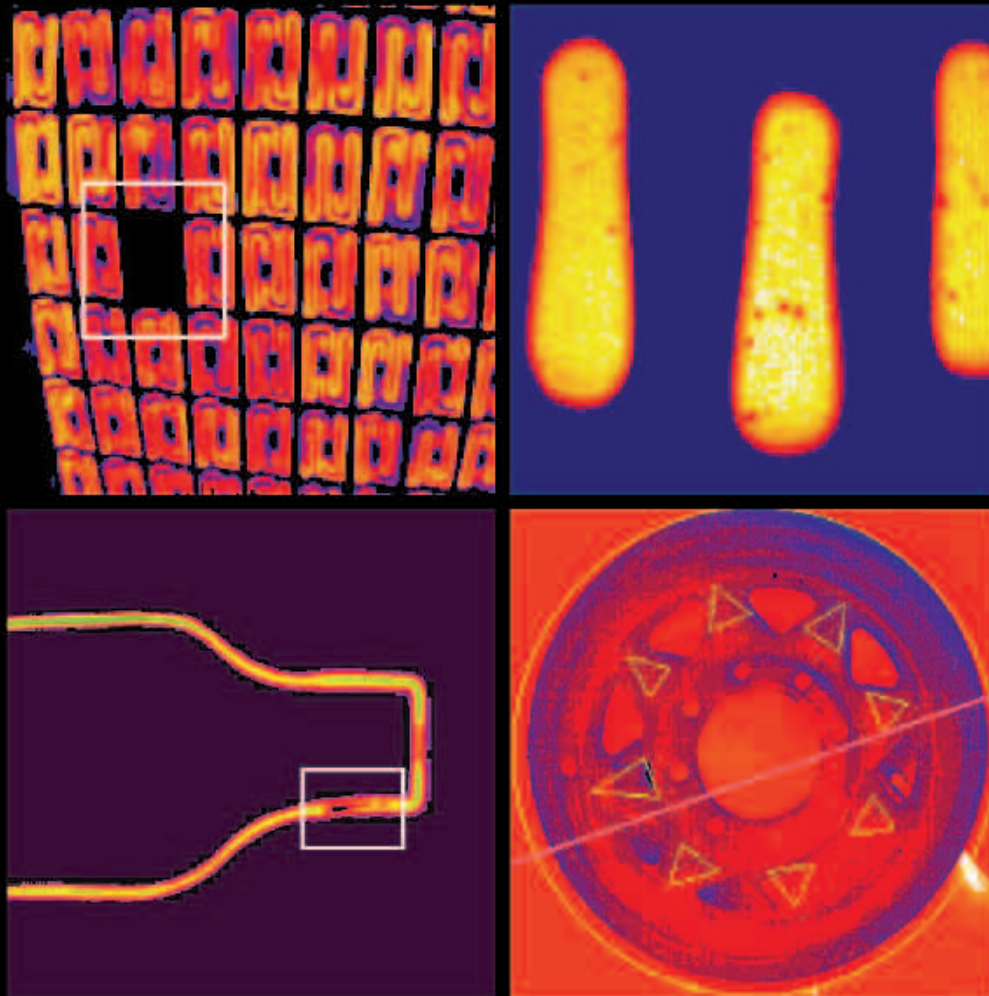


# Maxline<sup>®</sup> 2

## Thermal Imaging Solutions for Manufacturing



For automated Process Control and  
Process Inspection applications

**IRCON<sup>®</sup>**

# IRCON Maxline<sup>®</sup> 2 Thermal Imaging and Analysis Solutions

The Maxline 2 infrared thermal imaging platform

+

Ircon specialized Image Processing and Analysis software

+

Your and our expertise working together

Adding it all up, you are presented with powerful potential to address some of your most difficult temperature monitoring and analysis challenges. Backed up by Ircon expertise and ongoing support, you can achieve comprehensive solutions that meet your needs.

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Mold or Form Temperatures

Infrared thermal imaging enables seeing things not visible to the naked eye. It can provide a powerful tool for monitoring temperature conditions in manufacturing and research processes.

Thermal Seal Integrity

Ircon has advanced this technology to provide you highly efficient and reliable in-line solutions for process monitoring that can be tailored to initiate appropriate automated responses.

Converting Processes

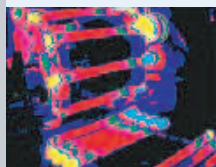
We have built a suite of solutions that can help give you greater assurance about the overall quality and precision of your production output.

