



XR 4000

AREA ARRAY X-RAY INSPECTION SYSTEM



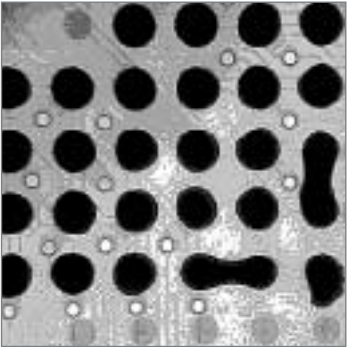
LCD SCREEN



PCB IN XR 4000



X-RAY IMAGE



SOLUTIONS FOR THE ELECTRONICS INTERCONNECTION PROCESS

XR 4000

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PACE Incorporated, the leading provider of Soldering, Rework and BGA solutions, now offers the newest in X-Ray inspection equipment, the XR 4000. The XR 4000 is ideal for assuring the integrity of your production process when used for post-production inspection. The versatile XR 4000 is also the best choice for rework inspection and/or incoming quality inspection. The XR 4000 delivers real-time, full motion x-ray video and features a powerful 70 kVa x-ray tube that can easily see through dense multiplayer PCBs and back planes as well as challenging metal capped BGAs. The variable angle X-Ray head means increased inspection capabilities and the ability to see "open" solder joints. The XR 4000 is designed for both heavy production or rework environments where bench-top X-ray systems may not be adequate to see through the work or where additional features such as angled viewing are desired. The system is one of the most versatile on the market and is also one of the most affordable.

SPECIFICATION	XR4000	SPEC. cont	XR4000
PART NUMBERS	8007-0399	XR4000 120 VAC	SPATIAL RESOLUTION 20 lp/mm
	8007-0400	XR4000 230 VAC	
	8007-0399-01	XR4000 with PC, LCD monitor, & inspection software 120 VAC	
	8007-0400-01	XR4000 with PC, LCD monitor, & inspection software 230 VAC	
SYSTEM DIMENSIONS	H:1525mm (60") W: 1270mm (50") D: 835mm (33") Weight: 204 Kg (450lbs) Max PCB size: 685 (27") x 685mm (27") with manipulator. 685mm (27") x Unlimited without manipulator		XR 4000 ADJUSTMENTS Two speed motorized PCB manipulator Zoom ± Image Gain ± Angular Rotation of X-Ray head Toggle - live image/capture Memory - Stores Gain and Zoom settings Frame averaging
POWER REQUIREMENTS	120v, XX W or 230v, XX W		
X-RAY GENERATION	X-Ray Tube, 70 kVa		
MAX PCB SIZE	w/Manipulator 737mm (29") x 685mm (27")		
FOCAL SPOT	.2mm (.008")		
FOCAL SPOT TO IMAGE	124mm (4.875")		
ZOOM RANGE	7 - 40x		
PCB MANIPULATION	Motorized X/Y Positioner controlled via joystick.		
CONTRAST RESOLUTION	Can resolve a .025mm (.001") gold wire.		
		X-RAY ACTUATION	
		OPENING CLEARANCE	32mm (1.25")
		SAFETY FEATURES	Fully enclosed cabinet with leaded acrylic, leaded vinyl and interlocks that prevent operation when cabinet is open

XR4000 SHOWN WITH OPTIONAL LCD DISPLAY MONITOR



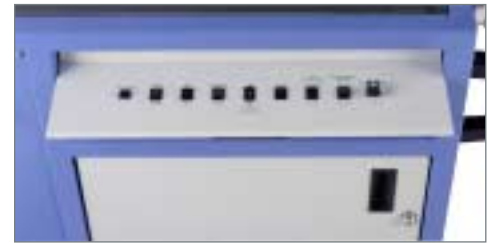
PCB IN POSITION FOR INSPECTION



Please Note. Red targeting laser for easy PCB positioning below the X-ray head.

XR 4000

The patented camera technology within the XR 4000 delivers unsurpassed line pair resolution. When combined with the high-resolution, zoom-camera, defects as small as .025mm (.001") are easily identified. Ease of use for the operator is paramount for the XR 4000 as all of the controls are mounted on a retractable front panel for easy operator access. The capabilities of the XR

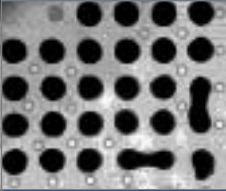
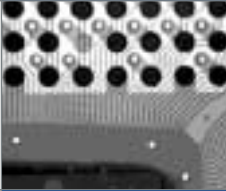
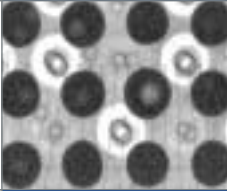
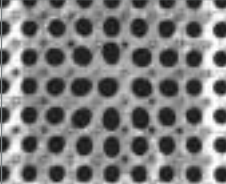
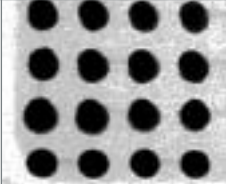



