Dialogic® Diva® System Release 8.5WIN Service Update 8

Reference Guide

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Contractor/ manufacturer is:

Dialogic CORPORATION.

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This Agreement has been drafted in English at the express wish of the parties. Ce contrat a été rédigé en anglais à la demande expresse des parties.

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About This Publication

How to use this online guide
- To view a section, click the corresponding blue underlined phrase in the table below.
- To view a topic that contains further information, click the corresponding blue underlined phrases in this guide.
- You may wish to print out the pages required for installing the drivers.

Structure of this guide

This guide provides a detailed description of how to install and configure the Dialogic® Diva® System Release software, and how to troubleshoot your ISDN or channelized T1 connection should that become necessary.

This guide is structured as follows:

Section	Contents
Dialogic® Diva® System Release WIN Software	Dialogic® Diva® System Release software features, supported hardware, and requirements for software installation
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SNMP Support For A Dialogic® Diva® Media Board	Installation of the SNMP service and description of supported OIDs
Uninstalling	Uninstallation of the Dialogic® Diva® Media Boards in the Device Manager or with Dialogic® Diva® Uninstall
Management Tools	Tools available for monitoring active connections and getting statistic information on all connections
Maintenance Tools	Debugging tools available for locating installation errors or connection issues
Dialogic® Diva® Media Board Features	Overview of the functions provided by the various interfaces
About Customer Services	Information on how to get technical support for Dialogic® Diva® products

CHAPTER 1

Dialogic® Diva® System Release WIN Software

The Dialogic® Diva® System Release 8.5WIN Service Update 8 (Diva System Release 8.5.8WIN) software enables you to use your Dialogic® Diva® Media Board with Windows® XP, Windows Server® 2003, Windows Vista®, Windows Server® 2008 (including R2), or Windows® 7. The Diva System Release software provides the required drivers and software modules to install, configure, test and debug systems that use Diva Media Boards and the Dialogic® Diva® softIP for SIP Software module. The Diva System Release software provides the basis for all types of telephony applications, including UM/Fax, voice, conference, modem, monitoring, and VoIP/FoIP gateway applications.

Features

The below feature overview lists the Diva System Release software features. For Dialogic® Diva® softIP for SIP Software features see page 17. For Dialogic® Diva® Media Board Features see page 60.

New features in Diva System Release 8.5.8WIN

- Support for G.723 codec for Dialogic® Diva® Multiport V-PRI Media Boards

- Dialogic® Diva® softIP for SIP Software available on 64-bit operating systems

- Optimized performance for POS and Analog Modem applications when using Dialogic® Diva® V-8PRI PCIe FS Media Boards

- New DMA streaming interface for Dialogic® Diva® V-1PRI PCIe, V-2PRI PCIe, V-4PRI PCIe, and V-8PRI PCIe Media Boards

  The new DMA interface adds virtual DMA channels providing an increased data transfer performance. This interface enables also the usage of SIPcontrol with the V-8PRI PCIe Media Board on all channels.

- Support of the Diva V-8PRI PCIe Media Board with Dialogic® Diva® SIPcontrol software

- Replace the product packer "self extracting ARJ" for the WEB download with "iexpress.exe" from Microsoft®. It provides a GUI with the possibility to specify a target directory at the destination system.

Diva System Release WIN software features

The list below provides an overview of the features supported by the Dialogic® Diva® System Release software. For information on further supported features of Diva Media Boards, refer to Dialogic® Diva® Media Board Features on page 60 of this reference guide.

License-based features for Dialogic® Diva® V-1PRI, V-2PRI, V-4PRI, and V-8PRI Media Boards

- Support for RTAudio voice codec with default bit rates: 24 kbps for 16 kHz and 8.8 kbps for 8 kHz

- Support for AMR-NB voice codec

  Note: Using the AMR-NB resource in connection with a Dialogic® Diva® product does not grant the right to practice the AMR-NB standard. To seek a patent license agreement to practice the standard, contact the VoiceAge Corporation at http://www.voiceage.com/licensing.php.

- Support for G.723.1 voice codec

- Support for G.729 incl. Annex A and Annex B voice codec

- Support for the following fax and modem features. These licensable features are divided into three groups:

High-end TDM fax support, up to V.34 (33.600 bps and lower bit rates)

- Support for Fax G3, T.30, V.34 HDX, V.17, V.29, V.27ter, V.21, V.34

- Fax Compression MH, MR, MMR

- Error Correction Mode ECM

- Fax Polling

- Reversal Fax Direction

- Fax Password, Sub Addressing, "new header line"

- Page Formats A4, B4, A3

- Resolutions fine, super fine, ultra fine

- Color Fax JPEG format

- T.38 FoIP (PSTN - IP Gateway mode)

TDM fax support, e.g., for typical Unified Messaging (UM) applications, up to V.34

Note: At most, half of the available channels can be licensed for these fax features.

- Support for Fax G3, T.30, V.17, V.29, V.27ter, V.21

- Fax Compression MH, MR, MMR

- Error Correction Mode ECM

- Fax Polling

- Reversal Fax Direction

- Fax Password, Sub Addressing, "new header line"

- Page Formats A4, B4, A3

- Resolutions fine, super fine, ultra fine

- Color Fax JPEG format

- T.38 FoIP (PSTN - IP Gateway mode)

Data modem support, up to V.90

- All modem modulations POS up to V.90 (client and server side)

- V.21, V.23, V.22, V.22bis, Bell 103, Bell 103 SIA, Bell 212A, V.32, V.32bis, V.34, V.90, including error correction MNP, V.42, SDLC and compressions V.42bis, MNP 5

- POS modulations V.22 FC, V.22bis FC, V.29 FC

- Text telephone modem: V.18, V.21, Bell 103, V.23, EDT, Baudot 45, Baudot 47, Baudot 50, DTMF

- Extended modulations V.23 half duplex, V.23 on hook (SMSC mode), V.23 off hook, Bell 202 (POS), Telenot

- With V.90, up to 20 channels per E1 or T1 line are possible. All other modem emulations offer the full amount of channels.

License-free features

General features

- Using the Dialogic® Diva® Media Boards as DSP Resource Board with

  - the Dialogic® Diva® softIP Software (see page 17 for more information)

  - CAPI and Diva SDK-based applications

    Diva Media Boards with DSPs, except Dialogic® Diva® PRI/E1/T1-8 PCI, Dialogic® Diva® V-4PRI PCIe FS, and Dialogic® Diva® V-8PRI PCIe FS Media Boards, can be used as conventional TDM boards and/or as DSP Resource Boards for third party application scenarios that require DSPs, such as Clear Channel Fax

or Clear Channel Modem but also for VoIP codecs for transcoding. The latter can be implemented by a CAPI or Dialogic® Diva® SDK application via so-called NULL PLCIs. Please contact Dialogic Customer Support for more information.

- Interoperability with the Dialogic® Brooktrout® Bfv API SDK: The Dialogic® Brooktrout® SR140 Fax Software version 5.2.1 has been tested to be V.34/T.38 interoperable with the Dialogic® Diva® SIPcontrol™ Software. The Brooktrout SR140 Fax Software is high-performance, host-based T.38 fax software for IP networks.

- Support for 64-bit version of all supported operating systems

    Note: The 64-bit version of the Diva System Release software supports RAS, CAPI, TAPI (without Dialogic® Wave driver), Port driver, and SNMP service.

- Support for the ISDN basic rate interface (BRI), the ISDN primary rate interface (PRI), the channelized E1 interface, and the channelized T1 interface

- Support for fractional PRI, E1, and T1 lines

- Support for multiple PRI, E1, and T1 lines

- Support for analog lines

- Support for multiple CPU operating systems

- Automatic Diva Media Board detection

- Support for ISDN lines with a transfer rate of 64 kbps or 56 kbps (for example some regions in the USA)

- Support for channelized T1 lines with a transfer rate of 56 kbps (see Channelized T1 (robbed bit signaling) on page 15)

- Support for unchannelized lines with a transfer rate of 64 kbps or 56 kbps

- Support for R2 signaling E1 lines with a transfer rate of 64 kbps

- Support for up to 8 Diva Media Boards in one system using Dialogic® Diva® BRI, 4BRI, T1/PRI, and V-2PRI Media Boards

- Support for up to 480 B-channels for Dialogic® Diva® V-4PRI or V-8PRI Media Boards (the total amount of channels that can be used depends on the application)

- Modem connections up to 56 kbps (V.90)

- COM port (modem emulation)

- Support for CAPI-based applications through CAPI 2032.DLL, CAPI 20.DLL (32-bit and 16-bit versions), and CAPI2064.DLL (64-bit versions) for Windows®

- Support for applications using the Dialogic® Diva® SDK via the Dialogic® Diva® API, the Dialogic® Diva® Component API, or the Dialogic® Diva® API for .NET.

- Support for TAPI-based applications through the Dialogic® Diva® Telephony Service Provider (TSP)

- Support for all known switch types (ISDN protocols)

- Support for QSIG protocol (see QSIG features on page 15)

- Additional security through support of RSA

- Interfaces: RAS WMP, modem emulation, CAPI, Dialogic® Diva® TSP

- Compatible to V.22 Fast Connect terminals with V.22 Dialogic® Diva® Fast Setup via Port driver.

- M-Board:

    - Middleware between Dialogic® Diva® Media Boards and interfaces (CAPI, COM port)

    - As Combined Board, it can group several Diva Media Boards and specific lines of any Diva Multiport Media Board and abstract them as one board to the application (see "Combined Board" in the Dialogic® Diva® Configuration Manager Online Help file (DSMain.chm)). Separate configuration of each individual line of

any Dialogic® Diva® 4BRI, V-2PRI, V-4PRI, V-8PRI, and Analog Media Board are possible. The Combined Board feature can group up to 120 channels. Since the Diva V-8PRI Media Board provides 240 channels, 2 Combined Boards need to be created to run this feature.

- Without the Combined Board feature, the application placing an outgoing call would look for a free E1/T1 trunk board by board, that means that the Combined Board does a Load Balancing over all physical E1/T1 trunks. If the cable of one trunk is not connected, the Combined Board looks for a connected trunk and sends the call via this trunk on a free channel.

- With the Internal Call Transfer, an application can forward a call to another application. It is possible for application manufacturers and developers to detect the characteristic of a call (Fax, Voice, Modem, etc) and forward the call to another, compatible application. This is required if a solution is splitted into multiple single applications. This feature is especially relevant for application developers. For further documentation, contact the Dialogic Support team.

- With the Call Transfer Emulation (ECT Emulation), an application can initiate a Call Transfer at a high level call control API (e.g., CAPI, Dialogic® Diva® SDK, TAPI, etc.). The M-Board can emulate a regular Call Transfer behavior at the upper interface (Call Transfer result and disconnect towards the application) while the Diva Media Board bridges the two channels together, also known as tromboning. This helps if the switch does not support Call Transfer or if it is required to bridge a gap between the Call Transfer start and completion (board stays connected until the switch completes a Call Transfer). This feature can be configured in the Dialogic® Diva® Configuration Manager under **ECT Emulation**. For more information, see the Diva Configuratiton Manager Online Help file (DSMain.chm).

   Note: Line Interconnect is not supported for Diva Media Boards grouped in a Combined Board.

- Selectable call direction for each port of a Diva Analog or V-Analog Media Board

- Dialogic® Diva® Multiport V-PRI Media Boards: Creation of a trace message in the trace file if maximum operation temperature is exceeded.

- Support for IP and TDM hybrid installations via high speed DMA (Direct Memory Access) procedures using Diva softIP software. For the complete Diva softIP software features set, see page 18.

- Support for collecting phone ranges or a specific number on incoming calls by the software.

- Support for a wide range of Windows® event logs. Driver and connection errors and informative messages are listed in the MOM (Microsoft® Operation Manager). For a detailed description of the errors and messages, see the Dialogic® Diva® Configuration Manager Online Help file (DSMain.chm).

- Support for call deflection or call rerouting

- Support for Explicit Call Transfer (ETSI) including Link ID Request

- Support for redirecting number emulation (for incoming calls). In this case, the called party number is delivered as redirecting number to the application.

- ECT Link Balance: To avoid confusion with call transfer and multiple incoming calls, each incoming call is delivered to a separate TEI. This feature is only valid for Dialogic® Diva® BRI Media Boards and Point-to-Multipoint interfaces.

- Call Rate Limiter: Limitation of the amount of outgoing calls per second. Some switches may require limitation of calls in order to grant stability of the PSTN network.

RAS (Remote Access Service) features

- Connection to ISDN routers, enabling access to a remote LAN or the Internet

- Network access for PPP-compatible clients

- Connection to a Windows® server from digital, analog, and mobile networks with only one telephone number

- Automatic detection of ISDN service, synchronous/asynchronous framing, and B-channel protocol of incoming calls

- Synchronous/asynchronous conversion

- Support for LAN protocols: TCP/IP, IPX/SPX, NetBIOS, NetBEUI, LAN Manager API

- Support for ISDN B-channel protocols: HDLC, X.75, V.120, V.110, PIAFS 1.0 and 2.1, modem V.34+ and V.90, fax connections, V.42/LAPM (error correction), and V.42bis compression

- Encryption, data compression, number checking, shorthold mode, callback function

Modem emulation

- COM port for 16-bit, 32-bit, and 64-bit Windows® applications
- TAPI-compliant pre-initialized Dialogic® Diva® modems:
  - Diva Analog Modem
  - Diva Fax Modem (Fax Class 1/ Fax Class 2)
  - Diva V.120 Modem (64K)
  - Diva V.120 Modem (56K)
  - Diva V.110 Modem
  - Diva X.75 Modem (64K)
  - Diva X.75 Modem (56K)
  - Diva PPP-Modem (64K)
  - Diva PPP-Modem (56K)
  - Diva X.25 Modem
  - Diva Generic Modem:
    - Network access for PPP-compatible clients
    - Automatic detection of ISDN service, synchronous/asynchronous framing and B-channel protocol
    - Synchronous/asynchronous conversion
    - Encryption, data compression, number checking, shorthold mode, callback function

CAPI features

Supplementary services

- Number identification services: MSN, DDI, SUB, CLIP, CLIR, COLP, COLR, KEY, RDN
- Call offering services: TP, CFU, CFB, CFNR, CD
- Call completion services: CW, HOLD, ECT, CCBS, CCNR
- Charging services: AoC
- Three-party conference
- Others: User-to-user signaling

Fax and voice features

- Fax compression (MH, MR 2D coding, MMR T.6 coding) and error-correction mode (ECM)
- Fax connections up to 33,6 kbps
- Class 1 and class 2 fax interface
- Fax polling
- Extended fax
- Fax tone detection
- Reversal of fax direction
- Support for color fax via CAPI
  - Support for JPEG format
  - Support for sending and receiving single or multi-page documents
  - Support for fallback to gray scale if remote side does not support color fax
- Dynamic switching of B-channel protocols

- DTMF transmission, DTMF detection

- DTMF clamping

- Cross-board switching via interline connect (DSP-based monitor, bridge, and mixer for voice connections; supports multiline conference calls)

- Page formats: ISO A4, ISO B4, ISO A3

- Standard, fine, super-fine, and ultra-fine resolution

- Echo cancellation - 128 ms

- Echo cancellation - 256 ms on Diva Multiport V-PRI Media Boards

- Generic tone detection for single and dual tones

- Real time protocol (RTP)

- DSP-based secure RTP (sRTP)

- Dynamic anti-jitter buffering

- Comfort noise generation (CNG)

- Voice activity detection (VAD)

- Support for GSM-FR for Dialogic® Diva® V-2PRI, V-4PRI, and V-8PRI Media Boards

- Support for DSP-based iLBC voice codec for Diva V-2PRI, V-4PRI, and V-8PRI Media Boards

   Notes:

   - For the GIPS iLBC public license, refer to the gips_iLBClicense.pdf stored in the Dialogic® Diva® program directory.

   - iLBC is only available on Dialogic® Diva® V-2PRI PCI, V-4PRI PCI, V-1PRI PCIe HS, V-2PRI PCIe HS, and V-4PRI PCIe FS Media Boards. On Dialogic® Diva® V-4PRI PCIe HS Media Boards, only up to 72 channels are supported.

Diva TSP features

- Supplementary services based on CAPI: CLIP, CLIR, COLP, COLR, HOLD, CFU, CFB, CFNR, ECT, AoC, CCBS, CCNR

- Media mode (unknown, interactive voice, automated voice)

- Wave audio format (8-bit 8 kHZ a-law, 8-bit 8 kHz μ-law, 8-bit 8 kHz PCM)

- DTMF tone generation and detection based on CAPI

QSIG features

- Support for generic QSIG according to ECMA and ISO (for more information see Supplementary services)

- Tests have been conducted for the various switch types (for a complete list of all supported types see Supplementary services)

Channelized T1 (robbed bit signaling)

- Trunk modes (loop, ground, and wink start)

- Tone dialing (DTMF and MF)

- Pulse dialing

- Ringer and busy tone detection

- 56 kbps transfer rate

- Call transfer

Dialogic® Diva® Media Boards

Supported Dialogic® Diva® Media Boards

The Dialogic® Diva® System Release software supports the following Dialogic® Diva® Media Boards (maximum eight Diva Analog, BRI, 4BRI, PRI, V-2PRI, four Diva V-4PRI, or two V-8PRI Media Boards in one computer).

Diva Media Boards with DSPs can also function as resource Board for the Diva softIP software. See Using Dialogic® Diva® Media Boards as DSP Resource Board with the Dialogic® Diva® softIP Software on page 20 for more information. For more information about the Diva softIP software module, see Dialogic® Diva® softIP for SIP Software on page 17.