Glass and Fiber Optics Production

The potential is limitless, and many possibilities are available today. Ircon can help you implement solutions appropriate to your operations.

Packaging Production

Incinerator or Oven Monitoring

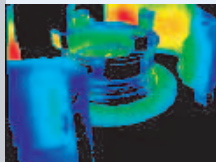


### Product Quality Monitoring

Monitor temperatures of your products at critical steps of development or production, ensuring quality standards are met. Identify problems before they can become major issues.

Heating Processes

Paper Production

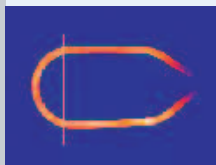


### Mold and Form Inspection

Measure surface temperatures of molds used for plastic, foundry, and die casting operations, to assure alliance with production requirements.

Extrusion Processes

Plastic Film Production

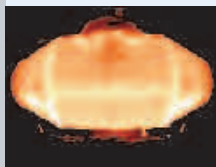


### Seal or Weld Integrity Inspection

Critical with food, pharmaceutical and medical products, automated checking of thermal seal integrity provides a rapid, reliable and non-disruptive means to detect flaws and lower contamination potential. Metal weld integrity can also be assured with reliable, repeatable consistency.

Weld Integrity

Textile Production



### Vessel Inspection

Take a step back and monitor the surface temperatures or contents of large containers, such as tanks or vessels, for safety, fill capacity or temperature maintenance purposes.

Semiconductor Manufacturing

Circuit Board Testing

Tank Level and Vessel Inspection

Food and Drug Production

Medical Product Inspection

Metals Production, Forging or Processing

Corrosion Monitoring and Detection

### IRCON means Infrared Control.

Founded in 1962, we offer broad application expertise and a wide range of products, applying infrared sensing technologies for temperature monitoring and control.

With over 88,000 Ircon instruments installed worldwide, we have helped tailor each solution to the unique needs of each customer.

Our products are designed to perform reliably under the harshest conditions with accuracy and repeatability, to stand the test of time.



# MAXLINE<sup>®</sup> 2 Thermal Imaging Systems

Icon Maxline 2 systems are designed to address challenging industrial temperature measurement, thermal monitoring and process inspection demands:

## State-of-the-Art Thermal Monitoring

Each Maxline 2 system incorporates infrared thermal imaging and processing innovations that make them unique and total in-line solutions for automated process control and inspection applications. Each system offers automatic calibration, ambient temperature and motion correction features that provide a true, repeatable perspective of your process.

## Industrial Grade Features

Maxline 2 systems are designed to serve industrial applications, with rugged components built to serve reliably for many years. Our camera is compact, sealed (NEMA 4 - IP67 rated), and stainless steel-enclosed, with no external moving parts and capable of processing full-image (320x240 pixels) temperature radiometry at 60 frames per second. An accessory enclosure keeps the camera cool and lens clean in extremely harsh environments. Our processors and software operate at speeds that will match your process. For safety and convenience, control and adjustment of the system and camera(s) can occur remotely – even via the Internet.

## Adapatability

Both Maxline 2 Processors – the Industrial Operator Interface and the Embedded Processor Box (pictured below) – can operate multiple cameras simultaneously, depending on the application, and have built-in input/output relay and networking capabilities. This enables you to manage multiple processes and communicate with other systems if needed for greater interoperability and control.

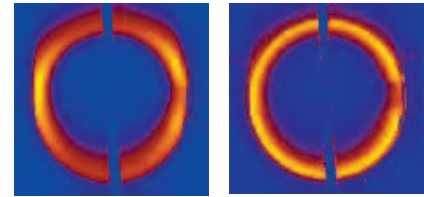
## Pre-Configured Convenience

Each Maxline 2 system is designed to be a complete, dedicated solution. To assure dependability, repeatability and reliable accuracy, we eliminate for you the configuration and compatibility challenges typical with choosing components from multiple suppliers. We offer added peace of mind that your solution will begin producing results for you with minimal startup time, disruptions and expense.

## Ongoing Support

Icon offers training and technical support programs to support you long after installation. Combined with our wealth of application knowledge, we can help you later reconfigure your Maxline 2 system to adapt with your changing needs.

### Unique De-Blurring Capability for Moving Targets



□ Before □ After

Through fast infrared image capture and processing, and a unique, patent-pending real-time image de-blurring algorithm, Maxline 2 systems enable you to measure processes accurately.

