



CA-ZOOM PAN-TILT-ZOOM

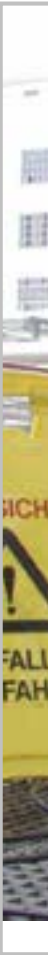
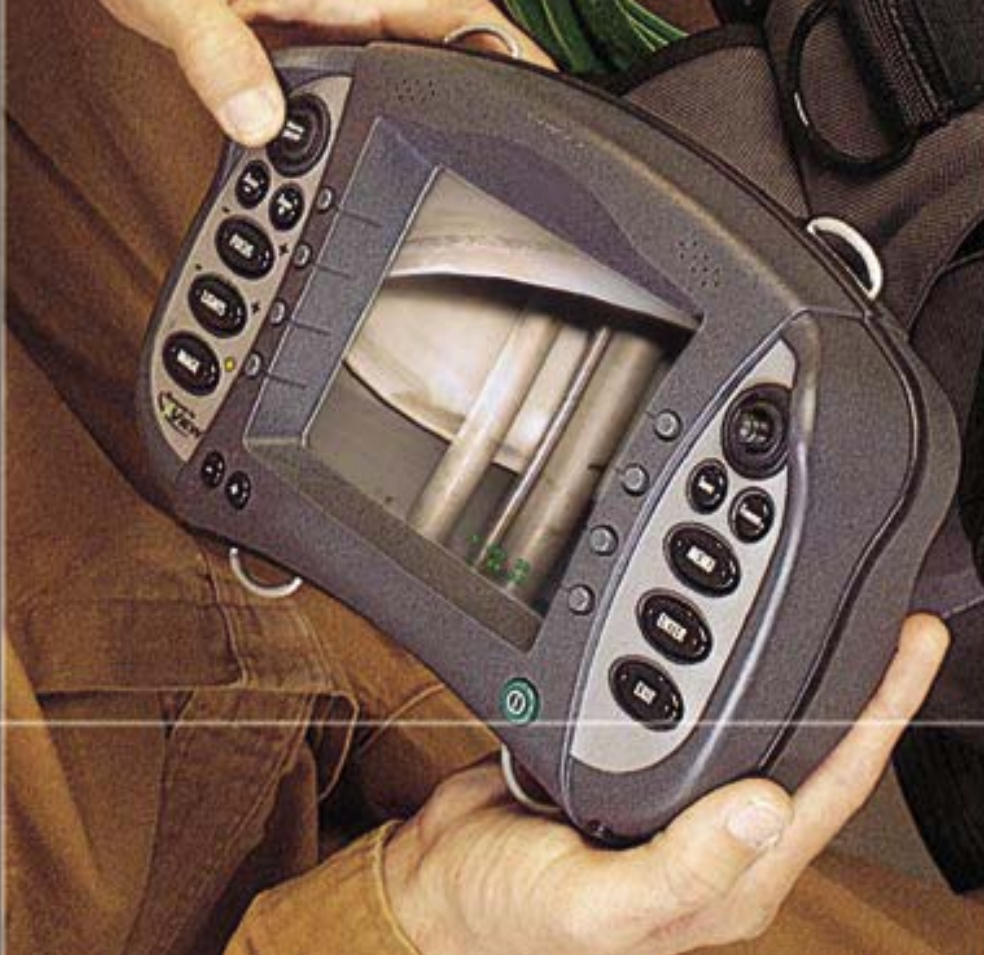
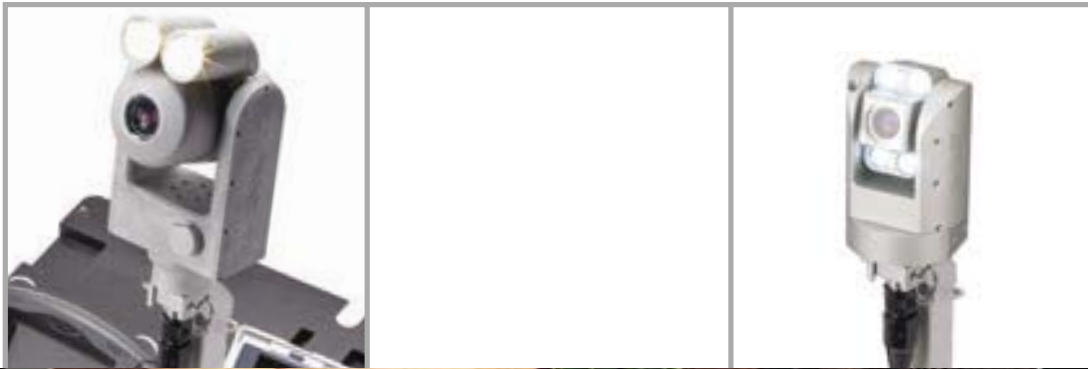


Remote Visual Inspection

Advanced.

Portable.

Modular.



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Inspecting chemical plant vessel with PTZ 140 system, extension pole and swivel ball tripod.

