

Heat Treatment Workshop

Infrared Thermal Imaging Products

Presented by:

Jay Duenow, Regional Manager

Raytek Portable Products



Agenda

- Raytek Corporation Overview
- Measuring Temperature
- Basic Heat Transfer Theory
- Key Markets for Thermal Imaging Products
- Key Industries for Thermal Imaging Products
- Raytek ThermoView Ti30
- Raytek PhotoTemp MX6
- Questions

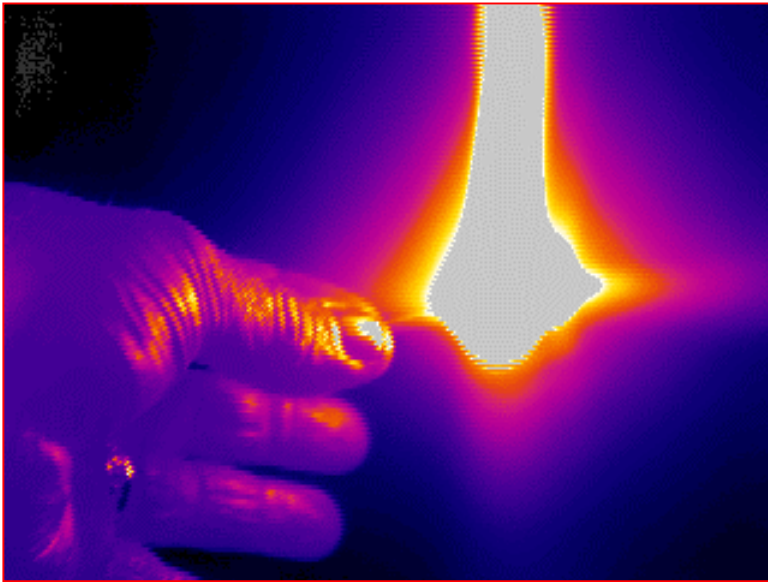
Raytek Corporation



A leading worldwide supplier of noncontact infrared thermometers for industrial, maintenance, and quality control applications.



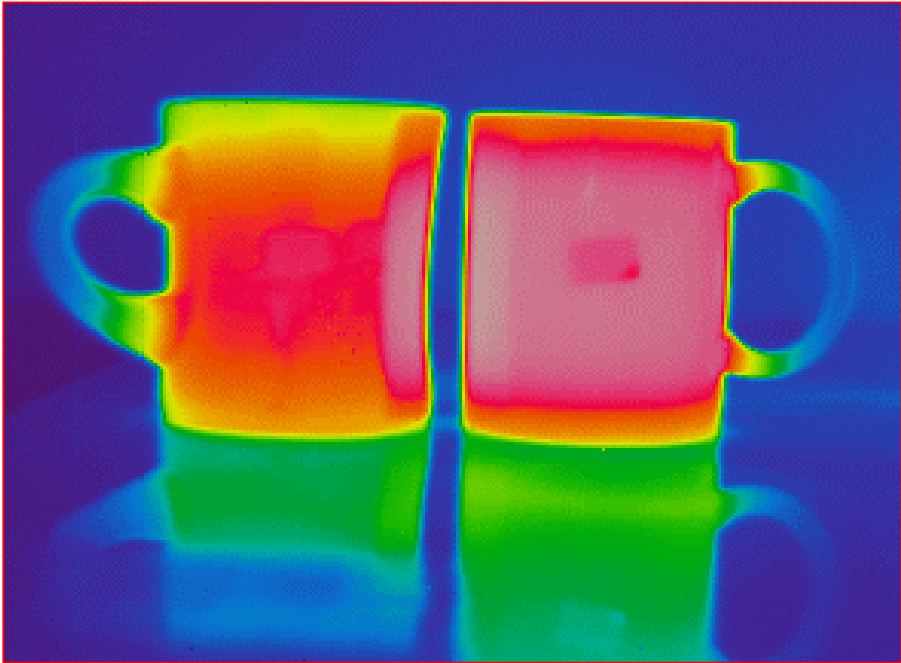
Temperature and radiation



Radiometers measure electromagnetic infrared radiation and then, from that, *infer* temperature!

Higher temperature = more infrared radiation (usually!)

