



Product Reference Guide

Polycom VSX 7000



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1. VSX 7000 Product Release Highlights

- **What's being announced?**
 - ***Polycom VSX 7000 - The best quality, most advanced video conferencing product available at the Entry Level! This set-top appliance provides great quality audio and video with a new, user friendly interface.***

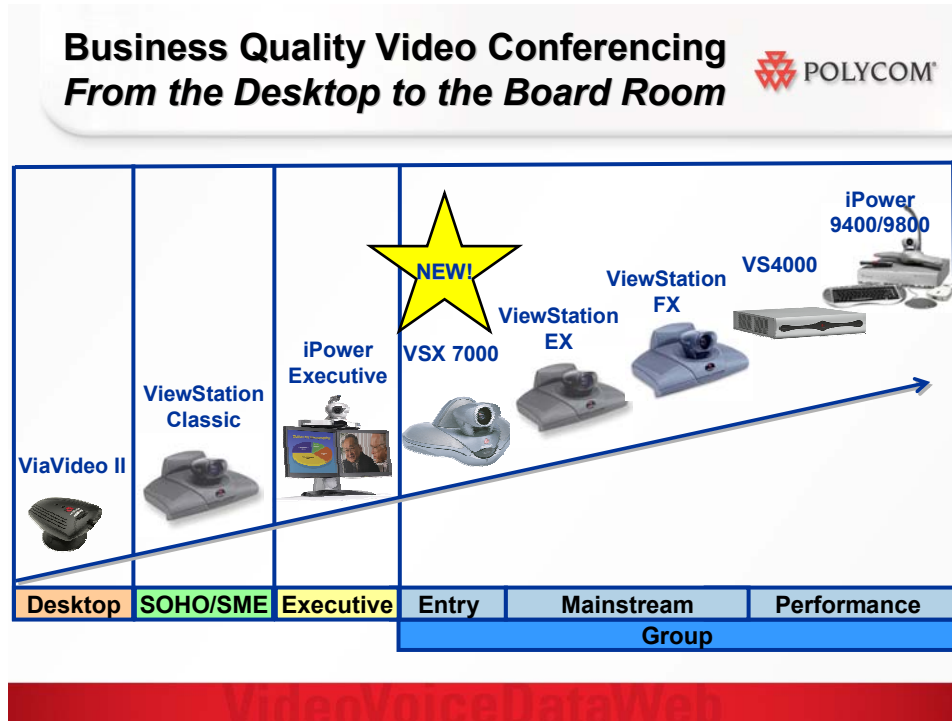
- **When is it being announced?**
 - **Worldwide announcement October 6, 2003 (8:30 a.m. EST US)**

- **Where is it being announced?**
 - **It is being announced globally via Press Release**

- **When is it available?**
 - **October 6, 2003**



2. VSX 7000 Positioning



Product Positioning

- The VSX 7000 is a compliment to the current Polycom video product line and extends the Polycom video product offerings to deliver new levels of price/performance at the *Entry Level*.
 - The VSX 7000 will be launched in the ENTRY category
 - The ViewStation Classic systems (ViewStation SP products, and ViewStation H.323, 128, 512 and MP) are positioned in the SOHO/SME category
 - The ViewStation EX/FX are in the MAINSTREAM category
 - The VS4000 and iPower 9000 series are in the PERFORMANCE category



VSX 7000 Overview and Messaging

***For the first time, the best quality, most advanced video conferencing
is now available at the **Entry Level*****

Polycom's latest entry-point system offers no-compromise video and audio performance. Just some highlights:

- Near-CD Quality, Crystal Clear Audio
 - Polycom delivers, unparalleled audio as crystal clear and powerful as being in the same room, with Siren 14 - 14 kHz fidelity audio, and new Subwoofer.
- TV-like Video
 - Using the most advanced technology, Polycom delivers exceptionally natural, smooth motion video with H.264 and Pro-Motion
- Innovative Ease of Use
 - New graphical user interface designed and customizable for "easy-to-use" everyday videoconferencing, and manageability, including: Polycom Dual Monitor Emulation; Polycom Kiosk mode, and Customizable Camera Icons
- Ultimate versatility
 - Expandability options enable the VSX 7000 to be configured for any application
- ...And an integrated part of The Polycom Office.