Inspecting large, hazardous or inaccessible areas just got easier with the CA-ZOOM® PTZ (Pan-Tilt-Zoom) Digital Inspection Systems™.

Delivering the most advanced digital imaging and measurement capabilities available, the CA-ZOOM PTZ-6.0 system provides clear and precise high resolution video and still image capture of inspections. Manage, measure, compare and e-mail images, even add audio and text annotation for later recall.

- Interchangeable Camera Head Diameter Options for large-area viewing with limited access.
- High-resolution video and still image capture (470 HTV lines).
- Remote operation with hand-held controller with built in color-VGA LCD monitor to control zoom, lighting, image and measurement.
- On-screen control of miniDV recorder.
- Parallel Laser measurement accessory.
- On-screen temperature, pressure, PTZ position, time/date and character generation display.
- Portable operating and shipping case.



HARDWARE FEATURES



CA-ZOOM® PTZ Digital Inspection System™ shown here with standard equipment. System can be equipped with the interchangeable PTZ100 and/or PTZ140 camera heads.

PTZ140

Incorporates a 25x optical with a 12x digital for a 300x total zoom capability. Additionally the camera is equipped with two high-power 35-watt lights offered with wide and narrow beam spreads.



PTZ100

Incorporates a 10x optical with a 4x digital for a 40x total zoom capability. Additionally the camera is equipped with four 5-watt LED lights offered with wide and narrow beam spreads.



Camera head/optics The CA-ZOOM® PTZ-6.0 camera heads are enclosed, inertly pressurized and sealed to protect sensitive electronics when submerged.

Hand-held controller

Use of the hand-held controller at distances up to 15.0 m (50.0 ft) from the camera control unit. The unit contains a 16.0 cm (6.4 in) diagonal color VGA resolution LCD monitor, dual joysticks for camera pan and tilt; control buttons for zoom, lighting, image control, and extensive menu functions for image management.



MiniDV Recorder

Operate the miniDV Recorder from the hand-held controller. The MiniDV recording format delivers 3x the color bandwidth of a VHS tape and includes a Memory Stick Media® terminal, MPEG movie capture capabilities from tapes and USB streaming video port.



Camera Control Unit (CCU)/Processor

Portable, case-mounted, or rack-mounted camera controller. A Pentium®-class processor runs a real-time, multitasking software operating system which supports file storage on internal flash memory or floppy disk. Includes connectors for camera, hand-held controller, miniDV control, video input/output and keyboard for text generation.



PS/2 Accessory Keyboard

CCU contains an integrated text generator which may be operated using the hand-held controller's joystick, or an external keyboard.



Cable/Cable Reel

Rugged cable and cable reel for operation up to 500.0 m (1640.0 ft). Underwater operation up to 45.0 m (150.0 ft).



Portable Shipping/Operating Case

CA-Zoom PTZ-6.0 cuts down on setup and teardown time by incorporating all components into a portable, wheeled shipping case. Just roll it to the inspection site and operate the system right from the case.



PTZ 140

With the CA-Zoom® PTZ-6.0 Digital Inspection System™, Everest VIT now offers two camera head options to enable you to increase your inspection capabilities from one base platform. Built-in control functions and advanced iVIEW™ image management platform are all packaged into one unit.



PTZ 140 with optional laser accessory.

Dual-Controlled High-Powered Lighting
2 lamps, 35 W each, with focused dichroic reflectors
Spot or flood illumination available
Turbo lamp mode: 80 w total

Camera Module
25x Optical (12x digital) Zoom Camera Module.

Lightweight
Anodized aluminum or optional stainless steel housing.

Tilt Capability
234° total tilt (+129°/-105°)

Pressurized Purge Valve
Check for leaks and remove condensation.

Unitized Connectors
Heavy-duty underwater connector with steel keyway for safe alignment.

Slip-Clutch Mechanism
Prevents internal damage to pan and tilt components.

Pan Capability
360° total (+/-180°)
Optional 360° continuous pan capability.

	PTZ 140	PTZ 100
Weight	3.0 kg (6.7 lbs) with camera and lights (aluminum).	1.8 kg (3.9 lbs) with camera and lights (aluminum).
Size	287 mm L x 139.7 mm ø (12.6 in L x 5.5 in ø). Fits through a 140 mm (5.5 in) ø hole.	194 mm L x 98.4 mm ø (7.65 in L x 3.88 in ø). Fits through a 100.0 mm (3.94 in) ø hole.

PTZ 100

High-Performance Lighting

Spot or flood illumination available

Turbo lamp mode: 22 w total



PTZ 100 with optional laser accessory.

Camera Module

10x Optical (4x digital)
Zoom Camera Module.

Slip-Clutch Mechanism

Prevents internal damage to pan and tilt components.

Tilt Capability

Mechanical: 340° total (+/-170°)

Optical wide-angle: 256° total (+/-128°)

Optical tele-zoom: 280° total (+/-140°)

Lightweight

Anodized Aluminum housing

Pressurized Purge Valve

Check for leaks and remove condensation.

