Norstar Handbook

Version 10.0

**NORTEL
NETWORKS**

Table of Contents

Introduction

Introduction

Version 10.0 of the *Norstar Handbook* has been issued to include the following changes to the Norstar portfolio:

1. Introduction of:
    *   Norstar* Release 6.1 software
    *   T7316E telephone and T24 Key Indicator Module (KIM)
    *   Norstar Voice over Internet Protocol (VoIP) Gateway
    *   CallPilot* Release 2.0.
2. Norstar Voice Mail manufacture discontinue effective December 31, 2003.

Chapter Highlights

*   The Norstar Integrated Communication Systems* (ICS) portfolio – combines the latest technological advances with LCD windows on every Norstar telephone, providing powerful business communications that include ISDN functionality, Internet access, and desktop messaging
*   Norstar Modular ICS – targets businesses that use more than 20 telephones and supports analog or digital lines, including ISDN Basic Rate Interface (BRI) and ISDN Primary Rate Interface (PRI), for high-speed voice and data applications
*   Norstar Compact ICS – is built to meet the existing telephony requirements of small businesses with a requirement for 20 telephones or less and accommodates future growth
*   Norstar 3x8 – is expandable up to three lines and eight extensions and offers features that help businesses to manage communications and improve customer service
*   CallPilot* 100/150 – the voice messaging system for Norstar that offers advanced messaging applications for small and medium businesses
*   Norstar Automated Call Distribution (ACD) Systems – make call center capabilities realistic and cost-effective for businesses of most sizes
*   Norstar Computer Telephony Adapter (CTA) products – allow businesses to take advantage of the latest CTI applications.

Chapter Overview

The *Norstar Handbook* is a reference tool designed for representatives who sell the Nortel Networks* Norstar product portfolio in North America. The *Norstar Handbook* is packed with information about all current Norstar products and is updated by supplements when new products are introduced.

The content of the *Norstar Handbook* is organized so you can quickly find the most relevant section for a current project or request for information. The information you find here should help to make your Norstar sales easier, quicker and more professional.

The *Norstar Handbook* is intended for reference purposes only. Please consult the latest Norstar Product Catalog or ordering source for detailed specifications and ordering information.

The hardware mentioned in this handbook may not be a standard offering with your company. Before talking to a customer about information in this book, please check for availability, pricing, current distribution and support policies.

Nortel Networks

Nortel Networks is a global Internet and communications leader for service providers and enterprises, with capabilities spanning Optical Long Haul Networks, Wireless Networks, Enterprise Networks and Wireline Networks. Today, Nortel Networks is competing at the heart of the high-performance Internet to unleash its customers' potential to profit through an unrelenting focus on creating revenue-generating opportunities. It is working to unlock new streams of revenue, deliver unprecedented services, secure competitive advantage and create more powerful and lasting customer relationships. Nortel Networks serves the emerging and existing needs of service providers, carriers, dot-coms, small and medium-sized businesses and large corporations in more than 150 countries and territories around the world.

Nortel Networks has offices and facilities in Canada, Europe, Asia-Pacific, the Caribbean and Latin America, the Middle East, Africa and the United States.

Norstar Solutions

Nortel Networks delivers global, industry-leading enterprise solutions for businesses of all types and sizes. These include communications systems, call center and multimedia messaging applications, and interactive voice and data access products. The company's customer-driven solutions increasingly take advantage of Internet and computer integration, helping drive business performance, and creating a greater competitive advantage for our customers. One such Nortel Networks enterprise communications solution is Norstar Integrated Communications Systems (ICS).

Norstar ICS solutions provide complete, integrated communications to power businesses worldwide. Digital switching, applications, mobility and more – all work together – so building and using a Norstar communications system is simple.

The Norstar target market is made up of single-site, standalone businesses, multisite businesses and franchises, as well as branch offices and departments within large organizations. These are customers looking for a high quality traditional voice communications system. Market studies indicate that:

- Businesses make the decision to buy a telephone system every five to seven years
- Businesses make decisions quickly, based on their experience with telephone systems and the supplier's reputation
- Users' needs vary greatly, as do their understanding of how a telephone system can improve their business.

Since its introduction in 1988, Norstar has cost-effectively brought digital technology to the desktops of small businesses, ensured simplicity for the end user and provided an architecture that allows new functionality and the integration of applications into the system.

With more than 14 million telephone sets in over 80 countries, Norstar is *the #1 small system for business communications in the world.*

Market Trends

The following key trends, events and pressures are currently impacting the voice and data networking worlds:

Return on Investment Mentality

It's a fact that businesses today are looking for ways to increase revenue while reducing costs. By implementing an integrated voice and data solution, businesses can boost their productivity and improve their bottom line. And enterprises with branch office locations can increase their presence without increasing the cost of maintaining their remote locations, or without isolating their branch offices from head office.

Risk Containment

Most businesses, regardless of size, need to consider whether their initial capital investment in their communications system will be ready to take them into the future. The question of evolution or revolution is an important one when it comes to risk containment; for example, businesses need to determine whether their existing equipment can expand with their business, or if they require a complete system overhaul to accommodate growth and take their business into the future.

Definitive Business Plans

As the emerging standard in business communications, integrated voice and data offers the flexibility companies need to adopt transaction-based and integrated applications, gain new control in voice and data management and extend the same level of communications they have at head office to their remote offices. It is a proven technology option, and businesses are increasingly taking advantage of the benefits this type of communications system offers. The Norstar VoIP Gateway, introduced with Norstar Release 6.1, is the ideal solution for businesses looking for an entry-level integrated voice and data system.

Norstar Positioning

The main target markets for Norstar systems include:

• Price-sensitive customers

• Customers who require basic applications and have limited networking needs.

Key Messages

With its building-block design, the Norstar ICS portfolio offers powerful solutions that meet a business's current challenges, while providing the flexibility to meet future needs. Norstar's key messages include:

• Reduced total cost of ownership – Businesses can save money with Norstar's efficient call handling, as well as its ability to automate tasks like call routing and system reporting

• Simplicity – Norstar systems are easy to install, support and maintain, so customers can benefit from reduced training time and do not need to invest in technical support staff

• Reliability – Norstar has a Mean Time Between Failure (MTBF) rate of 100 years, the highest in the telecommunications industry

• Investment Protection – Norstar, the #1 selling small communications system for five years running, is a scalable solution that can grow as a customer's business grows.

Norstar ICS Portfolio

The Norstar ICS portfolio, introduced in 1994, is based on a vision that links computers and communications platforms, networks and components to deliver innovative solutions to today's business challenges and tomorrow's opportunities. With Norstar, a small system can offer companies the kind of power previously found only in big-business environments. Thanks to its building-block design, Norstar systems easily expand for even more power as the company grows. It's an approach that makes the most of voice technologies – both now and in the future.

Combining the latest technological advances with LCD windows on every Norstar telephone, ICS systems provide powerful, yet friendly and intuitive, business communications including ISDN functionality, Call Centers, Voice Messaging and Voice over Internet Protocol (VoIP).

Customers can choose from three Norstar platforms: Modular ICS, Compact ICS or 3x8. All of these platforms can integrate business communications to make employees more productive, reduce costs and provide superior customer service. The size of a business and its specific business communications requirements determine the Norstar system that best fits.

Norstar Modular ICS

The Norstar Modular ICS is the world's best-selling small business communications system. It provides today's businesses with the power and advanced applications they require, and the growth capacity and capabilities they will need for the future.

The Modular ICS is a module and cartridge-based system that offers unprecedented ease in installation, maintenance, expansion and customization. It targets businesses that use more than 20 telephones and require capabilities which allow for more power, more growth and more advanced applications. It can start as small as 4x32 (4 lines and 32 extensions). The Modular ICS can support analog or digital lines, including ISDN BRI and PRI for high-speed voice and data applications. With XC software installed, Modular ICS capacity increases to 248 ports.

Norstar Compact ICS

The Norstar Compact ICS can support up to eight ISDN Basic Rate Interface (BRI) connections (sixteen 64Kbps B-channels and eight 16Kbps D-channels) for voice, data, video or image transfer applications; up to eight Analog (LS/DS or CLID) lines; or a combination of both. In addition, the Compact ICS supports up to 24 Norstar telephones. It is designed to provide growth flexibility in a scalable format and is built to meet the existing telephony requirements of small businesses.

The system's software is contained on a Personal Computer Memory Card International Association (PCMCIA) memory card. The Compact ICS Control Unit is equipped with a slot that houses the removable PCMCIA card. The memory card is approximately the size of a credit card.

Norstar 3x8

The simple yet sophisticated Norstar 3x8 system was designed specifically for small businesses. It is expandable up to three lines and eight extensions and offers a wide variety of features to manage communications and improve customer service.

Norstar Key Selling Points and Benefits

Original research for Norstar told Nortel Networks that businesses wanted a telephone system that was flexible, reliable and, above all, easy to use. Norstar offers unified, scalable, high-capacity integrated voice and data solutions that can give businesses Internet access, high-speed data, wireless capabilities and a steady stream of revenue-generating applications. But whether companies want basic telephony or fully integrated voice and data, Norstar offers business solutions that keep customers coming back for more.

Key Benefits

By implementing a Norstar ICS solution, a business can:

- Reduce costs
- Expand business
- Improve customer service
- Enhance productivity
- Impress customers
- Take advantage of no-risk investment.

Reduce Costs

Norstar solutions reduce a business's costs by:

- Reducing time spent on repetitive communications
- Simplifying system configuration and remote diagnostics
- Eliminating employee training through ease of use
- Protecting business investments with scalable, reliable systems that grow with a business
- Delivering information via a cost-effective new media
- Providing management reports to optimize your resources
- Offering network solutions that reduce toll charges and recurring line costs.

Expand Business

Norstar solutions expand businesses by:

- Providing callers with customized recorded promotions
- Enabling 24-hour voice-based customer transactions by phone.

Improve Customer Service

Norstar solutions help businesses improve customer service by:

- Auto directing calls to the right person or area

- Using individualized voicemail to ensure that users never miss a call

- Queuing calls to ensure the caller has the opportunity to speak to a live person

- Offering 24-hour customer self-service by phone

- Providing constant communications for employees on the move.

Enhance Productivity

Norstar solutions enhance a business's productivity by:

- Providing simple and easy-to-use programming

- Protecting businesses against recurring equipment failure, with the highest reliability ratings in the industry

- Offering business-building applications like call processing, call centers and unified messaging.

Impress Customers

Norstar solutions help businesses impress their customers by:

- Projecting a professional business image through efficient, state-of-the-art communications

- Allowing businesses to stay in touch with their customers 24/7

- Letting users know who's calling before they answer the phone

- Leveling the playing field – making even a small business seem like a large business.

Take Advantage of No-Risk Investment

Nortel Networks is a 100+ year old company recognized as the leading global telecommunications equipment provider, Nortel Networks provides businesses with no risk investment by:

- Offering safe, secure and reliable Norstar solutions

- Standing behind Norstar with the Performance Promise

- Promising investment protection from one system to another

- Guaranteeing the quality and value of Norstar, which has been recognized as the world leader for six consecutive years.

Norstar Applications

Norstar Applications are designed to integrate with Norstar business communications systems to provide messaging, call management, faxing, email and much more. All Norstar Applications integrate seamlessly with Norstar systems, so they are easy to add as customers need them.

Norstar Messaging

Norstar CallPilot 100

Norstar CallPilot 100 is targeted at price-sensitive customers with minimal applications requirements. CallPilot 100 simplifies the portfolio with Web-based management and Keycode Retrieval System (KRS), while offering a common user interface that reduces training requirements.

CallPilot 100 Release 2.0 offers added value to small businesses with the optional additions of Messaging and VPIM/AMIS networking.

Norstar CallPilot 150

Norstar CallPilot 150 for Norstar provides a cost-effective solution for businesses with up to 300 users.

CallPilot 150 is an applications platform designed to address customers requiring additional mailbox expansion, a basic call center application and enhanced applications such as Unified Messaging and Digital Networking. CallPilot 150 provides an IP-ready 10/100 Mbps Ethernet connection for simplification of system administration and keycode retrieval.

CallPilot 150 Release 2.0 supports centralized voicemail and provides a single voice messaging solution for up to ten Norstar sites networked using MCDN over PRI.

CallPilot Desktop Messaging

CallPilot Desktop Messaging is the solution to information overload and is supported on both the CallPilot 100 and CallPilot 150. It lets users retrieve all incoming information – voice and email messages – directly from their computer screen. At a glance, a user can see who messages are from, when they arrived and how urgent they are. They can read or listen to messages in any order, forward or save them – all at the click of a mouse button. Even when voice and email messages are coming in faster than the user can retrieve them, they can manage and prioritize what's important, saving the rest for later.

Norstar Digital Networking

Norstar Digital Networking is the solution for almost any organization that wants fast, clear and seamless voice and fax communications to everyone across its local area network (LAN) or wide area network (WAN), or via the Internet. Digital Networking can transfer voice messages over a LAN/WAN, or the Internet, to Meridian Mail (with Network Gateway), CallPilot 100 or to CallPilot 150 systems using standard Internet protocols. It transfers voice messages seamlessly between Norstar systems. And with digital technology, these messages are unaffected by bandwidth or circuit quality, arriving at their destination crystal clear.

Norstar Call Centers

Norstar Automated Call Distribution (ACD) systems make the idea of "call center" capabilities realistic and cost-effective for most businesses, regardless of size. Whether a business needs a powerful ACD system for many agents or a smaller system for auto answering and call routing, Norstar ACD systems offer high value and are easily cost justified.

Norstar PRELUDE ACD

Norstar PRELUDE ACD is designed for businesses with as many as 15 active phone representatives and up to 30 incoming lines. To help improve how a business handles inbound calls, PRELUDE ACD offers essential features like: real-time group and system status displays, management reports, "longest-idle" call distribution, voice announcements played to callers on hold, call overflow, caller directed routing and other advanced call routing.

Norstar CINPHONY ACD

Norstar CINPHONY ACD offers additional capacity and supervisor functions to meet the needs of growing businesses. CINPHONY ACD is available in two capacity levels: Level I and Level II. Level I supports up to 30 representatives and 80 phone lines, and Level II supports up to 80 representatives and 120 phone lines. In addition to all the features of PRELUDE ACD, CINPHONY ACD provides: intelligent call routing, call categorization capabilities, priority queuing for callers, caller directed routing, export of ACD information to other software tools for specialized reporting, supervisor tools such as information displays on the Norstar telephone, help requests from employees and silent monitoring.

CallPilot Basic Call Center

Basic Call Center (BCC) is included on the CallPilot 150 platform and is an option on the CallPilot 100 platform. It is a call center application designed for customers with relatively minimal requirements for number of agents and queues and no requirement for supervisor monitoring. CallPilot BCC is probably best defined as a call center application for the more informal call center.

Norstar Desktop CTI

CTI. TAPI. Enablers. LANs. A world of complex new words for a simple idea. Norstar introduced Computer Telephony Integration (CTI) with its first system in 1988.

CTI connects the intelligence of the personal computer (PC) with the power and flexibility of Norstar ICS. Using Microsoft Telephony Applications Programming Interface® (TAPI), businesses can use a variety of CTI applications that combine telephone and computer functionality in exciting new ways to increase employee productivity and customer satisfaction.

The Norstar Computer Telephony Adapter (CTA) family of products bridge the language gap between telephone systems and computers, so businesses can take advantage of the latest CTI applications.

Norstar CTA 100

Norstar CTA 100 connects a PC and a Norstar telephone to Norstar ICS over a single pair of wires. The Norstar system delivers call information to the CTA 100, which sends the information to both the telephone and PC. The CTA 100 enables CTI applications like contact managers and screen pops, and even passes Caller ID through to the PC.

Norstar CTA 160*i*

Norstar CTA 160*i* is a card that fits in an expansion slot inside a PC – it is especially useful for users who are running out of space on their desktop. The CTA 160*i* provides the same services as the CTA 100.

Norstar Personal Call Manager

Personal Call Manager, a Microsoft Windows® 95/98/NT/2000/XP TAPI application, provides access to the features of a Norstar system from a PC. Users can answer calls, dial, build conference calls and even see call activity – all on their PC screen. When integrated with Calling Line ID, Personal Call Manager can "pop" a dialog box to a PC, showing who is calling and associated information that users may store in a database on their PC. This award-winning CTI application is packaged with all Norstar CTA products.

Norstar Mobility

Studies show that people spend approximately 2.5 hours a day away from their desks – and their phones. Think about the revenue impact the resulting inability to communicate could have on a business.

T7406 Cordless Telephone

The Business Series Telephone T7406 Cordless provides high-quality mobile communications within the user's work space. Seamless integration with Norstar lets the T7406 user take advantage of the same features and capabilities as an existing wired Norstar telephone.

Business Series Terminals

The Business Series Terminals (BST) are flexibly positioned for deployment on two system platforms, Norstar and Business Communication Manager, providing both investment protection and a migration path between either system. BSTs offer full integration with Norstar features, as well as integration with basic and advanced applications such as Voice Mail, Call Center (ACD), computer telephony integration (CTI) and Integrated Voice and Data Solutions.

While the BSTs boast the industry leadership and strengths of the Norstar telephone portfolio, the new portfolio also delivers new value-added features like tilt display, visual ring indicator, message waiting indication (MWI), new aesthetics, a streamlined footprint, new labeling strategy, an audio control center with a headset button and more.

- **T7100** – is simply designed for low-traffic areas such as lobbies, office kitchens, reception rooms and break rooms.

- **T7208** – is uniquely suited for lower internal and higher external calling volumes, such as reception areas, workstations with moderate call volumes and activity and with shared telephone situations such as manufacturing plants, retail departments or repair centers.

- **T7316E** – is a full-featured, multi-line telephone for feature-intense users such as managers and executive professionals, as well as for centralized answering and administrative positions. With the addition of the T24 Key Indicator Module, the T7316E supports a robust set of capabilities as a central answering position.

- **T24 Key Indicator Module (KIM)** – is a 24-button module that attaches directly to the T7316E; together they form the Business Series Terminal Central Answering Position (CAP).

- **T7406 Cordless** – is a full-featured, multi-line telephone for businesses that would benefit from a desk-centric mobility solution. It covers an area of up to 282,000 square feet and supports one to six employees, enabling employees to be more productive while moving about the office. It is ideal for small enterprise, branch office, retail, medical office, warehouse and manufacturing environments.

- **Audio Conferencing Unit** – extends voice connectivity to conference rooms and offices with crystal-clear clarity and reliability. Simply plug it into any telephone jack – it includes full-duplex technology and a keypad to access all of the conferencing features available from your Norstar system.

Nortel Networks and the Environment

Nortel Networks is dedicated to protecting and enhancing the environment. Our philosophy is set forth in our Corporate Environmental Policy, found online at http://www.nortelnetworks.com/corporate/community/environment/health_safety/policy.html.

Nortel Networks has demonstrated that sound environmental management can result in financial benefits to the business and added value to customers and other stakeholders. The very nature of our business helps reduce adverse environmental impacts. The use of networks for ecommerce and telecommuting reduces the need for travel, energy, raw materials and office space. By striving for both economic and environmental efficiencies, we will be a successful business and a responsible member of the global community.

Nortel Networks is adopting a global corporate approach to Environment Health and Safety Management Systems (EHSMS). We are pursuing a corporate registration to ISO 14001 as well as a certification of compliance to OHSAS 18001, the Occupational Health & Safety Management Standard. The Corporate ISO 14001 registration and OHSAS 18001 certification strategy will allow the business to derive the maximum benefit of EHS Management from both a global and local perspective. Registration with ISO 14001 and OHSAS 18001 certification offers stakeholders an assurance of commitment to systematic environment, health and safety management and a foundation for continual improvement.

Nortel Networks is taking responsibility for its products from conception to end-of-life. Both customers and legislators are putting pressure on telecommunication equipment and service providers to improve the environmental performance of products throughout the life cycle. Through the development of Product Life Cycle Management (PLCM) practices at Nortel Networks, we are confident in providing customers with added value, staying one step ahead of legislation and protecting the environment.

Nortel Networks will continue to pursue its mission of environmental responsibility, setting new goals and meeting new challenges through innovation and determination.

Hardware

Chapter Highlights

- Norstar Compact ICS – offers a flexible building-block design that expands cost-effectively and allows companies to easily add enhancements as their business needs change.

- Norstar Modular ICS – is designed to be both flexible and scalable, providing businesses with ample room to expand the system's software and hardware capacity.

- Norstar 3x8 System – targets small businesses and offers advanced Norstar functionality with many cost-saving set and system features not available with competitive systems.

- Norstar Core Units – are energy efficient, require low power consumption and are easily installed.

- Modular, Scalable Design – of Modular ICS/Compact ICS lets businesses choose the system that best fits their current needs while planning for the future.

- Customizable Integrated Applications – on Modular ICS/Compact ICS support voice messaging, automated attendant, telephone and computer telephony.

- High Bandwidth to the Desktop – lets businesses use applications like ISDN Basic Rate Interface (BRI) and Computer Telephony Integration (CTI) without changing their existing wiring.

Chapter Overview

Norstar Compact ICS meets the existing telephony requirements of small businesses. It is an exciting and simple solution that accommodates a business's future growth needs. Remote Tools provide Windows-based capabilities for programming, configuring and maintaining the Norstar Compact ICS and peripherals.

Norstar Modular ICS delivers increased processing power and networking capabilities, in addition to advanced features, that help businesses improve customer satisfaction and employee productivity. Its hardware offers easy installation and customization. The removable power supply eliminates the need for a business to send in the entire ICS for repair if the power supply fails.

Emerging Trends

Typically, the small-site business market is made up of users who need communications systems with three to 150 telephones. Industry analysts anticipate a continued strong market, as customers replace their older communications systems to gain the powerful advantages of new applications.

Today's business world is evolving. A business that would have been classified as a "small" business in the past might now have the same requirements for sophisticated features and performance as a business many times its size. These businesses are better thought of as "small-site" businesses with big business demands for the latest advances in:

- Mobility
- Messaging (voice, fax, email)
- Call centers
- Networking (LAN/WAN)
- Voice over Internet Protocol (VoIP)
- Simultaneous transmission of voice, data and video
- Computer/telephone integration and software applications
- Digital imaging
- Faster processing
- Video conferencing.

Benefits

The competitively priced Norstar Compact ICS meets the existing telephony requirements of small businesses, and can take them an additional step into new technology. The product is an exciting and simple solution which accommodates future growth, both in the number of lines and the available technology. It has a high feature-to-price ratio which shows value both today and in the future.

Modular ICS business customers want the assurance that their investment will be protected while their system grows, both in size and functionality. Norstar Modular ICS brings this value while preserving the simplicity of use that has become the Norstar trademark in the industry. Voice Mail, Call Center and CTI applications offer specific benefits that translate into improved customer service and employee efficiency, in addition to increased revenues.

The Modular ICS T1 is a cost-effective solution for businesses looking to increase their bandwidth, and the Modular ICS with ISDN Primary Rate Interface (PRI) offers benefits to businesses that have employees who telecommute.

The introduction of the Norstar Voice over Internet Protocol (VoIP) Gateway solution allows existing small multisite Norstar customers to cost effectively enter into the VoIP environment while providing an opportunity for larger multisite companies with Norstar systems to slowly migrate their voice network to IP. The Norstar VoIP Gateway also provides interoperability between Norstar and BCM, Meridian 1 IP Enabled and CSE 100. The Norstar VoIP Gateway enables trunk-side IP connectivity for Norstar by providing multisite customers with direct inter-office voice and fax traffic over an IP network. Utilizing their existing IP network, these customers will benefit from lower to eliminated monthly costs for long distance and leased PSTN charges.

Norstar Integrated Communications System (ICS)

Norstar is the worldwide market leader in small site communications systems. Two core units, the Norstar Compact ICS and Norstar Modular ICS, form the foundation for the continued success of Norstar. Nortel Networks continues to support the development of the Norstar portfolio through scalability, functionality and value-added core and application enhancements.

Compact ICS targets small businesses requiring four to 20 telephones and the resources to take advantage of new technological advances in the telecommunications industry.

Compact ICS starts as a 4x8 (4 lines and 8 station ports) system and can grow to a 8x24 system, (16x24 utilizing ISDN-BRI), without replacing the core unit. Since the Norstar telephone sets and most peripheral equipment presently operating on older Norstar core systems will work on the Norstar Compact ICS, Compact ICS is an attractive upgrade for users who currently have 3x8, Compact 6x16 or smaller Modular 8x24 systems. Compact ICS also provides a smooth transition to Modular ICS by allowing the larger system to reuse trunk cartridges, terminals, wiring and applications.

Modular ICS targets businesses that require between 20 and 150 telephones and capabilities which allow for more power, more growth and more advanced applications.

The Modular ICS core unit is equipped with 32 station ports and two slots for the addition of T1/ISDN-PRI, ISDN-BRI or analog trunk cartridges. Customers may grow this capacity as required by adding fiber station modules, fiber trunk modules and analog station modules, to a maximum capacity of 248 ports.

Modular ICS provides existing Norstar Modular 8x24 customers with the opportunity to upgrade to more advanced technology, such as T1, ISDN and larger system capacities, while maintaining much of their existing common equipment.

The Norstar 3x8 system will continue to be offered for small businesses who need basic key system features but do not require the advanced digital capabilities of the ICS portfolio, and don't see growth beyond eight telephones.

Figure 1   Norstar Portfolio
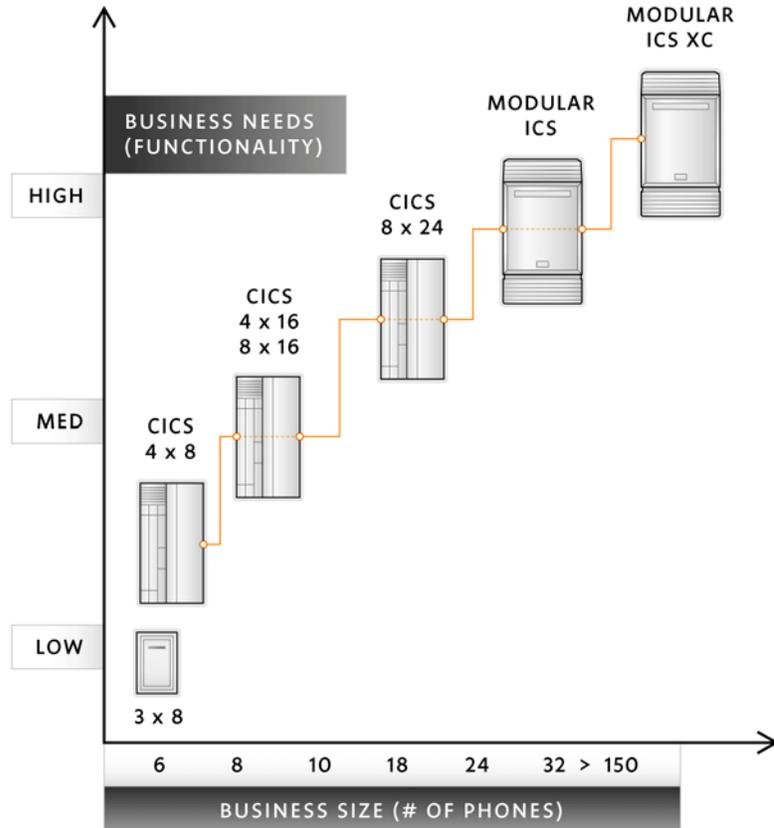
Norstar Core Units

Each Norstar core unit includes a power supply, an interface to connect outside lines and stations, and programmable memory. In addition, the Compact ICS and Modular ICS have separate, upgradable feature cartridges.

The Norstar core units are energy efficient, require low power consumption, and use standard grounded wall sockets. Analog devices are supported by either an Analog Terminal Adapter (ATA) or the Analog Station Module (Modular ICS only). The polarity insensitive single pair of twisted wire used for wiring stations makes installation simple.

The Norstar product family meets this growing market challenge with solutions that meet the needs of even the most sophisticated small systems customer.

Norstar 3x8 Customer Profile

Norstar 3x8 is a conveniently-sized, easy-to-install, small business system that delivers many advanced features.

Norstar 3x8 – Small Business Customer Profile

A Norstar 3x8 customer is a business that wants a fully-featured key system because it offers: on-site equipment that can be customized, features that manage a high level of internal calling patterns (e.g., paging, intercom, call handling) and the opportunity to control and maintain the communications system. The business requires a maximum of three lines and eight stations.

Norstar 3x8 – Home-based Business Customer Profile

The Norstar 3x8 home-based business customer has needs similar to the small business profile, however, the home business customer will likely have the need for smaller configurations and at least one full-featured set (T7316E) to meet many of the business's operating needs.

Norstar 3x8 Configuration

Figure 2   Norstar 3 x 8 Hardware

Norstar 3 x 8 Hardware

DESCRIPTION	
LENGTH:	330 MM (13 IN)
WIDTH:	240 MM (9.5 IN)
DEPTH:	75 MM (3 IN)
WEIGHT:	2 KG (4.4 LB)
COLOR:	DOLPHIN GREY

- The Norstar 3x8 is a self-contained unit that functions with built-in DR5 software. DR5 includes Disconnect Supervision and Calling Line ID interface capabilities.
- This system can be configured with up to three lines and eight stations (3x8).
- Advanced Norstar functionality offers many cost-saving set and system features not available with competitive systems.
- Custom programming enables a business to configure the system to best suit its particular needs.
- The Norstar 3x8 is easy to install and its small size means it will not take up much space.
- External (wall mountable) power supply.

Compact ICS Customer Profile

Norstar Compact ICS responds to the following trends in the small business market:

- The market is primarily driven by the needs of the traditional small site business.

- The small business market is rapidly changing from basic telephony requirements to enhanced, integrated needs. The market is looking for solution providers; applications which can provide a competitive differentiation are driving change.

- Businesses now expect their communication system to handle their current needs, have the flexibility and capability to meet their future growth needs, and protect their investment.

Compact ICS Configuration

- Two universal slots in the Compact ICS can accept any combination of the following trunk cartridges:

    - 2-port U Interface ISDN-BRI

    - 4-port U Interface ISDN-BRI

    - 4-port S/T Interface ISDN-BRI

    - Loop Start analog

    - Caller ID analog.

- The following table outlines the possible configurations for Compact ICS.

Table 1   Compact ICS Configurations

Software	Universal slot 1	Universal slot 2	Expansion slot	Maximum size
Restricted	Analog			4x8
Restricted	2-port U ISDN		Services	4x8
Standard	Analog			4x16
Standard	2-port U ISDN		Services	4x16
Standard	4-port U ISDN		Services	8x16
Standard	Analog	Analog		8x16
Standard	Analog	2-port U ISDN	Services	8x16
Standard	Analog	2-port U ISDN	Combination	8x24
Standard	Analog	4-port U ISDN	Services	12x16
Standard	Analog	4-port U ISDN	Combination	12x24
Standard	2-port U ISDN	2-port U ISDN	Services	8x16
Standard	2-port U ISDN	2-port U ISDN	Combination	8x24
Standard	2-port U ISDN	4-port U ISDN	Services	12x16
Standard	2-port U ISDN	4-port U ISDN	Combination	12x24
Standard	2-port U ISDN	4-port S/T ISDN	Services	4x20 (16 TCM + 4 S/T ISDN)
Standard	2-port U ISDN	4-port S/T ISDN	Combination	4x28 (24 TCM + 4 S/T ISDN)
Standard	4-port U ISDN	4-port U ISDN	Services	16x16
Standard	4-port U ISDN	4-port U ISDN	Combination	16x24
Standard	4-port U ISDN	4-port S/T ISDN	Services	8x20 (16 TCM + 4 S/T ISDN)
Standard	4-port U ISDN	4-port S/T ISDN	Combination	8x28 (24 TCM + 4 S/T ISDN)
Note: Analog trunk cartridges can be either Loop Start or Caller ID. This table assumes the use of all U Interfaces as network side connections, and the use of all S/T Interfaces as station side connections. The U Interfaces may be configured for station side connection and S/T Interfaces may be used for network side connections. (Use of an S/T Interface on the network side requires a customer supplied NT-1 Interface device.)				

Figure 3   Compact ICS Core Hardware

Compact ICS Core Hardware
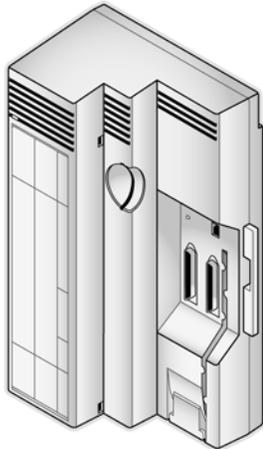
| DESCRIPTION	
LENGTH:	435 MM (17.3 IN)
WIDTH:	238 MM (9.4 IN)
DEPTH:	168 MM (6.63 IN)
WEIGHT:	3.05 KG (6.7 LB)
COLOR:	DOLPHIN GREY

- The Core Unit is easily mounted using three screws.
- A Services Cartridge plugs into the Core Unit expansion slot to provide synchronization to network timing for ISDN-BRI trunk cartridges.
- A Combination Services Cartridge is available to provide both timing for ISDN-BRI trunk cartridges and expansion from 16 to 24 station ports. (No Trunk Modules or Station Modules are required for expansion.)

- Two 50-pin Amphenol connections are used as the interface for CO trunks, stations, and for the internal ATA and RAD connections. The amphenols are also used for connection of external devices such as Music on Hold, source, paging and auxiliary ringers.
- The Internal Analog Terminal Adapter (I-ATA) provides one connection for a modem, fax machine or analog telephone, and does not take up a station port.
- For the customer who does not have a battery backup system, Emergency Line Transfer Connection provides a line to connect a 2500 set in the event of a power failure. Only available if the Compact ICS is configured with at least one analog line.
- An optional software keycode can be purchased to enable the Internal Remote Access Device (IRAD). Once the IRAD is enabled, Norstar Remote Utilities software allows remote programming for adds, moves and changes and troubleshooting. Moves, adds and changes can now be done from a single remote site, eliminating the need for a site visit.
- Remote administration translates into more efficient and faster response time when adds, moves or changes are required. Operational costs are reduced and the quick response time boosts customer satisfaction.

- Remote Tools is a component of Norstar Remote Utilities (NRU). Remote Tools provides Windows-based capabilities for configuring, programming, backing up and maintaining the Norstar Compact ICS and peripherals. See the *Remote Administration Chapter* for more information.

Figure 4   Global Analog Trunk Cartridge - LS/DS
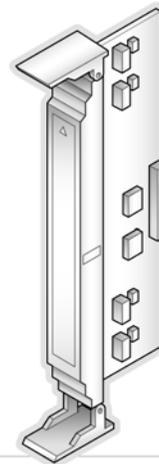

Compact ICS Interface Cartridges
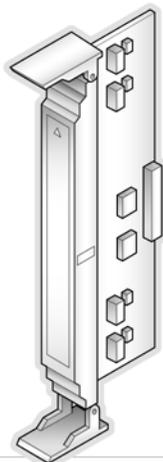
GLOBAL ANALOG TRUNK CARTRIDGE - LS/DS

- Provides access for up to four Central Office analog lines
- All LS (Loop Start)/DS (Disconnect Supervision) Trunk Cartridges have Disconnect Supervision capability and are labeled "DS" on the faceplate
- Compatible with the Modular ICS core, Fiber and Copper Trunk Modules, the Compact ICS core and the Modular 8x24 Copper Trunk Module.

Figure 5   Global Analog Trunk Cartridge - CLID

Compact ICS Interface Cartridges

GLOBAL ANALOG TRUNK CARTRIDGE - CLID

- The Caller Identification (CI) Trunk Cartridge has the same functionality as the LS/DS Trunk Cartridge, but with the additional capability to detect and translate incoming CMS/CLASS information for display on Norstar sets
- The CI Trunk Cartridge is required when any CMS/CLASS lines terminate on the Compact ICS core or the Modular ICS core or trunk modules
- Provides access for up to four Central Office analog lines
- Compatible with the Modular ICS core, Fiber and Copper Trunk Modules, the Compact ICS core and the Modular 8x24 Copper Trunk Module.
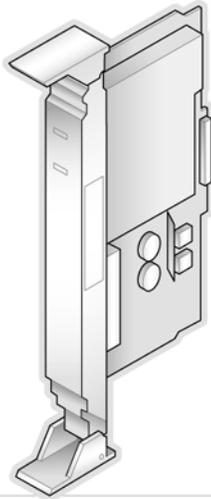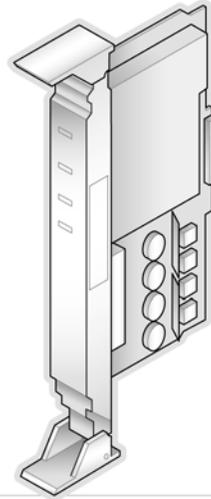
Figure 6   2-Port U Interface ISDN-BRI Cartridge

2-PORT U INTERFACE
ISDN-BRI CARTRIDGE

- Supports two ISDN-BRI U Interfaces per cartridge
- Integrated Network Termination Type 1 (NT-1) functionality
- Interfaces can be individually configured to be a network interface or a station side equipment interface
- Powered by the cartridge slot connector
- LED on cartridge faceplate gives visual indication of circuit status (activated or deactivated)
- Compatible with Compact ICS core and Modular ICS core and Fiber Trunk Module
- Requires Services Cartridge or Combination Services Cartridge on Compact ICS
- Requires either the Services Cartridge or the Combination Fiber 6-port Services Cartridge on Modular ICS.

Figure 7   4-Port U Interface ISDN-BRI Cartridge

4-PORT U INTERFACE
ISDN-BRI CARTRIDGE

- Supports four ISDN-BRI U Interfaces per cartridge
- Integrated Network Termination Type 1 (NT-1) functionality
- Interfaces can be individually configured to be a network interface or station side equipment interface
- Powered by the cartridge slot connector
- LED on cartridge faceplate gives visual indication of circuit status (activated or deactivated)
- Compatible with Compact ICS core and Modular ICS core and Fiber Trunk Module
- Requires Services Cartridge or Combination Services Cartridge on Compact ICS
- Requires either the Services Cartridge or the Combination Fiber 6-port Services Cartridge on Modular ICS.

*Figure 8   4-Port S/T Interface ISDN-BRI
             Cartridge*
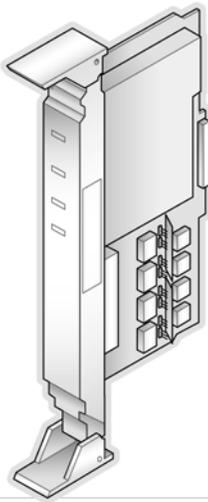
Figure 9   Services Cartridge

**4-PORT S/T INTERFACE
ISDN-BRI CARTRIDGE**

**SERVICES
CARTRIDGE**

- Supports four ISDN-BRI S/T Interfaces per cartridge
- Interfaces can be individually configured to be a network interface or a station side equipment interface (Use on the network side requires a customer supplied NT-1 interface device)
- Powered by the cartridge slot connector
- LED on cartridge faceplate gives visual indication of circuit status (activated or deactivated)
- Compatible with Compact ICS core and Modular ICS core and Fiber Trunk Module
- Requires Services Cartridge or Combination Services Cartridge on Compact ICS
- Requires either the Services Cartridge or the Combination Fiber 6-port Services Cartridge on Modular ICS.

- Provides clocking for ISDN-BRI circuits
- Only required if using ISDN-BRI cartridge; and 16 or fewer stations
- Installs in the Expansion Card slot in the core unit
- Compatible with Compact ICS only.

Figure 10 Combination Services Cartridge
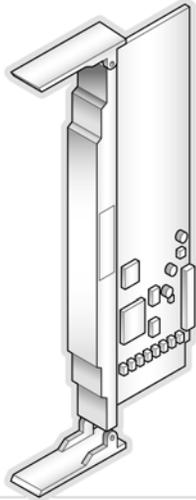
- Provides clocking for ISDN-BRI circuits and expansion from 16 to 24 station ports

- Required for TCM port expansion

- The Combination Services Cartridge replaces the 8-Port TCM Expansion Cartridge that is no longer available

- Compatible with Compact ICS only.

Compact ICS Expansion

Restricted to Standard Software Keycode Upgrade

The Compact ICS 4x8 Restricted Software can be upgraded by purchasing the Restricted to Standard Software keycode. This software keycode immediately enables the additional eight stations within the core unit, making 16 stations available without additional hardware.

The software keycode also enables the second universal trunk slot to support an additional trunk cartridge. Adding a Combination Services Cartridge allows further station expansion from 16 to 24.

The 4x8 software cartridge itself does not have to be replaced at any time during this expansion process.

On a Compact ICS 4x16 system with Standard Software, adding a Combination Services Cartridge expands the number of station ports from 16 to 24.

More lines are added by purchasing either an analog trunk cartridge (for four CO lines) or an ISDN-BRI cartridge (for up to eight ISDN digital circuits). The cartridge is inserted in the second universal trunk slot on the core unit.

Internal Remote Access Device Keycode Upgrade

The Internal Remote Access Device (IRAD) Software Keycode allows a customer who has purchased a Compact ICS with Standard Software or Restricted Software to enable the IRAD.

Compact ICS Core Unit Bundles

The following table shows the four Compact ICS core unit bundles that can be ordered, and how to expand them.

Table 2   Compact ICS Core Unit Bundles

Action	Item Purchased	Part #
To start with a 4x8 system and four LS/DS analog lines	Purchase a Compact ICS equipped with a LS/DS Analog Trunk Cartridge *and* Compact ICS 6.1 Restricted Software[2] (comes with English documentation)	NTBU0528 NT7B65AABT
To add 4 analog lines	Purchase Restricted to Standard Software keycode for upgrade (only if Restricted Software on system) *and* Purchase a LS/DS Analog Trunk Cartridge *or* a Caller ID Analog Trunk Cartridge	NTAB2000 NT7B69AAAA NT7B75AAAE

Action	Item Purchased	Part #
To add 4 ISDN circuits	Purchase a two-port U Interface ISDN-BRI Cartridge *and* a Services Cartridge	NT7B86GA-93 NTBB046D-93
To add 8 ISDN circuits	Purchase a four-port U Interface ISDN-BRI Cartridge *or* Purchase a four-port S/T Interface ISDN-BRI Cartridge *and* a Services Cartridge	NT7B87GA-93 NT7B76AA-93 NTBB04GD-93
To add 8 station ports	Purchase Restricted to Standard Software keycode for upgrade (only if Restricted Software on system)	NTAB2000
To add 16 station ports	Purchase a Combination Services Cartridge	NTBB04GC-93
To start with a 4x8 system and four Caller ID analog lines	Purchase a Compact ICS equipped with a Caller ID Analog Trunk Cartridge *and* Compact ICS 6.1 Restricted Software[2] (comes with English documentation) *or* Compact ICS 6.1 Standard Software[1] (comes with English documentation)	NTBU0686 NT7B65AABT NT7B65AABY
To add 4 analog lines	Purchase Restricted to Standard Software keycode for upgrade (only if Restricted Software on system) *and* Purchase an LS/DS Analog Trunk Cartridge *or* a Caller ID Analog Trunk Cartridge	NTAB2000 NT7B69AAAA NT7B75AAAE
To add 4 ISDN circuits	Purchase a two-port U Interface ISDN-BRI Cartridge *and* a Services Cartridge	NT7B86GA-93 NTBB04GD-93
To add 8 ISDN circuits	Purchase a four-port U Interface ISDN-BRI Cartridge *or* Purchase a four-port S/T Interface ISDN-BRI Cartridge *and* a Services Cartridge	NT7B87GA-93 NT7B76AA-93 NTBB04GD-93
To add 8 station ports	Purchase Restricted to Standard Software keycode for upgrade (only if Restricted Software on system)	NTAB2000
To add 16 station ports	Purchase a Combination Services Cartridge	NTBB04GC-93

Action	Item Purchased	Part #
To start with a 4x16 system and 4 ISDN-BRI U circuits	Purchase a Compact ICS equipped with a two-port U Interface ISDN-BRI Cartridge *and* a Services Cartridge *and* Compact ICS 6.1 Standard Software[1] (comes with English documentation)	NTBU0530 NTBB04GD-93 NT7B65AABY
To add 4 analog lines	Purchase a LS/DS Analog Trunk Cartridge *or* a Caller ID Trunk Cartridge	NT7B69AAAA NT7B65AABA
To add 4 ISDN circuits	Purchase a two-port U Interface ISDN-BRI Cartridge	NT7B86GA-93
To add 8 ISDN circuits	Purchase a four-port U Interface ISDN-BRI Cartridge *or* Purchase a four-port S/T Interface ISDN-BRI Cartridge	NT7B87GA-93 NT7B76AA-93
To add 8 station ports	Purchase a Combination Services Cartridge	NTBB04GC-93
To start with a 4x16 system and 8 ISDN-BRI U circuits	Purchase a Compact ICS equipped with a 4-port U Interface ISDN-BRI Cartridge *and* a Services Cartridge *and* Compact ICS 6.1 Standard Software[1] (comes with English documentation)	NTBU0531 NTBB04GD-93 NT7B65AABY
To add 4 analog lines	Purchase a LS/DS Analog Trunk Cartridge *or* a Caller ID Trunk Cartridge	NT7B69AAAA NT7B75AAAE
To add 4 ISDN circuits	Purchase a two-port U Interface ISDN-BRI Cartridge	NT7B86GA-93
To add 8 ISDN circuits	Purchase a two-port U Interface ISDN-BRI Cartridge *or* Purchase a two-port S/T Interface ISDN-BRI Cartridge	NT7B87GA-93 NT7B76AA-93
To add 8 station ports	Purchase a Combination Services Cartridge	NTBB04GC-93
Notes: [1] Compact ICS 6.1 Standard Software is also available with IRAD enabled – NT7B65AACC. [2] Compact ICS 6.1 Restricted Software is also available with IRAD enabled – NT7B65AABW.		

Modular ICS Customer Profile

A Norstar Modular ICS customer is looking for increased processing power, networking capability and advanced features that can be customized to fit both present and future communications needs.

This customer wants the ability to integrate high value applications in their system as the business need arises: advanced Voice Mail, Call Center applications, integrated Mobility, Internet access, ISDN and Desktop CTI.

The Modular ICS customer also wants to take full advantage of network services such as Calling Line ID (CLID) to improve customer satisfaction and business efficiencies. The Modular ICS product strengthens the ICS portfolio with a voice offering in the multisite networked market segment. This increases the product's addressable market to include multisite networked SMB customers requiring voice solutions. Moreover, the private networking enhancements provide further coupling to the Meridian 1 portfolio, providing business customers with more options.

Modular ICS T1 – Customer Profile

A Modular ICS customer will choose T1 for several reasons. Businesses which require greater bandwidth will first need to look at the economics of T1. Because the cost of installing T1 is dropping rapidly, more and more businesses are finding T1 is a viable option.

Fractional T1 allows a company to use part of a T1 circuit (for example, 10 rather than 24 lines). This option makes it economical for the traditional Norstar system and hybrid telephone user to purchase T1.

Beyond economics, T1 provides quality of service with enhanced features. T1 is attractive to companies looking for the ability to change bandwidth as required and to manage their own network.

Modular ICS ISDN-PRI – Customer Profile

The Modular ICS with PRI has been designed for the customer who has a requirement for high speed information access or transfer. This customer is one who currently uses T1 lines and is presently constrained by using dedicated voice and data lines. The PRI customer likely has a larger station size key system. The Modular ICS with PRI will appeal to the customer who is sensitive to the savings gained from call by call service selection, as this could represent an average minimum cost and efficiency savings of 20% over T1 systems.

Customers who have employees who telecommute and need access to company databases, networks, email, and so on, and those who have employees who frequently travel to attend meetings are likely PRI prospects. Customers who use multiple analog lines for telephone, fax and modem, as well as those who require data transfer or sharing of databases between multiple locations, will benefit greatly from the Modular ICS with PRI.

Modular ICS ISDN-BRI – Customer Profile

The BRI option for Modular ICS is designed for the customer who wants the speed and reliability of digital lines with the added flexibility and features of ISDN-BRI. The BRI customer likely has a smaller station size key system than the PRI customer.

With BRI lines, customers can integrate their ICS with ISDN equipment and applications, and take advantage of the central office services offered for ISDN. Like T1, ISDN-BRI offers an economical option for backing up leased lines.
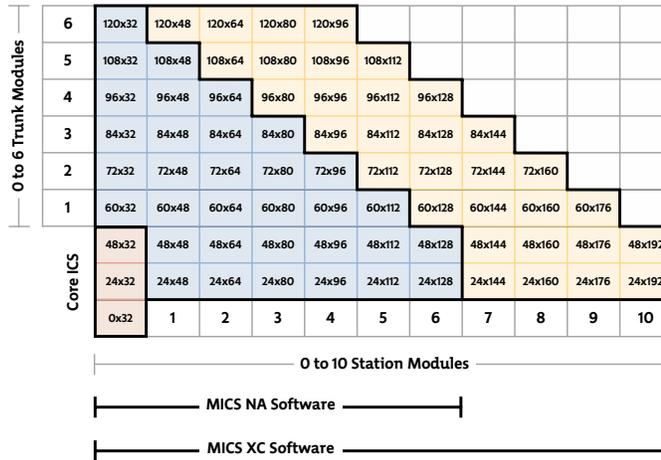
Modular ICS XC – Customer Profile

A customer for Modular ICS equipped with XC software is looking for a larger system configuration (10-port expandability) to meet the needs of a large or growing company. They want integration with the latest technology, such as voice processing, T1/PRI trunking and mixed analog/digital configuration, that will maximize their system use.

For a business that currently owns a Modular ICS, XC software is an easy and cost-effective way to upgrade to a more advanced system with more possibilities for integration.

Modular ICS Configuration

The following figure shows possible configurations for a Modular ICS connected to analog trunks. It shows two Analog Trunk Cartridges (ATC) and no Digital Trunk Interface (DTI) or Basic Rate Interface (BRI) Cartridges installed in the ICS. The configuration capacity depends on the software cartridge.
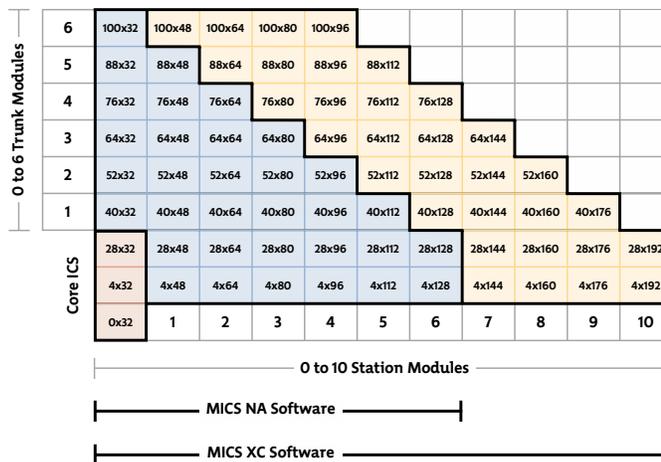
Figure 11 Modular ICS Configuration

0 to 6 Trunk Modules / Core ICS — 0 to 10 Station Modules

	0x32	1	2	3	4	5	6	7	8	9	10
6	120x32	120x48	120x64	120x80	120x96						
5	108x32	108x48	108x64	108x80	108x96	108x112					
4	96x32	96x48	96x64	96x80	96x96	96x112	96x128				
3	84x32	84x48	84x64	84x80	84x96	84x112	84x128	84x144			
2	72x32	72x48	72x64	72x80	72x96	72x112	72x128	72x144	72x160		
1	60x32	60x48	60x64	60x80	60x96	60x112	60x128	60x144	60x160	60x176	
	48x32	48x48	48x64	48x80	48x96	48x112	48x128	48x144	48x160	48x176	48x192
	24x32	24x48	24x64	24x80	24x96	24x112	24x128	24x144	24x160	24x176	24x192

MICS NA Software / MICS XC Software

The following figure shows possible configuration options for a Modular ICS connected to both T1 (or ISDN-PRI) and analog trunks. It shows one Analog Trunk Cartridge and one DTI Cartridge installed in the ICS. The configuration capacity depends on the software cartridge.

Note: Companion has been manufacture discontinued (MD), so the last two expansion ports are unused.

Figure 12 Modular ICS Configuration

0 to 6 Trunk Modules / Core ICS — 0 to 10 Station Modules

	0x32	1	2	3	4	5	6	7	8	9	10
6	100x32	100x48	100x64	100x80	100x96						
5	88x32	88x48	88x64	88x80	88x96	88x112					
4	76x32	76x48	76x64	76x80	76x96	76x112	76x128				
3	64x32	64x48	64x64	64x80	64x96	64x112	64x128	64x144			
2	52x32	52x48	52x64	52x80	52x96	52x112	52x128	52x144	52x160		
1	40x32	40x48	40x64	40x80	40x96	40x112	40x128	40x144	40x160	40x176	
	28x32	28x48	28x64	28x80	28x96	28x112	28x128	28x144	28x160	28x176	28x192
	4x32	4x48	4x64	4x80	4x96	4x112	4x128	4x144	4x160	4x176	4x192

MICS NA Software / MICS XC Software

Note: Companion has been manufacture discontinued (MD), so the last two expansion ports are unused.

