

Norstar Computer Telephony Integration

Overview



Computer Telephony Integration (CTI) provides companies with the ability to turn a desktop computer into a powerful communications tool that can combine sight, sound, text, animation, video, graphics and other sophisticated telecommunication functions.

While not new, CTI has now come of age with affordable, feature-rich solutions for improving customer service and employee productivity. CTI has been around for many years. The early systems required extensive design and integration activities and, as a result, were limited to large installations that could justify the expense. The dissemination of voice messaging, followed by ACD and IVR, were major milestones in the commercialization of CTI applications. Now, the next phase of CTI deployment, Desktop CTI, has arrived. Gone are the days of expensive customized applications driven by proprietary links between the telephone system and the computer. The proprietary nature of the early applications served as a significant deterrent to a faster implementation of CTI. In 1995, a set of industry standards were established (TAPI and TSAPI) and proprietary links gave way to open protocols, a critical milestone for wide-scale development of desktop CTI.

With the explosion of Microsoft's Windows 95/98 and Windows NT at the desktop, all of which include TAPI for no additional charge, TAPI was well on its way to becoming the de facto CTI standard. Norstar is aligning its CTI development with Microsoft TAPI, and will no longer continue development or support of TSAPI-based CTI applications.

Another new standard, Universal Serial Bus (USB) has been defined, with Nortel Networks taking a key role in the development of the standard. USB will make CTI at the desktop even simpler as it enhances bandwidth and uses a standard connection device. Consumers are now able to connect up to 127 peripherals to one USB port and implement multimedia applications. Most computers shipped since mid-1997 have USB capability, and this will assist in bringing CTI to even more desktops.

Norstar is an active participant in the development of technology to evolve telephone systems from voice-only services to multimedia services. There will be an increasingly wide variety of desktop CTI applications available to take advantage of this integration. Norstar leads the way with Personal Call Manager (PCM), which raises Norstar feature use by working with the TAPI Service Provider (TSP) to give the Windows[®] 95, 98 and Windows NT user a new, PC-based, Norstar user interface. Norstar PC Console, covered in detail later in this chapter, is also a part of the Norstar CTI portfolio.

Norstar and Desktop CTI

Norstar Desktop CTI combines the Norstar portfolio with the power of desktop computing. Turnkey enabler and applications software packages are available directly from Nortel and run on DR-5 or later Norstar systems.

TAPI is the primary and most common industry standard for Applications Programming Interfaces (APIs) and Norstar is aligning its CTI portfolio around the TAPI standard. Many TAPI-compliant applications are readily available, and can be easily used in conjunction with the Norstar to enable desktop CTI. In many cases, people are already using an application (such as contact management software) that is TAPI compliant.

In addition to TAPI applications, Norstar CTI enablers also support Norstar ACCESS applications.

The Norstar CTI portfolio includes CTI applications, the software enablers and the hardware connectivity devices. In addition to Norstar-developed and branded products, there is a wide variety of software available to CTI users. These additional applications are available through Nortel Business Affiliates, the Symposium Partners Program, and also “off the shelf.” More information about these additional sources is provided at the end of this chapter.

- Norstar CTI Software Applications
 - Norstar Personal Call Manager
 - Norstar PC Console
- Norstar Software Enablers
 - TAPI Service Provider (TSP) 2.0
- Norstar Computer Telephony Adapter (CTA) Hardware Devices
 - CTA 100
 - CTA 150i
 - CTA 500dm

Desktop CTI Functions

Desktop CTI applications address an extensive number of unique applications, each one tailored to a specific market or niche. There are many types of CTI applications, everything from the most basic screen pop, to intelligent dialing and call routing, to coordinated call/screen transfer and screen based telephony. The most common ones are identified in the following chart, along with the associated Norstar application:

| CTI Application Type | Norstar |
|--|---|
| <p>Screen Pop: also called Intelligent Answer or Call and Screen Synchronization. A screen pop refers to the change in the computer display that occurs simultaneously with the arrival of a new call. Using technologies such as ANI (Automatic Number Identification), CLID (Calling Line ID), or DNIS (Dialed Number Identification Service), the system searches the database for the caller's record and presents it to the computer display. The specific information about the caller will vary, depending upon the kind of information maintained by the company (e.g. Name, address, priority level, previous purchases etc.) A contact management software such as Symantec ACT! or Microsoft Outlook is the most frequent database used for screen pops.</p> | <p>Screen pops are enabled on the Norstar using the following:</p> <ul style="list-style-type: none"> • CTA device • TSP 2.0 (or earlier versions) • TAPI-compliant database application (e.g. Symantec ACT!, Microsoft Outlook, Goldmine) • middleware such as Revolution Rapport (required in some circumstances to co-ordinate client applications). |
| <p>Contact Management: many popular contact managers are TAPI enabled, meaning that dialing directly from the contact record is possible, as are screen pops of the appropriate record based on incoming CLID.</p> | <p>Contact Management is enabled on the Norstar using the following:</p> <ul style="list-style-type: none"> • CTA device • TSP 2.0 (or earlier versions) • Contact Management software such as Norstar Personal Call Manager (very basic contact manager); see chart of TAPI Applications later in this chapter for a list of TAPI enabled applications. |
| <p>Screen-based Telephony: also called Softphone. Screen-based telephony is the process of using the PC keyboard and mouse to answer, transfer, conference and manage telephone calls.</p> | <p>Screen-based telephony is enabled on the Norstar using the following:</p> <ul style="list-style-type: none"> • CTA device • TSP 2.0 (or earlier versions) • Software application such as Norstar Personal Call Manager |
| <p>Desktop video-conferencing: full-color, full-motion, live video and audio communications, as well as interactive information sharing are available at the Windows PC desktop, using the bandwidth of ISDN and an appropriate video conferencing software and camera.</p> | <p>Norstar CTA 500dm and a video conferencing application (e.g. Symposium Multimedia Desktop 5.1, Intel Proshare, PictureTel).</p> |

Target Market for Norstar Desktop CTI

Wherever there is a person working at a desk with a telephone and a computer, there is an opportunity to implement a Desktop CTI application. Many of these people might not realize that they are candidates for CTI, as the myth that “CTI is only for call centers” is still prevalent in the marketplace. The following questions will help you and your customer identify whether they are a potential candidate for a desktop CTI application:

Do you:

- ever say “I’ll transfer you, but if I lose you, the number is....”?
- use a contact manager to look up a name & number, then dial the phone?
- shuffle through business cards, sticky notes, address books to find a phone number that you “have right here somewhere”?
- dig through files and paper while talking to someone to see what you talked about last time...then have to ask them to remind you?
- have both a phone and a computer on your desk?
- wish you could see who called but didn’t leave a message?
- think you could use your time more efficiently?
- think you could justify an expenditure if the payback is less than one year?

An answer of “yes” to any one of the above questions will indicate an opportunity to discuss CTI applications at the desktop and position a Norstar CTI solution.

Market Segments

The target market for Desktop CTI solutions can be segmented into 3 distinct groups. The Knowledge Worker and Informal Call Centers markets are the fastest growing segments of the CTI marketplace and represent a significant opportunity for Norstar CTI solutions.

Knowledge Worker

The knowledge worker is an employee that “generally has both a telephone and computer at their desk, and are not part of a formal call center. This includes all types of professionals working in offices, such as computer programmers, accountants, lawyers...”(Pelorus, 1997)

In the past, the knowledge worker was not considered a candidate for CTI applications, as CTI was traditionally used only in call centers. It is now being recognized that the knowledge worker can benefit from the same kinds of CTI applications that call center agents have access to, and that knowledge workers frequently talk to customers. The growth of PC and LAN use, even in very small businesses (i.e. 1 or 2 employees) is also fueling the growth of CTI to the knowledge worker.

Informal Call Center

The informal call center is “...a newly emerging segment that brings together the traditional formal call center, knowledge workers, and SOHO professionals. While these people are not call center agents, they spend a good deal of their time answering the phone and responding to customer inquiries.” (Pelorus, 1997)

Employees working in an informal call center often do not think of themselves as a call center, as they might not have an ACD system nor the traditional agents, and are not dedicated to answering incoming calls. They may be part time agents and perform other duties within the business. Prospects for informal call centers are more difficult to identify as the person answering the call may not be identified as an “agent” or a “telephone service representative”. They could be the local expert in a particular department that takes calls from specific customers, or during specific times of the day, in addition to performing other duties. Typically, an informal call center involves using call center capabilities to provide an enhanced form of customer satisfaction or revenue achievement by making the best qualified persons available by phone.

Formal Call Center

A formal call center exists when a company dedicates several people to answer similar kinds of telephone calls. The individuals or agents within the formal call center specialize in answering incoming calls and concentrate on that activity. The incoming calls are managed and distributed to the agents through an ACD system.

CTI, especially screen pops, is invaluable to call center agents. With the introduction of Norstar TSP 2.0, screen pops can be made available to all agents with only one CTA device (acting as a server). This delivers a cost effective solution to the call center, as well as enhanced productivity for the agents.

Desktop CTI Benefits to Customers

The CTI revolution has brought the benefits of computer-telephony integration to a wider range of users – from the call center to the individual desktop. There is a broad selection of competitively priced, shrink-wrapped solutions available. The implementation of these solutions is quicker, easier, and less costly than it has ever been.

There is also improved application interworking across hybrid networks which means customers can now pick a single solution across an entire enterprise network.

Norstar’s support of CTI offers several benefits to our customers:

- **New Applications Solutions**
 - Customers can leverage the power of TAPI applications such as Personal Call Manager and Symposium Call Manager, along with other Nortel distributed Symposium Partner Program applications.
- **Investment Protection**
 - Nortel and Norstar will continue to support development of TAPI standards. Customers can be assured that their investments in TAPI will have long-term evolution commitments.
- **Purchase Flexibility**
 - A TAPI-compliant application—whether off-the-shelf or custom—will be supported by Norstar’s TSP software. Productivity is maximized as more vendors incorporate TAPI functions in their applications.

- **Cost Effective CTI Solutions**
 - Robust CTI solutions based on these standards can be implemented at a fraction of the cost of custom applications—redefining business for maximum profitability with the power of CTI.

Increasing the number of new communications applications, calling traffic and access to enhanced services like voice mail, ACD and IVR will continue to fuel growth in the CTI market.

Desktop CTI Benefits to End Users

Implementing desktop CTI solutions in a business today offers many benefits to both the knowledge worker and the formal or informal call center agent.

CTI can increase productivity

- Screen pop solutions, utilizing CLID information, save time on the phone by retrieving valuable client information before answering the call.
- Contact management applications manage large amounts of client information and make it available instantly.
- Call control capabilities enable telephony features such as dialing, conference calling and transferring to be integrated into PC applications, reducing time and complexity.
- Voice recognition and activation enables employees to continue working on that document or spreadsheet while the PC searches for the number to dial.