Pan Capability

354° total (+ / - 177°)

Unitized Connectors

Heavy-duty underwater connector with steel keyway for safe alignment.

The CA-ZOOM® PTZ puts image control in the palm of your hand – letting you capture, file, compare, annotate, measure and review at the touch of a button. Position the camera, adjust the lights, zoom in on the problem and record the evidence.

SOFTWARE FEATURES

Soft Buttons

Context sensitive buttons using on-screen labels

Zoom

Activate optical zoom and control digital zoom with soft buttons

Focus

Manually focus the camera head

Lights

Select flood and/or spotlights and control brightness with soft buttons

Image Brightness

Controls camera gain, iris and electronic shutter

Volume

Raise/lower playback volume

Menu

Enable on-screen menus

Enter

Selects highlighted on-screen menu selections

Exit

Exits on-screen menu selections

The left side of the hand-held controller lets the operator control the camera functions, including zoom, focus, lights and image brightness.

The new, larger 16.0 cm (6.4 in) diagonal VGA-resolution color screen gives the operator a clearer, sharper view of live images, or images recalled from memory.

Serial number verification of nuclear fuel

Powered by
iVIEW™



iVIEW™ Image Management Platform Features Include:

Multi-Function Joystick

Dual joystick controls for camera pan-and-tilt, menu navigation and character generator control.

Intuitive Drop-Down Menu System

Access the advanced feature set via a drop-down menu system.

Advanced Camera Setup

Menu-driven setup features provide options for enabling or disabling the digital zoom range, brightness (shutter, iris, gain), invert positioning control of pan-and-tilt, and camera home positioning.

Laser Measurement

Parallel laser accessory mounted on the camera head provides a reference for measurement on a perpendicular surface.

Position Settings

Set camera home and zero positions by moving the camera to the desired location and saving this setting. Set up to 10 additional preset locations, for pan-tilt-zoom.

Image Freeze and Storage

A single-button press activates freeze frame and image storage. A separate button provides a freeze-only function.

File Manager

A full-featured embedded file management system with a thumbnail-based image recall system. Create and name file folders, and move and store files between folders on internal flash memory and floppy disks.

Integrated Text Generator with Arrow Annotation

Text annotation and graphic callout arrows can be placed onto the live display or any frozen or recalled image. Text can be created using an external keyboard or the pendant's joystick. Create preset text messages in advance and quickly recall them during inspection operations. Your company logo, or other bitmap file, can be stored with captured images and displayed on-screen.

Digital Video Recording

On-screen control of Sony® mini-DV digital video recorder.

Multi-Language Interface

Select from English, German, Spanish, Italian, French, Portuguese, Japanese, or Swedish for on-screen text annotation. Custom language capability also available.



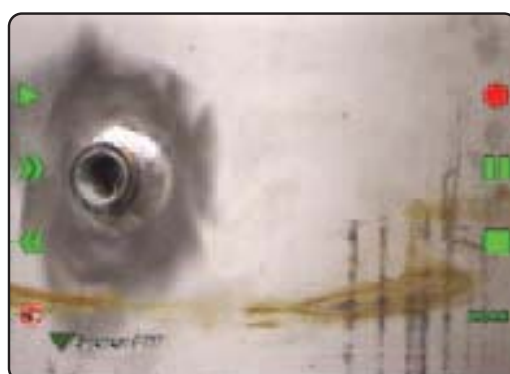
Advanced Camera Setup



Advanced Image Control



Position Settings



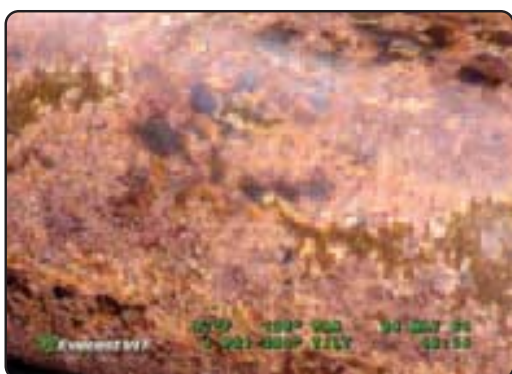
Digital Video Recorder Control



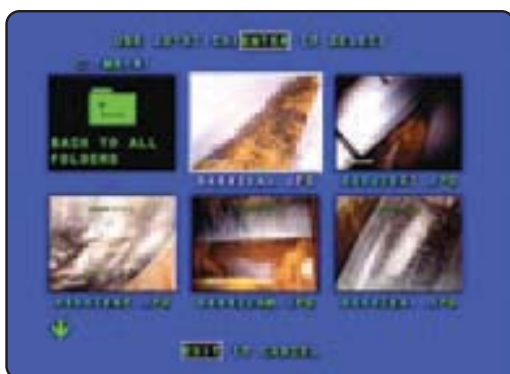
Split-Screen Menu



Laser Measurement



On-Screen Display of Temperature, Pressure, PTZ position, Time & Date and your logo



File Manager

APPLICATIONS / INDUSTRIES



Glass-Lined Vessel: interior



Detached agitator blade in mixing vessel due to broken bolts

The CA-ZOOM® PTZ Digital Inspection System™ helps process and power industries throughout the world maintain efficient operation and lower costs by reducing or eliminating downtime and lost production time, as well as improving worker safety.