Note: These configuration charts are examples only and do not encompass the full range of trunking options associated with ISDN-BRI interface cartridges or E&M trunk cartridges.
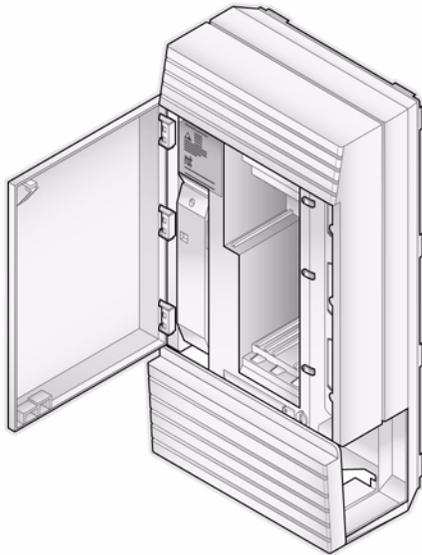
Modular ICS Expansion

The Modular ICS system can support up to ten additional modules, each connected to the core unit via a fiber DS-30 connector. The following table summarizes the expansion capability.

Table 3   Modular ICS Expansion Capabilities

Expansion Port	Fiber Trunk Module	Fiber Station Module	Analog Station Module
3	Supports LS/DS, CI, DID, E&M and ISDN-BRI	Each module supports the addition of 16 incremental digital station ports.	Each port supports an Analog Station Module (ASM) for 8 ports of analog connectivity. A second ASM may be daisy-chained to the first ASM to provide a total 16 ports of analog connections per fiber expansion port.
4			
5	Supports LS/DS, CI, DID and E&M		
6			
7			
8			
9	Not supported		
10			
11			
12			
13		Not supported	Not supported
14			

Figure 13 Modular ICS Core Hardware

Modular ICS Core Hardware

DESCRIPTION	
LENGTH:	63 CM (24.8 IN)
WIDTH:	30 CM (11.8 IN)
DEPTH:	17 CM (6.7 IN)
WEIGHT:	14 KG (30.8 LB)
COLOR:	DOLPHIN GREY

- The Norstar Modular ICS is a module and cartridge-based system offering easy installation, maintenance, expansion and customization
- The Modular ICS supports digital T1 lines, ISDN Primary Rate Interface (PRI) and Basic Rate Interface (BRI) circuits, as well as Analog Loop Start, CI, DID and E&M lines
- All lines are supported through cartridges installed in either the core Modular ICS or Trunk Modules (see configuration charts on the previous pages)

- The removable power supply eliminates the need to send the entire ICS in for repair if the power supply fails
- Modular ICS customers looking to expand to a large system can use the capability of Modular ICS with XC software to grow to 248 ports
- Other features include support of 32 stations on the core Modular ICS, a single locking door, a label for customer configuration information, and an optional Fiber Cable Management Kit to speed installation and ensure proper handling of the fiber connection cables
- Includes one emergency transfer port per trunk cartridge slot if an analog trunk cartridge is installed in the Modular ICS. In a system with Digital Trunk Cartridges only, emergency service is not supported.
- Cartridge slots in the Modular ICS can house:
  - One-piece or two-piece software feature cartridge
  - Services Cartridge
  - Fiber Trunk and Station Modules
  - Combination Expansion and Services Cartridges
  - ISDN-BRI, Digital, LS/DS Analog and Caller ID Trunk Cartridges.

44

Figure 14 *Software Feature Cartridge*

SOFTWARE FEATURE CARTRIDGE
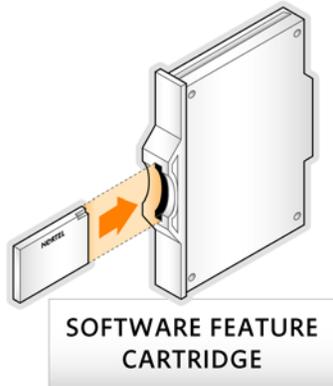
- Contains the system software for the Modular ICS operation, including the call processing, administration and maintenance features and functions

- The two-piece cartridge contains expanded RAM and system software on a PCMCIA card

- Customer data (RAM) is stored on the ICS and is preserved during software upgrades and power outages

- Four versions of software are available:

    - NA-Modular ICS – Expanded feature capability replaces Release 6.0 and supports up to six expansion modules

    - CDA-Modular ICS-XC – Expanded capability supports up to ten expansion modules (Available in Canada)

    - USA-Modular ICS-XC – Expanded capability supports up to ten expansion modules (Available in the United States)

- Release 1, Centrex- Provides transparent operation of popular Centrex features. It does not support T1, ISDN-PRI, ISDN-BRI or expansion beyond six ports.

Figure 15 *Fiber Station Module (0 x 16)*

Fiber Station Module (0 x 16)

DESCRIPTION	
LENGTH:	625 MM (24.6 IN)
WIDTH:	98 MM (3.85 IN)
DEPTH:	171 MM (6.73 IN)
WEIGHT:	2415 G (5.31 LB)
COLOR:	DOLPHIN GREY

- To add additional station ports to the Modular ICS core, Fiber Station Modules may be connected by a fiber cable

- Each Fiber Station Module expands the core Modular ICS system by up to 16 station ports.

Figure 16 Fiber Trunk Module (12 x 0)

Fiber Trunk Module (12 x 0)
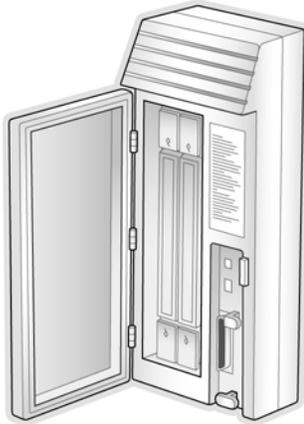
DESCRIPTION	
LENGTH:	625 MM (24.6 IN)
WIDTH:	198 MM (7.8 IN)
DEPTH:	171 MM (6.73 IN)
WEIGHT:	5142 G (11.33 LB)
COLOR:	DOLPHIN GREY

• To add trunk interfaces to the core Modular ICS, Fiber Trunk Modules may be connected to the Modular ICS by a fiber cable

• Holds up to three Trunk Cartridges, with the number of additional lines depending on the cartridge being installed:

Table 4   Fiber Trunk Module Card Capacity

Card	Lines per Card
ISDN-BRI	8
LS/DS	4
CI	4
DID	4
E&M	2

• Includes one emergency transfer port

• Supports all analog trunk cartridges

• Supports ISDN-BRI Cards only on Trunk Modules 3 and 4 (2-port expansion), or Trunk Modules 7 or 8 (six or 12-port expansion)

• Supports one DTI Card (The Fiber Trunk Module must be connected to expansion port 3 or 4 (2-port expansion), or 7 or 8 (six or 12-port expansion)).

Figure 17 Analog Station Module (ASM)

Analog Station Module (ASM)
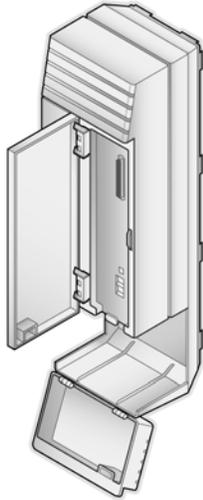
DESCRIPTION	
LENGTH:	630 MM (25 IN)
WIDTH:	150 MM (5.9 IN)
DEPTH:	170 MM (6.5 IN)
WEIGHT:	3.7 KG (8.3 LB)
COLOR:	DOLPHIN GREY

- Compatible with Modular ICS products with fiber interface capabilities
- Supports eight analog devices (data or voice) with speeds up to and including 33.6 Kbps (Maximum data transmission rate is subject to the quality of the end-to-end channel and cannot be guaranteed)
- Includes three connectors: one DS-30 fiber link for daisy-chaining and one 50-pin male amphenol connector that provides connections for up to eight analog devices
- Connects to a Fiber Expansion Cartridge on the core Modular ICS with a DS-30 fiber cable (Either a two or six port Fiber Expansion Cartridge may be used)

- The second DS-30 jack on the ASM may be used to daisy-chain a second ASM to the first (A maximum of two ASMs, providing a total of 16 analog ports, can be connected through a single DS-30 port)
- Includes an integrated auto ranging 110-220 volt power supply
- Approximately 1.5 times wider than the Fiber Station Module
- A third ASM can connect via a DS-30 fiber link to the next available port on the Expansion Cartridge. A fourth ASM can be daisy-chained to the third ASM. The total number of ASMs that can be installed on a system is determined by the number of DS-30 ports available on the core.
- Two versions of the ASM are available:
  - Standard ASM M0x8A
  - ASM with Message Waiting Indication (ASM with MWI) M0x8M
- The ASM with MWI supports visual message indication (on 2500 sets with a message lamp provided) or stuttered dial tone (when the handset is lifted). (Note: the standard ASM does not provide visual message waiting indication but can be configured to provide a stuttered dial tone if connected to a Modular ICS with DR 1.1 software or later. The standard ASM cannot be upgraded to an ASM with MWI.)
- The standard ASM is compatible with all Modular ICS software releases. The ASM with MWI is compatible only with DR 1.1 and XC 1.1 software or later.

- The ASM and the ASM with MWI may be used in combination with each other and/or with existing ATA-2s, allowing for customized analog solutions. All features currently supported on the ATA-2 are supported by both versions of the Analog Station Module.

- The maximum loop length for any On-Premise analog station is 4,000 feet. Off-Premise Extensions (OPX) are not supported from the ASM. The existing ATA-2 devices will still be used to support OPX extensions.

- CLASS/CMS capabilities and Disconnect Supervision are not supported on the Analog Station Module. This is consistent with ATA-2 functionality.

Modular ICS Cartridges

- Expansion Cartridges provide the connection point for expansion of the system via trunk or station modules
- Services Cartridges contain the clocking services to support ISDN and T1
- Interface Cartridges connect the Norstar system with the central office, and in the case of ISDN-BRI cartridges may be configured for station side IDSN devices.

Modular ICS Cartridge Compatibility

Table 5   Modular ICS Cartridge Compatibility

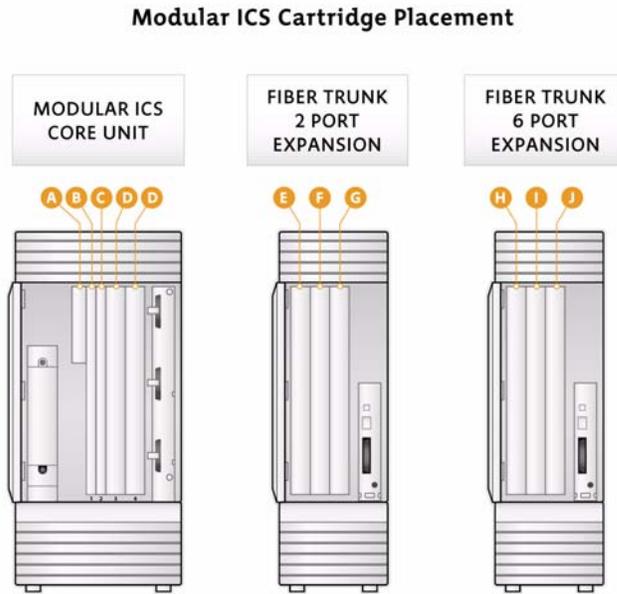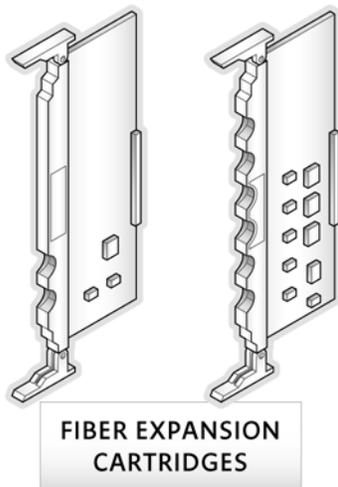| Cartridges	Modular ICS		
	Core	Fiber Trunk Module	Copper Trunk Module
Expansion			
Modular ICS Fiber Expansion two-port	√		
Modular ICS Fiber Expansion six-port	√		
Clocking Services/Expansion			
Services Cartridge	√		
Modular ICS Combination Fiber 6-Port Services Cartridge	√		
Interface			
ISDN-BRI 2 U Interface	√	√ [1]	
ISDN-BRI 4 U Interface	√	√ [1]	
ISDN-BRI 4 S/T Interface	√	√ [1])	
Digital Trunk Interface	√	√ [2]	
LS/DS Analog Trunk Cartridge	√	√	√
Caller ID Trunk Cartridge	√	√	√
E&M/DISA Trunk Cartridge		√	√
DID Trunk Cartridge		√	√
Notes: [1] ISDN-BRI 2 U Interface, 4 U Interface and 4 S/T Interface cartridges can be installed in Fiber Trunk Modules 1 and 2 only. [2] One DTI cartridge can be installed in slot 1 of a Fiber Trunk Module. Once a DTI cartridge is installed, the remaining two slots cannot be used.			

Figure 18 Modular ICS Cartridge Placement
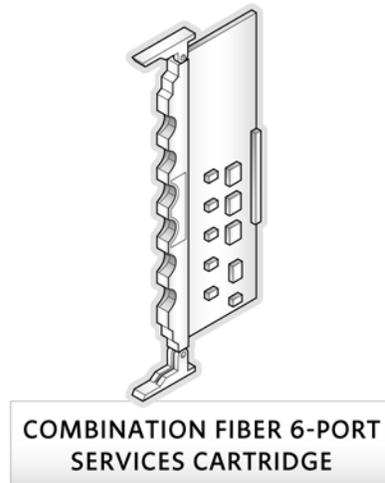

Table 6   Modular ICS Cartridge Placement

Slot	Cartridge
Modular ICS Core Unit	
Slot A	Modular ICS or Modular ICS XC Software Cartridge
Slot B	Services Cartridge or Combo Six-Port Services Cartridge
Slot C	Two-Port, Six-Port or Combo Six-Port Services Cartridge
Slot D	Two-Port U, Four-Port U or Four-Port S/T ISDN-BRI Cartridges; Digital Trunk Interface, LS/DS Loop Start or CI Trunk Cartridges
Fiber Trunk 2-Port Expansion	
Slot E	Digital Trunk Interface[1], BRI Analog Loop, DID or E&M Trunk Cartridges
Slot F	BRI Analog Loop, DID or E&M Trunk Cartridges
Slot G	BRI Analog Loop, DID or E&M Trunk Cartridges
Fiber Trunk 6-Port Expansion	
Slot H	Digital Trunk Interface[2], BRI Analog Loop, LS/DS Loop Start, CI, DID or E&M Trunk Cartridges
Slot I	BRI Analog Loop, DID or E&M Trunk Cartridges
Slot J	BRI Analog Loop, DID or E&M Trunk Cartridges
Notes: [1] If a Digital Trunk Interface is used, then slots F and G are unused. [2] If a Digital Trunk Interface is used, then slots I and J are unused and the Trunk Module must be connected to port 7 or 8.	

Figure 19 Fiber Expansion Cartridges

FIBER EXPANSION
CARTRIDGES

Figure 20 Combination Fiber 6-Port Services Cartridge

COMBINATION FIBER 6-PORT
SERVICES CARTRIDGE

- Connects additional Fiber Trunk, Fiber Station or ASMs to expand core Modular ICS capacity
- Fits into slot 2 (a half-width slot) of the ICS. The other half-width slot (slot 1) is reserved for the Services Cartridge.
- With XC software, two Six-Port Expansion Cartridges can be installed in the Modular ICS, the first in slot 2, the second in slot 1
- Compatible with the Module ICS core only.

- Connects additional Fiber Trunk and/or Station Modules to expand the core capacity of a Modular ICS equipped with XC software to a maximum of 10 expansion ports (248 total ports maximum configuration)
- Contains the clocking service required to support T1 or ISDN-PRI on the DTI cartridge or an ISDN-BRI Cartridge
- Fits into slots 1 and 2 of the Modular ICS and works with XC software, and regular DR 1.1 and later software (Requires fiber connections)
- Compatible with the Modular ICS core only.

Figure 21 Services Cartridge
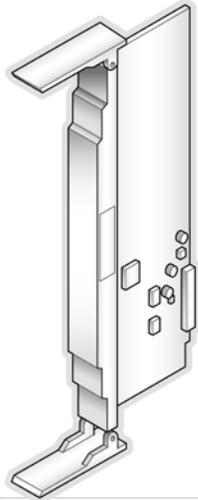
SERVICES
CARTRIDGE

- Provides clocking service necessary for digital networks
- Required if using DTI cartridge(s) or ISDN-BRI Interface cartridge(s)
- One cartridge supports all clocking required, regardless of the number or mixture of DTIs and/or ISDN-BRI Interface cartridges
- Uses slot 1 of the core ICS and cannot be used if a Copper Expansion Upgrade Cartridge is installed
- Compatible with the Modular ICS core only.

Figure 22 Digital Trunk Interface Cartridge

DIGITAL TRUNK
INTERFACE CARTRIDGE

- Provides access for up to 24 digital T1 or ISDN-PRI channels. It comes equipped with built-in Channel Service Unit (CSU) functionality to support the integrity of digital signaling.
- The core Modular ICS can support up to two DTIs for a total of 48 T1 or ISDN-PRI (digital) lines. One additional T1 can be installed in the first Trunk Module that provides a total of three T-1s for 72 trunks.
- Requires either the Services Cartridge or the Combination Fiber Six-Port Services Cartridge
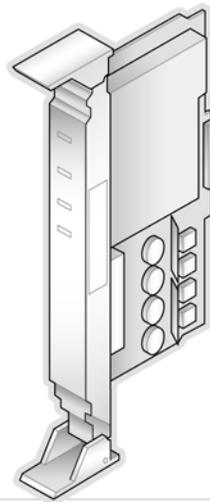- Compatible with the Modular ICS core and first slot of first Trunk Module.

Figure 23 2-Port U Interface ISDN-BRI Cartridge
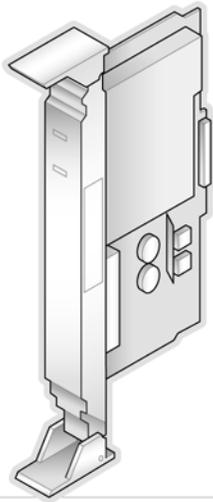
2-PORT U INTERFACE ISDN-BRI CARTRIDGE

- Supports two ISDN-BRI U Interfaces per cartridge
- Integrated Network Termination Type 1 (NT-1) functionality
- Interfaces can be individually configured to be a network interface or a station side equipment interface
- Powered by the cartridge slot connector
- LED on cartridge faceplate provides visual indication of circuit status (activated or deactivated)
- Compatible with Compact ICS core and Modular ICS core and Fiber Trunk Module.
- Requires Services Cartridge or Combination Services Cartridge on Compact ICS
- Requires either the Services Cartridge or the Combination Fiber Six-Port Services Cartridge on Modular ICS.

Figure 24 4-Port U Interface ISDN-BRI Cartridge

4-PORT U INTERFACE ISDN-BRI CARTRIDGE

- Supports four ISDN-BRI U Interfaces per cartridge
- Integrated Network Termination Type 1 (NT-1) functionality
- Interfaces can be individually configured to be a network interface or station side equipment interface
- Powered by the cartridge slot connector
- LED on cartridge faceplate provides visual indication of circuit status (activated or deactivated)
- Compatible with Compact ICS core and Modular ICS core and Fiber Trunk Module
- Requires Services Cartridge or Combination Services Cartridge on Compact ICS
- Requires either the Services Cartridge or the Combination Fiber Six-Port Services Cartridge on Modular ICS.
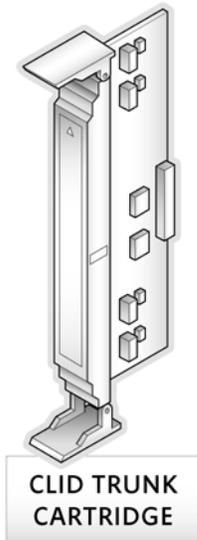
Figure 25 4-Port S/T Interface ISDN-BRI Cartridge
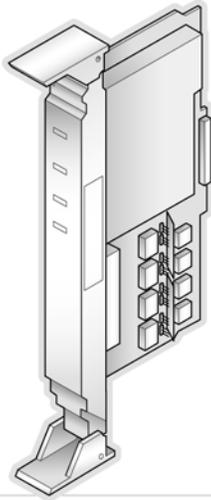
4-PORT S/T INTERFACE
ISDN-BRI CARTRIDGE

- Supports four ISDN-BRI S/T Interfaces per cartridge
- Configurable to be a network interface or a station side equipment interface (Use on the network side requires a customer supplied NT-1 interface device)
- Powered by the cartridge slot connector
- LED on cartridge faceplate provides visual indication of circuit status (activated or deactivated)
- Compatible with Compact ICS core and Modular ICS core and Fiber Trunk Module
- Requires Services Cartridge or Combination Services Cartridge on Compact ICS
- Requires either the Services Cartridge or the Combination Fiber Six-Port Services Cartridge on Modular ICS.

Figure 26 LS/DS Analog Trunk Cartridge
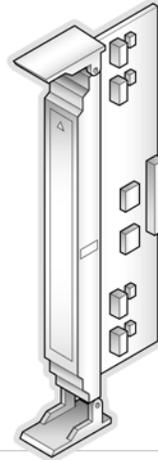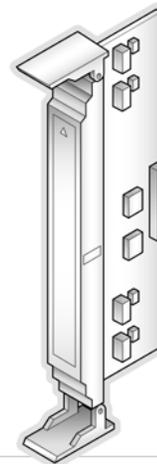

LS/DS ANALOG
TRUNK CARTRIDGE

- Provides access for up to four Central Office analog lines
- All LS (Loop Start)/DS (Disconnect Supervision) Trunk Cartridges have Disconnect Supervision capability and are labeled with "DS" on the faceplate
- Also called the New DS Loop Start Trunk Cartridge
- Compatible with the Modular ICS core, Fiber and Copper Trunk Modules, the Compact ICS core and the Modular 8x24 Copper Trunk Module.

Figure 27 *CLID Trunk Cartridge*

Figure 28 *E&M/Direct Inward System Access (DISA) Trunk Cartridge*

CLID TRUNK CARTRIDGE

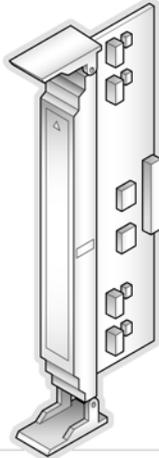**E&M/DIRECT INWARD SYSTEM ACCESS (DISA) TRUNK CARTRIDGE**

- Provides the same functionality as the LS/DS Trunk Cartridge but with the added capability to detect and translate incoming CMS/CLASS information for display on Norstar sets
- Required when any CMS/CLASS lines terminate on the Modular ICS core or Trunk Module or Compact ICS core
- Provides access for up to four Central Office analog lines
- Compatible with the Modular ICS core, Fiber and Copper Trunk Modules, the Compact ICS core and the Modular 8x24 Copper Trunk Module.

- Provides E&M tie line private networking between Norstars in a private networking configuration
- Contains two E&M Type II Trunk interfaces.
- Contains two DTMF receivers required to support DISA on Loop-Start Trunks
- Compatible with the Modular ICS Fiber Trunk Module and the Modular 8x24 Copper Trunk Module.

Figure 29 DID Analog Trunk Cartridge

- Routes calls from the public network directly to sets, bypassing an attendant, reducing traffic to the Central Answering Position (CAP)
- Provide Disconnect Supervision
- Does not support CMS/CLASS services
- Provides access for up to four CO lines
- Compatible with the Modular ICS Fiber Trunk Module and the Modular 8x24 Copper Trunk Module.
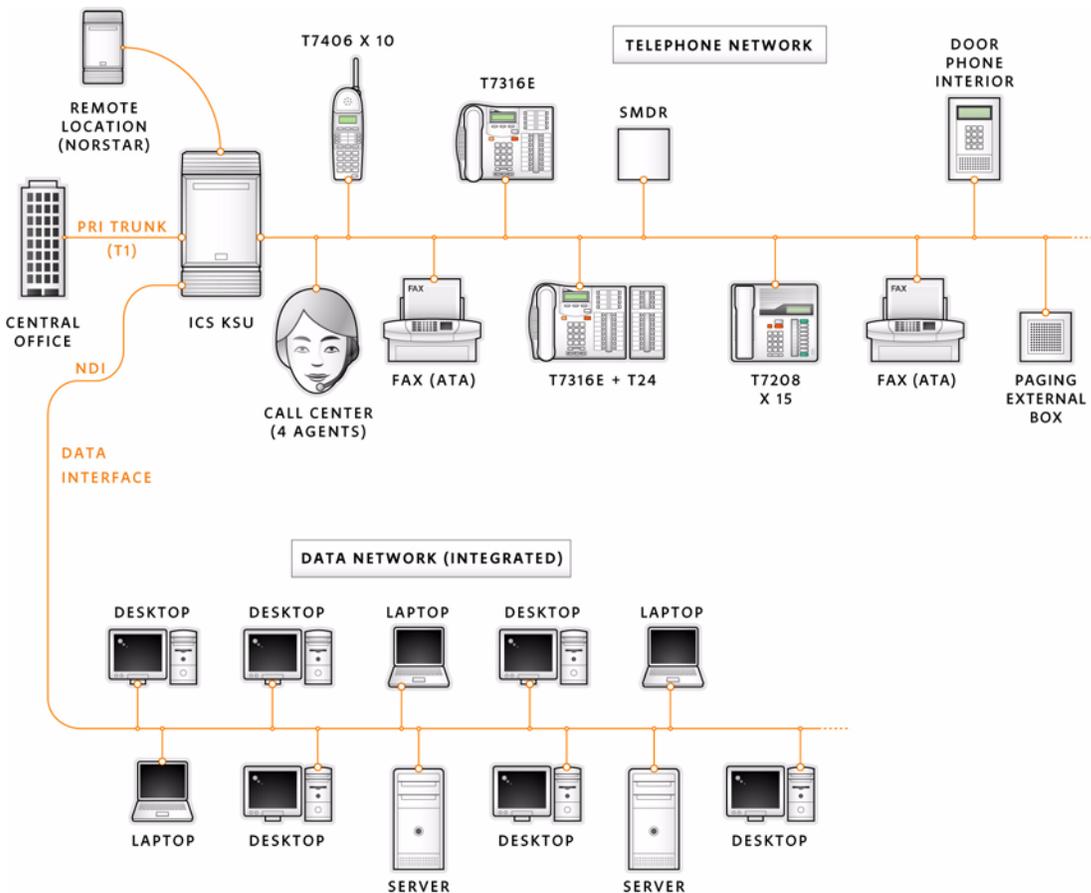
Sample Configurations

The following diagrams show how the various ICS components fit together in a large system configuration and a small system configuration, respectively.

Large System Configuration Example

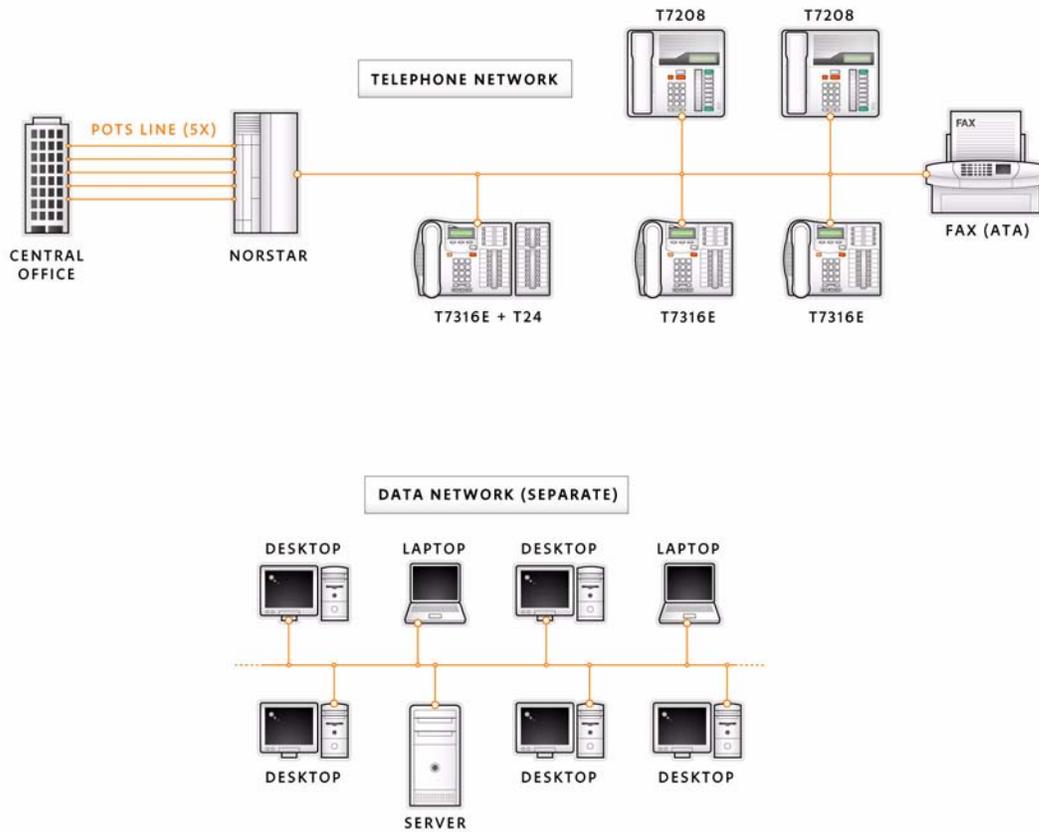Law office with 45 employees. Voice and data networks are integrated.

Figure 30 Large System Configuration Example

Small System Configuration Example

Medical office with five employees. Voice and data networks are separate.

Figure 31 Small System Configuration Example

Software and System Administration

Chapter Highlights

- Modular ICS/Compact ICS 6.1 Software Release – brings more functionality to the Norstar platform, providing small to medium-sized businesses with "high-end" advanced applications

- Modular ICS/Compact ICS 6.1 Software Additions and Enhancements – offer significant benefits while increasing the Norstar product portfolio's addressable market

- Built-in Auto Attendant – lets businesses handle large volumes of calls in an efficient and professional manner, helping to reduce operating costs and free up personnel to perform other duties

- System Answer – simplifies the job of answering calls by making sure all calls are answered within a set number of rings

- Custom Call Routing (CCR) – takes over the job of answering and transferring calls, providing fast access for callers to businesses that receive several group- or person-specific calls a day

- Fax Switch – listens to incoming lines and transfers calls automatically to a fax machine connected to the Norstar system, eliminating the need for an external device to monitor incoming trunk lines for fax tones.

Chapter Overview

The Modular ICS/Compact ICS 6.1 program consists of a new Modular ICS software release in addition to the upissue of any applications and peripherals for compatibility. This new software release also includes a number of core feature enhancements.

Modular ICS Software Cartridge Overview

The Modular ICS provides a high degree of customization and growth to suit individual user needs and provides the enhanced, integrated features and networking that small site businesses are demanding.

Three versions of the Software Cartridge are available, based on the system requirements and market (US or Canada):

•   Modular ICS 6.1 NA Software Feature Cartridge – provides capacity up to six expansion ports

•   USA – Modular ICS – XC 6.1 Software Feature Cartridge – provides expansion beyond 6 expansion ports to a maximum of 10

•   CDA – Modular ICS – XC 6.1 Software Feature Cartridge – provides expansion beyond 6 expansion ports to a maximum of 10

A fourth Software Cartridge is also available:

•   Release 1 Centrex

    •   Provides transparent operation of popular Centrex features. Does not support T1, ISDN Basic Rate Interface (BRI), Companion or expansion beyond six ports.

Note:　　On an XC system, the maximum number of sets that can have the same line appearance is 50. This limit is reduced by 15 for every portable telephone that has an appearance of the line.

Compact ICS Software Cartridge Overview

The Compact ICS provides a high degree of customization to suit individual user needs, and provides the enhanced, integrated features that small businesses are requesting.

The software cartridge – an industry standard PCMCIA (Personal Computer Memory Card International Association) – is used to run the system. It is approximately the size of a credit card and stores the system programming. The insertion slot on the core unit is cut away so the software load ID number can be read without removing the cartridge.

Four versions of the Compact ICS software cartridge are available:

- Compact ICS Standard Software Feature Cartridge with Internal Remote Access Device (IRAD)-enabled is IRAD enabled.

- Compact ICS Standard Software Feature Cartridge with Internal Remote Access Device (IRAD) enabled and Programmable Auto Attendant Prompts – offers the same as the Standard Software outlined above, is IRAD enabled and includes the ability to customize Auto Attendant prompts.

- Compact ICS Restricted Software Feature Cartridge with Programmable Auto Attendant Prompts – supports the use of one universal cartridge slot, for a maximum of four Central Office (CO) trunks and 8 of the 16 potential station ports. To expand the system beyond 4x8, a Restricted to Standard Software Keycode upgrade must be purchased.

- Compact ICS Restricted Software Feature Cartridge with Programmable Auto Attendant Prompts and Internal Remote Access Device (IRAD) enabled – offers the same as the Restricted Software outlined above, but with IRAD enabled.

Norstar Modular ICS/Compact ICS Release 6.1

Additions and Enhancements

Norstar Modular ICS/Compact ICS Release 6.1 provides the following software enhancements and additional features:

Support for the T7316E and T24 Key Indicator Module

The Business Series Terminals (BST) Central Answering Position (CAP) is the latest addition to the BST portfolio. It consists of a T7316 Enhanced (T7316E) multi-purpose professional terminal and a T24 Key Indicator Module (KIM). This fills the gap for a CAP in the BST product line. The CAP is created by directly attaching one or more T24 Key Indicator Modules to a T7316E terminal running Release 6.1 of the Norstar software.

Silent Monitoring on Hunt Groups

This feature adds the ability for a supervisor to silently monitor Hunt Group calls. In addition to allowing a supervisor to listen in on calls to monitor call quality levels, this feature offers a cost-effective method for training employees who answer customer calls.

12 Digit Destination Codes

This feature allows up to 12 digit destination codes to be programmed within Modular ICS/Compact ICS Release 6.1. This increases the length of programmable destination codes from seven digits in the previous release of the Norstar software.

Multiple Least Cost Routing

This feature provides additional least cost routes in each of the service modes programmed in Norstar. This provides additional flexibility to the least cost routing capabilities of Norstar Modular ICS/Compact ICS and ensures that businesses can take advantage of less expensive long distance facilities.

Display Caller ID While Busy

This feature displays the Caller ID (CLID) for an external call even while the destination user is busy on another call. This provides the user with improved call answering information to offer enhanced customer service.

Norstar ICS Software Features

Table 7   Norstar ICS Features

Norstar ICS Feature	CICS 1.0	CICS 2.0	CICS 4.0	CICS 4.1	CICS 4.1/4.2	CICS 6.0	CICS 6.1	MICS R1T1 & CTX	MICS 1.0	MICS 1.1	MICS 2.0	MICS 3.0	MICS 4.0	MICS 4.1	MICS 5.0	MICS 6.0	MICS 6.1
Access control to Link, LNR, SNR			√	√	√	√	√				√	√	√	√	√	√	√
Accidental Disconnect	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Administration & Configuration tree (new programming structure)		√	√	√	√	√	√				√	√	√	√	√	√	√
Alpha Tagging						√	√									√	√
Analog Station Module Recognition									√	√	√	√	√	√	√	√	√
Answer Groups/Keys	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Autodial Keys	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
• 24 Digits	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
• Store Facility Access	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
• Store Reach Through Codes	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Automated Attendant	√	√	√	√	√	√	√										
• Custom Call Routing	√	√	√	√	√	√	√										
• System Answer	√	√	√	√	√	√	√										
Automatic Daylight Savings Time	√	√	√	√	√	√	√			√	√	√	√	√	√	√	√
Automatic Line Selection	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Automatic Set Relocation	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
• Programmable On/Off	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Auxiliary ringing	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
• For lines in service modes	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Background Music	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Busy Lamp Indication	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
• On line pool key	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Button Inquiry	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Call Display when busy	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Call Duration timer	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Call Forward	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
• All calls	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
• Call Forward Busy	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√

Norstar ICS Feature	CICS 1.0	CICS 2.0	CICS 4.0	CICS 4.1	CICS 4.1/4.2	CICS 6.0	CICS 6.1	MICS R1T1 & CTX	MICS 1.0	MICS 1.1	MICS 2.0	MICS 3.0	MICS 4.0	MICS 4.1	MICS 5.0	MICS 6.0	MICS 6.1
• No Answer	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
• Override	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Call Identification	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Call Park	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
• 9 Call Park codes	√	√	√	√	√	√	√	√	√	√							
• 25 Call Park codes											√	√	√	√	√	√	√
• Round robin code assignment		√	√	√	√	√	√			√	√	√	√	√	√	√	√
• Time outs (30-600 sec.)	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
• With Callback	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Call Pickup	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
• Directed	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
• Pickup Groups (four groups in Compact ICS, nine groups in Modular ICS)	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
• Trunk Answer From Any Station	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Call Queuing	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Camp-On	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Central Answering Position	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
• CAP feature & autodial only	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
• BLF indication	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Class of Service	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
• 19 COS Passwords	√	√	√	√	√	√	√										
• 100 COS Passwords								√	√	√	√	√	√	√	√	√	√
• Dialing Abilities	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
CLID on all Target Lines					√	√	√									√	√
CLID when busy							√										√
CMS/CLASS																	
• Call Information Session	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
• 80 Caller Log	√	√	√	√	√	√	√										
• 300 Caller Logs										√							
• 600 Caller Logs								√	√			√	√	√	√	√	√
• Calling Name Display	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
• Calling Number Display	√	√		√		√	√	√	√	√	√	√	√	√	√	√	√
• LOGIT Feature	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√

Norstar ICS Feature	CICS 1.0	CICS 2.0	CICS 4.0	CICS 4.1	CICS 4.1/4.2	CICS 6.0	CICS 6.1	MICS R1T1 & CTX	MICS 1.0	MICS 1.1	MICS 2.0	MICS 3.0	MICS 4.0	MICS 4.1	MICS 5.0	MICS 6.0	MICS 6.1
• Long Distance Indicator	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Conference	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
• Independently hold two calls	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
• Using Privacy	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Copy Settings for Control Sets and Lines						√	√	√								√	√
Delayed Ring Transfer	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
• To prime	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
• Programmable # of rings	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Destination Code Digit Length	7	7	7	7	7	7	12		7	7	7	7	7	7	7	7	12
Dial Attendant Set	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
• Direct Dial Digit (0-9)	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Dialing Modes	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
• Standard	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
• Automatic	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
• Predial	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Dial Mode for Lines – pulse/tone	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Direct Station Select Buttons	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Disconnect Supervision	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Discriminating Ringing at Set	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Distinctive Line Ringing						√	√									√	√
• HG Distinctive Ring						√	√									√	√
Do Not Disturb	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
• DND On Busy	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
End-to-End Signaling	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Enhanced Call Restrictions and Overrides	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
• 25 Dialing Filers (max)	√	√	√	√	√	√	√										
• 100 Dialing Filers (max)								√	√	√	√	√	√	√	√	√	√
• Alternate toll restrictions	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
• System Speed Dial overrides	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
ETSI Network Call Redirection									√							√	√
External Call Forward				√	√	√	√							√	√	√	√

Norstar ICS Feature	CICS 1.0	CICS 2.0	CICS 4.0	CICS 4.1	CICS 4.1/4.2	CICS 6.0	CICS 6.1	MICS R1T1 & CTX	MICS 1.0	MICS 1.1	MICS 2.0	MICS 3.0	MICS 4.0	MICS 4.1	MICS 5.0	MICS 6.0	MICS 6.1
External Line Access Code	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Fax Switch				√	√	√	√										
Flexible Numbering Plan	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
• Changing DN length	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Group Listening	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Handsfree	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
• Automatic	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Hold	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
• Held Line Reminder	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Hospitality				√	√	√	√						√	√	√	√	√
• Alarm				√	√	√	√						√	√	√	√	√
• Room Condition				√	√	√	√						√	√	√	√	√
• Room Occupancy				√	√	√	√						√	√	√	√	√
Host Delay	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Host System Signaling	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
• Feature code compression	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
• Pause, run/stop, timed release	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
• Programmed release	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
• Recall/Link	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Hot Line	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Hunt Groups			√	√	√	√	√						√	√	√	√	√
• Max. number of groups			6	6	6	6	6						24	24	24	24	24
• Members per group			24	24	24	24	24						40	40	40	40	40
• Selectable Modes			√	√	√	√	√						√	√	√	√	√
• Busy Options			√	√	√	√	√						√	√	√	√	√
IDM Support												√	√	√	√	√	√
Incoming Line Groups	√	√						√	√	√	√	√					
Installer Password	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Intercom Key Assignment	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
ISDN BRI features		√	√	√	√	√	√				√	√	√	√	√	√	√
• Basic Call Trunking		√	√	√	√	√	√				√	√	√	√	√	√	√
• Calling Name ID			√	√	√	√	√						√	√	√	√	√

Norstar ICS Feature	CICS 1.0	CICS 2.0	CICS 4.0	CICS 4.1	CICS 4.1/4.2	CICS 6.0	CICS 6.1	MICS R1T1 & CTX	MICS 1.0	MICS 1.1	MICS 2.0	MICS 3.0	MICS 4.0	MICS 4.1	MICS 5.0	MICS 6.0	MICS 6.1
• Calling Number ID (incoming calls only)		√	√	√	√	√	√				√	√	√	√	√	√	√
• Subaddressing		√	√	√	√	√	√				√	√	√	√	√	√	√
ISDN-PRI features													√	√	√	√	√
• Basic Call Trunking													√	√	√	√	√
• Calling Name ID													√	√	√	√	√
• Calling Number ID													√	√	√	√	√
• Call by Call Service Selection													√	√	√	√	√
• E911													√	√	√	√	√
• Fractional PRI													√	√	√	√	√
• ETSI MCID																√	√
Language Choice	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Last Number Redial	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
• Number of Digits	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24
Line Button Relocation	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Line Names	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Line Pool(s)	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Line Redirection	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Line Types (Pool, Public, Private)	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Link/Flash (Recall)	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Listen On Hold	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Long Tones	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Loss Plan	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Messages (Send, Waiting, Reply)	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
• Static Time & Date		√	√	√	√	√	√				√	√	√	√	√	√	√
Multiple Line Appearances	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Music/Tone/Silence On Hold	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Networking – Norstar to Meridian 1													√	√	√	√	√
• Centralized PSTN													√	√	√	√	√
• CDP													√	√	√	√	√
• Name and Number ID													√	√	√	√	√
• MCDN (Centralized Voice Mail)															√	√	√
• MCDN ICCL																√	√

Norstar ICS Feature	CICS 1.0	CICS 2.0	CICS 4.0	CICS 4.1	CICS 4.1/4.2	CICS 6.0	CICS 6.1	MICS R1T1 & CTX	MICS 1.0	MICS 1.1	MICS 2.0	MICS 3.0	MICS 4.0	MICS 4.1	MICS 5.0	MICS 6.0	MICS 6.1
• MCDN TAT																√	√
• MCDN Camp-On																√	√
• MCDN Break-In																√	√
Networking – Norstar-to-Norstar																√	√
Night Service	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
• Flexible	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
• Service Modes	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
On-hook Dialing	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Outgoing Name/Number Blocking				√	√	√	√							√	√	√	√
Paging	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
• Internal (Multiple Zones)	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
• Page Yes/No Per Set	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
• Page time-out		√	√	√	√	√	√			√	√	√	√	√	√	√	√
• Page tone on/off		√	√	√	√	√	√			√	√	√	√	√	√	√	√
Password Protection	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Preselection/Call Screening	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Prime Line Select	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Prime Set(s)	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
• Multiple prime sets	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Priority Call	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Privacy	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
• On/Off	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
• Per Line	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Private Networking															√	√	√
Centralized Voice Mail on Norstar																√	√
Centralized Auto Attendant on Norstar																√	√
Ringing Line Preference	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Remote System Access	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Receiver Volume	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Receive Tones	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Restriction Override Password(s)	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Ring Again (Internal)	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√

Norstar ICS Feature	CICS 1.0	CICS 2.0	CICS 4.0	CICS 4.1	CICS 4.1/4.2	CICS 6.0	CICS 6.1	MICS R1T1 & CTX	MICS 1.0	MICS 1.1	MICS 2.0	MICS 3.0	MICS 4.0	MICS 4.1	MICS 5.0	MICS 6.0	MICS 6.1
• On busy line pool	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Routing Service	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Routing Service Routes	1	1	1	1	1	1	3		1	1	1	1	1	1	1	1	3
Saved Number Redial	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Service Modes	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Silent Monitoring for Hunt Group Calls							√										√
Speed Dial: Personal	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
• All sets supported	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
• Number of Digits	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24
Speed Dial: System	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
• Number of Entries	70	70	70	70	70	255	255	70	70	70	70	70	70	70	70	255	255
• Number of Digits	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24
• Name Support	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Station Set Test	√	√	√	√	√	√	√				√	√	√	√	√	√	√
System Version	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
System Wide Call Appearance								√								√	√
Telephone Admin Lock	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Time/Date Display	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Transfer	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
• Immediate	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
• With announcement	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
• With Callback	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
• Over Public Network	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Unsupervised Conference	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
User programmable feature keys	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Voice Call	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Voice Call Deny	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√

Norstar 3X8 Software Features

Table 8   Norstar 3x8 Software Features

Norstar 3x8 Feature	DR1	DR5
Accidental Disconnect	√	√
Answer Buttons		√
Autodial Keys	√	√
• Number of Digits	16	24
• Store Facility Access		√
• Store Reach Through Codes		√
Automatic Line Selection	√	√
Automatic Set Relocation	√	√
• Programmable on/off		√
Auxiliary Ringing	√	√
• For lines in Service Modes	Night Service	√
Background Music	√	√
Busy Lamp Indication	√	√
• On M7324 DSS keys		√
• On line pool key		√
Button Inquiry	√	√
• Examine speed dial numbers		√
Call Display When Busy	√	√
Call Duration Timer	√	√
Call Forward	√	√
• All Calls	√	√
• Call Forward Busy		√
• Forward No Answer Delay		√
• No Answer		√
• Override	√	√
Call Identification (Internal Calls)	√	√
Call Park		√
• Prefix Digit		0-9
• Time-Outs (30 – 600 sec.)		√
• With Callback		√
Call Pickup	√	√
• Directed		√
• Pickup Groups (four groups)	√	√
• Trunk Answer from Any Station	√	√
Call Queuing		√

Norstar 3x8 Feature	DR1	DR5
Camp-On		√
Central Answering Position		√
• (CAP features & autodial only)		
Class of Service		√
• COS Passwords		20
• Dialing abilities		√
CMS/CLASS		√
• Call Information Session		80 calls
• Caller Log		80 calls
• Calling Name Display		√
• Calling Number Display		√
• CO VMail Message Waiting Indicator		√
• LOGIT Feature		√
• Long Distance Indicator		√
Conference	√	√
• Independently hold two calls		√
• Unsupervised		√
• Using Privacy		√
Custom Business Products Compatibility		√
Delayed Ring Transfer	√	√
• To Prime	√	√
• After programmable number of rings		√
Dial "X" Set (Direct Dial Set)		√
• Direct Dial Digit	0 only	0-9
• Destination Set	Extn. 21 only	Flexible
Dialing Modes	√	√
• Standard	√	√
• Automatic		√
• Predial		√
Dial Mode for Lines – pulse/tone	√	√
Dial Pad Feedback	√	√
Direct Station Select Buttons	√	√
Disconnect Supervision		√
Discriminating Ringing at Set	√	√
Distinctive Ringing Cadence	√	√
Do Not Disturb	√	√
End-to-End Signaling	√	√
• Long tones – External		√

Norstar 3x8 Feature	DR1	DR5
• Long tones– Internal		√
• Long tones – On Ext. paging port		√
External Line Access	√	√
Flexible Call Restrictions (on a per line basis)	Uses Tables	Filters
• Dialing Filters (max)		25
• Filter Restrictions per System (max)		200
• No. of digits per restriction	10	15
• No. of digits per exception/override	14	16
• Restrictions per filter (max)		48
Group Listening		√
Handsfree	√	√
• Answerback	√	√
• Automatic		√
• With Mute Capability	√	√
Hold	√	√
• Automatic	√	√
• Exclusive	√	√
• Held Line Reminder	√	√
• Reminder Delay Range (seconds)	30-120	30-180
• I-Hold/U-Hold/Mutual Hold	√	√
• Listen on Hold	√	√
Host Delay		√
Host System Signaling (Called Centrex/PBX features on DR1)	√	√
• Feature code compression		√
• Pause, run/stop, timed release	√	√
• Programmed release		√
• Recall/Link	√	√
Hot Line – External, Internal & none		√
Installer Password		√
Intercom Key Assignment	√	√
Language Choice	√	√
Last Number Redial	√	√
• Number of Digits	16	24
• Selects facilities used on original call		√
• Convert to auto/speed dial		√
Line Button Relocation		√
Line Name		√

Norstar 3x8 Feature	DR1	DR5
Line Pool	√	√
• Number of Pools	1	3
• Ring Again on Busy Pool		√
• Pool Access Code	9	√
Line Selection	√	√
• Manual	√	√
• Preselection		√
Line Types (Pool, Public, Private)	√	√
Line Redirection		√
• allow/deny per set, redirecting burst		√
Link	√	√
Listen On Hold	√	√
Long Tones		√
Loss Plan	√	√
Messages (Send, Waiting, Reply)	√	√
Multiple Line Appearances	√	√
Music/Tone/Silence On Hold	√	√
On-hook Dialing	√	√
• Using special features (i.e., last number redial)	√	√
Paging	√	√
• On/Off on a per set basis		√
• Internal zones		3
• External speaker	√	√
• Long tones on paging port		√
• Receive page Y or N per set	√	Zones
Preselection/Call Screening	√	√
Prime Line Select	√	√
Prime Set	√	√
• Call Forward to prime set		√
• Callback to prime	√	√
• Delayed Ring Transfer (DRT) to prime	√	√
• Number of Rings until DRT	3	1,2,3,4,6 or 10
Priority Call – per set, on/off option		√
Privacy	√	√
• On Lines	√	√
• Control		√
Receive Tones Y/N (ATA tone pass through)		√
Release	√	√

Norstar 3x8 Feature	DR1	DR5
Ring Again (Internal)	√	√
• On Busy	√	√
• On Busy Line Pool		√
• On No Answer		√
Ringing Line Preference	√	√
Saved Number Redial		√
• 24 digit & previous line		√
Service Modes		√
Set Names	√	√
Speed Dial: Personal	√	√
• Number of Digits	16	24
• Restriction Override Capability		√
• Name Support		√
• Display Digits Y/N		√
• Line Selection		√
Speed Dial: System	√	√
• Number of entries	30	70
• Number of Digits	16	24
• Name Support		√
• Restriction Override Capability		√
• Display Digits Y/N		√
• Line Selection		√
System Version		√
Telephone Admin Lock		√
Time/Date Display	√	√
• Show time temporarily during call		√
Transfer	√	√
• Number of rings for callback		3,4,5,6 or 12
• Over Public Network		√
• Unified; Immediate & with announce		√
• Using Conference	√	√
• Using Hold	√	√
• With Callback		√
Unsupervised Conference		√
User programmable feature keys	√	√
Voice Call	√	√
Voice Call Deny	√	√

Norstar Software Features and Benefits

This section describes Norstar software features and some of the possible benefits customers can realize. Check the software feature chart to determine what features are available on the various system software options.

Note: * denotes the described feature is a CMS/CLASS line feature and not a Norstar feature.

Table 9   Norstar Software Features and Benefits

Feature	Description	Benefits
Access Control to Link, LNR, SNR	Gives the system administrator the option to remove access to Link, LNR and/or SNR on a set-by-set basis.	Prevents toll fraud by forcing set to adhere to Norstar call restrictions.
Accidental Disconnect Protection	Lets users retrieve a call within one second if they accidentally drop the receiver back into the cradle when answering a call.	Ensures users do not lose calls and thereby provides more professional call handling.
Alternate Restrictions	Alters which calls can be made by changing dialing restrictions according to both time of day and day of week.	Helps control unauthorized calling.
Answer Groups (also called Answer Button or Answer DN)	A telephone button with an indicator that is used to monitor ringing calls at another set. Calls are answered at the monitoring set by pressing the active button.	Allows a person to monitor or answer all calls at another phone by simply pressing one button.
Auto Answer	Used with DID, DISA and E&M trunks, ensures that the Norstar system automatically answers calls, bypassing the attendant; a caller enters the digits for routing to a specific set or line pool access.	Improves customer service by offering more efficient incoming call handling.
Auto Bump On/Off	When a Call Log becomes full, Auto Bumping "On" causes deletion of the oldest entry previously viewed, and logs the new call; when "Off," the Norstar system will not log new calls.	Provides automated log management if desired.
Autodial (Internal and External)	Lets users program internal or external numbers onto memory buttons for one-button dialing access.	Saves time by providing direct access to another person in or outside the office with no need to remember the number.