CTI may reduce costs/increase revenues

- Less time on the phone translates into reduced 1-800 charges and more time spent with potential new customers or selling additional products and services to existing customers.
- Maximize investment in applications such as contact management programs by integrating telephony capabilities into programs that users already know how to use, and reduce training costs as a result.
- Implement CTI solutions in a client/server configuration, reducing system administration and maintenance costs.
- Many off-the-shelf TAPI compliant applications already exist or are already being used, minimizing the need for custom development costs and making “plug and play” software applications a reality. Most of these applications can be easily modified or adjusted, usually by the end-user themselves, to suit the needs of a particular business.

CTI can enhance customer service

- Greeting customers by name and knowing the details of their history enhances the personal relationship and facilitates satisfying their needs faster and more efficiently. Customers don't have to waste time repeating the same information every time they call.
- Managing telephony features through a simple drag and drop PC interface means never again having to say “I'll transfer you but if I lose you here is the number”.
- Whatever the industry, applications are available to make that customer feel special and that translates into enhanced customer satisfaction and increased loyalty.

- The Norstar passes CLID along with the caller during the entire duration of that call, and avoids the customer having to repeat their request if they are transferred elsewhere in the business.

The Norstar Personal Productivity Suite

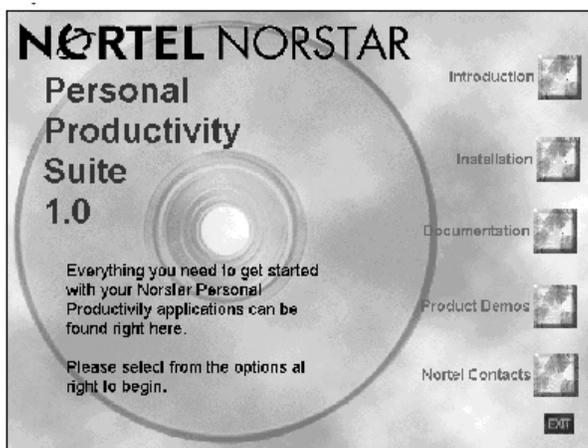
The Personal Productivity Suite is a browser based CD-ROM, designed for easy installation of software, and “surfing” capabilities. The Personal Productivity Suite contains all of the Norstar Desktop CTI applications and documentation, the TAPI Service Provider 2.0, the drivers required for installation of the CTA devices and product demonstrations of Norstar and Symposium Partner Program CTI applications.

A variety of product demos and short presentations have been included to provide further information on Nortel Symposium products, Norstar products, and Symposium Partner Program TAPI applications.

The Personal Productivity Suite also includes a copy of the Microsoft TAPI 2.1 upgrade for the convenience of the Norstar customers that require it.

As its name suggests, it is the full suite of Norstar Personal Productivity applications you need to CTI-enable your desktop PC. Like many software developers, Norstar is introducing its desktop CTI applications as a suite, with additions and enhancements to be added to the suite as they become available.

Personal Productivity Suite main menu



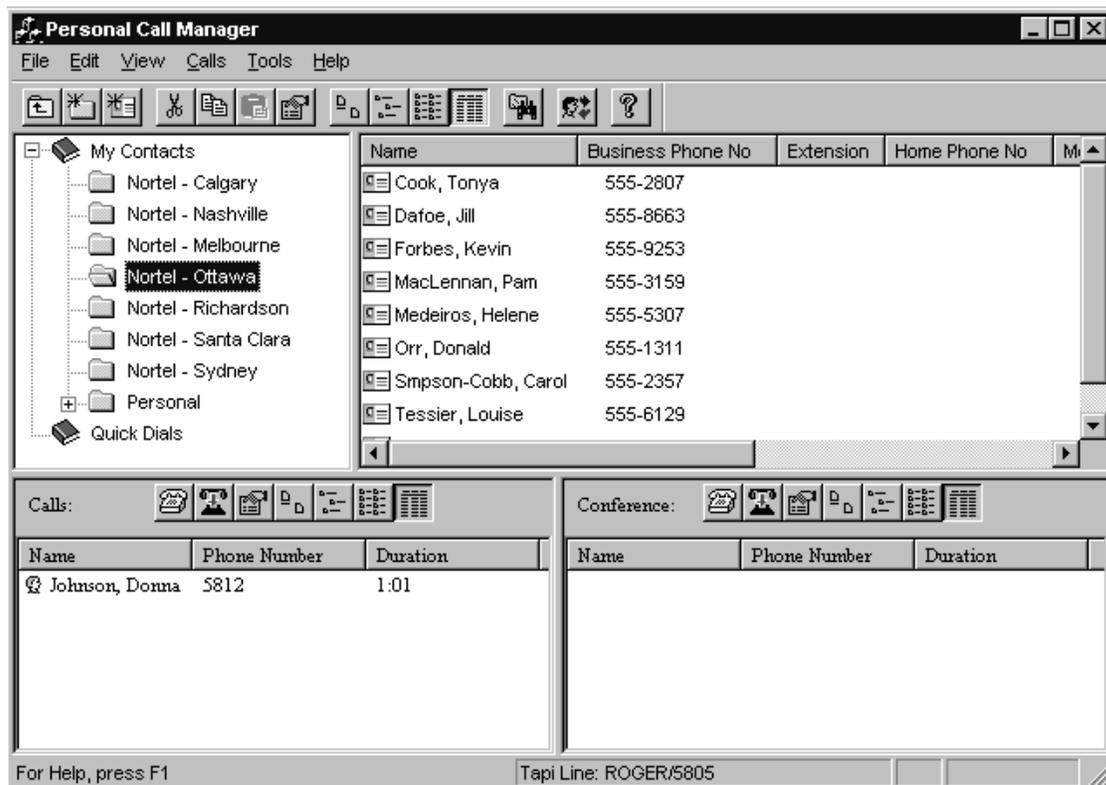
Personal Call Manager

Norstar Personal Call Manager (PCM) is an award winning TAPI-based telephony application designed for use on the Windows[®] 95/98/NT operating system. PCM brings much of the feature rich Norstar user interface to the Windows 95/98/NT desktop computer. With PCM, you can access an internal data base directory, double click on a name to dial, conference or transfer calls; all with the ease of a mouse, eliminating the guess work and perceived frustration of using advanced telephone features.

Norstar Personal Call Manager 1.2 has been updated to operate with Windows 95/98 and Windows NT 4.0, as well as provide some new feature enhancements.

Personal Call Manager 1.2, included on the Norstar Personal Productivity Suite, is optimized to work with the Norstar TSP and fully integrates with the Norstar system.

PCM has two main models of operation: operation from the Windows task tray and operation from the main application window. The most common telephony tasks such as dial, hang-up, transfer and conference can be performed from the task tray icon. As well, access to the last callers/called list and quick dials is available from the icon. For more complex telephony operations as well as access to the personal address book, a main application window is provided. The look-and-feel of this window follows the Windows 95 style guidelines.



Norstar Address Book

The Address Book is the portion of Personal Call Manager 1.2 where you store telephone numbers and addresses of the people and businesses you deal with. Each entry in the Address Book is called a contact. A contact is normally the telephone number of a person or business, but can be any number you want to keep track of or store in PCM. Features of the address book include:

- hierarchical tree view of contacts – the folders within the address book can be sorted and organized to meet your needs. The left side of the window shows the tree structure (ie. how folders are organized), and the right side of the window shows the contents of the highlighted folder. The contents can be viewed as large icons, small icons, list or detail. Files are organized into “Quick Dials” and “My Contacts”
- extended information on each contact including business phone, home phone, fax and mobile phone
- Import/export text files
- sound file storage in contact record (for example, “Bob calling” to audibly alert the user of the caller’s identification)
- storage of bit map images in contact window (for example, logos or pictures of contacts)

Features of Personal Call Manager

All features of PCM can be invoked using either a mouse or the keyboard. The primary benefit of the PC interface is that management of call is visual, and most easily handled by “drag and drop”. Common features include:

- **Dial** – you can make a call using task tray or Calls menu, the toolbar, the Address Book, or the Quick Dial list.
- **Answer/Hold/Unhold** – PCM notifies you of an incoming call, and of the CLID (if you subscribe to the service). The icon changes as the status of the call changes from active to held.
- **Multiple Calls** – PCM can control several calls at once, equal to the number of lines available on the Norstar set. All calls appear in the main window, although only one can be active at any time (with exception of a conference call, when two calls are active at once). When a second call is answered, the current call is automatically placed on hold.
- **Conference** – a conference call connects yourself and two others onto a single call. Two lines (minimum) are required to appear on the Norstar set. As with the Norstar set, a conference call placed on hold from PCM puts both of the callers on hold, enabling them only to speak with each other. Splitting a conference call (via the right mouse button), ends the conference, putting one caller on hold and keeping one caller active.
- **Transfer (blind and announced)** – transferring a call to another Norstar set is as easy as a mouse click; calls can be transferred “blind” (i.e. without talking to the recipient of the call first), or “announced” (i.e. informing the recipient who is being transferred to them).
- **Call Forward** – the number to which your telephone is forwarded appears on the Status Bar. Call forwarding your telephone to an external telephone number is not supported when you are using the Norstar TSP.

- **Do Not Disturb (DND)** – the telephone will not ring, but the line indicator will flash. The “you have a new call” dialog box will still appear on your PC screen when your phone is on DND.
- **Calling Line Identification (CLID)** – telephone numbers of incoming calls will be shown if you subscribe to a CLID service.
- **Call duration** – a running count of how many minutes the call has been connected appears next to the active call icon.
- **Last Callers/Call Log** – PCM keeps a call log of both inbound and outbound calls, showing who called/was called and the time the call was received/made. This is a useful feature to identify callers that might not have left a voice message.

Enhancements of Personal Call Manager 1.2

- **Duplicate contact records** – when a duplicate contact record is being entered, the user will be notified.
- **One step call release** – if only one call is displayed on PCM and disconnect is requested, the call will be disconnected without requesting the user to select the appropriate call.
- **Printing capabilities** – the call log, a single contact, and the contents of a folder will all be print enabled.
- **Open contact for incoming calls** – a new option will be added to the Tools/Preferences menu to enable a contact record to automatically pop when an incoming call is answered.
- **Sort capability in Call Log** – both the incoming and outgoing call log can be sorted by any of the fields (i.e. name, phone number, date & time, or call duration).

Note: Note: The Norstar TSP 2.0 is compatible with Modular and Compact ICS 4.0. Personal Call Manager 1.0 and 1.2 are both compatible with Modular and Compact ICS 4.0, and do not need to be upgraded, as long as the TSP is upgraded to TSP 2.0.

System Requirements

The following minimum system requirements must be met by any computer wishing to run the PCM software:

- Windows[®] 95 or greater
- CD-ROM or 3.5" drive (3.5" diskettes can be produced from the PCM CD-ROM)
- 8 MB RAM (16 MB recommended)
- 8 MB free disk space
- 486 DX or greater processor
- Norstar TAPI Service Provider (TSP) and supporting hardware

Note: PCM requires a Windows[®] 95 or greater operating system. Norstar TSP 2.0 supports Windows 95, 98 and Windows NT 4.0. Norstar TSP 1.2 will support Windows 3.1 and 95, however the PCM is limited to Windows[®] 95 or greater environments only.