PTZ assists with confined space inspection

Ca-Zoom systems provide the remote viewing capabilities allowing inspection of vessels for cleanliness, defects, interior indications of cracks and many other features of the vessel surface. The collection of digital images of the inspection allows for historical comparisons of previous vessel inspections to identify and track changes of tanks or vessel profiles.



Inspection through a 100mm (3.94 in) ϕ nozzle



Power and Process Applications:

- Tank and Vessel Inspection
- Weld Inspections
- Corrosion Evaluation
- Coke Drum Lining Inspection
- Tray Towers
- Floating Roof Inspection
- Fractionation Towers
- Refractory Lining
- Railroad and Truck Tank Cars
- HVAC, Elevator and Mine Shaft

Fractionation Tower Inspection



Nuclear Applications:

Tanks and Vessels

ALARA

Reactor Vessel

On-line Monitoring

Nuclear Fuel

Bundle/Serial

Number Verification

Fuel Movement and
Refueling Operations

Fuel Bundle Failure
Analysis

Spent Fuel Pool

Reactor Coolant
Pump

CRDM and BMI
Inspections

Large Pipe Inspection

Remote Monitoring of
Contaminated Rooms
and Hot Cells

Steam Generator
Bowl and Secondary
Side Inspection

Remote Tooling

FOSAR



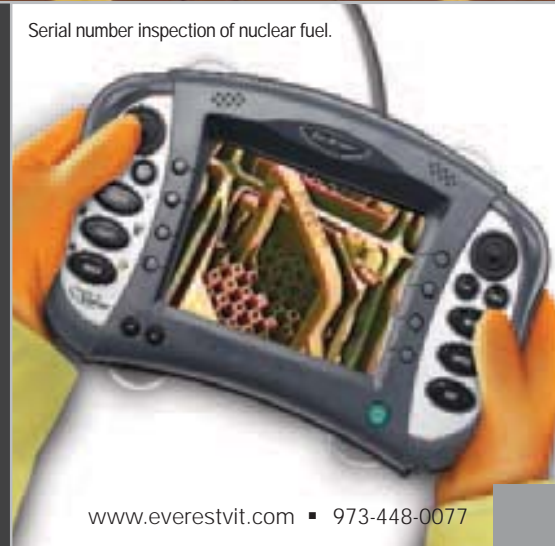
Operators perform nuclear reactor vessel visual inspections with Ca-Zoom PTZ Digital Inspection System

The advanced CA-ZOOM® PTZ Digital Inspection System™ facilitates efficient inspection and surveillance activities in the power generation industry.

The CA-ZOOM PTZ series of cameras are used extensively in nuclear power plants and nuclear waste management facilities and is the equipment of choice for major service companies worldwide. The CA-ZOOM PTZ system facilitates efficient inspection and surveillance activities and its versatile design provides outage service personnel with equipment for a wide range of applications.

In the nuclear industry, the systems are used for inspection or surveillance activities in refueling, reactor vessel maintenance and for 10-year in-service inspections. Loose parts, tools or debris dropped into power generation systems may be retrieved from hard-to-reach areas without the need for disassembly of plant equipment with the aid of the CA-ZOOM PTZ.

Serial number inspection of nuclear fuel.



CUSTOM PRODUCTS

Developing exactly what you need

When the standard CA-ZOOM® PTZ system does not meet your exact requirements, our Custom Solutions Group is ready and willing to solve your unique application requirements. Everest VIT has over 20 years of experience delivering customized products to hundreds of specific RVI demands.

A custom CA-Zoom PTZ monitors operation of inspection arm in nuclear reactor vessel



Air-cooled PTZ for elevated-temperature operation
Tool Head Cameras for robotic equipment installations
Vibration-Resistant Cameras for aircraft engine test cells
Laptop PC-Based Camera Control Unit/Processor
PTZ Cameras on robotic crawlers



Laptop PC-based portable Camera Control Unit for automated inspections



4-Light PTZ
 with wide-angle
 lens adapter



Tool-Head Zoom Cameras

MODULAR SYSTEM AND ACCESSORIES

BASE SYSTEM



PC CONNECTIVITY/APPLICATIONS



iView™ Remote PTZ

Allows full capability remote inspections, from either the next room or across the world, via high-speed Internet connection. Once the CA-Zoom® PTZ 6.0 is connected to a PC at the inspection site, a remote user has full access to all menu functions, can control camera movement and utilize all advanced camera capabilities. iView Remote supports MPEG 4-based motion video capture and allows still capture to laptop or PC.