Feature	Description	Benefits
Automatic Number Identification (ANI)	Delivers the calling line number. (T1 Specific)	Improves customer service when used to pull customer info from a database before the user speaks with the customer.
Automatic Route Selection (ARS)	Automatically selects the preprogrammed long-distance carrier based on the dialed digits, time of day and day of week.	Lowers costs by insuring that the cheapest available long-distance routes are being used.
Automatic Callback (AC) *	Automatically redials the last outgoing number dialed. If it's busy, the CO will use "Ring Again" to monitor the line. When it is free, the caller will hear special ringing, and the number and/or name of the called party will be delivered to the LCD. Multiple busy lines can be monitored for up to 30 minutes. Users can program this feature as an external autodial for one button convenience.	Improves productivity as the caller, while waiting, can work or continue to use the telephone. With Norstar, the special ring is easy to hear, and callers are quickly identified with call display.
Automatic Daylight Savings Time	Ensures that the system clock automatically falls back one hour on the last Sunday of October at 2:00 a.m. and automatically advances one hour on the first Sunday of April at 2:00 a.m. This feature can be deactivated where not applicable.	Eliminates the next business day confusion about time and how to program the change. Users no longer have to remember to take care of this.
Automatic Line Selection	When answering incoming ringing calls, automatically selects the longest ringing line first. Ringing incoming calls are automatically connected by lifting the receiver, pressing Handsfree, or using Call Queuing.	Users do not need to know which line is ringing or which call has been ringing the longest.
Automatic Recall (AR) *	Works the same as AC and applies to the last incoming call received.	Saves time.
Automatic Set Relocation	Ensures that sets moved to a different location will retain all custom programming.	Saves time and money during employee moves. Employees can keep the same extension number.

Feature	Description	Benefits
Auxiliary Ringing	Allows a set's headset jack to send ringing tones via an amplifier to an external loud ringer connected to the set.	Users can hear a ringing set in a noisy environment.
Background Music	Lets users listen to music (customer supplied) through the set's speaker when the set is idle.	If supplied, it delivers music to a user's set to enhance their work environment.
Button (Key) Inquiry	Allows a user to check the programming on memory buttons.	Ensures current programming matches the button labeling.
Call Duration Timer	Temporarily displays the length of the last or current call so a user can record it.	Users can track time spent on calls; useful for account billing.
Call Forward All Calls	Sends all calls to another set.	Improves customer service by ensuring all calls are answered.
Call Forward No Answer	After a preset number of rings, transfers an unanswered call to another DN.	Ensures a user's phone is answered if the user is unable to answer a call or has forgotten to activate Call Forward.
Call Forward On Busy	Immediately sends calls to another DN if a set is busy.	Ensures users are not disturbed when a set is busy, and that calls are routed promptly.
Call Forward Override	Lets users override Call Forward, meaning that when a set is on Call Forward, the "Forward To" set can still call the "Forwarded" set to relay important messages.	Improves office communications; users can inform others of important messages or ask for forwarding to be cancelled.
Call Forward – Selective	Lets users transfer a call to the Prime set by pressing the "Do Not Disturb" button when a Central Office line is ringing.	Improves time management for the user, who can view the caller's name and then choose to accept or reject it.
Call Information	Allows users to display information about incoming calls. For external calls, CMS is required and users can display the caller's name, telephone number and the line name. For internal calls, users can display the name and the internal number.	Improves customer service as users can obtain information about ringing, answering, or held calls.

Feature	Description	Benefits
Call Log	Allows the user to enter Call Log to view stored information including: Caller's name and/or number (if delivered from the CO), Date and Time, Answered Call Indication and Repeat Call Counter.	Increases business opportunities and improves customer service by capturing caller's number and/or name even if the call goes unanswered. It also improves productivity by allowing a user to redial the caller's phone number.
Call Log – Optional Password	Lets users enable password protection of their call log.	Provides the user with security for their call log.
Calling Name & Number Display	Lets users view the name and number of the incoming caller, both before answering and during the call. The calling number is also stored in the Call Log. (Requires CMS/CLASS, ISDN BRI or ISDN-PRI.)	Improves customer service. In conjunction with Call Log, this feature increases business opportunities. The users can pass on the caller's number to an associated PC application to improve customer service for example, by triggering automatic customer profile retrieval.
Calling Name & Number Display Blocking	Lets users prevent delivery of calling name and/or number when they place a call. For outgoing calls, Norstar supports one button convenience when the user wishes to "block" their number and/or name. (Requires CMS/CLASS, ISDN BRI or ISDN-PRI.) On incoming calls, the Norstar user will be presented with "Private Name" and/or "Private Number" when receiving a "blocked" call.	Maintains privacy and security for outgoing calls. Identifies callers who have blocked their number and/or name for inbound calls.

Feature	Description	Benefits
Call Park – Linear/Round Robin	Lets system administrators choose linear or round robin call park codes. With linear codes, the system assigns the first free call park code to the call. This means that the first few call park codes will be used most frequently. In busy environments this can cause confusion when calls have been hung up or called back and within moments a new call is parked using the same code. Round robin call park codes are assigned sequentially until the maximum number of codes is reached (25) before starting again at the first code.	Provides system configuration flexibility and customization to customer needs.
Call Park (With Callback)	Lets users place an active call automatically on hold and assigned it a code so they can retrieve it from another set.	Improves efficiency, as users can retrieve parked calls from any Norstar set in the system.
Call Pickup Directed + Intercom #	Lets users answer a ringing call at any other set by dialing the ringing set's intercom number.	Simplifies call answering and efficiency, as users knows whose set they are answering.
Call Pickup Group	Lets users answer any call ringing at another set within the pickup group.	Improves efficiency with respect to call coverage for incoming calls.
Call Pickup Trunk Answer From Any Station	Allows users to answer a ringing external call at any other set.	Improves after-hours communications, as calls can be heard and answered from any station.
Call Queuing	Answers the next available call, but gives priority to the longest waiting external call.	Improves customer service, because users answer calls promptly and efficiently. (Used with DR3 and higher.)
Call Waiting	Answers the next available call, but gives priority to the longest waiting external call.	Provides the same benefits as Call Queuing. (Used only with Centrex, Centrex+ and R1/Centrex software.)
Callback	Automatically returns unanswered parked or transferred calls to the originating set after a preset number of seconds.	Improves customer service, as all calls will be answered.

Feature	Description	Benefits
Camp-On (Call Waiting)	Ensures that an external call waits at a busy set, making alerting tones, until a user answers it or until Callback returns it to the originating set.	Allows more calls than a set has lines to wait at a set; alerting tones or illuminated LCD notify the user of a waiting call.
Central Answering Position (CAP)	(Also known as a Key Lamp Module) A CAP module connected to an M7324 set may be assigned enhanced CAP status. This allows lines assigned to this DN to be moved to the CAP module. The Compact ICS supports one enhanced CAP position and the Modular ICS supports up to five enhanced CAP positions.	
Class of Service (COS)	Controls the Norstar features and lines available when a user places a call within the system or remotely. A call can be associated with a line, a set or a Class of Service (COS) password.	It offers efficient system control and management.
Class of Service (COS) Password	A six-digit code that lets users switch from their current class of service to one that lets them dial a number prohibited by their current class of service. It is used when DISA access is controlled with passwords. This feature has been enhanced to include an access package which defines the set of line pools a user may access and provides access to remote paging capabilities. The number of COS passwords has been increased to 100 six-digit passwords (from 19). In addition, a remote caller can change the Class of Service of an incoming call by dialing the DISA DN and entering a COS password.	Maintains system security by limiting access to authorized users and limiting those users to the features they require. Minimizes unauthorized system access.
CLID on Busy	Users will automatically receive CLID information while busy on another call.	Provides the user with improved call answering information to offer enhanced customer service.

Feature	Description	Benefits
Compression of Feature Codes	Users can compress reach-through codes (link, run/stop, programmed release, pause) to use less digit space in Auto Dial or Speed Dial programming modes.	Increases space for longer numbers, features or access codes in Auto Dial or Speed Dial sequences.
Conference (Three-Person)	Lets users create a three-person call with two other internal or external parties. Conferences are easily set up with LCD prompts; Automatic Hold protects the first call from being accidentally cut off.	Reduces meeting expenses,.as users can conduct meetings over the phone.
Consultation Hold	A user can put a call or conference on hold to consult with others on another line; held parties can still talk with each other.	Saves a user's time and effort, as he or she can obtain additional information without having to terminate and later re-establish the call.
Coordinated Dialing Plan	Calls can be programmed to route over a network based on destination codes.	Network calls can be programmed in a manner consistent with local calls.
Custom Business Products Compatibility	Interfacing with an IBM-compatible PC is made possible with a PCI Card, allowing access to PC programs specially developed for Norstar.	Expands the system's level of functionality.
Customer Originated Trace *	Lets users send the number of the last incoming call to the telephone company. This includes calls where the name and/or number have been blocked. Note: The user does not receive the caller's number. Security procedures vary with different telephone companies.	Helps eliminate malicious and nuisance calls.
Delayed Ring Transfer (DRT)	Automatically transfers an incoming call to a "prime set" after a preset number of rings.	Improves customer service, as the system answers all calls.
Dial "0" Station (Dial "X")	Lets users reach the designated receptionist set from any other set in the system by pressing the intercom key followed by the designated digit.	Improves efficiency, as users can reach a receptionist or control person in the office quickly and easily.

Feature	Description	Benefits
Dial Intercom	Lets users quickly call coworkers internally by pressing the Intercom button and dialing the intercom number.	Provides easy access to coworkers, while keeping outside lines free.
Dialing Filters	Provide virtually unlimited flexibility in programming dialing restrictions and exceptions. Restriction override tables are replaced from previous Modular software versions.	Controls access to lines.
Dialing Modes	Lets users select from the following dialing mode options:	
Dialing Mode: Standard	Lets users choose a line and dial a call using either the receiver or handsfree.	Offers a more efficient dialing process.
Dialing Mode: Automatic	Lets users automatically select the set's Prime line by pressing a dialpad button, thus saving time.	Provides a convenient, handsfree dialing option.
Dialing Mode: Predial	Lets users enter, check and edit a number before selecting a line.	Dialing mistakes are eliminated.
Dial Mode for Lines	Temporarily changes set from pulse to tone mode by pressing # to signal external systems and devices.	Improves external communications by letting users activate/access equipment such as voice recording devices.
DID Template	Automatically assigns target lines and received numbers as the set DN. The system preserves these assignments when it expands. (Typically, the installer programs these assignments.)	Businesses with a network can easily integrate a new system or expand existing systems by using this template.
Direct Dial – Flexible Digits	A systemwide digit users deploy to call a direct dial set.	Internal dialing and communications are enhanced.
Direct Dial – Multiple Attendants	Single-digit access to an attendant. There may be up to five direct dial sets in the system, but each extension is assigned to a single direct dial set.	Improves customer service.

Feature	Description	Benefits
Direct Inward System Access (DISA)	Allows remote users to dial directly into the Compact ICS system to access Norstar features. Users hear a stuttered dial tone and must enter a Class of Service (COS) password to gain access to the system.	Provides added security by controlling system access. Remote access can be assigned to specific users who need to use the system's network connections or other services. Ensures that users can access the system from remote locations using a Class of Service password. Used as a security feature to control remote access into the Norstar system using Central Office lines; configured with Loop, DID and E&M Trunks. Controls Norstar system access.
Disconnect Supervision	Drops the line immediately after an external call disconnects.	Prevents the system from identifying a line as on hold or busy, thus denying access, when in fact it is really idle. (Note: the local telephone company must also support Disconnect Supervision.)
Discriminating Ringing at Set	Ensures that Norstar sets ring differently for internal and external calls so users can easily distinguish between call types.	Provides improved call handling and customer service.
Distinctive Ringing/Call Waiting *	Provides special ringing or call waiting tones, if the caller is included in a user-specified list of numbers.	Improves customer service by providing an indication of a special customer's call.
Do Not Disturb (DND)	Ensures that incoming calls will not ring at a set, but the LCD line indicator will continue to flash as calls are forwarded to the prime set.	Allows users to work uninterrupted when necessary.
Do Not Disturb (On Busy)	Provides internal and private network callers with a busy tone instead of ringing while the user is on a call. External callers are transferred to the Prime set for answering. The line indicator for an external incoming call flashes, but the phone does not ring.	Eliminates the distraction of a second line ringing, while ensuring that external callers are routed to an answering position.

Feature	Description	Benefits
Enhanced Trunking Connectivity Private Network – E&M (Tie) Trunk Connectivity	Connect to a Norstar system to create a private network between locations. For each system within the network, the length of directory numbers (DNs), line pools and line pool access codes are the same.	Ensures cost-effective efficient internal communications.
Enhanced Trunking Connectivity Public Network – DID Trunk Connectivity	Lets incoming callers bypass the attendant and be directly routed to a target line.	Improves call handling.
Enhanced Trunking Connectivity Public Network – Remote Access	Provides off-site remote access to Norstar's private or public network facilities, which avoids public network toll costs.	Helps to improve cost controls.
Executive Busy Override (Priority Calls)	Lets users within a Norstar system force a voice connection to busy set or one on "Do Not Disturb" anywhere in the system.	Ensures that, in the case of a true emergency, the calling party can establish contact.
External Call Forward	Allows the ICS to forward calls to destinations external to the system by utilizing outgoing lines.	Improves customer service by allowing a user to externally forward calls transferred to their intercom number.
External Calls on Intercom Keys	Lets users program lines to ring on an intercom key.	Lets users utilize more buttons for features by using intercom keys for external calls.
External/Network Transfer	Allows the user to transfer calls not only internally, but over the public or a private network.	Improves customer service by allowing users to transfer the caller to the correct party, even if they are not on the Norstar system.
External Line Access	Lets users directly access outside lines by buttons on individual phones or indirectly by a line pool.	Ensures users can bypass the receptionist to place outside calls, thereby saving time and money.
Fax Switch	A Compact ICS 4.1 feature that listens to incoming lines and automatically transfers the call to a fax machine connected to the Norstar.	Eliminates the need for an external device to monitor incoming trunk lines for Fax tones.
Feature Access Key	Lets users program any feature code onto a memory button.	Offers fast, single-button access to frequently-used features.

Feature	Description	Benefits
Flexible Call Restrictions and Overrides	Lets users apply call restrictions and overrides to individual lines and/or sets, but can override them with passwords.	Maintains Call Restrictions cost control, yet provides access to selected numbers within the restricted categories.
Flexible Numbering Plan – Changing DN Length	Means that the length of the Directory Number (internal number) can be from two to seven digits. All DNs in a system must be of the same length.	Provides users with flexibility in assigning internal numbers. It is also helpful when the system is part of a network and a uniform series of internal numbers is required.
Group Listening	Lets a group hear an incoming voice on both handset and speaker, while outgoing voice occurs only through the handset.	Eliminates background noise. While a group listens to a call through the speaker, the caller hears more clearly through the receiver.
Group Set Copy	Allows system programmers to copy data from one set to a range of DNs. Two options are provided: copy from a set to all like sets, or copy from a set to all like sets within a specified range (e.g., copy data from a M7310 to all M7310s within the range). Copying can be done for a particular subheading of programming or to duplicate all or a portion of programming for a set.	Saves time.
Handsfree Answerback	Internal voice calls automatically turn on the set microphone so users can reply without touching the set. (Not available with the M7100.)	A user can answer the telephone and continue working; the caller terminates the conversation.
Handsfree – Automatic	Lets users program the set microphone and speaker to automatically turn on every time a call is answered or placed. (Not available with the M7100.)	Saves time by providing more convenient handsfree operation.
Held Line Reminder	Plays periodic reminder tones on external calls on hold. These tones play over the set speaker until a user retrieves the call.	Improves customer service because a user will be less likely to forget the call.

Feature	Description	Benefits
Hold – Automatic	Automatically places an active call on hold if the user forgets to press the Hold button before selecting a second line, an intercom or a Transfer button.	Prevents internal and external calls from accidental cutoff during transfers.
Hold – Exclusive	Lets users retrieve their call only at the set where they placed it on hold.	Ensures privacy.
I-Hold/U-Hold Indication	Ensures that LCD line indicators will flash faster for held calls at the user's own set than for calls on hold at other sets.	Lets users easily identify calls held at their own set from those held at others' sets.
Hospitality Services	• Alarm provides an alarm clock capability on Norstar sets and analog telephones connected to an ATA or an ASM. Both room sets and common sets can be programmed to sound an audible alert at a requested time. • Room Condition (RC) allows users to exchange information about the serviced state of a room. Users are front desk attendants and cleaning or maintenance personnel of an establishment. • Room Occupancy (RO) allows front desk operators to assign dialing restrictions to room sets, and also works with the Room Condition feature.	Enhance the usefulness of the Norstar ICS in small to medium-sized hotel/motel/hospital facilities.
Hot Line	Lets users program a set to call a specific internal or external number whenever its handset is lifted or the handsfree button is pressed.	Saves time and effort by providing convenient, direct access to a frequently-called location.

Feature	Description	Benefits
Hunt Groups	Enable a single directory number to call a group of sets. Hunt Groups replace Incoming Line Groups on Modular ICS and Compact ICS 4.0 and higher. Three hunting modes are available: broadcast, sequential and rotary. All Norstar sets, Companion sets, PC Consoles and 2500 analog sets can be assigned to a Hunt Group.	Improves call answering coverage and allows calls to be directed to specialized knowledge.
Incoming Line Groups (replaced by Hunt Groups for Modular ICS and Compact ICS 4.0 and higher)	Incoming Central Office lines are grouped together under a line group and assigned to individual telephones. (Cannot be assigned to an M7100 set or to a single-line set attached to an ATA.)	All calls over multiple lines can be answered by any telephone assigned.
Language Choice	User can select one of three languages for their Norstar set: English, French or Spanish. (The same system may have multiple languages active simultaneously.)	Provides the user with flexibility to accommodate alternative language requirements.
Last Number Redial	Lets users redial the last externally dialed number.	Saves time, as it is convenient to redial a busy number.
Line Assignment (Set)	Lets users assign a maximum of eight lines to any of the sets in the system.	
Line Names	Lets users program names for incoming and outgoing lines.	Informs the user of whose line is ringing to permit more personalized greeting when answering. Users can also quickly identify which outgoing line they are using.
Line Pool(s)	Lets users select a line from a pool of lines using an access code when several external lines are shared by a group of telephones.	Reduces line costs and the number of button appearances when lines are shared among a number of sets.
Line Pool(s) – Busy Status	Turns on the LCD set indicator when all lines in a Line Pool are busy.	Saves time, because users don't have to keep checking for a free line.

Feature	Description	Benefits
Line Profile	Ensures that line settings programmed in Configuration and Administration will appear on the M7310 or M7324 set display. (Not available on Compact or 3x8.)	Programming information is easily verified.
Line Redirection	(Often referred to as Selective Line Redirection.) Incoming calls on one or more lines can be redirected on a Norstar set to one or more locations outside the system complying with associated dialing filters. Redirected calls cannot be answered from another set. (Not available with M7100.)	Users can receive calls at any location.
Line Selection	Lets users manually press idle or ringing lines to override the automatic line selection feature.	Lets a user override the Automatic Line Selection feature.
Link/Flash (Recall)	Lets users deploy a link signal to access special features if the Norstar system is connected to a PBX or Centrex.	Allows the Norstar system to hear a "second dial tone," before accessing Centrex or PBX features.
Listen On Hold	Lets users "on hold" work handsfree while waiting by pressing the hold button, replacing the handset and then reselecting the held line. The call can now be monitored through the speaker.	Users can work handsfree, while waiting for the caller to return.
Log Space (CLID)	Has been increased to a maximum of 250 entries per system.	
Logging Options	Lets the user can determine which type of calls will be logged at a set (i.e., no one answered, unanswered by me, log all calls, and no autologging).	Allows user to customize own set. Also allows the user to capture the calling information on important calls.
LOGIT (Manual Logging)	Lets users manually enter incoming calls after they are answered if the calls are not automatically logged.	Allows the user to capture calling information for only those calls important to them.
Long Tones	Sends long DTMF tones to access devices.	Users can operate devices requiring long continuous tones.

Feature	Description	Benefits
Loss Package	Compensates for Loop Start (analog) trunk quality. Allows selection of appropriate loss/gain and impedance settings for each line. The settings are based on the distance between location of ICS and the service providing Central Office.	Provides improved quality of service for customers with analog lines.
Maintenance Alarms	Provide alarm codes on a designated Alarm Telephone to notify users of a component fault and its location within the system.	Provides instant notification and diagnostic information for problems requiring distributor servicing.
Make Set Busy	Makes the associated Centrex line busy when activated on a Centrex line.	Minimizes interruptions without losing calls.
MCDN	Signaling used to network a Norstar to a Meridian 1 PBX.	Provides centralized voice messaging to drive down cost and improve internal communication.
Message Leave (List)	Ensures that display messages ("Message for you") are sent to other set displays requesting a callback.	Saves time, as callers do not have to keep calling back or leave a message with a receptionist.
Message Waiting (List)	Lets users automatically call back the person who sent "Message for you" to their display or cancel the message.	Improves internal communications.
Move Lines	Moves assigned lines to different LCD memory buttons on the set (except Handsfree, Intercom or Answer buttons) or Enhanced CAP.	Lets users customize the line appearance on their sets, as well as line answering patterns.
Multiple Least Cost Routing	Provides additional least cost routes in each of the service modes to be programmed before the user will receive and expensive route warning tone.	Provides additional flexibility to the least cost routing capabilities and ensures businesses can take advantage of less expensive long distance facilities.
Music/Tone/Silence On Hold	Lets external callers on hold within the system listen to music (customer supplied), a periodic tone or silence, as preset by the system administrator.	Assures callers, through tones or music, that they are still on hold and have not been disconnected, thus reducing the number of abandoned calls.

Feature	Description	Benefits
Network Direct Dial	Lets users dial one digit to reach a specific destination on either a public or a private network.	Saves time and improves productivity.
Night Service	Ensures that outside calls that normally ring at the Prime Set also ring at additional, preselected sets during preset times.	Improves internal communications and customer relations, as the system answers after-hours calls.
Numbering Plan – Flexible	Lets users control the length and sequence of digits needed to access other sets or outside lines.	Users can be given intercom numbers to match other PBX and Centrex numbers.
On-Hook Dialing	Lets users choose to dial directly from the dialpad and speak using the handset or handsfree button.	Convenient for the user.
Outgoing Name and Number Blocking (ONN)	Allows callers to block their name and number on a per call basis so that they cannot be identified. ONN is a direct block against CLID devices. Once ONN is activated by the caller on the Norstar the CO is alerted to block the calling party's name and number to the person being called.	Increases caller confidentiality and guarantees privacy and security on a call by call basis.
Paging – Internal Internal zones Zones 0-6	Allows users to initiate a page or be paged internally through the set speakers. It is also easy to make announcements through the Norstar set speakers to a select group of users or to all sets.	Ensures that users who are away from their sets, but within the office, will still receive notification of calls.
Paging Feature Enhancement	Enables users to program page time-out. A system-wide parameter can administer the paging tone to be "on" or "off."	Minimizes the length of time the feature is tied up at one set or left on by accident.
Paging – External	Allows users to make external paging announcements when Norstar is connected to a user-supplied amplifier and speaker.	Paging announcements can easily be sent to rooms or areas without telephone sets.
Paging – External and Internal Zones 0-6	Allows users to make announcements using both the Norstar set speakers and the office's loudspeaker system.	It is easy to make systemwide announcements to everyone within your organization.

Feature	Description	Benefits
Paging Set Access	Allows users to deny individual sets the ability to perform paging.	Improves security of paging system. Sets in open areas can be denied the ability to page (i.e., classrooms or motel rooms.).
Passive CLID	CLID information can be delivered to all Norstar sets with a ringing line appearance, instead of displaying the information about an incoming call to one set only.	Ideal when employees share phones or move around an office.
Password Protection	Lets the coordinator change the system administration password for added security.	Helps to protect system programming data.
Preselection/Call Screening	Displays the assigned name of the caller's set or line on the set display.	Lets users identify the caller or the line being used.
Prime Line	Allows users to assign a line (CO, Intercom or Line Pool) to a set as its primary line of use for automatic outgoing line selection.	Saves time, as users can begin dialing immediately without selecting a line.
Prime Set	Lets users designate a set as prime or backup to receive unanswered calls via Delayed Ring Transfers, Held Line Reminders and Do Not Disturb transfers, and overflow call routing.	Offers more efficient call handling.
Priority Call	Lets users interrupt a conversation on a busy set or override DND. Users have the option to block a Priority Call, but it cannot be ignored.	Ensures that users can reach the caller in the case of an emergency.
Privacy – On Lines	Automatically prevents another telephone, which shares a user's line, to access or join the user's call.	Ensures security and confidentiality.
Privacy Control	Allows a third person to join a call.	A two-way call is easily turned into a conference call.
Programmed Release	Programmed at the end of an external autodial sequence from a PBX or Centrex. It works like Rls, but retains the line for that user.	Time is saved by letting a single button be programmed to end a call once the information has been sent.

Feature	Description	Benefits
Receiver Volume	Lets users program volume to retain the user's desired setting. All Norstar sets purchased after August 1994 are compatible with the Receiver Volume feature.	Individuals within the system can set their own receiver volume.
Remote System Access	Allows callers on the public network to access the system directly, without going through the attendant. Once in the system, the caller can access some of the system's resources (dialing capabilities, line pool access, feature access). The Compact ICS supports remote system access on auto-answer loop start trunks (Disconnect Supervision must be enabled). • Auto Answer DN – when a user dials into the system on an auto-answer loop start trunk that is not configured to answer with DISA, no password is required to access the Norstar system. The COS that applies to the call is determined by the COS for the trunk on which the user is calling. • DISA DN – when a user dials in on a trunk that has auto-answer with DISA, the system presents a stuttered dial tone to prompt the user to enter their Class of Service password. The Class of Service that applies to the call is determined by this COS password.	Saves time, as users don't have to go through the attendant.
Restriction Override Password + Password	Allows users to bypass any call restrictions applied to any set or line.	Gives selected users convenient and efficient access to a restricted set or line.
Ring Again on Busy Set	Alerts a user when a previously busy set becomes available.	Saves time, as users are free to continue working while they wait.

Feature	Description	Benefits
Ring Again on Busy Line Pool	Alerts users when a line becomes free in a line pool.	Saves time and frustration, as users can continue working without monitoring the availability of busy outside lines.
Ring Again on No Answer	Notifies a user when a set that was not answered is used.	Avoids unnecessary redialing. It is an efficient way to know when someone has returned to their office.
Ringing Line Preference	When several lines are ringing, the longest ringing call will automatically be queued to be answered first.	Provides better customer service, as a user can answer calls in the order they were received.
Ringing Service	Now alternate ringing can be programmed for day of week as well as time of day.	Provides the flexibility to change which set rings after hours or on weekends.
Routing Service/Destination Codes	A programming section that allows outgoing calls to be directed automatically, based on the numbers a caller dials (also called Automatic Route Selection, or ARS). For systems linked in a network, routing can create a transparent or coordinated dialing plan. To make programming routes easier, digit absorption feature has been added to the Routing feature of the Norstar ICS. Digit absorption selects the portion of the destination code that is always absorbed by the system and not used in the dialing sequence. For the Norstar ICS, ARS allows the programming of 500 destination codes and 999 routes and a maximum of 12 digits for each destination code.	Installer programming time is greatly reduced in terms of entering the routing codes and more flexibility is provided for routing codes.
Saved Number Redial or last number key	Saves and later recalls the external telephone number that appears on the display.	Saves time and effort, as a person can quickly redial the number.

Feature	Description	Benefits
Selective Call Rejection *	When activated, screens incoming calls against a user-specified list of numbers that need to be rejected. If the call is rejected, the caller hears a message informing them the called party does not wish to receive their call; the last incoming number can be added to the selective call rejection list even if the number is "Private."	Provides an effective deterrent to malicious and nuisance calls, especially when combined with Call Trace.
Selective Line Redirection	See Line Redirection.	
Set Names	Names can be programmed for internal sets.	Lets users screen calls and verify status on the LCD display; forwarded calls are answered more professionally, because the display shows to whom the call was originally placed.
Set Profile	Lets users view system administration data for each set in the system.	Improves network control, as an administrator can view programming information on specific set configurations and general administration data.
Service Modes	Lets users program three different service modes (e.g., lunch, evening, night) with their own ringing arrangements for automatic or manual activation.	Gives users increased control over the system's call handling setup. It also offers greater system flexibility.
Silent Monitor on Hunt Groups	Allows a supervisor to silently monitor Hunt Group calls.	Offers a cost-effective method for training employees who answer customer calls.
Speed Dial Access – Personal and System + Code	Allows a person to access both Personal and System Speed Dial Codes.	Prevents dialing mistakes, saves time, and is more convenient.
Speed Dial Line Selection	Uses a specific line as determined in administration for speed dialing.	Allows the preprogramming of specific lines for each number.
Speed Dial – Personal Programming	Allows users to add or change a Personal Speed Dial number on their set.	Provides fast, error-free dialing, with increased flexibility, for a user's personal telephone directory.
Speed Dial System Bypass Restrictions	Lets users program speed dial numbers to override set and line restrictions.	Allows easy access to selected numbers within restricted categories.

Feature	Description	Benefits
Speed Dial System Names	Allows users to program a name, instead of a number, to appear on the set display whenever that speed dial code is accessed.	Keeps confidential the actual number being dialed.
Start DN Option	Allows users to choose the start Directory Number and Directory Number Length, rather than the previous mandatory 221. Typically programmed by the installer under Configuration.	Provides flexibility of uniform Directory Numbers over a network.
Station Set Test	Provides users with the ability to determine if there is a physical problem with their Norstar set before returning it to the distributor or factory for repair. Pressing Feature 805 on the set activates Station Set Test. The LCD prompts the user through the testing procedure. All tests are available for all sets, with the exception of the Headset Speaker Test, which is not available on the M7100, because it does not have a headset option.	If users or service representatives suspect something is wrong with a button, the speaker, the display or some part of the Norstar set hardware, a quick test can be done to see which part is broken.
Target Lines	Virtual, not physical, lines dedicated to receiving and routing incoming calls on DID or auto-answer trunks to a specific destination; DR5 supports up to 104 target lines which offer attendant bypass and line concentration.	Enables the optimum use of available resources.
Telephone Administration Lock	Lets users program three settings (Full, Partial, None) in Administration.	Controls the specific features users can program on their sets.
Time and Date Display	Displays the time and date on an idle set's LCD.	Eliminates a person's need to have a workstation clock.
Time and Date – Show Time	Temporarily displays, for three seconds, the time and date while a user is on a call.	Improves efficiency in a busy office environment.
Timed Release	Signal releases a call from the line, but keeps the line for another call.	Ensures that, if users are making consecutive fax or data calls, they don't have to worry about access to that line.

Feature	Description	Benefits
Transfer Immediate (With Callback)	Allows users to transfer a call directly to another set; if the call is unanswered, callback occurs after a preset number of rings.	Improves handling of transferred calls.
Transfer Using Conference	Allows users to transfer a call to an internal number.	Ensures users do not lose calls during a transfer. Better customer service and more professional call handling result.
Transfer Using Hold	Lets users transfer calls by pressing the hold button.	Provides a quick, convenient method for transferring users sharing the same line appearances.
Transfer with Announce	A user announces an internal or external call to the designated party before transferring it by simply staying on the line. To do an immediate transfer, press "OK" soft key or the release key.	The user transferring a call can verify the person is available to receive the transfer.
Unsupervised Conference	Lets users establish a conference call between two outside parties. The user can then exit from the call without disconnecting the remaining two people, provided one of those callers was incoming and the incoming line has Disconnect Supervision.	Prevents inconvenience if two parties wish to continue a conversation that is not relevant to the user.
User Preferences	Provides an alternative method for programming user's administration features. The following can now be programmed in one session from any phone in the system for a single set or a group of sets: external autodialers, feature keys, language, display contrast, call log options, internal autodialers, personal speed dialers, ring type and dialing modes.	Saves time and improves efficiency.
Voice Call	Lets users make a voice announcement or begin a conversation through the speaker of another telephone.	Saves time.

Feature	Description	Benefits
Voice Call Deny	Prevents a set from receiving voice calls.	Prevents interruptions from voice calls while the user is still alerted of incoming internal calls.
Wait for Dial Tone	Causes a sequence of numbers to pause until dial tone is present on the line before continuing to dial. (The system must be equipped with a Services Cartridge. Systems with ICS software do not require additional hardware for this feature.)	

Telephones, Accessories, and Peripherals

Chapter Highlights

- Business Series Terminals (BST)– offer rich and enhanced capabilities that provide telephony solutions for a broad landscape of users, ranging from the needs of users with low call traffic patterns and minimal feature requirements to the more demanding needs of high-volume users and business executives

- T7100 BST – delivers Norstar and BCM features and reliability to low-traffic areas such as lobbies, office kitchens, reception rooms and break rooms

- T7208 BST – is a cost-effective solution suited for lower internal and higher external calling volumes

- T7316E BST – is a full-featured multiline telephone that offers ample coverage for business call areas and support for feature-intense usage

- T24 Key Indicator Module (KIM) – is a 24-button module that attaches directly to the T7316E to form the BST Central Answering Position (CAP)

- T7406 Cordless – is a full-featured, multiline telephone for businesses that would benefit from a workplace mobility solution

- Desktop Assistant Labeling Application – is a software application that lets end users create and download customized labels for their sets

- LCD with Tilt Display – provides clearer viewing of information and message prompts in diverse learning environments.

Chapter Overview

More than a base core unit is required to make a Norstar system functional. Users or businesses need to add other proprietary products, such as telephone sets. Products can be selected from three main product groups: telephones, accessories and peripherals.

As the next-generation telephones that build on the Norstar portfolio, the Business Series Terminals (BST) set the standard for durability, reliability and flexibility. Businesses can deploy these products to support both the Business Communications Manager* (BCM) and Norstar systems with full backward-compatibility so that users can add them to their existing voice infrastructure to cost-effectively scale voice connectivity as their business grows.

The BSTs are equipped with a broad range of features, including built-in headset jacks, programmable buttons and automatic set relocation. Additionally, with the Desktop Assistant, a downloadable software tool, users can create customized labels for the T7100, T7208 and T7316E sets.

Emerging Trends

The idea of the telephone as a powerful business communications tool is still prevalent today. The telephone is the lifeline to any business – it is a direct line to customers, suppliers, remote offices and other key business contacts. Now, perhaps more than ever, companies need powerful systems and proven reliability in order to remain competitive in the business world. Companies need to focus on building their business, not on training end users and fielding support calls.

To end users, telephones are the system. They are the most critical interface to business productivity. Ranging from a single line set to multiline executive telephones, Nortel Networks BSTs, along with their accessories and peripherals, are designed to meet the changing conditions of the work environment. Nortel Networks BSTs offer rock-solid reliability and allow businesses to smoothly integrate their voice and data infrastructure over a common network and take advantage of powerful business applications such as Automatic Call Distribution (ACD), Computer Telephony Integration (CTI) and Voice Messaging.

Benefits

Norstar offers a range of user-friendly telephones in compact designs to fit any need in business. The BSTs are easy-to-use and provide powerful features, including programmable buttons, wall-mount capability and LCD window displays.

Norstar telephones offer the following benefits:

- Ease of use
- Increased employee efficiency
- Improved customer service.

Ease of use

Norstar is preprogrammed at the factory for the most commonly used features and functions so that installation and start-up time is minimal. The prompts in English, French or Spanish make employee orientation simple. Users can personalize programmable buttons and use tilt display with integrated VisualRing/Message Waiting Indicator for optimum viewing. With the integrated LCD window, standard on every set, users are prompted step-by-step through feature usage. And, the flexible design of Norstar makes it easy to add options that tailor the system to an individual user's needs.

Increased Employee Efficiency

Norstar improves employee efficiency by making it easier for users to place calls and use features. Programmable buttons, for example, let users place calls faster, while automatic set relocation lets users move their telephone without losing their programming. Standard and optional Norstar features guarantee users never lose a call.

Improved Customer Service

With Norstar, users can see who is calling before they pick up the handset. The Call Log feature captures each caller's number, allowing users to see on their LCD Window who called, how many times the person called, and if those calls were answered.

Business Series Terminals

BSTs offer a feature-rich portfolio with enhanced capabilities that provide telephony solutions for a broad landscape of users, from high-volume call positions and executives, to low-intensive users and small workgroups.

BSTs are flexibly positioned for deployment on two system platforms, Norstar and Business Communications Manager, providing both investment protection and a migration path between either system. BSTs offer full integration with Norstar and BCM features, as well as integration with basic and advanced applications such as Voice Mail, Call Center, CTI and Integrated Voice and Data Solutions.

While the BSTs boast the industry leadership and strengths of the Norstar telephone portfolio, the new portfolio also delivers new value-added features like Tilt Display, Visual Ring Indicator, Message Waiting Indication (MWI), new aesthetics, a streamlined footprint, new labeling strategy, an audio control center with a headset button and more.

Compatibility

Norstar

The Business Series Terminals are compatible with:

- Compact ICS (any release)*
- Modular ICS (any release)*
- 3x8 DR5
- Compact DR2, DR5, DR5-DS
- Modular DR2 and up
- Centrex, CTX+

Note: * To take advantage of the full functionality of the T7316E telephone, Release 6.1 software is required. The T7316E is compatible with previous software releases, however the new capabilities introduced with the T7316E and Release 6.1 software will not function. The T24 KIM requires Release 6.1 software to operate.

Features

While the BSTs boast the industry leadership and strengths of the Norstar telephone portfolio, the portfolio also delivers value-added features, including:

- Tilt Display – provides clearer viewing of information or message prompts on the LCD in different lighting environments.

- Message Waiting Indication (MWI)/Visual Ringing Lamp – alerts the user of incoming messages or that their phone is ringing when they are on another call.

- Headset Interface – is driven from the Digital Terminal Interface Chip (DTIC). Volume control for the headset is also provided. Operation of the headset is mutually exclusive with Handsfree operation. When a headset is connected, all operations normally associated with Handsfree operation affect the headset. This includes on-hook dialing, volume control while active and muting. For headsets, visit www.sencomm.com.

- Handsfree Interface – is programmed through the administration function and is supported by a microphone and loudspeaker.

- External Ringer Interface – receives alerting signals that are routed to the external ringer jack as well as to the speaker in the telephone. This alerting signal can be amplified and connected to external speakers to provide an auxiliary ringer function for the telephone. The external speaker is connected with a two-wire modular telephone cord to pins three and four of the external ringer jack.

Sets are available in the following colors:

- Platinum
- Charcoal.

Overview of Portfolio

Overview of T7100

Figure 32 T7100 Telephone

The T7100 telephone is part of the BST portfolio. It has one programmable button and a 1x16 character alphanumeric display to provide call progress information. There are no display buttons (soft keys) on the T7100 and it does not support headset or Handsfree.

The T7100 supports the following features:

* External Ringer Interface
* Message Waiting Indicator/Visual Ringing Lamp
* LCD with Tilt Display – The one-line by 16-character display on the T7100 telephone provides call progress information. Each character is generated from a matrix of 5x7 LCD dots under control of a built-in controller chip on the module.

Button Matrix

The T7100 buttons are as follows:

* 12 dial pad buttons
* Volume control (rocker type)
* Hold button
* Release button
* Feature button
* One programmable button.

Loop Limits

- Maximum loop length – 305 m (1000 ft) or 0.5mm (24 AWG) wire

- Maximum loop length – 790 m (2600 ft) with SAPS option

- Bridge taps – not permitted

- Loading coils – not permitted

Overview of T7208

Figure 33　T7208 Telephone

The T7208 telephone is part of the BST portfolio. It has eight fully programmable buttons, each with its own LCD indicator, and a 1x16 character alphanumeric display to provide call progress information. There are no display buttons (soft keys) on the T7208.

The T7208 supports the following features:

- External Ringer Interface

- Headset Interface

- Handsfree Interface

- Message Waiting Indicator/Visual Ringing Lamp

- LCD with Tilt Display – The one-line by 16-character display on the T7208 telephone provides call progress information. Each character is generated from a matrix of 5x7 LCD dots under control of a built-in controller chip on the module.

Button Matrix

The T7208 buttons are as follows:

- 12 dial pad buttons

- Volume control (rocker type)

- Hold button
- Release button
- Feature button
- Eight programmable buttons with indicators.

Loop Limits

- Maximum loop length – 305 m (1000ft) of 0.5 mm (24 AWG) wire
- Maximum loop length – 790 m (2600 ft) with SAPS option
- Bridge taps – not permitted
- Loading coils – not permitted

Overview of T7316E

Figure 34   T7316E Telephone

The T7316E telephone is part of the BST portfolio. It has 24 fully programmable buttons. 16 of the programmable buttons are supported by LCD indicators (for one button access to a combination of lines, features and autodial numbers). Release 6.1 software is required to program lines for all 16 buttons. Earlier versions of software allow up to ten lines to be programmed for line appearances.

Six of the programmable memory buttons are supported by LCD indicators (for one-button access to features and internal extensions).

Eight of the programmable memory buttons are used for one-button access to a combination of autodial numbers and features (these buttons are not supported by LCD indicators).

The T7316E supports the following features:

- External Ringer Interface
- Headset Interface
- Multi-Segment Indication – Icons show the status of the lines (i.e., ringing, on hold).
- Message Waiting Indicator/Visual Ringing Lamp
- LCD with Tilt Display – A two-line by 16-character display is included on the T7316E telephone. This module is used to display call progress information, as well as to provide the legends for the three display (soft key) buttons on the module. Each character is generated from a matrix of 5x7 LCD dots under control of a built-in controller chip on the module.

Button Matrix

The T7316E buttons are as follows:

- 12 dial pad buttons
- Volume control (rocker type)
- Hold button
- Release button
- Feature button
- Three display buttons (soft keys)
- 16 programmable buttons with indicators (for lines, features and autodial numbers)
- Eight programmable buttons without indicators (for autodial numbers and features).
- Fixed Handsfree button

Overview of T24 KIM

Figure 35   T24 KIM
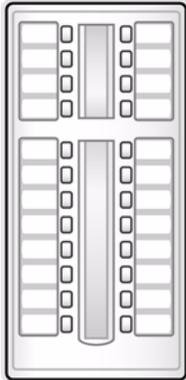
The T24 Key Indicator Module (KIM) is a 24-button module that attaches directly to the T7316E; together they form the Business Series Terminal (BST) Central Answering Position (CAP). This modular approach is extremely flexible and allows for easy configuration and expansion. Once in place, the BST CAP transforms a business's pace and efficiency by centralizing and efficiently distributing calls. Typical users include contact center supervisors, office administrators, building console operators and users with high to very high call volumes, such as Central Answering Positions.

The T24 KIM supports the following features:

- Busy Lamp Field/Direct Station Select support
- Multiple appearances of target lines and hunt groups
- Multi-segment indication
- 4 T24s per T7316E without PS
- 9 T24s per T7316E with PS
- Desk or wall mount
- Compatibility with BCM 3.5 or later and Norstar 6.1 or later.

Button Matrix:

- 24 programmable buttons with indicators (for lines, features and autodial numbers)

Overview of the T7406 Cordless

Figure 36   T7406 Telephone

BST T7406 is a full-featured, multiline telephone for businesses that would benefit from a workplace mobility solution. Covering an area of up to 282,000 square feet, the T7406 supports one to six people, enabling employees to be more productive while moving about the office. It is ideal for small enterprises, branch offices, retails, medical offices, warehouses and manufacturing environments.

The T7406 supports the following features:

• 900 MHz digital spread spectrum frequency hopping (DSSFH)

• Operating range of 300 feet (97 meters), with 282,000 square feet of coverage

• Backward compatibility with Norstar and BCM and full integration with their applications and features

• Maximum site density enables six handsets, including two wall bases, each supporting three T7406 handsets

• Nickel metal hydride battery that delivers up to five hours (with backlight off) continuous talk time or up to 72 hours standby time.

Portfolio Positioning

The following figure illustrates the positioning, price and performance of the BST portfolio:

Figure 37 Business Series Terminals Portfolio Positioning
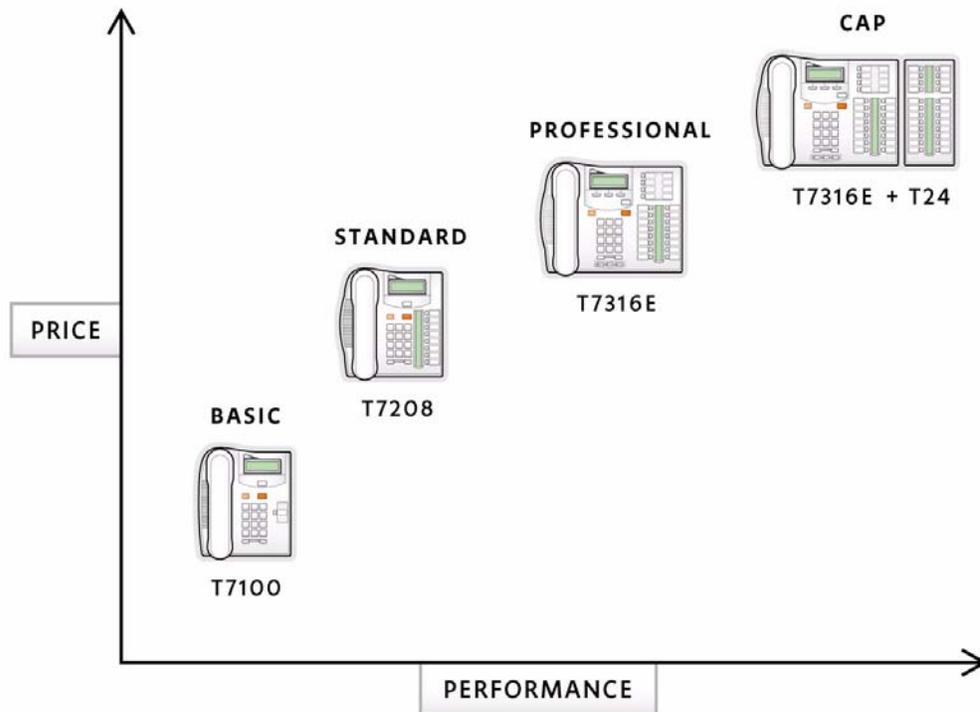
Advanced Features

Audio Control Center

Headset Button

The Headset button has the following capabilities:

• Users can leave their Headset plugged in, and toggle between Headset, Handset and Handsfree

• Users can press the Headset button to toggle from either Handset or Handsfree to Headset

• Users can press the Handsfree button to toggle from Headset to Handsfree

• Users can lift the Handset to toggle from Headset to Handset

• The Headset LED will be solid when the Headset is activated.

• The Headset button does not work until a Headset is plugged in – the set senses the Headset

• Users can answer incoming calls by pressing either the Headset button or the incoming line appearance.

There are three speech paths: Handset, Handsfree or Headset.

The speech path is dictated by the previous call. For example, if a person had used the Headset on the previous call, the speech path would immediately go to the Headset when the user pressed a ringing line to answer the next call. A user could also press Handsfree or pick up the Handset to have the call go to those speech paths.

Note: Nortel Networks does not support the connection of Headsets to the T7208 or T7316E telephones, unless Handsfree is enabled within the system programming.

Mute Button

The Mute Button has the following functions and capabilities:

• It mutes Handset, Handsfree or Headset

• The Mute LED flashes when on Mute

• The T7208 and T7316E sets have a separate Mute button

• Button inquiry (F*1) of the Handsfree Key displays "Handsfree/Mute." This message is sent from the KSU or BCM, which does not know if the set is a Business Series Terminal or a Norstar Telephone set (This messaging is required to ensure that KSU and BCM compatibility is the same as with the Norstar Telephone sets)

• The display does not show "Microphone Muted" when the Mute button is on

- A muted call placed on hold is no longer muted when a user retrieves it (This feature is different with the Norstar sets)

- If users press Handsfree when a call is on hold, their set will display the message "Microphone Muted." To unmute the set, users need to press the Handsfree key again. This messaging is necessary to ensure that KSU and BCM compatibility is the same as with the Norstar telephone sets.

Desktop Assistant Button Labeling Application

A software application tool called the Desktop Assistant has been developed to support the new button labeling strategy on the BST. The Desktop Assistant tool supports users in quickly and easily labeling their T7100, T7208 and T7316E telephone sets.

In the application, users select the set type they wish to label. They are then presented with an image of the set and are required to enter the text in the button label fields. For each button, users may select from font type, size and color and a background color. When complete the labels can be printed on a B+W or color printer and the data file (*.ntl) may be saved for later modification or for sharing among users.

Key features:

- Labels T7100, T7208, T7316E only (does not label T7406)
- Available in English, French, and Spanish
- Supported on Windows 95/98/2000/NT4 and XP

The Desktop Assistant Labeling application:

- Is used to print labels
- Is supported on Win95/98/NT4/2000/XP
- Is available in English
- Does not print labels for the Norstar Telephone sets
- Is not used to program the sets.

The Desktop Assistant Labeling application can be purchased on CD or is downloaded from the following Web site at no charge: http://www.nortelnetworks.com/sbs_desktopassistant.

Installation

The Business Series Terminals are designed for easy installation. After connecting the set to a spare station port on the Norstar or Business Communications Manager, the set will automatically boot up with a default-programming template assigned.

Norstar

On Norstar, the Installer can change the default programming by entering a programming session from any two line set (e.g., T7316E).

Accessories

Nortel Networks offers the following accessories:

*   Plastic Set Covers
*   Station Auxiliary Power Supply (SAPS)
*   Audio Conferencing Unit.

Plastic Set Covers

Description

Plastic set covers are available for the Business Series Terminals. The plastic set cover is designed to protect the telephones and the CAP module from dust and dirt in rugged use environments. It is made of a clear plastic material that is molded to the face of the telephone set, protecting all keys.

For protective plastic covers, visit http://www.telephonecovers.com.

Target Audience

The set covers are ideally suited for locations like automotive garages, warehouses, manufacturing facilities and restaurant kitchens.

Station Auxiliary Power Supply (SAPS)

Figure 38   Station Auxiliary Power Supply (SAPS)
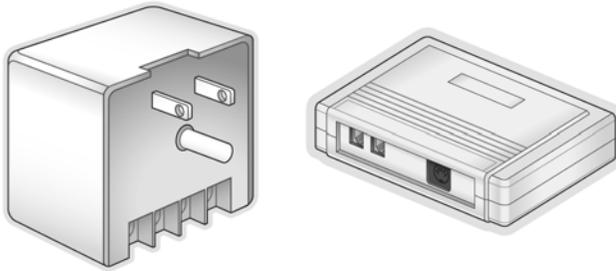
Table 10   Software Compatibility

Software	Compatibility
Independent of software	

Description

The Station Auxiliary Power Supply (SAPS) is used to extend the distance of a telephone set from 1,000 to 2,600 feet, using a dedicated cable, and is also required when more than four T24 KIM modules are connected to a T7316E telephone set.

Target Audience

The SAPS is ideal for Norstar installations in large facilities, such as shopping centers, warehouses, airports and manufacturing floors.

Audio Conferencing Unit

Figure 39 Audio Conferencing Unit

Description

The Audio Conferencing Unit allows businesses to extend voice connectivity to small- to medium-sized conference rooms and offices. This unit can easily be plugged into any digital telephone jack, and it does not require an additional telset, an analog adaptor or an analog line cord. Based on a sleek, space-age design, the Audio Conferencing Unit includes full-duplex technology and a keypad with a feature button that allows users to easily access all the conferencing features available from the Business Series Terminals product family.

The Audio Conferencing Unit allows users to:

*   Perform point-to-point teleconferencing – Users can confer privately with their team by pressing the mute button while on a conference call
*   Call into a conference bridge – Users can connect with other sites, rather than call in separately from their desks
*   Participate in another party's conference call – The conference call organizers can call into the user's unit at a previously arranged time, link the user in and begin the call
*   Set up a conference call with multiple parties – Users can call the parties and start the call. If a user wants to have a private conversation with one of the parties, the user can split the call, have the private conversation and then reconnect to the conference call.

Target Audience

The Audio Conferencing Unit is designed for use in conference rooms and offices. It allows participants at any location to interrupt any speaker cleanly, without clipping words or sentences. Users can be as productive as they would be in an in-person meeting, but without the time and expense of business travel.