Dialogic® Diva® BRI Media Boards

- Diva BRI-CTI PCI
- Diva BRI-2FX PCI
- Diva UM-BRI-2 PCI and PCIe
- Diva BRI-2 PCI and PCIe
- Diva UM-4BRI-8 PCI and PCIe
- Diva 4BRI-8 PCI and PCIe

Dialogic® Diva® PRI Media Boards

- Diva PRI/E1/T1-CTI PCI and PCIe
- Diva V-PRI/T1-24 PCI and PCIe
- Diva V-PRI/E1-30 PCI and PCIe
- Diva UM-PRI/T1-24 PCI and PCIe
- Diva UM-PRI/E1-30 PCI and PCIe
- Diva PRI/E1/T1-8 PCI
- Diva PRI/T1-24 PCI and PCIe
- Diva PRI/E1-30 PCI and PCIe

Dialogic® Diva® V-PRI Media Boards with multiple ports

- Diva V-2PRI/T1-48 PCI
- Diva V-1PRI/E1/T1-30 PCIe HS
- Diva V-2PRI/E1-60 PCI
- Diva V-2PRI/E1/T1-60 PCIe HS
- Diva V-4PRI/T1-96 PCI
- Diva V-4PRI/E1/T1-120 PCIe HS
- Diva V-4PRI/E1-120 PCI
- Diva V-4PRI/E1/T1-120 PCIe FS
- Diva V-8PRI/E1/T1-240 PCIe FS

Notes:

- "HS" stands for the half size and "FS" for the full size board format.
- Contact Dialogic Support for available firmware updates for V-xPRI PCIe Media Boards.

Dialogic® Diva® Analog Media Boards

- Diva UM-Analog-2 PCI and PCIe
- Diva UM-Analog-4 PCI and PCIe
- Diva UM-Analog-8 PCI and PCIe
- Diva Analog-2 PCI and PCIe
- Diva Analog-4 PCI and PCIe
- Diva Analog-8 PCI and PCIe

Dialogic® Diva® softIP for SIP software (virtual media board for IP)

- virtual Diva softIP v2.2 board

Dialogic® Diva® softIP for SIP Software

With the licensed-based Dialogic® Diva® softIP for SIP software module, the Diva System Release software offers a middleware that enables existing voice and fax applications to be fully integrated into Voice over IP networks using any standard Ethernet adapter. Technically speaking, the Diva softIP software is comparable to a Diva Media Board in that it provides functions such as voice and fax transmission, DTMF tones and supplementary services as well as conferencing between ISDN and VoIP connections as shown in the graphic.
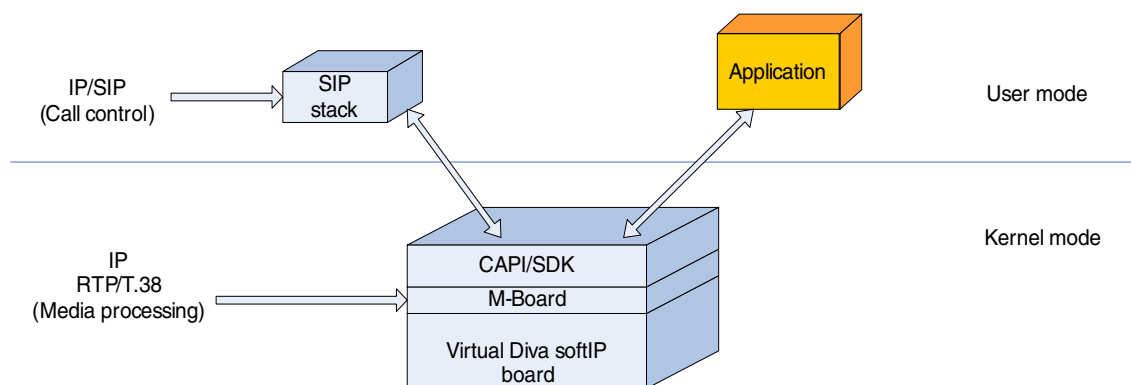
If the Diva softIP software and a Diva Media Board are combined in one system, they can concurrently be connected to TDM and IP systems and they can serve as basis for PSTN-IP gateway applications.

To use the Diva softIP software, you need to purchase the required number of licenses with your Dialogic® Diva® Media Board vendor and activate them in the Dialogic® Diva® Configuration Manager. See License Activation on page 30 for more information. There are two types of licences: Telephony (for voice applications) and Telephony+Fax (for voice and T.38 fax applications).

General Diva softIP software features

- Support for the following supplementary modems when Diva softIP software is used as software-only product:
  - V.18, without CTM
  - V.23 on/off hook
  - V.23s
  - V.23 rev
  - Bell 103 SIA
  - Bell 202 CID
  - Bell 202 POS
  - Telenot
- Support for the following virtualized environments:

- VMware® ESX 3.5
- Microsoft® Virtual Server 2005 R2
- Microsoft® Hyper-V™

  Note: For information about licensing in virtualized environments, see page 34.

- IP only configuration, software only (Host Media Processing)
- Support for mixed installation, i.e., Dialogic® Diva® hardware and Diva softIP software in one PC
- Support for up to 120 channels
- Support for 32-bit and 64-bit version of all supported operating systems
- Basic Call origination, termination, and Supplementary Services
- Diva API (SDK) support
- TAPI support
- CAPI 2.0 support
- Port driver support
- Tool to map between phone numbers and SIP URLs
- Licensing per PC fingerprint or USB dongle
- Support for Combined Board (The Combined Board abstracts the underlying Diva Media Board based channel segmentation into one media board towards the application interfaces (APIs), e.g., from 4 x 30 channels to 1 x 120 channels.)
- Automatic Resource Management (see Using Dialogic® Diva® Media Boards as DSP Resource Board with the Dialogic® Diva® softIP Software on page 20 for more information)
- Internal Service CAPI interface

  The Internal Service CAPI interface helps applications like the Dialogic® Diva® Line Test tool to more easily identify Diva Media Boards. This does not apply to Diva Media Boards grouped in the Combined Board, because the Combined Board does not allow for testing individual PSTN ports.

Dialogic® Diva® API (Dialogic® Diva® SDK) support

- IP only configuration, Host-Media Processing, software only
- TDM/IP hybrid configuration, mixed with Diva Media Boards

VoIP / CAPI 2.0 support

- Calling Party Number (inbound/outbound calls), including International Numbering Plan according to E.164 mapped to "+"
- Called Party Number (inbound/outbound calls), including International Numbering Plan according to E.164 mapped to "+"
- Redirecting Number, SIP Diversion Header (according draft-levy-sip-diversion-06.txt) mapped to Redirecting Number including International Numbering Plan according to E.164 mapped to "+"
- B-channel protocols, 64 Kb bit-transparent, Transparent, T.30*
- Fax support (T.30)*, MH, MR, MMR, ECM
- DTMF recognition and generation (inband and out of band according to RFC 2833)
- Line Interconnect
- Conferencing using Line Interconnect

  Note: Line Interconnect is not supported for Diva Media Boards grouped in a Combined Board.

- Call Transfer without consultation call (also known as Blind Transfer, Call Deflection or Single Step Call Transfer in active state).
- Explicit Call Transfer with consultation call with primary call on hold.
- Explicit Call Transfer with consultation call with primary call not on hold.

TAPI support

- Line Interconnect
- Conferencing

   Note: Line Interconnect is not supported for Diva Media Boards grouped in a Combined Board.

VoIP Call Control

- Session Initiation Protocol (SIP) according to RFC 3261
- Further SIP Methods: NOTIFY (RFC 3265), REFER (RFC 3515), SUBSCRIBE (RFC 3265), REGISTER (RFC 3261) with Digest Authentication, OPTIONS (RFC 3261)
- Session Description Protocol (SDP) according to RFC 2327
- SIP side Call Transfer (known as ECT) as transfer target (C-party) and as call initiator (A-party).
- Support of the SIP Register feature including HTTP Digest Authentication. This scheme is using a simple challenge/response mechanism and a shared secret between the two servers.
- SIP Diversion Header (according draft-levy-sip-diversion-06.txt)
- Proxy Authentication 407, Invite Authentication
- Proxy and Registrar address can be configured differently. REGISTER request can be sent to Registrar and INVITE to Proxy.
- SIP Signaling Proxy support if a Registrar is behind a Proxy
- Support of the SIP side Explicit Call Transfer
- Allow to have the port numbers (SIP and Media) configurable (also as a range of port numbers).

For more information about Proxy and Registrar configuration, see the Dialogic® Diva® softIP software Online Help file (DSsoftIP.chm)

Fax services

- T.38* for real-time fax over IP
- T.30* Fax Group 3 using T.38, up to 33.6 kbps (SuperG3 Fax).

   Note: The availability of the line speed depends also on the gateway or the remote IP Fax terminal.

   For more information about fax modes, see <u>Using Dialogic® Diva® Media Boards as DSP Resource Board with the Dialogic® Diva® softIP Software</u> on page 20.

- Fax* compression MH, MR, MMR
- Error Correction Mode (ECM)*

* Based on T.38 without own Soft Fax stack, feature depends on VoIP Gateway/Terminal.

Media Streaming

- PSTN standard codec, G.711, 64 kbps a-law / µ-law
- RTP/G.711 Clear Channel Fax to CAPI/SDK SFF Fax (incl. all existing T.30 and error correction features)
- G.729 with Dialogic® Diva® 4PRI Media Board as Resource Board

Tone handling

- Inband DTMF generation and detection (clear channel)
- DTMF generation and detection via RTP event (RFC 2833)
- Basic call origination and termination

Supplementary Services support

- Numbering Services (Called Party Number, Calling Party Number, Redirecting Number supporting also International E.164 format)

- Call Hold/Retrieve

- Call Transfer without consultation call, in active call state (also known as Blind Transfer/Call Deflection in active state or Single Step Call Transfer).

- SIP side Call Transfer (known as ECT) as transfer target (C-party) and as call initiator (A-party).

- Conference using Line Interconnect (see [VoIP / CAPI 2.0 support](#) on page 18)

  Note: Line Interconnect is not supported for Diva Media Boards grouped in a Combined Board.

- Message Waiting Activation/Deactivation (to activate/deactivate MWI lamps on remote phones, e.g., connected via a gateway or on IP phones)

Using Dialogic® Diva® Media Boards as DSP Resource Board with the Dialogic® Diva® softIP Software

All Diva Media Boards with DSPs, except Dialogic® Diva® PRI/E1/T1-8 PCI, Dialogic® Diva® V-4PRI PCIe FS, and Dialogic® Diva® V-8PRI PCIe FS Media Boards, can be used as conventional TDM boards and/or as DSP resource board. In the resource board mode, the external interfaces are disabled and the Diva Media Board functions only in combination with the Diva softIP software and thus provides functions to voice, Clear Channel Fax and Clear Channel Modem connections. Clear Channel Fax can be used by PSTN-IP gateways that do not support T.38 fax so that the fax signal is transmitted in clear channel mode.

Note: If the Diva softIP software is used together with the Diva Media Board as resource board, Clear Channel Fax is used for fax transmission. If the Diva softIP software is used as stand-alone product, T.38 Fax is used.

If Diva Media Boards with DSPs and the Diva softIP software are installed in the same system, calls that are initiated without the need to allocate hardware DSP resources (e.g., voice) are preferably routed via the Diva softIP software. If all available channels of the Diva softIP software are used and no channels of the Diva Media Board are reserved for DSP usage, the remaining DSP-enabled channels of the Diva Media Board are also used for non DSP-related calls.

During a call, the call characteristic may change and may require a switchover from the Diva softIP board to the Diva Media Board or vice versa. In this case, the Combined Board internally reroutes the call using the required resources. To enable the switchover, you need to combine both boards in the Dialogic® Diva® Configuration Manager. See the Dialogic® Diva® Configuration Manager Online Help file for more information.

Supported operating systems

The following operating systems are supported:

- Microsoft® Windows® 7 (32bit and x64)
- Microsoft® Windows® Server 2008 (32bit and x64)
- Microsoft® Windows® Server 2008 R2 (x64)
- Microsoft® Windows® Vista (32bit and x64)
- Microsoft® Windows® Server 2003 (32bit and x64)
- Microsoft® Windows® XP (32bit and x64)

Supported switch types

Dialogic® Diva® Media Boards currently support the following switch types:

Public line ISDN protocols

EMEA PRI and BRI

- 1TR6 (legacy Germany and old PBXs)
- ETSI Australia variant (On Ramp ETSI)
- ETSI (Europe, Africa)
- ETSI Hong Kong variant

- ETSI Serbia variant
- ETSI Taiwan variant
- ETSI New Zealand variant
- INS-Net 64 / 1500 (Japan)
- VN4 (legacy France, old PBXs)
- VN6 (current France)

Line Side E.1

- Australian P2
- Ericsson
- Melcas
- NEC
- Nortel

R2 CAS (E.1 only)

- Argentina
- Brazil
- China
- India
- Indonesia
- Korea
- Mexico
- Philippines
- Thailand
- Venezuela

USA PRI and BRI

- 5ESS Custom (AT&T)
- 5ESS Ni Avaya (Lucent)
- DMS 100 (Nortel)
- EWSD (Siemens)

USA T.1/PRI

- 4ESS
- T.1 RBS

Carrier Grade

ITU-T ISUP SS7

POTS

Worldwide POTS

PBX protocols

- Generic QSIG T.1 and E.1

  Note: The Generic QSIG switch type can be used for the majority of PBXs

- ETSI

  Note: Many European PBXs use the regular ETSI protocol (PRI and BRI).

Specific major PBX types

- Alcatel 4200
- Alcatel 4400
- Alcatel 4410
- ASCOM Ascotel 2020
- ASCOM Ascotel 2030
- ASCOM Ascotel 2050
- ASCOM Ascotel 2060
- DeTeWe OpenCOM 1000
- Ericsson MD110/BP250
- GPT Realitis iSDX
- Lucent Definity
- Matracom 6500
- Nortel Meridian
- Nortel opt11 Rev23
- Siemens Hicom 150
- Siemens Hicom 300
- Siemens Hipath 3000
- Siemens Hipath 4000
- Tenovis QSig

CHAPTER 2

Software Installation

This chapter describes the hardware and software requirements for installing the Dialogic® Diva® System Release software, it also describes how to download the installation files and how to install the Diva System Release software.

Requirements for Dialogic® Diva® System Release software installation

For the installation of the Diva System Release software, the following requirements have to be met:

- PC/AT-compatible computer (at least 500 MHz or higher processor with at least 500 MB RAM)
- Windows® XP, Windows Server® 2003, Windows Vista®, Windows Server® 2008, Windows Server® 2008 R2, or Windows® 7 operating system
- At least 15 MB free space on the drive on which the operating system is installed
- An installed Dialogic® Diva® Media Board

Dialogic® Diva® V-PRI Media Boards with multiple ports

- At least 1.5 GHz or higher processor
- At least 512 MB RAM (if more than one board is installed the capacity needs to be at least 1 GB)
- Power supply with 450 W (6 A with 3.3 V per Diva multiport PRI Media Board)

Note: Depending on the computer, a stronger power supply may need to be used.

To install your Dialogic® Diva® Media Board in your computer, refer to the printed installation guide that came with your Diva Media Board or that you downloaded from the Dialogic web site.

Requirements for Dialogic® Diva® softIP Software installation

For the installation of the Diva softIP software, the following requirements have to be met:

- Windows® XP (with Service Pack 2 or higher), Windows Server® 2003 (with Service Pack 1 or higher), Windows Vista® (with Service Pack 1 or higher), Windows® 7 (Service Pack 1 or higher) operating system
- System requirements recommended from Microsoft for the respective operating system
- Computer with USB interface for USB dongle
- An installed NDIS 5 compatible network controller

Notes:

- For Windows® XP, you have to deactivate your firewall.
- The Diva softIP software cannot be installed on a Terminal Server.

To download the installation files

1. Open the following web site
   http://www.dialogic.com/products/tdm_boards/system_release_software/default.htm.
2. In the **Diva Software Drivers** table, click **Diva SR Software for Windows**.
3. Under **Related Links**, select **Download Diva SR software for Windows**.
4. Follow the instructions on the web and copy the installation files to your hard disk and do not change the directory structure of the extracted files.

General installation information

Basic driver support for most Dialogic® Diva® Media Boards is provided by the Windows® operating systems. These Diva Media Boards are fully detected, and a basic set of drivers is installed automatically. Diva Media Boards without basic driver support are detected as new hardware.

The installation procedure is the same for all Diva Media Boards.

- If the Diva Media Board is fully detected, you can directly install the Dialogic® Diva® drivers as described in To install the software on page 25.

- If the Diva Media Board is detected as "New Hardware", first abort the Windows® installation and then install the Diva drivers as described in To install the software on page 25.

Note: You should not attempt to install the software for your Dialogic® Diva® Media Board at the same time as the operating system.

Note for Dialogic® Diva® UM-Media Boards: During installation, Diva UM-Media Boards might be displayed with the name prefix "V-". After the installation of the Dialogic® Diva® System Release 8.5, Service Update 7 (or higher) software, the name will be displayed as Diva "UM-" Media Board.

Notes for the Dialogic® Diva® softIP software:

- If you chose to activate your license via the USB dongle, which came with your Dialogic® Diva® softIP software package, do not plug the dongle into the USB port on your computer until the Diva softIP software installation is complete.