Advanced User Interface

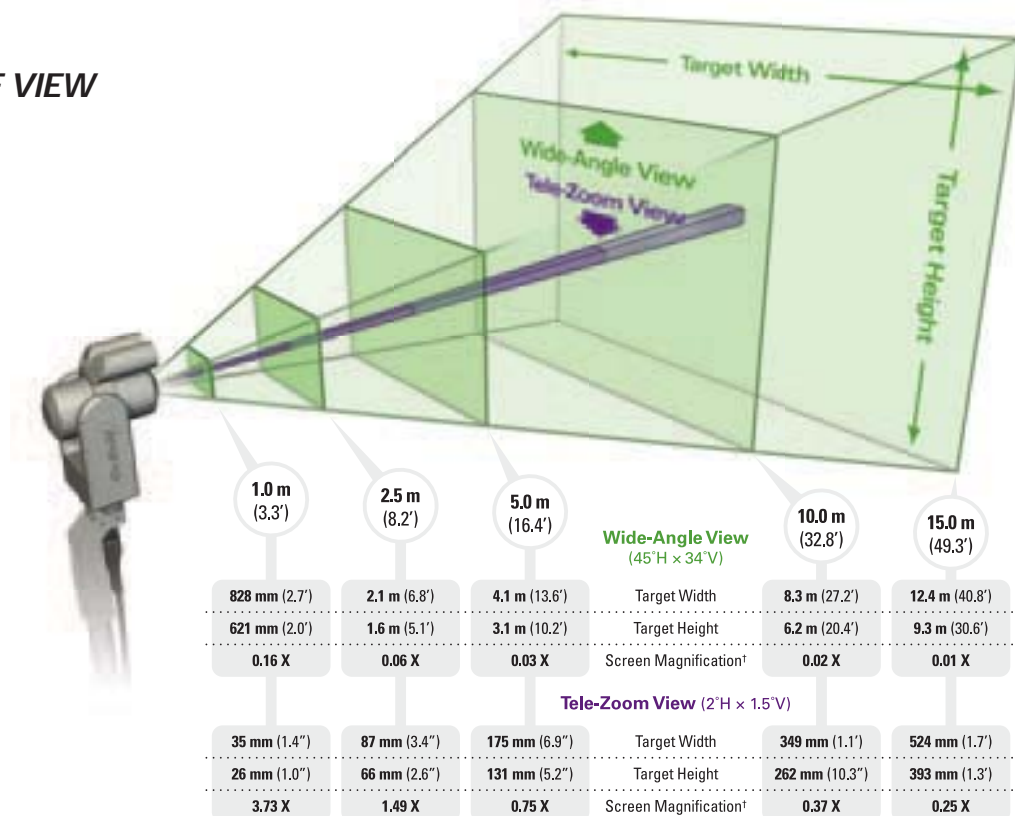


iView PC

FREE software which allows you to manipulate, re-measure and compare, annotate, e-mail images to other locations, review inspection results, and generate automatic reports in Microsoft® Word™ format. Download iVIEW PC from the Everest VIT website or obtain a copy on CD ROM from Everest VIT.

SPECIFICATIONS: PTZ 140

FIELD OF VIEW



All values are measured "in air" and are approximate with slight variations based on NTSC or PAL format. Multiply values by 0.75 for underwater FOV or target size. Magnification increases x1.33 for underwater use.

†Screen magnification calculated assuming 6.4" diagonal LCD screen.

Camera

Type:	Color 1/6 in Super HAD™ CCD (NTSC and PAL)
Resolution:	470 HTV Lines NTSC, 460 HTV Lines PAL
Zoom:	25x optical, 12x digital for a total 300x, f=2.4 mm to 60 mm
Field of View:	In-air FOV is 2.0° H x 1.5° V in telephoto; minimum distance of 800.0 mm (31.5 in) In-air FOV is 45° H x 34° V in wide-angle; minimum distance of 35.0 mm (1.4 in)
Focus:	Automatic & manual
Iris:	Automatic & manual (f1.6 – close)
Electronic Shutter:	Automatic & manual (1/10,000 sec. to 1 sec.)
Sensitivity:	2.5 lux; gain adjust -3 dB – 28 dB
Construction:	Anodized aluminum or stainless steel