Peripherals

Nortel Networks offers the following peripherals:

- Analog Terminal Adapters (ATA)

- Doorphone

- Fast Remote Access Device (FastRAD)

- Station Message Detail Recording (SMDR).

For more information about the Computer Telephony Adapter (CTA) products, see the Norstar *Computer Telephony Integration* chapter of this book.

Analog Terminal Adapters

Figure 40 Analog Terminal Adapters

Table 11   Software Compatibility

Software	Compatibility		
	ATA	**EATA**	**ATA-2**
Compact ICS, any release		√	√ [2]
Modular ICS, any release		√	√
3x8 DR5	√	√	√
DR1 (3x8, 6x18, 8x24)	√	√ [1]	√ [1]
Compact DR2	√	√ [1]	√ [1]
Compact DR5	√	√	√
Compact DR5-DS	√	√	√
Modular DR2	√	√ [1]	√ [1]
Modular DR3	√	√	√
Modular DR4	√	√	√
Modular DR5	√	√	√
Centrex, CTX+	√	√	√
Notes: [1] ATA functionality only. [2] Compact ICS has a built-in ATA, but is also compatible with ATA-2.			

Description

The Norstar Analog Terminal Adapter-2 (ATA-2) converts Norstar digital interfaces to analog for communication with such analog devices as single line telephones, FAX machines, modems and answering machines. Single line sets can interface with Norstar system features such as Call Waiting, Call Forward and many more. The ATA-2 provides a means of connecting a single line set to the Norstar system in either a long loop or off-premise extension configuration.

The ATA-2 supports all the features currently supported by the EATA. As well, it has been enhanced to support faster data transmission speeds, up to and including 28.8 Kbps, and has a more compact design for a simplified installation. (Note that the maximum data transmission rate is subject to the quality of the end-to-end channel and cannot be guaranteed.)

The ATA-2 is powered by a grounded AC power supply that is packaged with the ATA-2.

CMS/CLASS feature interworking is not supported by any version of the Analog Terminal Adapter.

Note: For high density analog connectivity with a Modular ICS, customers may make use of the Analog Station Module. For more information about the Analog Station Module, see the *Hardware* chapter of this book.

Table 12　Feature Chart

Feature	ATA-2
Alternate Line	√
Call Forward	√
Call Park	√
Call Pickup – Group or Directed	√
Call Queuing/Waiting	√
Camp	√
CDR Account Codes	√
Centrex/PBX Reach Through	√
Conference	√
Hold – Exclusive	√
Hold – Public	√
LNR	√
Line Pool Selection	√
Link	√
Page – General	√
Page – External	√
Page – External/Internal	√
Page – Internal	√
Priority Call	√
Privacy Control	√
Reach Through – Timed Release	√
Restriction Override	√
Ring Again	√
Saved Number Redial	√
Send Message	√
Separate Power Supply	√
SMDR Account Codes	√
System Speed Dial	√
Toll Restriction Improvements	√
Tones On	√
Transfer	√
Trunk Answer	√
Voice Call	√
Voice Mail – Access via DN	√
Voice Mail – Mailbox access	√
Voice Mail – Leave message	√

Doorphone

Figure 41　Doorphone

Table 13　Software Compatibility

Software	Compatibility
Compact ICS, any release	√
Modular ICS, any release	√
3x8 DR5	√
DR1 (3x8, 6x16, 8x24)	√
Compact DR2	√
Compact DR5	√
Compact DR5-DS	√
Modular DR2	√
Modular DR3	√
Modular DR4	√
Modular DR5	√
Centrex, CTX+	√

Description

The Doorphone is a fully digital, wall-mounted, TCM-based terminal that connects directly to a Norstar station port. It requires no analog terminal adapter, external power supply or hardware programming. When equipped with the optional Door Opening Controller (DOC), the Doorphone provides security and convenience for Norstar users wherever an intercom and/or controlled access is required.

Pressing the "Call" button on the Doorphone places an intercom call to one or more Norstar telephones on the system, simultaneously displaying the Doorphone's name in the LCD window. Calls can be answered either with the handset or on handsfree. If a call is not answered, an optional page (distinctive chime) may be directed to telephones in a selected zone. The Doorphone can also be programmed to be answered by voicemail.

Up to four Doorphones can be supported on a Norstar system, with each Doorphone capable of being programmed to ring and/or page a different group of sets, providing flexible call coverage.

Equipped with the optional DOC, the Doorphone allows the occupant to unlock electric doors simply by pressing an open soft key display button or a dial pad digit on their Norstar set. In addition, because the Doorphone with the DOC enables electronic devices to be controlled through contact closure (third party supplied), dial pad digit commands from a Norstar telephone allows a building occupant to remotely activate alarm systems, surveillance cameras, lights and so on.

Each Doorphone can communicate with up to twelve DOCs, providing control of up to 12 electrical devices through the telephone dial pad.

Fast Remote Access Device (FastRAD)

Figure 42　Fast Remote Access Device (FastRAD)

Table 14　Software Compatibility

Software	Compatibility		
	Original RAD	**Enhanced RAD**	**Fast RAD**
Compact ICS, any release	√ [1] [2]	√	√
Modular ICS, any release	√ [2]	√	√
3x8 DR5	√	√	√
Compact DR2	√	√	√
Compact DR5	√	√	√
Compact DR5-DS	√	√	√
Modular DR2	√	√	√
Modular DR3	√	√	√
Modular DR4	√	√	√
Modular DR5	√	√	√
Centrex, CTX+	√	√	√
Notes: [1] An optional software keycode can be purchased to enable the internal RAD (I-RAD) of the Compact ICS. [2] RAD is not compatible with Modular ICS 2.0 or Compact ICS 2.0. Note: See Appendix B for Norstar Manager and Norstar Remote Utilities compatibility details.			

Description

The FastRAD offers improvements in data transmission rates and security and replaces the enhanced RAD.

The FastRAD is an integral part of local and remote administration and maintenance capabilities of Norstar. It is located on the customer premises and is the physical interface hardware connection.

Remote administration and programming PC applications such as Norstar Remote Utilities (NRU), the Companion Diagnostic System (CDS) and Companion Manager communicate with the ICS using the FastRAD. It uses its built-in modem to provide a communications interface between the target Norstar system and the PC. It can also provide access to the proprietary Norstar D-channel information for the translation and processing of Norstar administration commands, and automatic detection and reporting of ICS alarms.

Customers using the FastRAD with NRU will notice the following enhancements over the previous RAD releases:

*   Reduced operational costs, due to faster transmission speeds
*   Enhanced security with user defined passwords and access lockout
*   Improved customer satisfaction, due to faster response times
*   Distributor image as a responsive service provider making use of leading-edge technology.

The FastRAD is more compact than the existing RAD and is powered through an external power supply. It can be mounted horizontally with the connectors facing up or vertically with the connectors facing to the right.

The FastRAD is connected to the operations center through the Norstar ICS and the public switched telephone network. Remote communications are provided through a secure data link at speeds up to 14,400 bps. Full duplex communications are provided by an internal modem which supports the V.32/V.32bit protocols. These protocols support modem rates of 14.4k, 9600 and 4800 bps. Since there are no external CO line interfaces built into the FastRAD, the only remote connection can be made through an ICS line.

The FastRAD also provides access from a local terminal. The local terminal connects to the FastRAD through an RS-232 port running at 300, 1200, 2400, 4800, 9600 or 19,200 baud. The design and operation of the FastRAD assumes that only one FastRAD will be connected to the ICS.

An optional software keycode can be purchased to enable the Internal RAD (IRAD) of the Compact ICS.

Station Message Detail Recording (SMDR)

Figure 43 Station Message Detail Recording (SMDR)

Table 15   Software Compatibility

Software	Compatibility	
	SMDR 5	SMDR 6
Compact ICS, any release	√	√
Modular ICS, any release	√	√
3x8 DR5	√	√
DR1 (3x8, 6x16, 8x24)		
Compact DR2	√	√
Compact DR5	√	√
Compact DR5-DS	√	√
Modular DR2	√	√
Modular DR3	√	√
Modular DR4	√	√
Modular DR5	√	√
Centrex, CTX+	√	√
* Release 1 only		

Description

Station Message Detail Recording (SMDR) serves as an interface which lets the user track basic call detail information by: all calls, outgoing calls only, calls with an account code, or by long distance calls. Connected to any station port, it provides basic reports in Norstar or Meridian 1 format. The unit is the interface to import call detail information into Norstar PC Applications software.

SMDR supports the following capabilities:

- CLID and ANI information in Norstar and SLI format
- ISDN trunks and terminals
- Maximum of 120 simultaneous line calls
- Serial port support for baud rates from 1,200 to 19,200
- TCM pass through for support of a Norstar station set on the same TCM loop
- Reduction of hardware requirements to conform with industry standard cable connections
- LED status indicator.

Target Audience

Companies interested in gathering telephone activity data to monitor and manage their Norstar system will find SMDR beneficial. SMDR provides a simple billing process with account codes. System Administrators can review SMDR call data to develop practical call management procedures to minimize call problems.

Networking

Chapter Highlights

- ISDN Basic Rate Interface (BRI) and ISDN Primary Rate Interface (PRI) for Norstar – address business's growing demand for more sophisticated data applications and replace today's analog modem technology with digital transmission speeds up to 128 kbps

- MCDN Private Networking – offers the advantage of shared applications, allowing companies to take advantage of centralized voice mail and automated attendant across multisite locations

- Norstar IP Gateway – offers a cost-effective entry level IP networking solution for existing Norstar multisite businesses

- Norstar Modular ICS – provides enhanced integrated features, including full ISDN PRI capability, and networking that small-site businesses are demanding

- The Norstar Data Interface (NDI) – lets small sites easily connect a Nortel Networks or third party data terminal equipment to the Norstar Modular ICS, so they benefit from the savings of consolidated network services

- Built-in CSU/DSU – lowers equipment costs, makes installations easier and eliminates the need for external cabling.

Chapter Overview

Norstar offers several networking capabilities that increase a business's ability to efficiently and effectively communicate between locations. These capabilities allow businesses to meet their current objectives and stay competitive. Norstar-to-Norstar networking, for example, allows multiple voicemail systems to be linked together as a single voice network, thereby eliminating boundaries between locations. So companies do not need to be restricted by multiple or geographically dispersed locations. Moreover, Norstar networking allows companies to realize cost savings by sharing advanced applications like voicemail between locations.

With Norstar digital networking, businesses can take advantage of the LAN/WAN it already has in place. Supporting Voice Profile for Internet Mail (VPIM) makes it easier for remote messaging systems to work together-even if they are from different manufacturers. Digital networking allows users to send voice mail messages and fax messages as data over their data network rather than the telephone network, thereby reducing long-distance charges. It also reduces network usage by enabling users to send a single message simultaneously to more than one recipient.

The Norstar VoIP Gateway delivers the Nortel Networks "One network. A world of choice." vision, as it seamlessly integrates Norstar into the evolutionary IP telephony portfolio. It provides IP networking of Norstar-to-Norstar and other Nortel Networks communications systems. IP replaces the PSTN or other private networks between locations and makes use of the capacity of the data network for voice communications, avoiding expensive access and long distance charges. The Norstar VoIP Gateway works on Compact Integrated Communications Systems as well as Modular Integrated Communications Systems.

Benefits

Norstar networking offers businesses a number of substantial benefits. It allows businesses to:

- Increase ROI – by enabling businesses to share advanced applications with multiple sites
- Reduce long-distance charges – by using digital networking to send voicemail and fax messages as data over the business's network, instead of the telephone network
- Eliminate boundaries between locations – by using private networking to seamlessly connect head office to remote sites
- Minimize investments in separate voice and data networks – by using an integrated solution that gives businesses the power to stay competitive in the global marketplace.

Networking Evolution

Each solution in the Norstar ICS portfolio offers a modular, scalable design that can expand easily as a business's needs dictate. Since its initial release, Norstar has evolved to stay current with emerging technology trends.

The following chart illustrates Norstar's evolution:

Table 16   Norstar Networking Evolution

Feature	MICS pre 4.0	MICS 4.0	MICS 5.0	MICS 6.0	Norstar VoIP Gateway
Connectivity	Analog E&M Tie Lines	PRI	MCDN - PRI	MCDN - PRI	Analog Loop
Basic Networking	√				
Basic Networking to Meridian 1		√			
Enhanced Networking to Meridian 1			√		
Norstar to Norstar Networking				√	√
Coordinated Dialing	√	√	√	√	√
Universal Dialing			√	√	
System Name Delivery		√			√
Station Number and Name Delivery			√	√	
Centralized Voice Mail			√	√	
Message Waiting Delivery			√	√	
IP Networking (Norstar to Norstar, Norstar to BCM, Norstar to M1 ITG)					√

Norstar and ISDN

Integrated Services Digital Network (ISDN) technology provides a fast, accurate and reliable means of sending and receiving data, images, text and voice information through a single pair of copper wires. The Norstar ICS platform provides ISDN functionality to the small site business.

With end-to-end digital connectivity on all transmission circuits, ISDN offers significantly higher bandwidth and speed than analog transmission. Because they are digital, ISDN lines provide better quality signaling than analog lines; and ISDN's out-of-band Data channel signaling offers faster call set-up and tear-down.

While an analog line only carries a single transmission at a time, an ISDN line can carry one or more voice, data, fax and video transmissions. For example, a user can connect to a remote computer and transfer a large data file while simultaneously making a voice call.

To transfer a 1MB data file, an analog modem operating at 14.4 Kb takes approximately 4.5 minutes. A 28.8 Kb modem cuts that transfer time in half. But by using just one channel of an ISDN line, transfer time is reduced to only one minute – and if two ISDN channels are used, transfer time for a 1MB file is slashed to just 30 seconds.

When transmitting data, connect time for an average ISDN call is approximately three seconds per call, compared with about 21 seconds for the average analog modem call.

ISDN supports access to existing public voice services, including POTS, virtual voice networks, 800 lines and 900 lines. ISDN also supports access to existing public data services, including Switched 56 and X.25. And because ISDN lines use the same twisted-pair copper wires as analog lines, customers do not need to rewire their premises to use ISDN.

ISDN supports a wide range of powerful business applications, such as file transfer, LAN-to-LAN connections, desktop sharing/white-boarding, video conferencing and video telephony, telecommuting and more.

ISDN Lines

ISDN lines are made up of separate channels that transmit information simultaneously:

- B (Bearer) – channels with individual speeds of 64 kbps for carrying a voice conversation, high-speed data flow or image

- D (Data) – channel for carrying control and signaling information and packet switched data.

Because each ISDN line has more than one B-channel, a user can perform more than one transmission at the same time using a single ISDN line. Alternatively, B-channels may be bonded into a single high-speed data line, to provide more bandwidth on demand for rapid transmission or receipt of data files.

Two types of ISDN service are available: Basic Rate Interface (BRI) and Primary Rate Interface (PRI). Norstar Compact ICS and Modular ICS both support ISDN BRI and the Modular ICS supports ISDN PRI as well.

Basic Rate Interface (BRI)

ISDN Basic Rate Interface (BRI) is known as "2B+D," because it consists of three separate channels: two B-channels, which can be used to carry a voice conversation, high-speed data flow or image; and one D-channel for carrying control and signaling information and packet-switched data, such as credit card verification.

Figure 44 ISDN Basic Rate Interface line – 2B + D
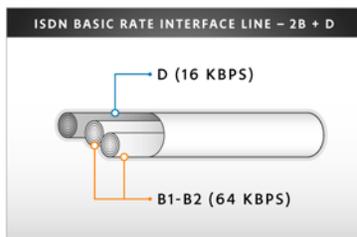
The two B-channels can replace two analog lines in many applications. As a result, many customers will be able to use a single BRI circuit, with a single access number, for all of their voice, fax and data transfer applications.

Primary Rate Interface (PRI)

ISDN Primary Rate Interface (PRI) is known as "23B+D," because it consists of 24 separate channels: 23 B-channels, each of which can be used to carry a voice conversation, high-speed data flow or image; and one D-channel for carrying control and signaling information. The D-channel of a PRI line cannot carry packet data (such as credit card verification).

Figure 45 ISDN Primary Rate Interface line – 23B + D
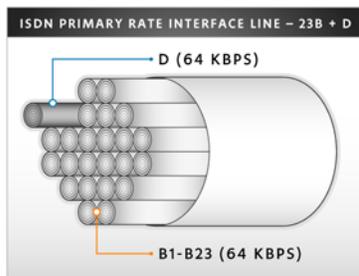
PRI uses the same hardware platform as T1 on the Norstar Modular ICS.

National ISDN Standards

National ISDN Standards are a set of standards developed by manufacturers and operating companies which enable ISDN services and equipment to be deployed in a multivendor environment. Equipment that is in agreement with 100% of the National ISDN Standard specifications is termed "compliant," and equipment that works in accordance with National ISDN Standards is termed "compatible." Norstar is compatible with the National ISDN Standards.

Ordering ISDN

Prior to the development of standardized Bellcore packages, ISDN services were ordered individually – a complicated and time-consuming process. Bellcore Capability Packages represent different configurations of ISDN services. In most instances, Norstar installations will use either Bellcore Capability Package "M" (voice and data) or "P" (voice, data and packet switching). In Canada, the familiar name for ISDN BRI is "Microlink"; the brand name for ISDN PRI is "Megalink."

Although Bellcore Capability Packages have greatly simplified the process of ordering ISDN services, different telcos may offer different combinations of ISDN service in addition to or instead of the Bellcore packages.

Preparing for ISDN

Before promoting ISDN solutions to their business customers, salespeople must consider and research the following questions:

• Is ISDN service available?

• Is the available ISDN service compatible with the National ISDN Standards?

• Is ISDN a cost-effective solution?

• What ISDN user groups or forums exist?

• What is the telco's time frame for ordering Bellcore packages supported by Norstar Compact and Modular ICS?

ISDN Network Services and Features

Norstar supports a variety of ISDN network features. These features are dependent on the type of Central Office facility serving the customer's location, as well as the service provider's network feature offering.

In many cases, the ISDN features provided by the network have been designed with a single connection in mind (e.g., to a residence). Thus, to avoid unexpected results, customers should clearly understand the use of these features in a line-concentrated key system.

Figure 46 ISDN Network Features

ISDN Network Feature	Description
Network Call Forward	Allows the customer to forward all incoming calls on a line to an external number. This feature is specific to a line and the customer must select the appropriate line key prior to invoking the feature. Once this feature has been invoked, the line will be available for outgoing calls only on the Norstar system.
Network Auto Dial	Allows a customer to automatically redial the last incoming number whether or not the call was answered. This feature is specific to a line and the customer must select the appropriate line key prior to invoking the feature.
Automatic Call Back	Allows a caller, who has been unable to reach a busy subscriber, to be notified when the subscriber goes on-hook. When the called line becomes idle, the calling line will ring. This feature is specific to a line and the customer must select the appropriate line key prior to invoking the feature. If another user selects the line and is on a call when the callback event occurs, the callback function will be dropped for the line and the customer will not receive another callback notification.
Calling Name & Number Delivery	Provides the name and number of the calling party on the display of any of the Norstar telephones. This network capability comes with nearly all BRI services at no additional charge. Calling name and number delivery on ISDN is received immediately by the customer, unlike analog calling line identification, which is provided between the first and second rings of the telephone. All the features and benefits currently available on Norstar for CLID will be supported on Calling Name and Number Delivery.
Calling Name & Number Delivery Blocking	Allows the customer to block the transfer of their name and number to the called party on a call-by-call basis.
Customer Originated Trace	Allows the recipient of obscene or harassing calls to request a trace of the last call received by their service provider. This feature is specific to a line and the customer must select the appropriate line key prior to invoking the feature.
Unidentified Call Rejection	Allows the customer to reject incoming calls from parties who have a privacy feature that prevents the delivery of the calling number. This feature is specific to a line and the customer must select the appropriate line key prior to invoking the feature.
Network Speed Dial	Allows the customer to store frequently called numbers for speed dialing. This feature is specific to a line and the customer must select the appropriate line key prior to invoking the feature.
Multiline Hunt Groups	Allows calls made on the customer's prime DN to hunt to the next available line or BRI circuit if the prime DN is busy.

MCDN Private Networking

Centralized Voice Mail

This feature implements centralized voicemail capabilities using MCDN over PRI. Two options are available to customers based on their networking requirements:

- Networking to M1– provides customers with the option to network their Norstar systems into Meridian 1 to take advantage of the voice messaging system within Meridian 1. Message waiting indication from Meridian 1 is delivered across the network to all users with mailboxes on the Meridian 1 system.

- Norstar-to-Norstar Networking – provides customers with the option of networking up to 10 Norstar sites together to take advantage of CallPilot 150 (Release 2.0) as the centralized voicemail solution. Message waiting indication from CallPilot 150 is delivered across the network to all users with mailboxes.

Centralized Auto Attendant

This feature implements a centralized automated attendant using MCDN with either the Meridian 1 voice messaging system when Norstar is networked to Meridian 1, or using CallPilot 150 (Release 2.0) when Norstar systems are networked together. The centralized Auto Attendant will allow any extension on the network to be dialed from the voice mail system's Automated Attendant.

Figure 47 Centralized Auto Attendant on Norstar
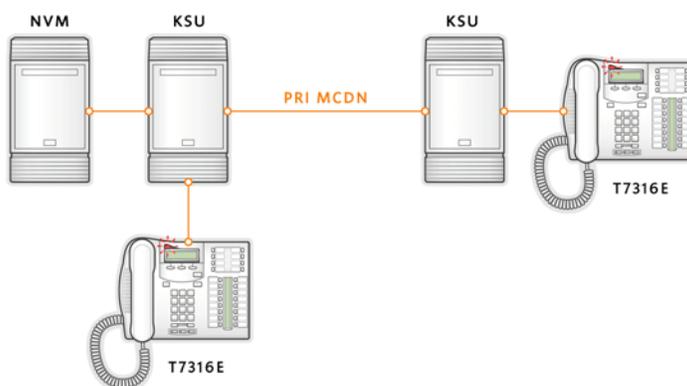
Meridian Customer Defined Network (MCDN) ISDN Call Connection Limitation (ICCL)

This feature limits the connections in the following conditions in an MCDN network. In a network it is possible for a call to be routed through many transit PBXs, either by misconfigurations or because of some error condition. The result is that the call initiation request blocks a number of channels, thereby making them unavailable for other calls. In order to protect the network against indefinite looping (and thereby locking of resources), the transit/tandem counter is added. At a transit PBX, before making a new call, the tandem counter value will be compared with the value programmed in the transit PBX (which will be in the range of 0-31). If the received value is more than the programmed value, the call will not be allowed to pass through and will be cleared back.

Trunk Anti-Trombone (TAT)

This feature optimizes the use of channels between sites on an MCDN network. On an MCDN network, due to certain features like network call forward and network call transfer, it is possible that there are two trunks in parallel between two nodes being used for the same call. In these scenarios, after the call is answered, the MCDN TAT bridges the call internally and removes the tromboned trunks.

MCDN Camp-On

This feature is a part of MCDN Network Attendant Services. It defines the way to Camp-On an enquiry call to a busy set. This feature enables the calling party (over the MCDN network) to indicate to the called party, who is already on an established call, that another call is waiting. It allows a busy extension to accept the new call by clearing the established call, or to reject the new call. Norstar supports this feature when initiated from the Meridian 1.

MCDN Break-In

This feature is a part of MCDN Network Attendant Service. It allows the network attendant, on encountering a busy destination, to break into the established conversation. The attendant console can have a key configured as the BKI (Break-In) key. Norstar supports this feature when initiated from the Meridian 1.

3rd Digital Trunk Interface (DTI) Support

This feature adds a 3rd DTI on the NA Modular ICS system apart from the existing two on-core DTIs. The 3rd DTI can be added to module 7 or 8 on a Mega system or on module 3 or 4 on a Mini system. This is applicable for all the protocols that are currently supported by on-core DTI and for profile 1 and 4 only. An upgraded DTI with new firmware is required for proper operation on off-core trunk module.

Norstar VoIP Gateway

The Voice over Internet Protocol (VoIP) Gateway brings Norstar into the world of IP telephony by providing IP trunking.

This new functionality allows small multisite businesses with Norstar systems to cost effectively enter into the VoIP environment while providing an opportunity for large multisite companies with Norstar systems to slowly migrate their network to VoIP. Nortel Networks has developed into the VoIP Gateway interoperability with Norstar, BCM, Meridian 1 and Succession 1000 for seamless VoIP calling between Nortel Networks platforms.

Norstar VoIP Gateway is compatible with - and works independently of - all releases of Modular ICS and Compact ICS software. With Norstar VoIP Gateway, IP replaces the PSTN or other private networks between locations and makes use of the data network's capacity for voice communications - so businesses can avoid costly access and long distance charges.

Norstar VoIP Gateway enables trunk-side IP connectivity for Norstar by providing multisite companies with direct interoffice voice and fax traffic over an IP network. And, because the Norstar VoIP Gateway is interoperable with other Nortel systems, businesses can benefit from a solution that enables seamless interworking.

The VoIP Gateway supports quality voice, through QoS, voice compression, echo cancellation, and buffers. It also supports common dialing plan and trunk CLID between Nortel Networks solution sites (Norstar, BCM, Meridian 1 and Succession 1000).

Business Challenges

In order to take full advantage of the VoIP market, it is necessary for sales representatives to understand the different challenges businesses face as they adapt to change in a competitive marketplace. Businesses today will most likely require a communications solution that offers the following:

- Continued support for existing Norstar systems
- Cost-effective VoIP calling
- Flexible migration path to IP telephony
- Reliability
- Scalability.

Target Markets

Norstar VoIP Gateway offers an entry-level adoption of IP-enabled solutions. As such, it targets the following customers:

- Small to medium-sized businesses – that have Norstar systems, but wish to upgrade to an entry-level VoIP solution while leveraging current investments
- Businesses with existing Norstar systems – that have no need for IP-networked applications and that would otherwise be in the market for a BCM system
- Small-to medium-sized multisite businesses – that have Norstar systems, but are experiencing high call volumes between locations

Although the Norstar IP Gateway meets the needs of all of the above target markets, this solution is specifically targeted at the Norstar installed base of customers who want an entry-level VoIP solution that protects their Norstar investment.

Key Features

The Norstar VoIP Gateway enhances the already feature-rich Norstar platform and includes these key features:

IP Routing Table

When the network solution does not use a Gatekeeper for address resolution, the originating Norstar VoIP Gateway will provide a table to parse the dialed digit to determine the appropriate destination IP address. Using the information assigned, the call then proceeds to the destination gateway. The table supports up to 50 entries. This feature removes the need for an expensive Gatekeeper in a small network.

Remote Gateway Line Hunt

The Remote Gateway Line Hunt feature allows for added flexibility to VoIP networks. With this feature, the trunks connected to the Gateway will automatically be assigned to an incoming call. If one trunk is busy, the next free trunk will be assigned automatically. There is no need to specify the destination trunk. This feature provides flexibility to the user, as both incoming and outgoing lines can be pooled.

Private Network Dialing Plan

Private Network Dialing Plan is supported on the Norstar VoIP Gateway. Networks can be configured with an n-digit dialing plan. For example, all users on a network can dial the four-digit extension number of any other user on the same network.

Calling Line ID Support

Calling Line ID (CLID) is provided to the called party identifying the Norstar system from which the call originated. This feature requires that the destination system be configured to support CLID.

Key Benefits

The Norstar VoIP Gateway offers businesses the following benefits:

- Reduced costs – by using IP to replace PSTN to avoid expensive access and long distance charges
- Simplified installation and configuration – with browser-based Operation Administration and Maintenance (OA&M)
- Flexibility – with trunks that are available to incoming and outgoing calls
- Interoperability – with Norstar, BCM, Meridian 1 and Succession 1000
- Increased employee efficiency – by enabling n-digit dialing between Nortel Networks enterprise sites
- Simplified installation and configuration – with browser-based Operations, Administration and Maintenance (OA&M).

Product Positioning

The Norstar VoIP Gateway adds significant value to Norstar, supporting Norstar feature- and applications-rich KTS solutions into the future with state-of-the-art IP technology. The addition of the Norstar VoIP Gateway to the Succession portfolio strengthens Nortel Networks commitment to installed base customers by offering them the option of a basic trunking IP Telephony solution that can be installed on their Compact ICS or Modular ICS regardless of software level.

Norstar VoIP Gateway:

- Supports Norstar into the future – by moving forward with state-of-the-art technology
- Strengthens commitment to installed base customers – because it can be installed on Modular ICS/Compact ICS regardless of software level
- Complements BCM – by offering an intermediate migration step to converged systems and BCM
- Provides options – for small- to medium-sized businesses that do not need IP-networked applications
- Brings Norstar into "One network. A world of choice." vision – by providing interoperability with BCM, Meridian 1 and Succession 1000.

Norstar System with VoIP Gateway

The following diagram illustrates an example of a Norstar system with a Norstar VoIP Gateway:

Figure 48 Norstar System with VoIP Gateway
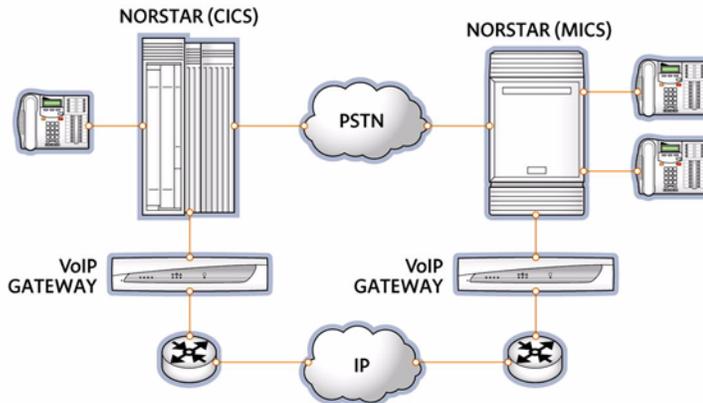
The Norstar VoIP Gateway provides IP networking of Norstar to Norstar and other Nortel Networks communications systems. IP replaces the PSTN or other private networks between locations and makes use of the capacity of the data network for voice communications, avoiding costly access and long distance charges. The Norstar VoIP Gateway works on Compact ICS as well as Modular ICS Systems, bringing this price-competitive solution small businesses as well as medium-sized businesses.

The Norstar VoIP Gateway complements BCM as an intermediate migration step to an integrated voice and data solution or as an option for small- to medium-sized businesses that do not require networked applications; these businesses can choose the path that best suits their needs.

The Norstar VoIP Gateway delivers the Nortel Networks "One network. A world of choice." vision to Norstar users, as the introduction of the Norstar VoIP Gateway expands the choices available to Norstar customers and seamlessly integrates Norstar into the evolutionary IP telephony portfolio, which includes BCM, Meridian 1 and Succession 1000.

Norstar Data Interface (NDI)

The Norstar Data Interface (NDI) allows small sites to connect a Nortel Networks or third party Data Terminal Equipment device (e.g., router) to the Modular ICS (4.1 or greater) system. Small sites benefit from the savings of consolidated network services (i.e., Universal or channelized T-1s).

The NDI is an external peripheral that connects the Norstar Modular ICS (4.1 or greater software) via any DS -30 fiber expansion port (including those reserved for Companion) to an external router or data terminal equipment using open synchronous serial interface standards (V.35, RS-232, EIA-530, EIA-530A, RS-449).

Physical Description

The NDI has three connectors on the back of the unit:

*   A fiber connector for the ICS
*   A 26-pin D-sud-type connector (female) for the data device serial interface
*   A 2-pin, 2-conductor jack connector for the external 9Vdc power supply.

Figure 49 Norstar Data Interface (NDI)

NDI weight: less than 1lb (0.4 kg).

Approximate dimensions: 170 mm x 140 mm x 40 mm.

Figure 50 Network Implementation of Norstar Data Interface
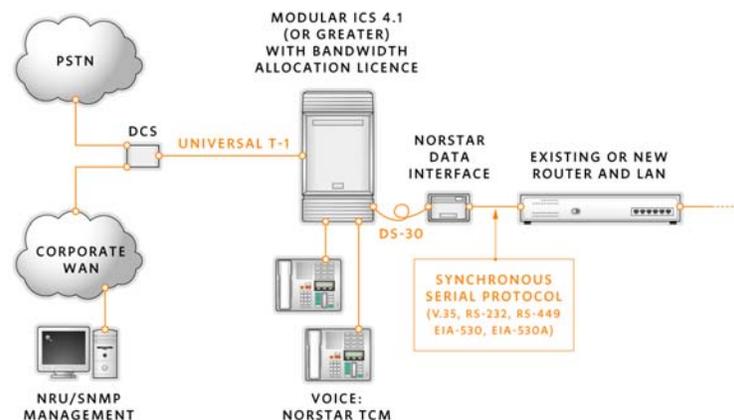
Typical Applications

The NDI eliminates the need for and cost of an external Channel Service Unit/Data Service Unit (CSU/DSU). A CSU/DSU is a hardware device about the size of an external modem that converts digital data frames from the communications technology used on a local area network (LAN) into frames appropriate to a wide area network (WAN) and vice versa.

The CSU/DSU functionality is integrated in the Modular ICS 4.1 (or greater) software and activated by the Bandwidth Allocation License. Having a built-in CSU/DSU lowers equipment costs, makes installation easier and eliminates the need for external cabling. The Modular ICS is effectively the small site gateway; it terminates all universal or channelized T1 WAN services and distributes the voice and data applications. NDI enables a PPP connection from branch office router to HQ router.

Figure 51   Typical Corporate HQ Networking Example
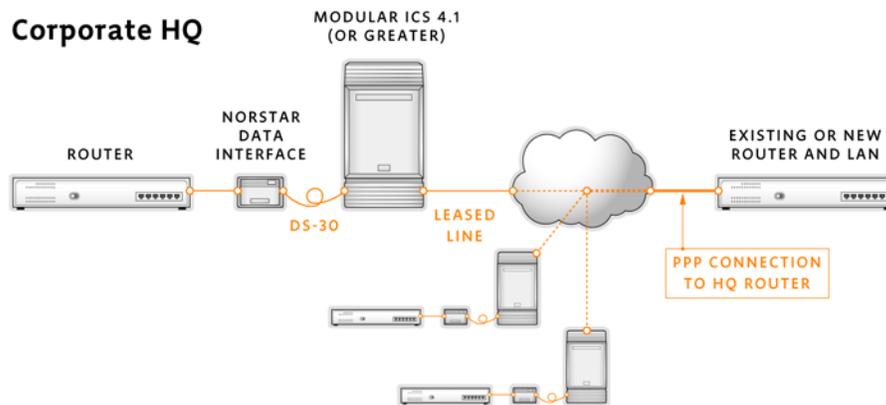
Figure 52   NDI Facilitates One Frame Relay Interface with Multiple PVCs to Multiple Far End Routers
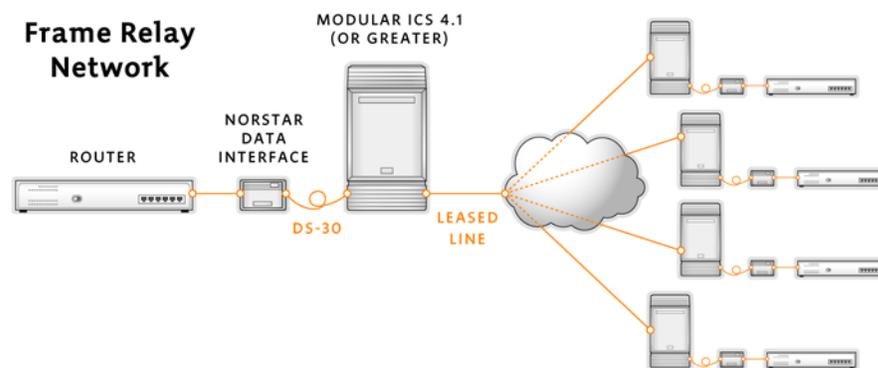
Networking Examples

Consolidated Network Services (Universal/Channelized T1)

In this example a universal or channelized T1, carrying both dedicated datacom services and switched voice, terminates on the Modular ICS system.

Figure 53 Consolidated Network Services Example
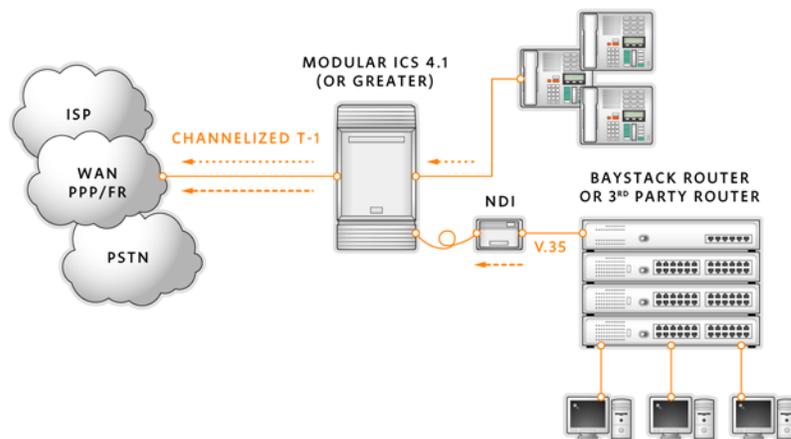
- The Bandwidth Allocation License is installed and configured to pass up to 1.544 Mbps (Frac-Full T1) of data services to the BayStack or third party router connected to the NDI via V.35

- The router transparently pulls channels from the T1 through the Modular ICS for branch to branch networking and Internet access

- The NDI facilitates clocking and connectivity services between the Modular ICS and the router.

Separate Voice and Data Services (PRI – voice and T1 – data)

In this example, a PRI line (Voice only) and a Frac-Full T1 (up to 1.544Mbps), carrying dedicated Point to Point or Frame Relay datacom services, terminate on two different DTI cards on the Modular ICS system.

Figure 54 Separate Voice and Data Services
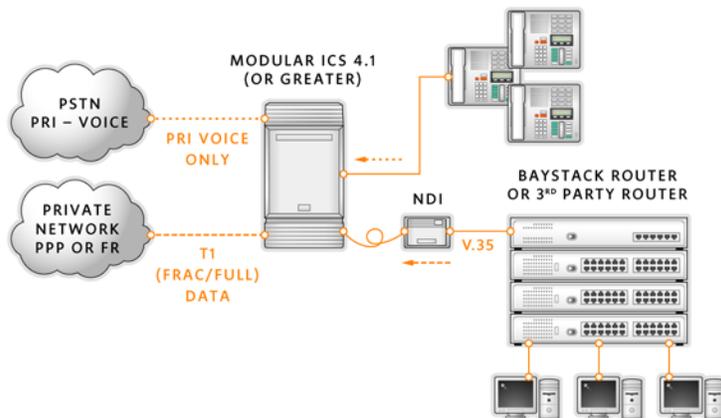
- The Bandwidth Allocation License is installed and configured to pass up to 1.544 Mbps (Frac-Full T1) of data services from the Frac/Full T1 to the BayStack or third party router connected to the NDI via V.35

- The router transparently pulls channels from the T1 through the Modular ICS for branch to branch networking and Internet access

- The NDI facilitates clocking and connectivity services between the Modular ICS and the router.

Consolidated Network Service (T1 - Voice and Internet)

In the following example, a universal/channelized T1, carrying voice services as well as Internet Services, terminates on the Modular ICS system.

Figure 55 Consolidated Network Service.
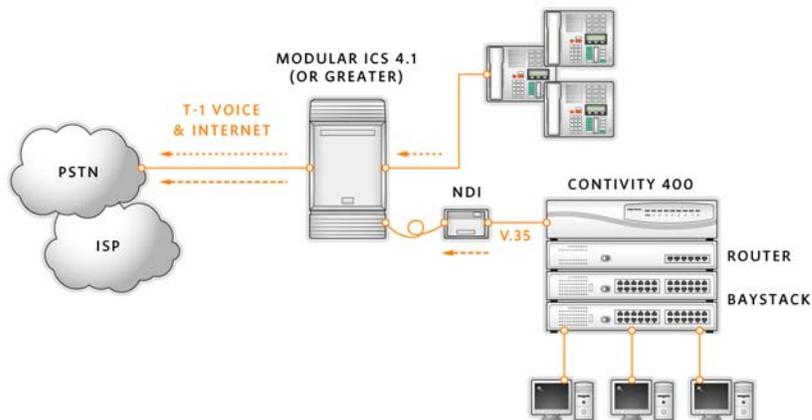
- The Bandwidth Allocation License is installed and configured to pass up to 1.544 Mbps (Frac-Full T1) of Internet Services to the Nortel Networks Contivity 400 that connects to the NDI via V.35

- The Contivity 400 transparently pulls channels and Internet Services from the T1 through the Modular ICS, for corporate-wide Internet access

- The NDI facilitates clocking and connectivity services between the Modular ICS and the Instant Internet.

ISDN Backup in Conjunction with NDI Fixed Access

In this example, a BRI loop connects from the Norstar Modular ICS and shares existing ISDN Network connections between voice and Data Terminal Equipment for BRI Dial Backup purposes. This can be done in conjunction with NDI Fixed Access to provide cost-effective backup and redundancy.

Figure 56 ISDN Backup in Conjunction with NDI Fixed Access
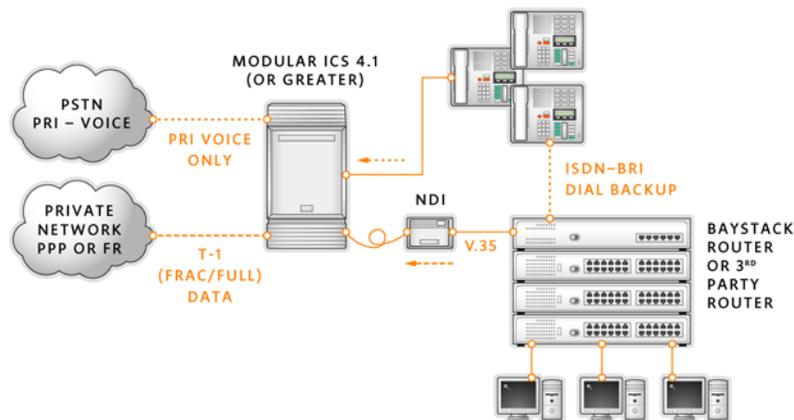
- The NDI enables the Modular ICS system to share its connection to a Universal/Channelized T1 network with a local area network (LAN)
- The NDI allows you to make more efficient use of your corporate network resources, and consolidate the equipment needed to support your voice and data networks.

Modular ICS with Internet Access via V.35

The following illustration is a high level view of a Contivity 400 connected to an LAN via a BayStack 420 Ethernet Switch, and connected to the Modular ICS through Norstar Data Interface, V.35 connection. This type of connection provides greater bandwidth through the Modular ICS for the LAN traffic (ISP bound).

The Modular ICS acts as the voice and data gateway to the world, providing voice connections as well as connecting the LAN users to the Internet Service Provider through the Contivity 400 and the NDI. The BayStack 420 Ethernet Switch provides high performance LAN connectivity for workstations.

Figure 57 Modular ICS with Internet Access via V.35
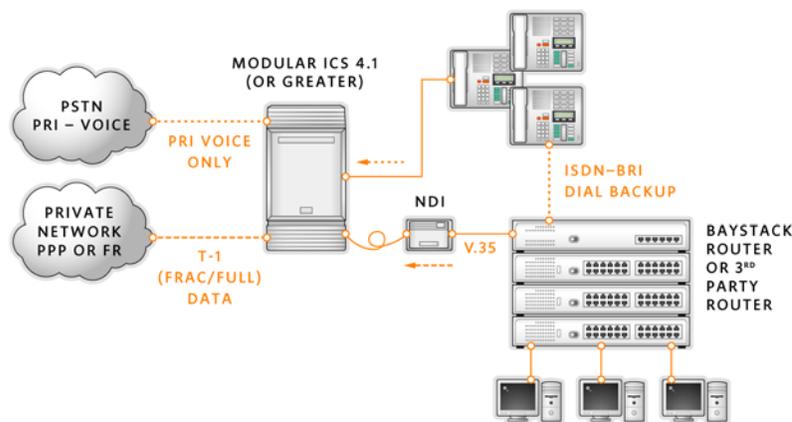
NDI Features

The Norstar Data Interface (NDI) is intended for the Modular ICS 4.1 (or greater) platform where fiber ports are available and where T1/E1 is supported. The Modular ICS platform must be running Modular ICS DR/XC 4.1 or later release and have the Bandwidth Allocation License activated in order for the NDI to function properly.

NDI Functionality

*   Connection of a Data Terminal Equipment device that supports V.35, RS-232, EIA-530, EIA-530A and RS-449 to the Norstar ICS via fiber cable (DS-30)
*   Transparent bit transport service using nailed up T1 channels
*   Synchronous bit rates up to 2 Mbps
*   Configurable bit rates in increments of 56,000 or 64,000 bit/s
*   Option to inverse the data bits to meet density requirements
*   Transmit clock source selection and transmit clock inversion
*   Hardware flow control (CTS/RTS)
*   Eight green LEDs to check or monitor status
*   Supports loopbacks between the NDI and the Modular ICS, and between the Data Terminal Equipment and the Modular ICS
*   Inverse MUX functionality to support a single PPP interface or a frame relay connection with multiple PVCs.

Transparent Bit Service

The NDI provides a transparent bit service and does not perform any link layer processing of the incoming bit stream. DTE devices communicate in a point-to-point fashion through the NDI. Consistent with commercially available CSU/DSUs, the NDI unit is not interpreting the bit stream.

Data Rates

The NDI supports data rates which are multiples of 56 Kbits/s or 64 Kbits/s. This allows use of T1 service where clear channel service is not available. Maximum rates are 1536 kbps for T1 and 1984 kbps for E1.

The NDI generates the clock to the DTE device based on the selected bit rate. The clock will be synchronized with the Norstar ICS main system clock.

Bit Insertion/Extraction

When Nx56k data rates are selected, the NDI will insert a bit into the least significant bit of the NxDS30 channels used on the network interface. Conversely the appropriate bit will be removed on the incoming data stream.

When Nx56K data rates are selected, the unused bit can be used to represent the Data Carrier Detect (DCD) signal. This allows the near end data device to determine the state of the communication channel.

Data Inversion

Transmissions which adhere to the HDLC/SDLC protocol never include more than six consecutive ones. Thus, by inverting the HDLC data stream before routing it to the T1 network, the ones density requirements are met on the transmit path because the inverted signal will never contain more than six zeroes in a row. This allows the DS0s to carry data at a rate of 64000 bps with the use of AMI line coding, and requires the far end DTI (DCE) to convert the data back to its original form before it reaches the customer's equipment.

Similarly, incoming data that has been inverted at the source with the intention of meeting the ones density requirements of the T1 network must be inverted again before being sent to the DTE. This scheme is only applicable to data streams that use protocols such as HDLC.

When the Data Inversion bit is set, the NDI stream is inverted before being routed to the T1 network and the T1 network data destined for NDI is inverted before being sent to the DTE.

Transmit Clock Source Selection and Transmit Clock Inversion

The NDI provides a clock with the data it transmits to the router (DTE). This allows the router to synchronize with the NDI data stream. Similarly the router (DTE) provides a clock with the data it transmits to the NDI. This allows the NDI to synchronize with the router data stream. The clock generated by the router must be frequency locked to a signal provided by the NDI.

The NDI provides the option to use the clock generated by the router (DTE) or an internally generated clock signal to synchronize to the router data stream. The option to use the clock generated by the router is required when the connection between the NDI is long and/or noisy.

When the NDI is using an internally generated clock to synchronize to the router data stream, the option also exists to use an inverted version of the internally generated clock. This has the effect of delaying the sampling of data and can be used to compensate for a long connection between the NDI and router where the round-trip delay exceeds one half-bit time.

The NDI also supports a mode where it will automatically select between using the clock generated by the router if it is present or where it will use the internally generated clock when the router clock is not present.

Loopbacks

The NDI provides a number of loopbacks to aid in testing, isolating and diagnosing data transmission problems. Loopbacks include:

* Local DTE Loopback (towards DTE)
* DS30 Loopback
* Remote Loopbacks (The NDI does not support or respond to any form of remote loopbacks initiated
  by data or test equipment external to the Norstar ICS).

WAN Protocols

Wide area network (WAN) protocols supported are based on the router or DTE connected to the NDI. The NDI transparently passes data communication services through as data traffic and ignores specific protocols. As long as the DTE can support a synchronous serial connection (V.35, RS-449, RS-232, EIA-530, EIA-530A) the NDI will facilitate a connection to the configured WAN services.

Components

In order for the NDI to function properly, the following components must be installed:

* Modular ICS 4.1 or later release with DTI card(s) installed
* Bandwidth Allocation License (BAL)
* NDI
* NDI Connection Cable.

System Configuration and Compatibility

The NDI product is compatible with Modular ICS DR/XC 4.1 or later releases. A fiber expansion port must be available. The appropriate NDI connection cable into the DTE and the Bandwidth Allocation License must be installed in order for the NDI to function properly. The NRU 8.1 or later release must be used to program or configure the NDI remotely.

The NDI is installed and configured as a data module on the Modular ICS. The Modular ICS must be programmed to recognize the NDI and Data Terminal Equipment.

Settings for the NDI can be programmed from any T7316E two-line display telephone or from a personal computer connected to the Modular ICS and running Norstar Remote Utilities 8.1 or greater.

The NDI can be configured to use different cables in order to support a range of interface standards. The NDI supports V.35, EIA 530A, EIA 530, RS-449 and RS-232 protocols.

Product Specifications

The NDI is intended for standard business environments. The applicable environmental requirement specifications are: I.E.C. 68-2-6/34; IEC 68-2-27-20.

The NDI complies with the regulatory requirements set forth by the following specifications:

- Canada: Safety – CSA C22.2 No. 950 (1995); EMC – ICES-003
- United States: Safety – UL 1950 Ed. 3; EMC – FCC Part 15.

Ordering Information

Three competitively priced NDI bundles are available for ordering. The bundles simplify the ordering process and ensure that distributors order and receive all the necessary parts to guarantee successful installation. One order code will represent the NDI, the Bandwidth Allocation License (BAL) and the appropriate NDI synchronous serial connection cable for the DTE. Please consult the Norstar Product Catalog for part numbers and prices.

Norstar Data Interface V.35 Bundle

The NDI V.35 Bundle is a cost-effective way to easily integrate the Norstar Modular ICS with a Nortel Networks or third party DTE device to consolidate voice and data network services over a single or multiple T-1s.

The bundle includes the NDI, BAL (the internal CSU/DSU keycode) and the NDI V.35 Cable to connect any DTE that supports the open V.35 synchronous protocol.

Norstar Data Interface Bay DB-44 Bundle

The NDI Bay DB-44 Bundle is a cost-effective way to easily integrate the Norstar Modular ICS with a BayStack router to consolidate voice and data network services over a single or multiple T-1s.

The bundle includes the NDI, BAL (the internal CSU/DSU keycode) and the NDI Bay DB-44 cable to connect any BayStack router (i.e., BayStack ARN, AN, etc.).

Norstar Data Interface Cisco DB-60 Bundle

The NDI Cisco DB-60 bundle is a cost effective way to easily integrate a Norstar Modular ICS with a new or existing Cisco router to consolidate voice and data network services over a single or multiple T-1s.

The bundle includes the NDI, BAL (the internal CSU/DSU keycode), and the NDI Cisco DB-60 cable to connect any Cisco router (i.e., Cisco 2500, 3810, etc.).

Separately Orderable Items

Norstar Data Interface (NDI)

NDI Installer Documentation Kit (English/French)

NDI Connection cables

- V.35 Synchronous Connection cable
- Cisco DB-60 (V.35) Synchronous Connection cable
- Bay DB-44 (V.35) Synchronous Connection cable
- RS-449 Synchronous Connection cable
- EIA-530/RS-232 Synchronous Connection cable
- EIA-530A Synchronous Connection cable.