Target Customers

VSX 7000 is targeted to any person who needs to work with others, to share ideas and to get things done. This includes:

- Traditional videoconferencing users who want the very best video and audio quality
- Users who want to broaden and deepen their use of technology and multimedia to be more efficient in increasingly geographically dispersed organizations
- Potential new users who demand systems that will support the way they want to communicate at a distance

Examples of applications of videoconferencing that are good candidates to use VSX 7000:

- Enterprises and Organizations that find the following features especially attractive:
 - Quality of the video and audio – delivering the best experience ever
 - Ease-of-use of Polycom's user interface – anyone knows how to use it
 - People+Content™ – gives users a natural feeling of being there, and seeing the material to present and discuss topics



- Healthcare Applications
 - Quality of the video and audio for the most demanding applications
 - People+Content™ for showing high resolution documents and images
- Educational/Distance learning applications:
 - Quality of the video and audio – delivering the best experience ever
 - Customizable camera source selection icons
- IT departments like VSX 7000 because of:
 - Robust management capability with Polycom Global Management System™ and built-in Web server
 - Alarms allow administrators to be pro-actively aware of problems with keyboard/remote battery, microphone, camera, directory, gatekeeper, etc.

3. Product Description

The following are the components and software options of the VSX 7000:

Base Components	Set-top unit Subwoofer Microphone Remote control
Optional Network Interfaces	QuadBRI ISDN Serial/V.35
Optional Components	Additional Display Adaptor Kit Additional Microphone Kit People+Content (Visual Concert VSX) Multipoint Software License AES (encryption) Software License

All systems also include basic cables (audio out, video out, power) and a documentation package (details later in this document).

3.1. Basic Components

The VSX 7000 is a set-top system with innovative design and function. The set-top unit itself includes the camera, integrated mid-range speaker and the basic I/O of the system. The companion subwoofer allows for great sound and is responsible for power and ISDN connectivity, allowing simplified cabling to the set-top unit.

Every system includes the ability for video calls over IP (H.323). In addition, there are two network interfaces choices for H.320 calls: Quad BRI or Serial/V.35.

The following sections describe the main components and software options in more detail.



Camera/Set-top Unit

The main unit includes a mechanical pan-tilt-zoom camera, an integrated mid-range speaker for conference audio and the input/output described in a later section of this document.

Combined with the subwoofer, the integrated mid-range speaker guarantees that good audio rendition is available at every installation, eliminating the possibility that poor quality speakers in the conference room would lower the quality of the customer's experience.



Subwoofer

A subwoofer is included with every VSX 7000, and serves the source of power for the set-top unit and is the source of the optional network interface modules. The subwoofer is especially useful in rendition of vowel sounds (lower frequencies) that make up good speech reproduction.

With a single cable connecting it to the main unit (including audio, power and ISDN signals), the subwoofer eliminates problematic cabling that would otherwise have to run all the way up to the set-top.



The subwoofer can be disabled if the installation calls for specialized audio in a conference room.



Microphones

The VSX 7000 microphone is a sophisticated device designed specifically for videoconferencing applications; it electronically locates the person speaking anywhere within a full 360° radius. It also includes Polycom's exclusive mute control, which serves as a button to mute the audio as well as an indicator of the system's mute status.

Up to 3 microphones can be used with a VSX 7000.



Remote Control

VSX 7000 debuts a new Polycom remote control, which includes several buttons frequently requested by customers, including: "Directory" key, "." for IP addresses, and "Camera" for easy access to video sources.





Documentation Set and Software Media

The following documents are available for the systems:

Document:	Available in:	For use by:
Installation instruction poster	Printed, Web	Individual performing installation or adding peripherals, etc.
Administrator's Guide	Web	System administrators seeking more information on configuration options, etc.
Getting Started Guide (User's Guide)	Web	Reference guide for end users – good tool for learning how to use system before going into conference room
Software Release Bulletin	Web	Individual performing installation or upgrading system – contains important information and tips on each software version

3.2. System Input/Output

Video Input

The following are the video inputs available on the systems:

Input	Connector	Type
Main camera	In set-top	People
Video content (for document camera, etc.)	4-pin mini DIN	People
PC/laptop input on Visual Concert VSX	15-pin D sub	Content
VCR	RCA	People

Video output

The systems' main monitor is an NTSC/PAL display. In addition, an Additional Display Adaptor Kit is available, allowing for a dual monitor set-up on NTSC/PAL or SVGA/XGA.