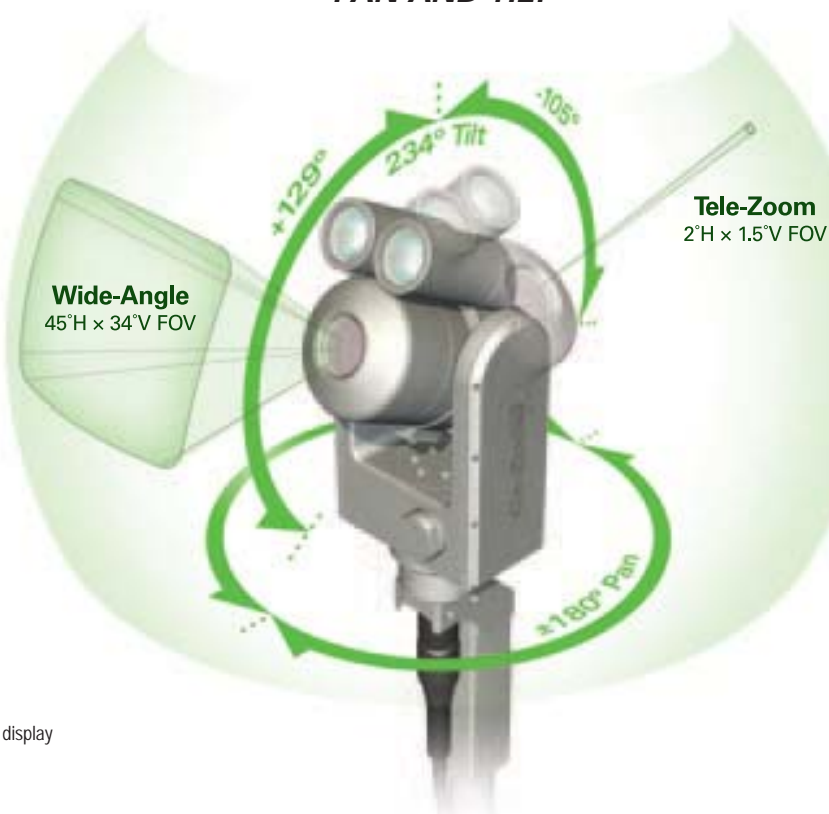
Lighting

2 lamps, 35 W each, with focused dichroic reflectors
 35 W flood: 16k lumens (1300cp) @ 30° (half-angle) beam spread
 35 W spot: 75k lumens (6000cp) @ 10° (half-angle) beam spread
 Turbo lamp mode: 80 W

Pan & Tilt

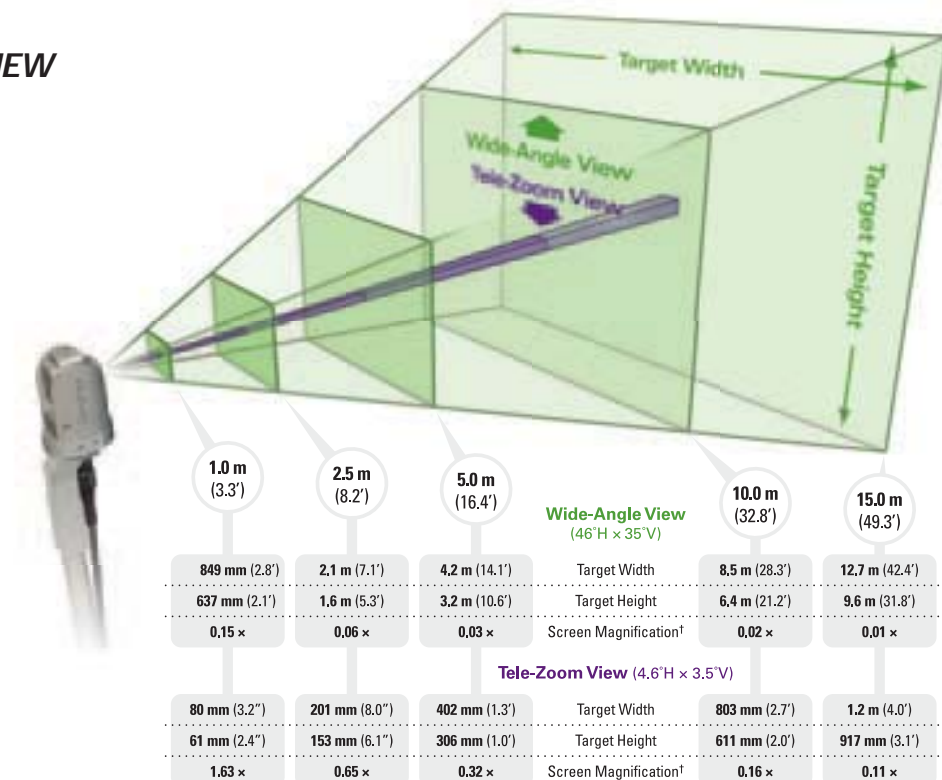
	Pan	Tilt
Range:	360° (+/-180°)	234° total (+129°/-105°)
Speed:	0 – 9°/sec	0 – 9°/sec
Torque:	0.9 Nm max. 8 in. lb. max.	0.9 Nm max. 8 in. lb. max.
Clutch-protected:	Yes	Yes
Weight:	3.0 kg (6.7 lbs) with camera and lights (aluminum)*	
Size:	287 mm L x 139.7 mm Ø (12.6 in L x 5.5 in Ø) Fits through a 140 mm (5.5 in) Ø opening	
Mounting:	Four 1/4 – 20 mounting points	
Feedback:	10k ohm potentiometer position feedback with optional data display *Available in stainless steel @ 6.0 kg (13.2 lbs)	

PAN AND TILT



SPECIFICATIONS: PTZ 100

FIELD OF VIEW



All values are measured "in air" and are approximate with slight variations based on NTSC or PAL format. Multiply values by 0.75 for underwater FOV or target size. Magnification increases x1.33 for underwater use.

†Screen magnification calculated assuming 6.4" diagonal LCD screen.

