predictable.

CDP_Drop_Using_ProgressTones_After_AcceptCall (Inbound)

Description: Specifies the call progress tone to be sent for dropping a call, when doing a `gc_DropCall()` after a `gc_AcceptCall()`.

Values:

- 0 [default]: The protocol sends the Answer Line signal, waits for the time specified by `CDP_TimeToRecognizeAnswer`, and then sends a Clear Backward line signal for call disconnection. In this case, the call will be charged for the remote calling subscriber, even though the call is not successful.
- 1: The protocol sends the appropriate call progress tone depending on the `gc_DropCall()` cause to the remote end, and waits for a Clear Forward Line signal for call disconnection.

CDP_FLAG_APPEND_F (Outbound)

Description: When the remote end asks for the next DNIS digit through Group A backward tone, and the protocol does not have any more DNIS available to be sent, this parameter specifies

whether to send the I-15 tone or to remain silent and prepare for A3 or A4 pulse from the remote end.

Values:

- 0 [default]: No tone will be sent to the remote end. In this case, A3 or A4 pulse is expected to be received from the remote end. In a case of overlapped sending (see description of **CDP_OVERLAP_SENDING_ENABLED** parameter), the remote end may also send A1 to request more information.
- 1: 'f' (I-15) will be sent to the remote end, indicating the end of information.

CDP_GrpB_Tone (Inbound)

Description: Determines whether the sender should be charged after receiving the tone. The tone is sent from the inbound end on receipt of Category for Group II. After this tone, the sequence of R2MF tone exchange is over and the call is connected. This is the last R2MF tone in establishment of a call.

Values:

- 6 [default]: Line free, chargeable (B-6)
- 7: Line free, not chargeable

CDP_IMMEDIATE_ACCEPTSTATE (Inbound)

Description: Specifies when the protocol transitions a call to the Accepted state.

Values:

- 0 [default]: The protocol should wait for the number of rings specified in **gc_AcceptCall()** to expire before transitioning to the Accepted state.
- 1: The protocol should transition a call to the Accepted state immediately upon receipt of **gc_AcceptCall()** and before the specified number of rings have been generated.

Guidelines: This parameter is ignored if the value of the **gc_AcceptCall()** rings parameter is 0.

CDP_IS_ANIAVAILABILITY_CHECK_NEEDED

Description: Determines whether the status of ANI availability is checked before ANI digits are exchanged. At the inbound side, this parameter specifies whether ANI availability at the outbound side has to be verified or if ANI digits can be requested directly. At the outbound side, ANI digits are passed directly or the inbound side is informed of the availability (status) first.

Values:

- 0 [default]: The status of ANI availability is not checked before ANI digits are exchanged. ANI digits can be requested directly without knowing the status of the outbound side.
- 1: The status of ANI availability is checked before ANI digits are exchanged. The inbound side requests the status of ANI availability. If ANI digits are available, the inbound side requests the ANI digits. The outbound side sends the status of ANI availability and then waits for the inbound request.

CDP_IS_CALLING_LINE_IDENTIFICATION_PERMITTED (Outbound)

Description: Specifies whether Calling Line Identification is enabled. This parameter is used to enable CLIP and CLIR conditions.

Values:

- 0: Calling Line Identification Rejected (CLIR). The requested information denied tone is sent to the inbound side.
- 1 [default]: Calling Line Identification Permitted (CLIP). ANI digits are sent to the inbound side.

CDP_NO_OF_DNIS_BEFORE_CAT (Inbound)

Description: Determines the number of DNIS digits that are to be received before any category information is received. If this parameter is set to non-zero, the following sequence of events occurs:

1. Partial DNIS digits are received.
2. Category digits are received.
3. The remaining DNIS digits are received.
4. ANI digits are received (if **CDP_ANI_ENABLED** is 1).
5. Category digits are received again.

Values:

- 0 [default]: Indicates that category must be received after all DNIS digits are received.
- Non-zero: Specifies the number of DNIS digits received before category information is received.

Guidelines: The behavior of the protocol will not be predictable, unless the following occurs:

- If this parameter is set to non-zero, **CDP_ANI_ENABLED** must be set to 1.
- If this parameter is set to non-zero, its value should be the minimum of **CDP_NUM_OF_DNIS_DIGITS** (if non-zero), **CDP_DNIS_MaxDigits**, and the actual DNIS digits to be received.

CDP_NUM_OF_AC_DIGITS (Inbound)

Description: Specifies the number of area code digits of the local exchange from where it received the call. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values: Default is 3.

CDP_NUM_OF_ANI_DIGITS (Inbound)

Description: Specifies the expected number of ANI digits to be received.

Values:

- 0 [default]: ANI collection is terminated by I-15 (end of dialing).
- Non-zero: Specifies the number of ANI digits expected. This number should always be less than **CDP_ANI_MaxDigits**.

CDP_NUM_OF_DNIS_DIGITS (Inbound)

Description: Specifies the expected number of DNIS digits to be received.

Values:

- 0: DNIS collection is terminated by I-15 (end of dialing).
- Non-zero [default is 2]: Specifies the number of DNIS digits expected. This number should always be less than **CDP_DNIS_MaxDigits**.

CDP_OVERLAP_SENDING_ENABLED (Outbound)

Description: Enables or disables the overlap sending feature.

Values:

- 0: Disables overlap sending. 'f' will be appended to DNIS digits received with **gc_MakeCall()** (if **CDP_FLAG_APPEND_F** is true), indicating the end of information.
- 1 [default]: Enables overlap sending. The remote end can request more DNIS information, in which case a REQMOREINFO event will be generated. **gc_SendMoreInfo()** with Null information will either cause 'f' to be sent to the remote end or will remain silent (depending on the value of **CDP_FLAG_APPEND_F**), thus indicating to the remote end that no more DNIS digits are available.

CDP_REJECT_WITH_A3B4 (Inbound)

Description: Determines the method for rejecting a call when an R2MF tone error is received during call setup.

Values:

- 0 [default]: Call is rejected with a direct group A tone (A-10), which is a spare tone that may be used to indicate congestion.
- 1: Call is rejected with an A3-B4 tone combination, which means the inbound (local) end sends an A-3 tone (send category and change over to group B tones). Then, the category is received and in response, a B-4 tone is sent to reject the call.

CDP_SEND_ALERTING_ON_R2MF_COMPLETION (Inbound)

Description: Controls when the protocol will send a GCEV_ALERTING event to the application.

Values:

- 0: GCEV_ALERTING is sent after receiving a ringback tone.
- 1 [default]: GCEV_ALERTING is sent after completion of the R2MF sequence (after receiving the last Group B tone).

CDP_SEND_BLOCK_AT_START_OR_REMOTE_BLOCK

Description: Specifies the bit pattern to be sent on the line at protocol open time and when the remote line goes BLOCKED.

Values:

- 0 [default]: If the protocol is used either as outbound only or as bidirectional.
- 1: If the protocol is used as inbound only.

CDP_TrunkPrefixNumber

Description: Specifies the trunk number used to dial to local exchange. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values: Default is 9.



Italy E1 Bidirectional Protocol Parameter Configuration

This chapter discusses the capabilities and parameters of the Italy E1 Bidirectional protocol in the following topics:

- General Protocol Information 155
- Country Dependent Parameter Descriptions 156

22.1 General Protocol Information

Protocol File Set

The files used with the Italy E1 protocol are listed and described in the following table.

File Type	File Name(s)	
	DM3†	Springware
Protocol Module	pdk_it_e1_io.qs and pdk_it_e1_io.hot (or pdk_it_e1_io.arm.hot for DMT160TEC boards)	pdk_it_e1_io.psi
Voice and Network Parameters	Not applicable	it_300.prm
Country Dependent Parameters	pdk_it_e1_io.cdp	pdk_it_e1_io.cdp
	gc_OpenEx() Protocol Name	
	Not applicable‡	pdk_it_e1_io

†Support on DM3 boards requires Intel® Dialogic® System Release 6.0 for PCI or later.
‡On DM3 boards, the protocol is determined at board initialization time and not when a Global Call device is opened. For compatibility, the **gc_OpenEx()** protocol name may be specified for DM3 boards, but it is not used.

Protocol Limitations

From the Accepted state, the protocol used in this country does not support a forced release of the line; that is, issuing a **gc_DropCall()** function after a **gc_AcceptCall()** function. If a forced release is attempted, the function will fail and an error is returned. To recover, the application should issue a **gc_AnswerCall()** function followed by **gc_DropCall()** and **gc_ReleaseCall()** functions. However, anytime a GCEV_DISCONNECTED event is received in the Accepted state, the **gc_DropCall()** function can be issued.

22.2 Country Dependent Parameter Descriptions

Note: A parameter can be inbound, outbound, or both inbound and outbound. An inbound parameter is used by the protocol when it is acting as inbound. An outbound parameter is used by the protocol when it is acting as outbound. A parameter that is both can be used by the protocol when it is acting as either inbound or outbound.

The modifiable parameters in the *pdk_it_e1_io.cdp* file are:

- [CDP_ClearBwdTimeOut](#)
- [CDP_DNIS_ENABLED](#)
- [CDP_IMMEDIATE_ACCEPTSTATE](#) (Inbound)
- [CDP_NUM_OF_DNIS_DIGITS](#)
- [CDP_ProtocolReset_Timeout](#)
- [CDP_SeizeAck_Timeout](#)
- [CDP_SEND_BLOCK_AT_START_OR_REMOTE_BLOCK](#)

In addition, see [Chapter 3, “Call Progress Analysis Parameters”](#) for configuring default call progress operation in the protocol.

CDP_ClearBwdTimeOut

Description: Defines the maximum time in milliseconds for a backward signal to clear.

Values: Time in milliseconds. Default is 150 (0.150 seconds).

CDP_DNIS_ENABLED

Description: Enables or disables the reception of dialed number identification service (DNIS) digits.

Values:

- 0: Disable the reception of DNIS digits.

Note: Even if this parameter is set to 0, the first forward tone being received will be First DNIS digit only.

- 1 [default]: Enable the reception of DNIS digits.

Guidelines: The behavior of the protocol is not predictable if this parameter is set to a value other than 0 or 1.

For DM3, if DNIS is disabled, you also have to remove **feature_DNIS** from the **SYS_FEATURES** parameter in the *.cdp* file. The **SYS_FEATURES** parameter looks like this:

```
All CHARSTRING_t SYS_FEATURES = "feature_outbound,feature_inbound,feature_DNIS"
```

CDP_IMMEDIATE_ACCEPTSTATE (Inbound)

Description: Specifies when the protocol transitions a call to the Accepted state.

Values:

- 0 [default]: The protocol should wait for the number of rings specified in **gc_AcceptCall()** to expire before transitioning to the Accepted state.
- 1: The protocol should transition a call to the Accepted state immediately upon receipt of **gc_AcceptCall()** and before the specified number of rings have been generated.

Guidelines: This parameter is ignored if the value of the **gc_AcceptCall()** rings parameter is 0.

CDP_NUM_OF_DNIS_DIGITS

Description: Specifies the expected number of DNIS digits to be received.

Values:

- 0: DNIS collection is terminated by I-15 (end of dialing).
- Non-zero [default is 4]: Specifies the number of DNIS digits expected.

CDP_ProtocolReset_Timeout

Description: Defines the maximum time-out in milliseconds for input remotely or from the environment if a protocol reset is active. On expiration of this time-out, the application returns to the initial state.

Values: Time in milliseconds. Default is 5000 (5 seconds).

CDP_SeizeAck_Timeout

Description: Defines the maximum time-out in milliseconds for a CAS_SEIZEACK event once the line is seized by sending a CAS_SEIZE. The remote end is expected to acknowledge the CAS_SEIZE event during this interval. If not, the outgoing call is considered to have failed.

Values: Time in milliseconds. Default is 5000 (5 seconds).

CDP_SEND_BLOCK_AT_START_OR_REMOTE_BLOCK

Description: Specifies the bit pattern to be sent on the line at protocol open time and when the remote line goes BLOCKED.

Values:

- 0 [default]: If the protocol is used either as outbound only or as bidirectional.
- 1: If the protocol is CPE on inbound only trunk or CO on outbound only trunk (that is, the protocol is acting as inbound only).



Korea GDS Lineside E1 Bidirectional Protocol Parameter Configuration

This chapter discusses the capabilities and parameters of the Korea GDS Lineside E1 Bidirectional protocol in the following topics:

- General Protocol Information 159
- Country Dependent Parameter Descriptions 160

23.1 General Protocol Information

Protocol File Set

The files used with the Korea GDS Lineside E1 protocol are listed and described in the following table.

File Type	Filename(s)	
	DM3	Springware
Protocol Module	pdk_sw_e1_gdsls_io.qs and pdk_sw_e1_gdsls_io.hot (or pdk_sw_e1_gdsls_io.arm.hot for DMT160TEC boards)	pdk_sw_e1_gdsls_io.psi
Voice and Network Parameters	Not applicable	r2_300.prm
Country Dependent Parameters	pdk_sw_e1_gdsls_io.cdp	pdk_sw_e1_gdsls_io.cdp
	gc_OpenEx() Protocol Name	
	Not applicable†	pdk_sw_e1_gdsls_io

†On DM3 boards, the protocol is determined at board initialization time and not when a Global Call device is opened. For compatibility, the **gc_OpenEx()** protocol name may be specified for DM3 boards, but it is not used.

Protocol Limitations

None.

23.2 Country Dependent Parameter Descriptions

Note: A parameter can be inbound, outbound, or both inbound and outbound. An inbound parameter is used by the protocol when it is acting as inbound. An outbound parameter is used by the protocol when it is acting as outbound. A parameter that is both can be used by the protocol when it is acting as either inbound or outbound.

The modifiable parameters in the *pdk_sw_e1_gdsls_io.cdp* file are:

- CAS Line Signals (FX or SA)
- CDP_BlindXferTime
- CDP_ConnectOnNoDialTone (Outbound)
- CDP_DelayInDialling (Outbound)
- CDP_DialToneWaitTime (Outbound)
- CDP_MinPBXHangupTime (Inbound)
- CDP_SeizeAck_Timeout
- CDP_WaitDialToneEnabled (Outbound)

In addition, see [Chapter 3, “Call Progress Analysis Parameters”](#) for configuring default call progress operation in the protocol.

CAS Line Signals (FX or SA)

Description: The *pdk_sw_e1_gdsls_io.cdp* file includes two sets of CAS signal definitions, one for FX and the other for SA signals. Only one set should be enabled (uncommented). You need to comment out the other set.

Values: By default, the FX signals are enabled and the SA signals are commented out.

Guidelines: Look in the CDP file for **Definitions for FX** and **Definitions for SA**. Make sure that one set is uncommented and the other is commented.

CDP_BlindXferTime

Description: After sending the address digits on a BlindTransfer request, the protocol waits for the time specified by this parameter before sending CAS_ONHOOK and switching back to IDLE state.

Values: Time in milliseconds. Default is 5000 (5 seconds).

CDP_ConnectOnNoDialTone (Outbound)

Description: Determines how the protocol should proceed when dial tone is not detected. If the parameter is enabled (set to 1), and no dial tone is detected, a local collision with an inbound call is assumed, and the call immediately transitions to Connected state.

Values:

- 0: Do not assume local collision and disconnect the call if no dial tone is detected.
- 1 [default]: Assume local collision and connect the perceived inbound call if no dial tone is detected.

Guidelines: This parameter is applicable only if the **CDP_WaitDialToneEnabled** parameter is set to 1.

CDP_DelayInDialling (Outbound)

Description: Specifies the delay time in dialing when the parameter **CDP_WaitDialToneEnabled** is not enabled.

Values: Default is 100.

CDP_DialToneWaitTime (Outbound)

Description: Defines the time that the protocol waits for a dial tone before an outbound call can be made.

Values: Time in milliseconds. Default is 10000 (10 seconds).

Guidelines: This parameter is applicable only if the **CDP_WaitDialToneEnabled** parameter is set to 1. If the time defined by this parameter is exceeded before dial tone is detected, the action taken depends on the value of the **CDP_ConnectOnNoDialTone** parameter as follows:

- If the **CDP_ConnectOnNoDialTone** parameter is set to 1, a local collision is assumed and the incoming call is connected.
- If the **CDP_ConnectOnNoDialTone** parameter is set to 0, the call attempt fails and a disconnect event is forwarded with a reason of no dial tone.

CDP_MinPBXHangupTime (Inbound)

Description: Specifies the length of the ring cycle and is used to determine if the remote end has dropped an incoming call. The timer is reset at the start of each ring cycle. If the timer expires without resetting, ringing has been acknowledged to stop indicating the call was dropped, as the caller has abandoned the call before it was answered.

Values: Time in milliseconds. Default is 5000 (5 seconds).

CDP_SeizeAck_Timeout

Description: Defines the maximum time-out in milliseconds for a CAS_SEIZEACK event once the line is seized by sending a CAS_SEIZE. The remote end is expected to acknowledge the CAS_SEIZE event during this interval. If not, the outgoing call is considered to have failed.

Values: Time in milliseconds. Default is 5000 (5 seconds).

CDP_WaitDialToneEnabled (Outbound)

Description: Determines if the protocol should wait for a dial tone before dialing. Note that this parameter does **not** apply to supervised transfers (consultation calls), in which case the dial tone is not verified.

Values:

- 0 [default]: Do not wait for dial tone before dialing.
- 1: Wait for dial tone before dialing.

Korea GDS Network E1 Bidirectional Protocol Parameter Configuration

This chapter discusses the capabilities and parameters of the Korea GDS Network E1 Bidirectional protocol in the following topics:

- General Protocol Information 163
- Country Dependent Parameter Descriptions 164

24.1 General Protocol Information

Protocol File Set

The files used with the Korea GDS Network E1 protocol are listed and described in the following table.

File Type	Filename(s)	
	DM3	Springware
Protocol Module	pdk_sw_e1_gdssw_io.qs and pdk_sw_e1_gdssw_io.hot (or pdk_sw_e1_gdssw_io.arm.hot for DMT160TEC boards)	pdk_sw_e1_gdssw_io.psi
Voice and Network Parameters	Not applicable	r2_300.prm
Country Dependent Parameters	pdk_sw_e1_gdssw_io.cdp	pdk_sw_e1_gdssw_io.cdp
	gc_OpenEx () Protocol Name	
	Not applicable†	pdk_sw_e1_gdssw_io

†On DM3 boards, the protocol is determined at board initialization time and not when a Global Call device is opened. For compatibility, the **gc_OpenEx ()** protocol name may be specified for DM3 boards, but it is not used.

Protocol Limitations

This protocol is not guaranteed to conform to or be in compliance with any official switch specifications and should be used only for testing purposes.

24.2 Country Dependent Parameter Descriptions

Note: A parameter can be inbound, outbound, or both inbound and outbound. An inbound parameter is used by the protocol when it is acting as inbound. An outbound parameter is used by the protocol when it is acting as outbound. A parameter that is both can be used by the protocol when it is acting as either inbound or outbound.

The modifiable parameters in the *pdsk_sw_e1_gdssw_io.cdp* file are:

- CAS Line Signals (FX or SA)
- CDP_DialToneEnabled (Inbound)
- CDP_NumDNISDigits (Inbound)
- CDP_OnHoldTime
- CDP_PBXDiscEnabled
- CDP_TERMINATINGMASK (Inbound)
- CDP_ToneGenStopTime (Inbound)

In addition, see [Chapter 3, “Call Progress Analysis Parameters”](#) for configuring default call progress operation in the protocol.

CAS Line Signals (FX or SA)

Description: The *pdsk_sw_e1_gdssw_io.cdp* file includes two sets of CAS signal definitions, one for FX and the other for SA signals. Only one set should be enabled (uncommented). You need to comment out the other set.

Values: By default, the FX signals are enabled and the SA signals are commented out.

Guidelines: Look in the CDP file for **Definitions for FX** and **Definitions for SA**. Make sure that one set is uncommented and the other is commented.

CDP_DialToneEnabled (Inbound)

Description: Determines whether PBX sends dial tone before receiving the first dialed number identification service (DNIS) digit.

Values:

- 0 [default]: Do not send dial tone before receiving first DNIS.
- 1: Send dial tone before receiving first DNIS.

CDP_NumDNISDigits (Inbound)

Description: Specifies the number of DNIS digits to be received.

Values: Default is 4.

CDP_OnHoldTime

Description: Specifies the time a call can be kept in the ONHOLD state. If the call does not come to ACTIVE state during this time, it is dropped.

Values: Time in milliseconds. Default is 60000 (60 seconds).

CDP_PBXDiscEnabled

Description: Determines if the remote PBX can initiate call disconnection.

Values:

- 0: Disable call disconnect supervision, since it is not supported by the PBX.
- 1 [default]: Enable call disconnect supervision provided by the PBX.

CDP_TERMINATINGMASK (Inbound)

Description: Specifies the string of digits that can terminate the dialed string. On receiving a digit from this mask, the collection of address digits will stop.

Values: Default is “#”

CDP_ToneGenStopTime (Inbound)

Description: Specifies the time that the PBX should wait after stopping generation of ringback tone and before sending busy tone.

Values: Time in milliseconds. Default is 12000 (12 seconds).





Korea R2 Bidirectional Protocol Parameter Configuration

25

This chapter discusses the capabilities and parameters of the Korea R2 Bidirectional protocol in the following topics:

- General Protocol Information 167
- Country Dependent Parameter Descriptions 167

25.1 General Protocol Information

Protocol File Set

The files used with the Korea R2 protocol are listed and described in the following table.

File Type	File Name(s)	
	DM3	Springware
Protocol Module	pdk_r2_io.qs and pdk_r2_io.hot (or pdk_r2_io.arm.hot for DMT160TEC boards)	pdk_r2_io.psi
Voice and Network Parameters	Not applicable	kr_300.prm
Country Dependent Parameters	pdk_kr_r2_io.cdp	pdk_kr_r2_io.cdp
	gc_OpenEx() Protocol Name	
	Not applicable†	pdk_kr_r2_io

†On DM3 boards, the protocol is determined at board initialization time and not when a Global Call device is opened. For compatibility, the **gc_OpenEx()** protocol name may be specified for DM3 boards, but it is not used.

Protocol Limitations

If a DropCall is attempted in the ACCEPTED state, the protocol will answer the call by sending out the ANSWER pattern before dropping the call, as forced release is not supported in this protocol.

25.2 Country Dependent Parameter Descriptions

Note: A parameter can be inbound, outbound, or both inbound and outbound. An inbound parameter is used by the protocol when it is acting as inbound. An outbound parameter is used by the protocol when it is acting as outbound. A parameter that is both can be used by the protocol when it is acting as either inbound or outbound.

The modifiable parameters in the *pdk_kr_r2_io.cdp* file are:

- CDP_ANI_ENABLED (Inbound)
- CDP_ANI_MaxDigits (Inbound)
- CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED
- CDP_ANI_WITHAC_FACILITY_ENABLED (Outbound)
- CDP_AreaCode
- CDP_CallingPartyCategory (Outbound)
- CDP_ConnectType (Outbound)
- CDP_DNIS_MaxDigits (Inbound)
- CDP_Drop_Using_ProgressTones_After_AcceptCall (Inbound)
- CDP_FLAG_APPEND_F (Outbound)
- CDP_GrpB_Tone (Inbound)
- CDP_IMMEDIATE_ACCEPTSTATE (Inbound)
- CDP_IS_ANIAVAILABILITY_CHECK_NEEDED
- CDP_IS_CALLING_LINE_IDENTIFICATION_PERMITTED (Outbound)
- CDP_NO_OF_DNIS_BEFORE_CAT (Inbound)
- CDP_NUM_OF_AC_DIGITS (Inbound)
- CDP_NUM_OF_ANI_DIGITS (Inbound)
- CDP_NUM_OF_DNIS_DIGITS (Inbound)
- CDP_OVERLAP_SENDING_ENABLED (Outbound)
- CDP_REJECT_WITH_A3B4 (Inbound)
- CDP_SEND_ALERTING_ON_R2MF_COMPLETION (Inbound)
- CDP_SEND_BLOCK_AT_START_OR_REMOTE_BLOCK
- CDP_TrunkPrefixNumber

In addition, see Chapter 3, “Call Progress Analysis Parameters” for configuring default call progress operation in the protocol.

CDP_ANI_ENABLED (Inbound)

Description: Enables or disables the reception of automatic number identification (ANI) digits.

Values:

- 0: Disable the reception of ANI digits.
- 1 [default]: Enable the reception of ANI digits.

Guidelines: If this parameter is set to a value other than 0 or 1, the behavior of the protocol is not predictable.

For DM3, if ANI is disabled, you also have to remove **feature_ANI** from the **SYS_FEATURES** parameter in the *.cdp* file. The **SYS_FEATURES** parameter looks like this:

```
All CHARSTRING_t SYS_FEATURES = "feature_outbound,feature_inbound,feature_DNIS,
feature_Billing,feature_ANI,feature_CAT,feature_MoreDNIS"
```

CDP_ANI_MaxDigits (Inbound)

Description: Specifies the maximum number of ANI digits that can be received when using this protocol.

Values: Default is 16.

Guidelines: If this parameter value is set to 0, the behavior of the protocol is not predictable.

CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED

Description: Specifies whether ANI is to be requested (inbound) or sent (outbound) with the area code.

Values:

- 0 [default]: Request (inbound) or send (outbound) ANI digits without area code.
- 1: Request (inbound) or send (outbound) area code with ANI digits.

CDP_ANI_WITHAC_FACILITY_ENABLED (Outbound)

Description: Specifies whether ANI digits and area code are sent to the inbound side. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values:

- 0 [default]: The requested information denied tone is sent to the inbound side.
- 1: ANI digits with area code are sent to the inbound side.

CDP_AreaCode

Description: Specifies the area code of the local exchange where the subscriber is connected. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values: Default is 987.

CDP_CallingPartyCategory (Outbound)

Description: Specifies the category of the calling subscriber.

Values:

- 1 [default]: Subscriber without priority
- 2: Subscriber with priority
- 3: Maintenance equipment
- 5: Operator
- 6: Data transmission

CDP_ConnectType (Outbound)

Description: Specifies the mode for outbound connect detection. Two types of connection events can be detected: the cas_answer received signaling bit pattern and the media type detection used

when post-connect call analysis is enabled. The application has options as to when the call is considered connected, as set by this parameter. The application also has options as to whether call analysis continues after the call has been connected when `cas_answer` is received first.

Values:

- 0 [default]: The protocol transitions to the connected state only when `cas_answer` is received. If `cas_answer` is received first, call analysis is stopped. If call analysis is received first, the result is sent to the application via a `GCEV_MEDIADETECTED` event, but the protocol does not transition to the connected state until `cas_answer` is received.
- 1: The protocol transitions to the connected state when the first event (either `cas_answer` or call analysis) is received. If `cas_answer` is received first, call analysis still continues and the result is sent to the application via a `GCEV_MEDIADETECTED` event. If call analysis is received first, the subsequent `cas_answer` is ignored.
- 2: The protocol transitions to the connected state when the first event (either `cas_answer` or call analysis) is received. If `cas_answer` is received first, call analysis is stopped. If call analysis is received first, the subsequent `cas_answer` is ignored.
- 3: The protocol transitions to the connected state only when call analysis is received. If call analysis is received first, the subsequent `cas_answer` is ignored. If `cas_answer` is received first, it is ignored.

CDP_DNIS_MaxDigits (Inbound)

Description: Specifies the maximum number of dialed number identification service (DNIS) digits that can be received when using this protocol.

Values: Default is 16.

Guidelines: If this parameter value is set to 0, the behavior of the protocol is not predictable.

CDP_Drop_Using_ProgressTones_After_AcceptCall (Inbound)

Description: Specifies the call progress tone to be sent for dropping a call, when doing a `gc_DropCall()` after a `gc_AcceptCall()`.

Values:

- 0 [default]: The protocol sends the Answer Line signal, waits for the time specified by `CDP_TimeToRecognizeAnswer`, and then sends a Clear Backward line signal for call disconnection. In this case, the call will be charged for the remote calling subscriber, even though the call is not successful.
- 1: The protocol sends the appropriate call progress tone depending on the `gc_DropCall()` cause to the remote end, and waits for a Clear Forward Line signal for call disconnection.

CDP_FLAG_APPEND_F (Outbound)

Description: When the remote end asks for the next DNIS digit through Group A backward tone, and the protocol does not have any more DNIS available to be sent, this parameter specifies

whether to send the I-15 tone or to remain silent and prepare for A3 or A4 pulse from the remote end.

Values:

- 0 [default]: No tone will be sent to the remote end. In this case, A3 or A4 pulse is expected to be received from the remote end. In a case of overlapped sending (see description of **CDP_OVERLAP_SENDING_ENABLED** parameter), the remote end may also send A1 to request more information.
- 1: 'f' (I-15) will be sent to the remote end, indicating the end of information.

CDP_GrpB_Tone (Inbound)

Description: Determines whether the sender should be charged after receiving the tone. The tone is sent from the inbound end on receipt of Category for Group II. After this tone, the sequence of R2MF tone exchange is over and the call is connected. This is the last R2MF tone in establishment of a call.

Values:

- 6 [default]: Line free, not chargeable
- 7: Line free, chargeable

CDP_IMMEDIATE_ACCEPTSTATE (Inbound)

Description: Specifies when the protocol transitions a call to the Accepted state.

Values:

- 0 [default]: The protocol should wait for the number of rings specified in **gc_AcceptCall()** to expire before transitioning to the Accepted state.
- 1: The protocol should transition a call to the Accepted state immediately upon receipt of **gc_AcceptCall()** and before the specified number of rings have been generated.

Guidelines: This parameter is ignored if the value of the **gc_AcceptCall()** rings parameter is 0.

CDP_IS_ANIAVAILABILITY_CHECK_NEEDED

Description: Determines whether the status of ANI availability is checked before ANI digits are exchanged. At the inbound side, this parameter specifies whether ANI availability at the outbound side has to be verified or if ANI digits can be requested directly. At the outbound side, ANI digits are passed directly or the inbound side is informed of the availability (status) first.