- The drivers of the Diva softIP software are installed together with the drivers of the Dialogic® Diva® Media Boards. To use the Diva softIP software, you need to purchase a license and activate it in the Dialogic® Diva® Configuration Manager. Only after having activated the license and having activated the configuration, you can add the Dialogic® Diva® softIP software as virtual board to the boards pane in the Diva Configuration Manager and configure it.

Before you start to install the Dialogic® Diva® System Release WIN software as described in To install the software on page 25, you need to download the latest installation files, see To download the installation files on page 23.

Windows® XP and Windows Server® 2003

- The following Dialogic® Diva® Media Boards are fully detected:

  Diva BRI-CTI
  Diva BRI-2FX
  Diva BRI-2
  Diva 4BRI-8

- The following Diva Media Boards are detected as "New Hardware":

  Diva PRI   Diva UM-BRI-2
  Diva Analog-2   Diva UM-4BRI-8
  Diva Analog-4   Diva V-PRI
  Diva Analog-8   Diva UM-PRI
                              Diva V-2PRI
                              Diva V-4PRI
                              Diva V-1PRI HS
                              Diva V-2PRI HS
                              Diva V-4PRI HS
                              Diva V-4PRI FS
                              Diva V-8PRI FS
                              Diva UM-Analog-2
                              Diva UM-Analog-4
                              Diva UM-Analog-8

Windows Vista®, Windows Server® 2008, and Windows® 7

- The following Dialogic® Diva® Media Boards are fully detected:

  Diva BRI-CTI   Diva V-PRI
  Diva BRI-2FX
  Diva BRI-2
  Diva 4BRI-8
  Diva PRI
  Diva Analog-4
  Diva Analog-8

- The following Diva Media Boards are detected as "New Hardware":

  Diva Analog-2   Diva UM-BRI-2
                                            Diva UM-4BRI-8
                                            Diva UM-PRI
                                            Diva V-2PRI
                                            Diva V-4PRI
                                            Diva V-1PRI HS
                                            Diva V-2PRI HS
                                            Diva V-4PRI HS
                                            Diva V-4PRI FS
                                            Diva V-8PRI FS
                                            Diva UM-Analog-2
                                            Diva UM-Analog-4
                                            Diva UM-Analog-8

  Note: "HS" stands for the half size and "FS" for the full size board format.

To install the software

Important for Dialogic® Diva® softIP software: If you chose to activate your license via the USB dongle, which came with your Dialogic® Diva® softIP software package, do not plug the dongle into the USB port on your computer until the Dialogic® Diva® softIP software installation is complete.

Note: If multiple Dialogic® Diva® Media Boards are installed, the wizard will be visible only once for each update or configuration of the software. The configured parameters correspond to all Diva Media Boards.

1. From the Windows® task bar, click **Start** > **Run**.

2. Enter the path to the update file on the hard disk, e.g.
   `C:\Temp\DIVA`
   (where C: is the hard disk drive letter)

3. In the welcome dialog box, click **Next** to start updating the drivers for all installed Diva Media Boards.

   Note: If you installed a Diva Media Board that is not supported with this software version, the **Unsupported Board** box appears. For supported Diva Media Boards, see Supported Dialogic® Diva® Media Boards on page 16. This software version currently supports only the boards listed there.

4. The **License Agreement** box appears. Read the license agreement carefully. If you understand it and accept its terms, select **I accept the above license agreement** and click **Next**. If you do not understand and/or accept its terms, click **Cancel** to exit the process. You need to accept the license agreement to be able to update the drivers.

5. Select the switch type for your configuration in the **Default Switch Type** box if you have a Dialogic® Diva®
ISDN Media Board installed, or in the **Default Analog Switch Type** box if you have a Dialogic® Diva®
Analog Media Board installed.
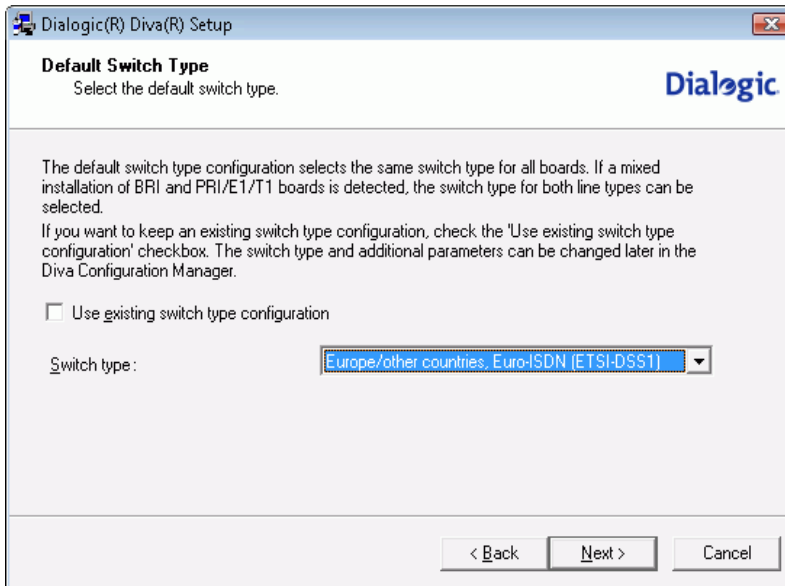
   Note: If you are changing the configuration and you want to use the same switch type as you selected
   during the update, select **Use existing switch type configuration**.

   Click **Next**.

6. In the **Installation Mode** box, select if you want to install the board in default mode, customized mode, or
   secure mode.
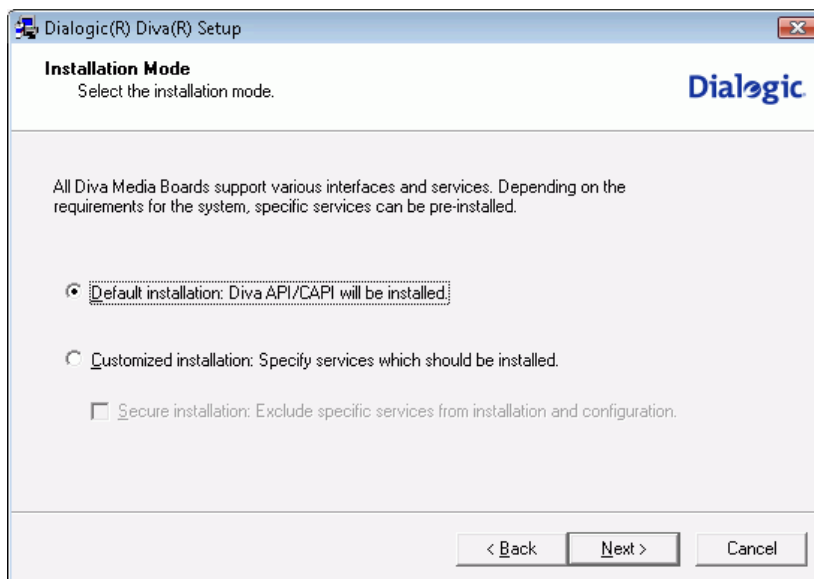
   • If you select **Default installation**, the Remote Access Service and Dialogic® Diva® API/CAPI are installed.
     Click **Next** and go to to continue with the installation.

   • If you select **Customized installation**, you can specify the services that are to be supported. Click **Next**
     and go to to continue with the installation.

   • If you select **Secure installation**, you can set security settings for the various services and interfaces.
     Additionally, you can set a password to prevent that unauthorized users change the settings. Click **Next**
     and proceed with the following step.

   Note: The services that you deactivate during the installation are not available in the Dialogic® Diva®

Configuration Manager. You have the opportunity to use these services if you activate them in the Dialogic®
Diva® Configuration Assistant. See Changing the configuration: on page 29.

7. In the **Security Settings** box, all possible services and interfaces are selected. Disable the services or
interfaces you do not want to use for security reasons. You can set a password to prevent unauthorized
users from changing the settings.
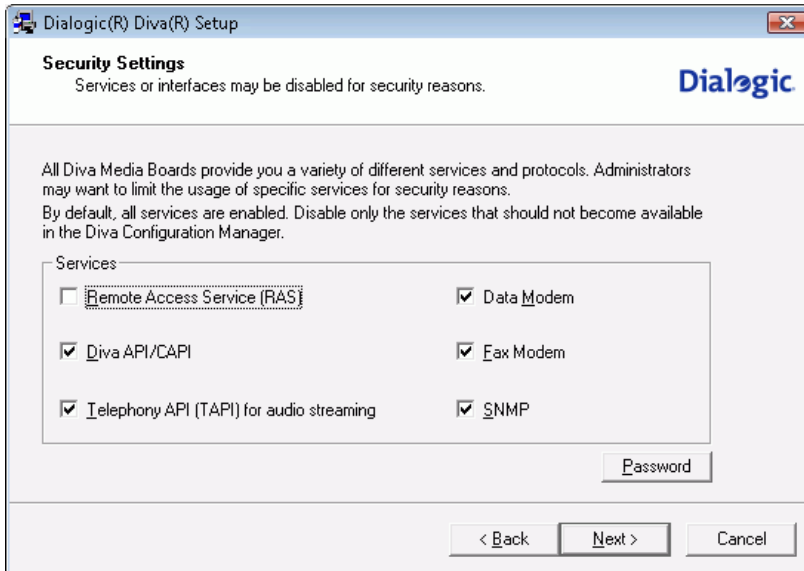
You need to deactivate at least one service. If all services need to be available, you have to configure them,
see step 8 on page 27.

Click **Next**.

8. In the **Services and Interface Selection** box, select the services and interfaces you need for your system.
If you selected **Secure Installation**, the services and interfaces you disabled in step 7 on page 27 cannot
be selected anymore. Click **Next**.
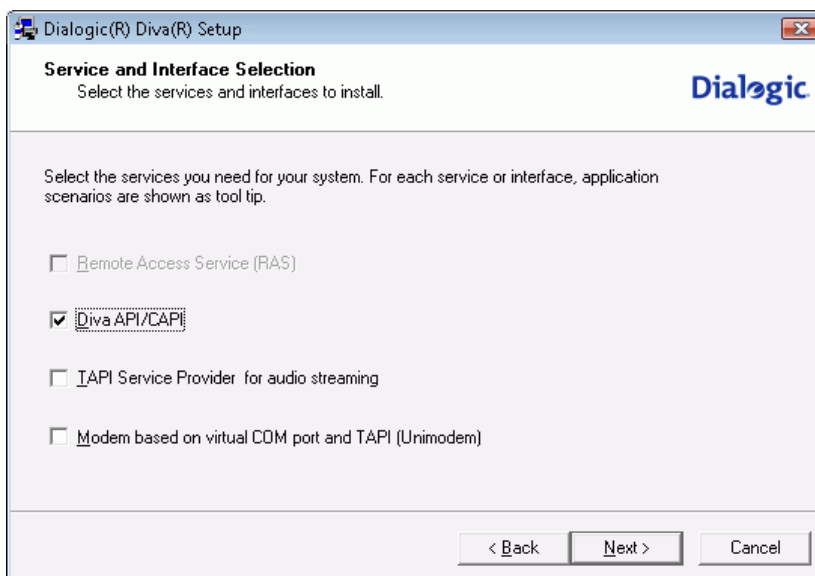
9. If you selected the service **Modem based on virtual COM port and TAPI (Unimodem)**, the **Modem Installation** box appears.
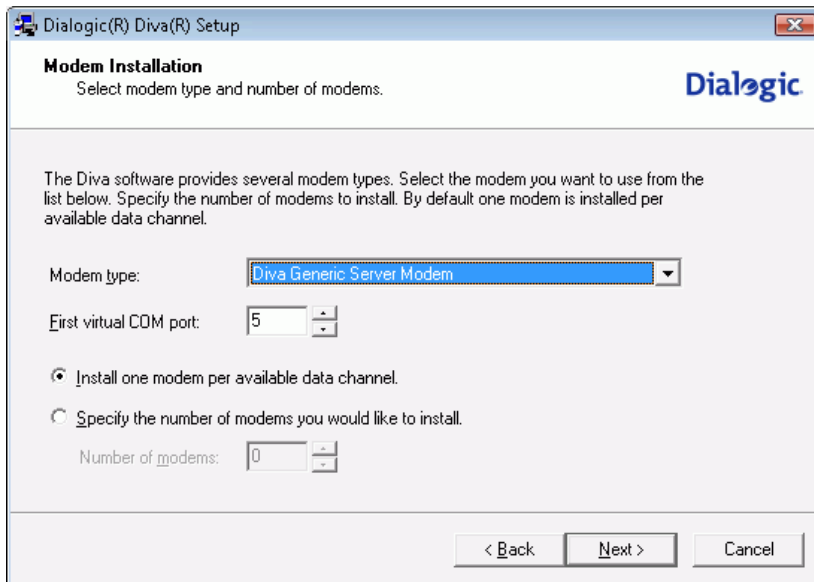
Select the virtual modem you want to use. If you do not want to use one modem per B-channel, select **Specify the number of modems you would like to install** and enter the number of modems. Click **Next**.

10. In the **Incoming Call Policy** box, select how to handle incoming calls.
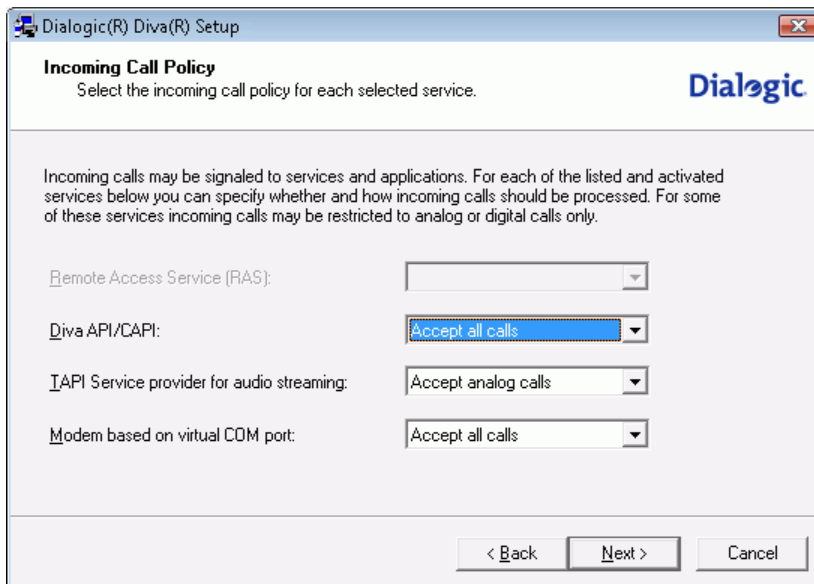
Click **Next**.

11. In the displayed dialog box, the selected options are listed.
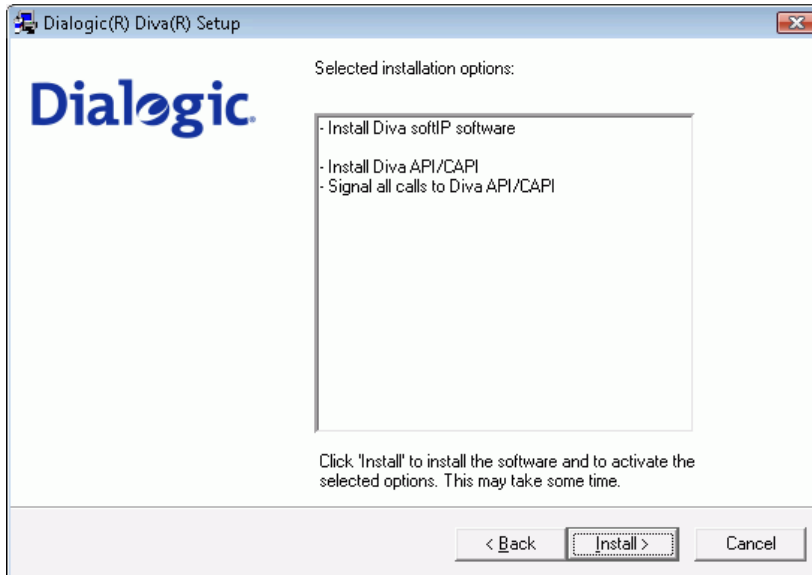
Click **Back** if you need to change the settings. Click **Next** to copy the appropriate files to your system.

Note: If you are installing a Beta version of the Dialogic® Diva® System Release software, a message might appear, warning you that the software has not been tested with Windows®. Continue with the installation. This message indicates only that the Diva System Release software does not yet have Microsoft certification; it does not prevent a correct installation of the software.
Official final releases of the Diva System Release software are certified by Microsoft® and this message does not appear.

12. When the copy process is complete, click **Finish** to complete the update.

Note: Depending on your system configuration, you may be prompted to restart your computer. Make sure that the **Restart your computer** option is selected to restart it after the update is complete.

You can now open the Diva Configuration Manager to add components and configure them.

See Configuration with installed hardware on page 35.

Changing the configuration:

If you have already updated the drivers and you need to change the configuration:

1. Click **Start** > **Programs** > **Dialogic Diva** > **Configuration Wizard**. The **Configuration Wizard** box appears. If you did not set a password during the update, click **Next**. If you set a password, enter it, and then click **Next**.

Note: If you change the configuration, existing settings will be overwritten.

2. Proceed as described in step 5 on page 26.

CHAPTER 3

License Activation

You need to generate a license if you have installed one of the following products and purchased a license for one of the following functionalities. For the Dialogic® Diva® System Release WIN software, licenses are available as free 30-day test licenses. For the Dialogic® Diva® softIP for SIP software a free test license for two channels (voice and fax) is available on the Dialogic web site. If you use the Diva softIP software in a virtualized environment, see also Licensing the Dialogic® Diva® softIP Software in virtualized environments on page 34.