Camera

Type:	Color 1/4" Super HAD™ CCD NTSC and PAL
Resolution:	470 HTV Lines NTSC, 460 HTV Lines PAL
Zoom:	10x optical (4x digital) for a total of 40x (f=4.2 mm to 42 mm)
Field of View:	In-air FOV is 4.6° H x 3.5° V in telephoto; minimum distance of 1m (3.28 ft) In-air FOV is 4.6° H x 3.5° V in wide-angle; minimum distance of 10 mm (0.39 in)
Focus:	Automatic & manual
Iris:	Automatic & manual (f1.8 – close)
Electronic Shutter:	Automatic & manual (1/10,000 sec. – 1 sec.)
Sensitivity:	2.0 lux; gain adjust -3 dB – 28 dB
Construction:	Anodized aluminum

Lighting

Four lights; 2 x 2 control

10 w flood: (2 x 5 w) 2.5k lumens (200cp) @ 30° beam spread

10 w spot: (2 x 5 w) 11k lumens (900cp) @ 10° beam spread

Turbo lamp mode: 22 w total

Pan & Tilt

	Pan	Tilt
Range:	354° total (+/-177°)	Mechanical: 340° total (+/-170°) Optical wide-angle: 256° total (+/-128°) Optical tele-zoom: 280° total (+/-140°)
Speed:	0 – 9°/sec	0 – 11°/sec
Torque:	0.9 Nm max. 8 in. lb. max.	0.9 Nm max. 8 in. lb. max.
Clutch-protected:	Yes	Yes
Weight:	1.8 kg (3.9 lbs) with camera and lights (aluminum)	
Size:	194 mm L x 98.4 mm ø (7.65 in L x 3.88 in ø) Fits through a 100.0 mm (3.94 in) ø opening	
Mounting:	Four 1/4 – 20 mounting points	
Feedback:	10k ohm potentiometer position feedback	

PAN AND TILT



Camera Operating Environment (PTZ140/PTZ100)

Temperature:	-18° C to 49° C (0° F to 120° F)
Pressure:	Waterproof to 45.0 m (150.0 ft) or 4.5 bar (65 psi) external
Radiation Tolerance:	PTZ140: Dose Rate: Approximately 50 Gy/hr (~5,000 R/hr) – Cumulative Dose: Approximately 600 Gy/hr (~60,000 rads) PTZ100: Dose Rate: Approximately 10 Gy/hr (~1,000 R/hr) – Cumulative Dose: Approximately 220 Gy/hr (~22,000 rads)
Pressurization:	Schrader valve with protective cap – 0.7 bar (10 psi) internal for inert gas

Camera Control Unit (CCU)/Processor

- Portable or case-mounted CCU
- Dimensions: 39.0 cm (15.4 in) L x 28.0 cm (11.0 in) W x 13.5 cm (5.3 in) D
- Weight: 6.0 kg (13.2 lbs)
- Power Requirement: AC Power Nominal input: 100-240V, 50-60Hz, 3amps
- CCU has video input/output capability (Composite and S-Video)
- Connector for optional mini-DV video recorder
- Processor: 32-bit Pentium®-class embedded computer system
- Memory: Program and data stored in 16 MB flash memory
- File Storage Capacity:
 - Internal** – Up to 14 .BMPs, 70 super high-qual .JPG, 140 high-qual .JPGs, or 450 standard-qual .JPGs
 - 3.5 in Floppy disk** – 1 .BMP, 7 super high-qual .JPG, 14 high-qual .JPGs, or 48 standard-qual .JPGs
 - FlashPath™ disk** – Up to 28 .BMPs, 140 super high-qual .JPG, 280 high-qual .JPGs, or 900 standard-qual .JPGs
- Images can be stored on internal flash memory, a 3.5 in floppy or removable FlashPath™ disk

Hand-held Controller

Monitor:	16.0 cm (6.4 in) diagonal full-resolution color VGA (640 by 480 pixels)
Temperature:	0° – 49° C (32° – 120° F)
Weight:	1.4 kg (3.1 lbs)
Cable:	Ruggedized 5.0 m (16.0 ft)
Audio:	Built-in microphone, speaker, and headset connector
Recording Options:	Mini-DV video recorder control from hand-held controller
Controls:	Back-lit buttons and joystick pan/tilt/menu navigation
Soft buttons:	Programmable for enhanced camera and accessory operations