Norstar TAPI Service Provider (TSP) 2.0

The Norstar TAPI Service Provider 2.0 delivers significant new functionality into the desktop CTI solutions arena. Norstar users can now implement cost effective solutions through either a direct connect configuration or a client/server configuration on an expanded range of Microsoft operating systems. This flexibility enables TAPI applications to be deployed throughout an organization in a cost effective and simple fashion.

Where does TAPI fit in?

TAPI (Telephony Application Programming Interface) is a product developed by Microsoft to provide a “standard” interface between the telephone switch and PC applications. Microsoft TAPI 2.0 provides standards for:

- third party call control
- full 32-bit implementation and support of 32-bit service providers
- support for Windows NT Workstation and Server
- call queuing

Microsoft TAPI 2.1 specifically adds remote client support. This enables a user to use a TAPI application from a desktop PC and communicate with the TAPI Server via the LAN. There is no need to have a physical CTI device connected to that PC. It is required, however, that this PC is “registered” at the server as a remote client, and that the remote client option of Microsoft TAPI 2.1 is “turned on” at the PC.

The Norstar TAPI Service Provider (TSP) 2.0 is required to support applications using the TAPI 2.x interface from Microsoft. TSP 2.0 supports both of the recent releases of the TAPI specification (TAPI 2.0, released in 1996, as well as TAPI 2.1, released in 1997.)

It is important to recognize that TAPI is only an enabler that translates “requests” made by the TAPI application at the desktop.

TSP 2.0 Features

TSP 2.0 was developed to support these new features of TAPI 2.0 and 2.1. The following list of features are included in TSP 2.0:

- **Full 32-bit implementation** – supports a broader range of applications. (Windows 3.1 was a 16 bit operating system; Windows 95/98/NT are 32 bit operating systems.)
- **Support of Windows NT 4.0 at the desktop** – Norstar CTI can now work at Windows 95/98 and Windows NT 4.0 servers and desktops (Note: the terminology used by Microsoft Windows NT for use at the desktop is “Workstation”. The two terms are used interchangeably in this chapter).
- **Direct-connect CTI** – Norstar TSP 2.0 can be used in a configuration where the CTA device (CTA 100, CTA 150*i*, or CTA 500*dm*) is connected directly to a desktop PC and Norstar set, similar to the configuration used with TSP 1.2.

- **Server-connect CTI** – a single CTA device can be connected to the Norstar and to a Windows NT server, and any PC on the LAN can enjoy the benefits of CTI and TAPI applications through use of a TSP 2.0 seat license and TAPI 2.1's Remote Service Provider.
(Note: TAPI 2.1 delivers a remote service provider, which enables a remote PC to utilize TAPI commands from a CTA device connected to a service. TAPI 2.1 must be installed on the desktop and the remote service provider option must be enabled; a Norstar TSP seat license is installed and enabled at the Windows NT Server for each server-connected PC.)
- **Full support for the entire CTA family** – software drivers for the CTA 100, CTA 150i, and CTA 500dm products are included within the TSP 2.0.
- **Auto detect of the CTA device** – TSP 2.0 will automatically detect which COM port the CTA device is connected to, eliminating the need to set the correct COM port during installation.
- **Drop support of Windows 3.1 and TelAdaptor/Norlink** – applications running on Windows 3.1 must use TSP 1.2. The TeleAdaptor and Norlink have been replaced by the CTA 100, which is supported by TSP 2.0.

Note: TSP 1.2 is compatible with Norstar systems up to Modular ICS 3.0; there will be no further development on TSP 1.2 to support newer KSU software.

Norstar TSAPI will be manufacture discontinued as of the TSP 2.0 availability (1Q99). There is very little interest in TSAPI in the CTI market place at this time. Novell and Lucent have stopped investing in the product and have provided no roadmap for its long-term evolution. Nortel Networks Meridian has also discontinued support of TSAPI applications.

Via a Norstar CTA device (CTA 100, CTA 150i, CTA 500dm), Norstar TSP 2.0 allows TAPI applications to control the telephone set attached to the device (first party call control). Third party call control is also possible with TSP 2.0, in either a direct connect or server connect mode, on any of the clients or on the server itself.

CTI applications in a direct-connect mode are supported by Windows 95/98, and by all of the CTA devices. The CTA 100 is also supported by Windows NT. CTA 150i and CTA 500dm are not supported by Windows NT.

In order to implement CTI in a server-connect mode, the CTA device must be supported by Windows NT 4.0, and the clients must have TAPI 2.1 installed. In addition, each desktop must have the remote access component of TAPI 2.1 "turned on".

Other CTI Applications

Symposium Multimedia Conferencing 5.1

Symposium Multimedia Conferencing 5.1 is a part of the Nortel Symposium family of products. This application is a desktop video-conferencing solution for use on Meridian and Norstar systems. Combined with Norstar Modular ICS or Compact ICS ISDN-BRI and a CTA 500dm, customers may choose to dedicate or share the BRI line to the videoconferencing system, ensuring that videoconferencing is a viable alternative to business travel. Symposium Multimedia Conferencing 5.1 offers:

- Business quality video conferencing with built-in compatibility with the largest number of installed base video systems
- T.120 data conferencing including white boarding, file transfer and application sharing
- Directory dialing and call logging
- Special remote presentation features such as multiple camera and audio choices
- Audio options enabling use of headset for privacy, microphone and speaker compatibility with built-in echo cancellation for office meetings
- Video on hold – to allow privacy during a video call
- Frame grabber to capture and save either the local or remote video image
- Interactive chat – a text tool for use during the conference.

Symposium Multimedia Conferencing has been tested with Norstar Modular and Compact ICS systems with ISDN-BRI. More information is available in Norstar Solutions Tip 007, “Norstar and MultiMedia Conferencing Solution”, available for download from the Solutions website (www.nortelnetworks.com/norstar-itas).

TAPI Application Examples

Using a Norstar Computer Telephony Adapter to connect the PC to the Norstar, Norstar customers can now enjoy the many benefits offered by CTI. The Norstar CTA 100, CTA 150i and CTA 500dm can provide a wide array of business solutions that can fit into many existing LAN, client/server or stand alone PC environments.

The Microsoft standard for the desktop environment is the Telephony Application Programming Interface (TAPI). TAPI allows a Windows application to operate on many different switch platforms with little or no modification. In order to support TAPI, Nortel is providing the TAPI Service Provider (TSP) drivers for the Norstar. The TSP is a software layer that resides between the TAPI application and the Norstar system. This TSP adds new value to the Norstar by enabling the operation of Windows[®] telephony applications.

A TAPI application such as a “Personal Call Manager” runs on the users desktop computer (TAPI compatible Windows environments), drawing on and issuing telephony commands from that position.

Installation is relatively simple and can be completed by individuals familiar with Windows applications.

Note: Norstar TAPI previously used the TelAdaptor and the PCIB-TAPI card. Now TAPI uses products from the Computer Telephony Adapter family to connect to Norstar.

The TSP is packaged with the Norstar Personal Productivity Suite.

TAPI System Requirements

You must have the following minimum hardware requirements to use Norstar TSP:

- 386/33 MHz PC, EISA, or ISA bus
- 3.5" disk drive
- 450 Kbytes of free memory (RAM)
- 820 Kbytes of free disk space for Norstar TSP files
- mouse (optional, but highly recommended for installation)
- VGA or SVGA display
- one of the members of the CTA interface device family

You must have the following minimum software requirements to use Norstar TSP:

- MS-DOS 5.0 or later and either Microsoft Windows[®] 3.1 or Windows[®] for Workgroups 3.1 or later - supported by TSP 1.2 only.

OR

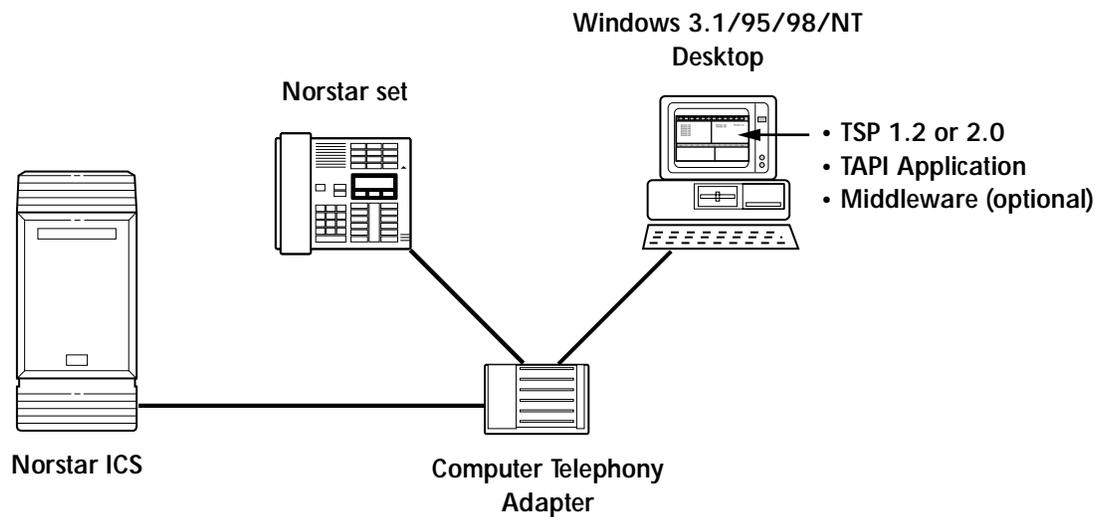
- Windows[®] 95, 98 or NT

The following illustrations summarize several TAPI implementations that utilize the Norstar TAPI Service Provider and the CTA connectivity devices on a Windows 3.1 or Windows 95/98/NT desktop PC.

Direct Connect

The following illustration shows an individual desktop productivity solution utilizing Personal Call Manager or any one of a growing number of Nortel and other off-the-shelf TAPI applications. In this configuration, the individual user has full control and administration of the application. Typical customers would include any knowledge worker with a PC and Norstar telephone on their desktop who wants to better manage their telephone contacts and features or any customer that is currently using an off-the-shelf TAPI compliant application.