Note: You can purchase the license with your Dialogic® Diva® Media Board vendor.

Product	Functionality
Diva System Release WIN software	• Dialogic® Diva® softIP for SIP software • Dialogic® Diva® SIPcontrol™ Software (See the Dialogic® Diva® SIPcontrol™ Software Reference Guide for information about activating the license.) • Dialogic® Diva® softSS7 software (See the Dialogic® Diva® softSS7 software Reference Guide for information about activating the license.)

Dialogic® Diva® V-1PRI, V-2PRI PCI and PCIe, V-4PRI PCI and PCIe, V-8PRI Media Board	The Diva V-1 PRI PCIe HS, Diva V-2PRI PCI, Diva V-2PRI PCIe HS, and Diva V-4PRI PCIe FS Media Boards offer full TDM channel density via licenses with full performance for all modem and fax features.
	With the Diva V-4PRI PCI, Diva V-4PRI PCIe HS (12 DSPs) and the Diva V-8PRI PCIe FS (24 DSPs) Media Boards, V.90, data modem support and V. 34 fax support are available via licenses but not on all channels, due to limited DSP V. 90 resources. V.32 data modem and V.17 fax can be done on all channels.
	The following modem and fax features are supported via licenses:
	• **Data modem support up to V.90**
	  Notes:
	  - Diva V-4PRI PCI Media Boards support up to 100 channels (25 channels per trunk)
	  - Diva V-4PRI PCIe HS and Diva V-8PRI PCIe FS Media Boards support up to 15 channels per trunk when used for high speed modem connections. On low speed connections, full channel density is supported.
	• **VoIP Codec (G.723.1, G.729, AM-NB, RT Audio)**
	  Note: Using the AMR-NB resource in connection with a Dialogic® Diva® product does not grant the right to practice the AMR-NB standard. To seek a patent license agreement to practice the standard, contact the VoiceAge Corporation at http://www.voiceage.com/licensing.php.
	
	• **VoIP Codec G.723.1**
	
	• **UM/Fax support up to V.34**
	  If you purchased a UM/Fax V.34 license, the number of simultaneous fax calls is limited to half the number of channels the Dialogic® Diva® Media Board offers:
	
	(see table below)
	
	If you need more than 50% of the channels for simultaneous fax calls, you may purchase regular V.34 fax licenses.

Diva Media Board	Total number of channels	Supported channels for simultaneous fax calls
Diva V-1PRI Media Board	30/24	15/12
Diva V-2PRI Media Board	60/48	30/24
Diva V-4PRI Media Board	120/96	60/48
Diva V-8PRI Media Board	240/192	120/96

- **TDM fax support up to V.34**

  To use V.34 fax, you need to purchase the following amount of fax channels:

  Note: With the Diva V-4PRI PCIe HS (12 DSPs) and the Diva V-8PRI PCIe FS (24 DSPs) Media Board, data modem support and fax support are available via licenses but not on all channels, due to limited DSP resources.

Diva Media Board	Fax channels to purchase
Diva V-2PRI Media Board	60/48
Diva V-4PRI Media Board	120/96
Diva V-8PRI Media Board	240/192

To activate your license, you need the following information:

- Device Unique ID (DUID)
- Proof of Purchase Code (PPC)

As soon as you have both, the DUID and the PPC, visit the Dialogic® Diva® Activation site to register your PPC together with the DUID and you will receive your license file. Activate this license file in the License Manager of the Dialogic® Diva® Configuration Manager. For more information, see To activate the license file.

Device Unique ID (DUID)

The DUID binds the license to the installed Dialogic® Diva® Media Board.

To get the DUID:

1. Click **Start** > **Programs** > **Dialogic Diva** > **Configuration Manager**.

2. In the Diva Configuration Manager, click **Tools** > **License Manager**.
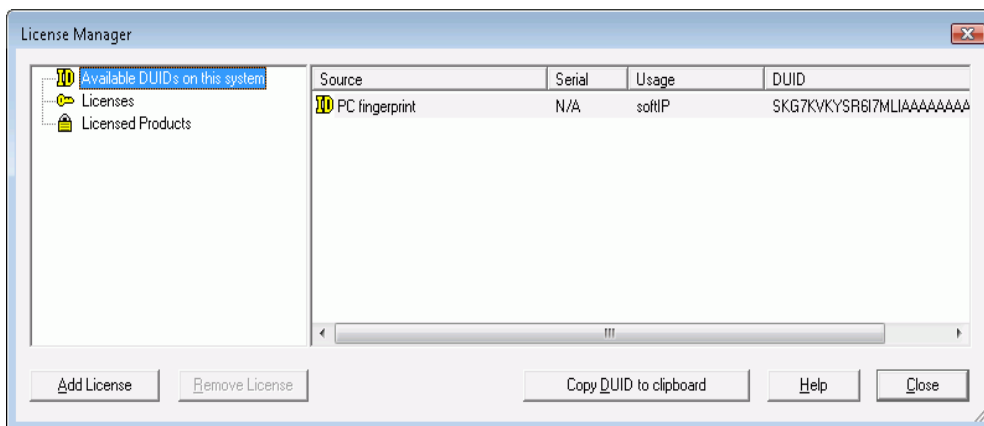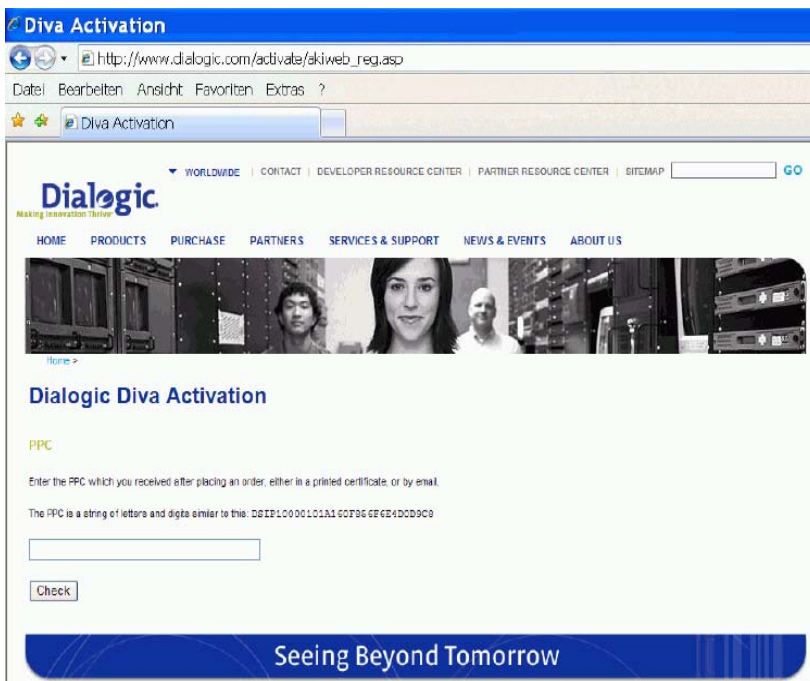
3. On the left side of the **License Manager** box, click **Available DUIDs on this system** so that it is highlighted.

4. If you have a WIBU-Key dongle inserted in your PC, you may select between your system DUID (PC fingerprint) and the DUID of the dongle. Select the DUID you want to use.

5. On the right side, click **Copy DUID to clipboard**.

6. If you need to do the web activation using another computer, open an editor, paste the DUID, and save the file.

Proof of Purchase Code (PPC)

When you purchase the license, you will receive a PPC either in printed form or via email. By registering this PPC, you represent and warrant that you lawfully purchased the license.
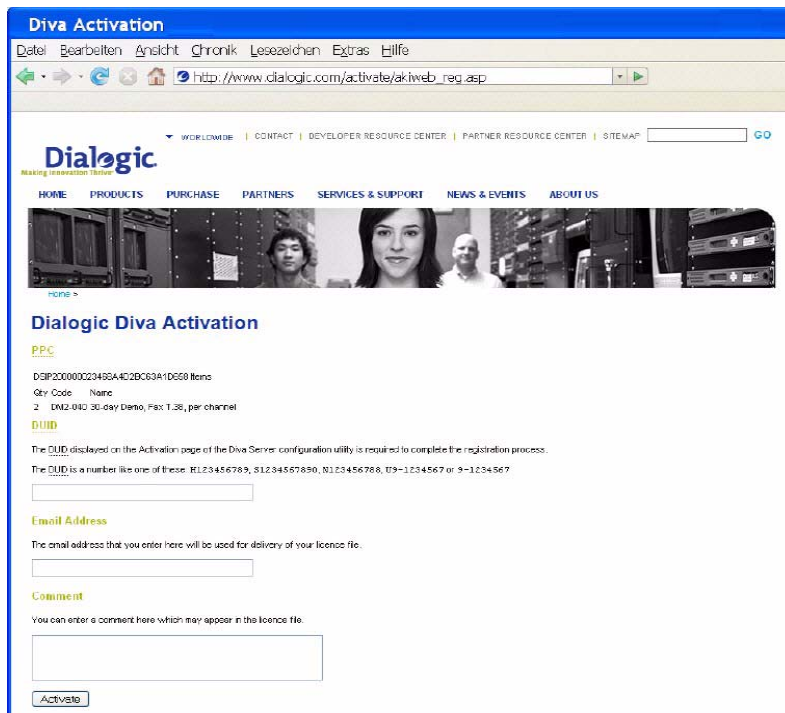
To register your PPC and DUID

1. Open the following web site: http://www.dialogic.com/activate.
2. Enter your PPC and click **Check**.

3. If your PPC is valid, the following web site will open:

   Paste your Device Unique ID (DUID) that you saved earlier, and enter your email address to which the license file should be sent.
4. Click **Activate** to generate the license file that will be sent to the email address you have entered.
5. Save the license file and activate it. For more information, see .

To activate the license file

Note: The date set in the system settings of your computer must be correct. Otherwise, you cannot add your license file.

1. Click **Tools** > **License Manager** in the menu bar of the Dialogic® Diva® Configuration Manager.

2. Click **Add License** and go to the directory where you saved the license key file.

3. Select the license file and click **Open**.

4. Your license file is now added to the License Manager.

5. Click **Close** to close the License Manager.

6. In the Configuration Manager, click **File** > **Activate** to activate the configuration.

7. Now, the functionality is unlocked for the feature set you acquired with your license.

8. To be able to use the Diva softIP for SIP software, you need to add it to the Diva Configuration Manager as described on page 33.

Add the Dialogic® Diva® softIP Software to the Dialogic® Diva® Configuration Manager

After you activated the license for the Diva softIP software as described above, you may add the Diva softIP software to the Dialogic® Diva® Configuration Manager:

1. Click **Start** > **Programs** > **Dialogic Diva** > **Configuration Manager**.

2. To insert the Diva softIP software, click **Insert** > **Dialogic Diva softIP Board**.

   See below an example of a default installation for a virtual Diva softIP board:
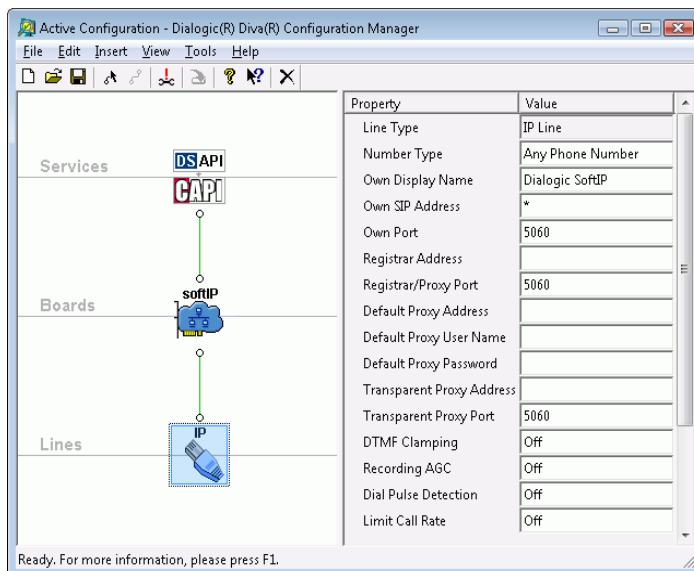
   The Dialogic® Diva® Configuration Manager Online Help file - DSMain.chm contains detailed information about the configuration of the properties.

Licensing the Dialogic® Diva® softIP Software in virtualized environments

In virtualized environments, the Diva softIP software license is bound to your system with the PC fingerprint only. The WIBU-Key USB dongle cannot be used for licensing purposes, because an access to the USB is not supported by virtualized environments. The license is bound to several hardware components of the PC, including the MAC address. Each virtual machine (VM) has its own MAC address; therefore, a separate license is required for each active VM with the Diva softIP software installed. Separate licenses are also needed for environments with parallel services, e.g., VM 1 operates a fax server using the Diva softIP software and VM 2 operates an IVR system using the Diva softIP software. Also, since the Diva softIP software license is bound to the hardware components as well, the Diva softIP software license will become invalid if you move the VM to another hardware platform.

You should assign a fixed MAC address to avoid that it changes, e.g., after copying the virturalized environment to a different place, or after restarting or reconfiguring the PC, otherwise the Diva softIP software license will become invalid.

If two VMs are used for failover only and are not active at the same time, the same MAC address may be assigned to both VMs, the active VM and the passive failover VM. In this case, the Diva softIP software license can be installed on both VMs, but you need to make sure that only one of the VMs is active, otherwise it may cause a MAC address conflict and the network communication may be interrupted.

CHAPTER 4

Software Configuration

Configuration with installed hardware

After you have installed your Dialogic® Diva® Media Board and the board drivers as described in Software Installation on page 23, you can start the Dialogic® Diva® Configuration Manager:

1. Click **Start** > **Programs** > **Dialogic Diva** > **Configuration Manager**.

2. The Diva Configuration Manager displays the configuration you chose during the software installation:

   • The detected Dialogic® Diva® Media Board is installed.

   • The Diva Media Board is assumed to be connected to a corresponding ISDN BRI, PRI, or analog line.

   • Line properties are either set by default or to the parameters you set in the Dialogic® Diva® Installation Wizard.

     Notes:

     • If you plan to use Channelized T1 Robbed Bit Signaling, then change the switch type in the line properties to "T1 Robbed Bit Signaling (RBS)" and your PRI line will change automatically into a T1 line (see "Line Properties" in the Diva Configuration Manager Online Help file (DSMain.chm)).

     • If you plan to use "Direct Access Mode" or "R2 Signaling E1", then change the switch type in the line properties accordingly and your PRI line will change automatically into an E1 line (see "Line Properties" in the Dialogic® Diva® Configuration Manager Online Help file (DSMain.chm)).

   • If you installed a fully detected Diva Media Board and chose **Default installation** during the driver update, then RAS and Dialogic® Diva® API/CAPI are installed and connected to the Diva Media Board.

   • If you installed a fully detected Diva Media Board and chose **Customized installation** or **Secure installation** during the driver update, then the services you selected are installed and connected to the Diva Media Board.

   • If you activated your license for the Dialogic® Diva® softIP for SIP software, add the software manually to the Configuration Manager. To do so, click **Insert** > **Dialogic Diva softIP Board**. The Diva softIP software icon is added to the **Boards** pane as shown in the graphic on page 36.

RAS and Diva API/CAPI are configured to accept all incoming calls. This can cause conflicts between the two services, since both services are then listening to the same phone numbers. To avoid these conflicts, you should assign different MSNs, phone numbers, or extensions to the services in the binding properties for each service (see "Binding Properties" in the Diva Configuration Manager Online Help file (DSMain.chm)).

When you are using a North-American D-channel protocol with a Dialogic® Diva® BRI Media Board, you must always assign ISDN numbers because otherwise incoming calls cannot be accepted (see "Binding Properties" in the Diva Configuration Manager Online Help file (DSMain.chm)).