This means that you can measure continuously moving targets – not just stationary items – without disrupting process time, and at process speeds up to 60 inches (1.5 meters) per second.\*

\* Based on camera mounting distance 15 inches (381 mm)

Two Maxline 2 processor options are available. Both allow multiple-camera image capture and analysis, and remote PC TCP/IP communication:

**Maxline 2 Industrial Operator Interface (X2P01)**  
Combines processing with a built-in display as a single unit. Designed for factory floor use, it can be installed as either a wall or surface mounted unit. A mouse and keyboard is supplied with each unit.

**Maxline 2 Embedded Processor Box (X2P02)**  
Possessing similar capabilities as the Industrial Operator Interface, but without the mouse, keyboard or built-in display, it is an ideal solution for those who want a smaller processor footprint, and are likely to most often access the system remotely.



# Maxline 2 Automation Applications

## ... for Process Inspection

Maxline 2 systems enable automated inspection of production processes, to ensure that standards are maintained, and output quality is high.

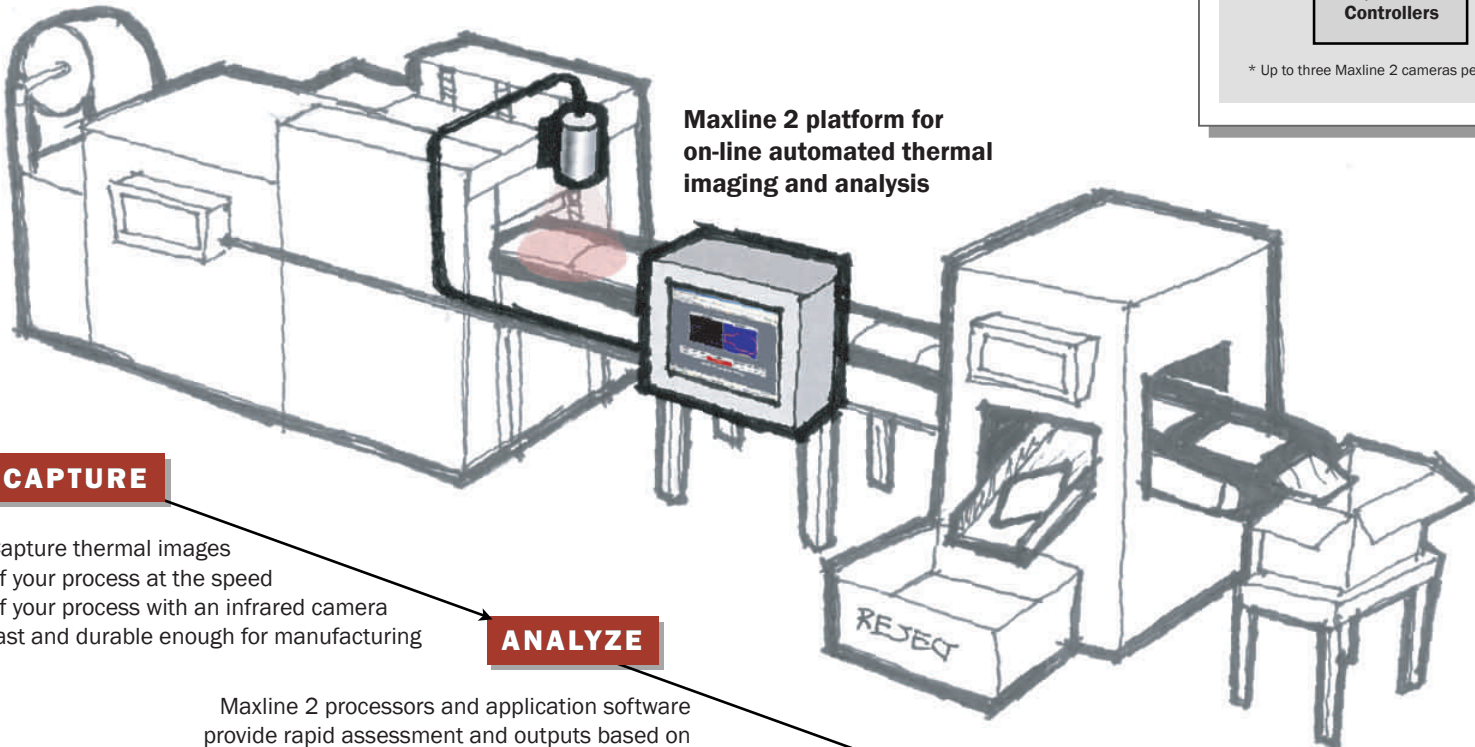
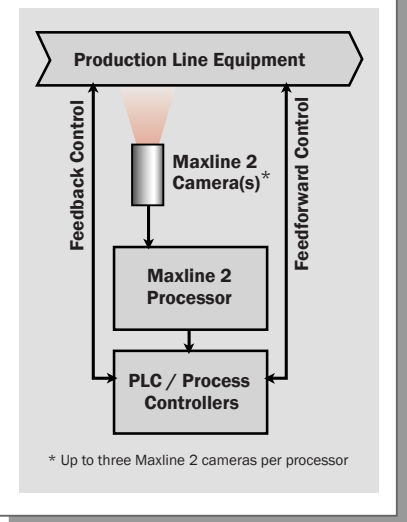
- Automated Process Control – Pass/Fail
- Automated Data Collection and Reporting for Trend Recognition