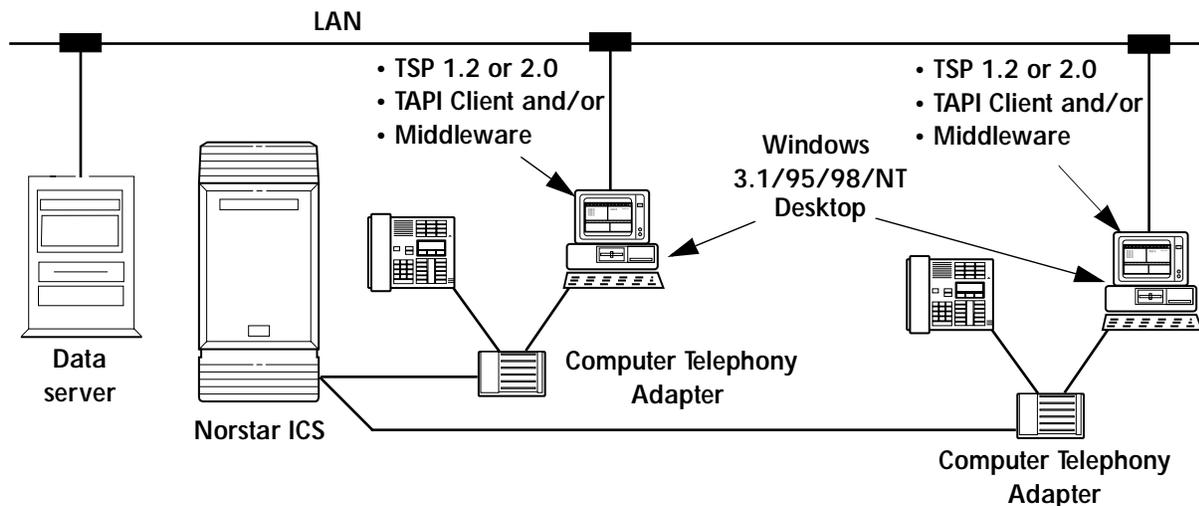
Direct connect means that the desktop PC and the Norstar set are directly connected to one another via a CTA device. This CTA device can be the CTA 100 or 500*dm*, which are external boxes sitting on the desktop, or it could be a CTA 150*i*, which is an internal card installed in the ISA slot on the desktop PC.



Direct Connect in a LAN Environment

PC users that already have LAN access to information on a database can enhance their productivity by using CTI. For example, if an insurance company has client information stored on a database, adding a CTA in direct connect mode and middleware (optional) will enable the employee to receive screen pops of the client information based on incoming CLID.

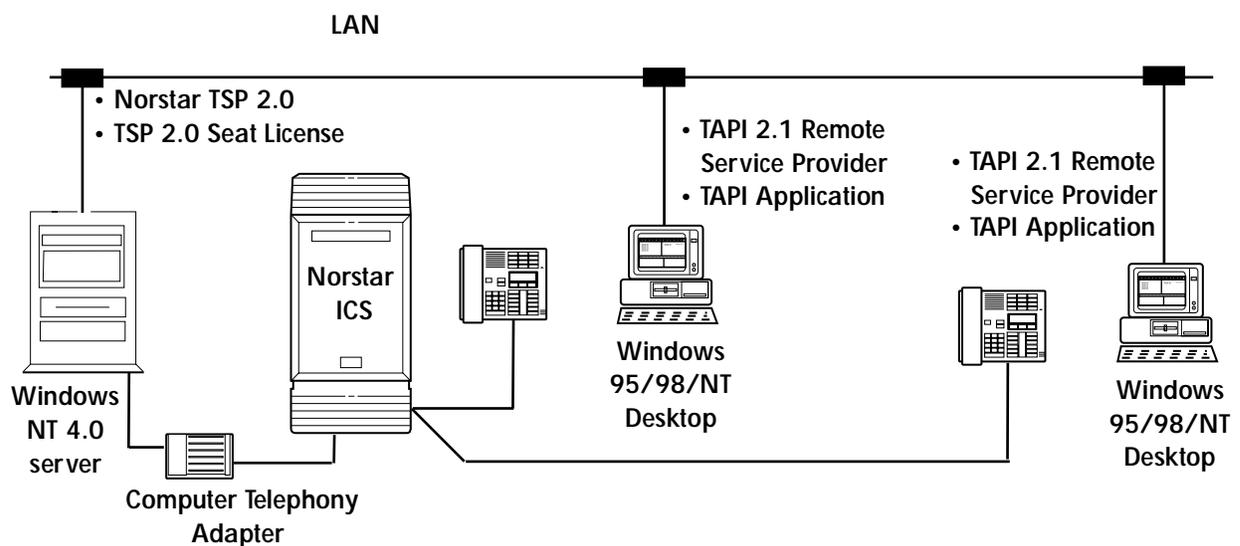
Middleware software is a layer of software installed on the desktop PC that uses incoming CLID to identify the appropriate client information and “point” to that file and invoke a screen pop at the desktop PC. There are a variety of readily available middleware applications such as Symposium Partner Program’s Revolution Rapport. The specific middleware used will vary depending upon the database being accessed; assistance can be provided by the Norstar Information Bureau.



Server Connect in a LAN Environment

In the server-connect model, there is one CTA device that is connected to a Windows NT 4.0 Server, and a logical relationship between the other Norstar telesets and the user. TSP 2.0 is installed on the Windows NT 4.0 server and the appropriate number of seat licenses are installed. (Licenses are packaged in increments of 5, 10, 25 and unlimited.)

During the installation of the seat licenses, a table that identifies which user (person) is associated with which Norstar teleset is completed. This user can then log onto the LAN from any PC (using his user ID and password), and control the functions of his phone. This is an example of third-party call control. Each desktop PC must have the TAPI 2.1 Remote Service Provider "turned on".



Norstar Computer Telephony Adapters

The Norstar Computer Telephony Adapter (CTA) products are positioned as a comprehensive and simple method of installing industry standard TAPI connectivity on the Norstar system. The product family includes an upgrading capability and supports both basic and more advanced customer applications.

All CTA products come equipped with the Norstar Personal Productivity Suite, which includes TSP 2.0 and Norstar Personal Call Manager software application.

The CTA's primary purpose is to connect the computer to the phone. In short, these connectivity devices are the actual hardware devices that sit between the computer and the phone. The TSP software is loaded directly on the computer to complete the TAPI integration. PCM provides the screen-based telephony application that enables the end user to activate certain features of Norstar, using the graphical user interface and the mouse of the Windows[®] 95/98/NT PC.

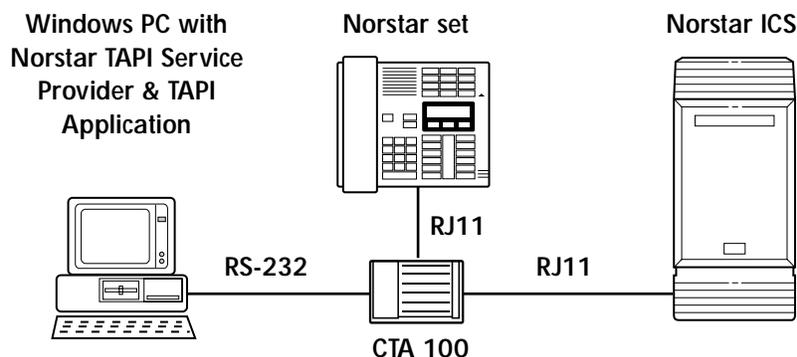
Note: All CTA devices listed below can also support Norstar ACCESS applications.

CTA 100

The CTA 100 is an easily installed TAPI connectivity device that provides TAPI connectivity via an RS-232 serial port. The CTA 100 also supports Norstar ACCESS applications.

The CTA 100 connects the 7000 series Norstar telephone to a Windows[®] PC via a RS-232 serial port. This set up provides D-channel connectivity which is required to support a wide selection of TAPI applications such as Personal Call Manager, Symposium, Symposium Partners and Business Affiliates solutions. It is a physical hardware device, located at a specific desktop, where a Windows[®] based PC is linked to a Norstar set or at a Windows NT server. The CTA 100 is recommended for any CTI user who wants call control and support of industry standard TAPI applications.

The following illustration shows the direct connection of CTA 100 to a Norstar ICS and a Norstar set. The CTA 100 is connected to a local PC through an RS-232 connection. The RS-232 connection provides serial connectivity to the local PC via a 9-pin connector.



Since the CTA 100 provides TAPI connectivity, Norstar customers will be able to enhance the communication value of their Norstar system by using a wide variety of Nortel or third party applications. This product is well suited to customers looking to translate the benefits of CTI to their businesses by increasing the rate of CTI deployment on the Norstar system. This device is also the ideal product to stimulate a customer trial of desktop CTI. For example, a customer already using a TAPI compliant application or contact manager can enable screen based dialing and screen pops simply by installing a CTA 100.

The CTA 100 package includes:

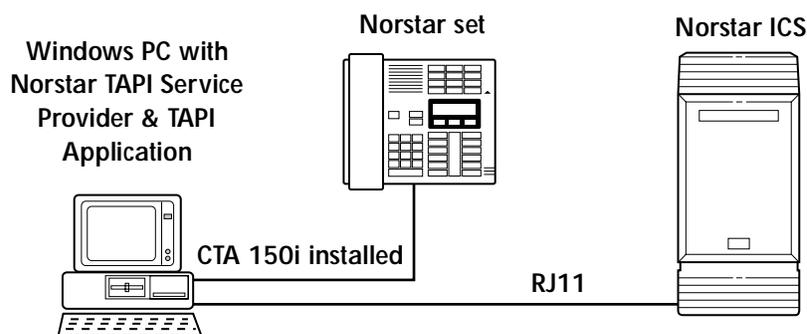
- CTA 100 device
- Norstar Personal Productivity Suite
- Power supply and all necessary cables.

CTA 150i

The CTA 150i provides a direct interface linking the desktop PC to the Norstar system and telephone set by insertion into an industry standard ISA slot in the PC. You should use the CTA 150i if a RS-232 port on a PC is unavailable. The CTA 150i performs the same functions as the CTA 100.

The CTA 150i replaces the PCIB card and supports both TAPI and Norstar ACCESS applications. Moving forward, the CTA 150i will remain in the Norstar portfolio to address the market need for an alternative to the RS-232 method of connecting to the PC.

The CTA 150i is an excellent alternative for customers who prefer the aesthetics of an internal solution and for anyone that does not have an available serial port on their PC.



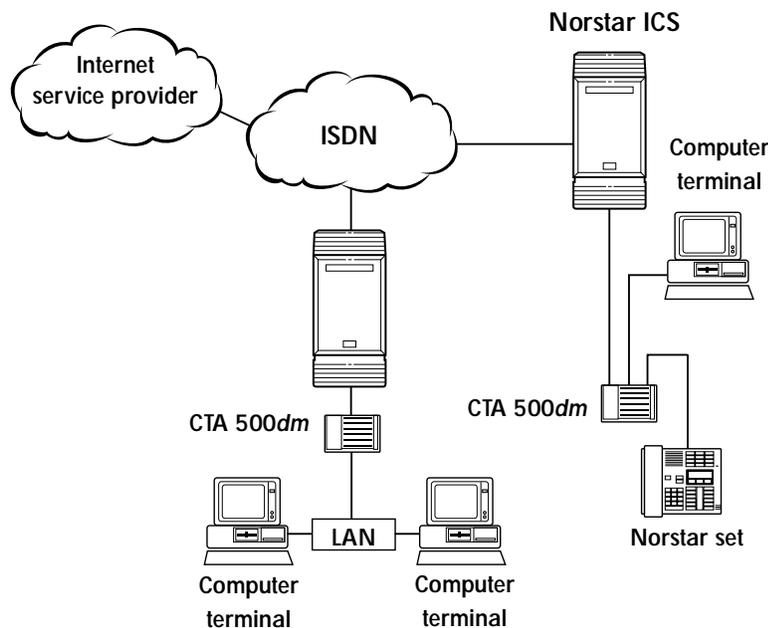
The CTA 150i package includes:

- CTA 150i device
- Norstar Personal Productivity Suite
- All necessary cables.