Values:

- 0 [default]: The status of ANI availability is not checked before ANI digits are exchanged. ANI digits can be requested directly without knowing the status of the outbound side.
- 1: The status of ANI availability is checked before ANI digits are exchanged. The inbound side requests the status of ANI availability. If ANI digits are available, the inbound side requests the ANI digits. The outbound side sends the status of ANI availability and then waits for the inbound request.

CDP_IS_CALLING_LINE_IDENTIFICATION_PERMITTED (Outbound)

Description: Specifies whether Calling Line Identification is enabled. This parameter is used to enable CLIP and CLIR conditions.

Values:

- 0: Calling Line Identification Rejected (CLIR). The requested information denied tone is sent to the inbound side.
- 1 [default]: Calling Line Identification Permitted (CLIP). ANI digits are sent to the inbound side.

CDP_NO_OF_DNIS_BEFORE_CAT (Inbound)

Description: Determines the number of DNIS digits that are to be received before any category information is received. If this parameter is set to non-zero, the following sequence of events occurs:

1. Partial DNIS digits are received.
2. Category digits are received.
3. The remaining DNIS digits are received.
4. ANI digits are received (if **CDP_ANI_ENABLED** is 1).
5. Category digits are received again.

Values:

- 0 [default]: Indicates that category must be received after all DNIS digits are received.
- Non-zero: Specifies the number of DNIS digits received before category information is received.

Guidelines: The behavior of the protocol will not be predictable, unless the following occurs:

- If this parameter is set to non-zero, **CDP_ANI_ENABLED** must be set to 1.
- If this parameter is set to non-zero, its value should be the minimum of **CDP_NUM_OF_DNIS_DIGITS** (if non-zero), **CDP_DNIS_MaxDigits**, and the actual DNIS digits to be received.

CDP_NUM_OF_AC_DIGITS (Inbound)

Description: Specifies the number of area code digits of the local exchange from where it received the call. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values: Default is 3.

CDP_NUM_OF_ANI_DIGITS (Inbound)

Description: Specifies the expected number of ANI digits to be received.

Values:

- 0 [default]: ANI collection is terminated by I-15 (end of dialing).
- Non-zero: Specifies the number of ANI digits expected. This number should always be less than **CDP_ANI_MaxDigits**.

CDP_NUM_OF_DNIS_DIGITS (Inbound)

Description: Specifies the expected number of DNIS digits to be received.

Values:

- 0: DNIS collection is terminated by I-15 (end of dialing).
- Non-zero [default is 4]: Specifies the number of DNIS digits expected. This number should always be less than **CDP_DNIS_MaxDigits**.

CDP_OVERLAP_SENDING_ENABLED (Outbound)

Description: Enables or disables the overlap sending feature.

Values:

- 0: Disables overlap sending. 'f' will be appended to DNIS digits received with **gc_MakeCall()** (if **CDP_FLAG_APPEND_F** is true), indicating the end of information.
- 1 [default]: Enables overlap sending. The remote end can request more DNIS information, in which case a REQMOREINFO event will be generated. **gc_SendMoreInfo()** with Null information will either cause 'f' to be sent to the remote end or will remain silent (depending on the value of **CDP_FLAG_APPEND_F**), thus indicating to the remote end that no more DNIS digits are available.

CDP_REJECT_WITH_A3B4 (Inbound)

Description: Determines the method for rejecting a call when an R2MF tone error is received during call setup.

Values:

- 0 [default]: Call is rejected with a direct group A tone (A-10), which is a spare tone that may be used to indicate congestion.
- 1: Call is rejected with an A3-B4 tone combination, which means that the inbound (local) end sends an A-3 tone (send category and change over to group B tones). Then, the category is received and in response, a B-4 tone is sent to reject the call.

CDP_SEND_ALERTING_ON_R2MF_COMPLETION (Inbound)

Description: Controls when the protocol will send a GCEV_ALERTING event to the application.

Values:

- 0: GCEV_ALERTING is sent after receiving a ringback tone.
- 1 [default]: GCEV_ALERTING is sent after completion of the R2MF sequence (after receiving the last Group B tone).

CDP_SEND_BLOCK_AT_START_OR_REMOTE_BLOCK

Description: Specifies the bit pattern to be sent on the line at protocol open time and when the remote line goes BLOCKED.

Values:

- 0 [default]: If the protocol is used either as outbound only or as bidirectional.
- 1: If the protocol is used as inbound only.

CDP_TrunkPrefixNumber

Description: Specifies the trunk number used to dial to local exchange. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values: Default is 9.



Lucent Lineside E1 Bidirectional Protocol Parameter Configuration 26

This chapter discusses the capabilities and parameters of the Lucent Lineside E1 Bidirectional protocol in the following topics:

- General Protocol Information 175
- Country Dependent Parameter Descriptions 176

26.1 General Protocol Information

Protocol File Set

The files used with the Lucent Lineside E1 protocol are listed and described in the following table.

File Type	File Name(s)	
	DM3	Springware
Protocol Module	pdk_sw_e1_fxs_io.qs and pdk_sw_e1_fxs_io.hot (or pdk_sw_e1_fxs_io.arm.hot for DMT160TEC boards)	pdk_sw_e1_fxs_io.psi
Voice and Network Parameters	Not applicable	r2_300.prm
Country Dependent Parameters	pdk_sw_e1_luls_io.cdp	pdk_sw_e1_luls_io.cdp
	gc_OpenEx() Protocol Name	
	Not applicable†	pdk_sw_e1_luls_io

†On DM3 boards, the protocol is determined at board initialization time and not when a Global Call device is opened. For compatibility, the **gc_OpenEx()** protocol name may be specified for DM3 boards, but it is not used.

Protocol Limitations

After a call is transferred with **gc_SetUpTransfer()**, you cannot issue a **gc_DropCall()** on the original call. You must drop the consultation call before the original call can be dropped. The behavior of the protocol is undefined if you try to drop the original call without dropping the consultation call first.

26.2 Country Dependent Parameter Descriptions

Note: A parameter can be inbound, outbound, or both inbound and outbound. An inbound parameter is used by the protocol when it is acting as inbound. An outbound parameter is used by the protocol when it is acting as outbound. A parameter that is both can be used by the protocol when it is acting as either inbound or outbound.

The modifiable parameters in the *pdk_sw_e1_luls_io.cdp* file are:

- CDP_BlindXferTime
- CDP_ConnectOnNoDialTone (Outbound)
- CDP_ConnectOnNoRingBack (Outbound)
- CDP_DelayInDialing (Outbound)
- CDP_DialToneWaitTime (Outbound)
- CDP_MinPBXHangupTime (Inbound)
- CDP_OnhookTime (Outbound)
- CDP_PBXDiscEnabled
- CDP_ProtocolStopsOffhook
- CDP_WaitDialToneEnabled (Outbound)

In addition, see [Chapter 3, “Call Progress Analysis Parameters”](#) for configuring default call progress operation in the protocol.

CDP_BlindXferTime

Description: After sending the address digits on a BlindTransfer request, the protocol waits for the time specified by this parameter before sending CAS_ONHOOK and switching back to IDLE state.

Values: Time in milliseconds. Default is 5000 (5 seconds).

CDP_ConnectOnNoDialTone (Outbound)

Description: Determines how the protocol should proceed when dial tone is not detected. If the parameter is enabled (set to 1), and no dial tone is detected, a local collision with an inbound call is assumed, and the call immediately transitions to Connected state.

Values:

- 0: Do not assume local collision and disconnect the call if no dial tone is detected.
- 1 [default]: Assume local collision and connect the perceived inbound call if no dial tone is detected.

Guidelines: This parameter is applicable only if the **CDP_WaitDialToneEnabled** parameter is set to 1.

CDP_ConnectOnNoRingBack (Outbound)

Description: Determines how the protocol should proceed when no ringback tone is detected. If the parameter is enabled (set to 1), and no ringback is detected, a remote collision with a remote outbound call is assumed, and the call immediately transitions to Connected state.

Values:

- 0 [default]: Do not assume remote collision and disconnect the call if no ringback is detected.
- 1: Assume remote collision and connect the call if no ringback is detected.

CDP_DelayInDialing (Outbound)

Description: Specifies the delay time in dialing when the parameter **CDP_WaitDialToneEnabled** is not enabled.

Values: Default is 100.

CDP_DialToneWaitTime (Outbound)

Description: Defines the time that the protocol waits for a dial tone before an outbound call can be made.

Values: Time in milliseconds. Default is 10000 (10 seconds).

Guidelines: This parameter is applicable only if the **CDP_WaitDialToneEnabled** parameter is set to 1. If the time defined by this parameter is exceeded before dial tone is detected, the action taken depends on the value of the **CDP_ConnectOnNoDialTone** parameter as follows:

- If the **CDP_ConnectOnNoDialTone** parameter is set to 1, a local collision is assumed and the incoming call is connected.
- If the **CDP_ConnectOnNoDialTone** parameter is set to 0, the call attempt fails and a disconnect event is forwarded with a reason of no dial tone.

CDP_MinPBXHangupTime (Inbound)

Description: Specifies the length of the ring cycle and is used to determine if the remote end (that is, the PBX) has dropped an incoming call. The timer is reset at the start of each ring cycle. If the timer expires without resetting, ringing has been acknowledged to stop indicating the PBX has dropped the call, as the caller has abandoned the call before it was answered.

Values: Time in milliseconds. Default is 5000 (5 seconds).

Guidelines: The value of this parameter is typically set to 6 seconds, which corresponds to the complete ring cycle (2 seconds on and 4 seconds of silence).

CDP_OnhookTime (Outbound)

Description: If Lineside E1 is outbound only and starts in the off-hook state, it remains in the off-hook state until it receives a **gc_MakeCall()**. This parameter specifies the time during which Lineside E1 should remain on-hook before processing the **gc_MakeCall()**.

Values: Time in milliseconds. Default is 500 (0.5 seconds).

CDP_PBXDiscEnabled

Description: Determines if the remote PBX can initiate call disconnection via CAS line signaling.

Values:

- 0: Disable call disconnect supervision, since it is not supported by the PBX.
- 1 [default]: Enable call disconnect supervision provided by the PBX.

CDP_ProtocolStopsOffhook

Description: Determines the state of the hook switch signaling (on-hook or off-hook) when the protocol stops after `gc_Close()`.

Note: This parameter has no effect on DM3 boards, because the protocol is not stopped until the board is stopped.

Values:

- 0 [default]: Set the hook switch state to on-hook.
- 1: Set the hook switch state to off-hook.

CDP_WaitDialToneEnabled (Outbound)

Description: Determines if the protocol should wait for a dial tone before dialing. Note that this parameter does **not** apply to supervised transfers (consultation calls), in which case the dial tone is not verified.

Values:

- 0 [default]: Do not wait for dial tone before dialing.
- 1: Wait for dial tone before dialing.

Malaysia R2 Bidirectional Protocol Parameter Configuration

This chapter discusses the capabilities and parameters of the Malaysia R2 Bidirectional protocol in the following topics:

- General Protocol Information 179
- Country Dependent Parameter Descriptions 179

27.1 General Protocol Information

Protocol File Set

The files used with the Malaysia R2 protocol are listed and described in the following table.

File Type	File Name(s)	
	DM3	Springware
Protocol Module	pdk_r2_io.qs and pdk_r2_io.hot (or pdk_r2_io.arm.hot for DMT160TEC boards)	pdk_r2_io.psi
Voice and Network Parameters	Not applicable	my_300.prm
Country Dependent Parameters	pdk_my_r2_io.cdp	pdk_my_r2_io.cdp
	gc_OpenEx() Protocol Name	
	Not applicable†	pdk_my_r2_io

†On DM3 boards, the protocol is determined at board initialization time and not when a Global Call device is opened. For compatibility, the **gc_OpenEx()** protocol name may be specified for DM3 boards, but it is not used.

Protocol Limitations

If a DropCall is attempted in the ACCEPTED state, the protocol will answer the call by sending out the ANSWER pattern before dropping the call, as forced release is not supported in this protocol.

27.2 Country Dependent Parameter Descriptions

Note: A parameter can be inbound, outbound, or both inbound and outbound. An inbound parameter is used by the protocol when it is acting as inbound. An outbound parameter is used by the protocol when it is acting as outbound. A parameter that is both can be used by the protocol when it is acting as either inbound or outbound.

The modifiable parameters in the *pdk_my_r2_io.cdp* file are:

- CDP_ANI_ENABLED (Inbound)
- CDP_ANI_MaxDigits (Inbound)
- CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED
- CDP_ANI_WITHAC_FACILITY_ENABLED (Outbound)
- CDP_AreaCode
- CDP_CallingPartyCategory (Outbound)
- CDP_ConnectType (Outbound)
- CDP_DNIS_MaxDigits (Inbound)
- CDP_Drop_Using_ProgressTones_After_AcceptCall (Inbound)
- CDP_FLAG_APPEND_F (Outbound)
- CDP_GrpB_Tone (Inbound)
- CDP_IMMEDIATE_ACCEPTSTATE (Inbound)
- CDP_IS_ANIAVAILABILITY_CHECK_NEEDED
- CDP_IS_CALLING_LINE_IDENTIFICATION_PERMITTED (Outbound)
- CDP_NO_OF_DNIS_BEFORE_CAT (Inbound)
- CDP_NUM_OF_AC_DIGITS (Inbound)
- CDP_NUM_OF_ANI_DIGITS (Inbound)
- CDP_NUM_OF_DNIS_DIGITS (Inbound)
- CDP_OVERLAP_SENDING_ENABLED (Outbound)
- CDP_REJECT_WITH_A3B4 (Inbound)
- CDP_SEND_ALERTING_ON_R2MF_COMPLETION (Inbound)
- CDP_SEND_BLOCK_AT_START_OR_REMOTE_BLOCK
- CDP_TrunkPrefixNumber

In addition, see Chapter 3, “Call Progress Analysis Parameters” for configuring default call progress operation in the protocol.

CDP_ANI_ENABLED (Inbound)

Description: Enables or disables the reception of automatic number identification (ANI) digits.

Values:

- 0: Disable the reception of ANI digits.
- 1 [default]: Enable the reception of ANI digits.

Guidelines: If this parameter is set to a value other than 0 or 1, the behavior of the protocol is not predictable.

For DM3, if ANI is disabled, you also have to remove **feature_ANI** from the **SYS_FEATURES** parameter in the *.cdp* file. The **SYS_FEATURES** parameter looks like this:

```
All CHARSTRING_t SYS_FEATURES = "feature_outbound,feature_inbound,feature_DNIS,
feature_Billing,feature_ANI,feature_CAT,feature_MoreDNIS"
```

CDP_ANI_MaxDigits (Inbound)

Description: Specifies the maximum number of ANI digits that can be received when using this protocol.

Values: Default is 16.

Guidelines: If this parameter value is set to 0, the behavior of the protocol is not predictable.

CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED

Description: Specifies whether ANI is to be requested (inbound) or sent (outbound) with the area code.

Values:

- 0 [default]: Request (inbound) or send (outbound) ANI digits without area code.
- 1: Request (inbound) or send (outbound) area code with ANI digits.

CDP_ANI_WITHAC_FACILITY_ENABLED (Outbound)

Description: Specifies whether ANI digits and area code are sent to the inbound side. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values:

- 0 [default]: The requested information denied tone is sent to the inbound side.
- 1: ANI digits with area code are sent to the inbound side.

CDP_AreaCode

Description: Specifies the area code of the local exchange where the subscriber is connected. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values: Default is 987.

CDP_CallingPartyCategory (Outbound)

Description: Specifies the category of the calling subscriber.

Values:

- 1: Operator with trunk offering
- 2 [default]: Ordinary subscriber
- 3: CCB unit free
- 4: Multicoin CCB
- 5: STD CCB
- 6: Test equipment
- 7: Subscriber with priority
- 8: Interception operator
- 9: Data transmission
- A: Reserved for operator initiated call with forward transfer facility (international)

CDP_ConnectType (Outbound)

Description: Specifies the mode for outbound connect detection. Two types of connection events can be detected: the cas_answer received signaling bit pattern and the media type detection used when post-connect call analysis is enabled. The application has options as to when the call is considered connected, as set by this parameter. The application also has options as to whether call analysis continues after the call has been connected when cas_answer is received first.

Values:

- 0 [default]: The protocol transitions to the connected state only when cas_answer is received. If cas_answer is received first, call analysis is stopped. If call analysis is received first, the result is sent to the application via a GCEV_MEDIADETECTED event, but the protocol does not transition to the connected state until cas_answer is received.
- 1: The protocol transitions to the connected state when the first event (either cas_answer or call analysis) is received. If cas_answer is received first, call analysis still continues and the result is sent to the application via a GCEV_MEDIADETECTED event. If call analysis is received first, the subsequent cas_answer is ignored.
- 2: The protocol transitions to the connected state when the first event (either cas_answer or call analysis) is received. If cas_answer is received first, call analysis is stopped. If call analysis is received first, the subsequent cas_answer is ignored.
- 3: The protocol transitions to the connected state only when call analysis is received. If call analysis is received first, the subsequent cas_answer is ignored. If cas_answer is received first, it is ignored.

CDP_DNIS_MaxDigits (Inbound)

Description: Specifies the maximum number of dialed number identification service (DNIS) digits that can be received when using this protocol.

Values: Default is 16.

Guidelines: If this parameter value is set to 0, the behavior of the protocol is not predictable.

CDP_Drop_Using_ProgressTones_After_AcceptCall (Inbound)

Description: Specifies the call progress tone to be sent for dropping a call, when doing a `gc_DropCall()` after a `gc_AcceptCall()`.

Values:

- 0 [default]: The protocol sends the Answer Line signal, waits for the time specified by `CDP_TimeToRecognizeAnswer`, and then sends a Clear Backward line signal for call disconnection. In this case, the call will be charged for the remote calling subscriber, even though the call is not successful.
- 1: The protocol sends the appropriate call progress tone depending on the `gc_DropCall()` cause to the remote end, and waits for a Clear Forward Line signal for call disconnection.

CDP_FLAG_APPEND_F (Outbound)

Description: When the remote end asks for the next DNIS digit through Group A backward tone, and the protocol does not have any more DNIS available to be sent, this parameter specifies whether to send the I-15 tone or to remain silent and prepare for A3 or A4 pulse from the remote end.

Values:

- 0 [default]: No tone will be sent to the remote end. In this case, A3 or A4 pulse is expected to be received from the remote end. In a case of overlapped sending (see description of `CDP_OVERLAP_SENDING_ENABLED` parameter), the remote end may also send A1 to request more information.
- 1: 'f' (I-15) will be sent to the remote end, indicating the end of information.

CDP_GrpB_Tone (Inbound)

Description: Determines whether the sender should be charged after receiving the tone. The tone is sent from the inbound end on receipt of Category for Group II. After this tone, the sequence of R2MF tone exchange is over and the call is connected. This is the last R2MF tone in establishment of a call.

Values:

- 1 [default]: Called party free, with metering
- 5: Called party free, without metering

CDP_IMMEDIATE_ACCEPTSTATE (Inbound)

Description: Specifies when the protocol transitions a call to the Accepted state.

Values:

- 0 [default]: The protocol should wait for the number of rings specified in `gc_AcceptCall()` to expire before transitioning to the Accepted state.
- 1: The protocol should transition a call to the Accepted state immediately upon receipt of `gc_AcceptCall()` and before the specified number of rings have been generated.

Guidelines: This parameter is ignored if the value of the `gc_AcceptCall()` rings parameter is 0.

CDP_IS_ANIAVAILABILITY_CHECK_NEEDED

Description: Determines whether the status of ANI availability is checked before ANI digits are exchanged. At the inbound side, this parameter specifies whether ANI availability at the outbound side has to be verified or if ANI digits can be requested directly. At the outbound side, ANI digits are passed directly or the inbound side is informed of the availability (status) first.

Values:

- 0 [default]: The status of ANI availability is not checked before ANI digits are exchanged. ANI digits can be requested directly without knowing the status of the outbound side.
- 1: The status of ANI availability is checked before ANI digits are exchanged. The inbound side requests the status of ANI availability. If ANI digits are available, the inbound side requests the ANI digits. The outbound side sends the status of ANI availability and then waits for the inbound request.

CDP_IS_CALLING_LINE_IDENTIFICATION_PERMITTED (Outbound)

Description: Specifies whether Calling Line Identification is enabled. This parameter is used to enable CLIP and CLIR conditions.

Values:

- 0: Calling Line Identification Rejected (CLIR). The requested information denied tone is sent to the inbound side.
- 1 [default]: Calling Line Identification Permitted (CLIP). ANI digits are sent to the inbound side.

CDP_NO_OF_DNIS_BEFORE_CAT (Inbound)

Description: Determines the number of DNIS digits that are to be received before any category information is received. If this parameter is set to non-zero, the following sequence of events occurs:

1. Partial DNIS digits are received.
2. Category digits are received.
3. The remaining DNIS digits are received.
4. ANI digits are received (if **CDP_ANI_ENABLED** is 1).
5. Category digits are received again.

Values:

- 0 [default]: Indicates that category must be received after all DNIS digits are received.
- Non-zero: Specifies the number of DNIS digits received before category information is received.

Guidelines: The behavior of the protocol will not be predictable, unless the following occurs:

- If this parameter is set to non-zero, **CDP_ANI_ENABLED** must be set to 1.
- If this parameter is set to non-zero, its value should be the minimum of **CDP_NUM_OF_DNIS_DIGITS** (if non-zero), **CDP_DNIS_MaxDigits**, and the actual DNIS digits to be received.

CDP_NUM_OF_AC_DIGITS (Inbound)

Description: Specifies the number of area code digits of the local exchange from where it received the call. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values: Default is 3.

CDP_NUM_OF_ANI_DIGITS (Inbound)

Description: Specifies the expected number of ANI digits to be received.

Values:

- 0 [default]: ANI collection is terminated by I-15 (end of dialing).
- Non-zero: Specifies the number of ANI digits expected. This number should always be less than **CDP_ANI_MaxDigits**.

CDP_NUM_OF_DNIS_DIGITS (Inbound)

Description: Specifies the expected number of DNIS digits to be received.

Values:

- 0: DNIS collection is terminated by I-15 (end of dialing).
- Non-zero [default is 4]: Specifies the number of DNIS digits expected. This number should always be less than **CDP_DNIS_MaxDigits**.

CDP_OVERLAP_SENDING_ENABLED (Outbound)

Description: Enables or disables the overlap sending feature.

Values:

- 0: Disables overlap sending. 'f' will be appended to DNIS digits received with **gc_MakeCall()** (if **CDP_FLAG_APPEND_F** is true), indicating the end of information.
- 1 [default]: Enables overlap sending. The remote end can request more DNIS information, in which case a **REQMOREINFO** event will be generated. **gc_SendMoreInfo()** with Null information will either cause 'f' to be sent to the remote end or will remain silent (depending on the value of **CDP_FLAG_APPEND_F**), thus indicating to the remote end that no more DNIS digits are available.

CDP_REJECT_WITH_A3B4 (Inbound)

Description: Determines the method for rejecting a call when an R2MF tone error is received during call setup.

Values:

- 0 [default]: Call is rejected with a direct group A tone (A-10), which is a spare tone that may be used to indicate congestion.
- 1: Call is rejected with an A3-B4 tone combination, which means that the inbound (local) end sends an A-3 tone (send category and change over to group B tones). Then, the category is received and in response, a B-4 tone is sent to reject the call.

CDP_SEND_ALERTING_ON_R2MF_COMPLETION (Inbound)

Description: Controls when the protocol will send a GCEV_ALERTING event to the application.

Values:

- 0: GCEV_ALERTING is sent after receiving a ringback tone.
- 1 [default]: GCEV_ALERTING is sent after completion of the R2MF sequence (after receiving the last Group B tone).

CDP_SEND_BLOCK_AT_START_OR_REMOTE_BLOCK

Description: Specifies the bit pattern to be sent on the line at protocol open time and when the remote line goes BLOCKED.

Values:

- 0 [default]: If the protocol is used either as outbound only or as bidirectional.
- 1: If the protocol is used as inbound only.

CDP_TrunkPrefixNumber

Description: Specifies the trunk number used to dial to local exchange. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values: Default is 9.

MELCAS Lineside Bidirectional Protocol Parameter Configuration 28

This chapter discusses the capabilities and parameters of the MELCAS Lineside Bidirectional protocol in the following topics:

- General Protocol Information 187
- Country Dependent Parameter Descriptions 187

28.1 General Protocol Information

Protocol File Set

The files used with the MELCAS Lineside protocol are listed and described in the following table.

File Type	Filename(s)	
	DM3	Springware
Protocol Module	pdk_sw_e1_mcls_io.qs and pdk_sw_e1_mcls_io.hot (or pdk_sw_e1_mcls_io.arm.hot for DMT160TEC boards)	pdk_sw_e1_mcls_io.psi
Voice and Network Parameters	Not applicable	r2_300.prm
Country Dependent Parameters	pdk_sw_e1_mcls_io.cdp	pdk_sw_e1_mcls_io.cdp
	gc_OpenEx() Protocol Name	
	Not applicable†	pdk_sw_e1_mcls_io

†On DM3 boards, the protocol is determined at board initialization time and not when a Global Call device is opened. For compatibility, the **gc_OpenEx()** protocol name may be specified for DM3 boards, but it is not used.

Protocol Limitations

None.

28.2 Country Dependent Parameter Descriptions

Note: A parameter can be inbound, outbound, or both inbound and outbound. An inbound parameter is used by the protocol when it is acting as inbound. An outbound parameter is used by the protocol when it is acting as outbound. A parameter that is both can be used by the protocol when it is acting as either inbound or outbound.

The modifiable parameters in the *pdk_sw_e1_mcls_io.cdp* file are:

- [CDP_ConnectType \(Outbound\)](#)
- [CDP_DTMF_DIALING \(Outbound\)](#)
- [CDP_SEND_BLOCK_AT_START_OR_REMOTE_BLOCK](#)

In addition, see [Chapter 3, “Call Progress Analysis Parameters”](#) for configuring default call progress operation in the protocol.

[CDP_ConnectType \(Outbound\)](#)

Description: Specifies the mode for outbound connect detection. Two types of connection events can be detected: the `cas_answer` received signaling bit pattern and the media type detection used when post-connect call analysis is enabled. The application has options as to when the call is considered connected, as set by this parameter. The application also has options as to whether call analysis continues after the call has been connected when `cas_answer` is received first.

Values:

- 0 [default]: The protocol transitions to the connected state only when `cas_answer` is received. If `cas_answer` is received first, call analysis is stopped. If call analysis is received first, the result is sent to the application via a `GCEV_MEDIADETECTED` event, but the protocol does not transition to the connected state until `cas_answer` is received.
- 1: The protocol transitions to the connected state when the first event (either `cas_answer` or call analysis) is received. If `cas_answer` is received first, call analysis still continues and the result is sent to the application via a `GCEV_MEDIADETECTED` event. If call analysis is received first, the subsequent `cas_answer` is ignored.
- 2: The protocol transitions to the connected state when the first event (either `cas_answer` or call analysis) is received. If `cas_answer` is received first, call analysis is stopped. If call analysis is received first, the subsequent `cas_answer` is ignored.
- 3: The protocol transitions to the connected state only when call analysis is received. If call analysis is received first, the subsequent `cas_answer` is ignored. If `cas_answer` is received first, it is ignored.

[CDP_DTMF_DIALING \(Outbound\)](#)

Description: Specifies whether digits are dialed in DTMF format or pulse format.

Values:

- 0: Pulse format
- 1 [default]: DTMF format

[CDP_SEND_BLOCK_AT_START_OR_REMOTE_BLOCK](#)

Description: Specifies the bit pattern to be sent on the line at protocol open time and when the remote line goes BLOCKED.

Values:

- 0 [default]: If the protocol is used either as outbound only or as bidirectional.
- 1: If the protocol is used as inbound only.

MELCAS Network Bidirectional Protocol Parameter Configuration

This chapter discusses the capabilities and parameters of the MELCAS Network Bidirectional protocol in the following topics:

- General Protocol Information 189
- Country Dependent Parameter Descriptions 189

29.1 General Protocol Information

Protocol File Set

The files used with the MELCAS Network protocol are listed and described in the following table.

File Type	Filename(s)	
	DM3	Springware
Protocol Module	pdk_sw_e1_mcsw_io.qs and pdk_sw_e1_mcsw_io.hot (or pdk_sw_e1_mcsw_io.arm.hot for DMT160TEC boards)	pdk_sw_e1_mcsw_io.psi
Voice and Network Parameters	Not applicable	r2_300.prm
Country Dependent Parameters	pdk_sw_e1_mcsw_io.cdp	pdk_sw_e1_mcsw_io.cdp
	gc_OpenEx() Protocol Name	
	Not applicable†	pdk_sw_e1_mcsw_io

†On DM3 boards, the protocol is determined at board initialization time and not when a Global Call device is opened. For compatibility, the **gc_OpenEx()** protocol name may be specified for DM3 boards, but it is not used.

Protocol Limitations

This protocol is not guaranteed to conform to or be in compliance with any official switch specifications and should be used only for testing purposes.

29.2 Country Dependent Parameter Descriptions

Note: A parameter can be inbound, outbound, or both inbound and outbound. An inbound parameter is used by the protocol when it is acting as inbound. An outbound parameter is used by the protocol when it is acting as outbound. A parameter that is both can be used by the protocol when it is acting as either inbound or outbound.

The modifiable parameters in the *pdk_sw_e1_mcsw_io.cdp* file are:

- [CDP_DTMF_DIALING \(Inbound\)](#)
- [CDP_NUM_OF_DNIS_DIGITS \(Inbound\)](#)
- [CDP_SEND_BLOCK_AT_START_OR_REMOTE_BLOCK](#)
- [CDP_TERM_TONE_STRING \(Inbound\)](#)
- [TONE_BUSY](#)
- [TONE_RINGBACK](#)

In addition, see [Chapter 3, “Call Progress Analysis Parameters”](#) for configuring default call progress operation in the protocol.

[CDP_DTMF_DIALING \(Inbound\)](#)

Description: Specifies whether digits are dialed in DTMF format or pulse format.

Values:

- 0: Pulse format
- 1 [default]: DTMF format

[CDP_NUM_OF_DNIS_DIGITS \(Inbound\)](#)

Description: Specifies the expected number of DNIS digits to be received.