Glossary of Networking Terms

Table 17   Glossary of Networking Terms

Term	Meaning
10Base2	Standard for baseband Ethernet. "10" Mbps, in "base" band form, to a maximum distance of about 200 meters. Also known as ThinNet.
10Base5	Standard for baseband Ethernet. "10" Mbps, in "base" band form, using 50-ohm coaxial cable to a maximum distance of about 500 meters. Also known as ThickNet.
10Base-T	An Ethernet local area network which works on twisted pair wiring that feels like telephone cabling. 10Base-T Ethernet local area networks work on home runs in which the wire from each workstation snakes directly to 10Base-T hub.
100Base-T	Essentially an extension of 10Base-T, 100Base-T is a 100 megabit-per-second local area network known by the generic name of Fast Ethernet. There are three basic implementations of Fast Ethernet – 100Base-TX, 100-Base-T4 and 100Base-FX.
56K	56 Kbps: a 64 Kbps digital circuit with 8 Kbps used for signaling. Sometimes called Switched 56.
56K FLEX	x2 is an emerging standard for running data over dialup phone lines at up to 53,000 bits per second one way and up to 33.5 Kbps the other way. The standard was developed for use on the Internet, with the 53Kbps channel flowing to the user.
Analog	An electrical wave or signal carrying sound. Analog signals vary in amplitude or frequency; the signal may be in any state at any time, depending on the voice or data.
ATM	Asynchronous Transfer Mode. ATM provides high-bandwidth, high-speed and large-capacity information delivery. It uses a packet switching technology that employs virtual circuits and multiplexing.
API	Application programming interface. Software that carries out lower level tasks such as managing windows, menus, icons etc.
Backbone	The high-speed, high-capacity cable that connects networks.
Bandwidth	A measure of the data-carrying capacity of a network connection or device. Analog is typically measured in cycles per second (Hertz), while digital is measured in bits per second (bps). For example, users connected to 10 Base-T hub all share the total bandwidth of 10 Mbps. As more users log on to the network through the hub, the bandwidth available to each user declines. A 10 Base-T switch, however, delivers dedicated bandwidth through each port, so each user directly connected to a switch gets 10 Mbps of bandwidth for themselves.
Bandwidth Allocation License (BAL)	A Bandwidth Allocation License is supplied with certain devices, but the BAL must be activated in order for a device such as an NDI to function properly.
Baseband	Networks that use all available bandwidth to send a single signal. This is a simple and relatively inexpensive system.

Term	Meaning
Bridge	A bridge extends the physical reach of networks beyond the limits of each LAN segment. Bridging connects two or more separate networks together. Bridging allows frames to be sent to all destinations regardless of the network protocols used. It also allows protocols that cannot be routed (such as NETBIOS) to be forwarded, and optimizes inter-network capacity by localizing traffic on LAN segments.
Broadband	Networks that divide bandwidth into frequency channels using a process called frequency division multiplexing (FDM). This process allows the network to send multiple signals simultaneously.
Bus	A common LAN topology in which all DTEs are connected to a common medium. Thus, all attached devices can receive transmission simultaneously. A bus can transmit data serially or in parallel.
Cache	A high speed memory designed to hold upcoming or soon to be accessed data. Speeds up a computer's operation.
Coaxial	A cable that can carry great quantities of information. It is made of an insulated central conducting wire wrapped inside a conducting layer and an outer protective layer.
CSU	Channel Service Unit. A device that terminates a digital line or channel to another device. A CSU is similar to a modem, except it can pass data at rates greater than 56 Kbps.
Datagram	A method of transmission where sections of a message are sent in scattered order and the correct order is restored by the receiving workstation.
DCE	Data Communications Equipment. This equipment is necessary for computers to connect to the network. DCEs include equipment such as modems and digital service units (DSUs).
DHCP	Dynamic Host Configuration Protocol. A protocol for automatic configuration that provides static and dynamic address allocation.
Digital	Binary code composed of 1s and 0s that represents information. This type of communication is much more accurate, or "cleaner," than analog.
DNS	Domain Naming System. A mechanism used in the Internet for translating names of host computers into addresses.
Domain	In the Internet, the last part of a symbolic naming hierarchy, such as.com, .ca, .edu, .net, etc. For example, in "www. nortelnetworks.com" the ".com" portion is the domain.
DSU	Digital/Data Service Unit. A DSU encodes and transmits digital information across a network. DSUs work in conjunction with CSUs.
DTE	Data Terminal Equipment. DTEs include personal computers (PCs), Macs, UNIX workstations, printers, fax machines and other end-user equipment on the network.
Duplex	Switched Ethernet connections can operate in either half or full duplex transmission modes. Full duplex mode doubles the speed of a device, i.e., boosting 10 Base-T switch operation to 20 Mbps and 100 Base-T operation to 200 Mbps.

Term	Meaning
Ethernet	A network protocol standard that specifies how data is placed on and retrieved from a common transmission medium. 10 Base-T is the standard with a transfer rate of 10 Mbps. Ethernet is the most common LAN.
Fast Ethernet	The faster version of Ethernet with a transfer rate of 100 Mbps. 100 Base-TX is the Fast Ethernet standard for copper cabling; 100 Base-FX is the Fast Ethernet standard for fiber optic cabling, which can carry signals farther. Fast Ethernet is ideal for sending large, complex files or using high-performance applications.
FDDI	Fiber Distributed Data Interface. FDDI is a LAN standard that provides very high transmission speeds over an optical fiber dual ring. FDDI uses a token-passing concept similar to token rings.
FDM	Frequency Division Multiplexing. FDM divides a channel into smaller frequency channels. Each message is formatted so it can travel within a precise frequency range. This way, many signals can be sent simultaneously.
Fiber optic	Fiber optics is a LAN technology using light pulses to deliver signals. These optical signals are high quality and can deliver a large amount of bandwidth over long distances.
Firewall	A combination of hardware and software which limits the exposure of a computer or group of computers to an attack from outside. The primary purpose of an Internet firewall is to provide a single point of entry where a defense can be implemented, allowing access to resources on the Internet from within the organization, and providing controlled access from the Internet to hosts inside the organization's internal networks.
Frame	Data bits grouped in a specific format, with source and destination addresses and a flag at each end to indicate the beginning and end of the frame.
Frame Relay	A protocol independent standard that uses data packets, or "frames," of different lengths. It is much faster than X.25 and capable of transferring large amounts of information.
FRAD	Frame Relay Access Device. A generic name for one of a family of devices usually located at a customer site which deploy multiplex and format traffic for entering a a frame relay network.
FTP	File Transfer Protocol. FTP provides access to files at remote sites linked to the Internet. It is widely used to upload and download information across the Internet.
Hardware Address	The unique address assigned to each network device to identify it on the network.
HTTP	HyperText Transfer Protocol. Invisible to the user, HTTP is the actual protocol used by the Web Server and the Client Browser to communicate over the "wire." In short, it is the protocol used for moving documents around the Internet.
Hub	A shared media connecting device for network wiring. All workstations on a shared media workgroup are linked to each other through the hub.
Interface	The physical connection that identifies how two systems will physically connect with each other and the types of equipment needed.

Term	Meaning
Interference	Energy or distortion that a signal sometimes acquires as it travels. This energy interferes with the signal.
Internet	An Internet is an open public network composed of many smaller networks. The best-known example of an Internet is the World Wide Web. Anyone can log on to the World Wide Web and access it for information.
Inter-networking	Refers to the exchange of information across networks. When LANs link to create a larger network, they form an inter-network. A WAN is an example of an inter-network.
Intranet	A closed network, available only to identified users. Many companies use intranets to provide information to their employees. This information is available only to employees, and not to the general public.
IP	Internet Protocol. The most important of the Internet protocols, it is software that keeps track of inter-network addresses for different nodes, routes outgoing messages, and recognizes incoming messages.
IP addressing	A system for assigning numbers to network subdivisions, domains, and nodes in TCP/IP networks.
IPNG	IP Next Generation. A term used to describe the efforts of the Internet Engineering Task Force to cope with the explosive growth of the Internet by defining the next generation of Internet Protocol.
IPX	Internet Packet eXchange. Novell Netware's LAN communications protocol, used to move data between server and/or workstation programs running on different network nodes.
ISDN	Integrated Services Digital Network. The public digital telephone service, which can support much faster data transfer rates than are currently possible with modems over normal, analog telephone lines. ISDN is available as Basic Rate ISDN (BRI – 2B + D) for bandwidth up to 128 Kbps, and Primary Rate ISDN (PRI – 23B + D), for bandwidth up to 1.5 Mbps.
ISP	Internet Service Provider. A vendor who provides access for customers (companies and private individuals) to the Internet and the World Wide Web, who also typically provide services like email. The user typically reaches his ISP by either dialing up with their own computer, modem and phone line, or over a dedicated line installed by a telephone company.
LAN	Local Area Network. LANs are systems of connected computers (and computer peripherals such as printers) in a geographically limited environment, such as an office building. LANs are based on a closed, permanent connection specifically set up for the LAN application. When LANs are linked together with routers, they become Wide Area Networks (WANs).
Loopback	Type of diagnostic test in which signal is returned to sending device after passing through Datacom link or network. Often done by excluding one piece of equipment after another.
MAC	Media Access Control. Often called the hardware address, the MAC identifies a specific device within a LAN for data delivery purposes.
MAN	Metropolitan Area Network. MANs are similar to, but smaller than, WANs. They typically connect two or more local area networks (LANs) within a limited area such as a city.

Term	Meaning
MAU	Multistation Attachment Unit. An attachment device, also called a transceiver, that is needed to connect the cable to the transmission medium.
MDA	Media Dependent Adapters. Device used to overcome 100 meter limit of Ethernet wiring. Used to extend range as required. Comes in fiber and copper modes.
Modem	A modem converts a digital signal into an analog signal for transmission across standard phone lines. Modems enable a computer to connect to the Internet.
MUX	A process that aggregates two or more channels onto a single transmission facility. Equipment is called multiplexor.
NAT	Network Address Translation. Protocol that ensures network addresses are intelligible to the system.
Netware	A very popular operating system for LANs from Novell.
NIC	Network Interface Card. Hardware that allows DTEs access to the network, acting as a link between the user components and the network components.
NOS	Network Operating Software, which enables users to access and use remote files and programs. The NOS also controls how, when and to whom LAN resources are allocated.
NT	Operating system from Microsoft which will let Windows run on high-end machines, such as file servers and workstations.
OC3	Optical Carrier 3. A high-speed fiber optic digital line, offering speeds up to 155.520 Mbps.
Octet	An eight-bit byte, which can be represented by a number between 0 and 255.
OSI Model	Open Systems Interconnection Model. An international set of standards governing how different systems can communicate with each other.
OS2	An operating system originally developed by IBM and Microsoft for use with Intel's microprocessors and with IBM personal computers. OS2 is a multitasking system that now runs on many different types of computers.
PCM	Pulse Code Modulation. A method used to encode analog signals into a digital format.
Peripheral	Equipment such as printers, fax machines or scanners that are shared between end users on a network.
Ports	The points at which devices connect to the network. Every switch, hub and router has a certain number of ports so computers or other networking devices can connect to each other and share information.
PPP	A connection oriented protocol used with TCP/IP applications. Much more robust than the older SLIP protocol. Has the potential to eliminate the need for bridging devices.
Protocol	A set of rules identifying how two systems will "talk" to each other, including identifying and translating the language spoken by each system.
PSTN	Public Switched Telephone Network. The regular telephone system.

Term	Meaning
Repeater	A network element used to connect similar network segments to each other.
Ring	A design of a local area network (LAN) where the wiring loops from one workstation to another, forming a circle.
Router	A network element used to connect networks and to direct the flow of information between two or more networks.
Routing	Routing helps to increase network capacity by localizing traffic on LAN segments and broadcasts resulting from bridged traffic. It also provides security by isolating traffic on segmented LANs. Routing provides a way to transfer user data from source to destination over different LAN and WAN links using one or more network protocol formats.
Segment	A collection of stations on a LAN using the same transmission medium, such as twisted pair or coaxial cable.
Server	A computer dedicated to providing information to the end user. Some basic types of servers are file servers, database servers and print servers.
SOCKS	Socket Secure (Server). An Internet security technology developed in 1990.
Stackable	Stackable refers to a system's capacity to connect devices via daisy chaining to additional devices.
Star	A common LAN topology, in which all DTEs are connected to a single, central device, which acts as a processing center and aids in the delivery of signals.
Station	End-user equipment on a network. Also called DTE or workstation.
Statistical Multiplexing	A method for transmitting multiple signals over one channel based on the requirements of connected devices. This method conserves valuable bandwidth space.
Switch	A switched-media connecting device for network wiring. All workstations on a switched workgroup are linked to each other through the switch. Switches are often used to segment the LAN because, unlike hubs, switches provide dedicated bandwidth to each port.
T1	A digital transmission link offering up to 1.544 Mbps. T1 uses two pairs of normal twisted wires, the same as you'd find in your house. T1 normally can handle 24 voice conversations, each one digitized at 64 Kbps. T1 lines are used for connecting networks across remote distances.
T3	A digital transmission link, offering up to 44.736 Mbps. The equivalent of 28 T1 lines.
TCP	Transmission Control Protocol. A Transport Layer protocol providing connection-oriented, end-to-end connectivity across networks.
TCP/IP	Transmission Control Protocol/Internet Protocol is a networking protocol that provides communication across interconnected networks, between computers with diverse hardware architectures and various operating systems. The most popular network that uses TCP/IP is the Internet.
TDM	Time Division Multiplexing. A method for transmitting multiple signals over one channel by transmitting a small piece of each signal one after the other.

Term	Meaning
Telnet	A protocol that provides connectivity between computers on the Internet, establishing character-based communication and allowing hosts with different operating systems to communicate.
Token Ring	A ring type of LAN in which a supervisory frame, or token, must be received by an attached terminal or workstation before that terminal or workstation can start transmitting.
Topology	The configuration of a data communications network.
Transceiver	An attachment device - also called a medium attachment unit (MAU) – used to connect a cable to a transmission medium.
Transmission	The transport of information over a physical media such as twisted pair wire or coaxial cable. The information being transmitted can be voice, data, video or image.
Tree	A common LAN topology, the tree is an extended bus LAN with additional "branches" added to extend the effective range of the network.
Twisted pair	Twisted pair wire is the standard telephone wire found inside most businesses and homes. It is inexpensive, lightweight and easy to handle.
UDP	User Datagram Protocol is an alternative to TCP at the Transport Layer, serving the same interface function between the network and application, but not providing error-checking or retransmissions.
URL	Uniform Resource Locator. A standardized way of representing different documents, media and network services on the Web.
V.35	A standard for trunk interface between a network access device and a packet network that defines signaling for data rates greater than 19.2 Kbps.
Virtual Circuits	Virtual circuits are connections that look and act like dedicated lines, but actually connect temporarily. Because the connection terminates once the call is complete, bandwidth stays open for other uses.
WAN	Wide area networks are networks of LANs. WANs connect LANs across a wide area such as a city, state or country. WANs often use high-speed transmission facilities as their connection.
Web cache	When a user accesses a Web page, the cache engine locally stores the page's graphics and HTML text. When another user later requests the same Web page, the content is pulled from the cache engine. This process improves download time for the user and reduces bandwidth use on the network.
Wildcards	Special characters used to represent one or more characters in an MS DOS file name. "ERASE*?A?" would erase all files with "A" as the middle letter in a three-letter suffix.
Winsock Apps	Winsocks (Windows Sockets) are standard APIs (applications programming interface) among Microsoft Windows (3.1, 95 and NT).
X.25	The first packet-switching technology for data networks, X.25 delivers packets of information over the best available route at any given time, depending on the need and the available resources.
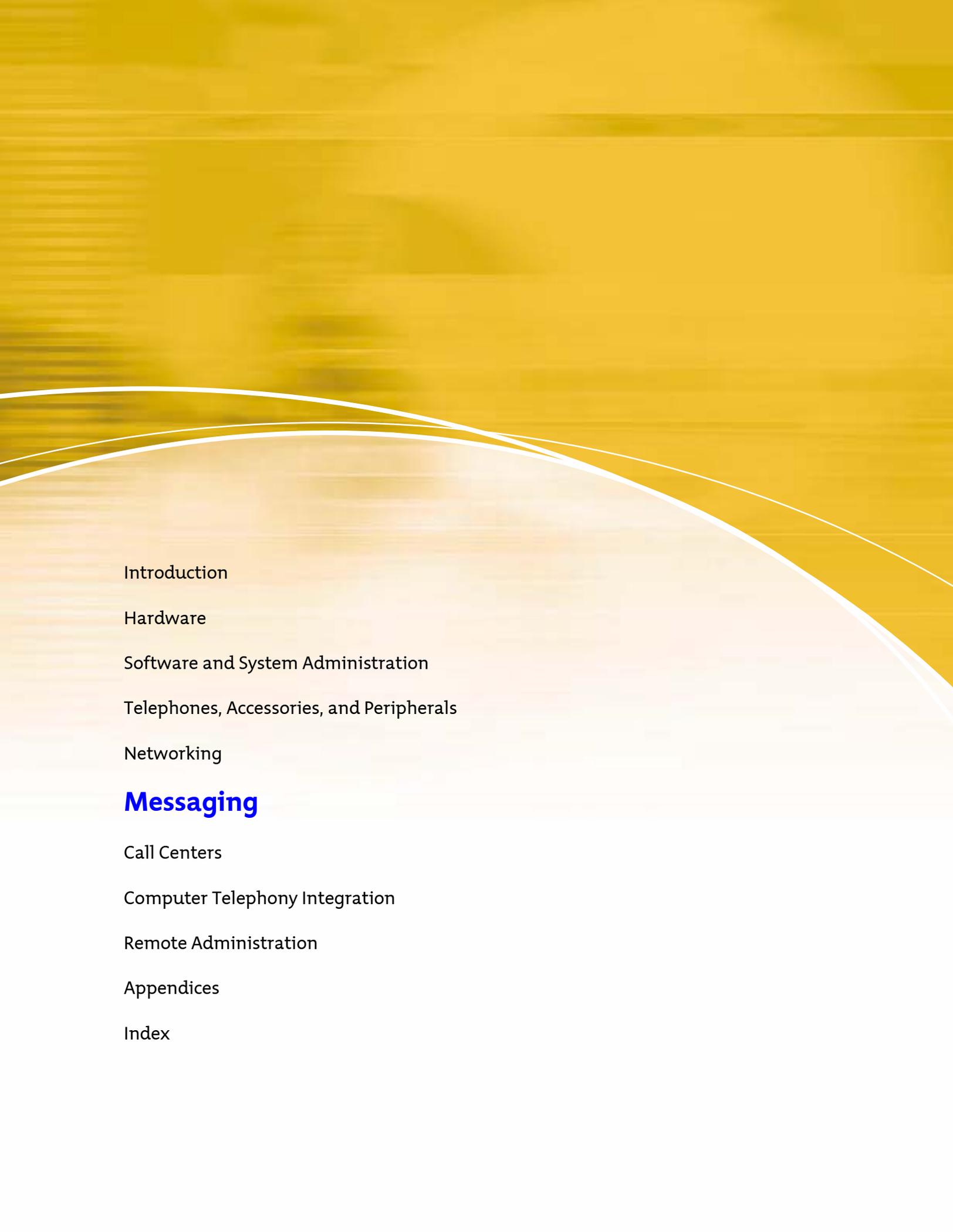
Messaging

Chapter Highlights

- CallPilot 150 – is the main offering in the Norstar messaging portfolio and delivers scalable, advanced messaging to growing small and mid-sized businesses with 30 to 200 users

- CallPilot 100 – is a new messaging offering that targets price-sensitive small businesses and provides a feature-rich, cost-effective solution equipped with 10 mailboxes

- Centralized Voice Mail on CallPilot 150 – means that networked sites can use one centralized applications server for Voice Mail and Attendant; this capability translates into significant cost savings

- Centralized Auto Attendant on CallPilot 150 – means that the Norstar VM application in the NAM acts as a centralized Auto Attendant for Norstars or Meridian 1s connected over an MCDN CDP network

- Automated Attendant – works as the Norstar voice messaging receptionist and ensures that calls are answered 24 hours a day, 7 days a week, allowing callers to direct their calls to the right person

- Mailboxes – enable companies to order up to 300 mailboxes that can be used to provide callers with important information or allow callers to leave messages anytime

- Custom Call Routing (CCR) – enhances Voice Messaging call routing abilities by allowing incoming calls to be redirected along call paths created by the system administrator.

Chapter Overview

The voicemail industry has experienced explosive growth over the last few years as more and more decision makers have become aware of voicemail/auto attendant products and the benefits they provide for their businesses. In fact, most businesses and organizations today use some form of voicemail, whether it is equipment on their premises, or voice mailboxes that are provided by a service bureau or telephone company. Currently, businesses are more interested in voice processing platforms that provide a high level of integration and advanced applications such as Desktop Messaging. The market interest in "unified" messaging is driven by the fact that messaging in all forms – fax, voicemail and email – is increasing annually. Industry analysts estimate that, last year, an average of 2.5 billion voice and email messages were sent and received daily in North America. And, even though fax is a relatively "old" technology, fax usage is growing steadily by 40% per year.

Businesses are also looking for ways that technology can help them maximize their resources, whether through people or equipment or facilities. Moreover, they are increasingly requiring centralized applications. With the release of CallPilot (Release 2.0), and the development of Centralized Voice Mail (CVM) capabilities, networked sites can now use one centralized applications server for Voice Mail and Attendant. No applications server at branch sites translates into huge cost savings.

CallPilot 100, offers price-sensitive small businesses a cost-effective next-generation voice messaging solution. This option targets smaller businesses that have advanced application requirements but a fewer number of employees.

Norstar Messaging Portfolio

Norstar offers a messaging product portfolio designed to meet the needs of businesses of any size – those from 10 mailboxes up to 300 mailboxes.

• CallPilot 150

• CallPilot 100.

CallPilot 150 and CallPilot 100 Integration with Norstar

CMS/Class Integration

In addition to the standard telephone answering and auto attendant call routing benefits, Norstar offers some specific advantages because of the tight integration between the ICS and voicemail. When the Norstar ICS is equipped with CMS/Class network features, CallPilot 100 and CallPilot 150 provide some very powerful business tools, including:

• Auto Attendant – can route calls based on up to 100 Calling Line Identification (CLID) numbers to either a specific CCR tree, extension or mailbox. This routing can also be performed based on area code or prefix. Using this capability means that calling customers can not only be routed to their geographic customer service representative based on their calling number, it also means that when that representative is already on the phone, they can hear a special greeting that insures they know their call is important.

• CLID – and the caller's name, if available, is stored in the mailbox with each message, and users can call back those numbers using the "CALL" soft key, speeding up return calls and simplifying the call return process.

In addition to the primary greeting and the extended absence (alternate) greeting, users can record up to three personalized CLID greetings for specific callers like a special customer.

Intelligent Integration

Competitive voicemail systems, when interfaced with Norstar ICS systems, cannot compare to the capabilities provided by the superior integration of CallPilot. These integrated capabilities are demonstrated by a simple and easy-to-use interface displayed in visual prompts on the telephone set, which guide the user to activate messaging commands and functions by using the soft keys just below the telephone LCD window. Also, the user gets message notification through a "Message For You" prompt which appears on the display whenever there is a new voice or fax message in the mailbox.

Other integration advantages include:

• Double the efficiency in connecting voice channels to the ICS core. Since CallPilot uses both the B1 and B2 channels on the ICS, half the number of station ports are required than in any competitive voice messaging system. This is a significant competitive advantage, especially when the customer's system is close to maximum station capacity.

• Access to the name directory on the telephone LCD display.

• Ability to retrieve calls that have forwarded to voicemail using "Interrupt" with Feature 987. This feature can help avoid several messages a day by talking live with the caller.

• Ability to route calls and have specialized greetings using incoming CLID information

• Instant status information on any DN – competitive systems must first transfer the call to determine the DN status

• Ability to retrieve messages on intercom by only supplying a password – competitive systems require mailbox number and password entry

• Transfer to an extension or external number from a CCR tree

• Ability to integrate CMS/Class features directly from the ICS without adding additional hardware devices

• In addition to all the user benefits derived from the Norstar integration, perhaps the most significant benefit for the customer is that Norstar provides a single vendor solution with products that meet or exceed Nortel reliability and quality standards.

General Norstar Voice Messaging Overview

CallPilot 100 and CallPilot 150 work with the core Norstar ICS, offering a receptionist service that routes calls and provides voice message taking capability. When enabled, CallPilot's Automated Attendant answers incoming calls and routes the calls to extensions and mailboxes within the system.

Voice Messaging Components

CallPilot's messaging has three main components: Automated Attendant, Mailboxes (voice messaging) and Custom Call Routing (CCR).

- **The Automated Attendant** – works as a receptionist would when answering incoming calls. Using a voice prompt, it plays a list of options to a caller. If the caller knows which option they want, they can interrupt the Automated Attendant by pressing their selection on the dial pad of any tone dial telephone. When the caller has selected an option, the Automated Attendant responds to the command by either routing the call to an extension or mailbox within the company, or directing a caller to the Company Directory or Designated Operator.

- **Mailboxes** – are added by the system coordinator and then initialized by the mailbox owner. They store the callers' voice messages. Any caller can leave a message after a mailbox is initialized.

- **Custom Call Routing (CCR)** – is a single-digit access application that provides callers with a series of voice prompts and call transfer options.

About the Automated Attendant

The Automated Attendant is the CallPilot receptionist. When enabled, the Automated Attendant answers the company's incoming telephone lines according to the time of day. When the Automated Attendant is enabled, the Automated Attendant menu prompt provides a list of options so that a caller can:

- Reach a DN or a mailbox in the company

- Leave a message in a mailbox

- Select an alternate language

- Look for an extension or mailbox in the Company Directory

- Reach the company receptionist or designated operator

- Open a Personal Mailbox as a mailbox owner.

The Automated Attendant provides callers with commands to use each of these options. Callers must press the button associated with the option they want to activate. For example, the Auto Attendant might provide the following command: "To use the Company Directory, please press 1."

Figure 58 CallPilot Call Answering Overview
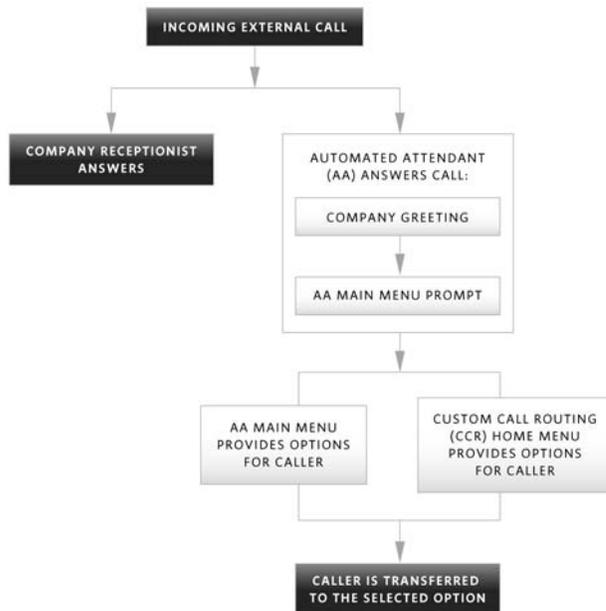
About the Company Directory

The Company Directory is a list of mailbox owners registered with Norstar voice messaging. Before mailbox owners can use their mailbox, they must record their names in the Company Directory. If mailbox owners do not want their names to appear in the Company Directory, they can see the system coordinator. Names included in the Company Directory can be changed at any time.

About the Mailboxes

A mailbox is a storage place for messages. CallPilot 150 can have a maximum of 300 mailboxes and CallPilot 100 can have a maximum of 40 mailboxes. There are four groups of Norstar voice messaging mailboxes, including:

- Special or Guest
- Personal
- Information
- Network Delivery.

The company's system coordinator administers Special Mailboxes.

The system coordinator uses the system coordinator mailbox as a Personal Mailbox in which employees can leave messages.

The system coordinator assigns Personal Mailboxes, which mailbox owners then maintain. Personal Mailboxes can be one of the following types:

*   User Mailboxes – store messages for users who are unable to answer their telephone. These mailboxes can be assigned to users with operating Norstar extensions.
*   Guest Mailboxes – provide temporary employees and guests with access to internal messaging and call routing features. Guest Mailboxes do not have an operating extension.

Information Mailboxes are designed to provide an informative message to a caller. This type of mailbox differs from the other mailboxes because it does not take messages; it plays a Personal Greeting to the caller, but does not prompt for, or allow, the caller to leave a message.

Network Delivery Mailboxes are used with the optional AMIS or Digital Networking applications to simplify addressing to remote locations.

How Custom Call Routing Works

Custom Call Routing (CCR) is an application that works with CallPilot voice messaging to provide a call routing path that directs incoming calls. CCR enhances the Norstar voice messaging call routing abilities by allowing incoming callers to route their own calls along call paths that the system coordinator has created. This application allows a company to customize the call routing capabilities to suit their needs. CCR does not replace CallPilot's messaging call routing function, but enhances it.

Designing and Building a CCR Tree

Designing a CCR Tree involves:

*   Determining frequently requested departments
*   Determining frequently called extensions
*   Making a list of goods and services for promotion in Information Messages
*   Selecting mailboxes assigned to Leave Message Points
*   Determining call Destination Types
*   Recording the prompts and messages.

About the Home Menu

The Home Menu is the introductory voice prompt that the system administrator records. It provides a list of single-digit options to a caller. After listening to the Home Menu, a caller selects an option by pressing a number on any tone dial telephone. Options in the Home Menu can route a caller to:

•   An information message

•   A mailbox to leave a message

•   An extension

•   Another menu.

CallPilot Feature Codes

When using CallPilot from a Norstar telephone, the user must enter a Feature Code. Feature Codes are used to access the different functions and options of CallPilot. Users can activate the following feature codes by pressing the numbers in parentheses below:

•   **Leave Message Feature Code (F980)** – lets mailbox owners leave a message in a mailbox initialized with Norstar voice messaging.

•   **Open Mailbox Feature Code (F981)** – lets mailbox owners open their Personal Mailboxes. All Personal Mailboxes are protected by a password that the mailbox owners establish.

•   **Operator Status Feature Code (F982)** – allows the system coordinator, receptionist or Designated Operator to set the Operator Status. When an Operator is unavailable, the Operator Status must be set to NO. This status alerts the Automated Attendant that the receptionist or Designated Operator is unavailable. Users also deploy this feature code to establish whether a business is open or closed. This feature code is protected by a password.

•   **Norstar Voice Messaging Directory Number (DN) Feature Code (F985)** – allows users to determine the CallPilot Directory Number (DN). This number lets users forward a Norstar telephone to their mailbox. Entering F985 will display the voice messaging DN on the telephone display.

•   **Transfer Feature Code (F986)** – lets users transfer calls to a mailbox. While the call is active (the call is not put on Hold), the user presses the memory button where Feature 986 is programmed, then enters the mailbox number where he or she wants to direct the call. The system then transfers the call.

•   **Interrupt Feature Code (F987**) – lets users interrupt a caller that is listening to the Personal Mailbox Greeting or is leaving a message. This allows a mailbox owner to speak with a caller who has reached their mailbox.

- **Record a Call Feature Code (F989)** – allows users to record the call they are presently on by pressing this feature code during the call. The conversation will be recorded in the mailbox corresponding to the DN of the telephone that activates Feature 989. The party who did not initiate the call may hear standard Norstar hold tones during the time it takes for the system to conference in voicemail. Then, both parties will hear the prompt, "this call is being recorded," followed by a recording beep tone. If the user targets more than one extension to one mailbox, he or she can press F989 from any of those telephones to converse in the assigned mailbox.

- **Single Button Call Forward to Voice Mail (F984)** – lets users program a single button to forward all calls automatically to voicemail.

User Interface

CallPilot 100 and CallPilot 150 allow users to select the type of interface they want to use when accessing their mailbox. This interface can be selected on a system-wide basis or on a per mailbox basis.

The Norstar user interface offers users the traditional Norstar interface using the set display and softkeys when accessing the capabilities of their mailbox.

The M1 user interface offers users the Meridian 1 interface using the M1 dial pad commands to access the features and capabilities of their mailbox.

CallPilot 100

CallPilot 100 addresses the price-sensitive business customer with minimal applications requirements. CallPilot 100 businesses should be those that require no more than four ports, nine hours of storage or 40 mailboxes. CallPilot 100 delivers a common user interface across multiple platforms, including Norstar, BCM and Meridian 1, thereby reducing training requirements. Businesses can purchase additional functionality. CallPilot 100 offers the following key features:

- 40 subscriber mailboxes (equipped with 10)
- Basic Call Center (optional)
- Call Center Reporting (optional)
- Backup and Restore (included)
- Web-based administration or set-based administration (included)
- Auto Attendant/CCR (included)
- Desktop Messaging (optional)
- VPIM/AMIS Networking (optional)
- four ports/nine hours (included).

CallPilot is a feature-rich, cost-effective messaging solution that offers benefits to end users, businesses and channel partners.

Note: CallPilot 100 requires a minimum 4.1 release on the Compact ICS or Modular ICS system. CallPilot 100 is also compatible with 3x8 DR5.1.

CallPilot 150

CallPilot 150 for Norstar is a small to medium-sized business voice messaging solution fully compatible with Compact ICS and Modular ICS Release 4.1 and greater. CallPilot 150 offers the following key features:

- Systemwide choice of either Norstar or CallPilot user interface
- IP enabled with 10/100 Ethernet port for system administration and maintenance
- 300 subscriber mailboxes (equipped with 32)
- Basic Call Center (included)
- Desktop Messaging (two seats included)
- Automated Attendant and Custom Call Routing (included)
- Eight ports /60 hours
- Web-based administration or set-based administration (included)
- VPIM/AMIS Networking (optional)
- Centralized Voice Mail (included).

CallPilot Positioning

Voice Mail Features

CallPilot provides a fully featured voice messaging solution, including Auto Attendant and Custom Call Routing (CCR). The following easy-to-use features provide flexibility to address the desired functionality for any level of user.

Table 18   Voice Mail Features

Standard Voice Mail	Automated Attendant
Auto answer with personal greeting	Call transfer – blind and screened
Broadcast Messages	Calling Name Display
Delivery Options (private, urgent, etc.)	Customer Call Routing (CCR)
Express Messaging	CCR Levels (10)
Guest Mailboxes	CCR Trees (4)
Informational Mailboxes	Dial Extension from CCR
Interrupt Caller Leaving a Message	External Transfer on Centrex
Message Waiting Notification	Flexible Business Hours
Never Full Mailboxes	Flexible Line Rings before answer
Outbound transfer from mailbox	Greeting Tables
Personal Mailboxes	Multiple Operators
Prerecorded greetings (4)	Remotely Record Greeting
Primary and Alternate Greetings	Remotely Set business open/closed
Record a Call	Reply based on CLID
Recovery of deleted message	Reports
Remote Call Forward to Voice Mail	Single -digit menus
Reports	Touchtone gate
Timed delivery of messages	Transfer to CCR Tree

IP-Ready Ethernet Port

CallPilot provides an IP-ready 10/100 Mbps Ethernet connection for simplification of system administration, Keycode retrieval and activation of advanced features such as Desktop Messaging and Digital Networking (VPIM).

A third-party Web server software resides on the CallPilot 100/150 platform, enabling simple and easy access to system administration through any Web browser. Access to system programming is as easy as making a dialup Internet connection and accessing the remote CallPilot system's IP address to perform all administrative changes with an easy graphical user interface (GUI). Manual telset-based administration capabilities are still available if the customer chooses this option.

Keycode Retrieval System (KRS)

Each CallPilot 100/150 ships with a unique system ID which is then matched to the authorization code of the purchased upgrade option. When the customer enters these two codes into the Keycode Retrieval System (KRS), the applicable keycode is generated to enable the purchased option. The ability to generate keycodes through the KRS ensures immediate access without the need to place calls to Nortel Networks support.

Keycode Retrieval System Implementation Details

CallPilot is enabled for base functionality out of the box with upgrade options that are enabled via keycodes. The upgrade option is in the form of a paper document with a unique authorization code that the installer enters, along with the unique CallPilot ID, into the KRS to obtain the keycode.

Try-and-Buy Keycodes

Try-and-buy keycodes are available at no charge for a 60-day period. This offering lets customers "test out" these applications and experience the value they will bring in addressing their business needs – all without any obligation to purchase. The keycodes are easily accessible by way of the Web through the KRS. Businesses may request any or all of the listed keycodes.

CallPilot Manager

CallPilot Manager is a Web-based application for the set up and administration of CallPilot. System administrators can also perform administration through a T7316E telephone set. Administrators can initialize CallPilot using either CallPilot Manager or a two-line display telephone.

CallPilot Manager comes enabled on the CallPilot platform. With built-in server software, CallPilot does not require business customers to load client software on to the PC. The PC Web browser software allows for CallPilot administration.

Computer Requirements

The computer used to run CallPilot Manager must have:

- Windows NT or Windows workstation running a Pentium 133 or later CPU
- 64 MB RAM
- 10 MB disk space
- Minimum screen resolution of 1024x768 pixels.

Browser Requirements

To run CallPilot Manager, users or businesses must have:

- Java Virtual Machine 5.0 (build 5.0.0.3188 or later)
- Netscape Communicator 4.0.5 or later (but not 6.0)
- Microsoft Internet Explorer 4.0 or later (but not 6.0)

With Netscape Communicator, users must set the following parameters:

- Enable Java: on
- Cached document comparison: every time.

With Microsoft Internet Explorer, users must set the following parameters:

- Check for newer versions: every visit to the page
- Java JIT compiler enabled: on

For more information about these settings, refer to the Web browser's Help.

Starting CallPilot Manager

1. Point the Web browser to http://<IP address>:6800/CallPilot Manager where <IP address> is the IP address of CallPilot.

2. The Administration Login screen appears. Enter the password in the **Password** box.

3. Click the **Submit** button. The CallPilot Manager Main Menu appears.

Figure 59   CallPilot Manager Main Menu
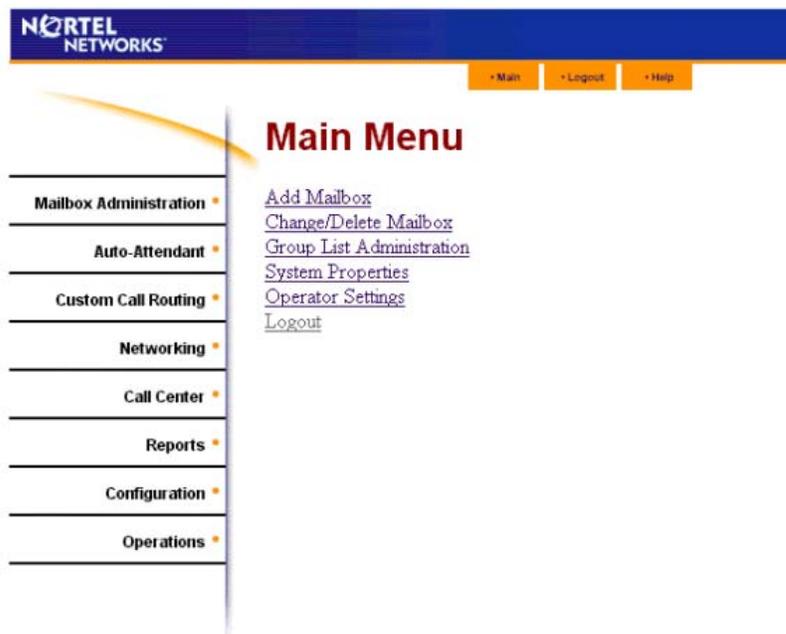
CallPilot Manager Benefits

CallPilot Manager provides the following benefits:

- Remote access to one or more CallPilot systems from a central point
- Can be accessed from any PC with a Web browser
- Online help with keyword search
- No dedicated dialup line.

CallPilot Customer Value Proposition

CallPilot for Norstar and small Meridian provides a feature-rich, cost-effective voice messaging solution to small to medium-sized businesses with the flexibility for businesses to purchase options in increments best suited to their needs.

User interface options provide choices to the user based on preference; these options minimize the need for retraining. Web-based administration capabilities ensure a quick, easy and cost-effective method for system administration changes, while also providing a telset-based option for those customers who prefer this method.

CallPilot Reporting

CallPilot includes a number of reports allowing system administrators to view CallPilot programming settings, mailbox information and status and available message time.

Generating a Report

To generate a report:

1. Click the **Report** heading.
2. Click the link for the report you want to generate. The report will appear in a new window.
3. Click **Print** to print the report.
4. Click **Close** to close the report window.

CallPilot Reports

CallPilot allows users to generate the following reports:

- Directory
- Mailbox Information
- Mailbox Activity
- Event Log
- CCR Tree Usage
- Port Usage/Call Handling
- Message Usage
- System Configuration

Directory Report

The Directory report shows information for mailbox owners listed in the Company Directory.

Table 19   Directory Report

Heading	Description
Subscriber	The mailbox owner's name.
MB	The mailbox number.
Type	The type of mailbox.
Ext	The extension number.
Name Recorded	Indicates whether the mailbox owner has recorded their name in the company directory.
Greeting Recorded	Indicates whether the mailbox owner has recorded a greeting.

If both Name Recorded and Greeting Recorded are N, the mailbox will not be initialized.

Mailbox Information Report

The Mailbox Information report shows information for each mailbox.

Table 20   Mailbox Information Report

Heading	Description
MB	The mailbox number.
Type	The mailbox type. Can be one of the following types: • SUB – Subscriber • ADM – Administrator • GDM – General Delivery Mailbox • FOD – Fax On Demand – BCM 2.5 only • FOV – Fax Overflow – BCM 2.5 only • NET – AMIS or Site • INFO – Information.
Directory Name	The name of the mailbox. An asterisk appears beside the name if the mailbox name is not in the Company Directory.
Ext	The mailbox extension.
COS	The Class of Service for the mailbox.
Total	The total volume of messages in the mailbox, not including space taken by mailbox greetings, shown as messages (Msg) and minutes (Min).
New	The total volume of new messages in the mailbox, shown as messages (Msg) and minutes (Min).
Outdial	The outdial parameters. This setting does not appear for CallPilot Mini.

The mailbox can have one or more information messages, which contain an alphanumeric tag and a descriptive string. To reduce the number of report output lines, a mailbox setting or condition is only reported if it differs from the default setting or normal condition.

Possible tags include:

Table 21   Mailbox Information Tags

Tag	Description
UNINIT	The mailbox is not initialized.
NONAMEREC	The mailbox is initialized, but a name is not recorded.
NOGREET	The mailbox is initialized, but a primary greeting is not recorded.
LOCKED	The mailbox is disabled because the number of incorrect password attempts is exceeded.
NOMWI	The mailbox has a primary extension, but Message Waiting is disabled.
FULL	The mailbox is full.
NOACCEPT	The subscriber has set the mailbox to not accept messages.
NOADDRESS	The address is not specified.
ALTDN1	Alternate extension 1 is defined.
ALTDN2	Alternate extension 2 is defined.
EXPRLINE	An Express Messaging line is defined. Only available on CallPilot 150.
ATDT	A Target Attendant is defined.
XFERS Screened	Transfers are screened. Blind transfers are normal and are not shown.
METHOD, LIMIT	The delivery method and maximum number of selections for a Fax On Demand mailbox.
RETRY, INT	The number of retries and interval in minutes for a Fax On Demand mailbox.
OPN/RNPHNOE	Off-Premise Notification to a telephone.
OPN/RNPAGER	Off-Premise Notification to a pager.
OPN/RNEXT	Off-Premise Notification to an extension.
OPN/RNSTATUS	Current status of Off-Premise Notification.
TRANSF	The telephone number used when Outbound Transfer is set to an external destination.
FAXPRE	Preset Fax destination – BCM 2.5 only.
SELECT, SIZE	For each document in a Fax On Demand mailbox, lists selection ID and size list in equivalent message minutes – BCM 2.5 only.
AMIS, MBOX	System access phone number and target mailbox number of a AMIS Network Delivery mailbox.
SITE, MBOX	Site address of a Network Delivery mailbox.

Mailbox Activity Report

The Mailbox Activity report shows seven-day usage information for all Subscriber mailboxes on the system. The last full day of activity represents the starting point of this report. For example, if the full day of activity is Tuesday, the report will begin on Tuesday and goes back seven days to the previous Wednesday.

The Mailbox Activity report shows:

• The number of messages recorded and their total length and average length

• The number of times the maximum message length is reached

• The number of messages received and their total and average length

• The number of times the mailbox is accessed for log or call answering (including total connect minutes and the resulting average)

• The average time before new messages are played

• The average time before messages are deleted

• The number of times logon authentication fails three times in succession

• The cumulative average for the above

• Whether Primary, Alternate and CLID-based greetings are recorded.

After a user generates a report, he or she can reset the statistics to set the counters to zero.

Event Log Report

The Event Log report lists events that can help users diagnose system problems. Events are shown with their date, time and error message.

CCR Tree Usage Report

The CCR Tree Usage report shows the following information for the previous seven days:

• The number of calls received by the CCR Tree

• The number of times each node was visited

• The Greeting Table from which the CCR Tree is referenced

• The last seven days for complete record collection (this does not include the day the report is generated)

• The most recent complete day in the left column

• Usage data as zeros for dates prior to the last change data.

The CCR Tree Usage report shows:

Table 22   CCR Tree Report

Heading	Description
Path	The selections a caller makes to reach a node. Usually the Home node is 0, although callers do not need to press a key to reach the Home node.
Calls for Each Day	Below each day is listed how many times callers accessed the node, not including any re-prompting. The calls for each day details: • Each call that arrives at the Tree • Calls that go from the Home node to sub-nodes • Calls that are sent to the node from CLID-based routing. • Calls that return to a Menu node by the previous menu operation (by pressing * at a sub-menu, or by the Next Action setting) The difference between the count for a menu and the sum of the counts for its sub-node is the number of times callers exit the menu by pressing * or hanging up.
Total Calls	Shows calls that go to the Home node from a Greeting Table and calls that go to any node in the CCR Tree from CLID-based routing. In the absence of CLID-based routing, the count of the Home node is usually the same as the Total Calls if the Home node is an Information node. The count can be higher if the Home node is a Menu node because the count of any Menu node is included if the caller returns to the menu.

Port Usage/Call Handling Report

The Port Usage/Call Handling report summarizes inbound and outbound call activity and port usage on a seven-day rolling basis. This report identifies volume and sources of call traffic, and it identifies whether the system requires additional ports.

The Port Usage section of the report lets users:

• See the last seven days for which record collection is complete

• Determine whether the system needs additional ports

• Find time periods where there is an insufficient number of ports

• See a summary of inbound and outbound call activity and port usage on a seven-day rolling basis.

The Port Usage section:

• Shows the last seven days for which record collection is complete

• Shows the most recent statistics in the left column

• Does not include the current day.

Table 23   Port Usage/Call Handling Report

Information	Description
Allocation	Shows the minimum and maximum number of ports allocated to voicemail.
Port Status	Shows an asterisk beside the port number if the port is disabled when the report is generated.
Period Start	Shows the percentage of the time period when all ports were busy for each day of the week. A non-zero value is possible, but a value consistently higher that 1% or 2% during peak time periods indicates a need for additional ports. Periods in which at least one port is disabled are shown with an asterisk.

The Call Handling section of the report allows users to see the types of calls that create traffic for the voicemail server.

The Call Handling section shows:

• Each class of call by number of calls, total duration and average duration

• All outgoing calls in a single category (for example, a call is counted as Message Notification even if the called party logs on)

• Outbound Transfer calls with the few seconds of additional connect time caused by the unsupervised transfer included in the connect time of the incoming call

• Call Screening calls with the holding time of the call to the subscriber set counted under the total connect time for the incoming call

• All days even if no data is collected for that day (these values are shown as zeros).

Message Usage Report

The Message Usage report shows the number of minutes of storage available on the voicemail server. If the value is too low, the user can:

• Upgrade storage capacity

• Encourage subscribers to delete unneeded messages

System Configuration Report

The System Configuration report shows how the system is configured.

Table 24   System Configuration Report

Heading	Description
System Options	Describes system-wide attributes and Auto Attendant properties such as Return to AA and Touchtone Gate.
Installed Voicemail Options	Lists the optional features enabled at your site.
AA Greetings	Lists system greetings, shows whether the greeting is recorded and lists the Greeting Tables that reference it. Greetings that are not recorded or used in any Greeting Table are not shown. The comment "TTG" appears for the prompt used as the custom Touchtone Greeting prompt.
Greeting Table	Shows the configuration of each Greeting Table.
Call Center Parameters	Appears if Call Center is installed. The Primary Alert, Secondary Alert, MIS Address and Refresh Channels are shown.
Call Center Agents	Appears if Call Center is installed. Shows the agents in the Call Center, their agent number, priority level and skillset status.
Call Center Skillsets	Appears if Call Center is installed. Shows skillset number and Day and Night status.
Call Center Routing Tables	Appears if Call Center is installed. Lists skillset name, number, Day service and Night Service configuration.
Call Center Overflow	For each skillset, shows if it is enabled, the Intelligent overflow rule that applies to it, its service mode, condition and action.
Call Center Greetings	Appears if Call Center is installed. Displays the status and skillset for each greeting.
Call Center Intelligent CLID/DNIS Routing	Shows the CLID/ANI or DNIS rule and action for each rule.
Line Answering	Shows the answering parameters for each line answered by CallPilot or Call Center. Lines that are not answered are not shown. This section does not appear if your switch does not require line administration. The skillset column appears only if Call Center is enabled. Skillset is blank for AA lines and Rings and Tables are blank for Call Center lines.
*General Networking Parameters	Appears if Message Networking is installed. It displays the General Networking properties.
*AMIS Networking Parameters	Appears if Message Networking is installed. It displays the AMIS-related parameters of the site that you set in Networking properties.
*Digital Networking Parameters	Appears if Message Networking is installed. It displays the digital-related parameters of the site that you set in Networking properties.
*Site Table	Appears if Message Networking is installed.
Note: * Some sections appear only if the option is installed. Call Center is not available for Call Pilot Mini.	

Advanced Voice Messaging Applications

AMIS Option

Audio Messaging Interchange Specification (AMIS) is the voice processing industry solution for networking remote voicemail systems provided by different vendors. The AMIS option allows the messaging community at one Norstar location to send and receive messages from other messaging communities that support the AMIS protocol. Each user can be reached via their AMIS address, which is a system access number (basically the telephone number of their local system), and their mailbox number. There are three methods whereby mailbox owners can send messages to mailboxes in other locations within the AMIS network. All of these methods can designate special time periods and lines on the Norstar voice messaging system to reduce long-distance costs when sending messages. The AMIS market targets the following customers:

*   Businesses with multisite operations

*   Businesses with voice messaging systems from multiple vendors

*   Single-site businesses whose primary business associates have AMIS capabilities.

Benefits of AMIS

Time and cost savings are two of the most important benefits of AMIS. Hard dollar savings that would improve a company's bottom line include:

*   Delay in sending of messages until lines are less busy

*   Delay in sending of messages until long-distance rates are cheaper

*   Easier access to all people within the network

*   Networkwide group lists

*   Networkwide broadcast messages

*   Networkwide reply to messages.

There are three ways in which messages can be sent:

*   Direct Addressing

*   Network Delivery Mailbox

*   Site-Based Addressing.

Direct Addressing

Direct Addressing allows a user to send a message to any mailbox in the network by entering the parameters required by the Norstar voice messaging system to reach the destination mailbox. These parameters include the telephone number of the destination site and the destination mailbox number.

Network Delivery Mailbox

The Network Delivery Mailbox stores the parameters required to reach the destination mailbox, including the telephone number of the destination site, which line or pool number is used to make the call and the destination mailbox number.

A person leaving a message simply records the message and sends it to the Network Delivery Mailbox. The Network Delivery Mailbox then automatically contacts the intended recipient's personal mailbox and delivers the message.

For this delivery method, a Network Delivery Mailbox must be set up for every person in the network to whom employees would want to send a message.

Rules for AMIS to Function

In order for AMIS to function:

- AMIS software must be enabled at all locations
- The Auto Attendant must answer the calls from other Voice Mail systems
- A Network Delivery Mailbox must be set up for each person in the network that is to receive messages in order to send a message using Network Delivery Mailboxes.

Desktop Messaging Application

Desktop Messaging Application Overview

Information overload is a real problem in today's workplaces. Every day, workers wade through stacks of faxes and must review, respond to, or otherwise deal with innumerable voice and email messages – one at a time. Communications via fax in North America are increasing annually by 40% and there are an estimated one billion voicemail messages and 1.5 billion email messages received daily in the workplace. The need for an effective message management tool has never been greater.

Norstar Desktop Messaging allows users to manage all their voice, fax and email messages from the convenience of their multimedia-equipped PC or laptop. Norstar has created a message management tool that is feature-rich, easy to use and provides users the capability to view and listen to all of their messages on their desktop or to retrieve them from any remote location.

Desktop Messaging also provides improved organizational communication and increased levels of productivity. Because users can access all of their messages in one session, either locally or remotely, view fax messages prior to printing, and prioritize which messages they access, they will spend less time on message management and more time on the aspects of their job which drive contributions to their organization.

Another advantage of Desktop Messaging is that an organization can maximize the investment they have already made in desktop equipment and in their LAN. And since fax messages can be viewed before printing, many users will just read faxes and not print them at all. Fax messages can also be sent to any printer on the LAN directly from the PC, which will significantly reduce the need for individual fax modems and analog connections.

Desktop Messaging Description

The Desktop Messaging product has both a server and a client component and is supported on both CallPilot 100 and CallPilot 150. CallPilot is connected via the on-board Ethernet port to the local computer network, and the Desktop Messaging software runs on CallPilot and communicates with client software installed on each user's PC. Desktop Messaging on CallPilot integrates with Microsoft Exchange, Outlook, Lotus Notes, GroupWise and Eudora client email applications.