XR4000 retractable control panel



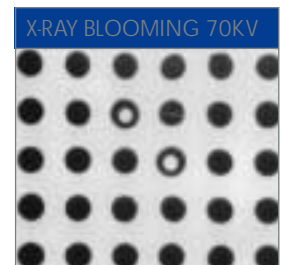
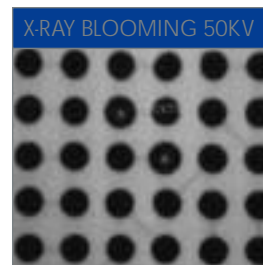
4000 with integrated PC and X-Ray Inspection software. The software allows images to be captured and stored electronically, defect analysis reports to be created (PDF format), and a reference library of defects is also standard. Examples of common defects are included with the software so that operators can compare the live image of their work with the reference image. When integrated with the TF 3000 BGA/CSP Rework system from PACE, the XR 4000 system can actually teach operators how to identify defects as part of the rework process. The library can be added to and modified so you can provide images of the actual work to the operator for immediate comparison. The XR 4000's housing is made of steel and will stand up to the most abusive environments. The system is easily relocated using the 4 Posi-Lock casters.

EXAMPLES OF COMMON DEFECTS

BRIDGING		MISSING SOLDER BALLS		SOLDER VOIDS	
	Bridging between solder joints is easily identified.		Missing solder balls can be identified easily.		Voids in solder spheres
SOLDER BALLS		COLD SOLDER		OPEN JOINTS	
	Solder balls in the centre of the package are oversized due to delamination and compression under die area.		Cold solder is signified by a jagged, irregular edge around the perimeter of the solder ball. Note that in this image only some of the balls show this signature.		Top Image: Solder ball shown with pad shadow below indicating no contact between ball & pad. Bottom Image: Figure 8 shape showing 2 unattached spherical shapes indicating no contact between pad & solder ball.

ARE YOU REJECTING GOOD BOARDS?

Voltage blooming is associated with the X-ray camera used in many competitor's X-ray inspection systems. The phenomenon occurs when applied voltage is increased, causing the white area of the X-ray image (the void) to expand (or bloom) and encroach on the black area. This makes a void appear larger than it really is. A void that occupies 10% of a solder sphere at 50 kV may appear to consume up to 50% of the solder sphere at higher voltages with a competitor's camera system. The patented camera technology found in PACE's XR 4000 is the only system of its type not subject to Voltage Blooming. The camera technology ensures that image size of voids remains consistent regardless of applied voltage.



A WORLDWIDE COMMITMENT

With offices worldwide, PACE is a recognized world leader in the development of solutions for the assembly and repair of highly advanced electronics. Our expertise extends back to the dawn of the modern electronics industry. In 1958, PACE introduced training programs for the repair of printed wire assemblies, and soon after, revolutionized the industry by creating the first self-contained vacuum desoldering system.

Today, PACE continues to provide innovative solutions, products and training for the rework, repair and testing of printed circuit assemblies. Our unique capabilities and evolving vision have provided universal solutions for thru-hole and surface mount assembly and rework problems for the most advanced electronics.

Additionally, PACE manufactures Fume Extraction Systems to reduce exposure to harmful particulates and gases created from hand soldering operations. PACE Fume Extraction Systems effectively remove these contaminants from the worker's breathing zone thereby reducing or eliminating health risks and improving productivity.

Our strong commitment and history of achievement has resulted in an unparalleled range of Assembly, Repair and Fume Extraction solutions to meet your needs whether working to ISO-9000, industrial, military or your own internal specifications. Whatever the challenge, PACE stands ready to help you set a new standard.



PACE USA

9030 Junction Drive
Annapolis Junction
MD 20701
U.S.A.
Tel: 301-490-9860
Fax: 301-498-3252

PACE EUROPE

Sherbourne House,
Sherbourne Drive
Tilbrook, Milton Keynes,
MK7 8HX
United Kingdom
Tel: (44) 1908-277666
Fax: (44) 1908-277777

INTERNET

www.paceworldwide.com

P/N 5400-0124 02/03

A CUSTOMER COMMITMENT

In 2001 the distinguished Frost & Sullivan Award for the World Surface Mount Technology Rework and Repair Equipment Industry was bestowed upon PACE.

The Frost & Sullivan Market Engineering Customer Service Leadership Award is presented to companies that have demonstrated superior responsiveness to customer needs and value-added support in technology and services.

PACE was selected based upon independent research with customers, key market participants and even our competition. This award reiterates PACE's commitment to excellence from product concept to customer service in the field. Frost & Sullivan's research recognizes that the key to PACE's success in the industry is our interactive approach with customers to provide solutions and respond to end-user feedback when developing products.

In 2002 PACE was awarded World Class Status, signifying that PACE uses best practices in its design, development and manufacturing processes to provide the finest quality products to its customers at the lowest possible cost. The first Maryland based company to receive this coveted award, PACE stands alone in its market segment in achieving this highly regarded status.

SOLUTIONS FOR THE ELECTRONICS INTERCONNECTION PROCESS

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PACE products meet or exceed all applicable military and civilian EOS/ESD, temperature stability and other specifications, including MIL-STD-2000, ANSI/J-STD-001, IPC 7711, IPC 7721 and IPC-A-610.

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