The following are the video outputs available on the systems:

- Main display: NTSC/PAL (4-pin mini DIN)
- Dual display: NTSC/PAL (4-pin mini DIN) or SVGA/XGA (15-pin D sub)
- VCR output (RCA)



Audio Input

The following are the audio inputs available on the various systems:

Input	For	Connector
Microphone connection (Polycom digital interface)	Microphone	Polycom-provided
Laptop audio input (on Visual Concert VSX)	Laptop/PC	3.5 mm phono
VCR	VCR playback	2x RCA

Audio Output

The following are the audio outputs available:

Output	Connector
Built-in speaker and Subwoofer	N/A
Alternative line out	2x RCA

Peripheral Connections

VSX 7000 systems provide for very flexible configuration of peripheral devices. The following table lists how various devices can be plugged in to the systems:

Device	How to plug it in?
Document camera	NTSC or PAL document camera can be connected to the back of the system via S-video.
Extra microphones	Up to 3 microphones can be connected to a VSX 7000 system.
Laptop or PC	Laptops or PCs can be connected to Visual Concert VSX via video (VGA) and audio (mini-phono) connectors.
VCR/DVD players	VCRs and DVD players can be connected to the back of the systems for playback via RCA cables for video and audio.

3.3. Network Interfaces

Interface	Maximum video rate
IP – 10/100BaseT Ethernet	2 Mbps
ISDN QuadBRI S/T	512 kbps
Serial/V.35	2 Mbps



3.4. Optional Components and Features

People+Content (Visual Concert™ VSX)

This includes software and a table-top pod designed to allow users to connect their laptop to the videoconferencing system during a call and present high-resolution graphics, live motion and audio.



Multipoint Software License

The internal MCU allows the user to dial a mix of IP and ISDN or IP and V.35 endpoints using the internal bridging capabilities of the VSX. This feature also allows a participant to dial into a call that is already in progress. This ability is made secure by the option of adding a “dial-in” password. Four total participants can be in the call at any one time.

In addition to standard people video, the internal MP supports People+Content functionality, which allows any of the sites in the call (not only host site) to present content and have full capabilities.

People+Content is only available when other systems in call support People+Content with software version 5.0 or higher.

4. Technologies

4.1. People+Content

Polycom’s patent-pending technology called People+Content is a radical departure from the traditional talking heads type of videoconferencing. With People+Content, Polycom addresses the overall concept that people and content need to be handled differently.



Four key elements describe how People+Content revolutionized the collaboration experience:

	People+Content	Traditional Videoconferencing Experience
Resolution and Frame Rate	People+Content ensures that the appropriate resolution and frame rates are used for content and for people. Example, in a meeting where participants need to view content (like a financial spreadsheet) as well as the other people in the meeting, it is best to view the content at the highest possible resolution and to view people so that motion is handled smoothly.	Traditional videoconferencing systems work within the bounds of the standards for the quality of people resolution at the far-end. The result is that the resolution is tuned for people and content is compromised and often unusable for participants.
Dual Images/Dual Streams	With Dual Images, users can see both the people and the content live images simultaneously.	Traditional videoconferencing systems will transmit either the people view (main or auxiliary camera) or a content view (document camera, laptop, etc.)
Dual Display Configurations	<p>With People+Content, participants have the option to see people on a dedicated people display and content on a separate high resolution content display.</p> <p>In a videoconference call, content is viewed on a high-resolution display (XGA) as is normally done in a conference room. This means that companies can integrate their existing meeting tools (like an InFocus projector) into the experience.</p>	<p>In a dual-display configuration people and content are treated the same. They are displayed on the main monitor. Therefore participants see either remote people or content on the main monitor, not both. The second monitor is used for viewing snapshots or the near end. This is awkward, not only for the far-end participants, but for the sender who has no way of knowing what the far end is seeing on the second display.</p> <p>In a videoconference call, content is displayed on a TV monitor versus an optimal projector display.</p>
Single Focus on Content (also known as “What you see, they see”, synchronized content)	People+Content displays only one content source at a time. All locations see that content: Imagine a point-to-point video call between ABC Co. and XYZ Co. to finalize a contract. With	More than one content source can be viewed at the same time by different participants. Imagine the same two companies negotiating a contract. During this point-to-point video call, both have their version