Basic heat transfer theory



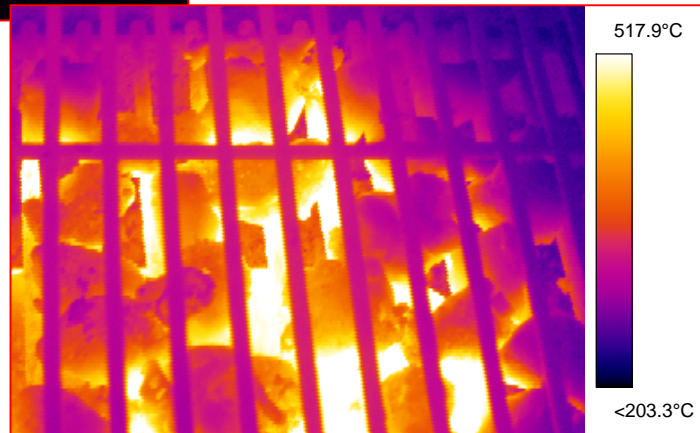
Mainly we see *surfaces*
Mainly the heat energy
of interest originates
from *inside*

What is the relationship
between inside and
outside?

Heat transfer modes



Radiation
Conduction
Convection



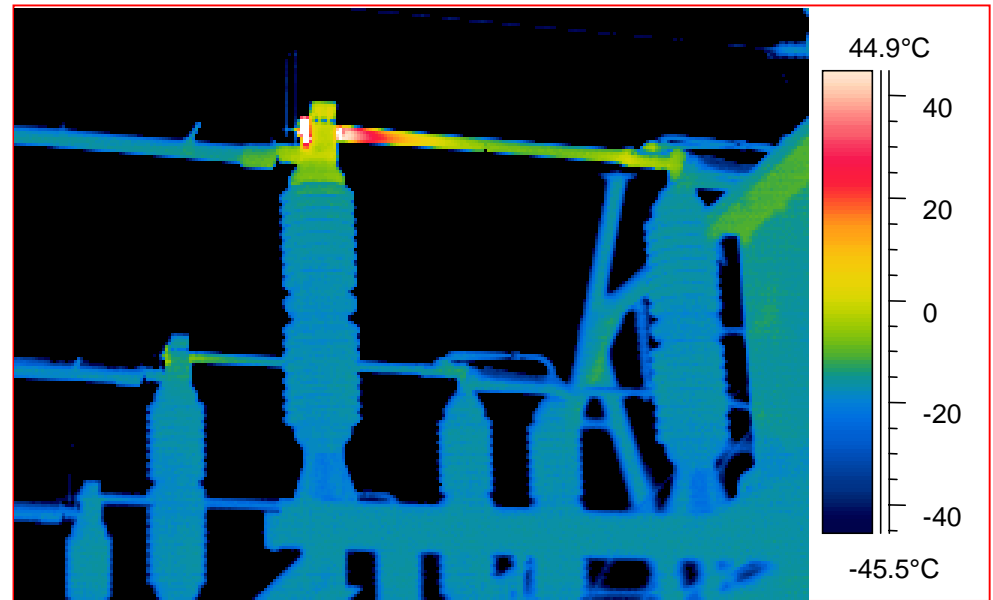
Heat energy

Net flow of energy is from warmer to cooler areas

Flow can be:

- Transient
- Steady-state

It can be useful to look at objects in *both* situations.



Key markets for infrared

Major markets:

- Electrical
 - In-plant
 - Utility
- Mechanical
- Roofs
- Buildings
- R&D

Minor markets:

- Biological
 - Equine
 - Medical
 - Agricultural
- Marine
- Security & law enforcement
- NDT
- Termite.

Key industries using infrared

Manufacturing

- Heavy
- Light

Pulp & Paper

Pharmaceutical

Petrochemical

Architects & engineers

Property managers

Consulting thermographers

Roofing

- Installers
- Consultants

Medical & veterinarian

Insulators

Builders

HVAC contractors.

Key industries using infrared

Facility maintenance

- Public
- Commercial
- Hospitals

Heavy equipment repair

Transportation

Electric utility

- Generation
- Transmission
- Distribution

Electrical contractors

Motor shops.

ThermoView™ Ti30



- Designed for Predictive Maintenance Applications
- Lightweight, Rugged, Easy to use
- Breakthrough Price Point
- Only One Model

ThermoView system



Product Overview

- Designed specifically for Preventive and Predictive Electrical and Mechanical Maintenance Applications
- Key features:
 - Radiometric capability
 - Fast target scanning
 - Full featured thermal analysis software standard
- Interactive User Guide
- 2 days free end user training
- List price US\$9,950

Batteries

Two choices:

- Re-chargeable (NMH)
- Replaceable (6 AAs)

5 hour run time

Insert into handle.