Values:

- 0: DNIS collection is terminated by I-15 (end of dialing).
- Non-zero [default is 4]: Specifies the number of DNIS digits expected.

[CDP_SEND_BLOCK_AT_START_OR_REMOTE_BLOCK](#)

Description: Specifies the bit pattern to be sent on the line at protocol open time and when the remote line goes BLOCKED.

Values:

- 0 [default]: If the protocol is used either as outbound only or as bidirectional.
- 1: If the protocol is used as inbound only.

[CDP_TERM_TONE_STRING \(Inbound\)](#)

Description: Specifies the characters used to identify the termination of the dialed string. This parameter is used only when [CDP_DTMF_DIALING](#) is set to 1.

Typically, the dialed digits are received until a tone corresponding to the characters specified in this string is received, or until [CDP_NUM_OF_DNIS_DIGITS](#) digits are received.

Values: Default is “#”

TONE_BUSY

Description: When a call is rejected (dropped) in the OFFERED state with a reason other than GC_NORMAL_CLEARING, the protocol sends this tone. In case of GC_NORMAL_CLEARING, the call is cleared by sending cas_disc_clr and then cas_idle line signals on the line.

Values: Default is 400,40,0,0,-17,0,150,50,400,100,0,1

Guidelines: See Table 5 for the meaning of each argument of a tone definition.

TONE_RINGBACK

Description: Specifies the ringback tone for this protocol.

Values: Default is 600,60,0,0,-17,0,100,50,400,100,1,1

Guidelines: See Table 5 for the meaning of each argument of a tone definition.

Table 5. TONE_t Signal Definition Parameters

Parameter Number	Name	Description	Detect/Generate	Edge/Cadence Detection
1	Frequency 1	Frequency of first tone (in Hertz)	Detect, Generate	Edge, Cadence
2	Frequency 1 deviation	Frequency deviation for first tone (in Hertz)	Detect	Edge, Cadence
3	Frequency 2	Frequency of second tone (in Hertz)	Detect, Generate	Edge, Cadence
4	Frequency 2 deviation	Frequency deviation for second tone (in Hertz)	Detect	Edge, Cadence
5	Amplitude 1	Amplitude of first tone (in dB)	Generate	Neither
6	Amplitude 2	Amplitude of second tone (in dB)	Generate	Neither
7	On time	On duration (in milliseconds) Note: The minimum recommended value is 50.	Detect, Generate	Cadence
8	On time deviation	On time deviation (in milliseconds) Note: The minimum recommended value is 50.	Detect	Cadence
9	Off time	Off duration (in milliseconds) Note: The minimum recommended value is 50.	Detect, Generate	Cadence
10	Off time deviation	Off time deviation (in milliseconds) Note: The minimum recommended value is 50.	Detect	Cadence

Table 5. TONE_t Signal Definition Parameters (Continued)

Parameter Number	Name	Description	Detect/Generate	Edge/Cadence Detection
11	Mode	Detection notification: <ul style="list-style-type: none"> • 1 for the onset of the tone. This specifies leading edge in edge detection mode and onset of cadence detection in cadence detection mode. • 0 for the termination of the tone. This specifies trailing edge in edge detection mode and the termination of the cadence after the specified number of cycles in cadence detection mode. 	Detect	Edge, Cadence
12	Repeat count	Repetition count (the number of repetitions on cycles)	Detect, Generate	Cadence

Mexico R2 Bidirectional Protocol 30

Parameter Configuration

This chapter discusses the capabilities and parameters of the Mexico R2 Bidirectional protocol in the following topics:

- General Protocol Information 193
- Country Dependent Parameter Descriptions 193

30.1 General Protocol Information

Protocol File Set

The files used with the Mexico R2 protocol are listed and described in the following table.

File Type	File Name(s)	
	DM3	Springware
Protocol Module	pdk_mx_r2_io.qs and pdk_mx_r2_io.hot (or pdk_mx_r2_io.arm.hot for DMT160TEC boards)	pdk_mx_r2_io.psi
Voice and Network Parameters	Not applicable	mx_300.prm
Country Dependent Parameters	pdk_mx_r2_io.cdp	pdk_mx_r2_io.cdp
	gc_OpenEx() Protocol Name	
	Not applicable†	pdk_mx_r2_io

†On DM3 boards, the protocol is determined at board initialization time and not when a Global Call device is opened. For compatibility, the **gc_OpenEx()** protocol name may be specified for DM3 boards, but it is not used.

Protocol Limitations

None.

30.2 Country Dependent Parameter Descriptions

Note: A parameter can be inbound, outbound, or both inbound and outbound. An inbound parameter is used by the protocol when it is acting as inbound. An outbound parameter is used by the protocol when it is acting as outbound. A parameter that is both can be used by the protocol when it is acting as either inbound or outbound.

The modifiable parameters in the *pdk_mx_r2_io.cdp* file are:

- CDP_ANI_ENABLED
- CDP_ANI_MaxDigits
- CDP_CallingPartyCategory_3
- CDP_CallingPartyCategory_6
- CDP_DNIS_DIGITS_BEFORE_ANI
- CDP_DNIS_ENABLED
- CDP_DNIS_MaxDigits
- CDP_GrpB_Tone
- CDP_IMMEDIATE_ACCEPTSTATE (Inbound)
- CDP_NUM_OF_ANI_DIGITS
- CDP_NUM_OF_DNIS_DIGITS
- CDP_SEND_ALERTING_ON_R2MF_COMPLETION (Inbound)
- CDP_SEND_BLOCK_AT_START_OR_REMOTE_BLOCK

In addition, see [Chapter 3, “Call Progress Analysis Parameters”](#) for configuring default call progress operation in the protocol.

CDP_ANI_ENABLED

Description: Enables or disables the reception of automatic number identification (ANI) digits.

Values:

- 0: Disable the reception of ANI digits.
- 1 [default]: Enable the reception of ANI digits.

Guidelines: If this parameter is set to a value other than 0 or 1, the behavior of the protocol is not predictable.

For DM3, if ANI is disabled, you also have to remove **feature_ANI** from the **SYS_FEATURES** parameter in the *.cdp* file. The **SYS_FEATURES** parameter looks like this:

```
ALL CHARSTRING_t SYS_FEATURES = "feature_outbound,feature_inbound,feature_DNIS,  
feature_ANI,feature_CAT,feature_Billing,feature_MoreDNIS"
```

CDP_ANI_MaxDigits

Description: Specifies the maximum number of ANI digits that can be received when using this protocol.

Values: Default is 16.

Guidelines: If this parameter value is set to 0, the behavior of the protocol is not predictable.

CDP_CallingPartyCategory_3

Description: Specifies the category of the calling subscriber, II(3).

Values:

- 1 [default]: Operator with offering facility
- 2: Normal subscriber
- 3: Reserve
- 4: Reserve
- 5: ATME equipment
- 6: Maintenance equipment
- 7: Reserve
- 8: Reserve - interception operator
- 9-15: Reserve

CDP_CallingPartyCategory_6

Description: Specifies the category of the calling subscriber, II(6).

Values:

- 1: Reserve
- 2: Normal subscriber
- 3 [default]: Box
- 4: Time and cost
- 5: Reserve - equipment ATME
- 6: Maintenance equipment
- 7: Share - 2
- 8: Share - 3
- 9: Share - 1
- 10: Reserve - Operator without possibility of offer
- 11-15: Reserve

CDP_DNIS_DIGITS_BEFORE_ANI

Description: Determines the number of dialed number identification service (DNIS) digits that are to be received before any ANI digits are received. If this parameter is set to non-zero, the following sequence of events occurs:

1. Partial DNIS digits are received.
2. Category digit(s) are received.
3. The remaining DNIS digits are received.
4. ANI digits are received (if **CDP_ANI_ENABLED** is 1).
5. Category digits are received again.

Values:

- 0 [default]: Indicates that ANI digits must be received after all DNIS digits are received.
- Non-zero: Specifies the number of DNIS digits received before ANI digits are received.

Guidelines: The behavior of the protocol will not be predictable, unless the following occurs:

- If this parameter is set to non-zero, **CDP_ANI_ENABLED** must be set to 1.
- If this parameter is set to non-zero, its value should be the minimum of **CDP_NUM_OF_DNIS_DIGITS** (if non-zero), **CDP_DNIS_MaxDigits**, and the actual DNIS digits to be received.

CDP_DNIS_ENABLED

Description: Enables or disables the reception of DNIS digits.

Values:

- 0: Disable the reception of DNIS digits.
- 1 [default]: Enable the reception of DNIS digits.

Guidelines: Even if this parameter is set to 0, the first forward tone received will be the first DNIS digit only.

The behavior of the protocol is not predictable if this parameter is set to a value other than 0 or 1.

For DM3, if DNIS is disabled, you also have to remove **feature_DNIS** from the **SYS_FEATURES** parameter in the *.cdp* file. The **SYS_FEATURES** parameter looks like this:

```
All CHARSTRING_t SYS_FEATURES = "feature_outbound,feature_inbound,feature_DNIS,
feature_ANI,feature_CAT,feature_Billing,feature_MoreDNIS"
```

CDP_DNIS_MaxDigits

Description: Specifies the maximum number of DNIS digits that can be received when using this protocol.

Values: Default is 16.

Guidelines: If this parameter value is set to 0, the behavior of the protocol is not predictable.

CDP_GrpB_Tone

Description: Determines whether the sender should be charged after receiving the tone. The tone is sent from the inbound end on receipt of Category for Group II. After this tone, the sequence of R2MF tone exchange is over and the call is connected. This is the last R2MF tone in establishment of a call.

Values:

- 1 [default]: Line free, chargeable
- 6: Line free, not chargeable

CDP_IMMEDIATE_ACCEPTSTATE (Inbound)

Description: Specifies when the protocol transitions a call to the Accepted state.

Values:

- 0 [default]: The protocol should wait for the number of rings specified in **gc_AcceptCall()** to expire before transitioning to the Accepted state.
- 1: The protocol should transition a call to the Accepted state immediately upon receipt of **gc_AcceptCall()** and before the specified number of rings have been generated.

Guidelines: This parameter is ignored if the value of the **gc_AcceptCall()** rings parameter is 0.

CDP_NUM_OF_ANI_DIGITS

Description: Specifies the expected number of ANI digits to be received.

Values:

- 0 [default]: ANI collection is terminated by III-15 tone.
- Non-zero: Specifies the number of ANI digits expected. This number should always be less than **CDP_ANI_MaxDigits**.

CDP_NUM_OF_DNIS_DIGITS

Description: Specifies the expected number of DNIS digits to be received.

Values:

- 0: DNIS collection is terminated by III-15 tone.
- Non-zero [default is 4]: Specifies the number of DNIS digits expected. This number should always be less than **CDP_DNIS_MaxDigits**.

CDP_SEND_ALERTING_ON_R2MF_COMPLETION (Inbound)

Description: Controls when the protocol will send a GCEV_ALERTING event to the application.

Values:

- 0 [default]: GCEV_ALERTING is sent after receiving a ringback tone.
- 1: GCEV_ALERTING is sent after completion of the R2MF sequence (after receiving the last Group B tone).

CDP_SEND_BLOCK_AT_START_OR_REMOTE_BLOCK

Description: Specifies the bit pattern to be sent on the line at protocol open time and when the remote line goes BLOCKED.

Values:

- 0 [default]: If the protocol is used either as outbound only or as bidirectional.
- 1: If the protocol is used as inbound only.

Morocco R2 Bidirectional Protocol Parameter Configuration

This chapter discusses the capabilities and parameters of the Morocco R2 Bidirectional protocol in the following topics:

- General Protocol Information 199
- Country Dependent Parameter Descriptions 199

31.1 General Protocol Information

Protocol File Set

The files used with the Morocco R2 protocol are listed and described in the following table.

File Type	Filename(s)	
	DM3	Springware
Protocol Module	pdk_r2_io.qs and pdk_r2_io.hot (or pdk_r2_io.arm.hot for DMT160TEC boards)	pdk_r2_io.psi
Voice and Network Parameters	Not applicable	r2_300.prm
Country Dependent Parameters	pdk_ma_r2_io.cdp	pdk_ma_r2_io.cdp
	gc_OpenEx() Protocol Name	
	Not applicable†	pdk_ma_r2_io

†On DM3 boards, the protocol is determined at board initialization time and not when a Global Call device is opened. For compatibility, the **gc_OpenEx()** protocol name may be specified for DM3 boards, but it is not used.

Protocol Limitations

If a DropCall is attempted in the ACCEPTED state, the protocol will answer the call by sending out the ANSWER pattern before dropping the call, as forced release is not supported in this protocol.

31.2 Country Dependent Parameter Descriptions

Note: A parameter can be inbound, outbound, or both inbound and outbound. An inbound parameter is used by the protocol when it is acting as inbound. An outbound parameter is used by the protocol when it is acting as outbound. A parameter that is both can be used by the protocol when it is acting as either inbound or outbound.

The modifiable parameters in the *pdk_ma_r2_io.cdp* file are:

- CDP_ANI_ENABLED (Inbound)
- CDP_ANI_MaxDigits (Inbound)
- CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED
- CDP_ANI_WITHAC_FACILITY_ENABLED (Outbound)
- CDP_AreaCode
- CDP_CallingPartyCategory (Outbound)
- CDP_ConnectType (Outbound)
- CDP_DNIS_MaxDigits (Inbound)
- CDP_Drop_Using_ProgressTones_After_AcceptCall (Inbound)
- CDP_FLAG_APPEND_F (Outbound)
- CDP_GrpB_Tone (Inbound)
- CDP_IMMEDIATE_ACCEPTSTATE (Inbound)
- CDP_IS_ANIAVAILABILITY_CHECK_NEEDED
- CDP_IS_CALLING_LINE_IDENTIFICATION_PERMITTED (Outbound)
- CDP_NO_OF_DNIS_BEFORE_CAT (Inbound)
- CDP_NUM_OF_AC_DIGITS (Inbound)
- CDP_NUM_OF_ANI_DIGITS (Inbound)
- CDP_NUM_OF_DNIS_DIGITS (Inbound)
- CDP_OVERLAP_SENDING_ENABLED (Outbound)
- CDP_REJECT_WITH_A3B4 (Inbound)
- CDP_SEND_ALERTING_ON_R2MF_COMPLETION (Inbound)
- CDP_SEND_BLOCK_AT_START_OR_REMOTE_BLOCK
- CDP_TrunkPrefixNumber

In addition, see Chapter 3, “Call Progress Analysis Parameters” for configuring default call progress operation in the protocol.

CDP_ANI_ENABLED (Inbound)

Description: Enables or disables the reception of automatic number identification (ANI) digits.

Values:

- 0: Disable the reception of ANI digits.
- 1 [default]: Enable the reception of ANI digits.

Guidelines: If this parameter is set to a value other than 0 or 1, the behavior of the protocol is not predictable.

For DM3, if ANI is disabled, you also have to remove **feature_ANI** from the **SYS_FEATURES** parameter in the *.cdp* file. The **SYS_FEATURES** parameter looks like this:

```
All CHARSTRING_t SYS_FEATURES = "feature_outbound,feature_inbound,feature_DNIS,
feature_Billing,feature_ANI,feature_CAT,feature_MoreDNIS"
```

CDP_ANI_MaxDigits (Inbound)

Description: Specifies the maximum number of ANI digits that can be received when using this protocol.

Values: Default is 16.

Guidelines: If this parameter value is set to 0, the behavior of the protocol is not predictable.

CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED

Description: Specifies whether ANI is to be requested (inbound) or sent (outbound) with the area code.

Values:

- 0 [default]: Request (inbound) or send (outbound) ANI digits without area code.
- 1: Request (inbound) or send (outbound) area code with ANI digits.

CDP_ANI_WITHAC_FACILITY_ENABLED (Outbound)

Description: Specifies whether ANI digits and area code are sent to the inbound side. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values:

- 0 [default]: The requested information denied tone is sent to the inbound side.
- 1: ANI digits with area code are sent to the inbound side.

CDP_AreaCode

Description: Specifies the area code of the local exchange where the subscriber is connected. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values: Default is 987.

CDP_CallingPartyCategory (Outbound)

Description: Specifies the category of the calling subscriber.

Values:

- 1 [default]: Subscriber without priority
- 2: Subscriber with priority
- 3: Maintenance equipment
- 4: Coin box or subscriber with charge metering
- 5: Operator
- 6: Data transmission
- 11: C. P. T. P.
- 12: Special line
- 13: Mobile user
- 14: Virtual private network line
- 15: Special line

CDP_ConnectType (Outbound)

Description: Specifies the mode for outbound connect detection. Two types of connection events can be detected: the cas_answer received signaling bit pattern and the media type detection used when post-connect call analysis is enabled. The application has options as to when the call is considered connected, as set by this parameter. The application also has options as to whether call analysis continues after the call has been connected when cas_answer is received first.

Values:

- 0 [default]: The protocol transitions to the connected state only when cas_answer is received. If cas_answer is received first, call analysis is stopped. If call analysis is received first, the result is sent to the application via a GCEV_MEDIADETECTED event, but the protocol does not transition to the connected state until cas_answer is received.
- 1: The protocol transitions to the connected state when the first event (either cas_answer or call analysis) is received. If cas_answer is received first, call analysis still continues and the result is sent to the application via a GCEV_MEDIADETECTED event. If call analysis is received first, the subsequent cas_answer is ignored.
- 2: The protocol transitions to the connected state when the first event (either cas_answer or call analysis) is received. If cas_answer is received first, call analysis is stopped. If call analysis is received first, the subsequent cas_answer is ignored.
- 3: The protocol transitions to the connected state only when call analysis is received. If call analysis is received first, the subsequent cas_answer is ignored. If cas_answer is received first, it is ignored.

CDP_DNIS_MaxDigits (Inbound)

Description: Specifies the maximum number of dialed number identification service (DNIS) digits that can be received when using this protocol.

Values: Default is 16.

Guidelines: If this parameter value is set to 0, the behavior of the protocol is not predictable.

CDP_Drop_Using_ProgressTones_After_AcceptCall (Inbound)

Description: Specifies the call progress tone to be sent for dropping a call, when doing a `gc_DropCall()` after a `gc_AcceptCall()`.

Values:

- 0 [default]: The protocol sends the Answer Line signal, waits for the time specified by `CDP_TimeToRecognizeAnswer`, and then sends a Clear Backward line signal for call disconnection. In this case, the call will be charged for the remote calling subscriber, even though the call is not successful.
- 1: The protocol sends the appropriate call progress tone depending on the `gc_DropCall()` cause to the remote end, and waits for a Clear Forward Line signal for call disconnection.

CDP_FLAG_APPEND_F (Outbound)

Description: When the remote end asks for the next DNIS digit through Group A backward tone, and the protocol does not have any more DNIS available to be sent, this parameter specifies whether to send the I-15 tone or to remain silent and prepare for A3 or A4 pulse from the remote end.

Values:

- 0 [default]: No tone will be sent to the remote end. In this case, A3 or A4 pulse is expected to be received from the remote end. In a case of overlapped sending (see description of `CDP_OVERLAP_SENDING_ENABLED` parameter), the remote end may also send A1 to request more information.
- 1: 'f' (I-15) will be sent to the remote end, indicating the end of information.

CDP_GrpB_Tone (Inbound)

Description: Determines whether the sender should be charged after receiving the tone. The tone is sent from the inbound end on receipt of Category for Group II. After this tone, the sequence of R2MF tone exchange is over and the call is connected. This is the last R2MF tone in establishment of a call.

Values:

- 6 [default]: Line free, chargeable (B-6)
- 7: Line free, not chargeable (B-7)

CDP_IMMEDIATE_ACCEPTSTATE (Inbound)

Description: Specifies when the protocol transitions a call to the Accepted state.

Values:

- 0 [default]: The protocol should wait for the number of rings specified in `gc_AcceptCall()` to expire before transitioning to the Accepted state.
- 1: The protocol should transition a call to the Accepted state immediately upon receipt of `gc_AcceptCall()` and before the specified number of rings have been generated.

Guidelines: This parameter is ignored if the value of the `gc_AcceptCall()` rings parameter is 0.

CDP_IS_ANIAVAILABILITY_CHECK_NEEDED

Description: Determines whether the status of ANI availability is checked before ANI digits are exchanged. At the inbound side, this parameter specifies whether ANI availability at the outbound side has to be verified or if ANI digits can be requested directly. At the outbound side, ANI digits are passed directly or the inbound side is informed of the availability (status) first.

Values:

- 0 [default]: The status of ANI availability is not checked before ANI digits are exchanged. ANI digits can be requested directly without knowing the status of the outbound side.
- 1: The status of ANI availability is checked before ANI digits are exchanged. The inbound side requests the status of ANI availability. If ANI digits are available, the inbound side requests the ANI digits. The outbound side sends the status of ANI availability and then waits for the inbound request.

CDP_IS_CALLING_LINE_IDENTIFICATION_PERMITTED (Outbound)

Description: Specifies whether Calling Line Identification is enabled. This parameter is used to enable CLIP and CLIR conditions.

Values:

- 0: Calling Line Identification Rejected (CLIR). The requested information denied tone is sent to the inbound side.
- 1 [default]: Calling Line Identification Permitted (CLIP). ANI digits are sent to the inbound side.

CDP_NO_OF_DNIS_BEFORE_CAT (Inbound)

Description: Determines the number of DNIS digits that are to be received before any category information is received. If this parameter is set to non-zero, the following sequence of events occurs:

1. Partial DNIS digits are received.
2. Category digits are received.
3. The remaining DNIS digits are received.
4. ANI digits are received (if **CDP_ANI_ENABLED** is 1).
5. Category digits are received again.

Values:

- 0 [default]: Indicates that category must be received after all DNIS digits are received.
- Non-zero: Specifies the number of DNIS digits received before category information is received.

Guidelines: The behavior of the protocol will not be predictable, unless the following occurs:

- If this parameter is set to non-zero, **CDP_ANI_ENABLED** must be set to 1.
- If this parameter is set to non-zero, its value should be the minimum of **CDP_NUM_OF_DNIS_DIGITS** (if non-zero), **CDP_DNIS_MaxDigits**, and the actual DNIS digits to be received.

CDP_NUM_OF_AC_DIGITS (Inbound)

Description: Specifies the number of area code digits of the local exchange from where it received the call. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values: Default is 3.

CDP_NUM_OF_ANI_DIGITS (Inbound)

Description: Specifies the expected number of ANI digits to be received.

Values:

- 0 [default]: ANI collection is terminated by I-15 (end of dialing).
- Non-zero: Specifies the number of ANI digits expected. This number should always be less than **CDP_ANI_MaxDigits**.

CDP_NUM_OF_DNIS_DIGITS (Inbound)

Description: Specifies the expected number of DNIS digits to be received.

Values:

- 0: DNIS collection is terminated by I-15 (end of dialing).
- Non-zero [default is 4]: Specifies the number of DNIS digits expected. This number should always be less than **CDP_DNIS_MaxDigits**.

CDP_OVERLAP_SENDING_ENABLED (Outbound)

Description: Enables or disables the overlap sending feature.

Values:

- 0: Disables overlap sending. 'f' will be appended to DNIS digits received with **gc_MakeCall()** (if **CDP_FLAG_APPEND_F** is true), indicating the end of information.
- 1 [default]: Enables overlap sending. The remote end can request more DNIS information, in which case a **REQMOREINFO** event will be generated. **gc_SendMoreInfo()** with Null information will either cause 'f' to be sent to the remote end or will remain silent (depending on the value of **CDP_FLAG_APPEND_F**), thus indicating to the remote end that no more DNIS digits are available.

CDP_REJECT_WITH_A3B4 (Inbound)

Description: Determines the method for rejecting a call when an R2MF tone error is received during call setup.

Values:

- 0 [default]: Call is rejected with a direct group A tone (A-10), which is a spare tone that may be used to indicate congestion.
- 1: Call is rejected with an A3-B4 tone combination, which means that the inbound (local) end sends an A-3 tone (send category and change over to group B tones). Then, the category is received and in response, a B-4 tone is sent to reject the call.

CDP_SEND_ALERTING_ON_R2MF_COMPLETION (Inbound)

Description: Controls when the protocol will send a GCEV_ALERTING event to the application.

Values:

- 0: GCEV_ALERTING is sent after receiving a ringback tone.
- 1 [default]: GCEV_ALERTING is sent after completion of the R2MF sequence (after receiving the last Group B tone).

CDP_SEND_BLOCK_AT_START_OR_REMOTE_BLOCK

Description: Specifies the bit pattern to be sent on the line at protocol open time and when the remote line goes BLOCKED.

Values:

- 0 [default]: If the protocol is used either as outbound only or as bidirectional.
- 1: If the protocol is used as inbound only.

CDP_TrunkPrefixNumber

Description: Specifies the trunk number used to dial to local exchange. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values: Default is 9.

Nortel Meridian Lineside E1 Bidirectional Protocol Parameter Configuration

This chapter discusses the capabilities and parameters of the Nortel Meridian Lineside E1 Bidirectional protocol in the following topics:

- General Protocol Information 207
- Country Dependent Parameter Descriptions 208

32.1 General Protocol Information

Protocol File Set

The files used with the Nortel Meridian Lineside E1 protocol are listed and described in the following table.

File Type	File Name(s)	
	DM3	Springware
Protocol Module	pdk_sw_e1_fxs_io.qs and pdk_sw_e1_fxs_io.hot (or pdk_sw_e1_fxs_io.arm.hot for DMT160TEC boards)	pdk_sw_e1_fxs_io.psi
Voice and Network Parameters	Not applicable	r2_300.prm
Country Dependent Parameters	pdk_sw_e1_ntmd_io.cdp	pdk_sw_e1_ntmd_io.cdp
	gc_OpenEx() Protocol Name	
	Not applicable†	pdk_sw_e1_ntmd_io

†On DM3 boards, the protocol is determined at board initialization time and not when a Global Call device is opened. For compatibility, the **gc_OpenEx()** protocol name may be specified for DM3 boards, but it is not used.

Protocol Limitations

After a call is transferred with **gc_SetUpTransfer()**, you cannot issue a **gc_DropCall()** on the original call. You must drop the consultation call before the original call can be dropped. The behavior of the protocol is undefined if you try to drop the original call without dropping the consultation call first.

32.2 Country Dependent Parameter Descriptions

Note: A parameter can be inbound, outbound, or both inbound and outbound. An inbound parameter is used by the protocol when it is acting as inbound. An outbound parameter is used by the protocol when it is acting as outbound. A parameter that is both can be used by the protocol when it is acting as either inbound or outbound.

The modifiable parameters in the *pdk_sw_e1_ntmd_io.cdp* file are:

- CDP_BlindXferTime
- CDP_ConnectOnNoDialTone (Outbound)
- CDP_ConnectOnNoRingBack (Outbound)
- CDP_DelayInDialing (Outbound)
- CDP_DialToneWaitTime (Outbound)
- CDP_MinPBXHangupTime (Inbound)
- CDP_OnhookTime (Outbound)
- CDP_PBXDiscEnabled
- CDP_ProtocolStopsOffhook
- CDP_WaitDialToneEnabled (Outbound)

In addition, see [Chapter 3, “Call Progress Analysis Parameters”](#) for configuring default call progress operation in the protocol.

CDP_BlindXferTime

Description: After sending the address digits on a BlindTransfer request, the protocol waits for the time specified by this parameter before sending CAS_ONHOOK and switching back to IDLE state.

Values: Time in milliseconds. Default is 5000 (5 seconds).

CDP_ConnectOnNoDialTone (Outbound)

Description: Determines how the protocol should proceed when dial tone is not detected. If the parameter is enabled (set to 1), and no dial tone is detected, a local collision with an inbound call is assumed, and the call immediately transitions to Connected state. This parameter is used only if **CDP_WaitDialToneEnabled** is set to 1.

Values:

- 0: Do not assume local collision and disconnect the call if no dial tone is detected.
- 1 [default]: Assume local collision and connect the perceived inbound call if no dial tone is detected.



CDP_ConnectOnNoRingBack (Outbound)

Description: Determines how the protocol should proceed when no ringback tone is detected. If the parameter is enabled (set to 1), and no ringback is detected, a remote collision with a remote outbound call is assumed, and the call immediately transitions to Connected state.

Values:

- 0 [default]: Do not assume remote collision and disconnect the call if no ringback is detected.
- 1: Assume remote collision and connect the call if no ringback is detected.

CDP_DelayInDialing (Outbound)

Description: Specifies the delay time in dialing when the parameter **CDP_WaitDialToneEnabled** is not enabled.

Values: Default is 100.

CDP_DialToneWaitTime (Outbound)

Description: Defines the time that the protocol waits for a dial tone before an outbound call can be made.

Values: Time in milliseconds. Default is 10000 (10 seconds).

Guidelines: This parameter is applicable only if the **CDP_WaitDialToneEnabled** parameter is set to 1. If the time defined by this parameter is exceeded before dial tone is detected, the action taken depends on the value of the **CDP_ConnectOnNoDialTone** parameter as follows:

- If the **CDP_ConnectOnNoDialTone** parameter is set to 1, a local collision is assumed and the incoming call is connected.
- If the **CDP_ConnectOnNoDialTone** parameter is set to 0, the call attempt fails and a disconnect event is forwarded with a reason of no dial tone.

CDP_MinPBXHangupTime (Inbound)

Description: Specifies the length of the ring cycle and is used to determine if the remote end (that is, the PBX) has dropped an incoming call. The timer is reset at the start of each ring cycle. If the timer expires without resetting, ringing has been acknowledged to stop indicating the PBX has dropped the call, as the caller has abandoned the call before it was answered.

Values: Time in milliseconds. Default is 5000 (5 seconds).

Guidelines: The value of this parameter is typically set to 6 seconds, which corresponds to the complete ring cycle (2 seconds on and 4 seconds of silence).

CDP_OnhookTime (Outbound)

Description: If Lineside E1 is outbound only and starts in the off-hook state, it remains in the off-hook state until it receives a MakeCall. This parameter specifies the time during which Lineside E1 should remain on-hook before processing the MakeCall.

Values: Time in milliseconds. Default is 500 (0.5 seconds).