Optional Accessories

- Parallel Laser Measurement Accessory
- iView™ Remote PTZ Software for controlling the CA-Zoom® camera from a PC
- Second Video Hand-held Controller and 15 m (50.0 ft) controller cables
- Rack-mount Consoles
- PS/2 Keyboard
- Telescoping and Interconnecting Poles; Swivel Ball or standard Tripod
- Extension Cables
- Main Cables up to 500.0 m (1640.0 ft), Underwater Operation up to 45.0 m (150.0 ft)
- Slip-Ring Cable Reels
- MiniDV and Super VHS Video Tape Recorders
- High-Resolution Video Monitors

iVIEW Software Features

Zoom:	PTZ140: 25x optical, 12x digital zoom control PTZ100: 10x optical, 4x digital zoom control Enable/disable digital zoom capability
Camera Setup:	User interface of camera setup: long exposure, invert camera, pan/tilt range, stabilization, digital zoom on/off
Positions:	Set camera home and zero positions. Choose up to 10 preset positions for pan, tilt and zoom
On-Screen Information:	Temperature (°C/°F), Pressure (BAR/PSIG), Pan/Tilt position, Time/Date, Annotation text and logo
Lighting Control:	Software-controlled variable lamp intensity, includes turbo boost mode
Split-screen:	The split-screen menu allows for viewing a combination of live and stored images on screen
Audio Annotation:	The audio annotation allows for up to 15 seconds of audio information to be recorded and associated with a stored image file
Text Annotation:	Built-in full-screen text overlay generator using Joystick or PS/2 keyboard supports storage of up to forty (40) 2-line x 30 characters per line "preset text" scripts
Image Controls:	Manual/Auto control for brightness (shutter, iris or gain)
Image Recall:	Full-screen, live/recalled image
Measurement:	Video caliper and circle gauge comparison measurements supported
User Interface:	Simple drop-down menu-driven operation Menu navigation using joystick
Freeze Frame:	Freezes live image currently displayed on screen
Image Storage:	Images can be stored in folders in the flash memory, floppy disk, or FlashPath disk
Image Save:	Single-button activated quick-save feature
Image Formats:	Single image file with embedded annotation data User-selectable PC-compatible formats: Bitmap (.BMP), super high-quality JPEG (.JPG), high-quality JPEG (.JPG), standard-quality JPEG (.JPG)
File Manager:	Embedded file manager software supporting: file & folder creation, naming, deleting. Store to internal flash (C:\) or floppy disk (A:\) copy between A:\ and C:\
International Language Support:	English, French, German, Italian, Portuguese, Spanish, Japanese, or Swedish languages for on-screen prompts
Software Status:	On-screen software revision status display
Software Updates:	Field updateable via floppy disks
MiniDV Control:	Control miniDV recorder from hand-held controller's soft buttons
Remote Control:	All functions may be remotely controlled by a PC operating the iVIEW Remote PTZ application

Full System

- Portable carrying/shipping case contains the camera head, CCU, hand-held controller, keyboard, DV recorder accessory, 3.0 m (10.0 ft) patch cable
- Main cable requires separate carrying case

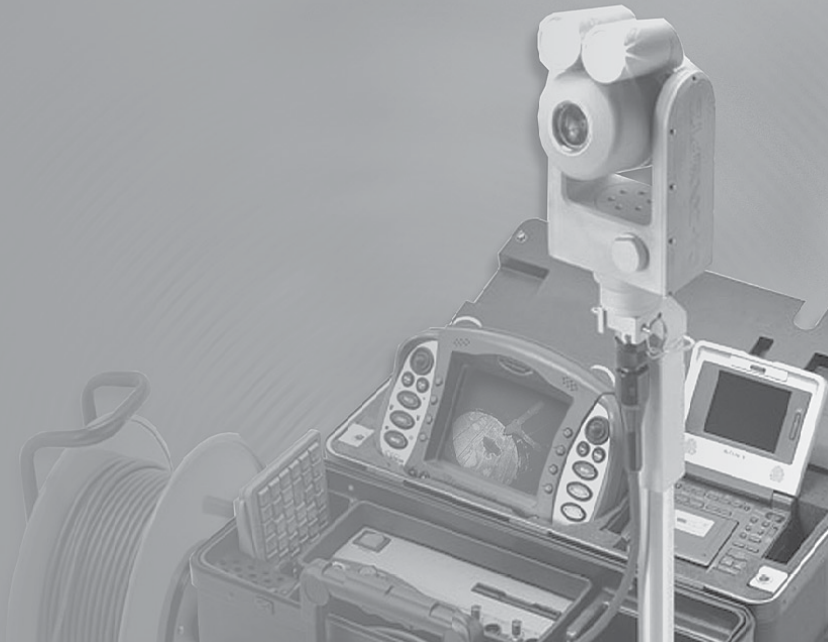
Case Dimensions:	65.3 cm L x 56.1 cm W x 27.2 cm D (25.7 in L x 22.1 in W x 10.7 in D)
System Weight:	PTZ140 - 23.4 kg (51.6 lbs), PTZ100 - 22.2 kg (48.8 lbs)





ABOUT EVEREST VIT

Everest VIT is the industry leader in the development of Remote Visual Inspection (RVI) equipment, sales, on-site service, rentals, and training. RVI provides viewing capabilities from a remote location, enabling companies around the world to inspect machinery, facilities and infrastructure in the safest, quickest and most cost-effective manner possible. Everest VIT's innovative products have been used to streamline the inspection process in all industries where safety, security and accuracy are of paramount concern, such as aviation, power generation, processing, manufacturing, law enforcement and infrastructure.



EVEREST VIT LOCATIONS Telephone numbers in **bold face** are toll free.

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