CTA 500dm

The CTA 500dm is designed for the CTI user requiring the increased bandwidth of ISDN-BRI in conjunction with the benefits of desktop CTI. This truly integrated solution provides the flexibility and benefits previously only possible by deploying multiple pieces of hardware and software on the desktop.

The CTA 500dm provides reliable high speed end to end digital connectivity between a computer and a remote data server, through the Norstar ICS and the public ISDN network. The CTA 500dm supports Point-to-Point protocol (PPP) and Multi-link PPP (MP), which are widely used in applications such as Internet access and remote LAN access.



A Norstar telephone can also be connected to the CTA 500dm to access Norstar voice services. You can simultaneously carry on a conversation while your computer is connected to the Internet or remote LAN, with no loss of ICS features. The CTA 500dm connects to the ICS using standard telephone cabling.

Multi-link PPP (MP) works with intelligent bandwidth management software, in the ICS, to provide dynamic bandwidth allocation. When the attached Norstar telephone is not in use, excess bandwidth can be reallocated for data traffic (up to 128 kbps). If you use the telephone, 64 kbps service is automatically reallocated for the conversation and the data connection continues at 64 kbps. When you hang up the telephone the extra bandwidth is automatically reallocated to the data connection.

In addition, some of the ICS resources (such as network access lines and calling line features) normally used for voice applications can be used for data traffic. Network access lines can be shared between CTA 500dms and the other traffic within the system. Features such as call logging, call restriction and routing based on time of day can be applied to data traffic for facility utilization and management.

In summary, the CTA 500*dm* offers:

- a modem replacement option, using PPP, MP
- high speed network rate (56, 64, 112, 128 kbps)
- high speed serial port (maximum 115.2 kbps)
- integrated desktop solutions (Norstar set, PPP/MP data version, CTI)
- bonding of two 56/64 kbps channels using MP
- dynamic bandwidth allocation between voice and data sessions
- data transfer via 3.4 khz audio call type in ISDN
- password authentication protocol support
- Hayes command dialing
- delivery of CLID
- in-field software upgrade for feature enhancement.

The CTA 500*dm* package includes:

- CTA 500*dm* device
- TSP 1.2 diskettes and Norstar Personal Call Manager CD-ROM
- Power supply and all necessary cables.

The following scenarios highlight the capabilities of CTA 500*dm* :

- A Norstar user equipped with a CTA 500*dm* at the desktop is in the process of accessing the Internet using his ISDN BRI at 115 kbps.
- The Norstar user receives a call to his Norstar telephone.
- The Norstar set rings and his CTI screen pop application presents the callers file information based on the incoming callers number; Internet access is unaffected and continues at 115 kbps.
- The Norstar user answers his telephone. 64 kbps is allocated to his voice call, and Internet access continues at 64 kbps.
- The Norstar user hangs up. Internet access automatically returns to 115 kbps.

Note: The CTA 500*dm* uses Norstar TSP 1.2 to support TAPI applications. An enhanced version, using Norstar TSP 2.0, is planned for release in Q2 1999. At present, TAPI support is not available on Modular and Compact ICS 4.0, when using the CTA 500*dm*.

Norstar TAPI Components

Components for Norstar TAPI implementation are described in the following chart:

| Component | Detail | Source |
|--------------------------------|--|--|
| User's PC | Windows [®] PC: 386 with 4 MB RAM with VGA or greater. Windows [®] 3.1, 3.11 (Windows [®] for Work Groups) or Windows [®] 95/98. Minimum hard drive processor and RAM requirements for individual TAPI applications may vary. Consult TAPI application user guides for specific requirements. | User supplied |
| Application | Application must be TAPI compliant. Runs on the user's desktop computer. | TAPI applications available from Nortel. (For example, Personal Call Manager.) Also available from 3rd party vendors or from Nortel's Symposium, Symposium Partners or Business Affiliates. See chart of TAPI applications later in this chapter. |
| Microsoft TAPI software | Allows a PC application to talk to a telephone system. | Built into Windows [®] 95/98 or Bundled with the TAPI applications Also available for Windows [®] 3.1 or Windows [®] 3.11. |
| Norstar TSP | Enabling software that allows the desired application to inter-operate with the Norstar. Installs on the user's desktop PC. | Purchased from Nortel, bundled with the Norstar Personal Productivity Suite. Installation is relatively simple and can be completed by individuals familiar with Windows [®] applications. |
| CTA 100 | A small plastic module which provides the RS-232 serial interface linking the desktop PC to the Norstar system and the telset. | Bundled with the Norstar Personal Productivity Suite. Package includes all cables and the power supply. |
| CTA 150i | Card which provides a direct interface linking the desktop PC to the Norstar system and the telset. Fits into industry standard (ISA) 8 bit slot of the PC. | Bundled with the Norstar Personal Productivity Suite. Package includes all cables. Does not require a power supply. |
| CTA 500dm | A small plastic module which provides reliable high speed end to end digital connectivity between a computer and a remote data server, through the Norstar ICS and the public ISDN network | Bundled with the Norstar Personal Call Manager and TSP 1.2. Package includes all cables and a power supply. |
| Norstar Telephones | M7100, M7208, M7310, M7324, M7410 | Purchased from Nortel. |
| Norstar Core Unit | Must be a North American model Norstar DR5 or above: Norstar 3X8, Compact 6X16 and Modular 8X24 DR5 Modular ICS R1/T1; XC-USA-1.0; XC-CDA-1.0 and higher Compact ICS 1.0 and higher | Purchased from Nortel. |

When to use the CTA 100

- simple installation - just plug in the cables and install the software
- for server-connect CTI environment
- no need to open the PC
- ideal for self-installation by the end user
- ideal for sales demos using portable laptop computers
- low risk of software conflicts since the CTA 100 uses COM1 or COM2 software interrupts, which are standard

When to use the CTA 150i

- more secure installation since it is not easily removed from the PC
- does not require additional AC power, since it draws power off the backplane of the PC
- has no footprint, i.e. does not require space on the desktop

The following matrix will help to select the optimal solution that is right for each end user.

| | CTA 100* | CTA 150i** | CTA 500dm |
|------------------------------------|-----------------|-------------------|------------------|
| Connectivity to PC | RS-232 | ISA Bus | RS-232 |
| TAPI support | Yes | Yes | Yes*** |
| Can be used in Server Connect Mode | Yes | No | No |
| Applications support | Basic | Basic | Integrated |
| Serial Port Required | Yes | No | Yes |
| External Power Supply | Yes | No | Yes |

* Replaces TelAdaptor and Norlink

** Replaces PCIB

*** Using TSP 1.2 only, up to Modular ICS 3.0

| | CTA 100 | CTA 150i | CTA 500dm |
|--|----------------|-----------------|------------------|
| Direct Connect Mode | | | |
| Windows 95 | Yes | Yes | Yes |
| Windows 98 | Yes | Yes | Yes |
| Windows NT | Yes | No | No |
| For Client PCs in a Server Connect Mode (note: server must be Windows NT 4.0) | | | |
| Windows 95 | Yes | No | No |
| Windows 98 | Yes | No | No |
| Windows NT | Yes | No | No |

TAPI Applications

A list of 50 common TAPI applications is provided in the following table. These TAPI applications are readily available and frequently in use. This table can be used as a reference tool to recognize customers that are candidates for CTI and require only the CTA device and TSP to enable desktop CTI. Specific details about any of the applications listed should be sourced from the vendor for non-Nortel marketed applications (Business Affiliate or other Applications categories).

| Application | Company | Norstar compatible (as per vendor) | Microsoft Windows OS | Type of application | Trial version on web | For more info |
|--|----------------------------|------------------------------------|----------------------|---------------------------------------|----------------------|--------------------------------------|
| Nortel Networks Applications * | | | | | | |
| Personal Call Manager | Nortel | Y | 95, 98 | Call Control/Contact Manager Software | N | www.nortel.com/norstar |
| Symposium Call Manager | Nortel | Y | 3.1, 95 | Call Control/Contact Manager Software | N | www.nortel.com/home/quick/ |
| Fastcall | Nortel | Y | 3.1, 95 | Screen Pop Software | demo only | www.nortel.com/entprods/visit/f.html |
| Symposium Fastview & Fastview+ | Nortel | N | 3.1, 95 | Call Centre Software | N | www.nortel.com/entprods/callcenter/ |
| Symposium Agent | Nortel | N | 95, NT | Call Centre Software | N | www.nortel.com/entprods/callcenter/ |
| Symposium Multimedia Conferencing | Nortel | Y | 3.1, 95 | Multimedia Communication Software | demo only | www.nortel.com/home/quick/ |
| Nortel Symposium Partner Applications * | | | | | | |
| Amicus Attorney | Gavel & Gown Software Inc. | Y | 3.1, 95 | Lawyer Productivity Software | Y | www.amicus.ca |
| Intuition | Answersoft Inc. | N | 95, NT 4.0 | Screen Pop Software | N | www.answersoft.com |
| Multi-line Pop! | Algo Communications Corp. | Y | 3.1, 95 | Screen Pop Software | Y | www.algocomm.com |
| Personal Caller ID | Algo Communications Corp. | Y | 3.1, 95 | Screen Pop Software | Y | www.algocomm.com |
| CT Pro | Algo Communications Corp. | Y | 3.1, 95 | Call Control Software | Y | www.algocomm.com |
| Phonekits Professional Edition | Algo Communications Corp. | Y | 3.1, 95 | Call Control Software | Y | www.algocomm.com |
| Pop! Server | Algo Communications Corp. | Y | NT | Screen Pop Software | N | www.algocomm.com |
| Rapport for TAPI | Revolution Software | Y | 95, 98, NT | Call Control Software | Y | www.revsoftware.com |
| Sixth Sense | Answersoft Inc. | N | 95, NT 4.0 | Call Centre Software | N | www.answersoft.com |
| SmartRoute | Answersoft Inc. | N | 95, NT 4.0 | Call Routing Software | N | www.answersoft.com |
| SoftPhone Agent | Answersoft Inc. | N | 95, NT 4.0 | Call Centre Software | N | www.answersoft.com |

* contact Nortel for further information

Note: The following charts listing Business Affiliate and 3rd Party Vendor Applications is provided for convenience only and is not intended as a list of Nortel recommended applications.