CDP_PBXDiscEnabled

Description: Determines if the remote PBX can initiate call disconnection via CAS line signaling.

Values:

- 0: Disable call disconnect supervision, since it is not supported by the PBX.
- 1 [default]: Enable call disconnect supervision provided by the PBX.

CDP_ProtocolStopsOffhook

Description: Determines the state of the hook switch signaling (on-hook or off-hook) when the protocol stops after `gc_Close()`.

Note: This parameter has no effect on DM3 boards, because the protocol is not stopped until the board is stopped.

Values:

- 0 [default]: Set the hook switch state to on-hook.
- 1: Set the hook switch state to off-hook.

CDP_WaitDialToneEnabled (Outbound)

Description: Determines if the protocol should wait for a dial tone before dialing. Note that this parameter does **not** apply to supervised transfers (consultation calls) in which case the dial tone is not verified.

Values:

- 0 [default]: Do not wait for dial tone before dialing.
- 1: Wait for dial tone before dialing.

North American Analog Bidirectional Protocol Parameter Configuration

This chapter discusses the capabilities and parameters of the North American Analog Bidirectional protocol in the following topics:

- General Protocol Information 211
- Country Dependent Parameter Descriptions 211

33.1 General Protocol Information

Protocol File Set

The files used with the North American Analog protocol are listed and described in the following table.

File Type	File Name(s)	
	DM3	Springware
Protocol Module		pdk_na_an_io.psi
Voice and Network Parameters		Not applicable
Country Dependent Parameters		pdk_na_an_io.cdp
	gc_OpenEx() Protocol Name	
		pdk_na_an_io
NOTE: This protocol is supported on Springware boards only. On DM3 boards, the analog protocol is embedded in the firmware.		

Protocol Limitations

None.

33.2 Country Dependent Parameter Descriptions

Note: A parameter can be inbound, outbound, or both inbound and outbound. An inbound parameter is used by the protocol when it is acting as inbound. An outbound parameter is used by the protocol when it is acting as outbound. A parameter that is both can be used by the protocol when it is acting as either inbound or outbound.

The modifiable parameters in the *pdk_na_an_io.cdp* file are:

- [CDP_ConnectOnNoRingBack \(Outbound\)](#)
- [CDP_Dgts_For_Outside_Line_In_PBX_ENV \(Outbound\)](#)
- [CDP_DialTone_As_Disconnect_In_Connected](#)
- [CDP_PBX_DialToneTimeout \(Outbound\)](#)
- [CDP_Time_Before_Blind_Dialing_Under_PBX_Env \(Outbound\)](#)
- [CDP_Timeout_Wait_For_RingOff_When_Drop_In_Offered \(Inbound\)](#)
- [CDP_Working_Under_PBX_Env \(Outbound\)](#)

In addition, see [Chapter 3, “Call Progress Analysis Parameters”](#) for configuring default call progress operation in the protocol.

[CDP_ConnectOnNoRingBack \(Outbound\)](#)

Description: Determines how the protocol should proceed when a remote collision occurs, that is, when the remote side (PBX) is making an outbound call and an inbound call is detected. In this case, call analysis on the local side will indicate no ringback tone. Setting this parameter can configure the protocol to connect the call even if a ringback tone is not detected.

Values:

- 0: Do not connect a call if no ringback is detected.
- 1 [default]: Connect a call even if no ringback is detected.

Guidelines: On media detection by call analysis, this parameter is overridden.

[CDP_Dgts_For_Outside_Line_In_PBX_ENV \(Outbound\)](#)

Description: Specifies the digit to be dialed for a PBX outside line. This parameter is valid only if [CDP_Working_Under_PBX_Env](#) is set to 1.

Values: Default is “9”.

[CDP_DialTone_As_Disconnect_In_Connected](#)

Description: Specifies if the reception of a dial tone is treated as a remote disconnect in the connected state.

Values:

- 0 [default]: Dial tone is ignored if received in the Connected state.
- 1: Reception of dial tone is treated as a remote disconnect in the Connected state.

[CDP_PBX_DialToneTimeout \(Outbound\)](#)

Description: Specifies the maximum time (in milliseconds) that the protocol waits for PBX dial tone before sending out digits. This parameter is valid only if [CDP_Working_Under_PBX_Env](#) is set to 1.

Values: Time in milliseconds. Default is 5000 (5 seconds).

CDP_Time_Before_Blind_Dialing_Under_PBX_Env (Outbound)

Description: Specifies the time that the protocol waits before dialing any digits if working under a PBX environment. This parameter is valid only if **CDP_Working_Under_PBX_Env** is set to 1.

Values:

- 0 [default]: Ignore this parameter. The protocol waits for a PBX dial tone before dialing any digits.
- Non-zero time in milliseconds: The protocol does not wait for a PBX dial tone; instead, the protocol waits for the time specified by this parameter before dialing any digits.

CDP_Timeout_Wait_For_RingOff_When_Drop_In_Offered (Inbound)

Description: Specifies the maximum time that the protocol waits for the outbound side to stop ringing before sending a GCEV_DROPCALL to the application, if DropCall is issued in the offered state. GCEV_DROPCALL is sent to the application at the expiration of this timer, or when RingOff is detected, whichever comes first. If the value of this parameter is 0, GCEV_DROPCALL is sent as soon as the protocol receives the DropCall request.

Values:

- 0 [default]: GCEV_DROPCALL is sent as soon as the protocol receives the DropCall request.
- Non-zero time in milliseconds: Time that the protocol waits for the outbound side to stop ringing before sending a GCEV_DROPCALL.

CDP_Working_Under_PBX_Env (Outbound)

Description: Specifies the sequence of actions taken by the protocol while making a call.

If set to 1, the protocol takes the following actions while making a call:

1. Go off-hook.
2. If **CDP_Time_Before_Blind_Dialing_Under_PBX_Env** is 0, go to step 3. Otherwise, go to step 5.
3. Wait for PBX dial tone (defined by **TONE_PBX_DIAL**).
4. Go to step 6.
5. Wait for **CDP_Time_Before_Blind_Dialing_Under_PBX_Env** milliseconds.
6. Dial the digit(s) specified by **CDP_Dgts_For_Outside_Line_In_PBX_ENV**.
7. Wait for regular dial tone defined by **TONE_DIAL** (should not be modified by the user).
8. Dial number specified by application via the **gc_MakeCall()** function.

Values:

- 0 [default]: Skip steps 2 to 6 above.
- 1: Perform steps 1 to 8 above.



Pakistan R2 Bidirectional Protocol Parameter Configuration

This chapter discusses the capabilities and parameters of the Pakistan R2 Bidirectional protocol in the following topics:

- General Protocol Information 215
- Country Dependent Parameter Descriptions 215

34.1 General Protocol Information

Protocol File Set

The files used with the Pakistan R2 protocol are listed and described in the following table.

File Type	File Name(s)	
	DM3	Springware
Protocol Module	pdk_r2_io.qs and pdk_r2_io.hot (or pdk_r2_io.arm.hot for DMT160TEC boards)	pdk_r2_io.psi
Voice and Network Parameters	Not applicable	r2_300.prm
Country Dependent Parameters	pdk_pk_r2_io.cdp	pdk_pk_r2_io.cdp
	gc_OpenEx() Protocol Name	
	Not applicable†	pdk_pk_r2_io

†On DM3 boards, the protocol is determined at board initialization time and not when a Global Call device is opened. For compatibility, the **gc_OpenEx()** protocol name may be specified for DM3 boards, but it is not used.

Protocol Limitations

If a DropCall is attempted in the ACCEPTED state, the protocol will answer the call by sending out the ANSWER pattern before dropping the call, as forced release is not supported in this protocol.

34.2 Country Dependent Parameter Descriptions

Note: A parameter can be inbound, outbound, or both inbound and outbound. An inbound parameter is used by the protocol when it is acting as inbound. An outbound parameter is used by the protocol when it is acting as outbound. A parameter that is both can be used by the protocol when it is acting as either inbound or outbound.

The modifiable parameters in the *pdk_pk_r2_io.cdp* file are:

- In addition, see Chapter 3, “Call Progress Analysis Parameters” for configuring default call progress operation in the protocol.
- CDP_ANI_MaxDigits (Inbound)
- CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED
- CDP_ANI_WITHAC_FACILITY_ENABLED (Outbound)
- CDP_AreaCode
- CDP_CallingPartyCategory (Outbound)
- CDP_ConnectType (Outbound)
- CDP_DNIS_MaxDigits (Inbound)
- CDP_Drop_Using_ProgressTones_After_AcceptCall (Inbound)
- CDP_FLAG_APPEND_F (Outbound)
- CDP_GrpB_Tone (Inbound)
- CDP_IMMEDIATE_ACCEPTSTATE (Inbound)
- CDP_IS_ANIAVAILABILITY_CHECK_NEEDED
- CDP_IS_CALLING_LINE_IDENTIFICATION_PERMITTED (Outbound)
- CDP_NO_OF_DNIS_BEFORE_CAT (Inbound)
- CDP_NUM_OF_AC_DIGITS (Inbound)
- CDP_NUM_OF_ANI_DIGITS (Inbound)
- CDP_NUM_OF_DNIS_DIGITS (Inbound)
- CDP_OVERLAP_SENDING_ENABLED (Outbound)
- CDP_REJECT_WITH_A3B4 (Inbound)
- CDP_SEND_ALERTING_ON_R2MF_COMPLETION (Inbound)
- CDP_SEND_BLOCK_AT_START_OR_REMOTE_BLOCK
- CDP_TrunkPrefixNumber

In addition, see Chapter 3, “Call Progress Analysis Parameters” for configuring default call progress operation in the protocol.

CDP_ANI_ENABLED (Inbound)

Description: Enables or disables the reception of automatic number identification (ANI) digits.

Values:

- 0: Disable the reception of ANI digits.
- 1 [default]: Enable the reception of ANI digits.

Guidelines: If this parameter is set to a value other than 0 or 1, the behavior of the protocol is not predictable.

For DM3, if ANI is disabled, you also have to remove **feature_ANI** from the **SYS_FEATURES** parameter in the *.cdp* file. The **SYS_FEATURES** parameter looks like this:

```
All CHARSTRING_t SYS_FEATURES = "feature_outbound,feature_inbound,feature_DNIS,  
feature_Billing,feature_ANI,feature_CAT,feature_MoreDNIS"
```

CDP_ANI_MaxDigits (Inbound)

Description: Specifies the maximum number of ANI digits that can be received when using this protocol.

Values: Default is 16.

Guidelines: If this parameter value is set to 0, the behavior of the protocol is not predictable.

CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED

Description: Specifies whether ANI is to be requested (inbound) or sent (outbound) with the area code.

Values:

- 0 [default]: Request (inbound) or send (outbound) ANI digits without area code.
- 1: Request (inbound) or send (outbound) area code with ANI digits.

CDP_ANI_WITHAC_FACILITY_ENABLED (Outbound)

Description: Specifies whether ANI digits and area code are sent to the inbound side. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values:

- 0 [default]: The requested information denied tone is sent to the inbound side.
- 1: ANI digits with area code are sent to the inbound side.

CDP_AreaCode

Description: Specifies the area code of the local exchange where the subscriber is connected. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values: Default is 987.

CDP_CallingPartyCategory (Outbound)

Description: Specifies the category of the calling subscriber.

Values:

- 1 [default]: Subscriber without priority
- 2: Subscriber with priority
- 3: Maintenance equipment
- 5: Operator
- 6: Data transmission
- 7: Subscriber (international)
- 8: Data transmission (international)
- 9: Subscriber with priority (international)
- A: Operator with forward facility (international)

CDP_ConnectType (Outbound)

Description: Specifies the mode for outbound connect detection. Two types of connection events can be detected: the cas_answer received signaling bit pattern and the media type detection used when post-connect call analysis is enabled. The application has options as to when the call is considered connected, as set by this parameter. The application also has options as to whether call analysis continues after the call has been connected when cas_answer is received first.

Values:

- 0 [default]: The protocol transitions to the connected state only when cas_answer is received. If cas_answer is received first, call analysis is stopped. If call analysis is received first, the result is sent to the application via a GCEV_MEDIADETECTED event, but the protocol does not transition to the connected state until cas_answer is received.
- 1: The protocol transitions to the connected state when the first event (either cas_answer or call analysis) is received. If cas_answer is received first, call analysis still continues and the result is sent to the application via a GCEV_MEDIADETECTED event. If call analysis is received first, the subsequent cas_answer is ignored.
- 2: The protocol transitions to the connected state when the first event (either cas_answer or call analysis) is received. If cas_answer is received first, call analysis is stopped. If call analysis is received first, the subsequent cas_answer is ignored.
- 3: The protocol transitions to the connected state only when call analysis is received. If call analysis is received first, the subsequent cas_answer is ignored. If cas_answer is received first, it is ignored.

CDP_DNIS_MaxDigits (Inbound)

Description: Specifies the maximum number of dialed number identification service (DNIS) digits that can be received when using this protocol.

Values: Default is 16.

Guidelines: If this parameter value is set to 0, the behavior of the protocol is not predictable.

CDP_Drop_Using_ProgressTones_After_AcceptCall (Inbound)

Description: Specifies the call progress tone to be sent for dropping a call, when doing a `gc_DropCall()` after a `gc_AcceptCall()`.

Values:

- 0 [default]: The protocol sends the Answer Line signal, waits for the time specified by `CDP_TimeToRecognizeAnswer`, and then sends a Clear Backward line signal for call disconnection. In this case, the call will be charged for the remote calling subscriber, even though the call is not successful.
- 1: The protocol sends the appropriate call progress tone depending on the `gc_DropCall()` cause to the remote end, and waits for a Clear Forward Line signal for call disconnection.

CDP_FLAG_APPEND_F (Outbound)

Description: When the remote end asks for the next DNIS digit through Group A backward tone, and the protocol does not have any more DNIS available to be sent, this parameter specifies whether to send the I-15 tone or to remain silent and prepare for A3 or A4 pulse from the remote end.

Values:

- 0 [default]: No tone will be sent to the remote end. In this case, A3 or A4 pulse is expected to be received from the remote end. In a case of overlapped sending (see description of `CDP_OVERLAP_SENDING_ENABLED` parameter), the remote end may also send A1 to request more information.
- 1: 'f' (I-15) will be sent to the remote end, indicating the end of information.

CDP_GrpB_Tone (Inbound)

Description: Determines whether the sender should be charged after receiving the tone. The tone is sent from the inbound end on receipt of Category for Group II. After this tone, the sequence of R2MF tone exchange is over and the call is connected. This is the last R2MF tone in establishment of a call.

Values:

- 6 [default]: Line free, not chargeable (B-6)
- 7: Line free, chargeable (B-7)

CDP_IMMEDIATE_ACCEPTSTATE (Inbound)

Description: Specifies when the protocol transitions a call to the Accepted state.

Values:

- 0 [default]: The protocol should wait for the number of rings specified in `gc_AcceptCall()` to expire before transitioning to the Accepted state.
- 1: The protocol should transition a call to the Accepted state immediately upon receipt of `gc_AcceptCall()` and before the specified number of rings have been generated.

Guidelines: This parameter is ignored if the value of the `gc_AcceptCall()` rings parameter is 0.

CDP_IS_ANIAVAILABILITY_CHECK_NEEDED

Description: Determines whether the status of ANI availability is checked before ANI digits are exchanged. At the inbound side, this parameter specifies whether ANI availability at the outbound side has to be verified or if ANI digits can be requested directly. At the outbound side, ANI digits are passed directly or the inbound side is informed of the availability (status) first.

Values:

- 0 [default]: The status of ANI availability is not checked before ANI digits are exchanged. ANI digits can be requested directly without knowing the status of the outbound side.
- 1: The status of ANI availability is checked before ANI digits are exchanged. The inbound side requests the status of ANI availability. If ANI digits are available, the inbound side requests the ANI digits. The outbound side sends the status of ANI availability and then waits for the inbound request.

CDP_IS_CALLING_LINE_IDENTIFICATION_PERMITTED (Outbound)

Description: Specifies whether Calling Line Identification is enabled. This parameter is used to enable CLIP and CLIR conditions.

Values:

- 0: Calling Line Identification Rejected (CLIR). The requested information denied tone is sent to the inbound side.
- 1 [default]: Calling Line Identification Permitted (CLIP). ANI digits are sent to the inbound side.

CDP_NO_OF_DNIS_BEFORE_CAT (Inbound)

Description: Determines the number of DNIS digits that are to be received before any category information is received. If this parameter is set to non-zero, the following sequence of events occurs:

1. Partial DNIS digits are received.
2. Category digits are received.
3. The remaining DNIS digits are received.
4. ANI digits are received (if **CDP_ANI_ENABLED** is 1).
5. Category digits are received again.

Values:

- 0 [default]: Indicates that category must be received after all DNIS digits are received.
- Non-zero: Specifies the number of DNIS digits received before category information is received.

Guidelines: The behavior of the protocol will not be predictable, unless the following occurs:

- If this parameter is set to non-zero, **CDP_ANI_ENABLED** must be set to 1.
- If this parameter is set to non-zero, its value should be the minimum of **CDP_NUM_OF_DNIS_DIGITS**, **CDP_DNIS_MaxDigits**, and the actual DNIS digits to be received.

CDP_NUM_OF_AC_DIGITS (Inbound)

Description: Specifies the number of area code digits of the local exchange from where it received the call. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values: Default is 3.

CDP_NUM_OF_ANI_DIGITS (Inbound)

Description: Specifies the expected number of ANI digits to be received.

Values:

- Non-zero [default is 4]: Specifies the number of ANI digits expected. This number should always be less than **CDP_ANI_MaxDigits**.

Guidelines: **CDP_NUM_OF_ANI_DIGITS** must have a non-zero value for Pakistan R2 protocol.

CDP_NUM_OF_DNIS_DIGITS (Inbound)

Description: Specifies the expected number of DNIS digits to be received.

Values:

- Non-zero [default is 4]: Specifies the number of DNIS digits expected. This number should always be less than **CDP_DNIS_MaxDigits**.

Guidelines: **CDP_NUM_OF_DNIS_DIGITS** must have a non-zero value for Pakistan R2 protocol.

CDP_OVERLAP_SENDING_ENABLED (Outbound)

Description: Enables or disables the overlap sending feature.

Values:

- 0: Disables overlap sending. 'f' will be appended to DNIS digits received with **gc_MakeCall()** (if **CDP_FLAG_APPEND_F** is true), indicating the end of information.
- 1 [default]: Enables overlap sending. The remote end can request more DNIS information, in which case a **REQMOREINFO** event will be generated. **gc_SendMoreInfo()** with Null information will either cause 'f' to be sent to the remote end or will remain silent (depending on the value of **CDP_FLAG_APPEND_F**), thus indicating to the remote end that no more DNIS digits are available.

CDP_REJECT_WITH_A3B4 (Inbound)

Description: Determines the method for rejecting a call when an R2MF tone error is received during call setup.

Values:

- 0 [default]: Call is rejected with a direct group A tone (A-10), which is a spare tone that may be used to indicate congestion.
- 1: Call is rejected with an A3-B4 tone combination, which means that the inbound (local) end sends an A-3 tone (send category and change over to group B tones). Then, the category is received and in response, a B-4 tone is sent to reject the call.

CDP_SEND_ALERTING_ON_R2MF_COMPLETION (Inbound)

Description: Controls when the protocol will send a GCEV_ALERTING event to the application.

Values:

- 0: GCEV_ALERTING is sent after receiving a ringback tone.
- 1 [default]: GCEV_ALERTING is sent after completion of the R2MF sequence (after receiving the last Group B tone).

CDP_SEND_BLOCK_AT_START_OR_REMOTE_BLOCK

Description: Specifies the bit pattern to be sent on the line at protocol open time and when the remote line goes BLOCKED.

Values:

- 0 [default]: If the protocol is used either as outbound only or as bidirectional.
- 1: If the protocol is used as inbound only.

CDP_TrunkPrefixNumber

Description: Specifies the trunk number used to dial to local exchange. This parameter is valid only if CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED is enabled.

Values: Default is 9.

Philippines R2 Bidirectional Protocol Parameter Configuration

This chapter discusses the capabilities and parameters of the Philippines R2 Bidirectional protocol in the following topics:

- General Protocol Information 223
- Country Dependent Parameter Descriptions 223

35.1 General Protocol Information

Protocol File Set

The files used with the Philippines R2 protocol are listed and described in the following table.

File Type	File Name(s)	
	DM3	Springware
Protocol Module	pdk_r2_io.qs and pdk_r2_io.hot (or pdk_r2_io.arm.hot for DMT160TEC boards)	pdk_r2_io.psi
Voice and Network Parameters	Not applicable	r2_300.prm
Country Dependent Parameters	pdk_ph_r2_io.cdp	pdk_ph_r2_io.cdp
	gc_OpenEx() Protocol Name	
	Not applicable†	pdk_ph_r2_io

†On DM3 boards, the protocol is determined at board initialization time and not when a Global Call device is opened. For compatibility, the **gc_OpenEx()** protocol name may be specified for DM3 boards, but it is not used.

Protocol Limitations

If a DropCall is attempted in the ACCEPTED state, the protocol will answer the call by sending out the ANSWER pattern before dropping the call, as forced release is not supported in this protocol.

35.2 Country Dependent Parameter Descriptions

Note: A parameter can be inbound, outbound, or both inbound and outbound. An inbound parameter is used by the protocol when it is acting as inbound. An outbound parameter is used by the protocol when it is acting as outbound. A parameter that is both can be used by the protocol when it is acting as either inbound or outbound.

The modifiable parameters in the *pdk_ph_r2_io.cdp* file are:

- CDP_ANI_ENABLED (Inbound)
- CDP_ANI_MaxDigits (Inbound)
- CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED
- CDP_ANI_WITHAC_FACILITY_ENABLED (Outbound)
- CDP_AreaCode
- CDP_CallingPartyCategory (Outbound)
- CDP_ConnectType (Outbound)
- CDP_DNIS_MaxDigits (Inbound)
- CDP_Drop_Using_ProgressTones_After_AcceptCall (Inbound)
- CDP_FLAG_APPEND_F (Outbound)
- CDP_GrpB_Tone (Inbound)
- CDP_IMMEDIATE_ACCEPTSTATE (Inbound)
- CDP_IS_ANIAVAILABILITY_CHECK_NEEDED
- CDP_IS_CALLING_LINE_IDENTIFICATION_PERMITTED (Outbound)
- CDP_NO_OF_DNIS_BEFORE_CAT (Inbound)
- CDP_NUM_OF_AC_DIGITS (Inbound)
- CDP_NUM_OF_ANI_DIGITS (Inbound)
- CDP_NUM_OF_DNIS_DIGITS (Inbound)
- CDP_OVERLAP_SENDING_ENABLED (Outbound)
- CDP_REJECT_WITH_A3B4 (Inbound)
- CDP_SEND_ALERTING_ON_R2MF_COMPLETION (Inbound)
- CDP_SEND_BLOCK_AT_START_OR_REMOTE_BLOCK
- CDP_TrunkPrefixNumber

In addition, see Chapter 3, “Call Progress Analysis Parameters” for configuring default call progress operation in the protocol.

CDP_ANI_ENABLED (Inbound)

Description: Enables or disables the reception of automatic number identification (ANI) digits.

Values:

- 0: Disable the reception of ANI digits.
- 1 [default]: Enable the reception of ANI digits.

Guidelines: If this parameter is set to a value other than 0 or 1, the behavior of the protocol is not predictable.

For DM3, if ANI is disabled, you also have to remove **feature_ANI** from the **SYS_FEATURES** parameter in the *.cdp* file. The **SYS_FEATURES** parameter looks like this:

```
All CHARSTRING_t SYS_FEATURES = "feature_outbound,feature_inbound,feature_DNIS,
feature_Billing,feature_ANI,feature_CAT,feature_MoreDNIS"
```

CDP_ANI_MaxDigits (Inbound)

Description: Specifies the maximum number of ANI digits that can be received when using this protocol.

Values: Default is 16.

Guidelines: If this parameter value is set to 0, the behavior of the protocol is not predictable.

CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED

Description: Specifies whether ANI is to be requested (inbound) or sent (outbound) with the area code.

Values:

- 0 [default]: Request (inbound) or send (outbound) ANI digits without area code.
- 1: Request (inbound) or send (outbound) area code with ANI digits.

CDP_ANI_WITHAC_FACILITY_ENABLED (Outbound)

Description: Specifies whether ANI digits and area code are sent to the inbound side. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values:

- 0 [default]: The requested information denied tone is sent to the inbound side.
- 1: ANI digits with area code are sent to the inbound side.

CDP_AreaCode

Description: Specifies the area code of the local exchange where the subscriber is connected. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values: Default is 987.

CDP_CallingPartyCategory (Outbound)

Description: Specifies the category of the calling subscriber.

Values:

- 1 [default]: Subscriber without priority

CDP_ConnectType (Outbound)

Description: Specifies the mode for outbound connect detection. Two types of connection events can be detected: the cas_answer received signaling bit pattern and the media type detection used when post-connect call analysis is enabled. The application has options as to when the call is

considered connected, as set by this parameter. The application also has options as to whether call analysis continues after the call has been connected when `cas_answer` is received first.

Values:

- 0 [default]: The protocol transitions to the connected state only when `cas_answer` is received. If `cas_answer` is received first, call analysis is stopped. If call analysis is received first, the result is sent to the application via a `GCEV_MEDIADETECTED` event, but the protocol does not transition to the connected state until `cas_answer` is received.
- 1: The protocol transitions to the connected state when the first event (either `cas_answer` or call analysis) is received. If `cas_answer` is received first, call analysis still continues and the result is sent to the application via a `GCEV_MEDIADETECTED` event. If call analysis is received first, the subsequent `cas_answer` is ignored.
- 2: The protocol transitions to the connected state when the first event (either `cas_answer` or call analysis) is received. If `cas_answer` is received first, call analysis is stopped. If call analysis is received first, the subsequent `cas_answer` is ignored.
- 3: The protocol transitions to the connected state only when call analysis is received. If call analysis is received first, the subsequent `cas_answer` is ignored. If `cas_answer` is received first, it is ignored.

CDP_DNIS_MaxDigits (Inbound)

Description: Specifies the maximum number of dialed number identification service (DNIS) digits that can be received when using this protocol.

Values: Default is 16.

Guidelines: If this parameter value is set to 0, the behavior of the protocol is not predictable.

CDP_Drop_Using_ProgressTones_After_AcceptCall (Inbound)

Description: Specifies the call progress tone to be sent for dropping a call, when doing a `gc_DropCall()` after a `gc_AcceptCall()`.

Values:

- 0 [default]: The protocol sends the Answer Line signal, waits for the time specified by `CDP_TimeToRecognizeAnswer`, and then sends a Clear Backward line signal for call disconnection. In this case, the call will be charged for the remote calling subscriber, even though the call is not successful.
- 1: The protocol sends the appropriate call progress tone depending on the `gc_DropCall()` cause to the remote end, and waits for a Clear Forward Line signal for call disconnection.

CDP_FLAG_APPEND_F (Outbound)

Description: When the remote end asks for the next DNIS digit through Group A backward tone, and the protocol does not have any more DNIS available to be sent, this parameter specifies

whether to send the I-15 tone or to remain silent and prepare for A3 or A4 pulse from the remote end.

Values:

- 0 [default]: No tone will be sent to the remote end. In this case, A3 or A4 pulse is expected to be received from the remote end. In a case of overlapped sending (see description of **CDP_OVERLAP_SENDING_ENABLED** parameter), the remote end may also send A1 to request more information.
- 1: 'f' (I-15) will be sent to the remote end, indicating the end of information.

CDP_GrpB_Tone (Inbound)

Description: Determines whether the sender should be charged after receiving the tone. The tone is sent from the inbound end on receipt of Category for Group II. After this tone, the sequence of R2MF tone exchange is over and the call is connected. This is the last R2MF tone in establishment of a call.

Values:

- 6 [default]: Line idle

CDP_IMMEDIATE_ACCEPTSTATE (Inbound)

Description: Specifies when the protocol transitions a call to the Accepted state.

Values:

- 0 [default]: The protocol should wait for the number of rings specified in **gc_AcceptCall()** to expire before transitioning to the Accepted state.
- 1: The protocol should transition a call to the Accepted state immediately upon receipt of **gc_AcceptCall()** and before the specified number of rings have been generated.

Guidelines: This parameter is ignored if the value of the **gc_AcceptCall()** rings parameter is 0.

CDP_IS_ANIAVAILABILITY_CHECK_NEEDED

Description: Determines whether the status of ANI availability is checked before ANI digits are exchanged. At the inbound side, this parameter specifies whether ANI availability at the outbound side has to be verified or if ANI digits can be requested directly. At the outbound side, ANI digits are passed directly or the inbound side is informed of the availability (status) first.

Values:

- 0 [default]: The status of ANI availability is not checked before ANI digits are exchanged. ANI digits can be requested directly without knowing the status of the outbound side.
- 1: The status of ANI availability is checked before ANI digits are exchanged. The inbound side requests the status of ANI availability. If ANI digits are available, the inbound side requests the ANI digits. The outbound side sends the status of ANI availability and then waits for the inbound request.

CDP_IS_CALLING_LINE_IDENTIFICATION_PERMITTED (Outbound)

Description: Specifies whether Calling Line Identification is enabled. This parameter is used to enable CLIP and CLIR conditions.

Values:

- 0: Calling Line Identification Rejected (CLIR). The requested information denied tone is sent to the inbound side.
- 1 [default]: Calling Line Identification Permitted (CLIP). ANI digits are sent to the inbound side.

CDP_NO_OF_DNIS_BEFORE_CAT (Inbound)

Description: Determines the number of DNIS digits that are to be received before any category information is received. If this parameter is set to non-zero, the following sequence of events occurs:

1. Partial DNIS digits are received.
2. Category digits are received.
3. The remaining DNIS digits are received.
4. ANI digits are received (if **CDP_ANI_ENABLED** is 1).
5. Category digits are received again.

Values:

- 0 [default]: Indicates that category must be received after all DNIS digits are received.
- Non-zero: Specifies the number of DNIS digits received before category information is received.