## ... for Process Control

Maxline 2 systems enable feedback and feed-forward process control, adjusting other systems with parameters they output. Output trend data may also be collected for reporting purposes.

- Automated Temperature Control
- Automated Process Control – Pass/Fail
- Automated Data Collection and Archiving for Record Keeping

### Typical Maxline 2 system control loop:



### CAPTURE

Capture thermal images of your process at the speed of your process with an infrared camera fast and durable enough for manufacturing

### ANALYZE

Maxline 2 processors and application software provide rapid assessment and outputs based on process conditions. Unique image deblurring features allow for inspection of continuously-moving objects.

### DETECT

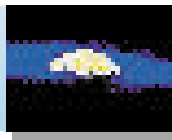
Process errors can be identified, with an alarm, control signal and diagnostic code initiated, so that your systems can react immediately.

### CONTROL

**Analysis Result**

**Thermal Image**

Record	Date	Time	Condition	Max T	S.Dev	Area	Max E	SDE
182031	2005-03-17	11:30:44	VG ME SE	96.2°C	7.9°C	1716	61.2°C	10.7°C



Defect Detected

Beyond automated detection, the critical step is what you do with the information gained. Maxline 2 outputs control signals and data for you to flexibly and automatically adapt production conditions, send alert notifications and save data for trending and other purposes. The Maxline 2 system also has built-in networking capabilities so that you can control and retrieve information from the system remotely.

### Systems Input / Output Possibilities:

Automated Temperature Control

Automated Process Control - Pass / Fail

Automated System Alarms and Warnings

Automated Data Collection and Reports for Trend Recognition

Remote Access and Control

# Specifications and Ordering Information

## TYPICAL MAXLINE 2 SYSTEM COMPONENTS

(Other components may be selected to suit your application)

	Maxline 2 Image Analysis System**	Maxline 2 Preform Inspection System	Maxline 2 Torpedo Car Inspection System* (Single Camera)	Maxline 2 Torpedo Car Inspection System* (Dual Camera)	Maxline 2 Thermal Seal Checking System**
Camera	XL-0250	XL-2500	XL-0500	XL-0500	XL-0250
Lens	XL02	XL03	XL01	XL01	XL02
Processor	X2P01	X2P02	X2P01	X2P01	X2P02
Software	X2S3	X2PR	X2TC	X2TC	X2SC
Outputs	X2RB1	X2S6	Internal	Internal	Internal
Enclosure			X2EEAP	X2EEAP	
Accessories 1	X2485		X2B	X2B	
Accessories 2			X2AHHD	X2AHHD	
Cable***	25' (7.6m)	25' (7.6m)	200' (61m)	200' (61m)	25' (7.6m)



**X2EEAP**  
Environmental Enclosure  
& Air Purge Accessory

For additional detail, ask  
for brochure #010153  
Patent 6,890,080



**X2RB1/X2RB2**  
I/O Relay Module

## MODEL NUMBERS

### CAMERA and RANGE

<b>XL-0250N</b>	-20-250°C (-4-482°F)	(8-14 micron)
<b>XL-0500N</b>	0-500°C (32-950°F)	(8-14 micron)
<b>XL-1200N</b>	100-1200°C (212-2200°F)	(10.58+/- .37 micron)
<b>XL-2500N</b>	400-2500°C (752-4532°F)	(8 micron)

