

GS150/GS150LE

Thermal Imaging System for Quality Control in Glass Processing Applications



*The GS150 provides real time temperature analysis for glass bending processes
(Photo: Courtesy of Glassrobots OY, Tampere, Finland)*



MP150 Linescanner



Thermal Imaging System for Glass Processes

The GS150 System is an automated temperature measurement system for glass bending, forming, annealing, and tempering processes.

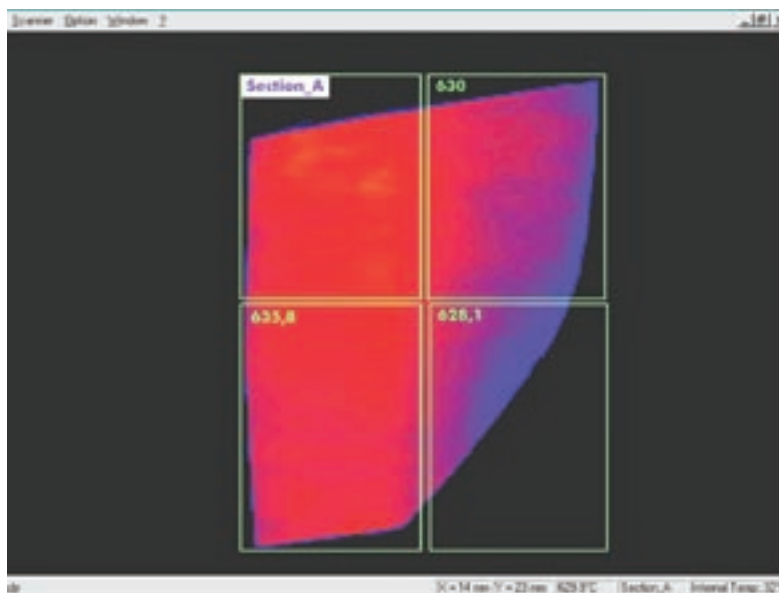
Benefits

- Improve profitability and product quality
- Reduce set-up time
- Detect defects quickly
- Automate quality monitoring for ISO 9000
- Reduce scrap

Features

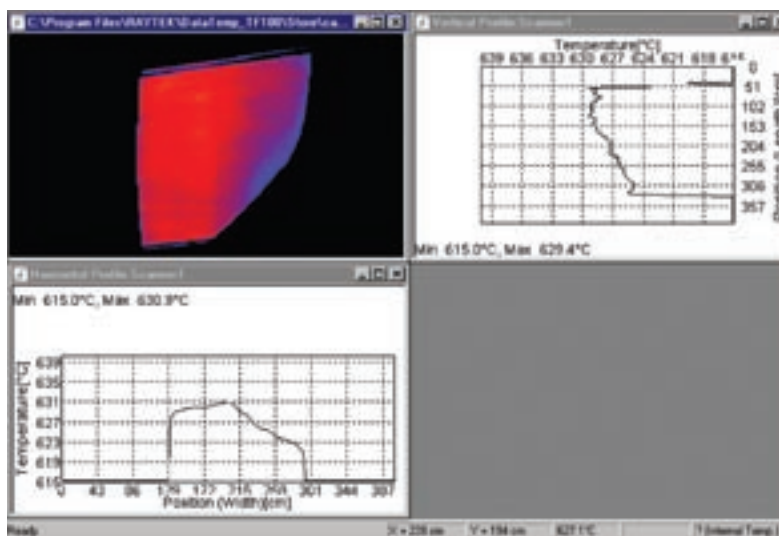
- Automatic emissivity correction for low emissivity glass (GS150LE)
- View complete thermal images and temperature profiles
- On board Ethernet TCP/IP communication
- Define product-specific configurations and data files
- Customize and display zones overlaid on thermal image
- Automatically analyze zone temperatures
- Fail-safe alarm logging
- Built-in line laser sighting
- Optional analog or digital outputs
- System interfaces: OPC or DDE server, analog or digital output modules, serial COM port
- Multiple language support

The GS150 Thermal Imaging System allows you to see what's happening in your glass process



Actual glass window thermogram showing heater zones

The grid overlay represents the heating element zones in the furnace. The average temperature of each zone is displayed in the corner. Zones can be tailored to each application depending on heater size and location. Temperatures for each zone are displayed as average, maximum, or minimum values. Serial or analog outputs can be configured to provide outputs proportional to each zone's temperature.