| Application | Company | Norstar compatible (as per vendor) | Microsoft Windows OS | Type of application | Trial version on web | For more info |
|--|-----------------------------------|------------------------------------|----------------------|--|----------------------|-------------------------------|
| Business Affiliate Applications ** | | | | | | |
| ACT! | Symantec | Y | 3.1, 95, NT | Contact Manager/Personal Information Manager | Y | www.symantec.com |
| CentrePoint | Coreshoft Technologies | Y | 95, NT | Unified Messaging/Call Control | Y | www.coreshoft.com |
| CT-Connect | Dialogic CT Division | Y | 95, NT | Call Control/Call Centre Software | N | www.dialogic.com |
| Day-Timer Organizer 98 | Day-Timer Concepts Inc. | Y | 3.1, 95, NT | Contact Manager/Personal Information Manager | Y | www.daytimer.com |
| Distributed Call Centre | Teloquent Communications | Y | 95, NT 4.0 | Call Centre Software | N | www.teloquent.com |
| Intellect | Clearwave Communications | Y | 3.1, 95, NT | Call Control/Screen Pop Software | Y | www.clearwave.com |
| Link | Page TeleComputing | N | 3.1, 95, NT | Call Control Software | N | www.page-tel.com |
| Maptel | MapTel Systems | N | 95, NT 4.0 | Screen Pop/Location Software | N | www.maptel.com |
| PhoneLine | CCOM Information Systems | N | 3.1, 95, NT | Call Control Software | N | www.ccom-infosys.com |
| PhoneLink | Telcom Automation | Y | 3.1 | Call Control Software | N | Users.aol.com/asktai/main.htm |
| PhoneMax | Active Voice | Y | 3.1, 95, NT | Call Control Software | Y | www.activevoice.com |
| Phonetastic Pro | Callware Technologies | Y | 3.1, 95 | Call Control Software | N | www.callware.com |
| Router for TAPI | Revolution Software | Y | 95, 98, NT | Call Routing Software | N | www.revsoftware.com |
| Star SMDR | StarMaker Systems | Y | 3.1, 95, NT | Call Control Software | N | www.starmaker-systems.com |
| Super-scripting | Digisoft Computers | N | 95, NT | Scripting Software | demo only | www.digtel.com |
| SupportMagic | Magic Solutions Inc. | N | 3.1, 95, NT | Help Desk Support Software | N | www.magicsolutions.com |
| Telescript | Digisoft Computers | N | 95, NT | Scripting Software | Y | www.digtel.com |
| TelAssist | Adv.Multi-point Conferencing Inc. | N | 3.1, 95 | Contact Manager/Personal Information Manager | Y | fox.nstn.ca:80/-amc/cit.html |
| TeleMagic (requires call control application) | Q & I Computer Systems Inc. | Y | 3.1, 95, NT | Contact Manager/Personal Information Manager | N | www.qisys.com |
| Other Applications (3rd Party Vendors) ** | | | | | | |
| Call Audit / Call Audit Voice | Mountain Systems | | 95, 98, NT 4.0 | Unified Messaging/Screen Pop Software | Y | www.mtnsys.com |
| Commence | Commence Corp. | | 3.1, 95 | Contact Manager/Personal Information Manager | N | www.commence.com |
| Goldmine (requires call control application) | Goldmine Software | | 95, NT | Contact Manager/Personal Information Manager | Y | www.goldminesw.com |
| Info Select | Micro Logic Corp. | | 95, NT | Contact Manager/Personal Information Manager | N | www.miclog.com |
| Janna Contact | Janna Systems Inc. | | 95, NT | Contact Manager/Personal Information Manager | Y | www.janna.com |
| Lotus Organizer | Lotus Development | | 95, NT 4.0 | Contact Manager/Personal Information Manager | Y | www.lotus.com |
| Maximizer (requires call control application) | Multiactive Software | | 95, 98, NT 4.0 | Contact Manager/Personal Information Manager | Y | www.maximizer.com |
| On-Schedule 97 | Odyssey Computing | | 95, NT | Contact Manager/Personal Information Manager | N | www.odysseyinc.com |
| Outlook 98 | Microsoft | | 95, NT 4.0 | Contact Manager/Personal Information Manager | N | www.microsoft.com |
| PackRat Pro 6.1 | Polaris Software | | 95, 98, NT 4.0 | Contact Manager/Personal Information Manager | Y | www.polarissoftware.com |
| Phone Dialer | Microsoft | | 95, 98, NT | Dialer | N | www.microsoft.com |
| Schedule+ | Microsoft | | 95, NT | Contact Manager/Personal Information Manager | N | www.microsoft.com |
| Sidekick 98 | Starfish Software | | 95, 98, NT 4.0 | Contact Manager/Personal Information Manager | N | www.starfish.com |
| Time & Chaos (requires call control application) | Isbister International | | 95, 98, NT 4.0 | Contact Manager/Personal Information Manager | Y | www.isbister.com |
| TransCOM | COM2001 | | 95 | Unified Messaging/Call Control | N | www.com2001.com |

** Contact vendor for further information.

Norstar PC Console Overview

The Norstar PC Console product provides the capability to attach one or more Windows® 95/98 and Windows NT PC's to a Norstar Integrated Communications System (ICS) for use by telephone system attendants. The program provides a graphical user interface for the easy handling of incoming call traffic and quick dispatch to the appropriate person or to Norstar voice messaging. PC Console runs with other Windows applications in a multi-tasking environment.

The Primary Attendant can be located wherever a Norstar telephone can be located. Additional Attendants can be located wherever a Norstar telephone and a Local Area Network (LAN) connection is available. Additional attendants for backup or overflow positions are installed through use of Attendant License upgrades. The upgrades are available in increments of one (1) or four (4), and are installed via software keycodes.

With Norstar PC Console you can:

- answer up to 144 incoming lines
- recognize and label who is calling the organization (note that target lines names are not displayed on incoming calls)
- access information about callers
- add or change caller records
- put numerous calls on hold
- see busy-line status of all phones
- view a directory of all extensions showing person and telephone status
- park calls and access paging
- transfer calls to voice mail (note that calls cannot be transferred to a guest mailbox - these calls can be transferred using the Norstar telephone)
- direct calls to an extension and display caller name in the telephone LCD window, even if the called party is on the phone
- allow the called party to control the call using options available on the Norstar M7324, M7310 and M7410 telephones
- provide management reports of how incoming callers are treated

PC Console 1.1 Overview

Norstar PC Console 1.1 was released in January 1999 to provide compatibility with Modular and Compact ICS 4.0. In addition, the following enhancements are included on PC Console Release 1.1:

- compatibility with Windows 95/98/NT
- Do Not Disturb icons (indicates when an employee's extension is set to DND)
- Call Forward icons (indicates when an employee has Call Forwarded to another extension)
- Hunt Group icons (the color of the regular phone icon will appear as blue if that extension is part of the hunt group).

Target Markets

The target market for the Norstar PC Console includes any new customer purchasing a Norstar Compact ICS or Modular ICS system, as well as, any customer already owning a Norstar CICS or MICS.

The predominant market for the Norstar PC Console are higher line size Norstar systems, or Norstar systems with high incoming call volumes. Another target market would be any customer who wants to utilize a dedicated front-desk primary answering position, either with or without a back-up answering position.

Norstar PC Console is an appropriate solution for customers that wish to:

- utilize a live attendant to handle incoming calls
- provide better service to their callers
- let employees know who is calling
- avoid missing important calls
- increase attendant productivity
- let management know how callers are serviced

PC Console Benefits to Customers

Companies of all kinds are striving to offer world class customer service, as well as understand the patterns of calls coming into a business in order to manage them appropriately. Additionally, many companies, in their attempt to offer a high level of customer service, believe that they will differentiate themselves by having a live attendant answer all calls. Norstar PC Console is a good fit for all of these business requirements.

Increased performance and employee productivity are also important to the small site business, and the GUI interface of the Norstar PC Console makes it very easy for an attendant to choose the necessary buttons and functions easily and quickly. The multi-tasking capabilities of Norstar PC Console also helps maximize the productivity of the attendant that also needs to perform other functions.

Enhanced customer service

Even before the call is answered, the Norstar PC Console can provide caller information to the Attendant to assist in handling the call. For example, the GUI can inform the Attendant of the caller's telephone number, the type of trunk group that the call came in on, and the amount of time that the caller has been waiting. The telephone call can be answered professionally and more efficiently because of the advanced information provided to the Attendant.

The graphical user interface of the Norstar PC Console can provide an Attendant with further information of a type that is not normally available with hardware-based consoles. For example, for any particular incoming call, the Norstar PC Console provides the Attendant with the names of the employees that the particular caller most often calls, along with the status of each employee's telephone. The Attendant is able to see immediately whether the target station is busy, and if so, the Attendant can quickly advise the caller of alternative employees for the caller to be connected to.

When calls are transferred back to the Attendant – e.g., in the case where the target station is not answered, or where the station user requests service from the Attendant – the Attendant can immediately be informed by Norstar PC Console as to the status of the situation.

Norstar PC Console can be configured to automatically transfer overflow calls to another Attendant when calls are coming in faster than the main Attendant can handle them. If the Attendant is on a lunch break, or otherwise unavailable to take calls, PC Console can direct all calls to a back-up attendant position. These are important and valuable features to the Norstar customer because they ensure that calls are not lost and that callers are not frustrated by delays or poor service.

Decreased operating costs

Norstar PC Console requires a Pentium-based PC running Windows 95 or higher. Because a proprietary monitor and computer hardware are not required to run Norstar PC Console, there is minimal additional equipment on the Attendant's desk and the customer realizes a lower entry cost to obtain a software-based Attendant Console product than with competitive products that require the purchase of a proprietary computer and keyboard.

Norstar PC Console also provides a multi-tenanting capability for multiple businesses using the same Norstar system.

Note: Norstar PC Console 1.1 does not provide the target line name on incoming calls.

Improved employee productivity

Because the Norstar PC Console only displays buttons that have to do with handling a particular call, the GUI interface appears to be less “cluttered” and “complicated-looking” than a typical Attendant Console. Since there are few buttons, it is easy for an Attendant to quickly select those buttons or features that are necessary to handle any particular telephone call.

Norstar PC Console works in a multi-tasking environment; this means that the Attendant can be using their PC to do other tasks such as word processing, and then quickly switch to the Attendant program when a screen pop notifies them of an incoming call.

The Norstar PC Console not only increases the personal productivity of the attendant, but also of employees that receive calls. The Attendant can communicate with an employee's telephone set, even when the employee is busy on another call. For example, caller information can be sent to the 2-line LCD display window on the employee's phone. The employee then decides what to do with the call, and with the use of soft keys, control it accordingly. All of this could be done without the employee leaving or disrupting the call that they are currently on.

PC Console Configuration

The Norstar PC Console is flexible enough to allow a variety of different configurations and work styles. In the most basic setup, a single Attendant position could be assigned to handle all of the incoming calls.