See below an example of a default installation for a Dialogic® Diva® PRI/E1/T1-CTI Media Board:
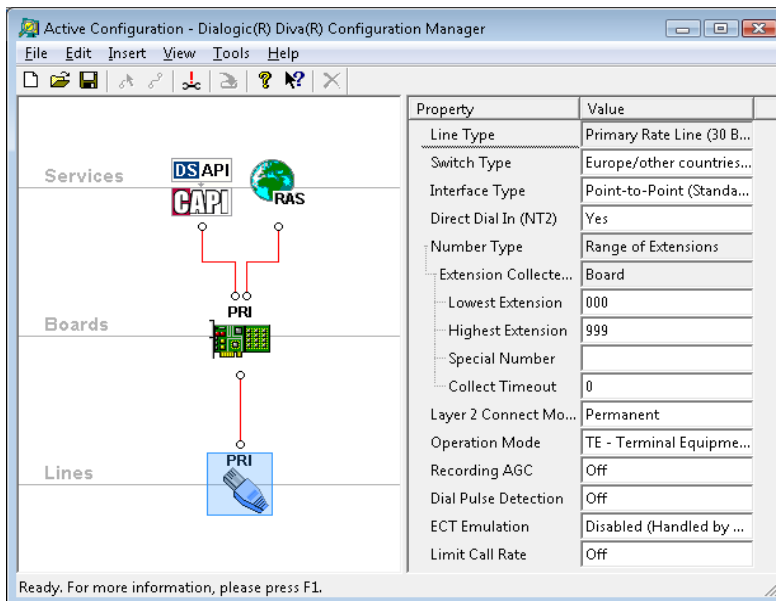
See below an example of a default installation for the Diva softIP software.
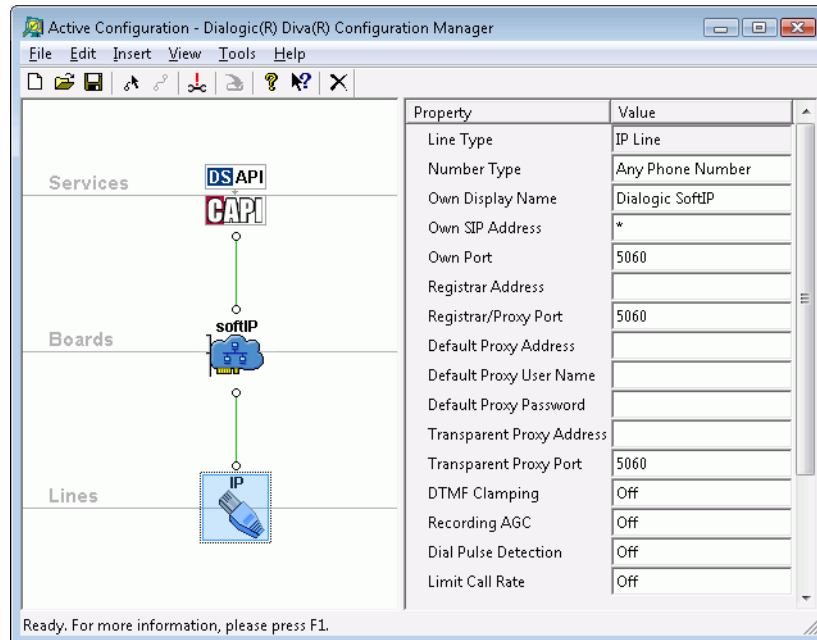
3. You can now add components to your Dialogic® Diva® System Release software and configure them as described in "Configuring" in the Diva Configuration Manager Online Help file (DSMain.chm).

Creating configuration files

You can create configuration files manually, without having a Dialogic® Diva® Media Board physically installed in your computer. With a manual configuration, the system administrator can create a complete configuration and save it as a configuration file. This configuration file can be made available to the users who then only need to install the board drivers and to activate the configuration created by the system administrator. As such, users do not need to configure the software.

To start an empty configuration:

1. Click **Start** > **Run**.

2. To enter the path to the Dialogic® Diva® Configuration Manager, type, for example:

   ```
   C:\Temp\DIVA\Disrvcfg.EXE
   ```
   (where C: is the hard disk drive letter).

   Click **OK**.

3. The Diva Configuration Manager is displayed with no components:
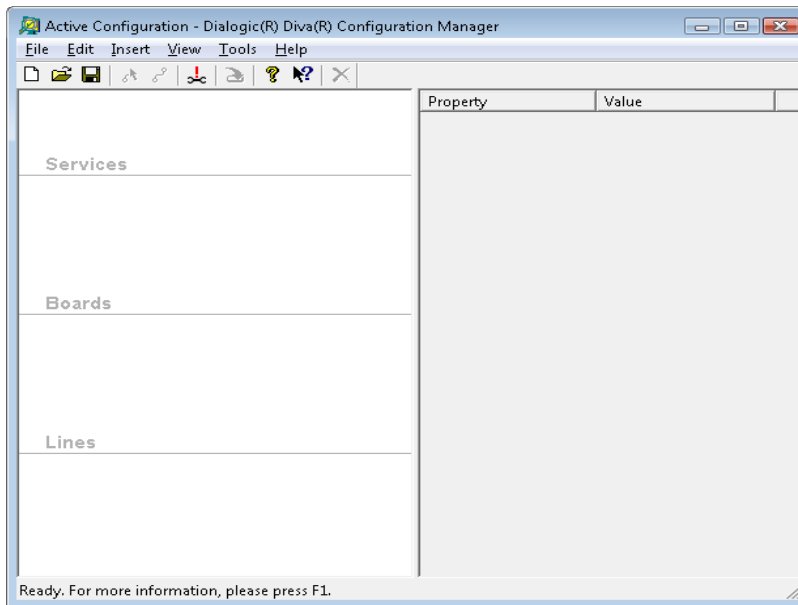
4. You can now do a complete manual configuration as described in "Configuring" in the Diva Configuration Manager Online Help file (DSMain.chm).

   Note: If configuration files have been created before, you can start the Diva Configuration Manager and load a configuration file. The configuration file is displayed and you can modify it according to your requirements.

To activate an existing configuration

To activate a configuration file for your system, open the configuration file and click **File** > **Activate**; or click the activate button in the toolbar.

Note: You can only activate a configuration file for your system if the Dialogic® Diva® Media Boards that are available in the Diva Configuration Manager correspond to the Diva Media Boards that are physically installed in your computer.

CHAPTER 5

Dial-Up Networking and RAS Administration

In the terminology used by the Remote Access Service, the calling station is referred to as the **Client** and the called station as the **Server**. The RAS client/server architecture allows a station to be defined simultaneously as a server and as a client, and therefore enables simultaneous initiation of outgoing and incoming ISDN or channelized T1 connections. For example, this enables the peer-to-peer connection of two Windows® XP or Windows Vista® workstations.

RAS client setup

The RAS client can be used to establish connections to the following remote stations:

- all Windows® operating systems with RAS in server mode
- Internet Service Provider
- TCP/IP router

Setting up a RAS client:

-
-

Under Windows® XP and Windows Server® 2003

1. *Under Windows® XP:*

    Click **Start** > **Settings** > **Control Panel** > **Network Connections**.

    In the **Network Connections** window, under **Network Tasks** on the left window side, double-click **Create a new connection**.

    Under Windows Server® 2003:

    Click **Start** > **Control Panel** > **Network Connections** > **New Connection Wizard**.

2. If the **Location Information** box appears, enter the country/region in which you are located. Enter your area code and, if required, your prefix number to access an outside line.

    Click **OK**.

3. If the **Phone and Modem Options** box appears, select your location.

    Click **OK**.

4. In the **New Connection Wizard**, click **Next**.

5. In the **Network Connection Type** box, select **Connect to the network at my workplace**.
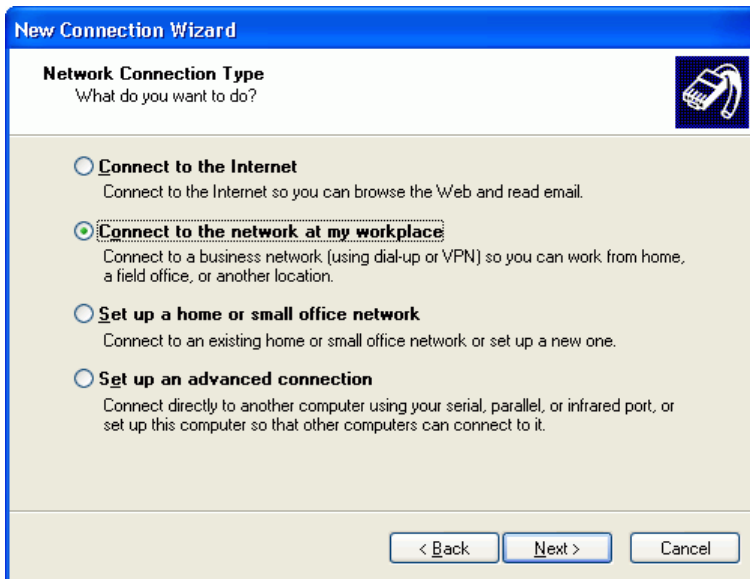
Note: The screen might appear slightly different under Windows Server® 2003.

Click **Next**.

6. In the **Network Connection** box, select **Dial-up connection** and click **Next**.

7. If you have configured more than one port for outgoing calls, you must specify a port:

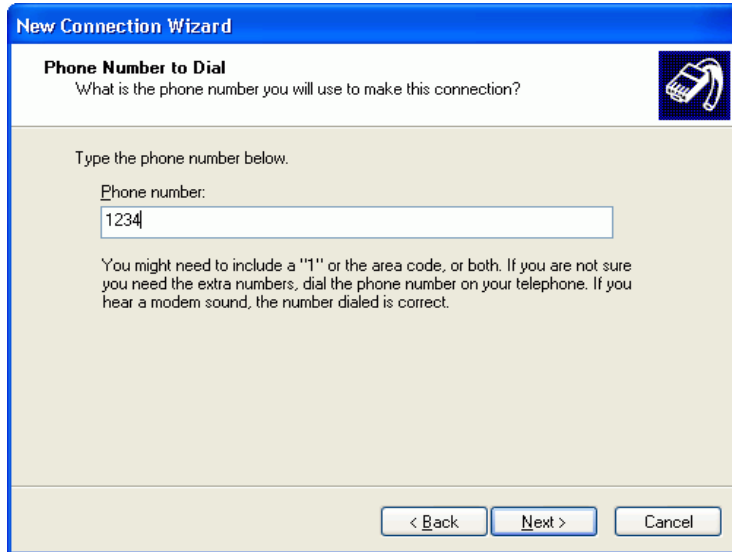Select a port, for example **ISDN channel - Dialogic Diva BRI-2** to dedicate a line to this outgoing connection.

The effect of the setting **All available ISDN lines multi-linked** is that RAS will automatically establish a connection over all lines.

Note: A larger number of active lines may increase telephone charges. With a normal basic rate interface, a connection with the setting **All available ISDN lines multi-linked** would be established over both B-channels.

Click **Next**.

8. In the **Connection Name** box, enter a name for your RAS connection. Click **Next**.

9. In the **Phone Number to Dial** box, enter the phone number of the server.

If the server is configured to use subaddresses, you must specify the appropriate subaddresses under **Phone Number:**, separated by the vertical stroke "|", (the pipe symbol, or press [Alt] and the digits [0], [1], [2] and [4] on the numeric keypad).

For example, if the phone number is 071594066 SUB 41, you must enter 071594066|41.

If your connection protocol is something other than synchronous HDLC, you must specify which protocol is used. This information can be attached to the server phone number, separated by the caret character "^".

For example, for an analog call, add "^MODEM" to the phone number of the server. For a call to GSM, add "^GSM1", "^GSM2" or "^GSM3".

If your connection uses something other than a transfer rate of 64 kbps, you must specify which transfer rate is used. This information can also be attached to the server phone number separated by the caret character "^".

For example, for a call to some regions in the United States where a line, a switch, or a device only supports a transfer rate of 56 kbps, add "^56K" to the server phone number. The "T1 RBS" switch type always uses a transfer rate of 56 kbps. Therefore, you must add "^56K" for all outgoing calls if you use this switch type. The required information can be found in the following table. The various parameters can also be entered in combination.

Designation	Description
Framing	
^HDLC	synchronous HDLC
^X.75	synchronous X.75
^ASYNC	additional information asynchronous
^SYNC	additional information synchronous
Services	
^XP	synchronous HDLC transparent (standard)
^V.120	asynchronous, default transfer rate is 64K, transfer rates given below can also be entered
^V.110	asynchronous, default transfer rate is 9600, transfer rates given below can also be entered
^GSM1	asynchronous without flow control, V.110/9600
^GSM2	asynchronous with flow control, V.110/9600
^GSM3	asynchronous with flow control, without LLC, V.110/9600
^PIAFS	PIAFS 2.1/64K (Dialogic® Diva® BRI, UM-BRI, 4BRI, UM-4BRI, any PRI, UM-PRI, and V-PRI Media Boards)
^PIAFS^32K	PIAFS 1.0/32K (Dialogic® Diva® BRI, UM-BRI, 4BRI, UM-4BRI, any PRI, UM-PRI, and V-PRI Media Boards)
^MODEM	asynchronous, entry of transfer speed is ignored, since this is handled by the modem
Speeds	
^600	asynchronous with ^V.110
^1200	asynchronous with ^V.110
^2400	asynchronous with ^V.110
^4800	asynchronous with ^V.110
^9600	asynchronous with ^V.110
^14400	asynchronous with ^V.110
^19200	asynchronous with ^V.110
^28800	asynchronous with ^V.110
^33600	asynchronous
^38400	asynchronous with ^V.110
^56K	HDLC, X.75, V.120
^64K	HDLC, X.75, V.120

    Click **Next**.

10. In the **Connection Availability** box, select whether the connection should be made available to all users or only to yourself.

    Click **Next**.

11. If you are connected to a network and you selected to make the connection available to all users, the **Internet Connection Sharing** box will be displayed.

12. Specify if your Internet connection can be shared by all users or if it should be available only to yourself. Click **Next**.

13. Click **Finish** to save the newly set up RAS client. If you need to make changes, click **Back** until you reach the box where the changes are to be made.

14. In the displayed dialog box, click the **Dial** button to connect.

Under Windows Vista®, Windows Server® 2008, and Windows® 7

Before you can set up the RAS client, you need to enable the RAS service.

To do so:

Under Windows Vista® and Windows Server® 2008:

1. Click **Start** > **Control Panel**.
2. Select **System and Maintenance** and then **Administrative Tools.**
3. Double-click **Services** and then double-click **Remote Access Connection Manager**.
4. On the **General** tab under **Startup type** select **Automatic**.
5. Click **OK**.

Under Windows® 7:

1. Click **Start** > **Control Panel**.
2. Select **System and Security** and then **Administrative Tools.**
3. Double-click **Services** and then double-click **Remote Access Connection Manager**.
4. On the **General** tab under **Startup type** select **Automatic**.
5. Click **OK**.

To set up the RAS client:

1. Click **Start** > **Control Panel**.
2. Select **Network and Internet** and then **Network and Sharing Center**.
3. *Under Windows Vista® and Windows Server® 2008:*
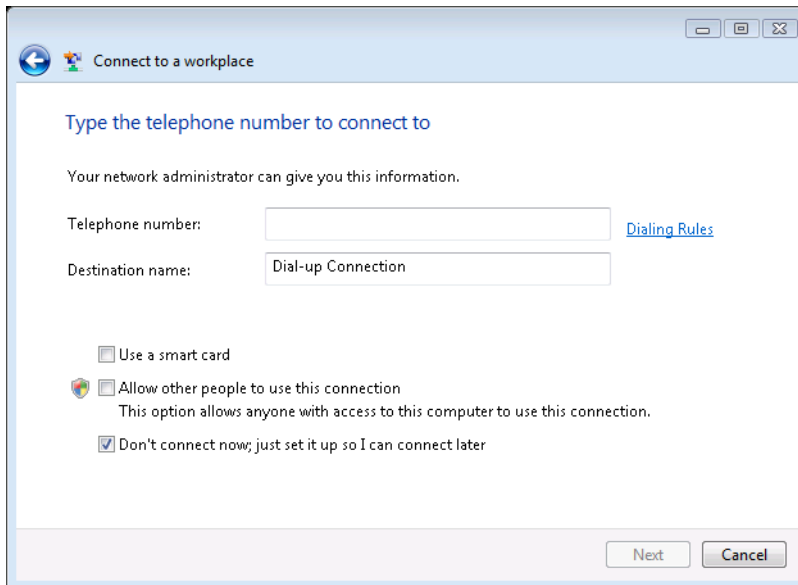
   Click **Set up a connection or network** on the left.

   Under Windows® 7:

   Under **Changing your networking settings**, select **Set up a connection or network**.
4. In the displayed box, double-click **Connect to a workplace**.
5. In the **How do you want to connect?** box, select **Dial directly**.
6. If you have installed more than one Dialogic® Diva® Media Board, you need to select one Diva Media Board.

7. In the displayed box, type the phone number of the RAS server you want to connect to. Enter a name for the RAS connection next to **Destination name**.
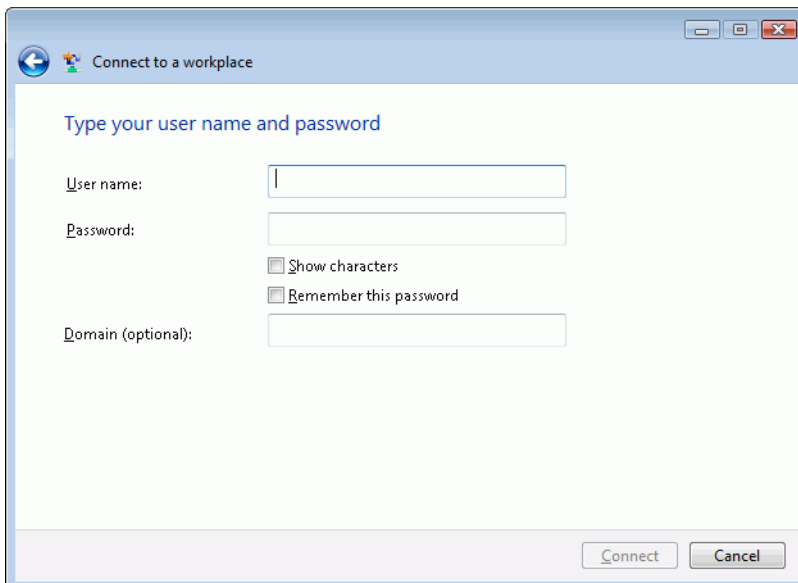
If the server is configured to use subaddresses, you must specify the appropriate subaddresses in the telephone number of the RAS server. For more information, go to on page 40.

If the connection should be made available to all users, select **Allow other people to use this connection**.

Click **Next**.

8. In the displayed box, enter the user name and password that you use to connect to the RAS server. Your IT administrator can give you the necessary information. Click **Connect** to establish a connection to the RAS server.

Assign multiple phone numbers to a connection

You can assign several phone numbers to a connection. These phone numbers will be used as alternative numbers if the first number fails, for example, when the line is busy.