Guidelines: The behavior of the protocol will not be predictable, unless the following occurs:

- If this parameter is set to non-zero, **CDP_ANI_ENABLED** must be set to 1.
- If this parameter is set to non-zero, its value should be the minimum of **CDP_NUM_OF_DNIS_DIGITS** (if non-zero), **CDP_DNIS_MaxDigits**, and the actual DNIS digits to be received.

CDP_NUM_OF_AC_DIGITS (Inbound)

Description: Specifies the number of area code digits of the local exchange from where it received the call. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values: Default is 3.

CDP_NUM_OF_ANI_DIGITS (Inbound)

Description: Specifies the expected number of ANI digits to be received.

Values:

- 0 [default]: ANI collection is terminated by I-15 (end of dialing).
- Non-zero: Specifies the number of ANI digits expected. This number should always be less than **CDP_ANI_MaxDigits**.

CDP_NUM_OF_DNIS_DIGITS (Inbound)

Description: Specifies the expected number of DNIS digits to be received.

Values:

- 0: DNIS collection is terminated by I-15 (end of dialing).
- Non-zero [default is 4]: Specifies the number of DNIS digits expected. This number should always be less than **CDP_DNIS_MaxDigits**.

CDP_OVERLAP_SENDING_ENABLED (Outbound)

Description: Enables or disables the overlap sending feature.

Values:

- 0: Disables overlap sending. 'f' will be appended to DNIS digits received with **gc_MakeCall()** (if **CDP_FLAG_APPEND_F** is true), indicating the end of information.
- 1 [default]: Enables overlap sending. The remote end can request more DNIS information, in which case a REQMOREINFO event will be generated. **gc_SendMoreInfo()** with Null information will either cause 'f' to be sent to the remote end or will remain silent (depending on the value of **CDP_FLAG_APPEND_F**), thus indicating to the remote end that no more DNIS digits are available.

CDP_REJECT_WITH_A3B4 (Inbound)

Description: Determines the method for rejecting a call when an R2MF tone error is received during call setup.

Values:

- 0 [default]: Call is rejected with a direct group A tone (A-10), which is a spare tone that may be used to indicate congestion.
- 1: Call is rejected with an A3-B4 tone combination, which means that the inbound (local) end sends an A-3 tone (send category and change over to group B tones). Then, the category is received and in response, a B-4 tone is sent to reject the call.

CDP_SEND_ALERTING_ON_R2MF_COMPLETION (Inbound)

Description: Controls when the protocol will send a GCEV_ALERTING event to the application.

Values:

- 0: GCEV_ALERTING is sent after receiving a ringback tone.
- 1 [default]: GCEV_ALERTING is sent after completion of the R2MF sequence (after receiving the last Group B tone).

CDP_SEND_BLOCK_AT_START_OR_REMOTE_BLOCK

Description: Specifies the bit pattern to be sent on the line at protocol open time and when the remote line goes BLOCKED.

Values:

- 0 [default]: If the protocol is used either as outbound only or as bidirectional.
- 1: If the protocol is used as inbound only.

CDP_TrunkPrefixNumber

Description: Specifies the trunk number used to dial to local exchange. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values: Default is 9.

Saudi Arabia R2 Bidirectional Protocol Parameter Configuration

This chapter discusses the capabilities and parameters of the Saudi Arabia R2 Bidirectional protocol in the following topics:

- General Protocol Information 231
- Country Dependent Parameter Descriptions 231

36.1 General Protocol Information

Protocol File Set

The files used with the Saudia Arabia R2 protocol are listed and described in the following table.

File Type	File Name(s)	
	DM3	Springware
Protocol Module	pdk_r2_io.qs and pdk_r2_io.hot (or pdk_r2_io.arm.hot for DMT160TEC boards)	pdk_r2_io.psi
Voice and Network Parameters	Not applicable	r2_300.prm
Country Dependent Parameters	pdk_sa_r2_io.cdp	pdk_sa_r2_io.cdp
	gc_OpenEx() Protocol Name	
	Not applicable†	pdk_sa_r2_io

†On DM3 boards, the protocol is determined at board initialization time and not when a Global Call device is opened. For compatibility, the **gc_OpenEx()** protocol name may be specified for DM3 boards, but it is not used.

Protocol Limitations

If a DropCall is attempted in the ACCEPTED state, the protocol will answer the call by sending out the ANSWER pattern before dropping the call, as forced release is not supported in this protocol.

36.2 Country Dependent Parameter Descriptions

Note: A parameter can be inbound, outbound, or both inbound and outbound. An inbound parameter is used by the protocol when it is acting as inbound. An outbound parameter is used by the protocol when it is acting as outbound. A parameter that is both can be used by the protocol when it is acting as either inbound or outbound.

The modifiable parameters in the *pdk_sa_r2_io.cdp* file are:

- CDP_ANI_ENABLED (Inbound)
- CDP_ANI_MaxDigits (Inbound)
- CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED
- CDP_ANI_WITHAC_FACILITY_ENABLED (Outbound)
- CDP_AreaCode
- CDP_CallingPartyCategory (Outbound)
- CDP_ConnectType (Outbound)
- CDP_DNIS_MaxDigits (Inbound)
- CDP_Drop_Using_ProgressTones_After_AcceptCall (Inbound)
- CDP_FLAG_APPEND_F (Outbound)
- CDP_GrpB_Tone (Inbound)
- CDP_IMMEDIATE_ACCEPTSTATE (Inbound)
- CDP_IS_ANIAVAILABILITY_CHECK_NEEDED
- CDP_IS_CALLING_LINE_IDENTIFICATION_PERMITTED (Outbound)
- CDP_NO_OF_DNIS_BEFORE_CAT (Inbound)
- CDP_NUM_OF_AC_DIGITS (Inbound)
- CDP_NUM_OF_ANI_DIGITS (Inbound)
- CDP_NUM_OF_DNIS_DIGITS (Inbound)
- CDP_OVERLAP_SENDING_ENABLED (Outbound)
- CDP_REJECT_WITH_A3B4 (Inbound)
- CDP_SEND_ALERTING_ON_R2MF_COMPLETION (Inbound)
- CDP_SEND_BLOCK_AT_START_OR_REMOTE_BLOCK
- CDP_TrunkPrefixNumber

In addition, see [Chapter 3, “Call Progress Analysis Parameters”](#) for configuring default call progress operation in the protocol.

CDP_ANI_ENABLED (Inbound)

Description: Enables or disables the reception of automatic number identification (ANI) digits.

Values:

- 0: Disable the reception of ANI digits.
- 1 [default]: Enable the reception of ANI digits.

Guidelines: If this parameter is set to a value other than 0 or 1, the behavior of the protocol is not predictable.

For DM3, if ANI is disabled, you also have to remove **feature_ANI** from the **SYS_FEATURES** parameter in the *.cdp* file. The **SYS_FEATURES** parameter looks like this:

```
All CHARSTRING_t SYS_FEATURES = "feature_outbound,feature_inbound,feature_DNIS,  
feature_Billing,feature_ANI,feature_CAT,feature_MoreDNIS"
```

CDP_ANI_MaxDigits (Inbound)

Description: Specifies the maximum number of ANI digits that can be received when using this protocol.

Values: Default is 16.

Guidelines: If this parameter value is set to 0, the behavior of the protocol is not predictable.

CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED

Description: Specifies whether ANI is to be requested (inbound) or sent (outbound) with the area code.

Values:

- 0 [default]: Request (inbound) or send (outbound) ANI digits without area code.
- 1: Request (inbound) or send (outbound) area code with ANI digits.

CDP_ANI_WITHAC_FACILITY_ENABLED (Outbound)

Description: Specifies whether ANI digits and area code are sent to the inbound side. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values:

- 0 [default]: The requested information denied tone is sent to the inbound side.
- 1: ANI digits with area code are sent to the inbound side.

CDP_AreaCode

Description: Specifies the area code of the local exchange where the subscriber is connected. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values: Default is 987.

CDP_CallingPartyCategory (Outbound)

Description: Specifies the category of the calling subscriber (one of the Group II forward signals).

Values:

- 1 [default]: II-1, subscriber without priority
- 2: II-2, subscriber with priority
- 3: II-3, maintenance equipment
- 5: II-5, operator
- 6: II-6, data transmission
- 7: II-7, subscriber (or operator without forward transfer facility)
- 8: II-8, data transmission
- 9: II-9, subscriber with priority
- A: II-10, operator with forward transfer facility
- B: II-11, coin telephone station barred from international access
- C: II-12, ISD coin telephone station
- D: II-13, private metering telephone station
- E: II-14, interception service operator
- F: II-15, exchange from which call is not transferred further

CDP_ConnectType (Outbound)

Description: Specifies the mode for outbound connect detection. Two types of connection events can be detected: the cas_answer received signaling bit pattern and the media type detection used when post-connect call analysis is enabled. The application has options as to when the call is considered connected, as set by this parameter. The application also has options as to whether call analysis continues after the call has been connected when cas_answer is received first.

Values:

- 0 [default]: The protocol transitions to the connected state only when cas_answer is received. If cas_answer is received first, call analysis is stopped. If call analysis is received first, the result is sent to the application via a GCEV_MEDIADETECTED event, but the protocol does not transition to the connected state until cas_answer is received.
- 1: The protocol transitions to the connected state when the first event (either cas_answer or call analysis) is received. If cas_answer is received first, call analysis still continues and the result is sent to the application via a GCEV_MEDIADETECTED event. If call analysis is received first, the subsequent cas_answer is ignored.
- 2: The protocol transitions to the connected state when the first event (either cas_answer or call analysis) is received. If cas_answer is received first, call analysis is stopped. If call analysis is received first, the subsequent cas_answer is ignored.
- 3: The protocol transitions to the connected state only when call analysis is received. If call analysis is received first, the subsequent cas_answer is ignored. If cas_answer is received first, it is ignored.

CDP_DNIS_MaxDigits (Inbound)

Description: Specifies the maximum number of dialed number identification service (DNIS) digits that can be received when using this protocol.

Values: Default is 16.

Guidelines: If this parameter value is set to 0, the behavior of the protocol is not predictable.

CDP_Drop_Using_ProgressTones_After_AcceptCall (Inbound)

Description: Specifies the call progress tone to be sent for dropping a call, when doing a `gc_DropCall()` after a `gc_AcceptCall()`.

Values:

- 0 [default]: The protocol sends the Answer Line signal, waits for the time specified by `CDP_TimeToRecognizeAnswer`, and then sends a Clear Backward line signal for call disconnection. In this case, the call will be charged for the remote calling subscriber, even though the call is not successful.
- 1: The protocol sends the appropriate call progress tone depending on the `gc_DropCall()` cause to the remote end, and waits for a Clear Forward Line signal for call disconnection.

CDP_FLAG_APPEND_F (Outbound)

Description: When the remote end asks for the next DNIS digit through Group A backward tone, and the protocol does not have any more DNIS available to be sent, this parameter specifies whether to send the I-15 tone or to remain silent and prepare for A3 or A4 pulse from the remote end.

Values:

- 0 [default]: No tone will be sent to the remote end. In this case, A3 or A4 pulse is expected to be received from the remote end. In a case of overlapped sending (see description of `CDP_OVERLAP_SENDING_ENABLED` parameter), the remote end may also send A1 to request more information.
- 1: 'f' (I-15) will be sent to the remote end, indicating the end of information.

CDP_GrpB_Tone (Inbound)

Description: Determines whether the sender should be charged after receiving the tone. The tone is sent from the inbound end on receipt of Category for Group II. After this tone, the sequence of R2MF tone exchange is over and the call is connected. This is the last R2MF tone in establishment of a call.

Values:

- 1: Line free, chargeable but the clearing of the call is under called party
- 3: Subscriber's line busy
- 4: Congestion
- 5: Unassigned number
- 6 [default]: Line free, chargeable
- 7: Subscriber's line free, no charge
- 8: Subscriber's line out of service
- 9: Subscriber's line marked for interception service

CDP_IMMEDIATE_ACCEPTSTATE (Inbound)

Description: Specifies when the protocol transitions a call to the Accepted state.

Values:

- 0 [default]: The protocol should wait for the number of rings specified in `gc_AcceptCall()` to expire before transitioning to the Accepted state.
- 1: The protocol should transition a call to the Accepted state immediately upon receipt of `gc_AcceptCall()` and before the specified number of rings have been generated.

Guidelines: This parameter is ignored if the value of the `gc_AcceptCall()` rings parameter is 0.

CDP_IS_ANIAVAILABILITY_CHECK_NEEDED

Description: Determines whether the status of ANI availability is checked before ANI digits are exchanged. At the inbound side, this parameter specifies whether ANI availability at the outbound side has to be verified or if ANI digits can be requested directly. At the outbound side, ANI digits are passed directly or the inbound side is informed of the availability (status) first.

Values:

- 0 [default]: The status of ANI availability is not checked before ANI digits are exchanged. ANI digits can be requested directly without knowing the status of the outbound side.
- 1: The status of ANI availability is checked before ANI digits are exchanged. The inbound side requests the status of ANI availability. If ANI digits are available, the inbound side requests the ANI digits. The outbound side sends the status of ANI availability and then waits for the inbound request.

CDP_IS_CALLING_LINE_IDENTIFICATION_PERMITTED (Outbound)

Description: Specifies whether Calling Line Identification is enabled. This parameter is used to enable CLIP and CLIR conditions.

Values:

- 0: Calling Line Identification Rejected (CLIR). The requested information denied tone is sent to the inbound side.
- 1 [default]: Calling Line Identification Permitted (CLIP). ANI digits are sent to the inbound side.

CDP_NO_OF_DNIS_BEFORE_CAT (Inbound)

Description: Determines the number of DNIS digits that are to be received before any category information is received. If this parameter is set to non-zero, the following sequence of events occurs:

1. Partial DNIS digits are received.
2. Category digits are received.
3. The remaining DNIS digits are received.
4. ANI digits are received (if **CDP_ANI_ENABLED** is 1).
5. Category digits are received again.

Values:

- 0 [default]: Indicates that category must be received after all DNIS digits are received.
- Non-zero: Specifies the number of DNIS digits received before category information is received.

Guidelines: The behavior of the protocol will not be predictable, unless the following occurs:

- If this parameter is set to non-zero, **CDP_ANI_ENABLED** must be set to 1.
- If this parameter is set to non-zero, its value should be the minimum of **CDP_NUM_OF_DNIS_DIGITS** (if non-zero), **CDP_DNIS_MaxDigits**, and the actual DNIS digits to be received.

CDP_NUM_OF_AC_DIGITS (Inbound)

Description: Specifies the number of area code digits of the local exchange from where it received the call. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values: Default is 0.

CDP_NUM_OF_ANI_DIGITS (Inbound)

Description: Specifies the expected number of ANI digits to be received.

Values:

- 0 [default]: ANI collection is terminated by I-15 (end of dialing).
- Non-zero: Specifies the number of ANI digits expected. This number should always be less than **CDP_ANI_MaxDigits**.

CDP_NUM_OF_DNIS_DIGITS (Inbound)

Description: Specifies the expected number of DNIS digits to be received.

Values:

- 0: DNIS collection is terminated by I-15 (end of dialing).
- Non-zero [default is 4]: Specifies the number of DNIS digits expected. This number should always be less than **CDP_DNIS_MaxDigits**.

CDP_OVERLAP_SENDING_ENABLED (Outbound)

Description: Enables or disables the overlap sending feature.

Values:

- 0: Disables overlap sending. 'f' will be appended to DNIS digits received with **gc_MakeCall()** (if **CDP_FLAG_APPEND_F** is true), indicating the end of information.
- 1 [default]: Enables overlap sending. The remote end can request more DNIS information, in which case a **REQMOREINFO** event will be generated. **gc_SendMoreInfo()** with Null information will either cause 'f' to be sent to the remote end or will remain silent (depending on the value of **CDP_FLAG_APPEND_F**), thus indicating to the remote end that no more DNIS digits are available.

CDP_REJECT_WITH_A3B4 (Inbound)

Description: Determines the method for rejecting a call when an R2MF tone error is received during call setup.

Values:

- 0 [default]: Call is rejected with a direct group A tone (A-10), which is a spare tone that may be used to indicate congestion.
- 1: Call is rejected with an A3-B4 tone combination, which means that the inbound (local) end sends an A-3 tone (send category and change over to group B tones). Then, the category is received and in response, a B-4 tone is sent to reject the call.

CDP_SEND_ALERTING_ON_R2MF_COMPLETION (Inbound)

Description: Controls when the protocol will send a **GCEV_ALERTING** event to the application.

Values:

- 0 [default]: **GCEV_ALERTING** is sent after receiving a ringback tone.
- 1: **GCEV_ALERTING** is sent after completion of the R2MF sequence (after receiving the last Group B tone).

CDP_SEND_BLOCK_AT_START_OR_REMOTE_BLOCK

Description: Specifies the bit pattern to be sent on the line at protocol open time and when the remote line goes BLOCKED.

Values:

- 0 [default]: If the protocol is used either as outbound only or as bidirectional.
- 1: If the protocol is used as inbound only.

CDP_TrunkPrefixNumber

Description: Specifies the trunk number used to dial to local exchange. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values: Default is 9.



Singapore R2 Bidirectional Protocol Parameter Configuration

This chapter discusses the capabilities and parameters of the Singapore R2 Bidirectional protocol in the following topics:

- General Protocol Information 241
- Country Dependent Parameter Descriptions 241

37.1 General Protocol Information

Protocol File Set

The files used with the Singapore R2 protocol are listed and described in the following table.

File Type	File Name(s)	
	DM3	Springware
Protocol Module	pdk_r2_io.qs and pdk_r2_io.hot (or pdk_r2_io.arm.hot for DMT160TEC boards)	pdk_r2_io.psi
Voice and Network Parameters	Not applicable	sg_300.prm
Country Dependent Parameters	pdk_sg_r2_io.cdp	pdk_sg_r2_io.cdp
	gc_OpenEx() Protocol Name	
	Not applicable†	pdk_sg_r2_io

†On DM3 boards, the protocol is determined at board initialization time and not when a Global Call device is opened. For compatibility, the **gc_OpenEx()** protocol name may be specified for DM3 boards, but it is not used.

Protocol Limitations

If a DropCall is attempted in the ACCEPTED state, the protocol will answer the call by sending out the ANSWER pattern before dropping the call, as forced release is not supported in this protocol.

37.2 Country Dependent Parameter Descriptions

Note: A parameter can be inbound, outbound, or both inbound and outbound. An inbound parameter is used by the protocol when it is acting as inbound. An outbound parameter is used by the protocol when it is acting as outbound. A parameter that is both can be used by the protocol when it is acting as either inbound or outbound.

The modifiable parameters in the *pdk_sg_r2_io.cdp* file are:

- CDP_ANI_ENABLED (Inbound)
- CDP_ANI_MaxDigits (Inbound)
- CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED
- CDP_ANI_WITHAC_FACILITY_ENABLED (Outbound)
- CDP_AreaCode
- CDP_CallingPartyCategory (Outbound)
- CDP_ConnectType (Outbound)
- CDP_DNIS_MaxDigits (Inbound)
- CDP_Drop_Using_ProgressTones_After_AcceptCall (Inbound)
- CDP_FLAG_APPEND_F (Outbound)
- CDP_GrpB_Tone (Inbound)
- CDP_IMMEDIATE_ACCEPTSTATE (Inbound)
- CDP_IS_ANIAVAILABILITY_CHECK_NEEDED
- CDP_IS_CALLING_LINE_IDENTIFICATION_PERMITTED (Outbound)
- CDP_NO_OF_DNIS_BEFORE_CAT (Inbound)
- CDP_NUM_OF_AC_DIGITS (Inbound)
- CDP_NUM_OF_ANI_DIGITS (Inbound)
- CDP_NUM_OF_DNIS_DIGITS (Inbound)
- CDP_OVERLAP_SENDING_ENABLED (Outbound)
- CDP_REJECT_WITH_A3B4 (Inbound)
- CDP_SEND_ALERTING_ON_R2MF_COMPLETION (Inbound)
- CDP_SEND_BLOCK_AT_START_OR_REMOTE_BLOCK
- CDP_TrunkPrefixNumber

In addition, see Chapter 3, “Call Progress Analysis Parameters” for configuring default call progress operation in the protocol.

CDP_ANI_ENABLED (Inbound)

Description: Enables or disables the reception of automatic number identification (ANI) digits.

Values:

- 0: Disable the reception of ANI digits.
- 1 [default]: Enable the reception of ANI digits.

Guidelines: If this parameter is set to a value other than 0 or 1, the behavior of the protocol is not predictable.

For DM3, if ANI is disabled, you also have to remove **feature_ANI** from the **SYS_FEATURES** parameter in the *.cdp* file. The **SYS_FEATURES** parameter looks like this:

```
All CHARSTRING_t SYS_FEATURES = "feature_outbound,feature_inbound,feature_DNIS,
feature_Billing,feature_ANI,feature_CAT,feature_MoreDNIS"
```

CDP_ANI_MaxDigits (Inbound)

Description: Specifies the maximum number of ANI digits that can be received when using this protocol.

Values: Default is 16.

Guidelines: If this parameter value is set to 0, the behavior of the protocol is not predictable.

CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED

Description: Specifies whether ANI is to be requested (inbound) or sent (outbound) with the area code.

Values:

- 0 [default]: Request (inbound) or send (outbound) ANI digits without area code.
- 1: Request (inbound) or send (outbound) area code with ANI digits.

CDP_ANI_WITHAC_FACILITY_ENABLED (Outbound)

Description: Specifies whether ANI digits and area code are sent to the inbound side. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values:

- 0 [default]: The requested information denied tone is sent to the inbound side.
- 1: ANI digits with area code are sent to the inbound side.

CDP_AreaCode

Description: Specifies the area code of the local exchange where the subscriber is connected. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values: Default is 987.

CDP_CallingPartyCategory (Outbound)

Description: Specifies the category of the calling subscriber.

Values:

- 1: Operator with trunk offering
- 2 [default]: Ordinary subscriber or operator without trunk offering facility
- 3: Pay phone (local/STD/IDD calls)
- 4: Ex-directory subscriber (defined but not in use)
- 5: Coinafon
- 6: Test equipment
- 7: Line test desk
- 8: Interception operator
- 9: Call from transit exchange that does not normally have the calling subscriber number information (for example, trunk/gateway)
- A: Indication of a transferred call

CDP_ConnectType (Outbound)

Description: Specifies the mode for outbound connect detection. Two types of connection events can be detected: the cas_answer received signaling bit pattern and the media type detection used when post-connect call analysis is enabled. The application has options as to when the call is considered connected, as set by this parameter. The application also has options as to whether call analysis continues after the call has been connected when cas_answer is received first.

Values:

- 0 [default]: The protocol transitions to the connected state only when cas_answer is received. If cas_answer is received first, call analysis is stopped. If call analysis is received first, the result is sent to the application via a GCEV_MEDIADETECTED event, but the protocol does not transition to the connected state until cas_answer is received.
- 1: The protocol transitions to the connected state when the first event (either cas_answer or call analysis) is received. If cas_answer is received first, call analysis still continues and the result is sent to the application via a GCEV_MEDIADETECTED event. If call analysis is received first, the subsequent cas_answer is ignored.
- 2: The protocol transitions to the connected state when the first event (either cas_answer or call analysis) is received. If cas_answer is received first, call analysis is stopped. If call analysis is received first, the subsequent cas_answer is ignored.
- 3: The protocol transitions to the connected state only when call analysis is received. If call analysis is received first, the subsequent cas_answer is ignored. If cas_answer is received first, it is ignored.

CDP_DNIS_MaxDigits (Inbound)

Description: Specifies the maximum number of dialed number identification service (DNIS) digits that can be received when using this protocol.

Values: Default is 16.

Guidelines: If this parameter value is set to 0, the behavior of the protocol is not predictable.

CDP_Drop_Using_ProgressTones_After_AcceptCall (Inbound)

Description: Specifies the call progress tone to be sent for dropping a call, when doing a `gc_DropCall()` after a `gc_AcceptCall()`.

Values:

- 0 [default]: The protocol sends the Answer Line signal, waits for the time specified by `CDP_TimeToRecognizeAnswer`, and then sends a Clear Backward line signal for call disconnection. In this case, the call will be charged for the remote calling subscriber, even though the call is not successful.
- 1: The protocol sends the appropriate call progress tone depending on the `gc_DropCall()` cause to the remote end, and waits for a Clear Forward Line signal for call disconnection.

CDP_FLAG_APPEND_F (Outbound)

Description: When the remote end asks for the next DNIS digit through Group A backward tone, and the protocol does not have any more DNIS available to be sent, this parameter specifies whether to send the I-15 tone or to remain silent and prepare for A3 or A4 pulse from the remote end.

Values:

- 0 [default]: No tone will be sent to the remote end. In this case, A3 or A4 pulse is expected to be received from the remote end. In a case of overlapped sending (see description of `CDP_OVERLAP_SENDING_ENABLED` parameter), the remote end may also send A1 to request more information.
- 1: 'f' (I-15) will be sent to the remote end, indicating the end of information.

CDP_GrpB_Tone (Inbound)

Description: Determines whether the sender should be charged after receiving the tone. The tone is sent from the inbound end on receipt of Category for Group II. After this tone, the sequence of R2MF tone exchange is over and the call is connected. This is the last R2MF tone in establishment of a call.

Values:

- 1 [default]: Called party free, chargeable
- 5: Called party free, not chargeable

CDP_IMMEDIATE_ACCEPTSTATE (Inbound)

Description: Specifies when the protocol transitions a call to the Accepted state.

Values:

- 0 [default]: The protocol should wait for the number of rings specified in `gc_AcceptCall()` to expire before transitioning to the Accepted state.
- 1: The protocol should transition a call to the Accepted state immediately upon receipt of `gc_AcceptCall()` and before the specified number of rings have been generated.

Guidelines: This parameter is ignored if the value of the `gc_AcceptCall()` rings parameter is 0.

CDP_IS_ANIAVAILABILITY_CHECK_NEEDED

Description: Determines whether the status of ANI availability is checked before ANI digits are exchanged. At the inbound side, this parameter specifies whether ANI availability at the outbound side has to be verified or if ANI digits can be requested directly. At the outbound side, ANI digits are passed directly or the inbound side is informed of the availability (status) first.

Values:

- 0 [default]: The status of ANI availability is not checked before ANI digits are exchanged. ANI digits can be requested directly without knowing the status of the outbound side.
- 1: The status of ANI availability is checked before ANI digits are exchanged. The inbound side requests the status of ANI availability. If ANI digits are available, the inbound side requests the ANI digits. The outbound side sends the status of ANI availability and then waits for the inbound request.

CDP_IS_CALLING_LINE_IDENTIFICATION_PERMITTED (Outbound)

Description: Specifies whether Calling Line Identification is enabled. This parameter is used to enable CLIP and CLIR conditions.

Values:

- 0: Calling Line Identification Rejected (CLIR). The requested information denied tone is sent to the inbound side.
- 1 [default]: Calling Line Identification Permitted (CLIP). ANI digits are sent to the inbound side.

CDP_NO_OF_DNIS_BEFORE_CAT (Inbound)

Description: Determines the number of DNIS digits that are to be received before any category information is received. If this parameter is set to non-zero, the following sequence of events occurs:

1. Partial DNIS digits are received.
2. Category digits are received.
3. The remaining DNIS digits are received.
4. ANI digits are received (if **CDP_ANI_ENABLED** is 1).
5. Category digits are received again.

Values:

- 0 [default]: Indicates that category must be received after all DNIS digits are received.
- Non-zero: Specifies the number of DNIS digits received before category information is received.

Guidelines: The behavior of the protocol will not be predictable, unless the following occurs:

- If this parameter is set to non-zero, **CDP_ANI_ENABLED** must be set to 1.
- If this parameter is set to non-zero, its value should be the minimum of **CDP_NUM_OF_DNIS_DIGITS** (if non-zero), **CDP_DNIS_MaxDigits**, and the actual DNIS digits to be received.

CDP_NUM_OF_AC_DIGITS (Inbound)

Description: Specifies the number of area code digits of the local exchange from where it received the call. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values: Default is 3.

CDP_NUM_OF_ANI_DIGITS (Inbound)

Description: Specifies the expected number of ANI digits to be received.

Values:

- 0 [default]: ANI collection is terminated by I-15 (end of dialing).
- Non-zero: Specifies the number of ANI digits expected. This number should always be less than **CDP_ANI_MaxDigits**.

CDP_NUM_OF_DNIS_DIGITS (Inbound)

Description: Specifies the expected number of DNIS digits to be received.

Values:

- 0: DNIS collection is terminated by I-15 (end of dialing).
- Non-zero [default is 4]: Specifies the number of DNIS digits expected. This number should always be less than **CDP_DNIS_MaxDigits**.

CDP_OVERLAP_SENDING_ENABLED (Outbound)

Description: Enables or disables the overlap sending feature.

Values:

- 0: Disables overlap sending. 'f' will be appended to DNIS digits received with **gc_MakeCall()** (if **CDP_FLAG_APPEND_F** is true), indicating the end of information.
- 1 [default]: Enables overlap sending. The remote end can request more DNIS information, in which case a **REQMOREINFO** event will be generated. **gc_SendMoreInfo()** with Null information will either cause 'f' to be sent to the remote end or will remain silent (depending on the value of **CDP_FLAG_APPEND_F**), thus indicating to the remote end that no more DNIS digits are available.

CDP_REJECT_WITH_A3B4 (Inbound)

Description: Determines the method for rejecting a call when an R2MF tone error is received during call setup.

Values:

- 0 [default]: Call is rejected with a direct group A tone (A-10), which is a spare tone that may be used to indicate congestion.
- 1: Call is rejected with an A3-B4 tone combination, which means that the inbound (local) end sends an A-3 tone (send category and change over to group B tones). Then, the category is received and in response, a B-4 tone is sent to reject the call.

CDP_SEND_ALERTING_ON_R2MF_COMPLETION (Inbound)

Description: Controls when the protocol will send a GCEV_ALERTING event to the application.

Values:

- 0: GCEV_ALERTING is sent after receiving a ringback tone.
- 1 [default]: GCEV_ALERTING is sent after completion of the R2MF sequence (after receiving the last Group B tone).