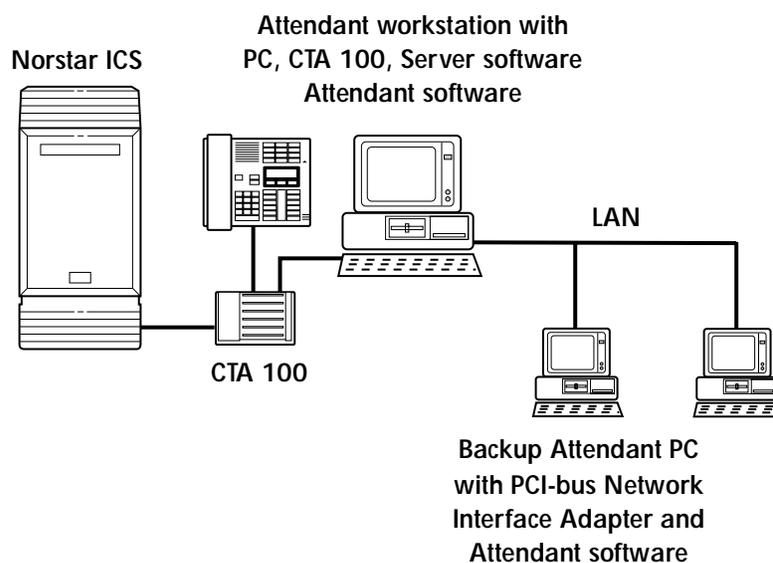
A second alternative is to assign a “back-up” or “overflow” Attendant, to assist the main Attendant. In the back-up Attendant situation, the main Attendant would have the capability to simply choose an option to cause all future incoming or Attendant-handled calls to be re-directed to the assigned back-up Attendant. This is extremely useful because the back-up Attendant would not have to physically relocate to the main Attendant’s desk.

Norstar PC Console runs on a Pentium-based personal computer (PC), in conjunction with a Computer Telephony Adapter and PC Console software. The PC Console Server software can reside on the Attendant’s PC, or on another PC within a LAN environment, providing the Attendant’s PC is also within the LAN. The PC Console Attendant software is installed on each PC that is being used by an attendant.

PC Console can be used as either a stand-alone model, where one attendant handles all incoming calls, or a networked model where one or more PCs on a LAN provide backup attendant positions. The Attendant’s PC connects to a Norstar CICS or MICS through a CTA 100 or CTA 150i.

Even when there are several attendants or back-up attendants, only one CTA device is required because the other PCs connect to the PC Console primary position via a PCI-bus Network Interface Adapter (10/100 MB Ethernet).

The following example shows PC Console installed in a system where there is one primary attendant, and a backup attendant via a LAN.



PC Console Architecture

The Norstar PC Console consists of three interrelated components:

- Server software
- Attendant software
- Reports software

Server Software

The Server software only needs to be installed in one PC, and can be installed in the Attendant's PC or any PC on the LAN, providing the Attendant PC is connected to the LAN. In most cases, the Server software will be installed on the PC used by the primary attendant. Once installed, the Server software receives notification of all incoming calls, outgoing calls, and change of status of all telephones. The Server software can also request your Norstar ICS to transfer calls, place calls, park calls, and perform other Norstar telephone functions. The Server software can support multiple Attendant and Assistant positions.

Attendant Software

The Attendant software provides a PC-based graphical user interface to perform the same functions as a Norstar telephone when answering and handling incoming calls. In a LAN environment, the Attendant software can also be installed in multiple positions to provide additional or overflow coverage. Attendant software is installed in each PC that is being used as an answering position by an attendant. Usually, the primary attendant will have both Server and Attendant software installed on their PC.

Reports Software

Reports software automatically collects information on incoming calls and tracks how callers are treated. This important information can be used to spot trends and provide answers to questions before they become problems. Reports can be requested from any Attendant or Assistant console and viewed on a PC screen, sent to an attached printer, or exported to other applications for further data manipulation. PC Console's reports include:

- Calls to Employee Report - this report shows the types of calls (personal, customer, vendor, etc.) employees are receiving over a defined time period.
- Calls by Customer Report - shows how incoming customer calls were handled by employees: call taken by employee, call taken by assistant, call routed to voice mail or call routed to operator.
- Extension Directory Report - lists all employees that are in the Norstar PC Console database along with their department information.

Call Handling

The Attendant and Assistants have access to many features, all of which are executed through the Norstar PC Console main window. The primary features and the main window are described in detail below.

- answer calls
- enter caller information
- find an extension
- transfer calls
- handle callbacks
- Visual Call Announcing in the Norstar Telephone LCD Window
- Call Control by the called party
- a Caller Database
- automatic reporting on incoming calls

Note: Visual Call Announce and Call Control are only available on Norstar M7324, M7310 or M7410 telephones.

Using the main window, the Attendant screen displays information about the incoming call such as caller name, company name and to whom the caller normally talks. The Attendant screen also shows a Company Directory with employee telephone status and personal status such as “away from office” or “away from desk”. The Attendant can also do a search for employees by name or department in the Company Directory. Once the employee’s extension is selected, the call can be transferred to their telephone, to their voice mailbox or to another number (e.g. home, cellular, pager).

Note: To transfer a call to a Guest Mailbox the Attendant must use the Feature key on their Norstar telephone.

Using a Windows 95/98/NT-compatible PC, the Attendant can type the caller’s name and transfer the call to the called party. The caller’s name only needs to be entered the first time. In subsequent calls, PC Console will “remember” the caller name and link it to the CLID.

The Attendant can also park the call automatically, page the called party and view parked calls to see details of all calls parked on the system. Or, the call can be processed according to “memo” instructions related to the caller. The current availability of employees is shown on the main window. For example, the notes field will identify if an employee is in a meeting or out of the office. When they are not covering calls, Attendants can be working on other tasks on their PC.

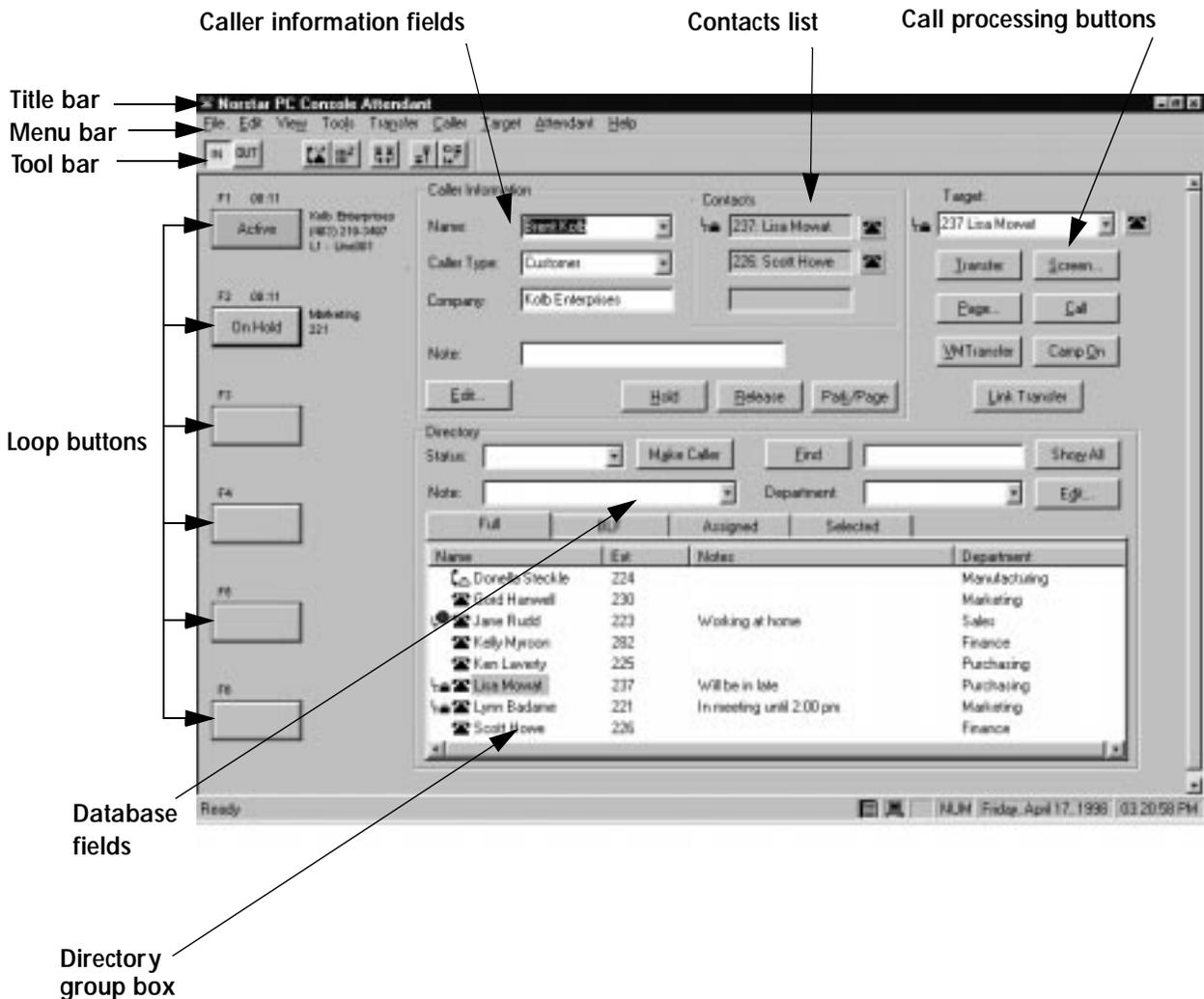
The Assistant

The Assistant performs the same functions as the Attendant when answering incoming calls. The Assistant is used to cover incoming calls for an individual, a work group, or a department.

Using a Windows 95/98/NT-compatible PC, The Assistant can be alerted by a Call Notification dialog box “popping” on their PC main window when a call is ringing the covered telephone set. This lets the Assistant pick up the ringing call if the called person does not answer. The assistant can easily add or remove telephone set(s) to be covered by selecting the extension(s) from the Assigned tab.

Components of the main window

The Norstar PC Console main window shows the following:

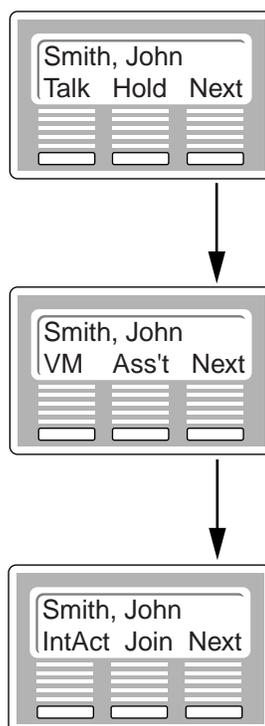


Visual Call Announce

Once the Attendant has routed the call to the extension, a low-level audible tone will alert the called person, even if they are on their phone. The caller's name will be displayed in their LCD window (M7324, M7310 and M7410 telephones only). In a busy office environment, visual call announce provides more privacy and less noise than paging.