1. *Under Windows® XP and Windows Server® 2003:*
    Click **Start** > **Settings** > **Control Panel** > **Network Connections** and right-click the connection to which you want to assign multiple numbers.

    Under Windows Vista® and Windows Server® 2008:

    Click **Start** > **Control Panel** > **Network and Internet** > **Network and Sharing Center** and on the left side click **Manage network connections**.

    Under Windows® 7:

    Click **Start** > **Control Panel** > **Network and Internet** > **Network and Sharing Center** and on the left side click **Change adapter settings**.

2. Right-click the connection to which you want to assign multiple numbers.

3. Select **Properties**.

4. In the properties dialog box of your connection, click the **General** tab. Click **Alternates**.

5. In the **Alternate Phone Numbers** box, check the option **If a number fails, try the next number**.

6. To add a new phone number to the list, click **Add**.

7. In the **Add Alternate Phone Number** box, enter the phone number. Click **OK**.

8. Click **OK** to close the **Alternate Phone Numbers** box.

9. Click **OK** again to close the properties dialog box.

To observe the progress of an active connection

1. Repeat steps 1 and 2 from <u>Assign multiple phone numbers to a connection</u>.

2. Select **Status** (see also <u>RAS status</u> on page 47).

To specify the network protocol(s) for every set-up connection

1. Repeat steps 1 to 3 from <u>Assign multiple phone numbers to a connection</u>.

2. In the properties dialog box of your connection, click the **Networking** tab.

You can now activate the desired network protocol(s) for your connection.

For more detailed information on the RAS client, see the Windows RAS documentation.

RAS server setup

Note: Windows® XP Professional, Windows Vista®, and Windows® 7 allow you to set up an incoming connection that can accept up to three (3) incoming calls.

To set up an connection under Windows® XP, start the **New Connection Wizard** and select **Set up an advanced connection** > **Accept incoming connections**.

To set up an connection under Windows Vista®, go to **Start** > **Control Panel** > **Network and Internet** > **Network and Sharing Center** and on the left side click **Manage network connections**. Click **File** and then **New Incoming Connection**.

To set up an connection under Windows® 7, go to Click **Start** > **Control Panel** > **Network and Internet** > **Network and Sharing Center** and on the left side click **Change adapter settings**. Press **Alt+F** and select **New Incoming connection.**

Since Windows® XP Professional and Windows Vista® do not allow for setting up a RAS server for a large number of incoming connections, the following description only refers to the Windows Server® 2003 and Windows Server® 2008 operating systems.

The Remote Access application enables you to configure and control the RAS server.

To configure and enable remote access under Windows Server® 2003 and Windows Server® 2008:

1. Click **Start** > **Settings > Control Panel > Administrative Tools** > **Routing and Remote Access**.

2. In the **Routing and Remote Access** window, right-click the entry for your computer and select **Configure and Enable Routing and Remote Access**.

3. In the **Routing and Remote Access Server Setup Wizard**, click **Next**.

4. In the **Configuration** dialog box, select **Remote access (dial-up or VPN)**.
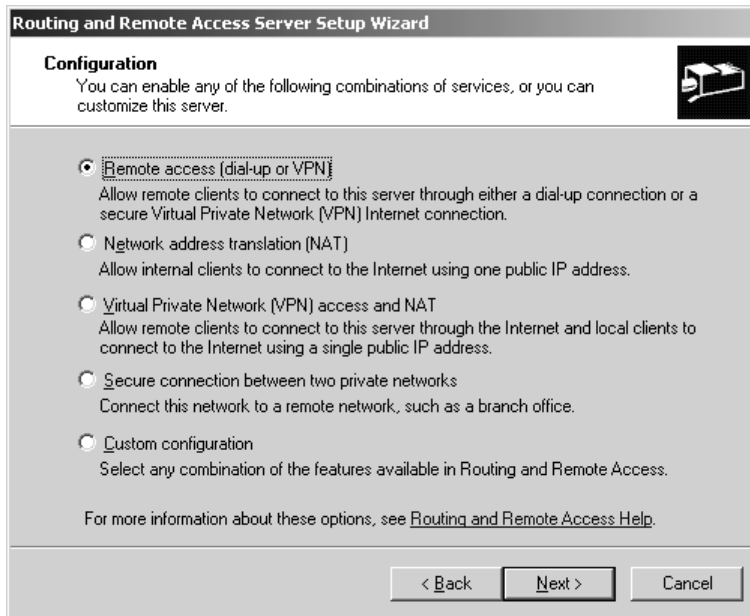
   Click **Next**.

5. In the **Remote Access** box, select whether the server should receive VPN and/or dial-up connections.

   Click **Next**.

6. In the **IP Address Assignment** box, specify whether IP addresses will be assigned to remote clients automatically or from a specified range.

   Click **Next**.

   Note: If you select to assign the IP addresses from a specified range, enter the address ranges in the following dialog boxes.

7. If your computer is part of a network, the **Managing Multiple Remote Access Servers** box is displayed.

   Specify if you want to set up your RAS server to use an existing RADIUS server. By default, the RADIUS server is not used.

   The RADIUS (Remote Authentication Dial-In User Service) protocol is used for managing remote user authentication and authorization in dial-up networks or virtual private networks. If a RADIUS server is available in your LAN, you can have your RAS connections authenticated and monitored by this server. You do not need to create your own remote access policies.

   Click **Next**.

8. Click **Finish** to finish the **Routing and Remote Access Server Setup Wizard**.

To configure access authorizations for the RAS server:

1. *Under Windows Server® 2003:*
   Click **Start** > **Administrative Tools** > **Computer Management**.

2. In the **Computer Management** window, select **System Tools** > **Local Users and Groups** > **Users**.

3. In the details pane, right-click the user for whom you want to configure the access authorizations.

   Select **Properties**.

4. In the properties dialog box, select the **Dial-in** tab and activate the desired access rights:
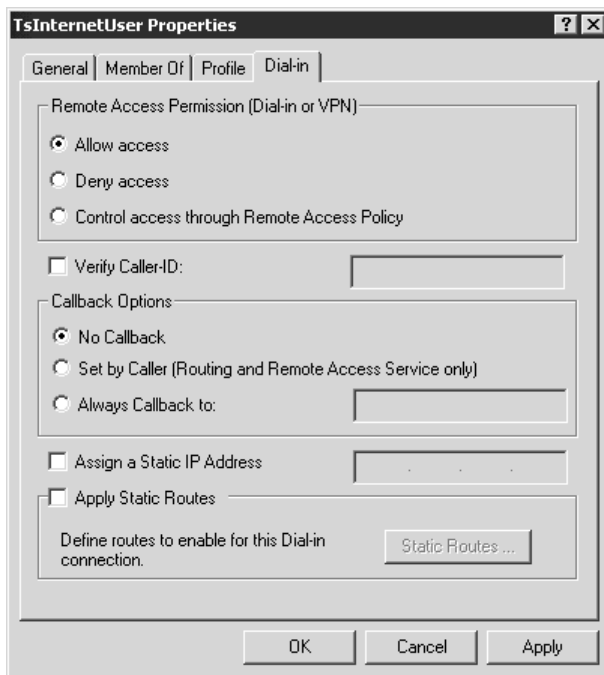
- **Allow access**
  The user has the direct permission to dial into the RAS server. This permission overrules all remote access policies.

- **Deny access**
  The user has no permission to dial into the RAS server. This denial also overrules all remote access policies.

- **Control access through Remote Access Policy**
  Depending on the Remote Access Policy, dial-in permission is granted or denied to the user. For further information on Remote Access Policies, see your Windows® documentation.

The following callback options can be configured:

- **No Callback**
  The client establishes the connection to the server and maintains the connection. The user of the RAS client assumes all charges.

- **Set by Caller (Routing and Remote Access Service only)**
  The client establishes the connection to the server, sends its current call number and then breaks the connection. The server calls the client back at the number given and therefore assumes the charges for the call. The client's call can therefore be made from any site.

- **Always Callback to**
  The client establishes the connection to the server, thereby indicating that a connection is required, and then breaks the connection. The server calls the client back at the preassigned call number. This provides that the client can call from one telephone terminal only. This provides that no other partner can call from another terminal, because this call number cannot be manipulated.

To close the dialog box, click **OK**.

Note: Only the users that are set up on the server are shown in the "Users" list. For information on how to configure authorizations for remote access for Windows Server® 2003 and Windows Server® 2008 domains, see your Windows® documentation.

RAS status

To monitor a currently active connection:

1. To monitor the status of a currently active outgoing connection, right-click the connection. Select **Status**.

2. The **RAS Status** monitor is displayed:
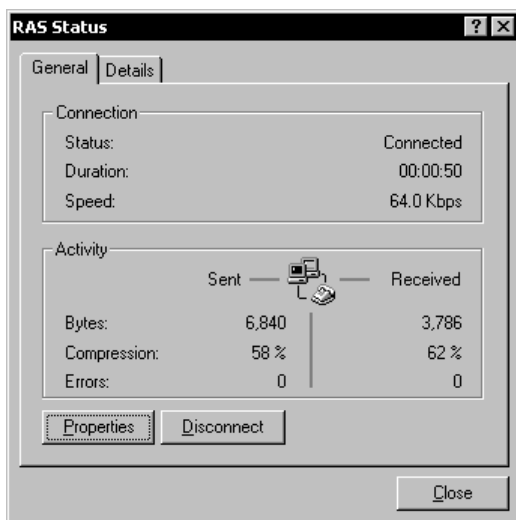
To monitor a connection each time it is active:

1. Click **Start** > **Control Panel** > **Network Connections** and select the desired connection.

2. In the displayed dialog box, click **Properties**.

3. In the properties dialog box, click the **General** tab:

   Check the option **Show icon in taskbar when connected**. Click **OK**.

4. Each time, when the connection is active, an icon is displayed in the Windows® taskbar.

To monitor the status of RAS server ports:

1. To monitor the status of a RAS server port, click **Start** > **Programs** > **Administrative Tools** > **Routing and Remote Access**.

2. In the **Routing and Remote Access** window, click the **+** next to your RAS server to expand the tree.

3. Click **Ports** to display the available ports in the right window pane.

4. Double-click the port for which you want to display the **Port Status**.

CHAPTER 6

SNMP Support For A Dialogic® Diva® Media Board

The Windows® implementation of the Simple Network Management Protocol (SNMP) is used to configure remote devices or to monitor network performance, to audit network usage, and to detect network faults or inappropriate access. The SNMP support is only available if the service is installed for your operating system. The output formats are defined in the MIB specification. Messages of the SNMP cannot be seen in the Dialogic® Diva® Diagnostics tool; for this, you need specific SNMP tools, which are not part of the Dialogic® Diva® System Release software. To activate the SNMP service, use the Dialogic® Diva® Configuration Manager. See the Dialogic® Diva® Configuration Manager Online Help file (DSMain.chm) for more information.

To activate SNMP support for a Dialogic® Diva® Media Board

1. Install the Windows® SNMP service as described below.
2. Add the SNMP service in the Diva Configuration Manager as described on on page 51.
3. Install an SNMP tool , e.g., Net.SNMP (optional, for testing only).
4. Restart your computer.
5. Verify the service status as described on page 51.
6. Verify the function of the SNMP service as described on page 52.

To install the Windows® SNMP service:

The installation of the SNMP service depends on the operating system.

For Windows® XP and Windows Server® 2003, see below.

For Windows Vista®, Windows Server® 2008, and Windows® 7, see page 50.

Under Windows® XP and Windows Server® 2003:

1. Click **Start** > **Control Panel** > **Add or Remove Programs**.
2. In the **Add or Remove Programs** box, click **Add/Remove Windows Components** on the left hand side.
3. The **Windows Components Wizard** box appears.
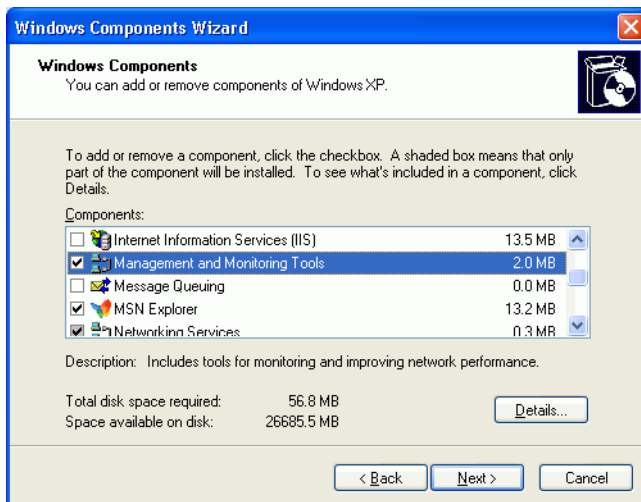
    Select **Management and Monitoring Tools** and click **Next**.

4. During the installation of the components, you might be asked to insert the CD-ROM of the operating system or to enter the path to a server on which the files of your operating system are stored.

5. In the **Completing Windows Components Wizard** dialog box, click **Finish** to terminate the installation and close all open dialog boxes.

You can now add the SNMP service to the Dialogic® Diva® Configuration Manager as described on page 51.

Under Windows Vista®, Windows Server® 2008, and Windows® 7

1. Click **Start** > **Control Panel** > **Programs** > **Programs and Features**.

2. Click **Turn Windows features on or off** in the left window pane. If your are ask for permission to continue, click **Continue**.

3. In the **Windows Features** dialog box, click the **+** sign next to **SNMP feature** (under Windows® 7 **Simple Network Management Protocol**), select this feature and select **WMI SNMP Provider**.
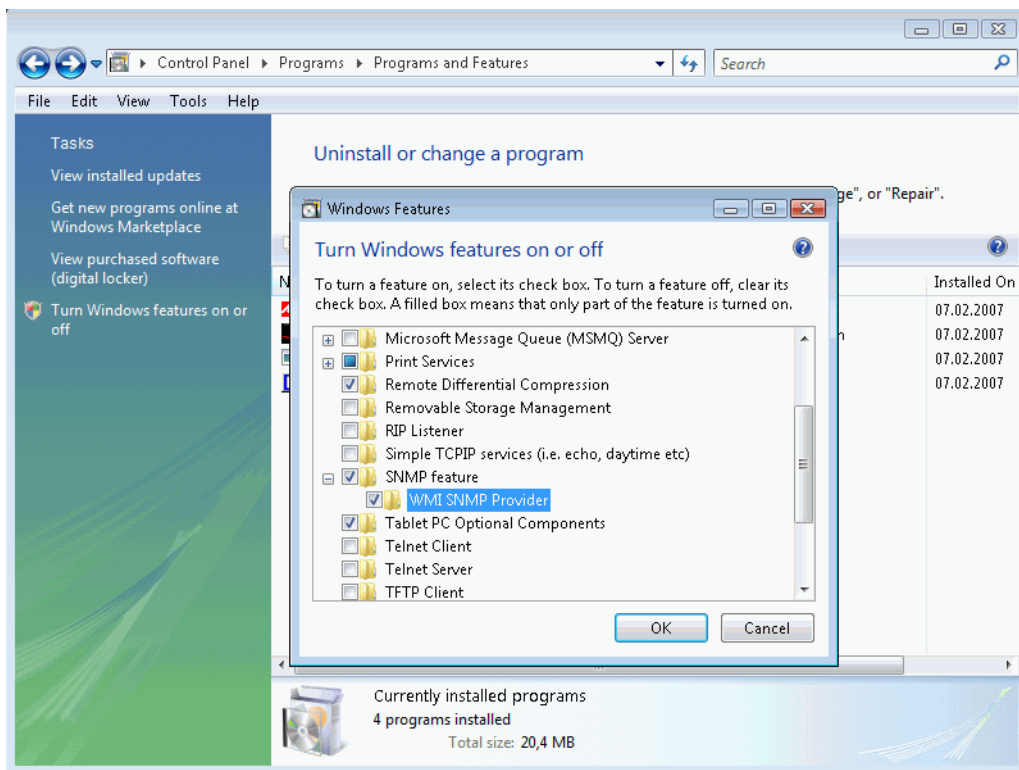
Click **OK**.

4. During the installation of the components, you might be asked to insert the CD-ROM of the operating system or to enter the path to a server on which the files of your operating system are stored.

5. Close all windows after the installation is finished.

6. You can now add the SNMP service to the Dialogic® Diva® Configuration Manager as described on page 51.

To add the SNMP service in the Dialogic® Diva® Configuration Manager

1. Click **Start** > **All Programs** > **Dialogic Diva** > **Configuration Manager** to open the Diva Configuration Manager.

2. In the menu bar, click **Insert** > **SNMP Service**. The SNMP Service is added to the Boards layer.

3. Activate the configuration. Once the configuration is activated, the Dialogic® Diva® System Release software validates if Windows® SNMP support is available. If it is not available, an error message is displayed and the SNMP icon is removed from the configuration.

Note: You do not need to connect the SNMP service to any Dialogic® Diva® Media Board. The SNMP is always available for all installed Diva Media Boards.

You can now install the SNMP tool and restart the PC. To install the SNMP tool correctly, consult the documentation of the tool.