Desktop Messaging fully complies with the user interfaces for handling attachments, message reply and other functions. CallPilot 150 comes equipped with two free seats of Desktop Messaging.

Desktop Messaging User Interface

To access the voice mailbox, the user launches their email application and is presented with a login dialog box, and is prompted to enter their mailbox password. Upon installation of Desktop Messaging on a user's PC, a new mailbox called "Nortel (CallPilot) Message Store" will be added to the set of mailboxes. Once the user has logged on to their email the standard mailbox viewer will be presented, which gives access to the mailbox/folder screen. The user can then open and view the contents of mailboxes, folders and messages.

The Desktop Messaging user interface is modeled after a standard established by many existing email applications. A traveling user or telecommuter can access the desktop interface from a laptop computer through a dialup connection to the PC network and take advantage of Desktop Messaging functionality.

Figure 60 Standard Mailbox Viewer
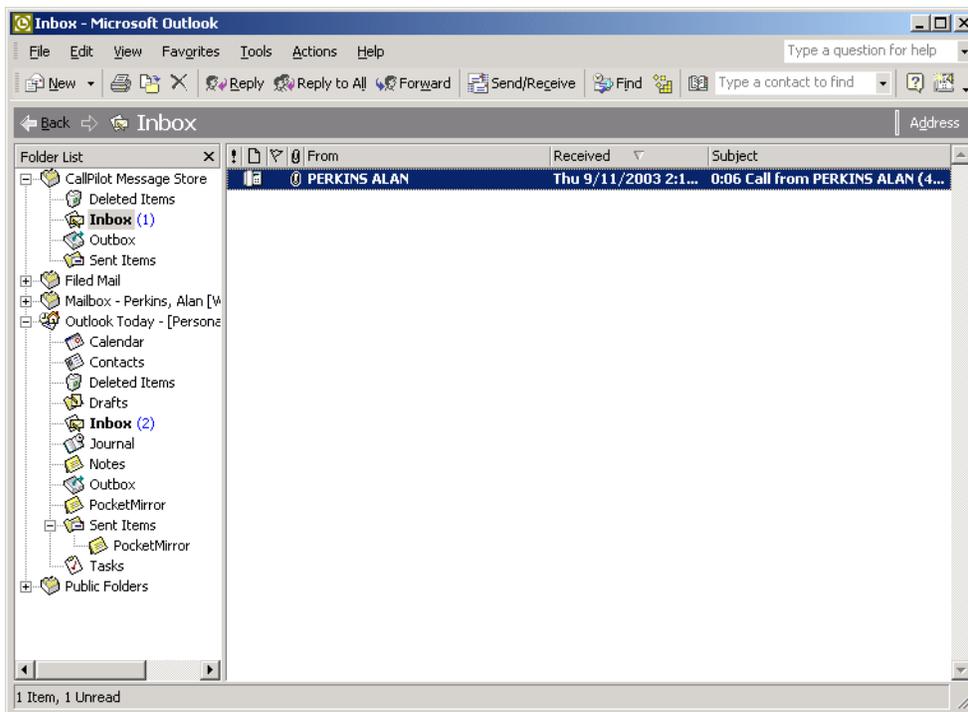
Figure 61   CallPilot Player
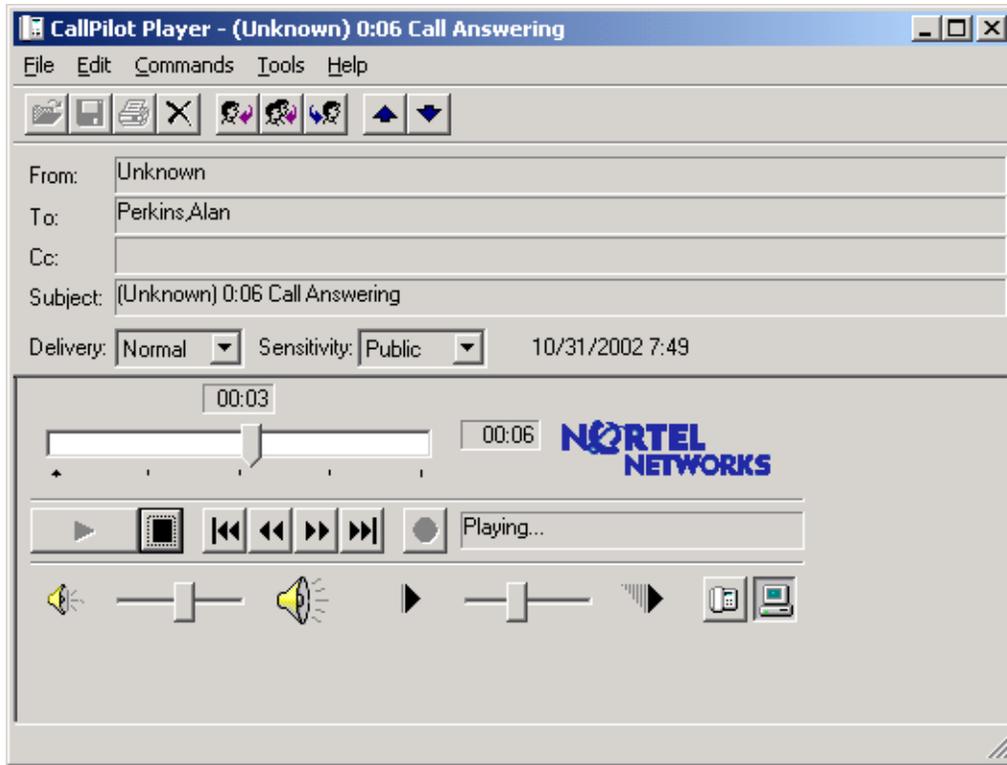
Desktop Messaging Features

From the desktop, the user can:

- Reply or reply to all messages

- Save any message

- View the message envelope information

- File messages

- Use the Help menu and access topics on Desktop Messaging

- Receive notification of new messages while logged on

- Print text messages

- Create new messages (either text or verbal) using the Compose Message command

- Create personal address book entries and lists

- Change mailbox password

- Prioritize and sort messages by:

    - Classification (i.e., urgent, certified, normal)

    - Date and time

    - Sender

    - Subject

- Play voice messages

- Record voice messages.

VPIM Option

Networking would not be important if everyone worked in one building and used one system for every kind of communication. But, people work within broad groups, both inside and outside their company; thus, networking is becoming an essential technology.

With digital networking technology, the sound quality of the sender's voice is not diminished by the quality or bandwidth of the transmitting circuit as it typically is with analog networking, like Audio Messaging Interchange Specification (AMIS). With digital networking, voice and fax messages are encoded, condensed and transmitted as data files, and sent from location to location using techniques that assure reliability. When the message arrives at the final destination, it is decoded and presented to the user as a normal voice message – with the clarity that the sender intended.

CallPilot with digital networking has the capability to send voice and text messages to other systems with Voice Profile for Internet Messaging (VPIM) enabled. In addition to providing efficient message exchange between CallPilot systems, Digital Networking can be used to network Meridian Mail systems equipped with Meridian Mail Net Gateway and Enterprise Networking software to digitally network voice messages.

The principal benefits of digital networking include:

- Cost-effective use of network resources for both voice and data transmission
- Reduced network usage by sending message one time to multiple remote recipients at one location
- Faster transmission that reduces transmission time and cost
- Norstar and Meridian Mail networking that enhances enterprise customer communications.

Figure 62 Digital Networking
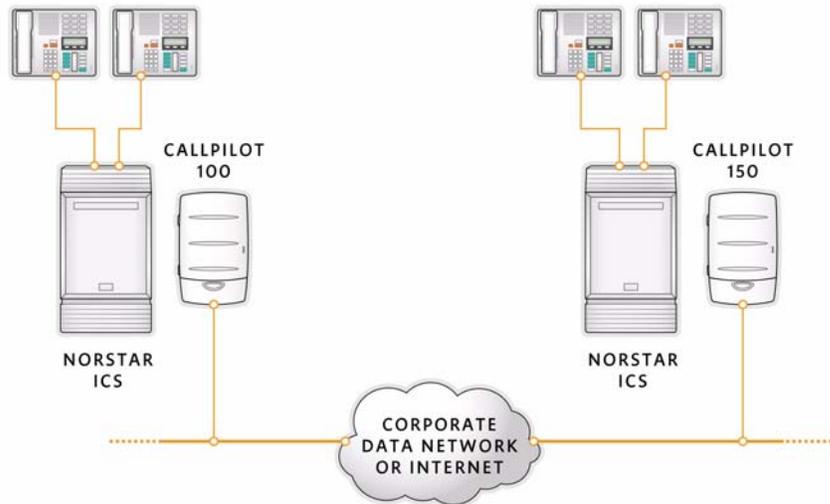
Digital Networking Benefits

Businesses do not want the expense of maintaining separate voice and data networks. Since voice and fax messages are sent as data files, Digital Networking will allow businesses to use their existing data networks as the transport for fax and voice messages, including their LAN/WAN environment, or even the Internet, to connect voice messaging systems.

Benefits of Digital Networking include:

- High message quality that improves communications
- Cost-effective use of network resources for both data and voice transmission
- Reduced network usage by sending messages one time to remote recipients at one location
- Faster transmission that improves communication and reduces transmission time
- Enhanced enterprise customer network messaging
- Timesaving by recording a message once and addressing it to multiple recipients
- Flexibility
- Transparency of communication
- Faster forwarding of messages, as messages can be forwarded to an individual by using only four digits, as if the recipient were down the hall
- Standardization of "look and feel" ensures that companies with several branches all appear to be the same (i.e., forwarding and replying to messages).

Digital Networking features include:

- Forwarding Network Messages – allows users to forward network messages to other local users; however, the message envelope of the originator of the network message is not preserved and forwarded with the message. Only the body of the message will be forwarded.

- Reply to Network Messages – lets a network message recipient reply and create an outgoing network message that is already addressed to the originator. The replier can also assign message delivery options before sending the message.

- Delivery Options – let users specify network messages as certified, urgent and private and implement them in exactly the same way as local messages.

- Non Delivery Notification (NDN) – means that when an error of some type occurs, preventing delivery of a network message, a network NDN is generated by the remote system (the system intended to receive the message). If a network message is addressed to multiple sites in a network and some sites cannot receive the message, other sites in the same network recipient lists can still receive the message successfully.

Digital Networking Description

To digitally network between Norstar Voice Mail Systems, each system on the network must use the on-board Ethernet port. CallPilot 100 and CallPilot 150 come equipped with a 10/100 Ethernet port.

CallPilot Features and Benefits

Administration

Table 25   Administration Features and Benefits

Feature	Description	Benefits
Backup and Restore	Applies to all system configuration attributes, except voicemail messages.	Ensures that data is saved in the event of system operational problems.
Create Mailbox Utility	When activated, seeks out all the Norstar ICS extensions that do not have mailboxes and creates mailboxes for these extensions with the following default characteristics: • The mailbox number which will be the same as the extension • The name, if available from the ICS • The directory listing, if available from the ICS • "Yes," for message waiting. The system administrator must designate other mailbox characteristics, but since the mailboxes are automatically configured, the system administrator can save time. The automatically set-up mailboxes will be uninitialized. The final display on the administering telephone set will show the number of mailboxes created. The administrator must acknowledge the display in order to complete this function. Create Mailbox Utility will not create mailboxes if any of the following conditions apply: • A mailbox with the same number already exists • The extension is used by some other mailbox or • The extension is identified as a voicemail channel or other "system" extension.	Speeds up mailbox configuration and makes administrator's job easier.
Custom directory	Lets users look up name matches in the directory by first name, last name or both names.	Users can change the directory search parameter without re-entering names.
Expedited Record Time-Out	Gives the caller a set of prompts (asking the caller to speak up, speak directly into the phone or press # for more options) when the system detects silence upon connecting the caller to a mailbox.	Reduces holding time and helps to maximize system channel usage.

AMIS Networking

Table 26   AMIS Networking Features and Benefits

Feature	Description	Benefits
Direct addressing	Allows a user to send a message to any mailbox in the network by entering the parameters required by Norstar Voice Mail	Saves time and improves efficiency.
Network delivery mailbox addressing	Means that the Network Delivery Mailbox stores the parameters required by Norstar Voice Mail to reach the destination mailbox.	Makes it faster and easier for the user.
Site-based addressing	Allows a subscriber to send voice messages to remote voicemail systems using the site address.	Maximizes the use of mailboxes on the system versus using the network delivery method, which requires a mailbox for every person at the remote site.

Automated Attendant Programming

Table 27   Automated Attendant Programming Features and Benefits

Feature	Description	Benefits
AA menu prompt	Can be turned on or off for each greeting table.	Allows flexibility.
Call Transfer – Blind	Lets users transfer a call directly to an extension with ringing starting immediately.	Speeds up call processing.
Call Transfer – Screened	Prompts callers to record their name, which is then played at the dialed extension. The called party then accepts or rejects the call without the caller's knowledge.	Called parties can avoid unnecessary interruptions.

Feature	Description	Benefits
Caller Display (Call Screening support on Call Forward)	When Call Forwarding is enabled, forwards all incoming calls immediately to voicemail. When the mailbox owner designates that they want to see caller information displayed at their telephone set, the display will show the name (or number) of the caller, as provided by the central office. This information is displayed and accompanied by an alert tone when the call is being forwarded to voicemail.	Users can work uninterrupted when required but still take certain essential calls.
Calling Name Display	Stores the calling name with the message if Norstar is equipped with CMS/CLASS and Name Display is delivered by the telco.	Users can see who called.
CLID Dialing Table Report	Lists all entries in the Call ID table. Each entry contains a telephone number, destination type and destination number.	Users can keep track of callers.
Dial Extension Number from CCR	Lets users dial any extension number from any menu point on a Custom Call Routing tree.	Improves efficiency.
Customize the AA menu prompt per greeting table	Customized for each greeting table to assign greetings to tables.	Allows flexibility.
Dual Language System Support	Lets callers and users switch between two languages at either the auto attendant or personal greeting level of system prompts.	Companies can use the language of their business. (English or French in Canada; English or Spanish in the United States.)
External Transfer on Centrex	Allows a multisite company to transfer callers between locations.	Saves time.
External Link Transfer, Single Trunk	(See Miscellaneous - Single Trunk External Link Transfer)	

Feature	Description	Benefits
Flexible Business Hours for Company Greetings	Lets users assign pre-recorded morning, afternoon and evening greetings to match a company's business hours. Users can assign these greetings to a specific greeting table for specific time of day and for each day of the week rather than on a systemwide basis.	Improves customer service by eliminating any confusion over hours of operation. Very efficient at routing internal communications.
Flexible Line Rings for Auto Answer	Transfers calls after a preset number of rings. Users can customize the system to meet their individual needs.	Improves customer service by eliminating wait time.
Greeting Tables	Let businesses customize the answering of their incoming lines.	Ensures that customers receive the appropriate time-of-day greeting. Also allows a company to customize greetings by department.
Multiple Operators	Once the dial "0" is assigned for a specific greeting table, it will override the designated operator defined in Feature 982.	Lets a business assign more than one operator.
Personal Greetings based on CLID	Plays a personal greeting to Calling Line ID callers only. A mailbox subscriber can program up to three specific telephone numbers, each with its own greeting.	Increased flexibility and customer service.
Remote Administration Menu	Lets users: • Remotely Record Company Greeting • Remotely Set Business Open or Closed From this menu, the administrator can change any company greeting or remotely set the business open or closed. Using Feature 983, the administrator identifies the greeting to be changed and can then play, record, rerecord and accept the changed greeting.	These functions are especially beneficial for severe weather or disaster conditions.

Feature	Description	Benefits
Reply based on CLID	Used for automatic replies to numbers collected from CMS/CLASS. Norstar Voice Mail will dial CLID with message by simply pressing the "call" soft key.	Saves time and improves efficiency.
Routing Calls based on CLID	Lets the system coordinator assign up to 100 unique telephone numbers to the Calling Line ID table. Each telephone number is given a destination type. The destination type determines where the call will be routed. This can be programmed by area code, exchanges or individual telephone number. Note: For the Calling Line ID table to operate, customers must subscribe to telco Call Display services: • Call Line Identification • Automatic Number Identification	Allows the AA to automatically route incoming calls to specific destinations such as a greeting table, mailbox, extension or CCR tree.
Single Digit Menus (CCR)	Is available with Custom Call Routing and lets a caller select a menu option by pressing a single digit.	Improves customer service and gives customers more detailed information very quickly.
Touchtone gate for Auto Attendant/CCR	Allows the system to quickly determine if the caller has DTMF capability and expedite the call if no DTMF is detected. In areas where rotary phones are common, or where reliable answer supervision is not provided by the public network, the long hold times previously experienced are eliminated.	Decreases hold times and frees up voice channels previously unnecessarily busied out.
Transfer Point to an External Number from CCR	Transfers callers to a number outside the Norstar system.	Saves time.
Transfer (via Feature 986) of an external caller to a specific CCR Tree	Directs callers to a specific CCR Tree.	Saves time.

Desktop Messaging

Table 28   Desktop Messaging Features and Benefits

Feature	Description	Benefits
Voice message manipulation (save, forward, etc.) on client PC	Allows users to save, forward, reply to, delete and archive voice messages using their PC.	Saves time and improves efficiency.
Voice message playback on client PC	Lets users play their voice messages using their PC.	Saves time and improves efficiency.
Voice message recording on client PC	Lets users record voice messages using their PC desktop.	Saves time and improves efficiency.
Voice message waiting indication on client PC	Notifies users when there is a voice message waiting.	Improves efficiency as users can return calls promptly.

Digital Networking

Table 29   Digital Networking Features and Benefits

Feature	Description	Benefits
Delivery options	Lets users highlight network messages as Certified, Urgent or Private.	Users can specify message importance.
Direct addressing	Allows users to send a message to any mailbox in the network by entering the parameters required by Norstar Voice Mail.	Saves time.
Forward Network Messages	Lets users forward the body of a network message to other local users.	Saves time.
Network delivery mailbox addressing	The Network Delivery Mailbox stores the parameters required by CallPilot to reach the destination mailbox.	Makes it faster and easier for the user.
Non Delivery Notification (NDN)	Is generated by the intended recipient system when an error preventing delivery occurs.	Users are notified when they need to send a message.
Reply to Network Messages	Lets a network message recipient reply and create an outgoing message that is already addressed to the originator.	Saves time, as users don't have to type in the recipient's address.

Feature	Description	Benefits
Site-based addressing	Allows the local subscriber to send voice messages to other company locations using the site address which is usually the same as, or similar to, the telephone number of the addressee.	Maximizes the use of the mailboxes on the system, compared to the network delivery mailbox method, which requires a mailbox for every person at the remote site.
VPIM (Voice Profile for Internet Mail) compatible	An emerging messaging standard that allows voice and fax messaging among unlike vendors' messaging systems over the Internet.	Allows for voice and fax messaging.

Group List programming

Table 30   Group List Programming Features and Benefits

Feature	Description	Benefits
Group Distribution Lists	Are created by the system coordinator and allow the same message to be delivered to a group of users by entering only one address destination or distribution list number.	Saves time in message preparation, production and, especially, delivery.

Mailbox programming

Table 31   Mailbox Programming Features and Benefits

Feature	Description	Benefits
Assigning Target Attendants	Lets each mailbox owner assign an extension as their dial-0 set.	Improves customer service, because transferred calls are answered by individuals more familiar with the mailbox owner's schedule.
Auto Answer with Personal Greeting	Answers calls after a preset number of rings with the personal greeting of the mailbox owner requesting the caller to leave a message.	Ensures callers receive detailed information of the mailbox owner's whereabouts and are provided with options (i.e., leave a message or transfer to a receptionist).
Automatic Reply to Internal Messages	Lets a mailbox owner automatically reply to a message with one keystroke.	Saves time because there is no need to look up extension numbers.

Feature	Description	Benefits
Broadcast Messages	Allows system coordinators to record a message and send it to every mailbox; it is played automatically, then erased as soon as the subscriber ends the session.	Improves internal communications by providing systemwide messaging capabilities. Every mailbox owner receives the same message.
Called party cancellation of Off-site notification	Lets the party receiving a remote notification call turn off notification to this destination. This is useful when a subscriber enters an incorrect destination telephone number. When the called party cancels notification the system removes the number from the subscriber message notification destination list and an NDN containing the incorrect telephone number is deposited in the subscriber's mailbox.	Ensures that if messages are delivered to the wrong person, the subscriber receives notification that the message was not delivered.
Cascading Off-Premise Message Notification	Lets users program five internal or external numbers that will notify a mailbox subscriber when a message is received in the mailbox. Each number is called in sequence if the number before does not answer. Numbers can be designated as a phone, pager or intercom. Depending on the Class of Service programming, each number can be called up to nine times at intervals of 5, 10, 15 or 30 minutes per attempt. If a pager is notified, the user must phone in to receive the message. If a phone is notified, the user can access their mailbox once they enter their password. Messages are immediately sent to users wherever they are located, therefore improving both external and internal communications.	Provides better customer service and quicker response time.
Enable or Disable General Delivery Mailbox	Can be disabled or enabled in System Administrator's Mailbox.	Improves convenience.
Envelope Information	Gives users the receipt time and date of a message, in addition to the sender's name. Users can receive this information by pressing "7" during or after a message.	Improves efficiency, as users know exactly when messages were left.
Express Internal Messaging	Lets users send internal messages without opening a person's own mailbox; the sender's name and extension are automatically included.	Improves communication.
Forward Copy with or without Comment	Allows users to forward mailbox messages to other mailboxes without rerecording the message.	Users can attach more comments to the original message.

Feature	Description	Benefits
General Delivery Mailboxes	Can collect messages after hours, from rotary dial telephones or for people who don't have a mailbox. The default status for the General Delivery Mailbox is enabled. The General Delivery Mailbox can be disabled or enabled as required by the company. When enabled, callers who reach the General Delivery Mailbox can leave a message. When disabled, callers will hear the Automated Attendant voice prompt. At any time, callers can press zero (0) to reach the operator. Note: If the operator is not available, the Automated Attendant voice prompts plays.	Improves customer service, as callers can leave messages after hours.
Guest mailboxes	Are useful for people who do not have a Norstar extension number, yet need voicemail access.	Helps improve communications internally.
General Delivery Mailbox	Is a "last stop" mailbox for unsuccessful call transfers returned to the operator who is, at that time, also unavailable.	Messages are stored in a centralized location.
Informational mailbox	Lets a business play frequently-requested information only, with no message-taking capabilities.	Eliminates users' need to repeat the same information to multiple callers, such as hours of business or the time of a performance.
Message Delivery Options: Normal, Certified, Private, Urgent	Are four options that increase the user's control over message delivery: • Normal: the message is delivered automatically (default). • Certified: the sender receives confirmation when the message is read. • Private: messages cannot be forwarded to another mailbox. • Urgent: a message can be queued to play after broadcast messages, but before "normal" messages.	Users can specify message type.
Message Waiting Notification	Notifies users when they receive new messages by displaying "message for you" on the user's display. When users open their mailbox, they can listen to their new and saved messages.	Improves communications, as it eliminates the need to log on to check for new messages.
Name Confirmation when Sending	Displays the name and number of the person or mailbox being contacted in the LCD display.	Eliminates delivery errors.

Feature	Description	Benefits
Name Directory or Extension Accessibility	Lets callers find any system mailbox extension by spelling the user's last name on the dial pad.	Increases a receptionist's productivity; faster processing of calls and improved customer service if the caller only knows the name of the person they are calling and not the extension number.
Never Full Mailboxes	Ensure that external callers will not be prevented from leaving a voice message in a personal mailbox, even if the mailbox is full. The only time an external caller cannot leave a message in a mailbox is when the system is full. To control misuse of the disk storage space, users with full mailboxes will not be able to retrieve new messages, or create, send, copy or reply to messages until at least one saved message has been deleted. In cases where all the messages in the mailbox are new, the user will be able to listen to at least one before they are prompted that some messages must be erased to retrieve new messages.	Allows for maximum storage capacity of the system and improves customer access to voicemail users.
Outbound Transfer from Mailbox	Lets callers, while listening to a personal greeting in a mailbox, press "7" to be transferred to an external number specified by the mailbox owner. The mailbox owner may choose to include this instruction as part of their greeting or keep it as a private arrangement for certain callers. When this feature is included in the mailbox class of service, the mailbox owner can turn this feature on and off.	Improves customer service by providing a means for urgent contact when necessary.
Playback Controls	Allow subscribers to move within or between messages, without listening to each message entirely.	Increases users' control while listening to their messages.
Personal mailbox	Is assigned to a particular person and extension number for his or her exclusive use.	Owners can receive detailed, confidential messages 24 hours a day.
Prerecorded Greetings Storage	Means that users can store up to 40 prerecorded greetings can be stored.	Saves time because a system coordinator does not have to rerecord new messages each day; messages remain consistent, thereby giving businesses a more professional image.

Feature	Description	Benefits
Primary and Alternate Greetings	Lets a mailbox subscriber switch between pre-recorded primary and alternate greetings.	Improves flexibility.
Recovering Deleted Messages	Lets a user revisit a previously deleted message during a mailbox session and save the message.	Users can move quickly through mailbox messages without the risk of accidentally deleting a message that they wish to retain.
Remote Call Forwarding to Voice Mail	Lets the mailbox owner turn Call Forwarding to Voice Mail on or off from a remote location.	If the user has forgotten to Call Forward or is unexpectedly away from the office, they can still forward to voicemail so that their customers do not have to wait through multiple rings.
Saved Message Queue and Retention Periods	Saves messages for a preset time period as determined by Class of Service; saved messages are stored in a queue and played after any new messages.	Users can save important messages in case they have forgotten some details.
System Coordinator Mailbox	Lets a system coordinator perform administration duties and send broadcast messages.	Ensures no calls are lost, while at the same time improving system management.
Urgent Message Notification	Notifies users of urgent messages. The prompt "This message is urgent" will precede playback and display an urgent message. Urgent messages will be moved to the front of the new message queue, ahead of non-urgent messages. When urgent messages are saved, the urgent indication is ignored and the message is queued in chronological order.	Improves user's time management by dealing with most important issues first.

Miscellaneous

Table 32   Miscellaneous Features and Benefits

Feature	Description	Benefits
Call Screening per set	Is particularly useful where Calling Line Identification (CLID) information is not available, or when the called party has a set without display capabilities.This feature is enabled on an individual mailbox basis from mailbox administration. Call Screening only applies to external calls dialed by callers using the extension dialing capabilities of Auto Attendant or Custom Call Routing. After an external caller enters the extension of the person they wish to speak to, the Automated Attendant asks the caller to record their name. The Automated Attendant then transfers the call to the extension, announces the name of the caller and offers the called party the option of accepting the call or letting the caller leave a Voice Mail message.	Improves productivity by allowing the user to choose whether to interrupt work to take a call.
Dynamic Voice Channel Allocation	Means that voice channels are not dedicated to an Automated Attendant or voice messaging.	Improves efficiency and speeds up call processing.
Enable or Disable the Company Directory	Lets the system coordinator enable or disable access to the company directory for internal and external users.	
Enable or Disable Voice Mail Feature	Lets the system manager globally enable/disable the Voice Mail feature. If Voice Mail is disabled, the calling party will not be answered by the subscriber's mailbox. Instead, the caller will be directed back to the Automated Attendant or CCR application for more options. When disabled, only Feature 980 and Feature 986 will be allowed to leave messages.	
External Volume Control	Allows users listening to messages from outside the company to increase the playback volume by pressing *.	Eliminates message distortion, and ensures users will hear details correctly.
Interrupt Feature	Allows mailbox users to retrieve calls that have been forwarded to voicemail. Call can be interrupted at any point during the mailbox session.	Provides users with the opportunity to retrieve calls if they are in the office.

Feature	Description	Benefits
Multiple recipients per message	Lets users send messages to multiple recipients with one set of delivery options applied to all recipients. When addressing the message, the subscriber can choose to add recipients or delivery options in any order prior to sending the message.	Saves time when sending messages to multiple recipients.
Record a Call	When activated by Feature Code 989 from the Norstar user's set, allows the user to have the mailbox act like a tape recorder and record the telephone conversation. The system prompts both parties "This call is being recorded." Once the conversation is recorded, it has the same appearance to Norstar Voice Mail as a voice message – so the user can forward it, delete it, or in conjunction with Desktop Messaging, can "archive" the call ("message") as a ".wave" file to a PC hard drive, floppy disc, or zip drive. Because of the sensitivity to local laws in different regions of North America, the feature is disabled for all Classes of Service and must be specifically enabled by the system administrator.	Users can record important conversations.
Semi-interruptible greetings (Extended Absence greetings)	Allows mailbox owners to let callers know about an extended absence. When the Extended Absence greeting is in use, callers who attempt to bypass it will be prompted that this is a special greeting and the system will give them the option to play the greeting again. A special tone precedes the greeting and alerts callers that it is in effect.	Improves customer satisfaction, as they can receive up-to-date information about absences.
Single Button Call Forward to Voice Mail	Lets users forward all calls automatically to voice mail by activating Feature 984.	Improves efficiency as users can work uninterrupted and can focus on projects that have critical deadlines.
Single Trunk External Link Transfer	Lets users transfer out of voicemail, externally, without tying up two trunks for the duration of the call.	Calls can be routed to the appropriate location for products and services, without tying up two trunks to complete the transaction. The business benefits by getting better trunk utilization on their system and being able to take and process more transactions.

Feature	Description	Benefits
Timed delivery of messages	Lets subscribers create a message and delay delivery of that message until after a specified date and time. The message can be delayed up to the number of days specified in the message retention class of service parameter for a given mailbox. If the Voice Mail system is using the AMIS protocol for networking messages, Timed Delivery messages will follow the standard AMIS rules with respect to call blocking (only urgent messages will be sent during call blocking periods).	Subscribers have more flexibility in recording and sending messages.
Trunk Answer On/Off	Permits system coordinators to turn on or off incoming trunk lines programmed for answering by the Auto Attendant.	Enhances voicemail system control.
Voice Mail Option	May be enabled or disabled at any time. The default status for the Voice Mail Option is enabled. When enabled, callers can access all mailboxes. Callers who try to reach an extension that is busy, or does not answer, will be transferred to the extension's mailbox. When the Voice Mail Option is disabled, callers cannot leave messages in any mailbox unless manually transferred to a mailbox. Callers can access Information Mailboxes.	When callers hear that the called party is not available, they get transferred to the Automated Attendant voice prompt. At any time, callers can press zero (0) to reach the operator.

Reports

Table 33   Reports Features and Benefits

Feature	Description	Benefits
Call Handling and Channel Usage Report	Provides traffic statistics on the types of calls handled, and the traffic against each port used by Norstar.	Lets businesses receive call traffic information.
CCR Usage Report	Provides the greeting table from which the CCR tree is currently referenced and a seven-day rolling count of the number of calls received by the tree and the number of times each path is visited.	Lets businesses keep track of calls.
Mailbox Activity Report	Shows seven day usage information for all subscriber mailboxes on the system.	Keeps track of mailbox activity.
Message Usage Report	Shows the number of minutes of storage available on the CallPilot system.	Keeps track of available minutes on CallPilot.
Numeric Mailbox Information Report	Includes more information about the mailbox.	Helps to identify potential usage problems and reports on all mailbox types, not just subscriber mailboxes.
System Configuration Report	Shows how the system is configured to include the number of ports, outdial channels, group lists and any options that may be installed on the system, such as AMIS or Digital Networking.	Convenience with one report that describes configuration.

Security

Table 34   Security Features and Benefits

Feature	Description	Benefits
Centrex Transfer Restrictions (Toll Fraud Protection)	Provides toll fraud protection for Centrex installations using the Centrex Transfer feature to transfer calls to other Centrex extensions. If the Centrex Transfer feature is enabled, the extension does not have to be located on the Norstar switch. If the requested extension is not a valid Norstar extension, and the Centrex Transfer feature is enabled, CallPilot will instruct the Norstar to perform a "hook-flash transfer" of the caller to the given extension number. This feature is valuable when the Norstar is used in a Centrex installation, but presents a possible security problem, in that a malicious caller or user could be "transferred" to an extension such as 9011, which has the effect of transferring the caller to the international operator, with resulting charges incurred by the owner of the Centrex line.	The Centrex Transfer Restrictions feature counters this security exposure by specifying a set of dialing sequences that will be denied in all cases when CallPilot requests a Centrex transfer.
Change of Operator Password	To improve security, a password can be changed from default "OPERATOR" (67372867) to any four to eight-digit sequence.	Personally chosen passwords are easier to remember and more secure.
Forced Password Change	Requires mailbox owners to periodically change their passwords. The intervals can be set for either 0, 30, 60 or 90 days (0 is interpreted as never changing the password). If the password has expired, it does not prevent access to the mailbox, but the user is prompted that the password has expired and the password must be changed.	Improves security.

Feature	Description	Benefits
Incorrect Password Detection and Lockout	Tracks the number of incorrect login attempts since the last successful login. When the number of unsuccessful attempts exceeds a threshold, the mailbox will be "locked out" and cannot be opened, even with the correct password, without administrator intervention. The maximum number of login attempts is controlled by the class of service.	Provides additional security.
Internal Norstar Set Initialization	Lets system administrators initialize mailboxes on the same system as CallPilot.	Provides additional security.
Outbound calls restricted to preset line/pool	Allows the Administrator to specify which line or pool is to be used for Norstar Voice Mail outgoing calls.	Helps control or prohibit toll fraud. Contributes to cost reduction.
Set-based restrictions for outbound calls	Means that outgoing calls initiated by Norstar Voice Mail are subject to the set-based restrictions, regardless of the line or pool selected as the outgoing facility.	Helps control or prohibit toll fraud. Contributes to cost reduction.

Call Centers

Chapter Highlights

- Norstar Call Center Applications – target call centers of all sizes and provide solutions for both formal and informal call centers that allow businesses to increase revenues, increase customer service and reduce costs

- CallPilot Basic Call Center (BCC) – is a complete call center solution that focuses on call routing capabilities and provides powerful ACD functionality, including built-in recorded announcements

- Norstar PRELUDE ACD – provides small to medium-sized businesses with ACD capabilities, caller-directed routing, and wallboard support

- Norstar CINPHONY ACD – offers advanced features and supervisor functions, including Silent Monitor, to meet the demands of growing call centers

- INFOCUS – is a software component that provides access to ACD status displays, report view, print and email functions

- Automated Attendant – is a cost-effective add-on solution for businesses that wish to direct calls to several different areas.

Chapter Overview

Wherever there are several people answering similar kinds of telephone calls — at an order desk or reservations office, in a customer service department or technical support center — there is an opportunity to implement Automatic Call Distribution (ACD).

Nortel Networks offers a comprehensive call center product portfolio for Norstar systems: CallPilot Basic Call Center, PRELUDE and CINPHONY. Each provides businesses, branch offices and departments with an effective tool to manage and organize how calls are distributed. When calls are distributed properly, customers can see increased customer satisfaction, staff productivity and revenue, as well as an improved office environment.

Emerging Trends

Today's call centers vary in terms of size, scope and complexity. The relative scale of a call center operation must be measured using more than one of these factors. Traditionally, call centers were large and formal; today, a small order department might serve a national market and require integration to sophisticated applications such as Voice Mail.

Formal call centers are generally departments whose sole function is to make outgoing calls or respond to incoming calls. Informal call centers, on the other hand, are groups or departments that perform a significant amount of telephone activities but do not exclusively answer or respond to calls.

Norstar Call Center applications target call centers of all sizes and provide solutions for both formal and informal call centers. CallPilot Basic Call Center (BCC), PRELUDE and CINPHONY assist companies in managing incoming calls and allow more calls to be processed by the same number of agents.

Research has shown that 34% of callers will enquire about a product or service advertised while on hold. All Norstar Call Center applications provide announcements that businesses can use to encourage callers to hold and to advertise products and services while callers are holding.

In addition, businesses can use reports and the real-time status display options that CallPilot Basic Call Center, PRELUDE and CINPHONY provide to manage individual and agent group performance. These capabilities can increase agent productivity. Industry studies show that an increase in agent productivity can range from 20 to 40%, depending on current call answering practices.

Benefits

Norstar Call Center applications offer very specific benefits to businesses of various sizes and enable these businesses to meet their objectives. A business's objectives are to:

- Increase revenues
- Reduce costs
- Improve customer service
- Optimize staffing resources.

Norstar Call Center applications enable businesses to meet these objectives in the following ways:

Increase Revenues

Norstar Call Center applications can help businesses create new revenue opportunities by expanding their market coverage, upselling their account base, extending their sales hours and educating their customers. Businesses can use the ACD routing features to automatically direct calls and offer extended hours, while providing superior customer service and increasing revenues. With a call center application, a business can cost effectively expand geographically, even internationally, and can turn marginal accounts into major customers.

Reduce Costs

Call Center applications can reduce a business's operating costs, sales costs, complaint costs and warranty and service costs. Norstar Call Center applications can help reduce operating costs by increasing flexibility of employees logging in and out of queues to match calling traffic and minimizing or eliminating receptionist call handling. Additionally, they can increase agent satisfaction and reduce agent absenteeism and turnover. PRELUDE and CINPHONY can further reduce operating costs by aiding with decisions about staffing needs, measuring and reporting agent efficiency promptly and directly, and reducing manager time spent on paperwork.

More efficient call allocation can also translate into reduced long-distance charges through better management of phone lines. Norstar Call Center applications can help reduce trunk costs by shortening customer hold time on 800/888 lines, reducing the number of returned calls to customers, as well as improving customer service and decreasing complaints. PRELUDE and CINPHONY further reduce trunk costs by routing calls according to priority, and utilizing the advantages of Call Identification routing to direct calls to the proper agent and reduce set-transaction times.

Improve Customer Service

Norstar Call Center applications can increase customer service by extending customer reach, through more effective call-handling, and by answering calls immediately. Moreover, businesses can easily make changes, such as programming queues for specific departments and using the Auto-logout feature to ensure calls will be answered by an available agent and not routed to an unattended agent set.

Optimize Staffing Resources

Norstar Call Center applications also help businesses to optimize their staffing resources. The Overflow feature expands the agent pool so that more agents are available to answer calls, and the Wrap feature gives agents time to prepare themselves for the next call, which helps to lessen stress for staff.

Call routing abilities help to balance the workload and off-load work from busy employees. Multi-skilled agents can be logged in to more than one group at a time, maximizing their efficiency. Call center applications enhance overall work environment and staff morale by reducing noise levels and ensuring an even distribution of calls.

Figure 63 Call Center Applications

PRICE

CINPHONY
- Level II – 80 active agents (240 configured), 80 groups, 120 lines
- Level I – 30 active agents (120 configured), 6 groups, 80 lines
- Intelligent routing and supervisory functions
- Real-time group and system status displays
- 16 system-wide reports
- Runs on dedicated or shared NAM

SOPHISTICATED CALL CENTER

PRELUDE
- 15 active agents (60 configured), 3 groups, 30 lines
- Enhanced routing and reporting
- Real-time group and system status displays
- 12 system-wide reports
- Runs on dedicated or shared NAM

ENHANCED CALL CENTER

CALLPILOT
- 10 active agents (20 configured), 2 groups, 15 lines
- Entry level ACD with focus on call routing capabilities
- Intelligent routing and supervisory functions
- Web-based administration
- Optional application on Call Pilot 150 platform

BASIC CALL CENTER

FUNCTIONALITY

Vertical Markets & Potential Applications

Table 35   Vertical Markets and Potential Applications

Market	Appointment Centers	Catalog Sales	Claims	Classified Ads	Circulation	Credit Authorization	Customer Service	Dispatch	Help Desk	Information	Order Entry	Registration	Reservations	Shareholder Service	Technical Services
Air Freight							√	√		√	√				
Airlines			√				√	√		√			√		
Cable TV Co.	√						√	√	√	√	√				√
Credit Approval Co.						√				√					
Distribution Co.	√	√	√				√	√			√				√
Banks, Credit Unions						√	√			√				√	
Gov't Info. Agencies	√	√	√				√	√	√	√			√		√
Hospitals	√						√	√		√		√			√
Hotels/Motels													√		
Insurance Co.	√		√				√		√	√					
Manufacturers		√	√				√		√		√				√
Newspapers				√	√		√			√					
Public Transit							√			√			√		
Public Utilities	√						√	√	√	√	√				√
Railroads			√				√	√		√			√		
Retail		√				√	√	√		√	√				√
Telemarketing Co.		√				√				√	√				
Ticket Offices						√				√	√		√		
Travel Agencies							√		√	√			√		
Universities	√	√								√		√	√		

CallPilot Basic Call Center

CallPilot Basic Call Center Overview

CallPilot Basic Call Center (BCC) is the latest addition to the Norstar Call Center portfolio. It is a software application designed to run with Voice Mail on the Norstar CallPilot 150 platform. CallPilot BCC provides basic Automatic Call Distribution (ACD) functionality in addition to call routing capabilities. A complete call center solution, CallPilot BCC provides powerful ACD capability, including built-in recorded announcements.

CallPilot BCC is an entry level ACD for the very small formal or informal call center. It removes the perceived complexity from ACD and provides small businesses, branch offices and departments with a cost-effective tool for managing and organizing how calls are handled within an organization. It provides simple installation, support and maintenance, as well as ease of programming through an intuitive Web-based browser.

The following table lists the features of CallPilot BCC.

Table 36   CallPilot Basic Call Center Features

Description	Value
Number of skillsets	2
Number of configured agents (available agent IDs)	20
Number of agent priority levels	20
Number of active agents	10
Number of active calls in all skillsets	15
Maximum number of active calls per skillset	15
Number of lines that can be configured	15
Number of voice ports (shared with CallPilot Voice Mail or dedicated)	8
Number of routing tables per skillset	2
Number of greetings	10
Number of steps per routing table	20
Number of overflow rules per skillset	20
Number of skillset mailboxes	2
Number of supervisors	10
Supervisor call monitoring	Yes
Intelligent Caller Input Routing – the ability to route a call to an Operator, Automated Attendant, skillset mailbox, CCR Tree or internal or external number.	Yes

Description	Value
Delegated Call Center Administration – the System Administrator can create a password to give a call center administrator or supervisor access to call center administration.	Yes
Intelligent Overflow Routing – the creation of rules to overflow, change the priority of, and move calls to multiple skillsets, a skillset mailbox, an internal or external number, a mailbox, the Automated Attendant or an operator.	Yes
Overflow rules per skillset	20
Overflow skillsets	1
Day of Week Service – specify the start and end times for the day and night skillset for each day of the week.	Yes
Call Center Reporting	Yes
Telephone (F983) administration	Limited
Web-based administration	Yes

CallPilot BCC users require more enhanced queuing and routing capabilities than Hunt Groups can provide. CallPilot BCC's primary function is to systematically hold calls in a queue and efficiently route them to employees or agents. A typical customer will:

- Have a very small, formal or informal call center application
- Not have a need to expand the call center beyond 10 agents and/or two groups
- Require basic call center functionality.

The Call Center Reporting package generates real-time and historical reports of the call traffic and performance a call center's resources. These reports allow management to quickly and easily analyze the efficiency of the call center and make changes as required. Historical reports can be generated to provide detailed or summarized information from specific defined time periods, including weekly summaries or a report from the previous year.

Norstar PRELUDE and CINPHONY ACD

ACD 3.6

Release History Notes

Table 37   ACD Release History Notes

Software Version	Introduction Date	Enhancements
3.1	January 1999	Compatibility with CICS 4.1 and MICS 4.1
3.2	July 1999	Caller Directed Routing (optional add-on)
		32 voice ports support
		Increased CINPHONY I ACD groups from 4 to 6
		Increased CINPHONY II ACD groups from 24 to 80
3.3	January 2000	Q Time Announcements
		Import capability for Caller Directed Routing
		Increased Caller Directed Routing tables from 1 to 3
		PRI capability for PRELUDE
3.4	October 2000	Companion support
		Compatibility with Business Series Terminals
		Increased the number of items in scheduler from 50 to 100
		Increased the number of report/file maintenance items from 150 to 200
		Increased the number of ANI/CLID Origination Numbers from 400 to 1000
		Increased the number of DNIS/DID Destination Numbers from 400 to 1000 in CINPHONY only
3.5	November 2001	Route Order Configuration
		Auto Logout Enhancement
		Call on Demand
3.6	October 2002	Compatibility with CICS/MICS 6.0 and CICS/MICS 6.1
		Discontinued Flash ACD
		Introduced CallPilot 100 with optional Call Center capability
		Introduced changes to CallPilot 150 to include Call Center capability

PRELUDE Overview

PRELUDE is designed for the small call center with up to 15 active agents, and introduces the Norstar user to ACD features with powerful capabilities. Features include:

- Up to 15 active agents
- Up to 60 configured agents
- Up to three ACD agent groups
- Up to 30 assigned lines
- PC-based configuration and administration
- Real-time group and system status displays
- 17 systemwide reports
- Advanced call routing tables can be customized and easily configured
- Support for CLID/ANI allows intelligent routing and effective integration with CTI
- LAN and remote access to reports (view and print), status display information and ACD administration via INFOCUS software
- Up to 32 voice channels (with PRELUDE 3.2 or later)
- Wallboard support
- Optional Automated Attendant
- Caller Directed Routing
- Queue time announcements.

The PRELUDE user has a small to medium-sized call center and the need to effectively analyze the performance of their call center agents via real-time group and system status displays and systemwide reports. Call Center Management, as well as advanced call queuing, are important to the PRELUDE customer.

CINPHONY ACD Overview

CINPHONY is a feature-rich ACD with additional capacity, advanced features and supervisor functions to meet the demands of the growing call center. Typically, the mature small call center profile includes several agents grouped under one or more supervisors and dedicated to the business of handling incoming calls. In addition to PRELUDE's features, CINPHONY offers:

- Two different levels

    - Level I has up to 30 active agents and 6 agent groups

    - Level II has up to 80 active agents and 80 agent groups

- Up to 32 voice channels (with CINPHONY 3.2 or later)

- Up to 120 assigned lines

- Intelligent routing based on DNIS and DID

- Call Categorization capabilities

- Priority queuing

- 17 management reports

- Extending the hours of the call center by using a PBX or Centrex transfer to send the call to an "open" call center

- Exporting call records to other software packages for specialized reporting

- Supervisory capabilities such as Silent Monitor, Agent Help, etc.

- Queue time announcements

- Caller Directed Routing.

CINPHONY users have growing call centers and require advanced functionality in order to effectively and intelligently route incoming calls. They also place a great deal of emphasis on the need to manage their call center via advanced reporting capabilities and require agent supervisory tools to guarantee quality customer service. The advanced functionality of CINPHONY lets businesses efficiently handle increasing volumes of calls.

Norstar PRELUDE and CINPHONY ACD Architecture

The standalone Norstar PRELUDE and CINPHONY ACD package includes: the PRELUDE or CINPHONY ACD software, INFOCUS Server software, documentation, monitor and keyboard, floor mount stand, and the Norstar Applications Module (NAM).

The Norstar Applications Module is equipped with all of the required hardware, including a modem, SVGA card, and an MS-BIC card.

The MS-BIC card provides eight physical voice channels. The number of physical voice channels can be expanded in increments of 8 up to a maximum of 32 by adding MS-PEC cards. ACD access to these channels is then provided in increments of two with software activation key(s).

Voice channels are only in use while the caller is listening to an announcement. They are not in use while on hold, or when the call is presented to the agent or while connected to the agent.

Customers purchase MS-PEC cards based on their individual needs. Fewer voice channels are needed than the average number of callers waiting in queue. For purchasing decisions, it is common to have a 3:1 ratio of callers in queue to voice channels.

An Uninterruptable Power Supply (UPS) minimizes the risk of losing valuable real-time calling information due to events of nature. It acts as a short term generator in the event of power outages and guards against power surges and dips.

A Backup Set must be designated for the ACD system. The set must be connected in order for the system to function. The Backup Set can be any Norstar set on the system. Calls will be routed to this set in the unlikely event that the system goes down.

PRELUDE Architecture

PRELUDE is designed for the small call center with up to 15 active agents (up to 60 agents can be configured) and introduces the Norstar user to ACD features with powerful capabilities. It offers many of the sophisticated call center features found on larger, more expensive ACD systems. These features include:

- 17 different systemwide reports
- Real-time Group and System Status Displays
- Digital voice announcements and messages stored on disk
- Longest idle call distribution
- LAN/remote access to status displays, reports and ACD admin
- Call overflow and other advanced call routing
- Wallboard support
- Agents can login at any Norstar set
- Scheduled reports and configuration changes.

CINPHONY Architecture

CINPHONY I expands on PRELUDE and is a feature-rich ACD with additional capacity and supervisor functions to meet the demands of the growing call center. It is designed for call centers with up to 30 active agents (up to 120 agents can be configured). CINPHONY II adds additional capacity to CINPHONY I systems, targeting small- to medium-sized call center locations with up to 80 active agents (up to 240 agents can be configured).

Building on the features PRELUDE provides, CINPHONY I and II both offer additional call center features such as:

- 17 different systemwide reports (including DNIS and DID reports)
- Allowing agents to handle calls in several groups
- Intelligent routing based on CLID, ANI, DNIS and DID information; call-directed routing.
- Call Categorization capabilities
- Priority Queuing and routing based on the skill level of agents
- The ability to extend the hours of the call center by using a trunk-to-trunk or Centrex transfer to send calls to an "open" call center
- Exporting call records to other popular software packages for specialized reporting
- Emergency routing.

In addition, CINPHONY provides supervisory tools to control the call center environment, including the following features:

- Display messages on a Norstar telephone display (messages such as the number of calls in queue or a request for "HELP" from an agent)
- Record a Call to help ensure call center quality and to assist in training agents
- Wallboard support
- Silent monitor and "JOIN" capabilities
- Create and change announcements easily
- An alert to make a supervisor aware whenever too many agents are logged out at the same time.

INFOCUS Software

Overview

INFOCUS is a software component for customer-provided PCs connected to the Norstar Applications Module. INFOCUS provides access to ACD Status Displays, Report View, Print, and email functions and ACD Administration. This enhances the accessibility of information for call center supervisors, ACD agents, executives and knowledge workers throughout the organization.

Components

The INFOCUS software has two components: the INFOCUS Server software, which provides the main connection back to the Norstar Applications Module running the ACD software, and the optional INFOCUS Client software.

*   **INFOCUS Server software** – is included with each PRELUDE and CINPHONY ACD package. This INFOCUS Server software connection provides access to Status Displays, Report View and Print functions and ACD Administration. The software is loaded onto a customer-provided PC and is connected to the Norstar Applications Module via the customer's LAN or direct NAM-to-PC connection. INFOCUS Server software is compatible with Windows 95/98/NT, 2000 and XP operating systems.
*   **INFOCUS Client software** – is an optional add-on that provides PCs on the LAN with access to Status Display and Report View and Print functions. Each client can be set up so that they only have access to real-time reports. In addition, an option to install password protected access to the ACD administration component is also provided. (Note: only one person may access administration at a time.) The connection from the INFOCUS Client to the INFOCUS Server is via LAN and all PCs are customer provided. INFOCUS Client software requires Windows 95/98/NT/2000/XP operating system.

INFOCUS Features

*   **Status Display** – provides color-coded call center statistics in both tabular and graphic format. The essential look-and-feel is the same as the current RS232-based Status Display for Windows. Users can access the status display information with a standard browser interface (i.e., Internet Explorer).
*   **Report View and Print** – lets users deploy the same standard browser interface to view and print ACD reports that have already been generated. Reports are also viewed using a standard browser interface (i.e., Internet Explorer).

- **ACD Administration** – provides access to the ACD configuration screens on the Norstar Applications Module. From a PC, a supervisor can operate the ACD as though he or she were sitting at the main ACD terminal and can perform all ACD administration functions. The ACD Administration screens with INFOCUS have the same interface as the main terminal and are the same as PRELUDE and CINPHONY.

- **Email Distribution of ACD Reports** – lets businesses generate, schedule and send ACD reports to each configured user's email address. This functionality allows for more efficient management of the call center. It assures that those individuals who need to see specific information about the operation of the business will now be able to review that information in a consistent and timely manner.

Connectivity

The INFOCUS Server PC can be physically connected to the Norstar Applications Module in two ways:

- Direct NAM-to-PC Connection – using a ComPort Connection
- Direct NAM-to-PC Connection – the INFOCUS Server PC can be connected directly to the Norstar Applications Module (NAM) using Network Interface Cards (NIC). A direct Point-to-Point connection is provided from a NIC installed on the NAM directly to a NIC on the customer-provided PC. The INFOCUS Server software then uses this connection to interface with the PRELUDE and CINPHONY 3.0 and above software running on the Applications Module.