CDP_SEND_BLOCK_AT_START_OR_REMOTE_BLOCK

Description: Specifies the bit pattern to be sent on the line at protocol open time and when the remote line goes BLOCKED.

Values:

- 0 [default]: If the protocol is used either as outbound only or as bidirectional.
- 1: If the protocol is used as inbound only.

CDP_TrunkPrefixNumber

Description: Specifies the trunk number used to dial to local exchange. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values: Default is 9.



Sweden P7 Bidirectional Protocol 38 Parameter Configuration

This chapter discusses the capabilities and parameters of the Sweden P7 Bidirectional protocol in the following topics:

- General Protocol Information 249
- Country Dependent Parameter Descriptions 250

38.1 General Protocol Information

Protocol File Set

The files used with the Sweden P7 protocol are listed and described in the following table.

File Type	File Name(s)	
	DM3†	Springware
Protocol Module	pdk_se_p7_io.qs and pdk_se_p7_io.hot (or pdk_se_p7_io.arm.hot for DMT160TEC boards)	pdk_se_p7_io.psi
Voice and Network Parameters	Not applicable	se_300.prm
Country Dependent Parameters	pdk_se_p7_io.cdp	pdk_se_p7_io.cdp
	gc_OpenEx() Protocol Name	
	Not applicable‡	pdk_se_p7_io

†Support on DM3 boards requires Intel® Dialogic® System Release 6.0 for PCI or later.
‡On DM3 boards, the protocol is determined at board initialization time and not when a Global Call device is opened. For compatibility, the **gc_OpenEx()** protocol name may be specified for DM3 boards, but it is not used.

Protocol Limitations

From the Accepted state, the protocol used in this country does not support a forced release of the line; that is, issuing a **gc_DropCall()** function after a **gc_AcceptCall()** function. If a forced release is attempted, the function will fail and an error is returned. To recover, the application should issue a **gc_AnswerCall()** function followed by **gc_DropCall()** and **gc_ReleaseCall()** functions. However, anytime a GCEV_DISCONNECTED event is received in the Accepted state, the **gc_DropCall()** function can be issued.

38.2 Country Dependent Parameter Descriptions

Note: A parameter can be inbound, outbound, or both inbound and outbound. An inbound parameter is used by the protocol when it is acting as inbound. An outbound parameter is used by the protocol when it is acting as outbound. A parameter that is both can be used by the protocol when it is acting as either inbound or outbound.

The modifiable parameters in the *pdk_se_p7_io.cdp* file are:

- [CDP_Dial_Using_DTMF](#) (Outbound)
- [CDP_DialToneEnabled](#) (Outbound)
- [CDP_IMMEDIATE_ACCEPTSTATE](#) (Inbound)
- [CDP_SEND_BLOCK_AT_START_OR_REMOTE_BLOCK](#)

In addition, see [Chapter 3, “Call Progress Analysis Parameters”](#) for configuring default call progress operation in the protocol.

[CDP_Dial_Using_DTMF](#) (Outbound)

Description: Determines whether DTMF digits are sent.

Values:

- 0: Decadic pulses are used for sending digits.
- 1 [default]: DTMF digits are sent.

[CDP_DialToneEnabled](#) (Outbound)

Description: Determines whether to wait for a dial tone before sending digits to the remote end.

Values:

- 0 [default]: Do not wait for dial tone before sending digits to the remote end.
- 1: Wait for dial tone before sending digits to the remote end.

[CDP_IMMEDIATE_ACCEPTSTATE](#) (Inbound)

Description: Specifies when the protocol transitions a call to the Accepted state.

Values:

- 0 [default]: The protocol should wait for the number of rings specified in `gc_AcceptCall()` to expire before transitioning to the Accepted state.
- 1: The protocol should transition a call to the Accepted state immediately upon receipt of `gc_AcceptCall()` and before the specified number of rings have been generated.

Guidelines: This parameter is ignored if the value of the `gc_AcceptCall()` rings parameter is 0.



CDP_SEND_BLOCK_AT_START_OR_REMOTE_BLOCK

Description: Specifies the bit pattern to be sent on the line at protocol open time and when the remote line goes BLOCKED.

Values:

- 0 [default]: If the protocol is used either as outbound only or as bidirectional.
- 1: If the protocol is used as inbound only.



Sweden P7 PBX Bidirectional Protocol Parameter Configuration

This chapter discusses the capabilities and parameters of the Sweden P7 PBX Bidirectional protocol in the following topics:

- General Protocol Information 253
- Country Dependent Parameter Descriptions 254

39.1 General Protocol Information

Protocol File Set

The files used with the Sweden P7 PBX protocol are listed and described in the following table.

File Type	File Name(s)	
	DM3†	Springware
Protocol Module	pdk_se_p7_pbx_io.qs and pdk_se_p7_pbx_io.hot (or pdk_se_p7_pbx_io.arm.hot for DMT160TEC boards)	pdk_se_p7_pbx_io.psi
Voice and Network Parameters	Not applicable	se_300.prm
Country Dependent Parameters	pdk_se_p7_pbx_io.cdp	pdk_se_p7_pbx_io.cdp
	gc_OpenEx() Protocol Name	
	Not applicable‡	pdk_se_p7_pbx_io

†Support on DM3 boards requires Intel® Dialogic® System Release 6.0 for PCI or later.
‡On DM3 boards, the protocol is determined at board initialization time and not when a Global Call device is opened. For compatibility, the **gc_OpenEx()** protocol name may be specified for DM3 boards, but it is not used.

Protocol Limitations

From the Accepted state, the protocol used in this country does not support a forced release of the line; that is, issuing a **gc_DropCall()** function after a **gc_AcceptCall()** function. If a forced release is attempted, the function will fail and an error is returned. To recover, the application should issue a **gc_AnswerCall()** function followed by **gc_DropCall()** and **gc_ReleaseCall()** functions. However, anytime a GCEV_DISCONNECTED event is received in the Accepted state, the **gc_DropCall()** function can be issued.

39.2 Country Dependent Parameter Descriptions

Note: A parameter can be inbound, outbound, or both inbound and outbound. An inbound parameter is used by the protocol when it is acting as inbound. An outbound parameter is used by the protocol when it is acting as outbound. A parameter that is both can be used by the protocol when it is acting as either inbound or outbound.

The modifiable parameters in the *pdk_se_p7_pbx_io.cdp* file are:

- [CDP_Dial_Using_DTMF \(Inbound\)](#)
- [CDP_DialToneEnabled \(Inbound\)](#)
- [CDP_IMMEDIATE_ACCEPTSTATE \(Inbound\)](#)
- [CDP_MaxDigits \(Inbound\)](#)
- [CDP_SEND_BLOCK_AT_START_OR_REMOTE_BLOCK](#)
- [CDP_Str_TermToneString \(Inbound\)](#)

In addition, see [Chapter 3, “Call Progress Analysis Parameters”](#) for configuring default call progress operation in the protocol.

[CDP_Dial_Using_DTMF \(Inbound\)](#)

Description: Determines whether DTMF digits will be received.

Values:

- 0: Decadic pulses are used for receiving digits.
- 1 [default]: DTMF digits will be received.

[CDP_DialToneEnabled \(Inbound\)](#)

Description: Determines whether to wait for a dial tone before sending digits to the remote end.

Values:

- 0 [default]: Do not wait for dial tone before sending digits to the remote end.
- 1: Wait for dial tone before sending digits to the remote end.

[CDP_IMMEDIATE_ACCEPTSTATE \(Inbound\)](#)

Description: Specifies when the protocol transitions a call to the Accepted state.

Values:

- 0 [default]: The protocol should wait for the number of rings specified in `gc_AcceptCall()` to expire before transitioning to the Accepted state.
- 1: The protocol should transition a call to the Accepted state immediately upon receipt of `gc_AcceptCall()` and before the specified number of rings have been generated.

Guidelines: This parameter is ignored if the value of the `gc_AcceptCall()` rings parameter is 0.

CDP_MaxDigits (Inbound)

Description: Specifies the maximum number of digits that can be received when using this protocol. If, however, DTMF is used, and the parameter **CDP_Str_TermToneString** is non-NULL, then this parameter means the number of maximum digits to be received. If some terminating digit is received before receiving this number of digits, the digit collection is terminated.

Values: Default is 4.

CDP_SEND_BLOCK_AT_START_OR_REMOTE_BLOCK

Description: Specifies the bit pattern to be sent on the line at protocol open time and when the remote line goes BLOCKED.

Values:

- 0 [default]: If the protocol is used either as outbound only or as bidirectional.
- 1: If the protocol is used as inbound only.

CDP_Str_TermToneString (Inbound)

Description: Specifies the string of digits that can terminate the receiving of digits. For example, if this parameter is set to #*, if * or # is received from the remote end while receiving DTMF digits, the protocol will stop receiving more digits.

Values: Default is #*.

Guidelines: This parameter is used only if DTMF is used for receiving digits. This parameter can be set to a NULL string (“”). In this case, the **CDP_MaxDigits** number of digits is received from the remote end.



Taiwan Modified R1 Bidirectional Protocol Parameter Configuration 40

This chapter discusses the capabilities and parameters of the Taiwan Modified R1 Bidirectional protocol in the following topics:

- [General Protocol Information](#) 257
- [Country Dependent Parameter Descriptions](#) 257

40.1 General Protocol Information

Protocol File Set

The files used with the Taiwan Modified R1 protocol are listed and described in the following table.

File Type	File Name(s)	
	DM3	Springware
Protocol Module	pdk_tw_mr1_io.qs and pdk_tw_mr1_io.hot (or pdk_tw_mr1_io.arm.hot for DMT160TEC boards)	pdk_tw_mr1_io.psi
Voice and Network Parameters	Not applicable	r2_300.prm
Country Dependent Parameters	pdk_tw_mr1_io.cdp	pdk_tw_mr1_io.cdp
	gc_OpenEx() Protocol Name	
	Not applicable†	pdk_tw_mr1_io

†On DM3 boards, the protocol is determined at board initialization time and not when a Global Call device is opened. For compatibility, the **gc_OpenEx()** protocol name may be specified for DM3 boards, but it is not used.

Protocol Limitations

None.

40.2 Country Dependent Parameter Descriptions

The modifiable parameters in the *pdk_tw_mr1_io.cdp* file are:

- [CDP_CallScenario](#)
- [CDP_SeizeAck_Timeout](#)

In addition, see [Chapter 3, “Call Progress Analysis Parameters”](#) for configuring default call progress operation in the protocol.

CDP_CallScenario

Description: Specifies the call scenario.

Values:

- 0: DNIS+ST ANSWER
- 1 [default]: DNIS+ST ANIWink KP+ANI+ST ANSWER

Guidelines: For DM3, if ANI is disabled, you also have to remove **feature_ANI** from the **SYS_FEATURES** parameter in the *.cdp* file. The **SYS_FEATURES** parameter looks like this:

```
ALL CHARSTRING_t SYS_FEATURES = "feature_outbound,feature_inbound,feature_DNIS,  
feature_Billing,feature_ANI,feature_CAT,feature_MoreDNIS"
```

CDP_SeizeAck_Timeout

Description: Defines the maximum time-out in milliseconds for a CAS_SEIZEACK event once the line is seized by sending a CAS_SEIZE. The remote end is expected to acknowledge the CAS_SEIZE event during this interval. If not, the outgoing call is considered to have failed.

Values: Time in milliseconds. Default is 5000 (5 seconds).

Taiwan T1 E&M Bidirectional Protocol Parameter Configuration

This chapter discusses the capabilities and parameters of the Taiwan T1 E&M Bidirectional protocol in the following topics:

- General Protocol Information 259
- Country Dependent Parameter Descriptions 259

41.1 General Protocol Information

The Taiwan T1 E&M protocol is used with the Taiwan Lucent Definity G3V8 switch with T1 signaling.

Protocol File Set

The files used with the Taiwan T1 E&M protocol are listed and described in the following table.

File Type	File Name(s)	
	DM3	Springware
Protocol Module	pdk_tw_em_io.qs and pdk_tw_em_io.hot (or pdk_tw_em_io.arm.hot for DMT160TEC boards)	pdk_tw_em_io.psi
Voice and Network Parameters	Not applicable	tw_240.prm
Country Dependent Parameters	pdk_tw_em_io.cdp	pdk_tw_em_io.cdp
	gc_OpenEx() Protocol Name	
	Not applicable†	pdk_tw_em_io

†On DM3 boards, the protocol is determined at board initialization time and not when a Global Call device is opened. For compatibility, the **gc_OpenEx()** protocol name may be specified for DM3 boards, but it is not used.

Protocol Limitations

Automatic number identification (ANI) is not supported by this version of the Taiwan T1 E&M protocol.

41.2 Country Dependent Parameter Descriptions

The only modifiable parameter in the *pdk_tw_em_io.cdp* file is:

- CDP_CallAnalysis_Enabled

In addition, see [Chapter 3, “Call Progress Analysis Parameters”](#) for configuring default call progress operation in the protocol.

CDP_CallAnalysis_Enabled

Description: Specifies whether to enable call analysis.

Values:

- 0: Do not enable call analysis.
- 1 [default]: Enable call analysis.

Thailand R2 Bidirectional Protocol Parameter Configuration

This chapter discusses the capabilities and parameters of the Thailand R2 Bidirectional protocol in the following topics:

- General Protocol Information 261
- Country Dependent Parameter Descriptions 261

42.1 General Protocol Information

Protocol File Set

The files used with the Thailand R2 protocol are listed and described in the following table.

File Type	File Name(s)	
	DM3	Springware
Protocol Module	pdk_r2_io.qs and pdk_r2_io.hot (or pdk_r2_io.arm.hot for DMT160TEC boards)	pdk_r2_io.psi
Voice and Network Parameters	Not applicable	r2_300.prm
Country Dependent Parameters	pdk_th_r2_io.cdp	pdk_th_r2_io.cdp
	gc_OpenEx() Protocol Name	
	Not applicable†	pdk_th_r2_io

†On DM3 boards, the protocol is determined at board initialization time and not when a Global Call device is opened. For compatibility, the **gc_OpenEx()** protocol name may be specified for DM3 boards, but it is not used.

Protocol Limitations

If a DropCall is attempted in the ACCEPTED state, the protocol will answer the call by sending out the ANSWER pattern before dropping the call, as forced release is not supported in this protocol.

42.2 Country Dependent Parameter Descriptions

Note: A parameter can be inbound, outbound, or both inbound and outbound. An inbound parameter is used by the protocol when it is acting as inbound. An outbound parameter is used by the protocol when it is acting as outbound. A parameter that is both can be used by the protocol when it is acting as either inbound or outbound.

The modifiable parameters in the *pdk_th_r2_io.cdp* file are:

- CDP_ANI_ENABLED (Inbound)
- CDP_ANI_MaxDigits (Inbound)
- CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED
- CDP_ANI_WITHAC_FACILITY_ENABLED (Outbound)
- CDP_AreaCode
- CDP_CallingPartyCategory (Outbound)
- CDP_ConnectType (Outbound)
- CDP_DNIS_MaxDigits (Inbound)
- CDP_Drop_Using_ProgressTones_After_AcceptCall (Inbound)
- CDP_FLAG_APPEND_F (Outbound)
- CDP_GrpB_Tone (Inbound)
- CDP_IMMEDIATE_ACCEPTSTATE (Inbound)
- CDP_IS_ANIAVAILABILITY_CHECK_NEEDED
- CDP_IS_CALLING_LINE_IDENTIFICATION_PERMITTED (Outbound)
- CDP_NO_OF_DNIS_BEFORE_CAT (Inbound)
- CDP_NUM_OF_AC_DIGITS (Inbound)
- CDP_NUM_OF_ANI_DIGITS (Inbound)
- CDP_NUM_OF_DNIS_DIGITS (Inbound)
- CDP_OVERLAP_SENDING_ENABLED (Outbound)
- CDP_REJECT_WITH_A3B4 (Inbound)
- CDP_SEND_ALERTING_ON_R2MF_COMPLETION (Inbound)
- CDP_SEND_BLOCK_AT_START_OR_REMOTE_BLOCK
- CDP_TrunkPrefixNumber

In addition, see Chapter 3, “Call Progress Analysis Parameters” for configuring default call progress operation in the protocol.

CDP_ANI_ENABLED (Inbound)

Description: Enables or disables the reception of automatic number identification (ANI) digits.

Values:

- 0: Disable the reception of ANI digits.
- 1 [default]: Enable the reception of ANI digits.

Guidelines: If this parameter is set to a value other than 0 or 1, the behavior of the protocol is not predictable.

For DM3, if ANI is disabled, you also have to remove **feature_ANI** from the **SYS_FEATURES** parameter in the *.cdp* file. The **SYS_FEATURES** parameter looks like this:

```
All CHARSTRING_t SYS_FEATURES = "feature_outbound,feature_inbound,feature_DNIS,
feature_Billing,feature_ANI,feature_CAT,feature_MoreDNIS"
```

CDP_ANI_MaxDigits (Inbound)

Description: Specifies the maximum number of ANI digits that can be received when using this protocol.

Values: Default is 16.

Guidelines: If this parameter value is set to 0, the behavior of the protocol is not predictable.

CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED

Description: Specifies whether ANI is to be requested (inbound) or sent (outbound) with the area code.

Values:

- 0 [default]: Request (inbound) or send (outbound) ANI digits without area code.
- 1: Request (inbound) or send (outbound) area code with ANI digits.

CDP_ANI_WITHAC_FACILITY_ENABLED (Outbound)

Description: Specifies whether ANI digits and area code are sent to the inbound side. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values:

- 0 [default]: The requested information denied tone is sent to the inbound side.
- 1: ANI digits with area code are sent to the inbound side.

CDP_AreaCode

Description: Specifies the area code of the local exchange where the subscriber is connected. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values: Default is 987.

CDP_CallingPartyCategory (Outbound)

Description: Specifies the category of the calling subscriber.

Values:

- 1: Operator
- 2 [default]: Ordinary subscriber
- 3: Coin box unit fee
- 4: Reserve for multicoin coin box
- 5: STD coin box
- 6: Test equipment
- 7: Line test desk
- 8: Intercepted operator
- 9: Reserve for data communication
- A: Immediate charge information service
- B: Subscriber with private meter
- F: No information about the A-party's category

CDP_ConnectType (Outbound)

Description: Specifies the mode for outbound connect detection. Two types of connection events can be detected: the cas_answer received signaling bit pattern and the media type detection used when post-connect call analysis is enabled. The application has options as to when the call is considered connected, as set by this parameter. The application also has options as to whether call analysis continues after the call has been connected when cas_answer is received first.

Values:

- 0 [default]: The protocol transitions to the connected state only when cas_answer is received. If cas_answer is received first, call analysis is stopped. If call analysis is received first, the result is sent to the application via a GCEV_MEDIADETECTED event, but the protocol does not transition to the connected state until cas_answer is received.
- 1: The protocol transitions to the connected state when the first event (either cas_answer or call analysis) is received. If cas_answer is received first, call analysis still continues and the result is sent to the application via a GCEV_MEDIADETECTED event. If call analysis is received first, the subsequent cas_answer is ignored.
- 2: The protocol transitions to the connected state when the first event (either cas_answer or call analysis) is received. If cas_answer is received first, call analysis is stopped. If call analysis is received first, the subsequent cas_answer is ignored.
- 3: The protocol transitions to the connected state only when call analysis is received. If call analysis is received first, the subsequent cas_answer is ignored. If cas_answer is received first, it is ignored.

CDP_DNIS_MaxDigits (Inbound)

Description: Specifies the maximum number of dialed number identification service (DNIS) digits that can be received when using this protocol.

Values: Default is 16.

Guidelines: If this parameter value is set to 0, the behavior of the protocol is not predictable.

CDP_Drop_Using_ProgressTones_After_AcceptCall (Inbound)

Description: Specifies the call progress tone to be sent for dropping a call, when doing a `gc_DropCall()` after a `gc_AcceptCall()`.

Values:

- 0 [default]: The protocol sends the Answer Line signal, waits for the time specified by `CDP_TimeToRecognizeAnswer`, and then sends a Clear Backward line signal for call disconnection. In this case, the call will be charged for the remote calling subscriber, even though the call is not successful.
- 1: The protocol sends the appropriate call progress tone depending on the `gc_DropCall()` cause to the remote end, and waits for a Clear Forward Line signal for call disconnection.

CDP_FLAG_APPEND_F (Outbound)

Description: When the remote end asks for the next DNIS digit through Group A backward tone, and the protocol does not have any more DNIS available to be sent, this parameter specifies whether to send the I-15 tone or to remain silent and prepare for A3 or A4 pulse from the remote end.

Values:

- 0 [default]: No tone will be sent to the remote end. In this case, A3 or A4 pulse is expected to be received from the remote end. In a case of overlapped sending (see description of `CDP_OVERLAP_SENDING_ENABLED` parameter), the remote end may also send A1 to request more information.
- 1: 'f' (I-15) will be sent to the remote end, indicating the end of information.

CDP_GrpB_Tone (Inbound)

Description: Determines whether the sender should be charged after receiving the tone. The tone is sent from the inbound end on receipt of Category for Group II. After this tone, the sequence of R2MF tone exchange is over and the call is connected. This is the last R2MF tone in establishment of a call.

Values:

- 1 [default]: Called subscriber free with metering
- 5: Called subscriber free without metering

CDP_IMMEDIATE_ACCEPTSTATE (Inbound)

Description: Specifies when the protocol transitions a call to the Accepted state.

Values:

- 0 [default]: The protocol should wait for the number of rings specified in `gc_AcceptCall()` to expire before transitioning to the Accepted state.
- 1: The protocol should transition a call to the Accepted state immediately upon receipt of `gc_AcceptCall()` and before the specified number of rings have been generated.

Guidelines: This parameter is ignored if the value of the `gc_AcceptCall()` rings parameter is 0.

CDP_IS_ANIAVAILABILITY_CHECK_NEEDED

Description: Determines whether the status of ANI availability is checked before ANI digits are exchanged. At the inbound side, this parameter specifies whether ANI availability at the outbound side has to be verified or if ANI digits can be requested directly. At the outbound side, ANI digits are passed directly or the inbound side is informed of the availability (status) first.

Values:

- 0 [default]: The status of ANI availability is not checked before ANI digits are exchanged. ANI digits can be requested directly without knowing the status of the outbound side.
- 1: The status of ANI availability is checked before ANI digits are exchanged. The inbound side requests the status of ANI availability. If ANI digits are available, the inbound side requests the ANI digits. The outbound side sends the status of ANI availability and then waits for the inbound request.

CDP_IS_CALLING_LINE_IDENTIFICATION_PERMITTED (Outbound)

Description: Specifies whether Calling Line Identification is enabled. This parameter is used to enable CLIP and CLIR conditions.

Values:

- 0: Calling Line Identification Rejected (CLIR). The requested information denied tone is sent to the inbound side.
- 1 [default]: Calling Line Identification Permitted (CLIP). ANI digits are sent to the inbound side.

CDP_NO_OF_DNIS_BEFORE_CAT (Inbound)

Description: Determines the number of DNIS digits that are to be received before any category information is received. If this parameter is set to non-zero, the following sequence of events occurs:

1. Partial DNIS digits are received.
2. Category digits are received.
3. The remaining DNIS digits are received.
4. ANI digits are received (if `CDP_ANI_ENABLED` is 1).
5. Category digits are received again.

Values:

- 0 [default]: Indicates that category must be received after all DNIS digits are received.
- Non-zero: Specifies the number of DNIS digits received before category information is received.

Guidelines: The behavior of the protocol will not be predictable, unless the following occurs:

- If this parameter is set to non-zero, `CDP_ANI_ENABLED` must be set to 1.

- If this parameter is set to non-zero, its value should be the minimum of **CDP_NUM_OF_DNIS_DIGITS** (if non-zero), **CDP_DNIS_MaxDigits**, and the actual DNIS digits to be received.

CDP_NUM_OF_AC_DIGITS (Inbound)

Description: Specifies the number of area code digits of the local exchange from where it received the call. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values: Default is 3.

CDP_NUM_OF_ANI_DIGITS (Inbound)

Description: Specifies the expected number of ANI digits to be received.

Values:

- 0 [default]: ANI collection is terminated by I-15 (end of dialing).
- Non-zero: Specifies the number of ANI digits expected. This number should always be less than **CDP_ANI_MaxDigits**.

CDP_NUM_OF_DNIS_DIGITS (Inbound)

Description: Specifies the expected number of DNIS digits to be received.

Values:

- 0: DNIS collection is terminated by I-15 (end of dialing).
- Non-zero [default is 4]: Specifies the number of DNIS digits expected. This number should always be less than **CDP_DNIS_MaxDigits**.

CDP_OVERLAP_SENDING_ENABLED (Outbound)

Description: Enables or disables the overlap sending feature.

Values:

- 0: Disables overlap sending. 'f' will be appended to DNIS digits received with **gc_MakeCall()** (if **CDP_FLAG_APPEND_F** is true), indicating the end of information.
- 1 [default]: Enables overlap sending. The remote end can request more DNIS information, in which case a **REQMOREINFO** event will be generated. **gc_SendMoreInfo()** with Null information will either cause 'f' to be sent to the remote end or will remain silent (depending on the value of **CDP_FLAG_APPEND_F**), thus indicating to the remote end that no more DNIS digits are available.

CDP_REJECT_WITH_A3B4 (Inbound)

Description: Determines the method for rejecting a call when an R2MF tone error is received during call setup.

Values:

- 0 [default]: Call is rejected with a direct group A tone (A-10), which is a spare tone that may be used to indicate congestion.
- 1: Call is rejected with an A3-B4 tone combination, which means that the inbound (local) end sends an A-3 tone (send category and change over to group B tones). Then, the category is received and in response, a B-4 tone is sent to reject the call.

CDP_SEND_ALERTING_ON_R2MF_COMPLETION (Inbound)

Description: Controls when the protocol will send a GCEV_ALERTING event to the application.

Values:

- 0: GCEV_ALERTING is sent after receiving a ringback tone.
- 1 [default]: GCEV_ALERTING is sent after completion of the R2MF sequence (after receiving the last Group B tone).

CDP_SEND_BLOCK_AT_START_OR_REMOTE_BLOCK

Description: Specifies the bit pattern to be sent on the line at protocol open time and when the remote line goes BLOCKED.

Values:

- 0 [default]: If the protocol is used either as outbound only or as bidirectional.
- 1: If the protocol is used as inbound only.

CDP_TrunkPrefixNumber

Description: Specifies the trunk number used to dial to local exchange. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values: Default is 9.

United States T1 Bidirectional Protocol Parameter Configuration

This chapter discusses the capabilities and parameters of the United States T1 Bidirectional protocol in the following topics:

- General Protocol Information 269
- Country Dependent Parameter Descriptions 270
- Parameter Values for Feature Groups A, B, and D 283

43.1 General Protocol Information

Protocol File Set

The files used with the United States T1 protocol are listed and described in the following table.

File Type	File Name(s)	
	DM3	Springware
Protocol Module	pdk_us_mf_io.qs and pdk_us_mf_io.hot (or pdk_us_mf_io.arm.hot for DMT160TEC boards)	pdk_us_mf_io.psi
Voice and Network Parameters	Not applicable	us_240.prm
Country Dependent Parameters	pdk_us_mf_io.cdp	pdk_us_mf_io.cdp
	gc_OpenEx() Protocol Name	
	Not applicable†	pdk_us_mf_io

†On DM3 boards, the protocol is determined at board initialization time and not when a Global Call device is opened. For compatibility, the **gc_OpenEx()** protocol name may be specified for DM3 boards, but it is not used.

Protocol Limitations

After a call is transferred with **gc_SetUpTransfer()**, you cannot issue a **gc_DropCall()** on the original call. You must drop the consultation call before the original call can be dropped. The behavior of the protocol is undefined if you try to drop the original call without dropping the consultation call first.

43.2 Country Dependent Parameter Descriptions

The modifiable parameters in the *pdk_us_mf_io.cdp* file are:

- CDP_BLIND_XFER_DIALTONE_TIMEOUT
- CDP_BLIND_XFER_POST_TIME
- CDP_BLIND_XFER_PRE_TIME
- CDP_BlockOnLOOS
- CDP_FORCED_RELEASE_ENABLED
- CDP_HOOKFLASH_ON_XFER
- CDP_HOOKFLASH_ON_XFER_DROP
- CDP_IN_ACCEPTBEFORERING
- CDP_IN_ANI_DigitType
- CDP_IN_ANI_Enabled
- CDP_IN_ANI_KP_Needed
- CDP_IN_ANI_MaxDigits
- CDP_IN_ANI_ST_Needed
- CDP_IN_ANI_Type_Pre
- CDP_IN_ANI_WINK_Needed
- CDP_IN_ANIKPDigit
- CDP_IN_ANISTDigit
- CDP_IN_DialTone_Needed
- CDP_IN_DNIS_BeforeANI
- CDP_IN_DNIS_DigitType
- CDP_IN_DNIS_Enabled
- CDP_IN_DNIS_KP_Needed
- CDP_IN_DNIS_MaxDigits
- CDP_IN_DNIS_ST_Needed
- CDP_IN_DNIS_WINK_Needed
- CDP_IN_DNISKPDigit
- CDP_IN_DNISSTDigit
- CDP_IN_EnableRingBack
- CDP_IN_GetDigitTime
- CDP_IN_WinkStart
- CDP_MIN_CallLength
- CDP_Min_HangupTime
- CDP_OUT_ANI_DigitType
- CDP_OUT_ANI_Enabled
- CDP_OUT_ANI_KP_Needed

- CDP_OUT_ANI_ST_Needed
- CDP_OUT_ANI_Type_Pre
- CDP_OUT_ANI_WINK_Needed
- CDP_OUT_ANIKPDigit
- CDP_OUT_ANISTDigit
- CDP_OUT_ANISring
- CDP_OUT_ConnectType
- CDP_OUT_DialTone_Needed
- CDP_OUT_DialTone_Timeout
- CDP_OUT_DNIS_BeforeANI
- CDP_OUT_DNIS_DigitType
- CDP_OUT_DNIS_Enabled
- CDP_OUT_DNIS_KP_Needed
- CDP_OUT_DNIS_ST_Needed
- CDP_OUT_DNIS_WINK_Needed
- CDP_OUT_DNISKPDigit
- CDP_OUT_DNISSTDigit
- CDP_OUT_EnableRingBack
- CDP_OUT_SeizeAck_Timeout
- CDP_OUT_SeizeDelay
- CDP_OUT_Send_Alerting_After_Dialing
- CDP_OUT_WinkStart
- CDP_SETUP_XFER_CPA
- CDP_SETUP_XFER_DIALTONE_TIMEOUT
- CDP_USE_DEFAULTANI
- CDP_Xfer_DigitType

In addition, see [Chapter 3, “Call Progress Analysis Parameters”](#) for configuring default call progress operation in the protocol.