To verify the service status

1. Click **Start** > **Control Panel** > **Administrative Tools** to open the **Administrative Tools** window.

2. In the **Administrative Tools** window, double-click **Services**.

3. In the **Services** window, right-click **SNMP Service** and select **Properties** from the list.

4. In the **Properties** dialog box, click the **Security** tab and under **Accepted community names**, click **Add**. Enter a community name, for instance, public, and for **Community rights**, select **READ ONLY**.
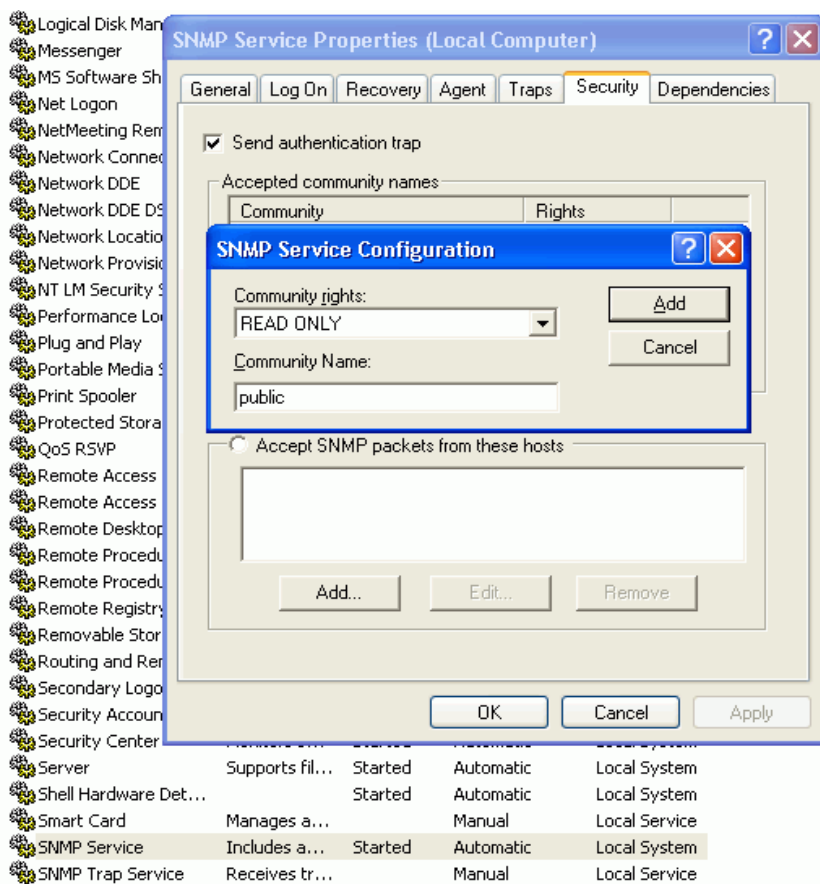
5. Click the **Traps** tab, enter the community name you added in the **Security** tab, and click **Add to list**.

6. Under **Traps destinations**, click **Add**, enter the name or IP address of the host computer, and click **Add**.
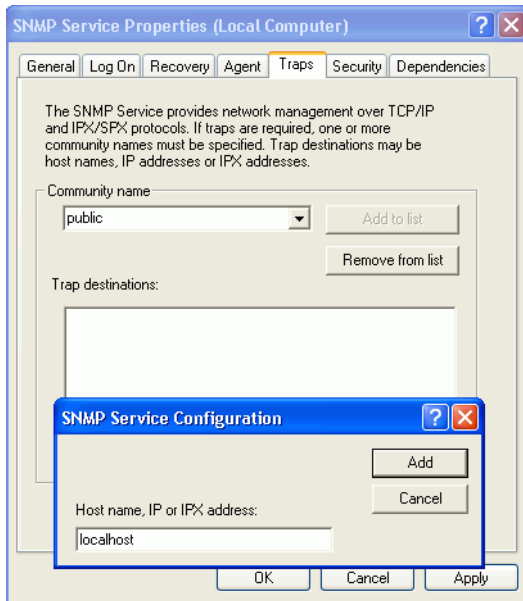
7. The host name is added to the list of Trap destinations.

8. Click **OK** to close the dialog box.

9. Restart the SNMP service. To do so, right-click **SNMP Service** in the **Services** window and select **Restart** from the list.

10. Close the **Services** window.

To verify the function of the SNMP service

1. Click **Start** > **Run** and type `cmd` to open a DOS window.

2. In the DOS window, type: `snmpwalk -v 2c -c public localhost interface | find_"Diva"`

The result should be similar to the following, which is for a Dialogic® Diva® V-4PRI Media Board:

```
IF-MIB::ifDescr.101 = STRING: Dialogic_Diva_V-4PRI/E1/T1_1030
IF-MIB::ifDescr.133 = STRING: Dialogic_Diva_V-4PRI/E1/T1_1030
IF-MIB::ifDescr.164 = STRING: Dialogic_Diva_V-4PRI/E1/T1_1030
IF-MIB::ifDescr.195 = STRING: Dialogic_Diva_V-4PRI/E1/T1_1030
```

3. In the DOS window, type: `snmptrapd -f -L o`

The result should be similar to the following:

`2006-01-28 11:14:35 NET-SNMP version 5.2.1.2 Started.`

You can create an output of traps if you change the status of the layer 1/2, for instance by disconnecting the cable from the Diva Media Board. The result after changing the status of layer 1/2 should be similar to the following:

2006-01-28 11:16:25 localhost [127.0.0.1] (via UDP: [127.0.0.1]:1053) TRAP, SNMP v1, community public

SNMPv2-SMI::enterprises.434.2 Link Up Trap (0) Uptime: 1:16:47.06

IF-MIB::ifIndex.101 = INTEGER: 101

SNMPv2-SMI::enterprises.434.2 Link Down Trap (0) Uptime: 1:16:48.57

IF-MIB::ifIndex.101 = INTEGER: 101

2006-01-28 11:16:26 localhost [127.0.0.1] (via UDP: [127.0.0.1]:1053) TRAP, SNMP v1, community public

SNMPv2-SMI::enterprises.434.2 Link Up Trap (0) Uptime: 1:16:48.81

IF-MIB::ifIndex.101 = INTEGER: 101

Supported MIBs, OIDs, and traps

This section provides information about supported MIBs, OIDs, and traps by the Dialogic® Diva® SNMP service and about the relationship between supported OIDs and Dialogic® Diva® Media Board management interface variables.

MIB-II (RFC 1213/2233)	Path	Description
MIB-II	interfaces.ifTable.ifEntry.	
	ifIndex	Unique index of Dialogic® Diva® interfaces starting with ifIndex-offset + 1 (see option -oN). First, all installed Dialogic® Diva® Media Boards are listed, followed by the available B-channels.
	ifDescr	For Dialogic® Diva® Media Boards, the board name and its serial number are returned. For B-channels, the string "BRI + ifIndex_of_board + number_of_b- channel_on_board" is returned.
	ifType	The type of the interface according to IANA: PRI, BRI, ISDN.
	ifMTU	Since the concept of MTU is not applicable on Dialogic® Diva® interfaces, they return always 0.
	ifSpeed	The maximum interface speed in bps
	ifAdminStatus	Always up
	ifOperStatus	The current operating status of the interface
	ifInBytes, ifInPackets, ifInErrors, ifOutBytes, ifOutPackets, ifOutErrors	For Dialogic® Diva® Media Boards, the added values of the D- and B-channel interface counters are returned. **mantool** reports these values in the following paths "Statistics\\[D|B]-Layer2\\[R|X]-[Bytes|Frames|Errors]". For B-channels, the following values are reported: "State\\B[n]\\L2 Stats\\R- [Bytes|Frames|Errors]".
	ifPhysAddr	Returns vendor-id, PnP-id, serial number of Dialogic® Diva® Media Boards formatted as hex string. Returns no information for B-channels.
	LinkUp/LinkDown Traps	For status changes of interfaces, a trap is generated that includes the appropriate ifOperStatus varbind. Trap destinations and access parameters must be configured in the underlying master agent (trapsink, etc.).
ISDN-MIB (RFC2127)	transmission.isdnMib.isdnMibObjects.isdnSignalingGroup	
	isdnSignalingGetIndex	Number of possible D-channels (equals number of installed Dialogic® Diva® Media Boards)
ISDN-MIB	transmission.isdnMib.isdnMibObjects.isdnBasicRateGroup .isdnBasicRateTable.isdnBasicRateEntry	Dialogic® Diva® BRI Media Boards
	isdnBasicRateIfType	isdns or isdnu (IANA-ifType 75, 76)
	isdnBasicRateLineTopology	pointToPoint or pointToMultipoint
	isdnBasicRateIfMode	TE mode or NT mode
	isdnBasicRateSignalMode	D-channel active or inactive

ISDN-MIB	transmission.isdnMib.isdnMibObjects.isdnBearerGroup.isdnBearerTable.isdnBearerEntry	B-channels
	isdnBearerChannelType	dialup or leased
	isdnBearerOperStatus	idle, active, unknown
	isdnBearerChannelIndex	Index of B-channel per Dialogic® Diva® Media Board
	isdnBearerPeerAddress	Remote address
	isdnBearerPeerSubAddress	Remote sub address
	isdnBearerCallOrigin	Answer or originate
	isdnBearerInfoType	Info type as per Q.931 (unrestrictedDigital)
	isdnBearerCallConnectTime	Time measured from start of divasnmpx
DIAL-CONTROL-MIB	transmission.dialControlMib.dialControlMibObjects.callActive.callActiveTable.callActiveEntry	
	callActiveSetupTime	Timeticks at start of call, measured from start of **divasnmpx**.
	callActiveIndex	Unique index
	callActivePeerAddress	Address of remote partner
	callActivePeerSubAddress	Subaddress of remote partner
	callActivePeerId	Always 0 (unknown)
	callActivePeerIfIndex	Always 0 (unknown)
	callActiveLogicalIfIndex	Index of entry in ifTable for the interface used by this call.
	callActiveConnectTime	0 if the call was not connected, otherwise timeticks measured from start of **divasnmpx**.
	callActiveCallState	State of call
	callActiveCallOrigin	Direction of call: Answer or originate
DIAL-CONTROL-MIB (RFC2128)	transmission.dialControlMib.dialControlMibObjects.callHistory	
	callHistoryTableMaxLength	The maximum number of entries in the callHistoryTable (read/write).
	callHistoryRetainTimer	The minimum amount of time in minutes that a callHistoryEntry will be maintained before being deleted.
DIAL-CONTROL-MIB	transmission.dialControlMib.dialControlMibObjects.callHistory.callHistoryTable.callHistoryEntry	
	callHistoryPeerAddress	Address of remote partner
	callHistoryPeerSubAddress	Subaddress of remote partner
	callHistoryPeerId	Always 0
	callHistoryPeerIfIndex	Always 0
	callHistoryLogicalIfIndex	Index of entry in ifTable for the interface used by this call.
	callHistoryDisconnectCause	Reason for disconnecting this call
	callHistoryDisconnectText	empty
	callHistoryConnectTime	Timeticks measured from start of **divasnmpx**.

	callHistoryDisconnectTime	Timeticks measured from start of **divasnmpx**.
	callHistoryCallOrigin	Direction of call: Answer or originate.

The definition for the ISDN-, DIAL-CONTROL-, and DS1-MIB can be imported into any management application to decode the OIDs reported by **divasnmpx**. For net-snmp, simply copy these files to the standard MIB path (usually <%program files%>\netsnmp\share\snmp\mibs) and tell the snmp command line tools to use them by exporting/setting the environment variable "MIBS" with the names of the appropriate MIBs (or simply the keyword ALL), e.g., **Set MIBS=ALL**.

CHAPTER 7

Uninstalling

If you want to uninstall all installed Dialogic® Diva® Media Boards and related software, use the Dialogic® Diva® Uninstall tool as described below. If you do not want to uninstall all Diva Media Boards, then use the Device Manager as described on on page 57.

Dialogic® Diva® Media Board uninstallation with Uninstall

1. Click **Start** > **Programs** > **Dialogic Diva** > **Uninstall**.

2. The welcome dialog box is displayed. Follow the instructions on the screen and click **Next** to continue.

3. In the **Confirm Uninstall** box, all installed Dialogic® Diva® Media Boards are displayed:
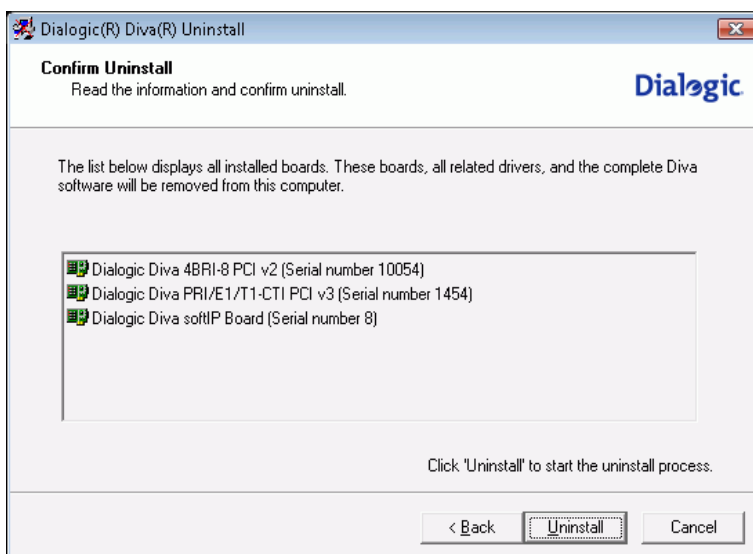
   Click **Next** to uninstall all Diva Media Boards and related drivers.

4. In the displayed dialog box, select if you want to shut down or restart your computer now or later.
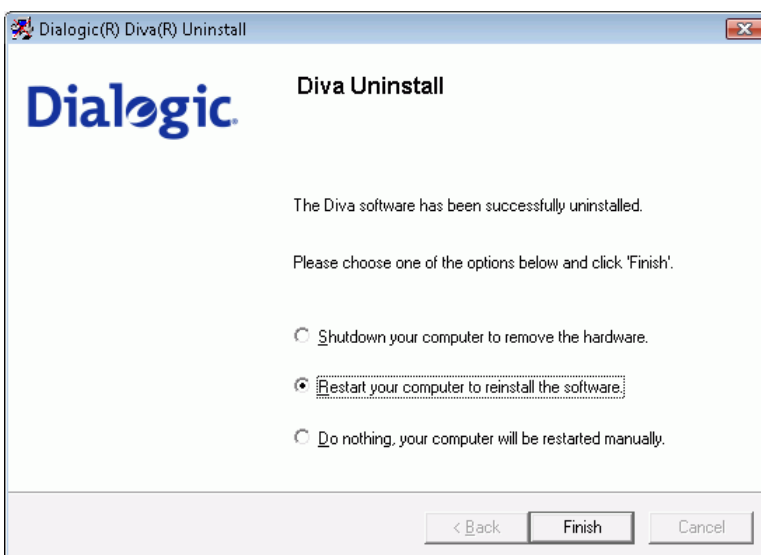
   Click **Finish**, to complete the process.

Dialogic® Diva® Media Board uninstallation with Device Manager

Note: The uninstallation with the Device Manager is not recommended for Windows Vista® and Windows® 7.

1. Click **Start** > **Control Panel**, and select **System** in the Control Panel window.

2. In the **System Properties** box, click the **Hardware** tab and then **Device Manager**.

3. In the **Device Manager** box, click the **+** sign next to **Network adapters**.

4. Right-click the entry of the Diva Media Board that you want to uninstall and select **Uninstall** from the list.

5. In the **Confirm Device Removal** box, click **OK** to start the uninstallation.

6. Shut down your computer and physically remove the Diva Media Board from your system. Otherwise, your Windows® operating system will detect and install the Board again when you restart your computer.

CHAPTER 8

Maintenance Tools

The Dialogic® Diva® System Release software offers the following tools for testing your connection and controller on your board, and for diagnosing and helping solve issues that might occur with your Dialogic® Diva® Media Board or the connection:

- [Dialogic® Diva® Line Test](#) below
- [Dialogic® Diva® Diagnostics](#) below

Dialogic® Diva® Line Test

To use the Dialogic® Diva® Line Test utility, you must have installed your Dialogic® Diva® Media Boards and Dialogic® Diva® System Release software, and you must have connected your ISDN, channelized E1, channelized T1, or analog line to the Diva Media Board.

1. To open Diva Line Test, click **Start** > **Programs** > **Dialogic Diva** > **Line Test**.

2. The **Line Test** box opens.

Diva Line Test offers the following tests:

- **Line Check:**

  Performs a quick check of your software installation and the physical connection.

- **Hardware Test:**

  Performs a test only of the controller.

- **Phone/Loop Test:**

  Performs basic bidirectional phone tests, to test the connection to other telephones or to itself.

- **Call Transfer Test:**

  Performs different call transfer tests, with the option to choose the transfer type.

- **Fax Test:**

  Performs basic bidirectional fax tests.

For more information about the tests, see the Dialogic® Diva® Line Test Online Help file (DSLineTest.chm).

If Diva Line Test does not return an error, but you still cannot get your Diva Media Board to work properly, then there might be an issue with the configuration of the application you are using with your board (such as Dial-Up Networking or faxing software).

Dialogic® Diva® Diagnostics

The Dialogic® Diva® Diagnostics tool can help with the analysis of issues if you encounter difficulties with the Dialogic® Diva® drivers or with the connection.

Every driver sends status messages and reports any error that occurs. The messages are saved in a specific memory area of a fixed size, so that the oldest messages are overwritten when the memory is full.

Diva Diagnostics enables the messages from Dialogic® Diva® Media Boards and various drivers to be displayed and saved.

1. To open Diva Diagnostics, click **Start** > **Programs** > **Dialogic Diva** > **Diagnostics**.

2. The **Diagnostics** box opens.

For more information see, the Dialogic® Diva® Diagnostics Online Help file (DivaTrace.chm).