ComPort Connection

Prior to INFOCUS v.1.30, it was not possible to connect the INFOCUS Server PC to the Norstar Applications Module (NAM) via a Serial (COM) Port connection. INFOCUS could only be connected to the NAM via a LAN. Now it is possible for the end user to connect the INFOCUS Server PC to the NAM using either the LAN or a COM Port connection. If using a COM port connection, data is sent from the NAM containing either PRELUDE or CINPHONY ACD to the INFOCUS PC via a Serial (COM) Port. If an end user wishes to install other INFOCUS Server PCs to view real-time data, the end user must use a Broadcast Box and connect the Server PCs with RS-232 cabling. It should also be noted that if using a COM Port connection, the Reports application in INFOCUS is not available. The ACD Reports are not available because they cannot be passed by a COM Port to the INFOCUS Server in a Web page format. It is also only possible to display 24 of the possible 80 configured groups using a COM port connection.

Figure 64 INFOCUS Connection Example
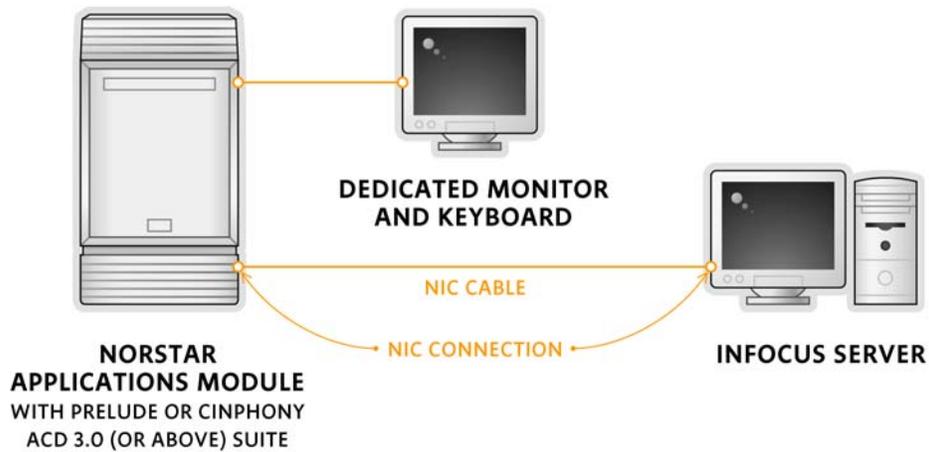
LAN Connection

The INFOCUS Server also connects to the Norstar Applications Module (NAM) in a LAN environment. In this scenario the LAN connection is provided from the NIC on the Applications Module to an appropriate LAN interface. INFOCUS Server software is then loaded on a customer-provided PC that is connected to the LAN. Additional INFOCUS Client software can then be added to other PCs on the LAN.

Note: The INFOCUS Server software is included with the PRELUDE and CINPHONY ACD 3.0 and above software. (INFOCUS Client licenses are available in one and five user add-on license options.)

Figure 65 INFOCUS Connection Example
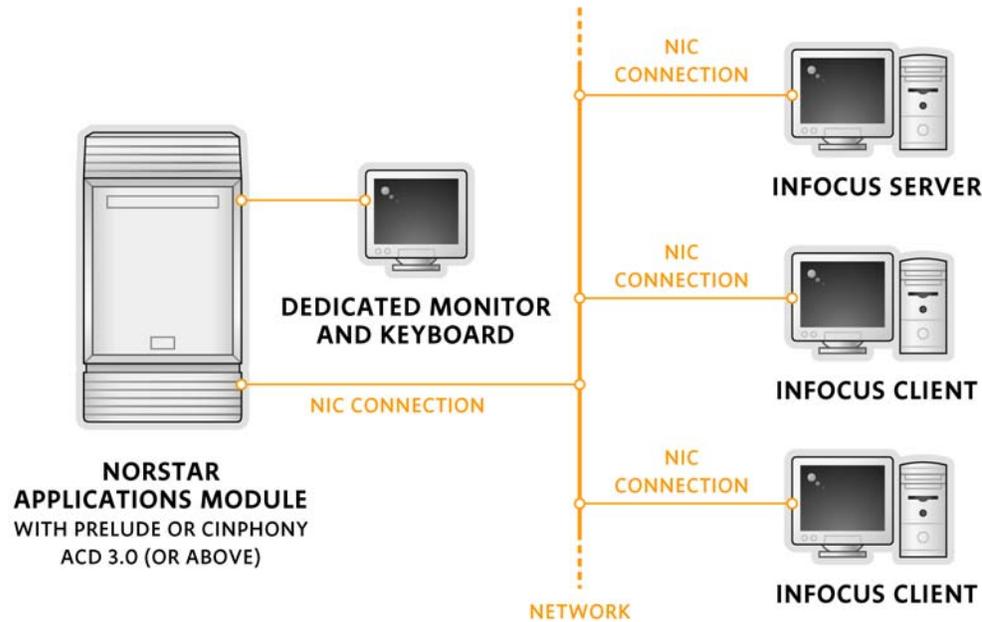
INFOCUS Remote Site Connectivity

For even greater flexibility, the INFOCUS Client software may be installed at an off-premise location and can be connected to the main ACD site using the Internet and/or modem.

*   **LAN Access to Status Display and Report View and Print** – To allow remote access to the Status Displays and Report View and Print options, the INFOCUS Server PC, located at the ACD 3.0 (and above) site, must be registered as a Website through an Internet Service Provider (ISP). INFOCUS Clients then access the Server through a Web connection.

Note: A LAN environment is required and the ACD Administration is not available remotely through the Internet connection.

*   **Modem-to-Modem Access to ACD Administration** – The INFOCUS Server and INFOCUS Client PCs may access the ACD Administration through a modem-to-modem connection to the Norstar Applications Module at the main site. Remote access to the Status Display and the Report View and Print functions are not available through this interface.

Product Delivery

The INFOCUS software is delivered on a CD-ROM that contains the required software for all INFOCUS functions. One INFOCUS Server package comes with the PRELUDE and CINPHONY ACD 3.0 and above products. INFOCUS Client software licenses are available as optional add-ons in one license and five license packages.

Add-Ons

Automated Attendant

The Automated Attendant for PRELUDE and CINPHONY ACD is a cost-effective solution for businesses that wish to direct calls to several different areas.

Automated Attendant commands can be used in the routing table to provide callers with a recorded message. Callers then follow announcement instructions to direct their call. Callers can press designated keys to direct the call to a group, extension, answering device or voicemail system. Or, if a caller has been on hold for a designated amount of time, the call can be bumped to the Automated Attendant where the caller receives options. Calls can be transferred out of PRELUDE and CINPHONY or directed to a specific call center group.

Status Display For Windows 3.1 or Windows 95/98/NT/2000/XP

This Windows-based application can be installed on one to four Remote PCs (connected to the Norstar PRELUDE and CINPHONY ACD processor) to receive Agent Statistics, Group Statistics, System Statistics and Voice Port Status.

A Status Display for Windows Broadcast Box must also be installed, if connecting more than one PC. The user can then display this data in several ways: Group Detail Status, Group Summary Status, System Status, Voice Port Status, Graphical Group Status, and Graphical System Status.

The user can also customize the status display by selecting one or more Groups, Alarm Limits on statistics and Agent Statistic field colors. These are Windows-based "Pop Out" real-time status screens.

INFOCUS Client Software Licenses

INFOCUS Client software licenses are available in increments of one or five to provide access to additional INFOCUS connections. The INFOCUS Client software facilitates access to ACD Status Displays, Report View and Print functions, and ACD Administration from a customer-provided PC.

The Status Display component provides color-coded call center statistics in both tabular and graphic format. This status display information is accessed using a standard browser interface (e.g., Internet Explorer). The Report View and Print uses the same standard browser interface to allow the customer to view and print ACD reports that have already been generated. The INFOCUS Client PC is connected in a LAN environment to the INFOCUS Server provided with PRELUDE and CINPHONY ACD 3.0 and above.

The PC running either the INFOCUS Server software or INFOCUS Client software must be provided by the customer and must have Windows 95/98/NT/2000/XP installed.

Wallboard Support

A wallboard must be supplied by the customer or distributor. Either a wallboard or Status Display for Windows can be connected to Norstar PRELUDE and CINPHONY ACD. They cannot run simultaneously; however, INFOCUS can run simultaneously with a wallboard.

Printer Requirements

An Epson LX300 dot matrix printer is available as an option to print reports from the ACD systems. Norstar PRELUDE and CINPHONY ACD can support over 125 different types of printers. Printer requirements include: 132 characters per line, parallel port, and HP Laser Jet or Epson compatible.

Upgrading Voice Channels

Table 38　Upgrading an MS-BIC Based System

Total Number of Voice Channels	PRELUDE 4 Channel	CINPHONY I 8 Channel	CINPHONY II 8 Channel
4			
6	1 ACD key		
8	2 ACD keys		
10 [1]	MS-PEC, 3 ACD keys	MS-PEC, 1 ACD key	MS-PEC
12	MS-PEC, 4 ACD keys	MS-PEC, 2 ACD keys	MS-PEC
14	MS-PEC, 5 ACD keys	MS-PEC, 3 ACD keys	MS-PEC, 1 ACD key
16	MS-PEC, 6 ACD keys	MS-PEC, 4 ACD keys	MS-PEC, 2 ACD keys

Notes:
[1] When upgrading to a 10 Channel system it is necessary to add 8 MB of RAM (for a total of 16 MB in the system). For application co-residency, memory must be upgraded to at least 32 MB.

Table 39　Upgrading a DVC Based System

Total Number of Voice Channels	PRELUDE 4 Channel	CINPHONY I 4 Channel	CINPHONY I 8 Channel	CINPHONY II 12 Channel
4				
6	DVC	[1]		
8	DVC, ACD key	DVC [1]		
10 [2]	2 DVCs, ACD key	2 DVCs	DVC	
12	2 DVCs, 2 ACD keys	2 DVCs, ACD key	DVC, ACD key	
14	3 DVCs, 2 ACD keys	3 DVCs, ACD key	2 DVCs, ACD key	DVC
16	3 DVCs, 3 ACD keys	3 DVCs, 2 ACD keys	2 DVCs, 2 ACD keys	DVC, ACD key

Notes:
[1] The CINPHONY II software includes the capability for 12 voice channels. When an MS-PEC is added to the Norstar CINPHONY II - 8 channel system it is automatically upgraded to 12 ports. An ACD Key is not required to turn on the additional channels of the MS-PEC card.
[2] When upgrading to a 10 Channel system it is necessary to add 8 MB of RAM (for a total of 16 MB in the system). For application co-residency, memory must be upgraded to at least 32 MB.

The preceding chart shows the components that need to be added to the base system to reach the desired number of channels. All Norstar PRELUDE and CINPHONY ACD modules can be expanded from two to 16 voice channels in two-channel increments, all within the same chassis.

Depending upon the configuration of the Norstar PRELUDE and CINPHONY ACD, when two additional channels are required, the upgrade is accomplished by adding either an MS-PEC card or enabling two voice channels on the MS-BIC or MS-PEC card. With older systems using DVC cards, expansion is accomplished by adding either a DVC card or enabling two channels on a DVC card via a software keycode.

An MS-PEC card (or DVC on older systems) is required if there are no unused channels on any of the cards already installed. A two-channel software key is required to enable unused voice channels on an installed MS-BIC, MS-PEC or DVC card.

The two-channel activation software key is a software diskette that is used to enable the voice channels on the MS-BIC or MS-PEC (or DVC) card. The diskette contains an authorization code and instructions on how to perform the upgrade. (A call will be made to Cintech's support line to enable the voice channels.) The two-channel software activation diskettes may be used only once and cannot be used on other systems.

Benefits of Scalability in PRELUDE and CINPHONY

PRELUDE and CINPHONY offer the following benefits:

- Enhancements can be added via a software upgrade

- Easy migration from PRELUDE to CINPHONY via software upgrade

- Eliminates the need to replace the main system. Each Norstar PRELUDE and CINPHONY ACD model may be expanded up to 32 voice channels within the same chassis.

Norstar PRELUDE and CINPHONY ACD modular design means that businesses can:

- Build a call center to meet their needs today

- Add features, functionality and capacity as their Norstar PRELUDE and CINPHONY ACD requirements grow.

CallPilot Basic Call Center Features

Table 40   CallPilot Basic Call Center Features

Capacities	CallPilot BCC
Maximum active agents	10
Maximum agent IDs (i.e., Configured agents)	20
Maximum groups	2
Supervisors	10
Steps in call routing table	20 day/20 night
Call routing tables (Day/Night)	2 per group
Overflow levels (per Group)	2
Maximum lines	15
Active voice channels • Basic configuration • Maximum configuration	 8 8
Announcements • Recorded • Simultaneous	 10 8
Station Set Configuration	Yes
GUI Administration	Yes
2500 Station Set Support	Yes
Companion Set Support	No
Business Series Terminal Support	Yes
Agent selection: Longest Idle	Yes
Agent selection: Top Down	Yes
Agent Set Info – Waiting time of call	No
Answer Forcing with Zip Tone	Yes
Auto Logout of Agents	Yes
Call Categorization	No
Capacities	CallPilot 150 ACD
Delayed Answer	Yes
DID/DNIS/Target Line Routing	Yes
Direct Transfer to Voice Mail	Yes
Intelligent Routing – CLID/ANI routing	Yes
Intelligent Routing – DNIS routing	Yes
Language Support • English Station Set Messages • French Station Set Messages • Spanish Set Messages	 Yes Yes Yes
Line Priority's Increase	Yes

Capacities	CallPilot BCC
Overflow	Yes
Password Protection	Yes
Priority Queuing	Yes
Record a Call – Agent	Yes
Queue Status	Yes
Queue Status Alerts	Yes
Scheduled Report Generation	Yes
Supervisor	Yes
Supervisor Monitor	Yes
Wrap	Yes
Wallboard Support	16
MIS Reporting	Yes

PRELUDE and CINPHONY Feature Comparisons

Table 41   PRELUDE and CINPHONY Feature Comparisons

Capacities	PRELUDE	CINPHONY	
		Level I	Level II
Maximum active agents	15	30	80
Maximum agent IDs (Configured agents)	60	120	240
Maximum groups	3	6	80
Supervisors	1[1]	1 per group	1 per group
Steps in call routing table	8	16	16
Call routing tables (Day/Night)	2 per group	2 per group	2 per group
Overflow levels (Per Group)	1	3	8
Maximum lines	30	80	120[2]
PRI support	3	1000	1000
Emergency routing groups		1	1
Active voice channels			
Basic configuration	4	8	12
Maximum configuration	32	32	32
Announcements			
Simultaneous announcements	Equal to # of installed voice channels minus the # of channels reserved for "Agent Records"		
Recorded announcements	240	240	240
Station Set/Screen-based configuration	Screen	Screen	Screen
Status Display			
Real-time Group Status Display	Yes	Yes	Yes
Real-time System Status Display	Yes	Yes	Yes
Reports			
Abandoned Call	Yes	Yes	Yes
ACD Call Profile Detail	Yes	Yes	Yes
Agent Profile by Group	Yes	Yes	Yes
Agent Profile	Yes	Yes	Yes
Agent Summary	Yes	Yes	Yes
ACD Call Profile Summary	Yes	Yes	Yes
Busy Line	Yes	Yes	Yes
Call Categorization	Yes	Yes	Yes
Call Categorization by Group	Yes	Yes	Yes
Overflow	Yes	Yes	Yes
Destination Number	Yes[3]	Yes	Yes
Group Profile	Yes	Yes	Yes

Capacities	PRELUDE	CINPHONY	
		Level I	Level II
Line Profile	Yes	Yes	Yes
Line Profile Summary	Yes	Yes	Yes
Monthly Summary	Yes	Yes	Yes
Routing Table	Yes	Yes	Yes
System Configuration	Yes	Yes	Yes
Historical Reporting	Unlimited[4]	Unlimited[4]	Unlimited[4]
Report Generation on Demand	Yes	Yes	Yes
Set-based Statistics	No	No	No
Notes: [1] PRELUDE provides supervision tools like status displays and reports. CINPHONY software is required when sophisticated features like Supervisor Messages, Silent Monitor and "Join" are required. [2] MICS 4.0>144 [3] PRELUDE will support 3 DNIS lines [4] Using data export, archiving, restore and purge features			

Table 42　PRELUDE and CINPHONY Feature Comparison

Standard Feature	PRELUDE	CINPHONY	
		Level I	Level II
2500 Station Set Support	Yes	Yes	Yes
Companion Set Support	Yes	Yes	Yes
Business Series Terminal Support	Yes	Yes	Yes
Agent HELP	No	Yes	Yes
Agent – Record Call	No	Yes	Yes
Agent selection: Longest Idle	Yes	Yes	Yes
Agent selection: Round Robin	Yes	Yes	Yes
Agent selection: Top Down	Yes	Yes	Yes
Alert	No	Yes	Yes
Answer Forcing with Zip Tone[1]	Yes	Yes	Yes
Auto Login of Agents	Yes	Yes	Yes
Auto Logout of Agents	Yes	Yes	Yes
Call Categorization[2]	Yes	Yes	Yes
Call on Demand	Yes	Yes	Yes
Data Export, Archive, Restore and Purge	No	Yes	Yes
Delayed Answer	Yes	Yes	Yes
DID/DNIS/Target Line Routing	Yes	Yes	Yes
Emergency Routing	No	Yes	Yes
Direct Transfer to Voice Mail	Yes	Yes	Yes

Standard Feature	PRELUDE	CINPHONY	
		Level I	Level II
Line Transfer	No	Yes	Yes
Link Transfer	No	Yes	Yes
Language Support • English Station Set Messages • French Station Set Messages • Spanish Set Messages	 Yes Yes Yes	 Yes Yes Yes	 Yes Yes Yes
No Answer (Routing Command)	Yes	Yes	Yes
Overflow	Yes	Yes	Yes
Password Protection	Yes	Yes	Yes
Priority Queuing	No	Yes	Yes
Route Order Configuration	Yes	Yes	Yes
Scheduled Configuration Changes	Yes	Yes	Yes
Scheduled Report Generation	Yes	Yes	Yes
Silent Monitor	No	Yes	Yes
Wrap	Yes	Yes	Yes
Optional Add-On Features			
INFOCUS Client User Licenses[3]	Yes	Yes	Yes
Automated Attendant • Menus per system	Yes 6	Yes 12	Yes 80
Caller Directed Routing	Yes	Yes	Yes
Wallboard Display	Yes	Yes	Yes
Recording Calls	No	Yes	Yes
Notes: [1] Not available with BST phones. [2] Currently not available with Companion. [3] PRELUDE and CINPHONY include one Infocus User License. Additional User Licenses are optional.			

CallPilot BCC, PRELUDE and CINPHONY Features and Benefits

Table 43   CallPilot BCC, PRELUDE and CINPHONY Features and Benefits

Feature	Description	Benefits
Agent	An individual who answers an ACD call. Agents are assigned to a group or multiple groups.	
Agent HELP	CINPHONY only. Lets an agent request Help from the Supervisor while on a call by pressing a feature key on a Norstar set. The agent's name will display on the supervisor's station set.	Supervisors can act as back-up on calls.
Agents Logged In (also known as Active Agents)	The total number of agents that can log in at one time: CallPilot BCC (10), PRELUDE (15), CINPHONY I (30) and CINPHONY II (80).	Helps to effectively utilize multiskilled agents by allowing highly trained agents to log into more than one group when appropriate.
Agent ID	Belongs to each individual agent. The Call Center applications use the agent ID number to login and identify an agent to the system.	Lets agents login easily.
Agent Record Call	CINPHONY only. Lets an agent, while on a call, record the call at the Norstar set. Once the call is recorded, the Supervisor can use the Play Call function to play back recording.	Allows supervisors to monitor agent calls.
Agent Selection – Longest Idle	Selects the agent who has been available the longest since last handling a call.	Ensures that workload is distributed equitably, while minimizing callers' wait time.
Agent Selection – Round Robin	PRELUDE and CINPHONY only. Sends a call to the next available Agent listed after the agent who handled the last call.	Increases efficiency.
Agent Selection – Top Down (Preferred)	Sends a call to the first available agent closest to the top of the list.	Ensures calls are sent to the agent with the most expertise when this routing type is desired.
ANI: Automatic Number Identification	PRELUDE, CINPHONY and CallPilot BCC. An option offered by the long distance carrier and provides incoming caller's telephone number. ANI information appears on the agent's Norstar station set display when the ACD call arrives.	PRELUDE, CINPHONY and CallPilot Call Center applications can route and prioritize calls based on the incoming number.

Feature	Description	Benefits
Announcements	Play to callers and encourage them to hold while they wait for an available agent. These voice announcements can also promote products and services.	Keeps callers up to date, as voice announcements can be quickly changed at the supervisor's Norstar set, making it easy to create announcements daily or as conditions change.
Recorded Announcement	Plays for a caller when it is evoked as a step in a Routing Table using the Announcement, Forced Announcement or Automated Attendant Routing Command. If the Automated Attendant Add-On is being used in PRELUDE or CINPHONY, totals for all levels increase. The Recorded Announcement Configuration screen keeps track of the announcements that were recorded. The total number of Recorded Announcements allowed: CallPilot BCC (10), PRELUDE (8), CINPHONY I (16) and CINPHONY II (72).	Improves customer service calls and keeps callers up to date.
Simultaneous Announcements	The total number of Recorded Announcements which can be played at one time is in direct relation to the number of Voice Channels which are active.	Allows more than one announcement to be played at one time.
Answer Forcing with Zip Tone	Applies only to agents wearing headsets. If Answer Forcing is enabled for an agent (Agent Configuration screen), a the system automatically sends a call to an agent when the agent is available. A zip tone precedes the call to let the agent know that a call is being forced to the headset.	Agents are aware when a call is coming through.
Auto Login of Agents	An external auxiliary application that administrators can load with Norstar PRELUDE and CINPHONY ACD software.	Allows the user to automatically log in non-human agents represented by a device or application.
Auto Logout of Agents	Activates if an available agent does not answer the ACD call within the specified time period. If the time threshold is exceeded, the available agent will be logged out and the call redirected to the next available agent.	Prevents a no answer situation and improves customer service, as it ensures calls are answered by an available agent.
Average Q Time Announcement	PRELUDE and CINPHONY ACD. Informs callers of the average time they will have to wait before their call is answered.	Provides valuable information to the callers in queue as to how long they may wait before being answered by an available agent.

Feature	Description	Benefits
Call Categorization	CINPHONY only. When an agent takes a call, he or she can enter a 1-to-12 digit Category Code on the Norstar set during the wrap time after the call is completed. The category code can be required or optional by group, and appears on the Norstar display after an agent completes a call.	Businesses can determine what types of calls are coming in and organize resources accordingly.
Caller Directed Routing	PRELUDE and CINPHONY only. Provides the ability to route incoming ACD calls based on DTMF digits the caller enters. This allows a caller to enter an identifiable number such as a customer ID number or product code. This number routes the call to the appropriate ACD group.	Saves time.
Call on Demand	PRELUDE and CINPHONY. When selected, lets an agent be "perpetually" unavailable. Calls can be distributed to this agent by pressing the AVAILABLE/UNAVAILABLE key to become available until the call is completed.	Agents can choose to be unavailable while on a call.
Calling Line Identification Routing (CLID/ANI)	PRELUDE, CINPHONY and CallPilot. Routes CLID and ANI calls coming in on an ACD line to a Group by the specified Originating Number.	Prioritizes calls so that specific callers (e.g., company's most important clients) are answered first.
Calls Queued Station Set Display	The total number of calls in queue and time of longest call in queue for a Group. An Agent can view this statistic on the Norstar set while on or off a call. An agent does not have to be logged in to the ACD to access this information.	Improves agents' time management, as agents can determine how busy the system is.
Configured Agents	The total number of agents that can be configured: CallPilot BCC (20), PRELUDE (60), CINPHONY I (120) and CINPHONY II (240).	Provides system security.
Configured Supervisors	CINPHONY and CallPilot BCC. The total number of Supervisors that can be configured: CINPHONY I (4), CINPHONY II (24) and CallPilot BCC (10).	Allows more than one supervisor to be configured.
Disconnect Supervision	The change in the transmission of a call when it goes from "off hook" to "on hook," or, in other words, when the caller hangs up. The Call Center applications use Disconnect Supervision to report on abandoned calls (e.g., when a caller hangs up before an agent becomes available).	Allows businesses to determine how well they are reaching customers and lets businesses make decisions (such as staffing, hours of operation) according to this information.

Feature	Description	Benefits
Data Export	CINPHONY only. Lets users export system data to a file by date and time ranges. The file is given an .EXP extension and listed in Report/File Maintenance so the user can copy or move the data (file) to floppy disks. This allows call data to be exported to other popular software applications such as Microsoft Word, Access, Excel, Quattro Pro for Windows, Dbase, Lotus 1-2-3 and many more.	Improves flexibility when businesses are tracking and using call center statistics.
Delay Answer: Routing Command	Delays answering incoming calls for a specified time period. The caller hears ringing until the delay passes or an agent becomes available.	Saves on 800/888 line charges, as it allows the ACD to recognize CLID and delays answering a call when no agent is available.
DID	CINPHONY only. Routes calls that come in on DID designated lines to a specific Group. The Destination Number Configuration table enables the user to list these numbers.	Improves efficiency by routing calls appropriately.
DNIS	Directs and prioritizes calls based on the number the customer dialed. The Destination Number Configuration table enables the user to list these numbers.	Improves customer service by ensuring that a business's best customers are given priority.
Emergency Routing Groups	CINPHONY only. Allows a single group to handle all calls during an emergency. To activate, the supervisor presses a feature key. Once activated, all calls are rerouted to the designated emergency group. A call that is directed to the emergency group will follow the group's routing table. Only one Emergency Group can be configured.	Ensures a call center's calls are answered, even in an emergency situation.
Expected Q Time Announcement	PRELUDE and CINPHONY ACD. An announcement to the caller that uses a calculation to inform the caller of how long they will have to continue to wait before their call is answered. Expected QTime incorporates the amount of time the caller has already been waiting.	Provides valuable information to the callers in queue as to how long they may have to continue waiting before being answered by an available agent.

Feature	Description	Benefits
Group	A collection of individual agents qualified to answer a specific type of call. For example, a company may group its agents by Customer Service, Accounts, Order Desk and Service Installation. This makes a total of four groups within the call center. An individual agent can be assigned to many different groups. Also called "Splits" or "Queues." The total number of Groups which can be configured: CallPilot BCC (2), PRELUDE (3), CINPHONY I (6), and CINPHONY II (80).	Provides flexibility to match business needs with personnel.
Groups Agent Simultaneously Logged-in	Means that the total number of Groups into which one Agent can log in is in direct relation to the number of Groups which can be configured: CallPilot BCC (2), PRELUDE (3), CINPHONY II (4) and CINPHONY II (24).	Helps effectively utilize multiskilled agents, as highly trained agents can be logged in to any or all groups.
Groups per Supervisor	CINPHONY only. The total number of Groups to which a supervisor can be assigned is in direct relation to the number of Groups which can be configured: CINPHONY I (4) and CINPHONY II (24).	
INFOCUS Software	PRELUDE and CINPHONY only. Software component for customer supplied PCs connected to the NAM. Provides access to ACD Status Displays, Report View and Print function and ACD Administration from a LAN or remote PC.	Enables the accessibility of information for call center supervisors, ACD agents, executives and knowledge workers throughout the organization.
Initial Installed Voice Channels	The number of Voice Channels supplied when the ACD software is first installed: CallPilot BCC (8),PRELUDE (4), CINPHONY I (8) and CINPHONY II (12).	Enables Norstar to inter-operate with various call centers.
Language Support	PRELUDE, CINPHONY and CallPilot BCC systems support English, French and Spanish for Agent and Supervisor functions from Norstar sets. Monitor and Key functions support English and French.	Companies can use the language of their business.
LCD prompted set-based programming	CallPilot BCC only. Lets users program CallPilot BCC from any T7316E station set. The programmer is led through a series of prompts using the station set soft keys to make selections and the keypad to enter data.	Simplifies installation, programming and administration with Norstar's superior integration capabilities.
Lines	The total number of Lines which can be configured: CallPilot BCC (15), PRELUDE (30), CINPHONY I (80) and CINPHONY II (120).	

Feature	Description	Benefits
Maximum Installed Voice Channels	CallPilot BCC supports a maximum of 4 or 8 voice channels. PRELUDE and CINPHONY can be expanded to support a maximum of 16 voice channels.	Lets businesses support multiple voice channels.
Management Information System (MIS)	An optional reporting package for Norstar ACD and CallPilot. Provides real-time, current and historic reports.	Lets users stay up to date with current information.
Overflow	Is useful for expediting call processing and allows calls to be made available to an alternate group other than the one for which the call was originally designated. The maximum number of calls that can wait for the group is specified in administration. Once the threshold is reached, calls are automatically made available to the alternate group in addition to the one for which the call was originally designated. If no agents are available in the second group, Norstar continues to monitor both groups for an available agent.	Increases number of calls handled, reduces customer hold time and increases agent productivity. Expedites call processing and expands the agent pool so that more agents are available to answer calls.
Overflow Groups	Once the Overflow threshold is reached, Groups are added to the pool of agents available to take the call. The total number of Overflow Groups which can be selected for the Group where calls are first routed: CallPilot BCC (1), PRELUDE (1), CINPHONY I (3) and CINPHONY II (8).	Useful for expediting call processing and expands the agent pool so that more agents are available to answer calls.
Password Protection	CINPHONY, PRELUDE and CallPilot BCC. The Configuration Menu, Reports Menu, Maintenance Menu, Restart and Quit can be password protected on the ACD main menu by using a password.	Provides system security.

Feature	Description	Benefits
Priority Queuing	CINPHONY and CallPilot BCC. Lets businesses give specific customers a preferential answering status. Calls are first given to agents based on the call's priority and then its time in queue. If no incoming calls have an assigned priority, the ACD will distribute the longest waiting call. Priorities can be set three different ways: • Group priority assigns a priority to each Group. Users can place a higher priority on Groups whose callers should be handled first (e.g., new orders versus repeat orders). When a call is transferred to a Group, it assumes the Group's priority. • Line Priority assigns each incoming line a priority from 1 (highest priority) to 10 (lowest priority). When a call comes in, it is assigned the priority of its line. Calls on lines with a higher priority will be answered before calls on lines with a lower priority, regardless of the lower priority calls time in queue. • Routing Command Priority allows a call's priority to change as it spends time in queue. See Routing Commands.	Ensures that preferred customers receive the highest level of service, as it provides them with a "special" phone number to ensure they receive the highest level of service. See ANI, CLID, DNIS and DID.
Real-time Configuration Changes	When changes are made and saved on Agent, Group, Supervisor, Emergency Group or Line Configuration screens, these changes can be updated immediately from the Update Configuration screen.	Lets the system to respond immediately to situations requiring configuration changes such as unexpected heavy call load.
Real-time Group Status Display	PRELUDE and CINPHONY only. Lets users view the call activity and status of agents in a single group on the Group Status Display screen. The Group Status Displays are color-coded to quickly identify a specific area of interest, and the status of Voice Channels also displays in real-time.	Provides detailed information about a specific group and allows supervisors to identify problems as they occur.
Real-time System Status Display	PRELUDE and CINPHONY only. Lets users view the call activity and status of all Groups in the system on the System Status Display screen. The display shows statistics for eight groups at a time and shows activities such as an agent logging in, or an agent becoming available for another call, as it happens. The ACD System Status Displays are color-coded to quickly identify a specific area of interest. The status of Voice Channels also displays in real-time.	Allows efficient real-time management of system.

Feature	Description	Benefits
Route Order Configuration	Lets users route calls to the appropriate Group using Line/DNIS/ANI or Caller Directed Routing tables.	Improves efficiency.
Routing Commands	Specific instructions used in the routing table for determining how to distribute an ACD call.	Routing tables allow callers to be routed differently after hours.
Routing Command: Alert	CINPHONY and CallPilot BCC. When a call reaches this command in a Routing Table, a ring is sounded at a specified Norstar set to alert a Supervisor or an Agent that a call has reached this alert status. The Alert Routing Command can be entered in a Day and/or Night Routing Table.	Agents and supervisors are aware of a call's status.
Routing Command: Announcement	Plays the assigned prerecorded announcement. If an agent becomes available before the announcement concludes, the announcement will be interrupted and the call distributed to the agent.	Encourages callers to hold and can be used to advertise products and services.
Routing Command: Delay Answer	Instructs the ACD to delay answering incoming calls for a specified time period. The caller hears ringing until the delay passes or an agent becomes available.	Saves 800 number charges when no agents are available.
Routing Command: Disconnect	Ends the call.	
Routing Command: Distribute	Searches for an available agent to answer the incoming call.	Allows businesses to customize the time calls are held in queue before an announcement is played.
Routing Command: Forced Announcement	Plays an announcement that cannot be interrupted. If an agent becomes available during a forced announcement, the caller will hear the entire announcement before his call is distributed to an agent.	Great for advertising products and services before calls are transferred to agents.
Routing Command: Go to Step	Functions as a loop command. This is used to send a call to different steps within the routing table.	Saves time.
Routing Command: Group	Sends the call to the other ACD group to follow that group's routing commands.	Saves time.
Routing Command: Increased Priority	CINPHONY and CallPilot BCC. Incrementally raises the call's value within the queue so that the call is answered quickly. For example, increases the priority of a call from 5 to 4 after the call has waited in queue for longer than one minute. See Priority Queuing for additional information.	Improves customer service as calls are answered faster.

Feature	Description	Benefits
Routing Command: Line Transfer	PRELUDE and CINPHONY only. Transfers a call to an external number by dialing out on a separate trunk and connecting the incoming and outgoing calls. Transfer will remain in use for the duration of the call. The call can be transferred to a specified Line or Line Pool. The Line Transfer can be entered in a Day and/or Night Routing Table.	Saves time.
Routing Command: Link Transfer	PRELUDE and CINPHONY only. The Link Transfer Routing Command can be entered in a Day and/or Night Routing Table. When a call reaches a Link transfer step, the call will be transferred via a flashhook to a phone number outside of the Norstar system. This is normally used on Centrex lines or when the Norstar system is installed behind a PBX.	Speeds up call processing.
Routing Command: No Answer	When this command is the first step of a Routing Table, the call will continue to ring until the caller hangs up. This is typically used after hours when a business does not wish to incur 800/888 line charges.	Saves money as businesses do not have to incur charges after hours.
Routing Command: Set Priority	CINPHONY only. Establishes the call's priority within the queue. See Priority Queuing for additional information.	Calls are prioritized and answered faster.
Routing Command: Transfer to	Transfers a call to an internal Norstar extension.	Lets agents direct calls easily.
Routing Command: Voice Mail Transfer	When a call reaches this command in a Routing Table, the call will be transferred to a specified CallPilot voicemail mailbox. The Voice Mail Transfer command can be entered in a Day and/or Night Routing Table.	Allows callers to leave messages rather than wait on hold.
Routing Tables	Include instructions that ensure incoming calls are distributed effectively.	Improves customer service.
Routing Tables per Group	For each Group, a user can specify a Day and a Night Routing Table.	Lets businesses customize routing tables.
Scheduled Configuration Changes: Routing Command	PRELUDE and CINPHONY only. When changes are made and saved on Agent, Group, Supervisor, Emergency Group, or Line Configuration screens, these changes can be scheduled for update on a specific date and time.	Lets administrators schedule changes in advance.
Silent Monitor	CINPHONY only. Lets supervisors monitor an agent's phone conversation without being heard on the line. The supervisor also has the option of joining the call.	Monitors the quality of customer service and for training new agents.

Feature	Description	Benefits
Skillset	Collects and distributes calls for departments such as "sales" and "technical support." If several calls arrive at the same time, the calls are held in a skillset where callers hear greetings and are put on hold until an agent is available.	Improves customer service as calls are handled by appropriate skillset.
Steps in Routing Table	The total number of Steps (Routing Command entries) which can be configured for the Day and Night Routing Tables: CallPilot BCC (20), PRELUDE (8) and CINPHONY (16).	Provides flexibility.
Supervisors per Group	CINPHONY only. The total number of Supervisors which can be assigned to one Group in CINPHONY I (1) and CINPHONY II (1).	
Telephone Service Factor (TSF) on Status Display	PRELUDE and CINPHONY only. The TSF is a gauge for measuring the service level of the call center. It is the percentage of calls answered within a Threshold period (in seconds or minutes) for the TSF Interval (in seconds or minutes). For example, a call center may set a goal of answering 80% of all ACD calls within 30 seconds. If the TSF is only 60% at a given time, then the call center is short of the TSF goal by 20%. PRELUDE and CINPHONY display the TSF on the real-time group status screen as well as on the ACD Call Profile Report.	Enables a business to track how efficiently the call center is working.
Voice Channels	Channels that ACD systems use to play recorded messages and record conversations with the Agent Record Call feature.	Monitors agent performance.
Wallboard software support	Allows connection between a wallboard and CallPilot BCC, PRELUDE or CINPHONY to display the following information: Group number, number of calls in queue, longest time of a call in queue, number of agents unavailable. The number of agents unavailable represents the number of agents who have logged in but are currently in one of the following states: manually unavailable, on a non-ACD incoming or outgoing call, or on an intercom call. Wallboard software is included within the ACD software.	Provides information on agent status.

Feature	Description	Benefits
Wrap	Time that agents have between answering ACD calls. This allows agents to categorize calls or do paperwork between calls. CallPilot BCC: Wrap length is user defined as between the range of 0 and 60 seconds. If Prompted Categorization is being used, a minimum of 10 seconds of Wrap time is required. PRELUDE and CINPHONY: The three ways to specify the length of wrap time are: • Automatic: specified time period (duration) for the wrap time. • Manual: the Agent must enter the Cancel Wrap Feature Code to end wrap time. • None: the Agent becomes available as soon as the call has ended.	Improves employee morale and customer service, as the additional time allows agents to prepare for the next incoming call and to ensure that records of the last call are complete.
2500 Analog Station Set	Includes support for 2500 series telephones, cordless phones and headsets when used in conjunction with an ATA or Analog Station Module. The 2500 set can be used to perform the following agent functions: Login, Logout, Available and Unavailable.	Allows for alternative types of sets or devices to be used as agent stations.
Standard Reports Descriptions	Lets users access the Norstar PRELUDE and CINPHONY databases through the Reports menu. Users can also access and generate management reports.	Companies can understand how agents and the system are performing.
Report: Abandoned Call Report	Lists and totals calls in which the caller waited on hold and hung up after a certain time period. It details Group, Date, Line, Time, Duration, Incoming Number and Name of each call abandoned during a specified time period. If available, ANI/CLID and DNIS numbers will be provided.	Allows a business to track how well it is reaching customers.
Report: ACD Call Profile Report	Profiles the count or percent of ACD calls received during a specified time period. The report lists each time period and provides information on how quickly a group is answering ACD calls. It also tracks the number/percent of abandoned calls, calls picked up and disconnected, and calls transferred for each time period.	Allows a business to see how efficiently the call center is working and where improvements can be made (e.g., staffing, hours of operation).
Report: ACD Call Profile Summary Report	Provides a summary-level view of the information presented in the ACD Call Profile Report. It supplies a summary of ACD calls received, including abandoned, disconnected and transferred calls, by group for a specified time period.	Evaluates group assignments, staffing levels and call activity by group.

Feature	Description	Benefits
Report: Agent Profile Report	Profiles an Agent's performance over a specified time period. It tracks the amount of logged-in time, time spent on ACD calls and how that time was spent, time spent on non-ACD calls, number of calls answered, and number of times supervisor help was requested.	Acts as a time management or training aid.
Report: Busy Line Report	Provides the date, time and duration when all lines assigned to an ACD Group are busy.	Allows a business to track how lines are being used and when.
Report: Call Categorization Report	CINPHONY only. Summarizes the call categorization information for a specified time period. It tracks the number of calls logged for each category.	Allows businesses to track what category of calls are coming in.
Report: Group Profile Report	Profiles a Group's performance for a specified time period. It tracks the number of calls received, whether calls were answered or abandoned, average amount of time a call spent in queue before being answered or abandoned, average time spent on various aspects of ACD calls, and number of auto-logouts and requests for Supervisor assistance.	Enables management to see how well a specific group is working and whether any changes are required.
Report: Group Overflow Report	Summarizes the number of ACD calls overflowing to other Groups, which Groups received these calls, and the number of calls received by each Group. It also tracks the number of ACD calls overflowing from other Groups to this Group, and the total number of calls received, answered and abandoned.	Keeps track of ACD calls and groups.
Report: Line Profile Report	Summarizes ACD line usage. It tracks, by specified time intervals, the number and duration of incoming and outgoing calls, summarizes ACD call activities and provides a percentage of the interval the line was in use.	Lets businesses keep track of call activity.
Report: Line Profile Summary Report	Provides a summary-level view of the information presented in the Line Profile report. It summarizes line usage by the ACD system.	Determines the percentage of time a line was busy, evaluates each line and how it is being used, identifies problems, determines if additional lines are needed and determines if there are excess lines.

Feature	Description	Benefits
Report: Monthly Summary Report	Summarizes the entire system or Group performance. It tracks number of calls received, calls answered, calls abandoned, time spent on various aspects of ACD calls, number of auto-logouts, supervisor requests for assistance and number of incoming, outgoing and intercom calls during the reporting period.	Lets businesses keep track of call activity on a monthly basis.
Report: Routing Table Report	Provides the Step number, Routing Command and value for the day and night Routing Tables. It tracks the number and percentage of all calls reaching each step on the Routing Table.	Enables a business to see how calls are flowing through a call center.
Report: System Configuration Report	Provides detailed information of selections made on the PRELUDE and CINPHONY Configuration screens.	Provides an important analysis tool for system support as well as a reference tool for the user to view system setup.
Report: Agent Profile by Group Report	Profiles agent performance by Group(s) for a specified time period. It tracks for each Group the amount of logged-in time, time spent on ACD calls and how that time was spent, time spent on non-ACD calls, number of calls answered and number of times Supervisor help was requested.	Lets businesses keep track of ACD calls.
Report: Call Categorization by Agent Report	CINPHONY only. Summarizes the call categorization information for a specified time period for each agent. It tracks the number of calls logged for each category by each agent.	Allows businesses to track calls by agent.
Report: Destination Number Report	CINPHONY only. Summarizes DNIS and DID usage. It tracks number and average duration of all DNIS and DID calls received during specified intervals, and provides a summary of DID/DNIS call activities.	Lets businesses keep track of DNIS and DID calls.
Report Generation – Scheduled	Lets users schedule current call data for processing and generate reports on a specified date and time.	Improves efficiency.

Computer Telephony Integration

Chapter Highlights

• Norstar Desktop Computer Telephony Integration (CTI) – combines the Norstar portfolio with the power of desktop computing and offers unique applications, each tailored to a specific market or niche

• Telephony Application Program Interface (TAPI) – is a standard program interface that enables computer users to use their PC to communicate over telephones or video phones to people- or phone-connected resources elsewhere in the world

• Norstar Personal Productivity Suite 2.2 – is the complete software package for desktop CTI, including the Personal Call Manager application, TAPI implementation software and CTA installation tools

• Personal Call Manager (PCM) – is a screen-based telephony and contact manager application that brings the call control features of Norstar telephones to the computer screen, offering features that allow users to increase productivity and improve customer service

• TAPI Service Provider (TSP) – is based on the Telephony Application Programming Interface (TAPI) standard developed by Microsoft, and is a simple and flexible tool for implementing CTI through either a direct-connect or client/server configuration

• Computer Telephony Adapter (CTA) devices – bridge the gap between telephone systems and computers and are based on the TAPI standard developed by Microsoft, to work with a wide variety of CTI applications.

Chapter Overview

Computer Telephony Integration (CTI) brings together the power of two of a business's most-used tools: the computer and the telephone. This technology allows users to manage all their communications right from the desktop. Users can receive, use, move and access information faster than ever before.

CTI has changed the way business works by significantly reducing repetitive tasks, so a business's employees will work more effectively, while reducing 800/888 line charges by handling customer calls more quickly.

Figure 66 Computer Telephony Integration
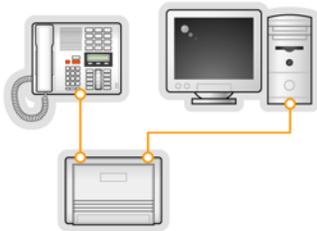
CTI provides companies with the ability to turn a desktop computer into a powerful communications tool that can combine sight, sound, text, animation, video, graphics and other sophisticated telecommunication functions.

Norstar is an active participant in the development of technology to evolve telephone systems from voice-only services to multimedia services. Service providers are offering a wide variety of desktop CTI applications 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), giving the Windows 95/98/NT, 2000 and XP user a new, PC-based Norstar user interface.

Norstar CTI enables users to integrate telephone and computer functionality. Applications include screen pops for instant access to customer information, management of voicemail and email, on-screen point-and-click telephone directories, remote access to communications resources for telecommuters and frequent travelers, intelligent call routing and control and database integration.

Emerging Trends

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. 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 and ACD 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, Microsoft established a set of industry standards (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 Windows 95/98/NT, 2000 and XP, 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.

Benefits

By taking advantage of CTI, businesses can:

- Get instant access to customer information – with screen pops that allow users to anticipate a customer's needs before they answer the call
- Increase employee efficiency – with features like Calling Line ID, which lets users know who is calling before they pick up the phone
- Increase customer service – with features like Call Routing, which routes callers to the appropriate department or person
- Save time – by enabling users to manage communications at the desktop and reduce repetitive tasks
- Save money – by reducing costly long-distance charges.

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). 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 a TAPI-compliant application (such as contact management software).

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, a wide variety of software is available to CTI users. These additional applications are available through Nortel Business Affiliates, the Symposium Partners Program, and also "off the shelf." These additional sources are discussed in further detail at the end of this chapter.

Presently, the Norstar CTI portfolio includes:

- Norstar Personal Productivity Suite Version 2.1
  - Norstar Personal Call Manager 1.2
  - TAPI Service Provider: Norstar TSP 4.3.
- Norstar Computer Telephony Adapter (CTA) Hardware Devices
  - CTA 100
  - CTA 160*i*.

Desktop CTI Functions

Desktop CTI applications address an extensive number of unique applications, each one tailored to a specific market or niche. Norstar offers many types of CTI applications, including the most basic screen pops, intelligent dialing and call routing, and coordinated call/screen transfer and screen-based telephony. The following table identifies the most common ones, along with the associated Norstar application

Table 44   Desktop CTI Functions

CTI Application Type	Norstar
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.	Screen pops are enabled on the Norstar using the following: • CTA device • TSP 4.3 (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).
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.	Contact Management is enabled on the Norstar using the following: • CTA device • TSP 4.3 (or earlier versions) • Contact Management software such as Norstar Personal Call Manager (very basic contact manager) • Note: see chart of TAPI Applications later in this chapter for a list of TAPI enabled applications.
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.	Screen-based telephony is enabled on the Norstar using the following: • CTA device • TSP 4.3 (or earlier versions) • Software application such as Norstar Personal Call Manager

Target Market for Norstar Desktop CTI

Where 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 businesses or individuals might not realize that they require CTI, as the myth that "CTI is only for call centers" is still prevalent in the marketplace.

Potential candidates for Norstar CTI solutions are employees who:

- Often disconnect callers when they try to transfer calls
- Use a contact manager to look up a name and number, then dial the phone number
- Shuffle through business cards, sticky notes and address books to find a phone number
- Dig through files and paper while talking to someone to see what they talked about last time
- Have both a phone and a computer on their desk
- Wish they could see who called, but the caller did not leave a message
- Think they could use their time more efficiently
- Think they could justify an expenditure if the payback were less than one year.

An answer of "yes" to any one of the above questions indicates an opportunity to discuss CTI applications at the desktop and position a Norstar CTI solution.

Market Segments

The target market for Personal Call Manager can be segmented into three distinct groups: knowledge worker, informal call center and formal call center. The knowledge worker and informal call center markets are the fastest growing segments of the CTI marketplace; these groups represent a significant opportunity for Norstar CTI solutions.

Knowledge Worker

Knowledge workers are typically employees who have both a telephone and a computer at their desk but are not part of a formal call center. This market includes all types of professionals working in offices, including accountants, lawyers and computer programmers.

In the past, the knowledge worker was not considered a candidate for CTI applications, as traditionally only businesses with call centers used this technology. Today, businesses are realizing that knowledge workers frequently talk to customers and, therefore, can benefit from the same kinds of CTI applications to which call center agents have access.

Informal Call Center

This type of call center brings together the traditional formal call center, knowledge workers and SOHO professionals. While employees in informal call centers are not call center agents, they spend a good deal of their time answering the phone and responding to customer inquiries. Employees working in an informal call center often do not think of themselves as a call center, as they might not have an Automatic Call Distribution (ACD) system and they are not traditional agents dedicated to answering incoming calls. They may be part-time agents who perform other duties within the business.

Prospects for informal call centers are more difficult to identify, as the employees answering calls may not be identified specifically as 'agents' or 'telephone service representatives.' An informal call center employee could be the local expert in a particular department who 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 most qualified persons available by phone.

Formal Call Center

A formal call center exists when a company dedicates a group of employees to answering similar kinds of telephone calls. Individuals or agents within formal call centers specialize in answering incoming calls and concentrate on that activity. An ACD system manages incoming calls and distributes them to agents.

Desktop CTI Benefits to End Users

In addition to their business benefits, desktop CTI solutions offer many benefits to both the knowledge worker and the formal or informal call center agent. CTI solutions can:

- Increase productivity
- Reduce costs/increase revenues
- Enhance customer service.

Increase Productivity

CTI solutions can increase employee productivity in the following ways:

• Providing agents with valuable client information, through screen pop solutions and CLID information, before they answer calls, thereby saving time on the phone

• Managing large amounts of client information with contact management applications, making it available instantly

• Reducing time and complexity by providing call control capabilities that allow telephony features such as dialing, conference calling and transferring to be integrated into PC applications.

Reduce Costs/Increase Revenues

CTI solutions can reduce a business's costs and increase its revenues in the following ways:

• Reducing 1-800 charges by spending less time on the phone and more time with potential new customers or selling additional products and services to existing customers

• Allowing a business to maximize its investment in applications such as contact management programs by integrating telephony capabilities into programs that users already know how to use, thereby reducing training costs

• Reducing system administration and maintenance costs by implementing CTI solutions in a client/server configuration

• Minimizing the need for custom development costs by allowing businesses to use off-the-shelf TAPI compliant applications.

Enhance Customer Service

CTI solutions can enhance a business's customer service in the following ways:

• Providing agents with client details and history, thereby enhancing personal relationships and satisfying customer needs faster and more efficiently

• Managing telephony features through a simple drag-and-drop PC interface, eliminating transfer problems

• Making customers feel special, translating into enhanced customer satisfaction and loyalty

• Passing CLID along with the caller during the entire duration of that call, so the callers do not have to repeat their request if they are transferred elsewhere in the business.

The Norstar Personal Productivity Suite 2.2

The Personal Productivity Suite CD-ROM contains all of the Norstar Desktop CTI applications and documentation, the TAPI Service Provider 4.2, the drivers required for installation of the CTA devices and product demonstrations of Norstar and Symposium Partner Program CTI applications.

The Suite also includes a variety of product demos and short presentations to provide further information on Nortel Symposium products, Norstar products and Symposium Partner Program TAPI applications.

In addition, the Personal Productivity Suite provides a copy of the Microsoft TAPI 4.3 upgrade for the convenience of the Norstar customers who require it.

As its name suggests, it is the full suite of Norstar Personal Productivity applications users or businesses need to CTI-enable their desktop PCs. Like many software developers, Norstar is introducing its desktop CTI applications as a suite. Users can add enhancements and additions as they become available.