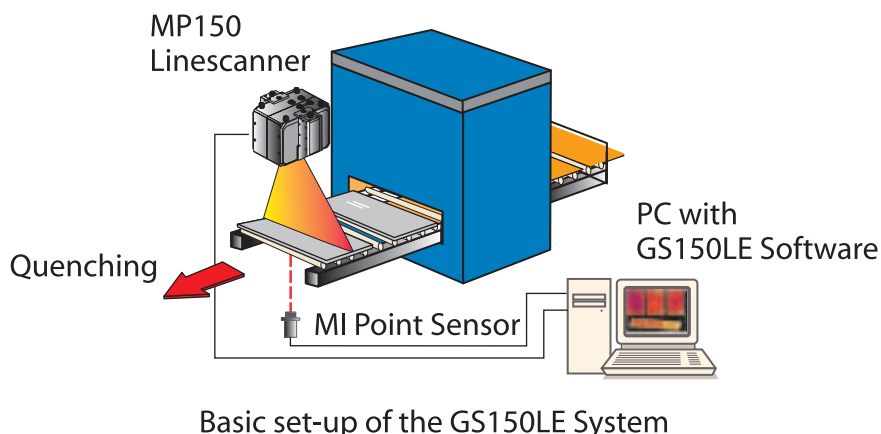
Actual thermogram showing temperature profiles

Thermal image data files can be recalled for subsequent analysis and display. As the cursor is moved around the thermal image to selected locations, the spot temperature and location (x- and y-coordinates) appear on the Task Bar. Move the cursor to selected spots, and the software displays the corresponding temperature profiles that intersect the spot location in the machine-direction and cross machine-direction.

The GS150LE Thermal Imaging System for low emissivity glass with automatic emissivity correction

The GS150LE incorporates all features of the proven Raytek GS150 System. It is suited for monitoring and optimizing glass treatment processes (e.g. tempering and one-sided coated glass). Coated glass has very low emissivity values (high reflection). Knowing the exact emissivity value is essential for infrared temperature measurements. With the addition of an IR point sensor that measures the temperature on the uncoated (bottom) side of the glass where the emissivity is known, the thermal image created by a Raytek MP150 linescanner can be corrected.

By quickly detecting thermal irregularities within the glass and identifying defective heating elements, the GS150LE allows glass processors to improve product quality and uniformity, and reduce scrap. If a fault or defect occurs, an alarm is triggered to allow for corrective action. Further, the GS150LE system allows the user to set-up predefined recipes to accommodate frequent product changes, such as loads of differing thickness.



Custom Configurations

DataTemp GS150/GS150LE Software allows custom configurations for any type of glass product or process.

General	Specify MP150 scan rate, PC COM ports, baud rate, and native language.
Temperature	Adjust emissivity, temperature range, and temperature units.
Geometry	Specify MP150 distance, installation angle, thermal image dimensions, and units.
Data File	Define product name, date and time stamp for storing images under alarm conditions, and data file storage path.
Trigger	“Trigger” images based on measured temperature or an externally applied trigger signal.
Zone	Configure any number of rectangular zones by size and location. Specify desired signal processing and alarm conditions for each zone.
Input/Output	Specify COM port, addresses, and channel numbers for optional Analog or Digital Output Modules and output zone results on a specified COM port. Define OPC interface.

System Features



Zone Configuration Screen

The screen allows specification of zone name, size, location, temperature limits, signal processing, output module configuration, and DDE connection

Processing Image

The MP150 measures a line of up to 512 points using a rotating mirror that scans a 90° field-of-view up to 150 times per second. The scanning of a glass part is initiated by the measured temperature, or an external “trigger” signal. As each heated glass part traverses the field-of-view, a two-dimensional thermal image or “thermogram” is formed.