### LENS

<b>XL01</b>	13 mm (68° x 51° FOV)
<b>XL02</b>	25 mm (34° x 25° FOV)
<b>XL03</b>	50 mm (17° x 12.5° FOV)
<b>XL0CF</b>	50 mm Close Focus Dist. 5.25"-10.5" (133-267mm)

### PROCESSOR

<b>X2P01</b>	Industrial Operator Interface
<b>X2P02</b>	Embedded Processor Box

### SOFTWARE

<b>X2S3</b>	Image Analysis Software
<b>X2PR</b>	Preform Inspection Software
<b>X2TC</b>	Torpedo Car Inspection Software
<b>X2SC</b>	Thermal Seal Checking Software

### INSTALLATION ACCESSORIES

<b>X2EEAP</b>	Environmental Enclosure & Air Purge Accessory
<b>X2B</b>	Blower, Filter, Blower Piping for Air Purge Accessory
<b>X2AHHD</b>	50-ft. Hose & Hardware for Air Purge Accessory

### OPTIONAL ACCESSORIES

<b>X2RB1</b>	I/O Relay Module (use with <b>X2P01</b> processor)
<b>X2RB2</b>	I/O Relay Module (use with <b>X2P02</b> processor)
<b>X2485</b>	RS-485 Card (dual port)
<b>X2MON</b>	Monitor/Keyboard/Mouse kit (for use with <b>X2P02</b> )
<b>X2S6</b>	4 Ch. Analog Output Card (for Preform Software Only)

## CAMERA SPECIFICATIONS

### PERFORMANCE

<b>Accuracy</b>	XL-025N - 2°C or 2% of reading whichever is greater XL-0500N, XL-1200N, XL-2500N - 1% of full scale
<b>NedT (NET)</b>	0.3°C @ 30°C with F/1.4 Lens for 0-250°C Range 1.0°C @ 30°C with F/1.4 Lens for 0-500°C Range
<b>Analog Video</b>	NTSC @ 60Hz.
<b>Digital Video</b>	14 Bit @ 60Hz.

### PHYSICAL CHARACTERISTICS

<b>Size</b>	3" Dia x 7" length (76mm dia x 178mm Length)
<b>Weight</b>	3.6 lbs. (1.6kg.)
<b>Operating Temp.</b>	0-45°C (32-113°F)
<b>Storage Temp.</b>	0-55°C (32-130°F)

## PROCESSOR DIMENSIONS (Removeable brackets are included with each processor kit.)

### INDUSTRIAL OPERATOR INTERFACE (X2P01)

<b>Unit Dimensions</b>	<b>W</b> 20" (508mm) <b>x</b> <b>H</b> 16" (406mm) <b>x</b> <b>D</b> 9" (229mm)
<b>Unit Dimensions w/Wall Mount Brackets</b>	<b>W</b> 22.125" (562mm) <b>x</b> <b>H</b> 16" (406mm) <b>x</b> <b>D</b> 9.375" (238mm)
	Allow at least 6" to both sides of Width for cable access and airflow.

### EMBEDDED PROCESSOR BOX (X2P02)

<b>Unit Dimensions</b>	<b>W</b> 10.64" (266mm) <b>x</b> <b>H</b> 5.28" (132mm) <b>x</b> <b>D</b> 10.16" (254mm)
<b>Unit Dimensions w/Surface Mount Brackets</b>	<b>W</b> 11.84" (296mm) <b>x</b> <b>H</b> 5.52" (138mm) <b>x</b> <b>D</b> 10.16" (254mm)
<b>Unit Dimensions w/Rack Mount Brackets</b>	<b>W</b> 19.28" (482mm) <b>x</b> <b>H</b> 5.28" (132mm) <b>x</b> <b>D</b> 10.16" (254mm)
	Allow at least 10" to back of Depth for cable access and airflow

NIST Calibration Provider



The Maxline 2 system with Industrial Operator Interface complies to the following standards and directives:

Electromagnetic Emissions (by Council Directive 89/336/EEC)  
Electromagnetic Immunity (by Council Directive 89/336/EEC)  
EN 61326 Class A EN 61000-4-3

\* US Patent # 6,837,616, and other patents pending  
\*\* Patent pending  
\*\*\* Cable lengths available from 15' (4.5m) to 200'(61m)



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