	People+Content	Traditional Videoconferencing Experience
	<p>People+Content, each company views the same version of the contract. When ABC Co. sends their version of the contract, both ABC Co. and XYZ Co. see it. If XYZ sends their version of the contract, both parties see it. The entire group sees whatever is last sent, always focused on a single content source.</p> <p>When a user selects content, the content is seen on all content displays including the local display eliminating the need to select the local preview button. This feature simplifies content management.</p>	<p>of the contract. If ABC Co. sends their version, XYZ Co. will view it. If XYZ Co. then sends their version of the contract, ABC Co. will view the XYZ contract. Now XYZ Co. is viewing ABC Co.'s version of the contract and vice versa. Participants are never sure what the other location is viewing. The group doesn't have one contract on which to focus at a time.</p> <p>When the presenter sends content to the far end, the near end doesn't see it unless the speaker takes the added step of pressing the near-end preview button.</p>

People+Content is supported on Polycom's VSX 7000, ViewStation EX/FX/VS4000 and iPower videoconferencing endpoints, as well as MGC multipoint servers.

4.2. Video Compression

Video compression is a critical technological component of videoconferencing. Under People+Content, VSX 7000 systems use different priorities for handling people video versus content video. The general rule is to focus on motion for people and to focus on resolution for content.

The following table describes the protocols used for video compression on the systems:

	People	Content
Protocols	H.264, H.263, H.261	H.263
Resolution	QCIF, CIF (352x288), SIF, 2x CIF/SIF (under Pro-Motion)	For PC/laptop (with ImageShare): XGA (1024x768), SVGA (800x600), VGA (640x480)
Frame rate	Up to 60/50 fields of interlaced video (under Pro-Motion) at 512kbps and above	Best possible at given resolution



H.264

H.264 is the 3rd generation of video algorithm standard being ratified by the ITU-T standards organization. This is advancement from the previous H.261 and H.263 video algorithms. The standard is applicable for H.320 and H.323 calls.

The main benefit of this new standard is that it provides very sharp video images even at low bandwidth calls. H.264 is especially effective at rates up to 384 kbps. At higher bandwidths (512 kbps and higher) H.263 with interlaced video (Pro-Motion) will continue to provide higher, more natural motion with great resolution.

On all Polycom systems, the appropriate video algorithm is chosen automatically. User does not have to manually set this before a call. In a multipoint call with MGC v5.0, the profile of the conference will define what video algorithm is used.

Pro-Motion

Pro-Motion is a trademark name for Polycom's implementation of interlaced video under the H.263++ video standard. With interlaced video (a.k.a. 60 fields per second), both odd and even fields of a 30 frames per second (in NTSC, 25 in PAL) of a live camera image are transmitted and rendered at the far end. This results in an image with higher spatial resolution and better motion rendition, which is optimal for "people" views. The alternative traditional 30 fps view produces some effects users typically perceive as "unnatural" video.

Pro-Motion on VSX systems can be activated as low as 512 kbps and produces a full screen image, rendering on the far-end the entire image captured by the camera.

4.3. Audio Compression

VSX 7000 supports a large set of audio compression algorithms in the industry. In addition to a full complement of ITU-T standards algorithms, VSX 7000 supports Siren™ 14, a new algorithm with a frequency response of 14 kHz.

The following table lists all algorithms supported:

Algorithm	Frequency response	Bandwidth	Supported in
Siren 14	14 kHz	24 – 48 kbps	H.320 and H.323
G.722.1	7 kHz	16 – 32 kbps	H.320 and H.323
G.722	7 kHz	48 – 56 kbps	H.320 and H.323
G.728	3.4 kHz	16 kbps	H.320 and H.323
G.711	3.4 kHz	56 kbps	H.320 and H.323

Siren 14 is the latest audio compression algorithm, delivering 14 kHz of audio response at bit rates of between 24 and 48 kbps. Polycom is the only company in the industry to offer such "super-wideband" audio capabilities, which provides incredible audio quality approaching that of CDs and MP3, while maintaining a modest network bandwidth requirement. With 14 kHz audio in a videoconference call, participants can better hear and understand each other, while eliminating the fatigue often associated with longer duration calls under inadequate audio quality.