Figure 67 Personal Productivity Suite Main Menu
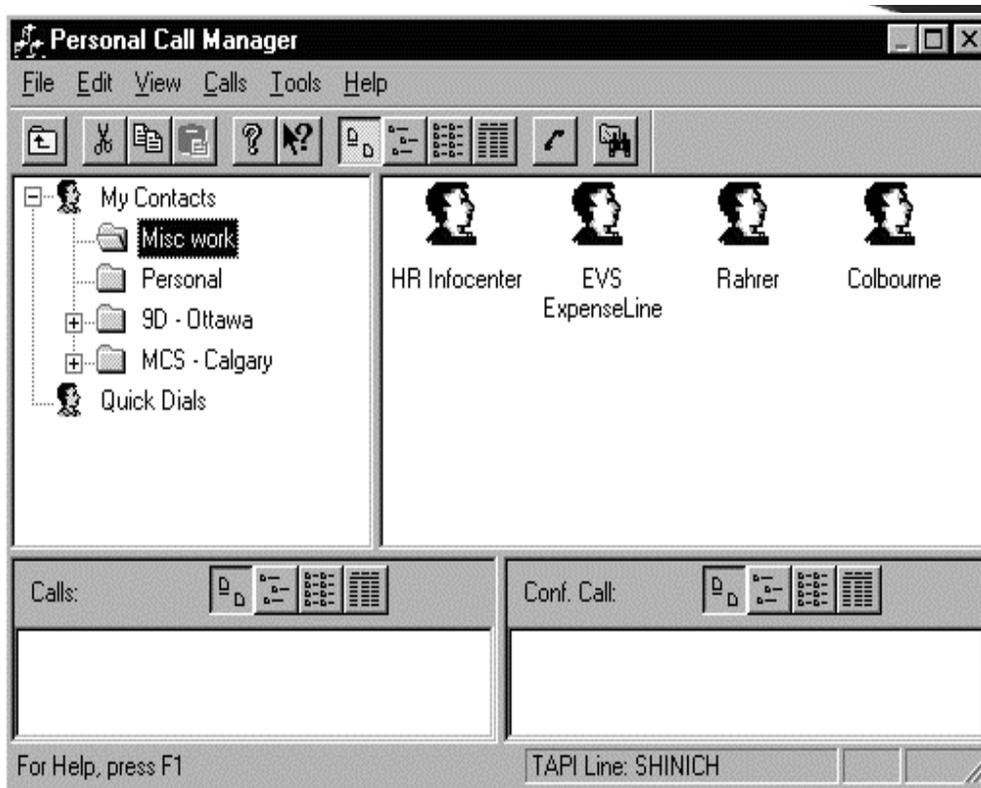
Personal Call Manager

Norstar Personal Call Manager (PCM) is an award-winning TAPI-based telephony application designed for use on Windows 95/98/NT/2000/XP operating systems. PCM brings much of the feature-rich Norstar user interface to the Windows 95/98/NT/2000/XP desktop computer. With PCM, users can access an internal database directory, double-click on a name to dial and conference or transfer calls, all with the ease of a mouse. This ease of use eliminates the guesswork and perceived frustration of using advanced telephone features.

Personal Call Manager 1.2, which the Norstar Personal Productivity Suite includes, 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. From the task tray icon, users can perform the most common telephony tasks, such as dial, hang-up, transfer and conference. The icon also provides access to the last callers/called list and quick dials. Users can perform more complex telephony operations on the main application window, as well as access the personal address book. The look and feel of this window follows the Windows 95 style guidelines.

Figure 68 Personal Call Manager
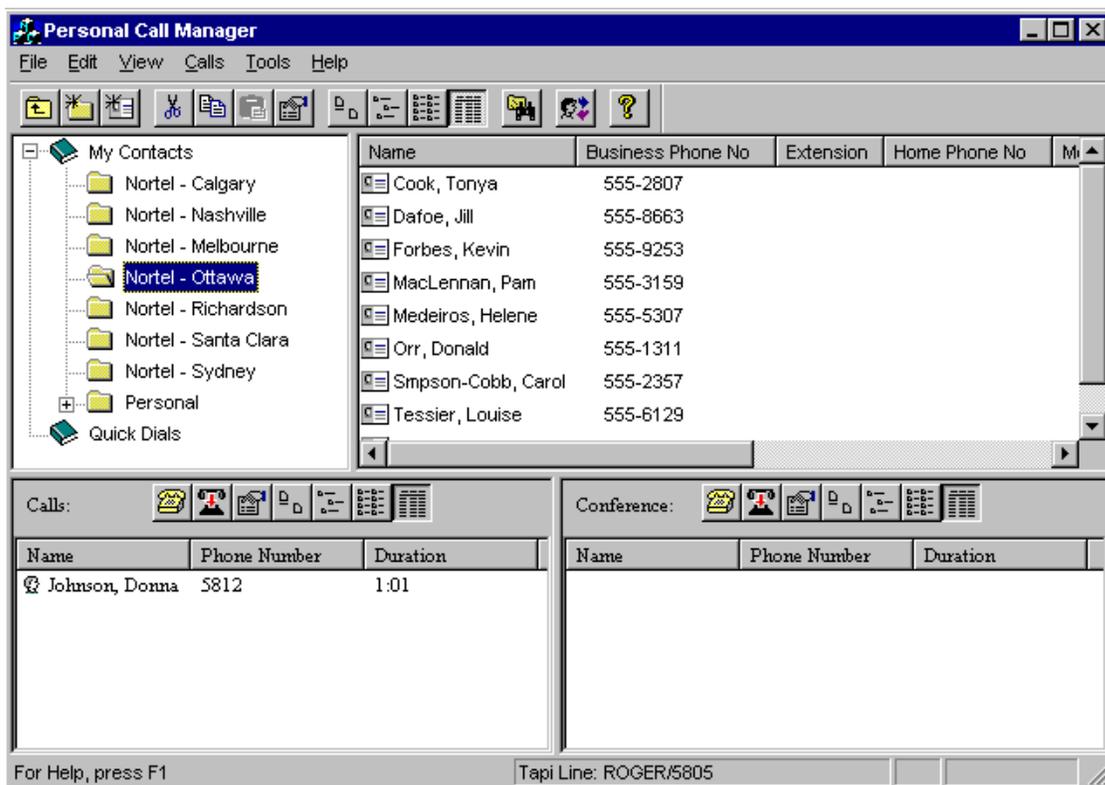
Norstar Address Book

The Address Book is the portion of Personal Call Manager 1.2 where users store telephone numbers and addresses of the people and businesses they 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 users want to keep track of or store in PCM. Features of the address book include:

- Hierarchical tree view of contacts – lets users sort and organize the folders within the address book to meet his or her individual needs. The left side of the window shows the tree structure (i.e., how folders are organized), and the right side of the window shows the contents of the highlighted folder. Users can view the contents 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).

Personal Call Manager Features

Users can invoke all PCM features using either a mouse or the keyboard. The primary benefit of the PC interface is that call management is visual, and most easily handled by "drag and drop." Common features include:

- **Dial** – lets users make calls using task tray or Calls menu, the toolbar, the Address Book or the Quick Dial list.

- **Answer/Hold/Unhold** – notifies the user of an incoming call and its CLID (if the user/business subscribes to the service). The icon changes as the status of the call changes from active to held.

- **Multiple Calls** – 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 the user answers a second call, the current call is automatically placed on hold.

- **Conference** – connects the user 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)** – transfers a call to another Norstar set; 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** – forwards calls to a different telephone set and displays, on the original set's status bar, the number to which a user's telephone is forwarded. The Norstar TSP does not support call forwarding to an external telephone number.

- **Do Not Disturb (DND)** – lets users work uninterrupted. The telephone will not ring, but the line indicator will flash. The dialog box, "You have a new call," will still appear on the user's PC screen when his or her set is on DND.

- **Calling Line Identification (CLID)** – displays telephone numbers of incoming calls on the telephone set if the user or business subscribes to a CLID service.

- **Call Duration** – performs a running count of how many minutes the call has been connected; this number appears next to the active call icon.

- **Last Callers/Call Log** – 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.

- **Duplicate contact records** – notifies users when they enter a duplicate contact record.

- **One-step call release** – disconnects the call without requesting the user to select the appropriate call. The system will perform this function if only one call is displayed on PCM and the user requests disconnect.

- **Printing capabilities** – allow users to print the call log, a single contact and the folder contents.

- **Open contact for incoming calls** – adds a new option to the Tools/Preferences menu that enables a contact record to automatically pop when a user answers an incoming call.

- **Sort capability in Call Log** – lets users sort both the incoming and outgoing call log by any of the fields (i.e., name, phone number, date and time or call duration).

System Requirements

To run the PCM software, computers must meet the following minimum system requirements:

- 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.

Norstar TAPI Service Provider (TSP) 4.2

The Norstar TAPI Service Provider 4.2 delivers significant functionality into the desktop CTI solutions arena. Norstar users can 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 is a product developed by Microsoft to provide a "standard" interface between the telephone switch and PC applications. Microsoft TAPI provides standards for:

• Third-party call control

• Full 32-bit implementation and support of 32-bit service providers

• Support for Windows XP Workstation and Server

• Call queuing.

Microsoft TAPI 2.1, released in 1997, specifically added remote client support. This support enables a user to run 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. The PC must, however, be "registered" at the server as a remote client, and the remote client option of Microsoft TAPI 2.1 must be 'turned on" at the PC.

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

TSP 4.2 Features

TSP 4.2 was developed to support the features of TAPI 2.0, 2.1, and 3.0. TSP 4.2 includes the following list of features:

- **Support of Windows 2000 at the desktop** – means that Norstar CTI can now work at Windows 95/98/NT4/2000 and XP 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 –** means that Norstar TSP 4.2 can be used in a configuration where the CTA device (CTA 100 or CTA 160*i*) is connected directly to a desktop PC and Norstar set, similar to the configuration used with earlier versions of TSP.

- **Server-connect CTI** – means that a single CTA device can be connected to the Norstar and to a Windows 2000 server, and any PC on the LAN can enjoy the benefits of CTI and TAPI applications through use of a TSP 4.2 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 and Windows 2000 Server for each server-connected PC. Licenses are based on the number of DNs to be monitored rather than the number of PCs connected to the server.)

- **Full support for the entire CTA family** – TSP 4.2 includes software drivers for the CTA 100 and CTA 160*i* products.

- **Auto detect of the CTA device** – TSP 4.2 will automatically detect which COM port the CTA device is connected to, eliminating the need to set the correct COM port during installation.

Via a Norstar CTA device (CTA 100 and CTA 160*i*), Norstar TSP 4.2 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 4.2, 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 95/98/2000/XP, and by all of the CTA devices.

In order to implement CTI in a server-connect mode, the CTA device must be supported by Windows NT 4.0 and Windows 2000, 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."

TAPI Application Examples

Using a Norstar Computer Telephony Adapter to connect the PC to the Norstar, businesses can now enjoy the many benefits CTI offers. The Norstar CTA 100 and CTA 160*i* can provide a wide array of business solutions that can fit into many existing LAN, client/server or standalone PC environments.

TAPI, the Microsoft standard for the desktop environment, allows a Windows application to operate on many different switch platforms with little or no modification. In order to support TAPI, Nortel Networks 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 Personal Call Manager runs on the user's 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.

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/2000/XP 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, an external box that sits on the desktop, or it could be a CTA 160*i*, an internal card installed in the PCI slot on the desktop PC.

Figure 69 Direct Connect Example
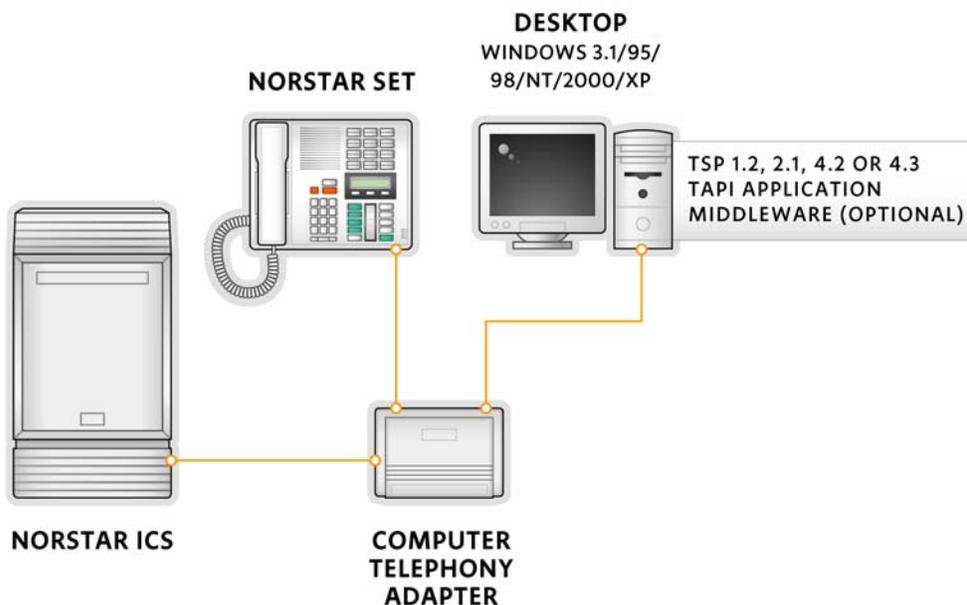
Direct Connect in a LAN Environment

PC users who 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 let employees 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. A variety of middleware applications, such as Symposium Partner Program's Revolution Rapport, are readily available. The specific middleware used will vary depending upon the database being accessed. The Norstar Information Bureau can provide assistance.

Figure 70 Direct Connect in a LAN Environment
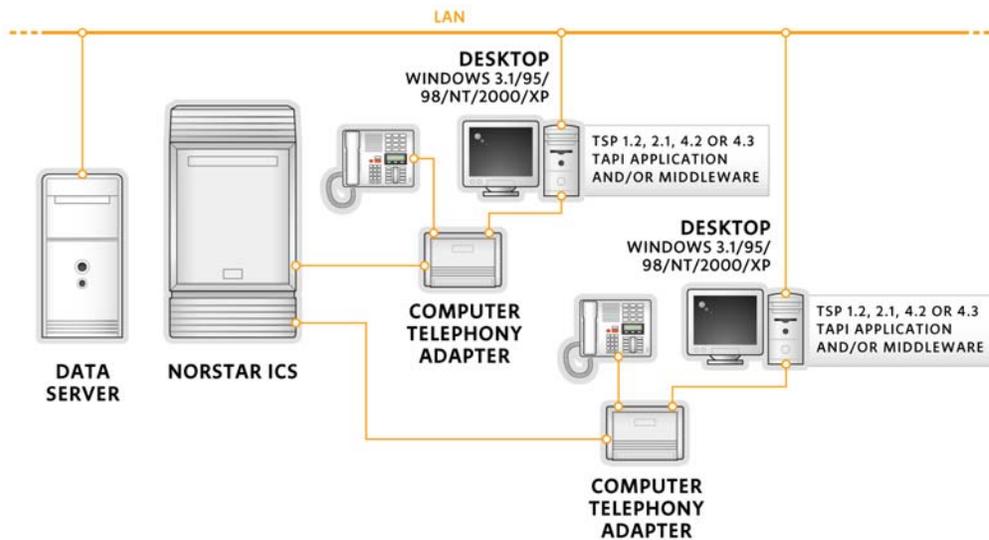
Server Connect in a LAN Environment

In the server-connect model, one CTA device is connected to a Windows NT 4.0, 2000 or XP server, and there is a logical relationship between the other Norstar telesets and the user. TSP 4.2 is installed on the Windows NT 4.0, Windows 2000, or Windows XP 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, the system administrator completes a table that identifies which user (person) is associated with which Norstar teleset. Users can then log on to the LAN from any PC (using their user ID and password), and control the functions of their phone. This is an example of third-party call control. Each desktop PC must have the TAPI 2.1 or 4.2 Remote Service Provider "turned on."

Figure 71   Server Connect in a LAN Environment
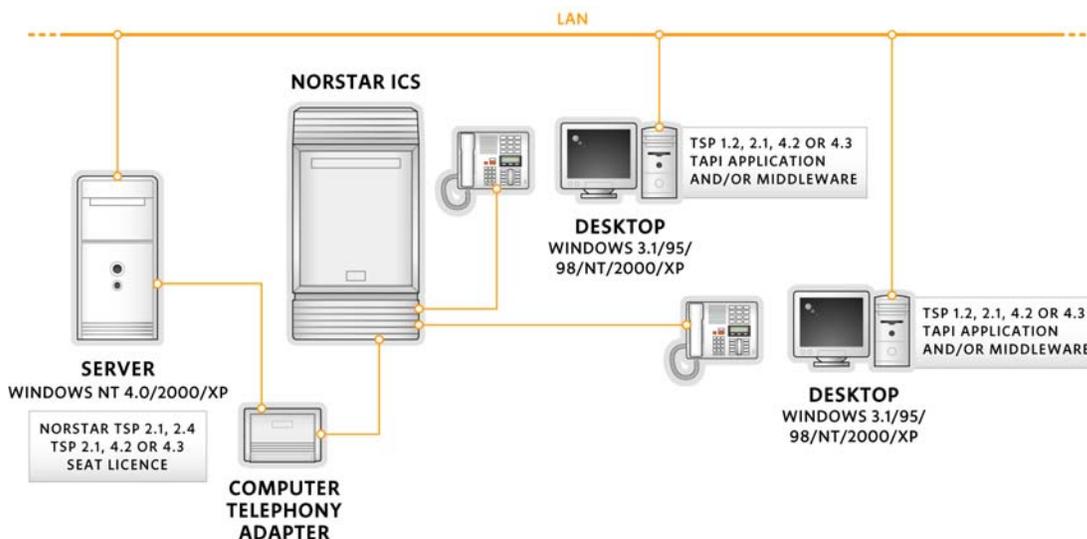
Norstar Computer Telephony Adapters

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 4.2 and Norstar Personal Call Manager software application.

The primary purpose of the CTA 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/2000/XP PC.

Note: All CTA devices listed 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. It 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 setup 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.

Figure 72 CTA 100 Connection
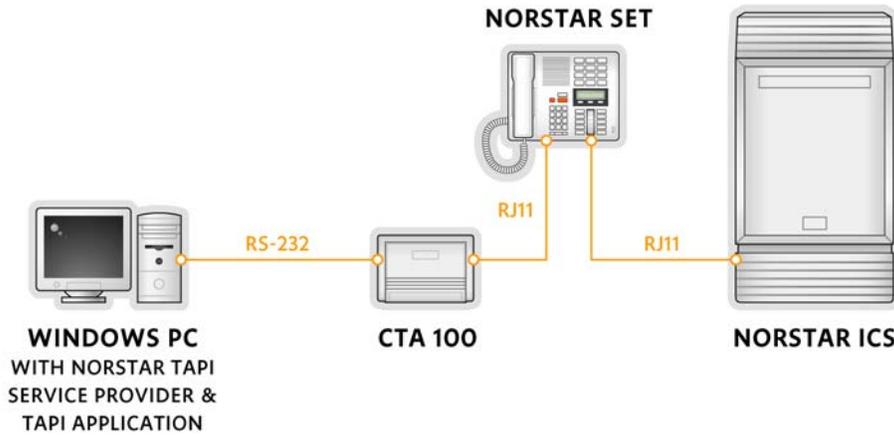
The previous figure shows the direct connection of CTA 100 to a Norstar ICS and a Norstar set. The CTA 100 is connected to a local PC through an RS-232 connection. The RS-232 connection provides serial connectivity to the local PC via a 9-pin connector.

Since the CTA 100 provides TAPI connectivity, Norstar customers can 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 160*i*

The CTA 160*i* provides a direct interface linking the desktop PC to the Norstar system and telephone set by insertion into an industry standard PCI slot in the PC. The CTA 160*i* automatically determines correct settings, eliminating the need to set dip switches. Users should use the CTA 160*i* if an RS-232 or USB port on a PC is unavailable. The CTA 160*i* performs the same functions as the CTA 100.

The CTA 160*i* is an excellent alternative for users who prefer the aesthetics of an internal solution as well as users who do not have an available serial port on their PCs.

Figure 73 CTA 160i Connection
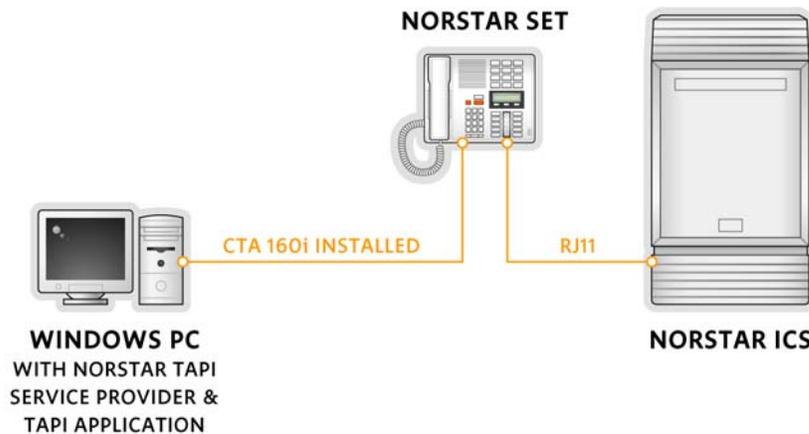
The CTA 160*i* package includes:

- CTA 160*i* device
- Norstar Personal Productivity Suite
- All necessary cables.

Norstar TAPI Components

Components for Norstar TAPI implementation are described in the following table

Table 45   Norstar TAPI Components

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), Windows 95/98, Windows NT 4.0, Windows 2000, Me. 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.
Microsoft TAPI software	Allows a PC application to talk to a telephone system.	Built into Windows 95/98/NT/2000 or Me. 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 160*i*	Card which provides a direct interface linking the desktop PC to the Norstar system and the telset. Fits into industry standard PCI slot of the PC.	Bundled with the Norstar Personal Productivity Suite. Package includes all cables. Does not require a power supply.
Norstar Telephones	T7100, T7208, T7316E	Purchased from Nortel.

Component	Detail	Source
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

The CTA 100:

- Is simple to install – just plug in the cables and install the software

- Is for server-connect CTI environment

- Is ideal for self-installation by the end user – no need to open the PC

- Is ideal for sales demos using portable laptop computers

- Has a low risk of software conflicts since the CTA 100 uses COM1 or COM2 software interrupts, which are standard.

When to use the CTA 160*i*

The CTA 160*i*:

- Offers 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.

Table 46   CTA 100 and CTA 160i Comparison

Feature	CTA 100	CTA 160i
Connectivity to PC	RS-232	PCI
TAPI support	Yes	Yes
Can be used in Server Connect Mode	Yes	Yes
Applications support	Basic	Basic
Serial Port Required	Yes	No
External Power Supply	Yes	No
Direct Connect Mode		
Windows 95	Yes	Yes
Windows 98	Yes	Yes
Windows NT	Yes	Yes
Windows 2000	Yes	No
Windows ME	Yes	No
For Client PCs in a Server Connect Mode (server must be Windows NT 4.0, 2000 or XP)		
Windows 95	Yes	Yes
Windows 98	Yes	Yes
Windows NT	Yes	Yes
Windows 2000	Yes	No

Nortel Networks Developer Program

The Nortel Networks Developer Program is designed to provide technical and marketing support to companies who work closely with Nortel Networks customers and distributors in delivering 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, companies receive a smooth implementation, prompt problem solving, and the best-in-class solution for their business needs.

For more information, visit:

http://www.nortelnetworks.com/prd/dpp/

Remote Administration

Remote Administration

Chapter Highlights

- Norstar Remote Utilities (NRU) – is the suite of remote programming, administration and maintenance tools for Norstar systems; it uses a PC to perform functions such as moves, adds and changes, in addition to other programming-related tasks

- ICS Tools – is a software package that consist of four tools and presents a series of windows and menus that allow users to navigate through different areas of the application and easily enter information and programming

- Remote Set Tool – is a fast, effective and easy-to-use remote administration tool that provides Windows-based capabilities for configuring, administering and maintaining Norstar systems and peripherals

- Backup and Restore Tool – retrieves a complete copy of all programming information or selected programming information from the ICS and stores it on a user's PC hard drive

- Browser Tool – lets users see and make changes to the ICS programming using an online connection

- Offline Programming Tool – uses a Microsoft Excel workbook to make system programming changes from a PC for downloading at a later time, helping to reduce costs by reducing the online time required to make system changes.

Chapter Overview

Norstar Manager was developed and introduced to the North American market in 1992 to provide an effective remote programming, administration and maintenance tool for Norstar systems. Over the years, this product has evolved and changed to include new tools and enhancements. Today, this suite of remote programming and maintenance tools is known as Norstar Remote Utilities (NRU).

Note: NRU Release 10.0 supports Modular ICS Release 6.1.

All versions of the Norstar Manager and NRU software use a PC to perform much of the programming required for new installations, adds, moves, changes and maintenance support on Norstar systems. For example, the following system changes can be completed from a remote site:

- Change the features programmed on the buttons of individual telephone sets
- Update the system speed dial list
- Backup system data
- Restore system programming from a backup
- Add, remove or change telephone DNs
- Add, remove or change line and ringing assignments on sets.

Emerging Trends

Businesses today are increasingly taking advantage of communications solutions that provide centralized configuration and management capabilities, as moves, adds and changes (MACs) are best performed from one location at a central PC. Centralizing MACs eliminates site visits for these requests while giving the service facility control over the Norstar system's configuration so that it is always up to date. Moreover, this capability not only lowers the cost of such services, but reduces the time needed to deliver them.

Companies are drawn to solutions like Norstar ICS systems because they improve efficiency in the area of technical support and save money in terms of personnel costs. Remote administration from a PC desktop is another marketplace demand, and businesses are choosing systems based on this capability.

Benefits

With the advanced remote administration tools Norstar systems offer, businesses can realize specific benefits, including reduced programming time and training costs, as well as reduced site visits. In many cases, NRU can fix the problem, saving the time and expense of a service call.

All of Norstar remote administration tools have been designed to enable channels and end users to provide superior service levels and cost-effective support of their Norstar systems.

Specific benefits offered by Norstar remote administration tools include:

- Reduction in customer site visits for service and maintenance
- Faster handling of service requests
- Centralization of technical expertise and system data
- More effective and timely service delivery.

Norstar Remote Utilities Connectivity

The NRU software application is installed on a windows-based PC located at a central administration site or at the phone system site. The NRU software on the PC and the Norstar ICS communicate through a Remote Access Device (RAD). A RAD must be installed at each of the phone system sites. There are two types of RADs available:

• Internal Remote Access Device (I-RAD). This device is available on the Compact ICS system only. The I-RAD is encased in the Compact ICS unit and is activated by software keycode.

• FastRAD2. This device is an external device which connects to the Norstar ICS via a TCM port. The FastRAD is used with all Norstar systems except the Compact ICS.

Figure 74 Norstar Remote Utilities Connectivity

PERSONAL
COMPUTER

REMOTE ACCESS
DEVICE
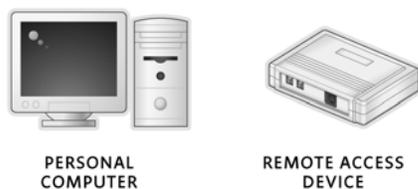
Local Connectivity

Local connectivity for customers who wish to use the NRU software to administer the Norstar phone system on-site is very simple. The PC running NRU software is connected to the RAD which is, in turn, connected to the Norstar ICS. This configuration allows the user to configure and maintain the Norstar system using a PC rather than the station set interface.

Remote Connectivity

NRU, in conjunction with the RAD, can be used to remotely program, administer and maintain Norstar systems. In this scenario, the PC running the NRU software would be located at a remote, central administration site. The RAD would be connected to the Norstar ICS at the phone system site. The RAD can auto-answer an existing line on the Norstar system or calls can be manually transferred to the RAD by an on-site operator. This eliminates the need for a dedicated line for remote maintenance.

The connection between the remote, central administration site and the phone system site can be made over a standard telephone line or over the IP network.

Figure 75 Standard Telephone Line Connection
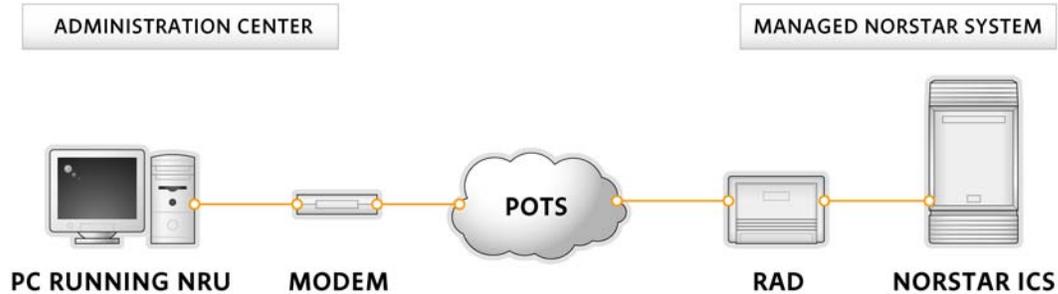
In this configuration, the PC running NRU at the remote, central administration site must be equipped with a standard modem. The PC can then outdial to the RAD at the phone system site, establish a connection and proceed with system programming changes.

Figure 76 IP Network Connection
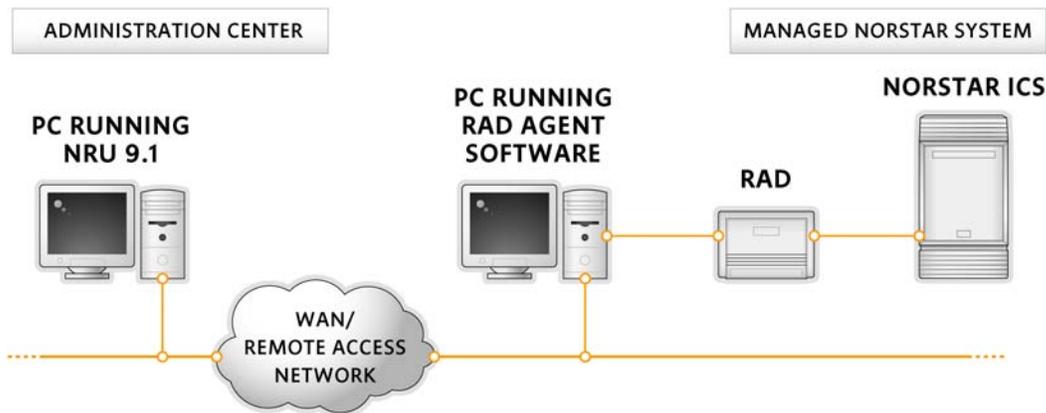
Remote administration of a Norstar system over the IP network utilizes the RAD Agent Software which is included on the NRU CD-ROM. In this scenario, two PCs are required. A PC running NRU would be located at the remote, central administration site, and a PC running the RAD Agent Software would be located at the phone system site. Both of these PCs must have a LAN connection to the IP network. The PC at the administration site accesses the IP network and sends the administration information to RAD Agent enabled PC at the remote site. When the remote PC receives the signal, the RAD Agent Software accepts the information and converts it into a code that the RAD, and hence the Norstar, can understand in order to execute the command.

Norstar Remote Utilities

NRU consists of:

- ICS Tools
- RAD Agent Software
- Documentation
- Norstar Voice Mail Manager.

NRU includes all of the above; however, the user has the option of installing all or only some of the components.

NRU 10.0 retains all of the previous functionality of NRU 9.1 and is compatible with Compact ICS/Modular ICS 6.1.

ICS Tools

The Norstar ICS Tools software package consists of four tools:

- The Remote Set, a part of the previous releases of NRU
- A faster Backup and Restore tool for Compact ICS 2.0 and Modular ICS 2.0 and higher
- A Browser tool which allows users to make program changes using an expanded view of ICS programming
- An Offline Programming tool which allows users to make ICS programming entries or changes for downloading at a later time.

Users can deploy the faster Backup and Restore tool, the Browser tool and the Offline Programming (OP) tool with Norstar Compact and Modular ICS 2.0 or higher. The Remote Set tool can be used with any previous release of Norstar software, except 3x8, Compact 6x16 and Modular 8x24 DR 1.

ICS Tools presents a series of windows and menus which allow you to navigate through the different areas of the application and easily enter information and programming.

Remote Set Tool

The Remote Set tool is a fast, effective, and easy-to-use remote administration tool that provides Windows-based capabilities for configuring, administering and maintaining Norstar systems and peripherals. The simulated Norstar set consists of keys and text displays and provides the interface from which the user can perform the same programming or set activity that can be administered from a normal on-site extension.

The Remote Set tool provides the following capabilities:

*   Multimedia interface that simulates a Norstar set of the desired type when programming

*   Remote configuration, administration and maintenance functions for most Norstar system types and software

*   Ability to remotely program voicemail features except those functions requiring voice capability

*   Direct queries of device status

*   Copying of extensions and lines within a system.

Backup and Restore Tool

The Backup and Restore tool can be used with Compact or Modular ICS 2.0 or higher systems. The Backup and Restore tool retrieves a complete copy of all programming information, or selected programming information, from the ICS and stores it, usually on your PC hard drive.

Users can deploy this new method when they:

*   Install a new Norstar system

*   Backup customer programming

*   Make significant changes to the programming of an ICS.

Browser Tool

The Browser tool allows users to view and change the programming of Norstar Modular ICS and Compact ICS systems running software version 2.0 or higher.

Similar to the Remote Set tool, the Browser tool lets you see and make changes to the ICS programming using an online connection. Instead of simulating the telephone display, the Browser tool shows the multiple levels of the programming tree (Tree List).

With the Browser tool, users can:

- Show and hide headings, subheadings and settings by expanding and collapsing the levels of the Tree List
- "Open" a heading to see additional settings
- Change settings by selecting options and entering information
- Change settings by adding or removing items from lists
- Use a dialog box to copy settings
- See programming upgrades take effect by refreshing Tree List.

Offline Programming Tool

The Offline Programming (OLP) tool uses a Microsoft Excel workbook, formatted to resemble the paper ICS programming record, to make system programming changes from a PC for downloading at a later time. Offline Programming reduces the amount of online time required to implement system programming changes. Also, the ability to schedule the update time means that, after hours, human supervision is not required to implement major system changes.

With the Offline Programming tool, users can:

- Manually enter programming data into the ICS Excel workbook
- Acquire full or partial programming information from an ICS which is already programmed and use it to populate an ICS workbook file
- Alter full or partial ICS programming data by manipulating the ICS Excel workbook and then transferring the updated programming to the ICS by manual activation or time scheduling.

Norstar Remote Utilities Software Features and Benefits

The following table describes the primary features and benefits common to Norstar Remote Utilities software.

Table 47   Norstar Remote Utilities Software Features and Benefits

Feature	Benefits
Remote System Programming Speeds Installation, Reduces Installation Costs	Whether installing a new system or a system upgrade, NRU reduces the time traditionally required to enter Norstar system data through an on-site telephone set. Programming is performed at a centrally located PC and then downloaded to the Norstar system either immediately or at a later scheduled time. Programming time can be reduced as much as 50%. Field technicians no longer have to be trained software programmers. Programming is completed in a central location while field staff use their time and expertise for the physical installation of equipment.
Remote Troubleshooting Reduces Number of On-site Visits, Speeds Problem Resolution	NRU provides the service facility with a window on all of its Norstar systems. When a Norstar system reports a problem, NRU can find the source before a repair crew makes a trip to the site. In many cases, the problem can be fixed by NRU, saving the time and expense of a service call. This remote troubleshooting capability can lead to significant cost savings by reducing site repair visits by at least 30%. When a problem occurs, an automatic alarm notification is received from the system. NRU uses a modem and the Norstar system's RAD to access the system. The Norstar system parameters are checked and the software performs a diagnostic test. If necessary, the service facility can check for faults in the system and in the wiring between the system and the telephone sets. Note: Cold restarts, the equivalent of start-up from an on-site set, are not supported by NRU.
Remote Moves, Adds, Changes Reduces Costs, Speeds Service	Most moves, adds and changes can be performed from the central PC, eliminating site visits for these requests. This not only lowers the cost of such services, it also reduces the time needed to deliver them. Centralizing moves, adds and changes also gives the service facility control over the Norstar system's configuration programming so it's always up to date.

Feature	Benefits
Online Programming Reduces Installation Costs, Increases Programming Flexibility	Online programming (using NRU's Tree Browser) provides remote programmers with the same real time access to Norstar systems that on-site system administrators have. Online programming lets the user call a remote Norstar system and perform all the functions that an installer or system administrator would normally perform using one of the system's on-site Norstar telephones. Some of the functions that can be viewed in an online session include: Button assignments on all sets Call processing status of sets (Busy/Idle, Call Forward, Do Not Disturb) Set levels for display contrast, ringing volume, ring type, language, etc. Complete Norstar programming for system, line and set parameters System inventory that gives a summary of what equipment is attached to the Norstar system.
Centralized System Database Increases Marketing Opportunities	NRU can take a current inventory of an installed Norstar system's equipment. This information can be used to create a central database for sales and marketing. For instance, a check of the database would reveal which systems have Norstar Voice Mail and which do not, indicating who should receive sales calls. The inventory information provides these details: System type Design release of the system hardware and software Station and trunk module. Sets or terminals attached to the system.
Enhanced Maintenance Database Increases Revenue	NRU provides two enhanced maintenance features which can be used as revenue generating options for maintenance contracts. The first is Alarm Monitoring. With this feature, the RAD – the communications link between Norstar and the application PC – will recognize alarm messages. The RAD will then automatically dial up to two pre-programmed numbers and send an alarm message back to the service facility. The second enhanced maintenance feature is Backup and Restore. This maintains a Norstar system's most recent programming for fast and complete restoration – without an on-site visit – in the event system programming is lost. Both of these features ensure that major system problems will be recognized and resolved quickly and completely.

Feature	Benefits
Security Protects System Integrity	NRU provides two levels of security - site security and operations security. With site security, each Norstar installation accessed by NRU is assigned its own site ID. The site IDs are checked to insure each is unique and used by only one site. Communication between NRU software and the Norstar system RAD will not be allowed until the proper site ID is presented to the RAD at the initial stages of the call set-up. With operations security, each person allowed access to NRU must have a user ID and password. Further security is provided by the proprietary communications protocol between the RAD and NRU.
Programming Record Increases Flexibility of Record Keeping	The Tree Browser and the OLP tool can be used to print a hard copy record of the system programming. The record includes information for all lines, sets, restrictions, overrides, etc. The record is easy to read and serves as a permanent record of system programming data.
Offline Programming Decreases Costs, Improves Productivity	The OLP tool allows the user to make ICS programming changes using their PC for downloading at a later time. This tool helps reduce costs by reducing the online time required to make system changes. Specifically: Option to acquire or transfer partial system programming rather than complete system programming For major system changes, reduce users' online time to the time required for data transfer only not data entry and transfer. Additionally, the ability to schedule downloading means that major changes (which may require taking the entire system down) can be entered during business hours but scheduled for implementation at night. This eliminates the need for human supervision of this process and reduces the businesses downtime.

Site License Agreements

NRU is distributed via site license agreements to assist distributors and major accounts in managing their internal and external configurations. NRU allows for a reduction in operational costs, creates new service revenue opportunities and positions a distributor as a responsive service provider through use of leading edge technology.

Option 1 – Single User Site License (CD-ROM)

- One non-reproducible copy of software and documentation
- License for a single user and single PC
- Option to purchase maintenance package for extension of agreement.

Option 2 – Multiuser Site License

- 10 non-reproducible copies of software and documentation
- Licenses for 10 specific sites/PCs
- Free upgrades based on terms of agreement which is re-negotiable annually
- Option to purchase maintenance package for extension of agreement
- Substantially reduced pricing over single site purchase.

Option 3 - Authorized Copier Site License

- One copy of software and documentation
- License to reproduce the software for an unlimited number of sites/PCs
- Free upgrades provided based on terms of agreement which is re-negotiable annually
- Option to purchase maintenance package for extension of agreement
- Option to purchase additional copies of documentation (ordered separately by CPC number)
- Substantially reduced pricing over single or multiuser purchases.

Norstar Remote Utilities Hardware and Software Specifications

Minimum Requirements

- 486 PC or higher (Pentium is recommended)
- A minimum of 16 MB RAM (32 MB RAM is recommended for OLP)
- 20 MB of virtual memory MS-DOS 5.0 or later
- 400+ kbs of conventional memory available in Windows
- Hard disk (minimum 100 MB free)
- VGA color monitor (640 X 480 pixels or higher resolution)
- CD-ROM drive
- Minimum Microsoft Windows 95
- Windows-compatible mouse
- A minimum of 14.4 Kbps Hayes-compatible internal or external modem
- One serial port (required for direct connection to RAD)
- 1.44 MB 3.5-inch floppy drive.

NRU can be used on-site with Norstar systems if the PC is equipped with RS-232 serial communications port. In this case, a modem is not required. However, a Norstar RAD must be attached to a station port on each Norstar system to allow communications between the PC and individual Norstar. The RAD acts as a modem and communications interface to the internal Norstar messaging system.

Appendices

Appendix A: Norstar Compatibility Matrix

This Compatibility Matrix is intended for reference purposes only. Please consult your local technical source for detailed specifications and ordering information.

Table 48   Norstar Compatibility Matrix

ICS Software Version	6.1	6.0	5.0	4.2	4.1.1	4.1	4.0	3.0	2.0	1.1	1.0
ICS System Products	CICS MICS	CICS MICS	MICS	CICS	CICS MICS	CICS MICS	CICS MICS	MICS	CICS MICS	MICS	CICS MICS
M Series Telephones	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Business Series Telephones (BSTs)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
T7316E	Yes[1]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
T24 KIM	Yes										
Message Waiting Lamp – BSTs	Yes	Yes	Yes	Yes	Yes						
T7406 Cordless	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Audio Conferencing Unit	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Doorphone	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Companion C3060 Portable	XC	XC	XC		XC	XC	XC	XC	XC	XC	CDA XC
Station Message Detail Recording (SMDR)	SMD R6	SMD R6	SMD R6	SMD R6	SMD R6	SMD R6	SMD R6	SMD R5	SMD R5	SMD R4	SMD R4
Voice Mail Interface (VMI)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Analog Terminal Adapters (ATA)	ATA2	ATA2	ATA2	ATA2	ATA2	ATA2	ATA2	ATA2	EATA	EATA	EATA
Analog Station Module (ASM)	Yes	Yes	Yes		MICS	MICS	MICS	Yes	MICS	Yes	
Norstar Data Interface (NDI)	Yes	Yes	Yes		MICS	MICS					
Remote Access Device (RAD)	Yes	Yes	Yes							Yes	MICS
Remote Access Device 2 (RAD 2)	Yes	Yes	Yes					Yes	MICS	Yes	MICS
FastRAD	Yes	Yes	Yes			MICS	MICS	Yes	MICS	Yes	MICS

ICS Software Version	6.1	6.0	5.0	4.2	4.1.1	4.1	4.0	3.0	2.0	1.1	1.0
ICS System Products	CICS MICS	CICS MICS	MICS	CICS	CICS MICS	CICS MICS	CICS MICS	MICS	CICS MICS	MICS	CICS MICS
FastRAD2	Yes	Yes	Yes		MICS	MICS	MICS	Yes	MICS	Yes	MICS
CTA100	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
CTA160i	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
CTA200		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Personal Productivity Suite	2.1	2.1	2.0								
TAPI 1.0								Yes	Yes	Yes	Yes
TAPI 1.4 to TAPI 2.0	Yes	Yes	Yes								
TAPI 2.1 to TAPI 3.1	Yes	Supp orted	Supp orted								
TSP 2.0	Yes	Yes	Yes				Yes	Yes	Yes	Yes	Yes
TSP 2.1	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
TSP 4.2 (Windows 2000 compatibility)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
TSP 4.3	Yes	Yes									
Personal Call Manager	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
PC Console		1.2	1.2	1.2	1.2	1.2	1.1	1.0	1.0	1.0	1.0
Norstar Remote Utilities (NRU)	10.0	9.1	9.0	9.0	8.1	8.1	8.0	7.0	5.0	5.0	5.0
Flash Light Voice Mail	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Flash Voice Mail	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.5	1.5	1.44	1.44
Call Pilot 100	Yes	Yes	Yes	Yes	Yes	Yes					
Call Pilot 150	Yes	Yes	Yes	Yes	Yes	Yes					
Norstar Voice Mail	4.1	4.1	4.0	4.0	4.0	4.0	4.0	3.0	2.1	2.0	1.0
PRELUDE & CINPHONY ACD	3.6	3.6	3.45. 006	3.3	3.3	3.3	3.1	3.0	2.00. 19	2.00. 15	2.00. 11
MINUET ACD	1.2	1.2	1.1	1.1	1.1	1.1	1.1	1.0	1.0	1.0	1.0
Flash ACD	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	
Dial By Name (DBN)	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.2	1.2	1.0	1.0
DS30 Adapter		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
OS/2 Access Version	6.0	6.0	5.0	4.2	4.2	4.2	4.0	2.6	2.5	2.2	2.0

Note:
[1] Version 6.1 CICS/MICS software is required to take advantage of the new feature functionality of the T7316E telephone.

Appendix B: Norstar/BCM Comparison Matrix

Table 49　Norstar/BCM Comparison Matrix

Feature	Compact ICS 6.1	Modular ICS 6.1	BCM 3.0
System Capabilities			
System Capacity	16X24 (BRI)	248 ports	≤ 309 ports [1]
Total Number of Stations	24	192	≤ 249 [2]
Redundant Power	No	No	Yes
Redundant Hard Drive	No	No	Yes
Redundant System Programming	No	No	Yes
Multiple language support	3	3	11
Digital Telephony	Yes	Yes	Yes
IP Telephony with QOS	No	No	Yes
Companion support	No	Yes	Yes
Wireless VoIP	No	No	Yes
DS Loop start	Yes	Yes	No
CLID Loop start	Yes	Yes	Yes-MBM
Analog DID	No	Yes	Yes-FEM+N[1]FTM
Analog E&M	No	Yes	Yes-FEM+N[1]FTM
ISDN PRI	No	Yes	Yes-MBM
ISDN BRI	Yes	Yes	Yes-MBM
T1/E-1	No	Yes	Yes[3]-MBM
Centrex (transparency)	No	Yes	No
Desktop Support			
M7100	Yes	Yes	Yes
M7208	Yes	Yes	Yes
M7310	Yes	Yes	Yes
M7324	Yes	Yes	Yes
T7100	Yes	Yes	Yes
T7208	Yes	Yes	Yes
T7316	Yes	Yes	Yes
T7316E	Yes	Yes	No
T24 KIM	Yes	Yes	No
T7406 Cordless	Yes	Yes	Yes
Audio Conference Unit	Yes	Yes	Yes
Analog Telephone support	Internal and External ATA	External ATA and ASM	External ATA and ASM MBM
Doorphone	Yes	Yes	Yes-Analog
i2002 Internet Telephone	No	No	Yes

Feature	Compact ICS 6.1	Modular ICS 6.1	BCM 3.0
i2004 Internet Telephone	No	No	Yes
i2050 Software Phone	No	No	Yes
Applications Support			
Voice Messaging	Hardware	Hardware	Keycode Enabled
Unified Messaging	No	Hardware	Keycode Enabled
Call Center	Hardware	Hardware	Keycode Enabled
Web Enabled Call Center (MMCC)	No	No	Yes
CTI	Hardware	Hardware	Keycode Enabled
Centralized Voice Mail (to M1)	No	Yes	Yes
Centralized Voice Mail (Norstar)	No	Yes	No
Centralized Voice Mail (BCM)	No	No	Keycode Enabled
Interactive Voice Response (IVR)	No	No	Keycode Enabled - RTE
MCDN over PRI Networking	No	Yes	Yes
MCDN over IP Networking	No	No	Yes
OAM			
Set-based programming	Yes	Yes	No
Windows-based programming	Yes	Yes	Yes
Web-based programming	No	No	Yes
SNMP	No	No	Yes
Network Management	No	No	Yes
Remote access	Yes	Yes	Yes
Remote programming	Yes	Yes	Yes
Remote diagnostics	Yes	Yes	Yes
Backup and Restore	Yes	Yes	Yes
Multisite System Management	No	No	Yes
Call Handling Features			
External Call Forward	Yes	Yes	Yes
Line redirection	Yes	Yes	Yes
Trunk to Trunk transfer	Yes	Yes	Yes
Privacy	Yes	Yes	Yes
Transfer	Yes	Yes	Yes
Conference	Yes	Yes	Yes
Call Pickup	Yes	Yes	Yes
Call Park	Yes	Yes	Yes
Hunt Groups	Yes	Yes	Yes
Caller ID logging	Yes	Yes	Yes
Call screening	Yes	Yes	Yes

Feature	Compact ICS 6.1	Modular ICS 6.1	BCM 3.0
DISA	No	Yes	Yes
Night Service	Yes	Yes	Yes
Coordinated Dialing Plan	No	Yes	Yes
Data Capabilities			
Data support through switch	No	No	Yes
Voice over IP – trunk	Yes	Yes	Yes
Voice over IP – station	No	No	Yes
QOS	No	No	Yes
Universal T1	No	Yes-NDI	Yes-DDIM
LAN Connectivity	External	External	Integrated
Internet access	Separate Hardware	Separate Hardware	Integrated
Router	Separate Hardware	Separate Hardware	Integrated
WAN Connectivity			
Frame Relay	No	No	Yes
PPP and PPPoE	No	No	Yes
Multi Link PPP	No	No	Yes

Notes:

[1] Subject to engineering rules. When all TDM resources are used for stations, 60 VoIP trunks remain available, along with support for IP stations.

[2] Total number of stations for BCM 3.0 a) 6/2 TDM/IP Split: ≤ 192 TDM + ≤ 58 IP for ≤ 250 Stations; b) 5/3 TDM/IP Split: ≤ 160 TDM + ≤ 90 IP for ≤ 250 Stations. Subtract 1 from these totals, required for provisioning VoIP trunks, leaving ≤ 249 Stations.

[3] European version of E1 supported on BCM.

ATA – Analog Terminal Adapter
DDIM – Digital Drop & Insert MUX MBM
FEM – Fiber Expansion Module (MBM)
FTM – Fiber Trunk Module (Norstar)
MBM – Media Bay Module
NDI – Norstar Data Interface
RTE – Run Time Engine

Appendix C: Product Manufacture Discontinue/End of Life Information

Table 50   Product Manufacture Discontinue/End of Life Information

Product	MD Date	EOL Date	Replaced by
Star Talk 110	Jan-95	Jan-05	Norstar VM
Star Talk 165	Jan-95	Jan-05	Norstar VM
Star Talk 385	Jan-95	Jan-05	Norstar VM
Star Talk Mini	Apr-95	Apr-05	Flash VM
6x16 KSU	Feb-97	Feb-07	CICS
8x24 KSU	Feb-97	Feb-07	MICS
NAM 1 (DVC)	Apr-97	Apr-07	NAM 2
Modular ICS 1.0 Software[1]	Sep-97	Sep-07	MICS 2.0 Software
Compact ICS 1.0 Software[1]	Sep-97	Sep-07	CICS 2.0 Software
Norlink	Mar-98[3]	Mar-03	CTA
Modular ICS 2.0 Software[1]	Jul-98	Jul-03	MICS 3.0 Software
NAM 2 (DVC/MSBIC)	Aug-98	Aug-03	NAM 2g
Modular ICS 3.0 Software[1]	Jan-99	Jan-04	MICS 4.0 Software
Compact ICS 2.0 Software[1]	Jan-99	Jan-04	CICS 4.0 Software
Modular ICS 4.0 Software[1]	Sep-99	Sep-04	MICS 4.1 Software
Compact ICS 4.0 Software[1]	Sep-99	Sep-04	CICS 4.1 Software
NAM 2g (MSBIC)	Oct-99	Oct-04	NAM 3g
CTA 150i	Nov-99	Nov-04	CTA 160i
CTA 500	Jan-00	Jan-05	No replacement
M7410	Feb-00	n/a[2]	T7406
IDM 200	Apr-00	Apr-05	NDI
Copper Trunk Module	Apr-00	Apr-05	Fiber Trunk Module
Copper Station Module	Apr-00	Apr-05	Fiber Station Module
Copper Expansion Cartridge	Apr-00	Apr-05	Fiber Expansion Cartridge
Norstar IVR	May-00	May-05	No replacement
Norstar Healthcare Receptionist	May-00	May-05	No replacement
Modular ICS 4.1 Software[1]	Dec-00	Dec-05	MICS 4.1.1 Software
Compact ICS 4.1 Software[1]	Dec-00	Dec-05	CICS 4.1.1 Software
Modular ICS 4.1.1 Software[1]	Jul-01	Jul-06	MICS 5.0 Software
Compact ICS 4.1.1 Software[1]	Jul-01	Jul-06	CICS 4.2 Software
Modular ICS 5.0 Software[1]	Nov-02	Nov-07	MICS 6.0 Software
Compact ICS 4.2 Software[1]	Nov-02	Nov-07	MICS 6.0 Software
Modular ICS 6.0 Software[1]	Jun-03	Jun-06	MICS 6.1 Software

Product	MD Date	EOL Date	Replaced by
Compact ICS 6.0 Software[1]	Jun-03	Jun-06	CICS 6.1 Software
CII (Compact & Modular)	May-02	May-07	No replacement
Legacy (6x16 & 8x24) DR 5.1 Software	May-02	May-07	CICS or MICS
Norstar Voice Mail Speech Rec	May-02	May-07	No replacement
M7410 Batteries	May-02	May-07	T7406
Voice Mail Interface (VMI)	May-02	May-07	No replacement
CTA 200	May-02	May-07	CTA 100
FlashTalk	Dec-02	Dec-07	CallPilot 100
M7100, M7208 & M7310	Jan-03[4]	Jan-06	BSTs
PC Console	Feb-03[5]	Feb-06	No replacement
Notes: [1] Core MICS/CICS software is automatically manufacture discontinued when new software is made available. Support is on new software only. [2] EOL doesn't apply to the M7410 since it was addressed via the Refund Program (Mar-01). [3] 10 year support - post MD date ended Dec-97. [4] 5 year support - post MD date ended Dec-02. [5] Current support is 3 years - post MD date.			

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