Installs in Minutes

The MP150 installs easily—just like a camera—and views the glass part from above... wherever it has a clear viewing path. Connecting the pre-wired cables (included) to a PC and entering installation dimensions in the GS150/GS150LE Software completes the installation process.

Scope of Delivery

RAYTGS150G5	MP150G5 Process Imager 5 micron spectral response, 100°C – 950°C (212°F – 1742°F) DataTemp GS150 Software Industrial power supply RS232/485 Scanner Converter
RAYTGS150LEG5	RAYTGS150G5 plus: GS150LE software MIG5 miniature point sensor Air Purge collar for MI sensor RS232/RS485 Point Sensor Converter
RAYTGS150LEUPDATE	Update from GS100 or GS150, includes: GS150LE software MI miniature sensor point Air Purge collar for MI sensor RS232/RS485 Point Sensor Converter

Options and Accessories

Part Number	Description
XXXTMP50ACCC	MP50 carrying case
XXXTMP50AC485CB10	10m RS485 cable extension
XXXTMP50ACPSCB10	10m Power cable extension
XXXTMP50ETH10	10m Ethernet Cable
XXXMP50ACMP	Mounting plate for adjustable Mounting base (or tripod)
XXXTMP50ARMB	Adjustable mounting base
XXXSYS16DA	Digital Output Module 16 channel, open collector
XXXSYS4AA	Analog Output Module 4 channel, mA or V
XXXSYS485CV	RS232/RS485 Converter (needed for Output Modules)
XXXSYSPSWM	Wall Mount Power Supply (24 VDC, 0.6A) needed for Analog /Digital Modules and SYS485CV converter

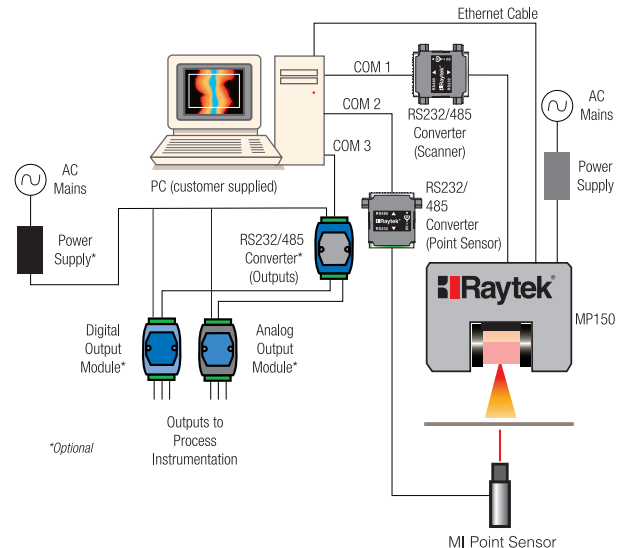
¹Contact Raytek Headquarters for information regarding optional protective enclosures

Specifications

System Accuracy	±0.5% of reading or ±3°C (6°F) whichever is greater
Repeatability	±1°C (2°F)
Optical Resolution	150:1 (90% energy) 450:1 (50% energy)
Ambient Temperature ¹	0 to 50°C (32 to 122°F) 180° (352°F) with water cooling
Field-of-View (FOV)	90° or 45°
Number of Temp. Points	256 points @ 150Hz 512 points @ 80Hz
Scan Rate	up to 150Hz
Physical Dimensions	200 x 180 x 190 mm 7.9 x 7.1 x 7.5 in.
Weight	7 kg (15.5 lbs)

Easy Installation

The small size of the MP150 Process Imager allows installation at the exit of the furnace or forming sections. The MP150 connects to a standard PC operating Windows® NT, 2000, or XP. The system's RS485 digital interface insures reliable operation over long cable runs. The diagram below represents a typical system installation. Optional Analog and Digital (open collector) Output Modules operate from a second serial COM port on the PC. The PC never has to be opened to install the GS150 System.



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