Siren 14 is supported on Polycom's VSX 7000 and iPower videoconferencing endpoints, as well as MGC multipoint servers.



4.4. Echo Cancellation, Automatic Noise Suppression and Gain Control

In addition to providing industry-leading technology for audio compression, VSX also delivers several audio enhancement technologies that truly help to simulate the experience of being in the same room with the far end. These technologies include:

IDEC

With Integrated Dynamic Echo Cancellation (IDEC), true full-duplex audio is provided, so that interruptions and doubletalk are possible without any of the echo and cutoffs heard on typical speakerphones and videoconferencing products. *IDEC continually updates its model of the room environment*, so if the microphone moves or the room is reconfigured, IDEC will quickly adapt and continue to offer full-duplex audio.

ANS

Automatic Noise Suppression is a technique that reduces the noise level found within the audio channel. The ANS algorithm can detect the difference between a true audio signal (such as speech) and the background noise caused by vents, fans, etc. Using the noise model that it constructs for these sources, ANS is able to eliminate the noise even when speech is present. ANS can produce virtually noiseless audio for most meeting environments.

AGC

Automatic Gain Control is another algorithm that greatly enhances the audio pickup system of VSX 7000 systems. AGC intelligently normalizes speaking volumes so that persons seated further away from the microphone sound as loud as those seated close to the microphone. By using sophisticated intelligence, AGC will keep the volume of a whisper low enough to stop it from being accidentally picked up by the far end, and will allow a loud speaker to sound as forceful as desired to get his or her point across.

4.5. Far-end Camera Control

Far end camera control is provided via the graphical user interface and in the remote controls. Different technology is used depending on the network communication protocol:

- In H.320 calls (ISDN and V.35), the system uses the H.281 protocol for far-end control. H.281 uses a low speed data channel (under H.224) for the transmission of camera commands.
- In H.323 calls (IP), the system uses H.323 Annex Q whenever the far-end supports it. If the far-end does not support Annex Q, the system will use a modified version of the standard which is compatible with the ViewStation, ViaVideo and (in limited) cases other manufacturers' product lines.

5. Systems Management

Two types of management can be combined in any given environment:

- Browser-based – through WebRemote an administrator can have access to any system on the network simply via a web browser.
- Polycom Global Management System – allows administrators to manage their videoconferencing deployment with a leading edge management tool.



Browser-based management

The system's Web server allows administrators to have access to the management functionality of the system via a web browser. Any system can be managed in any of the 11 languages supported in VSX 7000 – for example, an administrator in France can manage system in German in French, even though the system's local user interface is in German.

Complete system management via Web browser, including:

- Call control and Call Summary information
- System configuration
- System state
- Detailed call statistics
- Alarms

Polycom Global Management System

The Polycom Global Management System is an intelligent web-based system management software solution for IT professionals to manage your enterprise-wide video communications network. Global Management System has several components including: System Management, Global Directory, Software Update, Provisioning, and Reports. Global management System now has the ability to manage the VSX 7000 products in addition to the iPower, ViewStation®, ViaVideo™, Polycom PathNavigator™, WebCommander and any other third-party video communication products with an embedded web server.

For more information, please see Global Management System's pre-sales information.

6. Languages

User interface, remote control, documentation, remote control and audio keypad confirmation are all translated into English (American and UK), Japanese, German, French, Spanish, Portuguese, Italian, Korean, Traditional Chinese and Simplified Chinese. Norwegian translations are available in the user interface, the web browser and the audio keypad confirmation.

7. Product Software Release History

Release 5.0 of VSX 7000 (October 2003)

- Initial release of VSX 7000

Release 5.1* of VSX 7000 (planned for November 2003)

- Optional AES encryption software license*
- Availability of Serial/V.35 interface module*
- Audio and Video Error Concealment*
- Conference on Demand*



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