Call Control

Norstar PC Console lets the called party determine how they want to handle incoming calls, even when they are already occupied on a call. Rather than having all calls automatically forwarded to voice mail when they are busy, employees now have the option of managing their calls using the 3 interactive softkeys below the LCD window of their Norstar M7324, M7310, or M7410 telephone.



By pressing an interactive softkey beneath the LCD Window of the Norstar M7324, M7310, or M7410 telephone, the following options are available:

- Talk to the caller by pressing the “Talk” softkey
- Ask the caller to hold by pressing the “Hold” softkey, which delivers a pre-set message to the attendant, who can advise the caller of the hold request
- Automatically transfer the caller to voice mail by pressing “VM”
- Send the caller to an assistant by pressing the “Ass’t” softkey, which delivers a pre-set message to the Attendant, who can speak to the caller and transfer them to the assistant.
- Send the call back to the attendant by pressing the “Interact” softkey, which delivers a pre-set message to the attendant informing them to speak to the caller

- Join the caller with the current call by pressing the “Join” softkey

If the called party is on the phone, the name of the new caller will overwrite any information that is in the LCD window. The new caller’s name is displayed in the LCD Window of the telephone for all calls transferred from the Norstar PC Console, but will disappear in approximately 20 seconds.

Caller Database

One of the benefits of the Norstar PC Console is that it can be installed as a passive system and can work in the background without affecting the way the ICS operates. Thus, a database can be automatically built on all incoming caller information.

The Norstar PC Console will automatically create a caller database by collecting the following data elements on incoming calls:

- time of day and date
- Norstar ICS line on which the call was received
- caller’s name (name and company from Caller ID or entered by using the PC’s keyboard)
- caller’s telephone number (from Caller ID)
- extension of the person called
- whether the call went to a voice mailbox or was referred to an assistant
- duration of the call (minutes and seconds).

Through Caller ID and the keyboard entry into the Caller Information fields of the Norstar PC Console, a database of caller records is automatically built so that future callers can be identified. This makes the Attendant’s job easier and more efficient since a name is entered only once rather than every call. Extension data (name and/or number) is automatically downloaded from the Norstar ICS to the Norstar PC Console database.

Using the Edit function in the Caller Information group box, information can be entered into the caller database through a simple, “fill-in-the-blanks,” Windows-oriented data entry form. The caller database provides an important tool for management to see how callers to their organization are being treated.

The caller and employee database is a Microsoft Access 97 database and can be opened and manipulated using any application capable of working with Microsoft Access 97 databases.

System Requirements

PC Console comes bundled with:

- either the CTA 100 or CTA 150i
- software on a CD-ROM
- cables
- power supply (with CTA 100)
- installation instructions

PC system requirements

Whether you are installing both the Server and the Attendant programs or just the Attendant program on a PC, the following PC hardware and software is required:

Minimum hardware requirements:

- Pentium based PC
- 32 MB of memory or greater
- 10 MB available disk space (total disk space required for either the stand-alone model or networked model)

Note: Additional disk space may be required for the Server database. The required size of the Server database depends on the call volume and the frequency of call record deletion.

- CD-ROM drive (for program installation). If you want to install Norstar PC Console on a PC without a CD-ROM drive, the program can be installed over a Local Area Network from a PC that has one.
- SVGA monitor with a minimum resolution of 800x600 and .28 dot pitch or smaller
- keyboard and mouse supported by Windows
- Norstar Computer Telephony Adapter (CTA 100 or CTA 150i)
- printer supported by Windows (optional, for report printing)
- PCI-bus Network Interface Adapter, 10/100 MB Ethernet (only required for networked model)

Note: Excludes NE2000-Class cards.

Minimum software requirements:

- Windows[®] 95, Windows 98 or Windows NT 4.0 Operating System
- Norstar PC Console Server program (included in Norstar PC Console product)

Norstar Compatibility

PC Console 1.1 is compatible with the following

Norstar Releases

- CICS 1.0 and higher
- MICS XC 1.0, XL 1.0
- MICS 1.1 and higher

Attendant Telephones

- M7310, M7324, M7410

Visual Call Announce and Control

- M7310, M7324, M7410

Monitored Telephones

- M7100, M7208, M7310, M7324 (including Key Lamp Module if present), M7410
- Companion telephones
- 2500 telephones

Nortel Symposium

Nortel Symposium, launched as a Nortel brand in 1997, is a portfolio of integrated communications products. It offers a single point of contact for comprehensive CTI solutions through the existing Nortel authorized distributor network.

The vision of Symposium applications is that they operate across all Nortel switching platforms including Meridian, SL-100, DMS and Norstar.

The program offers a wide variety of innovative, complementary Symposium applications and support encompassing five different areas:

- Symposium Call Center brings new power to customer relationship management, offering advanced skillset routing, total call tracking, CTI and Internet capabilities. Other Call Center applications include IVR, Fast View, and Remote Agent.
- Symposium Desktop Applications are powerful multimedia communications tools for businesses, and include:
 - Symposium Multimedia Messaging which provides quick access to fax, e-mail and voice messages in a single computer window
 - Symposium Multimedia Conferencing, a versatile multimedia application for interactive collaboration with others through video conferencing, document sharing, whiteboarding, application sharing, and high speed file transfer.
- Symposium Multimedia Toolkits, which include application development tools and APIs, backed by expert developer support services.
- Symposium Professional Services works with Nortel authorized distributors to design and implement CTI solutions.
- Symposium Partners Program.

Nortel Symposium Partners Program

Businesses continually look for new ways to gain a competitive edge and improve the delivery of customer services. But with so many choices available on the market today, you're challenged to ensure compatibility and keep your options open. The Nortel Symposium Partners Program exists to help you find the best multimedia and power network solutions for your customers.

Nortel already has alliances with over 300 software developers and systems integrators to work with us through the Business Affiliate Program to develop applications which complement Nortel switching platforms. Nortel now takes the relationship with a select few of those companies to the next level.

The Symposium Partners Program is a co-marketing arrangement between Nortel and selected third party vendors. It allows Norstar to quickly offer a wide variety of new and complementary applications by co-marketing third-party solutions from some of the world's premier multimedia applications developers. Norstar Symposium Partners Program solutions are chosen at the recommendation of Norstar, and with input from the Norstar distributors.

Authorized Symposium Partners products can be recognized by the SPP logo on their products.



Currently, there are three Symposium Partners products available and tested for Norstar; negotiations are in progress with other vendors to selectively expand the program. The three current products are:

PhoneWare Agent (by Q.SyS, Inc.)

PhoneWare Agent offers a cost effective informal call center solution for workgroups ranging from 2 to 100 agents. The result is improved productivity and communications for help desk, inbound/ outbound sales groups, and customer service departments.

PhoneWare links to many standard databases and off-the-shelf applications. Agents are not only informed of who is calling, but are provided important customer information to handle the call. PhoneWare Agent can easily link directly to these applications and provide a screen pop, which greatly reduces call duration. Informal call centers can now handle more calls per agent and reduce telephone toll charges. Some of the features available with PhoneWare Agent are:

- On-demand Screen Pops
- Database Previews
- Database Dialing
- Call Logging (including Unanswered Call Notification) and Call Notes
- Call Recording.

Amicus Attorney (by Gavel & Gown Software Inc.)

The Amicus Attorney suite of products, currently available for the Windows platform, includes Amicus Attorney, Amicus Assistant, Amicus Team, and Amicus Telephone. Amicus Attorney is a comprehensive case manager, calendar, tickler, contact manager, time sheet and telephone management system. Amicus Telephone is a sophisticated telephone solution developed to work on Nortel switches with Microsoft's Telephony Application Programming Interface (TAPI).

The Amicus Attorney suite of products coordinates with word processing, e-mail, litigation support, accounting and similar programs, pulling them all together into a consistent interface. The key to Amicus Attorney is its integration of many kinds of legal information into one intuitive system. In fact, Amicus Attorney was developed by a practicing attorney as an in-house solution for a large law firm. It works the way an attorney works.

The business case for firms to buy Amicus is so compelling, because in most instances it will pay for itself in a matter of weeks. By automatically creating a client-specific record for each phone call, Amicus Telephone can easily enable an attorney to bill an extra 2-4 hours per week.

Rapport for TAPI (by Revolution Software)

Integrating the power of Norstar into desktop computing applications is now simpler than ever with Rapport for TAPI - a flexible, feature rich, 32-bit middleware application for personal call control/manager for screen pops.

Rapport for TAPI's ability to integrate with virtually any Windows application is a powerful tool that will save valuable productivity time by removing the need to open and close multiple applications.

Rapport is always visible to the user, but will not interrupt the active application. The user is presented with a simple indication of an incoming call in Rapport's monitor window, and can then decide to ignore the call or to answer and direct the incoming caller information to another application, such as Outlook or ACT!

One of Rapport's strongest attributes is the ability to send Caller ID into as many as five Windows applications, either automatically or on demand based on user-selectable options. If one caller needs to be looked up in ACT! and the next caller needs to be looked up in an accounting package, Rapport for TAPI can do it.

Business calls do not take place in a vacuum. They are often directly linked with information that exists in your software applications, such as Outlook, ACT! or Goldmine, or your proprietary Windows application. Rapport for TAPI integrates with virtually any Windows application, including both TAPI and non-TAPI applications, to perform screen pops and out bound dialing.

Outgoing calls can be made from virtually any Windows or DOS based application using several different yet very flexible methods. Rapport for TAPI also has the unique ability to enable the user to designate particular inbound lines on which to perform screen pops so the user isn't interrupted with call information from every line on their telset.

Features:

- Seamless, non-intrusive integration to any Windows desktop environment
- Increase productivity by eliminating misdials
- Call logging for later recall or printing
- Powerful personal and global dialing databases
- Place phone in "Do Not Disturb" state
- Audible and Visual message waiting indication
- Target line identification and screen popping
- Familiar Windows 95 interface with comprehensive "What's This" Help

What is the benefit to you and your customer?

Many customers want to purchase their communications solution from one vendor. By enabling you, the distributor, to purchase a complete solution through Norstar, you can offer that same one-stop shopping service to your customers.

Along with that one stop shopping comes the assurance that the third-party product has been test and verified against the Norstar platform and the knowledge that the Symposium Partners Program vendor is committed to working closely with Norstar and its distributors to ensure that customer needs are met. This includes support during and after the sale.

For more information contact:

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Web site: www.nortel.com/entprods/sympartners

Nortel Business Affiliate Program

The Nortel Business Affiliate Program is designed to provide technical and marketing support to companies who work closely with Nortel customers and distributors in delivering Computer Telephone Integrated (CTI) solutions. Affiliate companies include software application developers, value-added resellers of CTI applications, and system integrators that specialize in voice, video communications, and telephony application technologies, as well as organizations that want to develop private applications to work with Nortel equipment. With all suppliers (computer manufacturer, telecommunications supplier, and application software developer) of an integrated computer telephony solution working together, the customer receives a smooth implementation, prompt problem solving, and the best-in-class solution for their business needs.

For more information, contact:

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