CDP_BLIND_XFER_DIALTONE_TIMEOUT

Description: Defines the maximum time-out to wait for dial tone during a blind transfer.

Values:

- Time in milliseconds. Default is 5000 (5 seconds).
- 0: Disables waiting for dial tone during a blind transfer.

CDP_BLIND_XFER_POST_TIME

Description: Specifies the time between blind transfer dialing and hangup.

Values: Time in milliseconds. Default is 1000 (1 second).

CDP_BLIND_XFER_PRE_TIME

Description: Specifies the time between blind transfer hookflash and dialing.

Values: Time in milliseconds. Default is 0.

CDP_BlockOnLOOS

Description: Allows the protocol to send out CAS_BLOCKING to block the line whenever a channel is set out-of-service (by the application calling the `gc_SetChanState()` function).

Note: The ability to block the line is not supported on all switches.

Values:

- 0 [default]: Do not send blocking pattern when a channel is set out-of-service.
- 1: Send blocking pattern when a channel is set out-of-service.

CDP_FORCED_RELEASE_ENABLED

Description: Enables the protocol to support “forced release” of incoming calls from the Accepted state. The T1 protocol specification does not support forced release of incoming calls from the Accepted state. However, support for forcing release of incoming calls is supported in this implementation for flexibility with Global Call applications, which are permitted to call `gc_DropCall()` from the Accepted state. In this scenario, the call will be answered transparently without notification of the application and then immediately disconnected, i.e., a “forced release” of the line. Note that in doing this, additional implications exist and must be considered, i.e., billing, etc.

Values:

- 0: Does not support forced release. No implicit answer will be performed transparently in this scenario, and only a CAS hangup (idle) signal will be generated.
- 1 [default]: Supports forced release.

CDP_HOOKFLASH_ON_XFER

Description: Determines if a hookflash is sent by the protocol when a supervised and blind transfer is requested.

Values:

- 0: Do not send hookflash.
- 1 [default]: Send the hookflash.

CDP_HOOKFLASH_ON_XFER_DROP

Description: Determines if a hookflash is sent by the protocol if a supervised transfer request is aborted via a `gc_DropCall()` function.

Values:

- 0: Do not send hookflash.
- 1 [default]: Send the hookflash.

CDP_IN_ACCEPTBEFORERING

Description: Determines if an accept event should be sent before sending ringback tones.

Values:

- 0: Send the accept event after sending ringback tones.
- 1 [default]: Send the accept event before sending ringback tones.

CDP_IN_ANI_DigitType

Description: Determines the digit type for inbound automatic number identification (ANI) digits.

Values:

- 1 [default]: DTMF digits.
- 2: MF digits.

CDP_IN_ANI_Enabled

Description: Enables ANI collection. The ANI digits are terminated either by `CDP_IN_ANISTDigit` if `CDP_IN_ANI_ST_Needed` is set to 1, or by the maximum number of digits set by `CDP_IN_ANI_MaxDigits`.

Values:

- 0: ANI collection not enabled.
- 1 [default]: ANI collection enabled.

Guidelines: For DM3, if ANI is disabled, you also have to remove `feature_ANI` from the `SYS_FEATURES` parameter in the `.cdp` file. The `SYS_FEATURES` parameter looks like this:

```
All CHARSTRING_t SYS_FEATURES = "feature_outbound,feature_inbound,feature_DNIS,  
feature_ANI,feature_transfer"
```

CDP_IN_ANI_KP_Needed

Description: Specifies whether the ANI prefix digit is used.

Values:

- 0: ANI prefix digit is not needed.
- 1 [default]: ANI prefix digit is needed.

CDP_IN_ANI_MaxDigits

Description: Specifies the maximum number of ANI digits expected. ANI collection terminates if this value is reached.

Values: Default is 12 ANI digits.

CDP_IN_ANI_ST_Needed

Description: Specifies whether ANI digits are terminated by **CDP_IN_ANISTDigit**.

Values:

- 0: No termination digit added; ANI digits are terminated by the maximum number of digits set by **CDP_IN_ANI_MaxDigits**.
- 1 [default]: Termination digit added; ANI digits are terminated by the value set by **CDP_IN_ANISTDigit**.

CDP_IN_ANI_Type_Pre

Description: Specifies whether ANI digits are expected before generating the answer signal.

Values:

- 0: Do not expect ANI digits before the answer signal.
- 1 [default]: Expect ANI digits before the answer signal.

CDP_IN_ANI_WINK_Needed

Description: Specifies if a CAS_WINK signaling pattern should be generated immediately after the reception of the ANI digits.

Values:

- 0 [default]: Do not generate the CAS_WINK signaling pattern after ANI.
- 1: Generate the CAS_WINK signaling pattern after ANI.

CDP_IN_ANIKP_Digit

Description: Specifies the ANI prefix digit. This parameter has no effect if **CDP_IN_ANI_KP_Needed** is set to 0.

Values: Default is *.

CDP_IN_ANIST_Digit

Description: Specifies the ANI ST digit. This parameter has no effect if **CDP_IN_ANI_ST_Needed** is set to 0.

Values: Default is *.

CDP_IN_DialTone_Needed

Description: Specifies whether a dial tone should be generated after receiving a CAS_SEIZE to notify the CO that it can begin dialing.

Values:

- 0 [default]: Do not generate a dial tone.
- 1: Generate a dial tone.

CDP_IN_DNIS_BeforeANI

Description: Specifies whether dialed number identification service (DNIS) digits are received before ANI digits. This parameter is applicable only if **CDP_IN_DNIS_Enabled** is set to 1.

Values:

- 0 [default]: Receive the ANI digits before the DNIS digits.
- 1: Receive the DNIS digits before the ANI digits.

CDP_IN_DNIS_DigitType

Description: Determines the digit type for inbound DNIS digits.

Values:

- 1 [default]: DTMF digits.
- 2: MF digits.

CDP_IN_DNIS_Enabled

Description: Enables DNIS collection. The DNIS digits are terminated either by **CDP_IN_DNISSTDigit** if **CDP_IN_DNIS_ST_Needed** is set to 1, or by the maximum number of digits set by **CDP_IN_DNIS_MaxDigits**.

Values:

- 0: DNIS collection not enabled.
- 1 [default]: DNIS collection enabled.

Guidelines: For DM3, if DNIS is disabled, you also have to remove **feature_DNIS** from the **SYS_FEATURES** parameter in the *.cdp* file. The **SYS_FEATURES** parameter looks like this:

```
All CHARSTRING_t SYS_FEATURES = "feature_outbound,feature_inbound,feature_DNIS,  
feature_ANI,feature_transfer"
```

CDP_IN_DNIS_KP_Needed

Description: Specifies whether the DNIS prefix digit is used.

Values:

- 0 [default]: DNIS prefix digit is not needed.
- 1: DNIS prefix digit is needed.

CDP_IN_DNIS_MaxDigits

Description: Defines the maximum number of DNIS digits.

Values: Default is 12 DNIS digits.

CDP_IN_DNIS_ST_Needed

Description: Specifies whether DNIS digits are terminated by **CDP_IN_DNISSTDigit**.

Values:

- 0: No termination digit added; DNIS digits are terminated by the maximum number of digits set by **CDP_IN_DNIS_MaxDigits**.
- 1 [default]: Termination digit added; DNIS digits are terminated by the value set by **CDP_IN_DNISSTDigit**.

CDP_IN_DNIS_WINK_Needed

Description: Specifies whether a CAS_WINK signaling pattern should be generated immediately after the reception of the DNIS digits.

Values:

- 0 [default]: Do not generate the CAS_WINK signaling pattern after DNIS.
- 1: Generate the CAS_WINK signaling pattern after DNIS.

CDP_IN_DNISKPDigit

Description: Specifies the DNIS prefix digit. This parameter has no effect if **CDP_IN_DNIS_KP_Needed** is set to 0.

Values: Default is *.

CDP_IN_DNISSTDigit

Description: Specifies the DNIS ST digit. This parameter has no effect if **CDP_IN_DNIS_ST_Needed** is set to 0.

Values: Default is *.

CDP_IN_EnableRingBack

Description: Specifies whether a ringback should be generated before answering a call. The number of rings generated is determined by the value passed by the **gc_AcceptCall()** or **gc_AnswerCall()** function.

Values:

- 0 [default]: Do not generate a ringback.
- 1: Generate a ringback.

CDP_IN_GetDigitTime

Description: Specifies the total time the protocol will wait for the digit collection process to complete (for both DNIS and ANI).

Values: Time in milliseconds. Default is 10000 (10 seconds).

Guidelines: The value of **CDP_IN_GetDigitTime** must be greater than the values of the **PSL_TONE_RECEIVEDIGITS_FIRSTDIGIT_TO** and **PSL_TONE_RECEIVEDIGITS_INTERDIGIT_TO** parameters.

CDP_IN_WinkStart

Description: Specifies whether to generate a seizure acknowledgment CAS_WINK after receiving a CAS_SEIZE.

Values:

- 0: Immediate start.
- 1 [default]: Wink start.

CDP_MIN_CallLength

Description: Specifies the minimum length of time that an inbound or outbound call can be connected.

Values: Time in milliseconds. Default is 300 milliseconds.

CDP_Min_HangupTime

Description: Controls the amount of time after hangup during which the protocol will ignore any signaling transitions. It is primarily used to prevent a race condition where, after an outbound channel hangs up after the call has been delivered but before a call is connected, the remote inbound channel might answer anyway, and the ensuing transition can be interpreted as a CAS_SEIZE.

Values: Time in milliseconds. Default is 0.

Guidelines: This parameter is needed only if CAS_ANSWER and CAS_SEIZE transitions are the same, and usually only useful when running the protocol back to back, as most live switches would not attempt to answer a call that has been disconnected.

CDP_OUT_ANI_DigitType

Description: Determines the digit type for outbound ANI digits.

Values:

- 1 [default]: DTMF digits.
- 2: MF digits.

CDP_OUT_ANI_Enabled

Description: Enables ANI generation.

Values:

- 0: ANI collection not enabled.
- 1 [default]: ANI collection enabled.

CDP_OUT_ANI_KP_Needed

Description: Specifies whether the ANI prefix digit is used.

Values:

- 0: ANI prefix digit is not needed.
- 1 [default]: ANI prefix digit is needed.

CDP_OUT_ANI_ST_Needed

Description: Specifies whether ANI digits are terminated by **CDP_OUT_ANISTDigit**.

Values:

- 0: No termination digit added.
- 1 [default]: Termination digit added.

CDP_OUT_ANI_Type_Pre

Description: Specifies whether ANI digits will be generated before the reception of an answer signal.

Values:

- 0: Do not generate ANI digits before the answer signal.
- 1 [default]: Generate ANI digits before the answer signal.

CDP_OUT_ANI_WINK_Needed

Description: Specifies whether a CAS_WINK signaling pattern should be received immediately after the generation of the ANI digits.

Values:

- 0 [default]: A CAS_WINK signaling pattern does not have to be received.
- 1: A CAS_WINK signaling pattern must be received.

CDP_OUT_ANIKPDigit

Description: Specifies the ANI prefix digit. This parameter has no effect if **CDP_OUT_ANI_KP_Needed** is set to 0.

Values: Default is *.

CDP_OUT_ANISTDigit

Description: Specifies the ANI ST digit. This parameter has no effect if **CDP_OUT_ANI_ST_Needed** is set to 0.

Values: Default is *.

CDP_OUT_ANIString

Description: Specifies the string used as the ANI digits if **CDP_OUT_ANI_Enabled** is set to 1.

Values: Default is 5678.

CDP_OUT_ConnectType

Description: Specifies the mode for outbound connection detection. Two types of connection events can be detected: the cas_answer received signaling bit pattern and the media type detection used when post-connect call analysis is enabled. The application has options as to when the call is considered connected, as set by this parameter. The application also has options as to whether call analysis continues after the call has been connected when cas_answer is received first.

Values:

- 0 [default]: The protocol transitions to the connected state only when cas_answer is received. If cas_answer is received first, call analysis is stopped. If call analysis is received first, the result is sent to the application via a GCEV_MEDIADETECTED event, but the protocol does not transition to the connected state until cas_answer is received.
- 1: The protocol transitions to the connected state when the first event (either cas_answer or call analysis) is received. If cas_answer is received first, call analysis still continues and the result is sent to the application via a GCEV_MEDIADETECTED event. If call analysis is received first, the subsequent cas_answer is ignored.
- 2: The protocol transitions to the connected state when the first event (either cas_answer or call analysis) is received. If cas_answer is received first, call analysis is stopped. If call analysis is received first, the subsequent cas_answer is ignored.
- 3: The protocol transitions to the connected state only when call analysis is received. If call analysis is received first, the subsequent cas_answer is ignored. If cas_answer is received first, it is ignored.

CDP_OUT_DialTone_Needed

Description: Specifies whether a dial tone must be received after generating a CAS_SEIZE.

Values:

- 0 [default]: Do not receive a dial tone.
- 1: Receive a dial tone.



CDP_OUT_DialTone_Timeout

Description: Defines the time-out while waiting for a dial tone after a line seizure. This parameter is not used if **CDP_OUT_WinkStart** is set to 0.

Values: Time in milliseconds. Default is 5000 (5 seconds).

CDP_OUT_DNIS_BeforeANI

Description: Specifies whether DNIS digits are sent before ANI digits. This parameter is applicable only if **CDP_OUT_DNIS_Enabled** is set to 1.

Values:

- 0 [default]: Send the ANI digits before the DNIS digits.
- 1: Send the DNIS digits before the ANI digits.

CDP_OUT_DNIS_DigitType

Description: Determines the digit type for outbound DNIS digits.

Values:

- 1 [default]: DTMF digits.
- 2: MF digits.

CDP_OUT_DNIS_Enabled

Description: Enables DNIS.

Values:

- 0: DNIS not enabled.
- 1 [default]: DNIS enabled.

CDP_OUT_DNIS_KP_Needed

Description: Specifies whether the DNIS prefix digit is used.

Values:

- 0 [default]: DNIS prefix digit is not needed.
- 1: DNIS prefix digit is needed.

CDP_OUT_DNIS_ST_Needed

Description: Specifies whether DNIS digits are terminated by **CDP_OUT_DNISSTDigit**.

Values:

- 0: No termination digit added.
- 1 [default]: Termination digit added.

CDP_OUT_DNIS_WINK_NEEDED

Description: Specifies whether a CAS_WINK signaling pattern should be received immediately after sending the DNIS digits.

Values:

- 0 [default]: The reception of a CAS_WINK signaling pattern is not required.
- 1: The reception of a CAS_WINK signaling pattern is required.

CDP_OUT_DNISKPDigit

Description: Specifies the DNIS prefix digit. This parameter has no effect if **CDP_OUT_DNIS_KP_NEEDED** is set to 0.

Values: Default is *.

CDP_OUT_DNISSTDigit

Description: Specifies the DNIS ST digit. This parameter has no effect if **CDP_OUT_DNIS_ST_NEEDED** is set to 0.

Values: Default is *.

CDP_OUT_EnableRingBack

Description: Specifies whether a ringback must be received before a call is answered. The number of rings is determined by the value passed by the **gc_AcceptCall()** or **gc_AnswerCall()** function.

Values:

- 0 [default]: Do not receive a ringback.
- 1: Receive a ringback.

CDP_OUT_SeizeAck_Timeout

Description: Specifies the time-out while waiting for a CAS_WINK after a line seizure.

Values: Time in milliseconds. Default is 5000 (5 seconds).

CDP_OUT_SeizeDelay

Description: Specifies the desired delay between a makecall and a line seize attempt.

Values: Time in milliseconds. Default is 1000 (1 second).

CDP_OUT_Send_Alerting_After_Dialing

Description: Determines when the protocol sends a GCEV_ALERTING event to the application.

Values:

- 0 [default]: GCEV_ALERTING is sent when ringback is detected.
- 1: If call progress analysis is disabled, GCEV_ALERTING is sent after dialing is completed. If call progress analysis is enabled, GCEV_ALERTING is sent after dialing is initiated.

CDP_OUT_WinkStart

Description: Specifies whether a CAS_WINK seizure acknowledgment must be received following the generation of a seize request.

Values:

- 0: Immediate start, that is, no wink required.
- 1 [default]: Wink start, that is, wink required.

CDP_SETUP_XFER_CPA

Description: Enables call progress analysis during supervised transfer.

Values:

- 0: Call progress analysis disabled during supervised transfer.
- 1 [default]: Call progress analysis enabled during supervised transfer.

CDP_SETUP_XFER_DIALTONE_TIMEOUT

Description: Defines the maximum time-out to wait for dial tone during a supervised transfer.

Values:

- Time in milliseconds. Default is 5000 (5 seconds).
- 0: Disables waiting for dial tone during a supervised transfer.

CDP_USE_DEFAULTANI

Description: Once **CDP_OUT_ANI_Enabled** is set, specifies whether to use **CDP_OUT_ANIString** for the ANI. Otherwise, the number set by the application is used.

Values:

- 0 [default]: The number set by the application is used for ANI.
- 1: Use **CDP_OUT_ANIString** for the ANI.

CDP_Xfer_DigitType

Description: Determines the digit type for transfers.

Values:

- 1 [default]: DTMF digits.
- 2: MF digits.

43.3 Parameter Values for Feature Groups A, B, and D

Table 6 shows the parameters that should be set in your CDP file for Feature Groups A, B, and D.

Table 6. Parameter Values for Feature Groups A, B, and D

Parameter	FGA	FGB	FGD
CDP_IN_ANI_Enabled	0	0	1
CDP_IN_ANI_WINK_Needed	NA	NA	1
CDP_IN_DNIS_BeforeANI	NA	NA	1
CDP_IN_DNIS_Enabled	0	1	1
CDP_IN_DNIS_WINK_Needed	NA	0	0
CDP_IN_WinkStart	0	1	1
CDP_OUT_ANI_Enabled	0	0	1
CDP_OUT_ANI_WINK_Needed	NA	NA	1
CDP_OUT_DNIS_BeforeANI	NA	NA	1
CDP_OUT_DNIS_Enabled	0	1	1
CDP_OUT_DNIS_WINK_Needed	NA	0	0
CDP_OUT_WinkStart	0	1	1
NA - Not applicable. Modifying these values will have no effect because they are overridden by other settings.			



United States T1 FXS/LS Bidirectional Protocol Parameter Configuration

This chapter discusses the capabilities and parameters of the United States T1 FXS/LS Bidirectional protocol in the following topics:

- General Protocol Information 285
- Country Dependent Parameter Descriptions 286
- FXS Signaling Bit States 291
- FXS Call Scenarios 292

44.1 General Protocol Information

The United States T1 FXS/LS protocol is used in a system where a foreign exchange subscriber (FXS), for example, a voice mail system, is connected to a foreign exchange originator (FXO), for example, a private branch exchange (PBX).

Protocol File Set

The files used with the United States T1 FXS/LS protocol are listed and described in the following table.

File Type	File Name(s)	
	DM3	Springware
Protocol Module	pdk_us_ls_fxs_io.qs and pdk_us_ls_fxs_io.hot (or pdk_us_ls_fxs_io.arm.hot for DMT160TEC boards)	pdk_us_ls_fxs_io.psi
Voice and Network Parameters	Not applicable	Not applicable
Country Dependent Parameters	pdk_us_ls_fxs_io.cdp	pdk_us_ls_fxs_io.cdp
	gc_OpenEx() Protocol Name	
	Not applicable†	pdk_us_ls_fxs_io

†On DM3 boards, the protocol is determined at board initialization time and not when a Global Call device is opened. For compatibility, the **gc_OpenEx()** protocol name may be specified for DM3 boards, but it is not used.

Protocol Limitations

The United States T1 FXS/LS protocol has the following limitations:

- The protocol is **not** symmetrical. It is intended to converse with an FXO protocol at the remote side.
- After a call is transferred with `gc_SetUpTransfer()`, you cannot issue a `gc_DropCall()` on the original call. You must drop the consultation call before the original call can be dropped. The behavior of the protocol is undefined if you try to drop the original call without dropping the consultation call first.

44.2 Country Dependent Parameter Descriptions

The modifiable parameters in the `pdk_us_ls_fxs_io.cdp` file are:

- `CDP_BTPostDialDelay`
- `CDP_BTPreDialDelay`
- `CDP_BypassHookflashOnConsultationDrop`
- `CDP_BypassHookflashOnTransfer`
- `CDP_CONNECT_UPON_MEDIA`
- `CDP_ConnectOnNoDialTone`
- `CDP_ConnectOnNoRingBack`
- `CDP_DialToneWaitTime`
- `CDP_DisconnectToneSup`
- `CDP_IMMEDIATE_ACCEPTSTATE`
- `CDP_MinPBXHangupTime`
- `CDP_OnhookDuration`
- `CDP_PBXAnswerEnabled`
- `CDP_PBXDiscEnabled`
- `CDP_PostOffhookDelay`
- `CDP_ProtocolStartsOffhook`
- `CDP_ProtocolStopsOffhook`
- `CDP_Send_Alerting_Or_Connected_After_Dial`
- `CDP_WaitDialToneEnabled`

In addition, see [Chapter 3, “Call Progress Analysis Parameters”](#) for configuring default call progress operation in the protocol.

CDP_BTPostDialDelay

Description: Defines the intentional delay before hanging up after dialing on a blind transfer.

Values: Time in milliseconds. Default is 500 (0.5 seconds).

CDP_BTPreDialDelay

Description: Defines the intentional delay after the blind transfer hookflash and the start of dialing. Note that this should not be necessary assuming the wait for dial tone parameter, **CDP_WaitDialToneEnabled**, is enabled.

Values: Time in milliseconds. Default is 1000 (1 second).

CDP_BypassHookflashOnConsultationDrop

Description: Permits the protocol to bypass signaling a hookflash when dropping a consultation call. When enabled, no hookflash CAS signaling is sent and only applicable state changes are delivered to the application.

Values:

- 0 [default]: Parameter is disabled.
- 1: Parameter is enabled.

Guidelines: Normally, this parameter should be disabled. It should be enabled only when all consultation calls are assumed to initiate the disconnect.

CDP_BypassHookflashOnTransfer

Description: Permits the protocol to bypass signaling a hookflash when initiating either a supervised or unsupervised transfer via **gc_SetUpTransfer()** or **gc_BlindTransfer()** respectively. When enabled, no hookflash CAS signaling is sent and only applicable state changes are delivered to the application.

Values:

- 0 [default]: Parameter is disabled.
- 1: Parameter is enabled.

Guidelines: Normally, this parameter should be disabled.

CDP_CONNECT_UPON_MEDIA

Description: Determines whether a call should transition to the Connected state immediately on positive media detection, such as voice, fax, or modem detection.

Values:

- 0: Specifies that a call does not transition to the Connected state immediately on positive media detection, but relies on signaling bit changes to indicate that a connection has been established.
- 1 [default]: Specifies that a call transitions to the Connected state immediately upon positive media detection.

CDP_ConnectOnNoDialTone

Description: Determines how the protocol should proceed when dial tone is not detected. If the parameter is enabled (set to 1), and no dial tone is detected, a local collision with an inbound call is assumed, and the call immediately transitions to Connected state.

Values:

- 0: Do not assume local collision and disconnect the call if no dial tone is detected.
- 1 [default]: Assume local collision and connect the perceived inbound call if no dial tone is detected.

CDP_ConnectOnNoRingBack

Description: Determines how the protocol should proceed when no ringback tone is detected. If the parameter is enabled (set to 1), and no ringback is detected, a remote collision with a remote outbound call is assumed, and the call immediately transitions to Connected state.

Values:

- 0: Do not assume remote collision and disconnect the call if no ringback is detected.
- 1 [default]: Assume remote collision and connect the call if no ringback is detected.

CDP_DialToneWaitTime

Description: Defines the time that the protocol waits for a dial tone before an outbound call can be made.

Values: Time in milliseconds. Default is 5000 (5 seconds).

Guidelines: This parameter is applicable only if the **CDP_WaitDialToneEnabled** parameter is set to 1. If the time defined by this parameter is exceeded before dial tone is detected, the action taken depends on the value of the **CDP_ConnectOnNoDialTone** parameter as follows:

- If the **CDP_ConnectOnNoDialTone** parameter is set to 1, a local collision is assumed and the incoming call is connected.
- If the **CDP_ConnectOnNoDialTone** parameter is set to 0, the call attempt fails and a disconnect event is forwarded with a reason of no dial tone.

CDP_DisconnectToneSup

Description: Enables or disables disconnect tone supervision.

Values:

- 0: Disables disconnect tone supervision.
- 1 [default]: Enables disconnect tone supervision.

CDP_IMMEDIATE_ACCEPTSTATE

Description: Specifies when the protocol transitions a call to the Accepted state.

Values:

- 0 [default]: The protocol should wait for the number of rings specified in **gc_AcceptCall()** to expire before transitioning to the Accepted state.
- 1: The protocol should transition a call to the Accepted state immediately upon receipt of **gc_AcceptCall()** and before the specified number of rings have been generated.

CDP_MinPBXHangupTime

Description: Specifies the length of the ring cycle and is used to determine if the remote end (that is, the PBX) has dropped an incoming call. The timer is reset at the start of each ring cycle. If the timer expires without resetting, ringing has been acknowledged to stop indicating the PBX has dropped the call, as the caller has abandoned the call before it was answered.

Values: Time in milliseconds. Default is 6000 (6 seconds).

Guidelines: The value of this parameter is typically set to 6 seconds which corresponds to the complete ring cycle (2 seconds on and 4 seconds of silence).

CDP_OnhookDuration

Description: Defines the intentional delay for going on-hook prior to making a call. This behavior is only required when the **gc_WaitCall()** function has not been called to this point. Once the **gc_WaitCall()** function is called in a session, the line device is always on-hook when idle and hence this parameter is ignored.

Values: Time in milliseconds. Default is 2000 (2 seconds).

CDP_PBXAnswerEnabled

Description: Determines whether the remote PBX supports call answer supervision via CAS line signaling. If this parameter is enabled and the device detects the specified CAS answer line signaling, the outbound call transitions to the Connected state provided call progress is not mandated in the make call.

Values:

- 0: Disable call answer supervision, since it is not supported by the PBX.
- 1 [default]: Enable call answer supervision provided by the PBX.

CDP_PBXDiscEnabled

Description: Determines if the remote PBX can initiate call disconnection via CAS line signaling.

Values:

- 0: Disable call disconnect supervision, since it is not supported by the PBX.
- 1 [default]: Enable call disconnect supervision provided by the PBX.

CDP_PostOffhookDelay

Description: Defines the intentional delay after the off-hook prior to dialing digits. This is used primarily in scenarios when **CDP_WaitDialToneEnabled** is disabled (zero).

Values: Time in milliseconds. Default is 0.

CDP_ProtocolStartsOffhook

Description: Determines the state of the hook switch signaling (on-hook or off-hook) upon opening the device.

Values:

- 0: Set the hook switch state to on-hook.
- 1 [default]: Set the hook switch state to off-hook.

CDP_ProtocolStopsOffhook

Description: Determines the state of the hook switch signaling (on-hook or off-hook) when the protocol stops after **gc_Close()**.

Note: This parameter has no effect on DM3 boards, because the protocol is not stopped until the board is stopped.

Values:

- 0 [default]: Set the hook switch state to on-hook.
- 1: Set the hook switch state to off-hook.

CDP_Send_Alerting_Or_Connected_After_Dial

Description: Controls when the protocol will send a GCEV_ALERTING or GCEV_CONNECTED event to the application.

Values:

- 0 [default]: GCEV_ALERTING is sent when ringback is detected, and GCEV_CONNECTED is sent when the call is connected.
- 1: GCEV_ALERTING is sent after dialing is completed if call progress analysis is disabled, or after dialing is initiated if call progress analysis is enabled. However, if call progress analysis is disabled and **CDP_PBX_AnswerEnabled** is also disabled, then GCEV_CONNECTED will be sent after dialing instead of GCEV_ALERTING, because the protocol would not be able to reach the Connected state otherwise.

CDP_WaitDialToneEnabled

Description: Determines if the protocol should wait for a dial tone before dialing. Note that this parameter does **not** apply to supervised transfers (consultation calls), in which case the dial tone is not verified.

Values:

- 0: Do not wait for dial tone before dialing.
- 1 [default]: Have the FXS wait for dial tone before dialing.

44.3 FXS Signaling Bit States

The signaling bits for the various line states handled by the United States T1 FXS/LS protocol are shown in Table 7.

Note: FXS is a foreign exchange subscriber (for example, a voice mail system) connected to a foreign exchange originator (FXO, for example, a PBX). The A and B signaling bit meanings are not the same for both FXO and FXS; that is, they are not symmetrical.

Table 7. FXS Signaling Bit States

Line State	TX Bits		RX Bits		Comment
	A	B	A	B	
Loop open	0	1			On-hook
Loop closed	1	1			Off-hook
Normal talking state	1	1	0	1	
Detect idle	X	X	0	1	It is not possible to detect that the FXO side (PBX) is idle by examining the current state of the signaling bits. If the FXS (voice mail) side is on-hook, the line acts like an analog phone, that is, it is only possible to determine if the line is ringing or not. If the FXS side is off-hook, the incoming signaling bits are not guaranteed to be in any state, unless answer supervision and disconnect supervision are enabled.
Ringing	0	1	0	0	Ring (on state)
Current feed	0	1	0	1	Ring (off state)

Table 7. FXS Signaling Bit States (Continued)

Line State	TX Bits		RX Bits		Comment
	A	B	A	B	
Current feed reversal	1	1	X	R	Answer supervision, battery reversal. Answer supervision is implemented by alternating the B-bit between 0 and 1 in successive superframes. This feature is not supported by all PBX systems.
Current feed open	1	1	1	1	Disconnect supervision. Disconnect supervision should be interpreted as valid if the signaling bits remain in this state for more than 600 msec. This feature is not supported by all PBX systems.