CHAPTER 9

Management Tools

Dialogic® Diva® Management

Dialogic® Diva® Management software is integrated into the Microsoft® Management Console (MMC) via a snap-in. You may create your own set of management, for instance the Device Manager combined with the Diva Management software.

Diva Management is a tool that displays the current status of the connected lines, the active connections, and the history of connections. Simply testing lines and connectivity is also part of Diva Management software.

To open Diva Management as standalone program, click **Start** > **Programs** > **Dialogic Diva** > **Management**.

Diva Management offers the following statistics:

- **Status:**

  Displays an overview of all installed Dialogic® Diva® Media Boards in the system and the events taking place on these boards.

- **Active Connections:**

  Displays the Diva Media Boards with active incoming or outgoing calls.

- **Call History:**

  Displays the history for all conducted ingoing or outgoing calls.

For more information, see the Dialogic® Diva® Management Online Help file (DivaServerManagement.chm).

CHAPTER 10

Dialogic® Diva® Media Board Features

Dialogic® Diva® Media Boards provide different features and capabilities with the Dialogic® Diva® System Release software.

The interfaces supported by Diva Media Boards are as follows; however, not all features may be available on all the supported interfaces.

IDI	ISDN Direct Interface. Supports all features and capabilities of Dialogic® Diva® ISDN Media Boards.
WAN Miniport	Provides support for WAN protocols running over ISDN, channelized E1, channelized T1, or analog. Useful for connecting to Windows® Remote Access Services (RAS).
COM Port	For applications that require communications via a standard PC communications port.
CAPI 2.0 (Dialogic® Diva® API)	Common ISDN Application Programming Interface. A standard interface for applications to interact with Diva Media Boards.
TAPI	Telephony Application Programming Interface. An interface for communication programs to work with telephony and network services.

For features of Dialogic® Diva® BRI and PRI/E1/T1 Media Boards, see the tables from page 61 onward. For features of Dialogic® Diva® Analog Media Boards, see the tables from page 66 onward.

Features of Dialogic® Diva® BRI and PRI/T1/E1 Media Boards

Features via interface:	IDI	WAN MiniPort	COM Port	CAPI 2.0	TAPI
B-channel related:					
Transparent HDLC, 64/56[7] kbps	•	•	•	•	•[6]
Transparent (Voice)	•			•	•
X.75 64/56[7] kbps	•	•	•	•	•[6]
T.70/T.90 (T-Online)	•		•	•	•[6]
V.110 (GSM)[1][9]	•	•	•	•	•[6]
V.120 64/56 kbps (CompuServe)	•	•	•	•	•[6]
V.34+, V.90 analog modem[1][7][9]	•	•	•	•	•[6]
V.42, V.42bis[1][7][9]	•	•	•	•	•[6]
X.75/V.42bis	•			•	
Change of B-channel protocol during a call	•			•	
X.25[2], X.31, ISO 8208 in the B-channel	•		•	•	•[6]
PIAFS 1.0 and 2.1[7]	•	•			
SDLC	•			•	
Enabled for Fax Group 4 (incl. T.90/ISO 8208 and module mode detection)[9]	•			•	
T.30 Fax Group 3 (analog), Class 1 and 2[1][9][10]	•		•	•	•[6]
Fax with Error Correction Mode (ECM)[1][9] Fax with MR (D2 coding)[1][9] Fax with MMR (T.6 coding)[1][9]	•		•	•	•[6]
Fax 14.4 kbps[1][9][10]	•		•	•	•[6]
Fax 33.6 kbps (V.34)[1][9][10]	•			•	
Fax T.38 (up to 33.6 kbps)[1][9] [10]	•			•	
Fax tone detection[1]	•			•	
Reversal of fax direction[1][9]	•			•	
Fax polling / fax on demand[1][9]	•		•[5]	•	
Speed and feature indication (polling and ECM)[1][9]	•			•	
New fax header line[1][9]	•			•	
Page formats: ISO A4, ISO B4, ISO A3[1][9]	•			•	
Resolution: standard, fine, super-fine, ultra-fine[1][9]	•			•	
DTMF tone detection and transmission[3]	•			•	•
DTMF clamping[1]	•			•	
On-board switching and conferencing (via line interconnect)[8]	•			•	
Media mode (unknown, interactive voice, automated voice)[1]	•				•
Wave audio format (8-bit 8 kHz A-Law, 8-bit 8 kHz µ-Law, 8-bit 8 kHz PCM, 16-bit 8 kHz PCM)[1]	•				•
Silence detection				•	
Volume control					•

Features via interface:	IDI	WAN MiniPort	COM Port	CAPI 2.0	TAPI
Echo cancellation[1)7)]				•	
Real time protocol (RTP)[1)7)]				•	
Comfort noise generation (CNG)[1)7)]				•	
Voice activity detection (VAD)[1)7)]				•	
Dynamic anti-jitter buffer[1)7)]				•	
Audio tap[1)7)]				•	
GSM and G.726 voice codecs[1)7)]				•	
Recording AGC				•	
Supplementary Services:[4)]					
MSN (multiple subscriber number)	•	•	•	•	•
DDI (direct dialing-in)	•	•	•	•	•
SUB (sub-addressing)	•			•	
CLIP (calling line identification presentation)	•		•	•	•
CLIR (calling line identification restriction)	•			•	•
COLP (connected line identification presentation)	•			•	•
COLR (connected line identification restriction)	•			•	•
CCBS (call completion to busy subscriber)	•			•	•
CCNR (call completion on no reply)	•			•	•
TP (terminal portability)	•			•	
Call forwarding unconditional	•			•	•
Call forwarding busy	•			•	•
Call forwarding no reply	•			•	•
Call deflection/ Call rerouting	•			•	
CW (call waiting)	•			•	•
HOLD (hold and retrieve a call)	•			•	•
ECT (explicit call transfer)	•			•	•
Blind transfer					•
AoC (advice of charge)	•			•	•
Three-party conference	•			•	
Large conference	•			•	
User-to-user signaling	•			•	•
Others:					
Transparent D-channel	•			•	
X.25/D-channel including AO/DI support	•			•	

[1)] Features are not available with the Dialogic® Diva® PRI/E1/T1-CTI Media Boards.

[2)] CAPI 2.0 (Dialogic® Diva® API) supports X.25 in the B- and D-channel, permanent virtual connections (PVC) and switched virtual connections (SVC), and multiple logical connections per B-channel.
The COM port supports X.25 with one PVC in the B-channel.

[3)] DTMF tone detection and transmission is done via soft DTMF for the Dialogic® Diva® PRI/E1/T1-CTI Media Board.

[4)] For an overview on supplementary services support by the various switch types, see Supplementary services on page 64.

[5)] The COM Port supports fax polling for Fax Class 1 only.

[6)] Features are available with TAPI via Unimodem support.

7) Features are not available with the Dialogic® Diva® BRI-2FX Media Board.

8) For an overview on switching and conferencing support by the various Dialogic® Diva® Media Boards, see On-board switching and conferencing on page 63.

9) Features are not available with Dialogic® Diva® V-PRI boards. For Dialogic® Diva® V-1PRI, V-2PRI, V-4PRI, and V-8PRI Media Boards, features are available via licenses.

10) Dialogic® Diva® UM-BRI or UM-PRI/E1/T1 Media Boards support fax up to V.34 on 50% of the available channels.

On-board switching and conferencing

Some switches do not offer supplementary services such as call transfer, overlap sending, three-party conference, or large conference. For these switches, the Dialogic® Diva® Media Boards and software can provide these supplementary services by connecting or forwarding calls directly on the board (also known as "tromboning").

Support for on-board switching and conferencing depends on the installed Diva Media Board. The table below outlines the various types of switching and their support by Diva Media Boards.

Note: On-board switching and conferencing is only possible if it is supported by your application.

Switching and conferencing via board:	Switching and conferencing (within one board)	Cross-board switching
Dialogic® Diva® Analog Media Boards		
Diva Analog-2 Diva UM-Analog-2	•	•
Diva Analog-4 Diva UM-Analog-4 Diva Analog-8 Diva UM-Analog-8	•	•
Dialogic® Diva® BRI Media Boards		
Diva BRI-2FX		
Diva BRI-2 Diva UM-BRI-2	•	•
Diva 4BRI-8 Diva UM-4BRI-8	•	•
Dialogic® Diva® PRI Media Boards		
Diva PRI/E1/T1-CTI Diva PRI/E1/T1-8	•1)	•
Diva PRI/E1/T12) Diva V-PRI/E1/T1 Diva UM-PRI/E1/T1	•	•
Diva V-1PRI/E1/T1 Diva V-2PRI/E1/T1 Diva V-4PRI/E1/T1	•	•

1) Conference functionality is limited to eight (8) participants.

2) Except Dialogic® Diva® PRI/E1/T1-CTI and Diva PRI/E1/T1-8 Media Boards.

Supplementary services

The Dialogic® Diva® System Release software supports basic call services for the switch types that are available in the Dialogic® Diva® Configuration Manager. Additionally, it offers supplementary services for the following switch types:

- Euro-ISDN (ETSI) BRI and PRI

- 5ESS Custom (AT&T)

- 5ESS NI (Lucent/Avaya)

- DMS 100 (Nortel)

- QSIG

    QSIG support is available for the derivatives ECMA-QSIG, and ISO-QSIG. Thus, the QSIG switch type can be used with any PBX based on one of these derivatives.
    QSIG has been tested with a number of various switches, for example, Alcatel 4200, Alcatel 4400, 4410, DeTeWe OpenCom 1000/1010, Ericsson MD 110, Ericsson BP250, Siemens Hicom 150, Hicom 300, Lucent Definity, Matra 65xx, Nortel Meridian, Nortel M65xx, Siemens HiPath 3000, and Siemens HiPath 4000, Tenovis.

The table below gives a detailed overview of the supplementary services supported by the switch types listed above.

Note: The availability of supplementary services also depends on your PBX. For detailed information on supplementary services supported by your PBX, contact the PBX manufacturer.

Supplementary services with switch type	Euro-ISDN (ETSI) PRI	Euro-ISDN (ETSI) BRI	QSIG	5ESS Custom (AT&T), 5ESS NI (Lucent/Avaya), DMS 100
MSN (multiple subscriber number)	•	•	•	• (incoming)
DDI (direct dialing-in)	•	•	•	
SUB (sub-addressing)	•	•	•	•
CLIP (calling line identification presentation)	•	•	•	•
CLIR (calling line identification restriction)	•	•	•	•
COLP (connected line identification presentation)	•	•	•	•
COLR (connected line identification restriction)	•	•	•	•
KEY (keypad protocol)	•	•	•[4]	•
AoC (advice of charge)	•	•	•	
User-to-user signaling	•	•	•	
TP (terminal portability)		•		•
Call forwarding unconditional		•		
Call forwarding busy		•		
Call forwarding no reply		•		
Call deflection		•	•	
CW (call waiting)		•		•
HOLD (hold and retrieve a call)	•[1]	•	•[2]	•
ECT (explicit call transfer)		•	•[3]	•
ECT by rerouting			•	
ECT by join			•[3]	
Single-step call transfer (over CAPI deflection)			•	

Supplementary services with switch type	Euro-ISDN (ETSI) PRI	Euro-ISDN (ETSI) BRI	QSIG	5ESS Custom (AT&T), 5ESS NI (Lucent/Avaya), DMS 100
Three-party conference		•		•
Large conference		•		•
Drop conference		•		•
Name identification services			• (presented by switch)	• (presented by network)
Generic functional procedures (basis for supplementary services in Q-Sig environment)			•	
Common information			•	
Redirected number translation from Q-Sig to Q.931			•	
Escape message types				• (5ESS Custom only)
Call Appearance/Call Handling (CACH) plus configuration				•
Feature activators plus configuration				• (5ESS NI + DMS 100 only)
Network display conversion/treatment				•
Message waiting	•	•	•	•
CCBS (call completion to busy subscriber)		•	•	
CCNR (call completion on no reply)		•	•	

[1] HOLD is not a standard supplementary service for Euro-ISDN PRI, nevertheless some PBXs support call hold and retrieve.

[2] HOLD is not defined in QSIG but corresponding procedures are available.

[3] Call transfer is only possible if path replacement works.

[4] In a QSIG environment, the feature is also called "Simple Dialog".

Features of Dialogic® Diva® Analog Media Boards

Call control features

- Dial tone detection
- Dial pulse detection
- Pulse dialing
- Tone (DTMF/MF) dialing
- Busy tone detection
- Ring back tone detection
- Special Information Tone (SIT) detection
- Fax/modem detection
- Hold/Retrieve (via Hook Flash) and keypad protocol
- Analog caller identification (via FSK and DTMF signaling)
- Collection of DTMF post-dial digits
- DTMF parsing
- Call transfer
- Specify call direction
- Configurable PBX parameters
  - Disconnect active call
  - Disconnect hold call
  - Hold
  - Swap hold
  - Complete transfer
  - Hook-flash length
  - Retrieve mode

Voice and speech features

- G.711 coding (a-law, µ-law selectable)
- DTMF detection and generation
- DTMF clamping and filtering
- Generic tone detection and generation
- Pulse tone detection
- Full-duplex voice, "barge-in"
- Voice activity detection
- Silence detection
- Human talker detection
- Fax signal detection
- G.168 echo cancellation, up to 128 ms tail length
- Recording automatic gain control (AGC)
- Pitch control
- Audio tap

Voice over IP support

- G.711 voice codec (64 kbps, μ-law, A-law)

- G.726 voice codec (32 kbps)

- GSM voice codec (13 kbps)

- G.168 echo cancellation, up to 128 ms tail length, up to 256ms tail lenght configurable by application

- Adaptive jitter buffer

- Voice activity detection (VAD)

- Comfort noise generation (CNG)

- Real time protocol (RTP framing)

- Impedance calibration

Switching and Conferencing features

- On-board switching and conferencing

- Automatic gain control (AGC)

Fax features

- Support for fax class 1 and 2

- Support for fax group 3, T.30

  - V.17, V.29, V.27ter, V.21, V.34 modulation

  - Up to 33.600 bps with each channel (send and receive)

  - Fax compression MH, MR, MMR

  - Error Correction Mode (ECM)

  - Fax polling/ Fax on demand

  - Reversal of fax direction

  - Fax password

  - Fax sub addressing

  - New fax header line

  - Page formats: ISO A4, B4, A3

  - Standard, fine, super-fine and ultra-fine resolution

  - Color fax (JPEG-format)

  - T.38 FoIP (PSTN - IP Gateway Mode)

  Note: Dialogic® Diva® UM-Analog Media Boards support fax up to V.34 on 50% of the available lines.

Data modem features

- V.21, V.22, V.22bis, Bell 103, Bell 212A, V.32, V.32bis, V.34, V.42, V.42bis, V.90, MNP4, MNP5,

- Modem with extension: V.18, V.21, Bell 103, V.23, EDT, Baudot 45, Baudot 47, Baudot 50 incl. DTMF, V.42, V.42bis

CHAPTER 11

About Customer Services

Dialogic provides various options and arrangements for obtaining technical support for your Dialogic® product. We recommend that you use the Dialogic® Diva® Support Tools first before contacting your Dialogic supplier. Also, we suggest that you visit the Dialogic Technical Services & Support site, as it includes detailed information about a variety of topics. In the unusual case that neither your supplier nor the information on the Services & Support site adequately addresses your support issue, you can contact Dialogic Customer Support.

For more information see:

- Dialogic® Diva® Support Tools
- Dialogic Technical Services & Support web site
- Dialogic Customer Support

Dialogic® Diva® Support Tools

If an issue occurs during the operation of your Dialogic® Diva® product, use the following Dialogic® Diva® Support Tools:

- Dialogic® Diva® Line Test: With the Diva Line Test tool, you can test your hardware and perform simple phone test calls, call transfers, or basic inbound and outbound calls.
- Dialogic® Diva® Diagnostics: With the Diva Diagnostics tool, you can write traces for each Dialogic® Diva® Media Board or driver into a file.
- Dialogic® Diva® Management tool: With the Diva Management tool, you can view the current status of the connected lines, the active connections, and the history of the connections.

For more information about the Diva Support Tools tools, see the respective online help files.

If you cannot address the issue through use of these tools, contact your Dialogic supplier.

Dialogic Technical Services & Support web site

If your supplier is unable to help you to address your issue, you can visit the Services & Support web site. There, you can get access to:

- detailed information about the Dialogic® Pro™ Services (1 or 5 year 24/7 service contracts) at http://www.dialogic.com/support/DialogicPro/
- a help web section for Dialogic® products at http://www.dialogic.com/support/helpweb
- a download section, to install the current version of your software at http://www.dialogic.com/support/software.aspx
- a training section, with information about webinars as well as online and onsite trainings at http://www.dialogic.com/training
- a manuals section, that includes currently available documentation, at http://www.dialogic.com/manuals
- technical discussion forums about different developer-specific Q&A at http://www.dialogic.com/den/groups/developers/default.aspx
- the Dialogic Customer Support web site. For detailed information about how to contact Dialogic Customer Support, see Dialogic Customer Support on page 69.

Dialogic Customer Support

If the information on the Services & Support site did not help you address your issue, contact Dialogic Customer Support. See www.dialogic.com/support/contact for details on how to contact Dialogic.

Please note that when you contact Customer Support, you may need to provide or have handy one or more of the following:

- A debug trace (see Dialogic® Diva® Diagnostics Online Help file - DivaTrace.chm), and

- A copy of your active configuration (see Dialogic® Diva® Configuration Manager Online Help file - DSMain.chm).