

### TECHNICAL DATA

# TF Thermal Imaging System

## Quality Monitoring for Thermoforming Processes

The TF Thermal Imaging System allows users to visualize the temperature distribution of virtually any plastic part created in thermoforming processes.

In the core of each TF Thermal Imaging System is the MP Linescanner – which can measure a line of up to 1024 points by using a rotating mirror, which can scan a 90° field-of-view up to 300 times per second. This high scan rate enables the rapid detection of temperature discrepancies and hot spots. During the thermoforming process, each plastic sheet is scanned to create a two-dimensional thermal image, or “thermogram,” in real-time. The final thermal image is displayed each time a scanned sheet is indexed.

In addition to the MP Linescanner, each TF Thermal Imaging System features exclusive software that can sub-divide thermal images into specific areas of interest or zones. Each zone, which is overlaid on the thermal image, represents the heating elements in the furnace and can be processed to read the average, maximum or minimum temperature. The software also allows users to save thermal images for later analysis as well as alarm capabilities to alert to any thermal defects.

By utilizing OLE for Process Control (OPC), the TF Thermal Imaging System can communicate with a variety of common process control systems. As a result, the system is more than a measurement tool and can be used as an integral part of your total process control system.

### Features

- Detailed thermal images based on 76,800 pixels per second
- Define product-specific configurations (recipes)
- Play back stored files as a “movie”
- Heater zones overlaid on thermal image
- PC independent alarms
- Integrated OPC server for remote system control
- Analog or digital output modules
- On-board Ethernet TCP/IP communication
- Built-in laser sighting
- Multiple language support



### Benefits

- Quickly find material defects and failed heating elements
- Significantly reduce setup time
- Automate quality monitoring for ISO 9000
- Improve profitability and product quality
- Reduce scrap

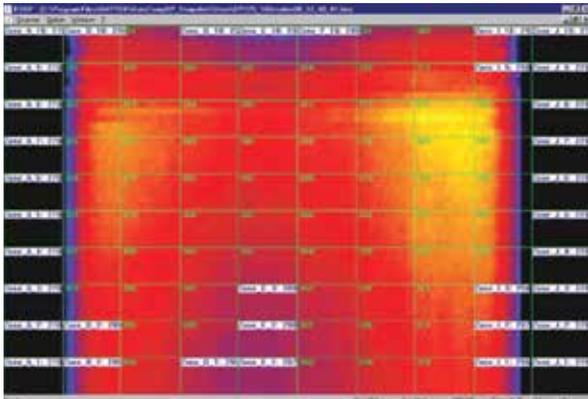
### Specifications

Temperature Range	20 to 350 °C (68 to 662 °F)
System Accuracy	± 2°C (4°F)
Repeatability	± 1 °C (2 °F)
Optical Resolution	170:1 (90% energy)
Ambient Temp	0 to 50 °C (32 to 122 °F), with internal water cooling 180 °C (356 °F)
Field of View	90°
Points per Line	up to 1024 pixels
Scan Rate	up to 300 Hz

## Sheet Analysis with 76,800 Pixels per Second

The intuitive TF System software displays each thermal image snapshot with overlaid customizable zones and zone results. The software also features multiple alarm settings, with high alarms appearing red and low alarms appearing blue. Additionally, to control the heater, zone results can be output to your PLC or SCADA system.

The TF System software also allows users to recall thermal image data files for analysis and display. During analysis, as the cursor is moved across the thermal image, the spot temperature and location (x- and y-coordinates) appear on the task bar.



Actual thermogram showing heater zones  
Overheated area on one part due to out of spec sheet thickness

### Scope of Delivery

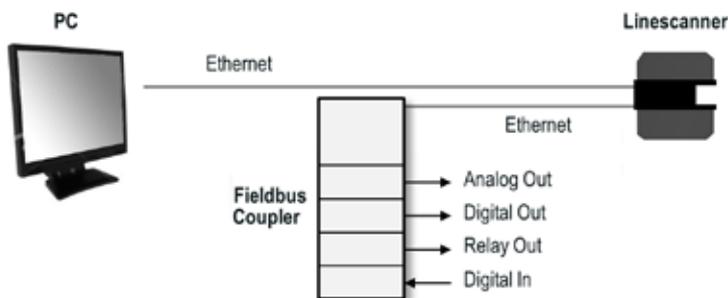
- MP-SYS-TF System including:
  - System software
  - Industrial power supply
  - Optical data carrier (operator's manual, DataTemp DP software)

### Accessories

- Adjustable mounting base (A-MP-RMB)
- Ethernet Fieldbus Coupler (A-IO-BASICKIT)
- Relay Output Module (A-IO-2R-NO)
- Analog Output Module (A-IO-2AOC-4)
- Digital Output Module (A-IO-16DO)

## Easy Installation

The MP Linescanner can be easily installed, much like a camera, and is capable of viewing the sheet between the oven and forming sections from above or below. By connecting pre-wired cables (included) to a PC and entering installation dimensions, the TF Software quickly completes the installation process for you.



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### Worldwide Service

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