44.4 FXS Call Scenarios

Table 8 through Table 13 show the signaling bit states for some common call scenarios.

Table 8. Outgoing Call from Voice Mail (FXS)

Line State	TX Bits		RX Bits		Comment
	A	B	A	B	
Idle	0	1	0	1	On-hook
Voice mail goes off-hook (waiting for dial tone)	1	1	0	1	Off-hook
Dial	1	1	0	1	
Remote side answers	1	1	0	1/0	Answer supervision, if supported by PBX

Table 9. Incoming Call to Voice Mail (FXS)

Line State	TX Bits		RX Bits		Comment
	A	B	A	B	
Idle	0	1	0	1	On-hook
PBX applies ringing:					
During ringing	0	1	0	0	Ring
At interval between ringing	0	1	0	1	No ring
Voice mail answers call	1	1	0	X	
Normal talking state	1	1	0	X	

Table 10. Incoming Call to Voice Mail (FXS) and Transfer to Extension

Line State	TX Bits		RX Bits		Comment
	A	B	A	B	
Idle	0	1	0	1	On-hook
PBX applies ringing:					
During ringing	0	1	0	0	Ring
At interval between ringing	0	1	0	1	No ring
Voice mail answers call	1	1	0	X	
Voice mail play prompt	1	1	0	X	"Please enter the extension number..."
Voice mail does hook flash	H†	1	0	X	A-bit temporarily set to 0 then back to 1
Voice mail dials extension	1	1	0	X	Delay before dialing
Voice mail goes off-hook	0	1	0	X	Delay before hang up
Voice mail waits for new call	0	1	0	X	Delay before accepting a new call
†H indicates that the A-bit state transitions from 1 to 0 to 1 to provide the hook flash.					

Table 11. Incoming Call to Voice Mail (FXS) but Abandoned Before Transfer

Line State	TX Bits		RX Bits		Comment
	A	B	A	B	
Idle	0	1	0	1	On-hook
PBX applies ringing:					
During ringing	0	1	0	0	Ring
At interval between ringing	0	1	0	1	No ring
PBX abandons call	0	1	0	1	Caller hangs up
PBX stops ringing call	0	1	0	1	

Table 12. Voice Mail (FXS) Disconnects Call

Line State	TX Bits		RX Bits		Comment
	A	B	A	B	
Normal talking state	1	1	0	X	
Voice mail goes on-hook	0	1	0	X	
Idle	0	1	0	1	



Table 13. PBX (FXO) Disconnects Call

Line State	TX Bits		RX Bits		Comment
	A	B	A	B	
Normal talking state	1	1	0	X	
PBX hangs up	1	1	1	X	Disconnect supervision, if supported by PBX
Idle	0	1	0	1	

Venezuela R2 Bidirectional Protocol Parameter Configuration

This chapter discusses the capabilities and parameters of the Venezuela R2 Bidirectional protocol in the following topics:

- General Protocol Information 295
- Country Dependent Parameter Descriptions 295

45.1 General Protocol Information

Protocol File Set

The files used with the Venezuela R2 protocol are listed and described in the following table.

File Type	Filename(s)	
	DM3	Springware
Protocol Module	pdk_r2_io.qs and pdk_r2_io.hot (or pdk_r2_io.arm.hot for DMT160TEC boards)	pdk_r2_io.psi
Voice and Network Parameters	Not applicable	r2_300.prm
Country Dependent Parameters	pdk_ve_r2_io.cdp	pdk_ve_r2_io.cdp
	gc_OpenEx() Protocol Name	
	Not applicable†	pdk_ve_r2_io

†On DM3 boards, the protocol is determined at board initialization time and not when a Global Call device is opened. For compatibility, the **gc_OpenEx()** protocol name may be specified for DM3 boards, but it is not used.

Protocol Limitations

If a DropCall is attempted in the ACCEPTED state, the protocol will answer the call by sending out the ANSWER pattern before dropping the call, as forced release is not supported in this protocol.

45.2 Country Dependent Parameter Descriptions

Note: A parameter can be inbound, outbound, or both inbound and outbound. An inbound parameter is used by the protocol when it is acting as inbound. An outbound parameter is used by the protocol when it is acting as outbound. A parameter that is both can be used by the protocol when it is acting as either inbound or outbound.

The modifiable parameters in the *pdk_ve_r2_io.cdp* file are:

- CDP_ANI_ENABLED (Inbound)
- CDP_ANI_MaxDigits (Inbound)
- CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED
- CDP_ANI_WITHAC_FACILITY_ENABLED (Outbound)
- CDP_AreaCode
- CDP_CallingPartyCategory (Outbound)
- CDP_ConnectType (Outbound)
- CDP_DNIS_MaxDigits (Inbound)
- CDP_Drop_Using_ProgressTones_After_AcceptCall (Inbound)
- CDP_FLAG_APPEND_F (Outbound)
- CDP_GrpB_Tone (Inbound)
- CDP_IMMEDIATE_ACCEPTSTATE (Inbound)
- CDP_IS_ANIAVAILABILITY_CHECK_NEEDED
- CDP_IS_CALLING_LINE_IDENTIFICATION_PERMITTED (Outbound)
- CDP_NO_OF_DNIS_BEFORE_CAT (Inbound)
- CDP_NUM_OF_AC_DIGITS (Inbound)
- CDP_NUM_OF_ANI_DIGITS (Inbound)
- CDP_NUM_OF_DNIS_DIGITS (Inbound)
- CDP_OVERLAP_SENDING_ENABLED (Outbound)
- CDP_REJECT_WITH_A3B4 (Inbound)
- CDP_SEND_ALERTING_ON_R2MF_COMPLETION (Inbound)
- CDP_SEND_BLOCK_AT_START_OR_REMOTE_BLOCK
- CDP_TrunkPrefixNumber

In addition, see Chapter 3, “Call Progress Analysis Parameters” for configuring default call progress operation in the protocol.

CDP_ANI_ENABLED (Inbound)

Description: Enables or disables the reception of automatic number identification (ANI) digits.

Values:

- 0: Disable the reception of ANI digits.
- 1 [default]: Enable the reception of ANI digits.

Guidelines: If this parameter is set to a value other than 0 or 1, the behavior of the protocol is not predictable.

For DM3, if ANI is disabled, you also have to remove **feature_ANI** from the **SYS_FEATURES** parameter in the *.cdp* file. The **SYS_FEATURES** parameter looks like this:

```
All CHARSTRING_t SYS_FEATURES = "feature_outbound,feature_inbound,feature_DNIS,
feature_Billing,feature_ANI,feature_CAT,feature_MoreDNIS"
```

CDP_ANI_MaxDigits (Inbound)

Description: Specifies the maximum number of ANI digits that can be received when using this protocol.

Values: Default is 16.

Guidelines: If this parameter value is set to 0, the behavior of the protocol is not predictable.

CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED

Description: Specifies whether ANI is to be requested (inbound) or sent (outbound) with the area code.

Values:

- 0 [default]: Request (inbound) or send (outbound) ANI digits without area code.
- 1: Request (inbound) or send (outbound) area code with ANI digits.

CDP_ANI_WITHAC_FACILITY_ENABLED (Outbound)

Description: Specifies whether ANI digits and area code are sent to the inbound side. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values:

- 0 [default]: The requested information denied tone is sent to the inbound side.
- 1: ANI digits with area code are sent to the inbound side.

CDP_AreaCode

Description: Specifies the area code of the local exchange where the subscriber is connected. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values: Default is 987.

CDP_CallingPartyCategory (Outbound)

Description: Specifies the category of the calling subscriber.

Values:

- 1 [default]: Subscriber without priority
- 2: Subscriber with priority
- 3: Maintenance equipment
- 4: Coin box or subscriber with charge metering
- 5: Operator
- 6: Data transmission
- 11: C. P. T. P.
- 12: Special line
- 13: Mobile user
- 14: Virtual private network line
- 15: Special line

CDP_ConnectType (Outbound)

Description: Specifies the mode for outbound connect detection. Two types of connection events can be detected: the cas_answer received signaling bit pattern and the media type detection used when post-connect call analysis is enabled. The application has options as to when the call is considered connected, as set by this parameter. The application also has options as to whether call analysis continues after the call has been connected when cas_answer is received first.

Values:

- 0 [default]: The protocol transitions to the connected state only when cas_answer is received. If cas_answer is received first, call analysis is stopped. If call analysis is received first, the result is sent to the application via a GCEV_MEDIADETECTED event, but the protocol does not transition to the connected state until cas_answer is received.
- 1: The protocol transitions to the connected state when the first event (either cas_answer or call analysis) is received. If cas_answer is received first, call analysis still continues and the result is sent to the application via a GCEV_MEDIADETECTED event. If call analysis is received first, the subsequent cas_answer is ignored.
- 2: The protocol transitions to the connected state when the first event (either cas_answer or call analysis) is received. If cas_answer is received first, call analysis is stopped. If call analysis is received first, the subsequent cas_answer is ignored.
- 3: The protocol transitions to the connected state only when call analysis is received. If call analysis is received first, the subsequent cas_answer is ignored. If cas_answer is received first, it is ignored.

CDP_DNIS_MaxDigits (Inbound)

Description: Specifies the maximum number of dialed number identification service (DNIS) digits that can be received when using this protocol.

Values: Default is 16.

Guidelines: If this parameter value is set to 0, the behavior of the protocol is not predictable.

CDP_Drop_Using_ProgressTones_After_AcceptCall (Inbound)

Description: Specifies the call progress tone to be sent for dropping a call, when doing a `gc_DropCall()` after a `gc_AcceptCall()`.

Values:

- 0 [default]: The protocol sends the Answer Line signal, waits for the time specified by `CDP_TimeToRecognizeAnswer`, and then sends a Clear Backward line signal for call disconnection. In this case, the call will be charged for the remote calling subscriber, even though the call is not successful.
- 1: The protocol sends the appropriate call progress tone depending on the `gc_DropCall()` cause to the remote end, and waits for a Clear Forward Line signal for call disconnection.

CDP_FLAG_APPEND_F (Outbound)

Description: When the remote end asks for the next DNIS digit through Group A backward tone, and the protocol does not have any more DNIS available to be sent, this parameter specifies whether to send the I-15 tone or to remain silent and prepare for A3 or A4 pulse from the remote end.

Values:

- 0 [default]: No tone will be sent to the remote end. In this case, A3 or A4 pulse is expected to be received from the remote end. In a case of overlapped sending (see description of `CDP_OVERLAP_SENDING_ENABLED` parameter), the remote end may also send A1 to request more information.
- 1: 'f' (I-15) will be sent to the remote end, indicating the end of information.

CDP_GrpB_Tone (Inbound)

Description: Determines whether the sender should be charged after receiving the tone. The tone is sent from the inbound end on receipt of Category for Group II. After this tone, the sequence of R2MF tone exchange is over and the call is connected. This is the last R2MF tone in establishment of a call.

Values:

- 6 [default]: Line free, chargeable (B-6)
- 7: Line free, not chargeable (B-7)

CDP_IMMEDIATE_ACCEPTSTATE (Inbound)

Description: Specifies when the protocol transitions a call to the Accepted state.

Values:

- 0 [default]: The protocol should wait for the number of rings specified in `gc_AcceptCall()` to expire before transitioning to the Accepted state.
- 1: The protocol should transition a call to the Accepted state immediately upon receipt of `gc_AcceptCall()` and before the specified number of rings have been generated.

Guidelines: This parameter is ignored if the value of the `gc_AcceptCall()` rings parameter is 0.

CDP_IS_ANIAVAILABILITY_CHECK_NEEDED

Description: Determines whether the status of ANI availability is checked before ANI digits are exchanged. At the inbound side, this parameter specifies whether ANI availability at the outbound side has to be verified or if ANI digits can be requested directly. At the outbound side, ANI digits are passed directly or the inbound side is informed of the availability (status) first.

Values:

- 0 [default]: The status of ANI availability is not checked before ANI digits are exchanged. ANI digits can be requested directly without knowing the status of the outbound side.
- 1: The status of ANI availability is checked before ANI digits are exchanged. The inbound side requests the status of ANI availability. If ANI digits are available, the inbound side requests the ANI digits. The outbound side sends the status of ANI availability and then waits for the inbound request.

CDP_IS_CALLING_LINE_IDENTIFICATION_PERMITTED (Outbound)

Description: Specifies whether Calling Line Identification is enabled. This parameter is used to enable CLIP and CLIR conditions.

Values:

- 0: Calling Line Identification Rejected (CLIR). The requested information denied tone is sent to the inbound side.
- 1 [default]: Calling Line Identification Permitted (CLIP). ANI digits are sent to the inbound side.

CDP_NO_OF_DNIS_BEFORE_CAT (Inbound)

Description: Determines the number of DNIS digits that are to be received before any category information is received. If this parameter is set to non-zero, the following sequence of events occurs:

1. Partial DNIS digits are received.
2. Category digits are received.
3. The remaining DNIS digits are received.
4. ANI digits are received (if **CDP_ANI_ENABLED** is 1).
5. Category digits are received again.

Values:

- 0 [default]: Indicates that category must be received after all DNIS digits are received.
- Non-zero: Specifies the number of DNIS digits received before category information is received.

Guidelines: The behavior of the protocol will not be predictable, unless the following occurs:

- If this parameter is set to non-zero, **CDP_ANI_ENABLED** must be set to 1.
- If this parameter is set to non-zero, its value should be the minimum of **CDP_NUM_OF_DNIS_DIGITS** (if non-zero), **CDP_DNIS_MaxDigits**, and the actual DNIS digits to be received.

CDP_NUM_OF_AC_DIGITS (Inbound)

Description: Specifies the number of area code digits of the local exchange from where it received the call. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values: Default is 3.

CDP_NUM_OF_ANI_DIGITS (Inbound)

Description: Specifies the expected number of ANI digits to be received.

Values:

- 0 [default]: ANI collection is terminated by I-15 (end of dialing).
- Non-zero: Specifies the number of ANI digits expected. This number should always be less than **CDP_ANI_MaxDigits**.

CDP_NUM_OF_DNIS_DIGITS (Inbound)

Description: Specifies the expected number of DNIS digits to be received.

Values:

- 0: DNIS collection is terminated by I-15 (end of dialing).
- Non-zero [default is 4]: Specifies the number of DNIS digits expected. This number should always be less than **CDP_DNIS_MaxDigits**.

CDP_OVERLAP_SENDING_ENABLED (Outbound)

Description: Enables or disables the overlap sending feature.

Values:

- 0: Disables overlap sending. 'f' will be appended to DNIS digits received with **gc_MakeCall()** (if **CDP_FLAG_APPEND_F** is true), indicating the end of information.
- 1 [default]: Enables overlap sending. The remote end can request more DNIS information, in which case a **REQMOREINFO** event will be generated. **gc_SendMoreInfo()** with Null information will either cause 'f' to be sent to the remote end or will remain silent (depending on the value of **CDP_FLAG_APPEND_F**), thus indicating to the remote end that no more DNIS digits are available.

CDP_REJECT_WITH_A3B4 (Inbound)

Description: Determines the method for rejecting a call when an R2MF tone error is received during call setup.

Values:

- 0 [default]: Call is rejected with a direct group A tone (A-10), which is a spare tone that may be used to indicate congestion.
- 1: Call is rejected with an A3-B4 tone combination, which means that the inbound (local) end sends an A-3 tone (send category and change over to group B tones). Then, the category is received and in response, a B-4 tone is sent to reject the call.



CDP_SEND_ALERTING_ON_R2MF_COMPLETION (Inbound)

Description: Controls when the protocol will send a GCEV_ALERTING event to the application.

Values:

- 0: GCEV_ALERTING is sent after receiving a ringback tone.
- 1 [default]: GCEV_ALERTING is sent after completion of the R2MF sequence (after receiving the last Group B tone).

CDP_SEND_BLOCK_AT_START_OR_REMOTE_BLOCK

Description: Specifies the bit pattern to be sent on the line at protocol open time and when the remote line goes BLOCKED.

Values:

- 0 [default]: If the protocol is used either as outbound only or as bidirectional.
- 1: If the protocol is used as inbound only.

CDP_TrunkPrefixNumber

Description: Specifies the trunk number used to dial to local exchange. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values: Default is 9.

Vietnam R2 Bidirectional Protocol 46 Parameter Configuration

This chapter discusses the capabilities and parameters of the Vietnam R2 Bidirectional protocol in the following topics:

- General Protocol Information 303
- Country Dependent Parameter Descriptions 303

46.1 General Protocol Information

Protocol File Set

The files used with the Vietnam R2 protocol are listed and described in the following table.

File Type	File Name(s)	
	DM3	Springware
Protocol Module	pdk_r2_io.qs and pdk_r2_io.hot (or pdk_r2_io.arm.hot for DMT160TEC boards)	pdk_r2_io.psi
Voice and Network Parameters	Not applicable	vn_300.prm
Country Dependent Parameters	pdk_vn_r2_io.cdp	pdk_vn_r2_io.cdp
	gc_OpenEx() Protocol Name	
	Not applicable†	pdk_vn_r2_io

†On DM3 boards, the protocol is determined at board initialization time and not when a Global Call device is opened. For compatibility, the **gc_OpenEx()** protocol name may be specified for DM3 boards, but it is not used.

Protocol Limitations

If a DropCall is attempted in the ACCEPTED state, the protocol will answer the call by sending out the ANSWER pattern before dropping the call, as forced release is not supported in this protocol.

46.2 Country Dependent Parameter Descriptions

Note: A parameter can be inbound, outbound, or both inbound and outbound. An inbound parameter is used by the protocol when it is acting as inbound. An outbound parameter is used by the protocol when it is acting as outbound. A parameter that is both can be used by the protocol when it is acting as either inbound or outbound.

The modifiable parameters in the *pdk_vn_r2_io.cdp* file are:

- CDP_ANI_ENABLED (Inbound)
- CDP_ANI_MaxDigits (Inbound)
- CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED
- CDP_ANI_WITHAC_FACILITY_ENABLED (Outbound)
- CDP_AreaCode
- CDP_CallingPartyCategory (Outbound)
- CDP_ConnectType (Outbound)
- CDP_DNIS_MaxDigits (Inbound)
- CDP_Drop_Using_ProgressTones_After_AcceptCall (Inbound)
- CDP_FLAG_APPEND_F (Outbound)
- CDP_GrpB_Tone (Inbound)
- CDP_IMMEDIATE_ACCEPTSTATE (Inbound)
- CDP_IS_ANIAVAILABILITY_CHECK_NEEDED
- CDP_IS_CALLING_LINE_IDENTIFICATION_PERMITTED (Outbound)
- CDP_NO_OF_DNIS_BEFORE_CAT (Inbound)
- CDP_NUM_OF_AC_DIGITS (Inbound)
- CDP_NUM_OF_ANI_DIGITS (Inbound)
- CDP_NUM_OF_DNIS_DIGITS (Inbound)
- CDP_OVERLAP_SENDING_ENABLED (Outbound)
- CDP_REJECT_WITH_A3B4 (Inbound)
- CDP_SEND_ALERTING_ON_R2MF_COMPLETION (Inbound)
- CDP_SEND_BLOCK_AT_START_OR_REMOTE_BLOCK
- CDP_TrunkPrefixNumber

In addition, see Chapter 3, “Call Progress Analysis Parameters” for configuring default call progress operation in the protocol.

CDP_ANI_ENABLED (Inbound)

Description: Enables or disables the reception of automatic number identification (ANI) digits.

Values:

- 0: Disable the reception of ANI digits.
- 1 [default]: Enable the reception of ANI digits.

Guidelines: If this parameter is set to a value other than 0 or 1, the behavior of the protocol is not predictable.

For DM3, if ANI is disabled, you also have to remove **feature_ANI** from the **SYS_FEATURES** parameter in the *.cdp* file. The **SYS_FEATURES** parameter looks like this:

```
All CHARSTRING_t SYS_FEATURES = "feature_outbound,feature_inbound,feature_DNIS,
feature_Billing,feature_ANI,feature_CAT,feature_MoreDNIS"
```

CDP_ANI_MaxDigits (Inbound)

Description: Specifies the maximum number of ANI digits that can be received when using this protocol.

Values: Default is 16.

Guidelines: If this parameter value is set to 0, the behavior of the protocol is not predictable.

CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED

Description: Specifies whether ANI is to be requested (inbound) or sent (outbound) with the area code.

Values:

- 0 [default]: Request (inbound) or send (outbound) ANI digits without area code.
- 1: Request (inbound) or send (outbound) area code with ANI digits.

CDP_ANI_WITHAC_FACILITY_ENABLED (Outbound)

Description: Specifies whether ANI digits and area code are sent to the inbound side. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values:

- 0 [default]: The requested information denied tone is sent to the inbound side.
- 1: ANI digits with area code are sent to the inbound side.

CDP_AreaCode

Description: Specifies the area code of the local exchange where the subscriber is connected. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values: Default is 987.

CDP_CallingPartyCategory (Outbound)

Description: Specifies the category of the calling subscriber.

Values:

- 1 [default]: Subscriber without priority
- 2: Subscriber with priority
- 3: Maintenance equipment
- 4: Interception center
- 5: Operator
- 6: Data transmission
- 7: Overseas subscriber
- 8: Data transmission international working
- 9: Overseas maintenance equipment
- A: Overseas operator
- B: Pay phone
- C: Category unavailable

CDP_ConnectType (Outbound)

Description: Specifies the mode for outbound connect detection. Two types of connection events can be detected: the cas_answer received signaling bit pattern and the media type detection used when post-connect call analysis is enabled. The application has options as to when the call is considered connected, as set by this parameter. The application also has options as to whether call analysis continues after the call has been connected when cas_answer is received first.

Values:

- 0 [default]: The protocol transitions to the connected state only when cas_answer is received. If cas_answer is received first, call analysis is stopped. If call analysis is received first, the result is sent to the application via a GCEV_MEDIADETECTED event, but the protocol does not transition to the connected state until cas_answer is received.
- 1: The protocol transitions to the connected state when the first event (either cas_answer or call analysis) is received. If cas_answer is received first, call analysis still continues and the result is sent to the application via a GCEV_MEDIADETECTED event. If call analysis is received first, the subsequent cas_answer is ignored.
- 2: The protocol transitions to the connected state when the first event (either cas_answer or call analysis) is received. If cas_answer is received first, call analysis is stopped. If call analysis is received first, the subsequent cas_answer is ignored.
- 3: The protocol transitions to the connected state only when call analysis is received. If call analysis is received first, the subsequent cas_answer is ignored. If cas_answer is received first, it is ignored.

CDP_DNIS_MaxDigits (Inbound)

Description: Specifies the maximum number of dialed number identification service (DNIS) digits that can be received when using this protocol.

Values: Default is 16.

Guidelines: If this parameter value is set to 0, the behavior of the protocol is not predictable.

CDP_Drop_Using_ProgressTones_After_AcceptCall (Inbound)

Description: Specifies the call progress tone to be sent for dropping a call, when doing a `gc_DropCall()` after a `gc_AcceptCall()`.

Values:

- 0 [default]: The protocol sends the Answer Line signal, waits for the time specified by `CDP_TimeToRecognizeAnswer`, and then sends a Clear Backward line signal for call disconnection. In this case, the call will be charged for the remote calling subscriber, even though the call is not successful.
- 1: The protocol sends the appropriate call progress tone depending on the `gc_DropCall()` cause to the remote end, and waits for a Clear Forward Line signal for call disconnection.

CDP_FLAG_APPEND_F (Outbound)

Description: When the remote end asks for the next DNIS digit through Group A backward tone, and the protocol does not have any more DNIS available to be sent, this parameter specifies whether to send the I-15 tone or to remain silent and prepare for A3 or A4 pulse from the remote end.

Values:

- 0 [default]: No tone will be sent to the remote end. In this case, A3 or A4 pulse is expected to be received from the remote end. In a case of overlapped sending (see description of `CDP_OVERLAP_SENDING_ENABLED` parameter), the remote end may also send A1 to request more information.
- 1: 'f' (I-15) will be sent to the remote end, indicating the end of information.

CDP_GrpB_Tone (Inbound)

Description: Determines whether the sender should be charged after receiving the tone. The tone is sent from the inbound end on receipt of Category for Group II. After this tone, the sequence of R2MF tone exchange is over and the call is connected. This is the last R2MF tone in establishment of a call.

Values:

- 6 [default]: Line idle, chargeable
- 7: Line idle, not chargeable

CDP_IMMEDIATE_ACCEPTSTATE (Inbound)

Description: Specifies when the protocol transitions a call to the Accepted state.

Values:

- 0 [default]: The protocol should wait for the number of rings specified in `gc_AcceptCall()` to expire before transitioning to the Accepted state.
- 1: The protocol should transition a call to the Accepted state immediately upon receipt of `gc_AcceptCall()` and before the specified number of rings have been generated.

Guidelines: This parameter is ignored if the value of the `gc_AcceptCall()` rings parameter is 0.

CDP_IS_ANIAVAILABILITY_CHECK_NEEDED

Description: Determines whether the status of ANI availability is checked before ANI digits are exchanged. At the inbound side, this parameter specifies whether ANI availability at the outbound side has to be verified or if ANI digits can be requested directly. At the outbound side, ANI digits are passed directly or the inbound side is informed of the availability (status) first.

Values:

- 0 [default]: The status of ANI availability is not checked before ANI digits are exchanged. ANI digits can be requested directly without knowing the status of the outbound side.
- 1: The status of ANI availability is checked before ANI digits are exchanged. The inbound side requests the status of ANI availability. If ANI digits are available, the inbound side requests the ANI digits. The outbound side sends the status of ANI availability and then waits for the inbound request.

CDP_IS_CALLING_LINE_IDENTIFICATION_PERMITTED (Outbound)

Description: Specifies whether Calling Line Identification is enabled. This parameter is used to enable CLIP and CLIR conditions.

Values:

- 0: Calling Line Identification Rejected (CLIR). The requested information denied tone is sent to the inbound side.
- 1 [default]: Calling Line Identification Permitted (CLIP). ANI digits are sent to the inbound side.

CDP_NO_OF_DNIS_BEFORE_CAT (Inbound)

Description: Determines the number of DNIS digits that are to be received before any category information is received. If this parameter is set to non-zero, the following sequence of events occurs:

1. Partial DNIS digits are received.
2. Category digits are received.
3. The remaining DNIS digits are received.
4. ANI digits are received (if `CDP_ANI_ENABLED` is 1).
5. Category digits are received again.

Values:

- 0 [default]: Indicates that category must be received after all DNIS digits are received.
- Non-zero: Specifies the number of DNIS digits received before category information is received.

Guidelines: The behavior of the protocol will not be predictable, unless the following occurs:

- If this parameter is set to non-zero, `CDP_ANI_ENABLED` must be set to 1.

- If this parameter is set to non-zero, its value should be the minimum of **CDP_NUM_OF_DNIS_DIGITS** (if non-zero), **CDP_DNIS_MaxDigits**, and the actual DNIS digits to be received.

CDP_NUM_OF_AC_DIGITS (Inbound)

Description: Specifies the number of area code digits of the local exchange from where it received the call. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values: Default is 3.

CDP_NUM_OF_ANI_DIGITS (Inbound)

Description: Specifies the expected number of ANI digits to be received.

Values:

- 0 [default]: ANI collection is terminated by I-15 (end of dialing).
- Non-zero: Specifies the number of ANI digits expected. This number should always be less than **CDP_ANI_MaxDigits**.

CDP_NUM_OF_DNIS_DIGITS (Inbound)

Description: Specifies the expected number of DNIS digits to be received.

Values:

- 0: DNIS collection is terminated by I-15 (end of dialing).
- Non-zero [default is 4]: Specifies the number of DNIS digits expected. This number should always be less than **CDP_DNIS_MaxDigits**.

CDP_OVERLAP_SENDING_ENABLED (Outbound)

Description: Enables or disables the overlap sending feature.

Values:

- 0: Disables overlap sending. 'f' will be appended to DNIS digits received with **gc_MakeCall()** (if **CDP_FLAG_APPEND_F** is true), indicating the end of information.
- 1 [default]: Enables overlap sending. The remote end can request more DNIS information, in which case a **REQMOREINFO** event will be generated. **gc_SendMoreInfo()** with Null information will either cause 'f' to be sent to the remote end or will remain silent (depending on the value of **CDP_FLAG_APPEND_F**), thus indicating to the remote end that no more DNIS digits are available.

CDP_REJECT_WITH_A3B4 (Inbound)

Description: Determines the method for rejecting a call when an R2MF tone error is received during call setup.

Values:

- 0 [default]: Call is rejected with a direct group A tone (A-10), which is a spare tone that may be used to indicate congestion.
- 1: Call is rejected with an A3-B4 tone combination, which means that the inbound (local) end sends an A-3 tone (send category and change over to group B tones). Then, the category is received and in response, a B-4 tone is sent to reject the call.

CDP_SEND_ALERTING_ON_R2MF_COMPLETION (Inbound)

Description: Controls when the protocol will send a GCEV_ALERTING event to the application.

Values:

- 0: GCEV_ALERTING is sent after receiving a ringback tone.
- 1 [default]: GCEV_ALERTING is sent after completion of the R2MF sequence (after receiving the last Group B tone).

CDP_SEND_BLOCK_AT_START_OR_REMOTE_BLOCK

Description: Specifies the bit pattern to be sent on the line at protocol open time and when the remote line goes BLOCKED.

Values:

- 0 [default]: If the protocol is used either as outbound only or as bidirectional.
- 1: If the protocol is used as inbound only.

CDP_TrunkPrefixNumber

Description: Specifies the trunk number used to dial to local exchange. This parameter is valid only if CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED is enabled.

Values: Default is 9.

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