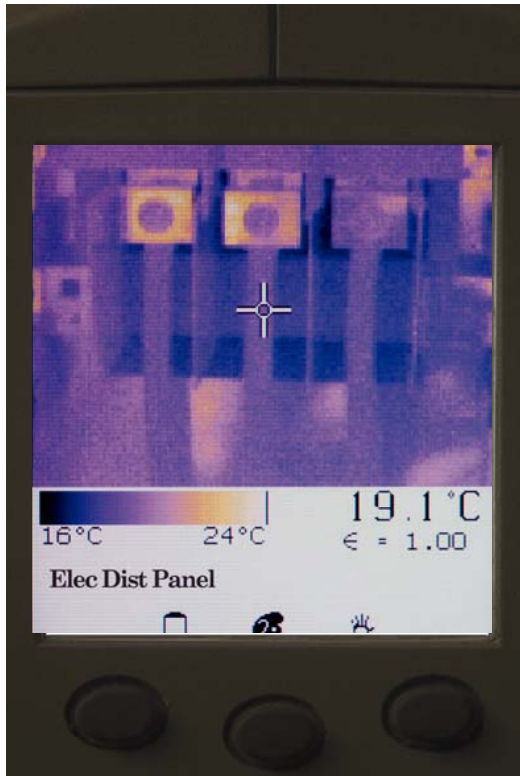


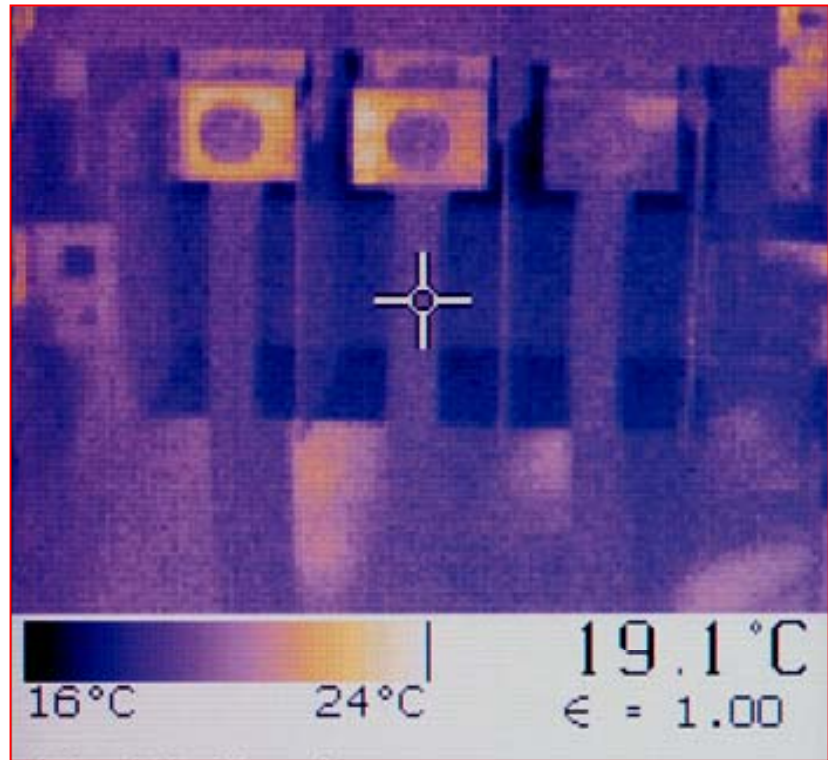
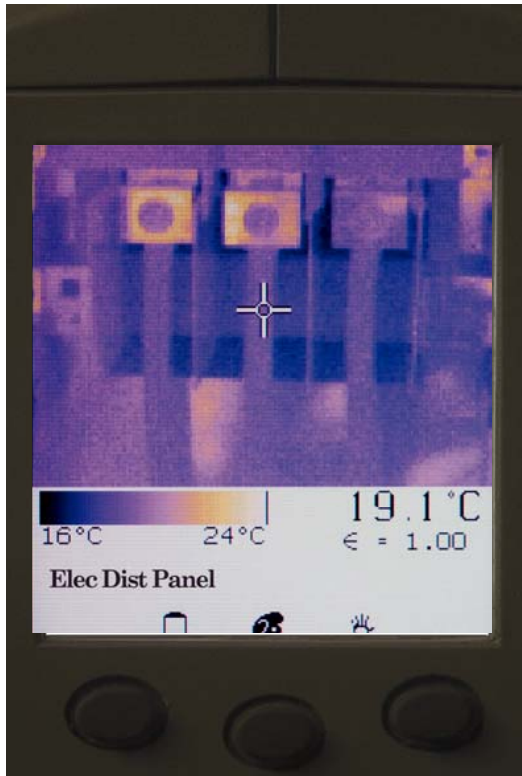
Getting an image

Point the camera
Focus
Pull trigger to freeze
Press UP key to store
Press MODE 3 times
and then UP/DOWN to
view stored images.



...and what an image!



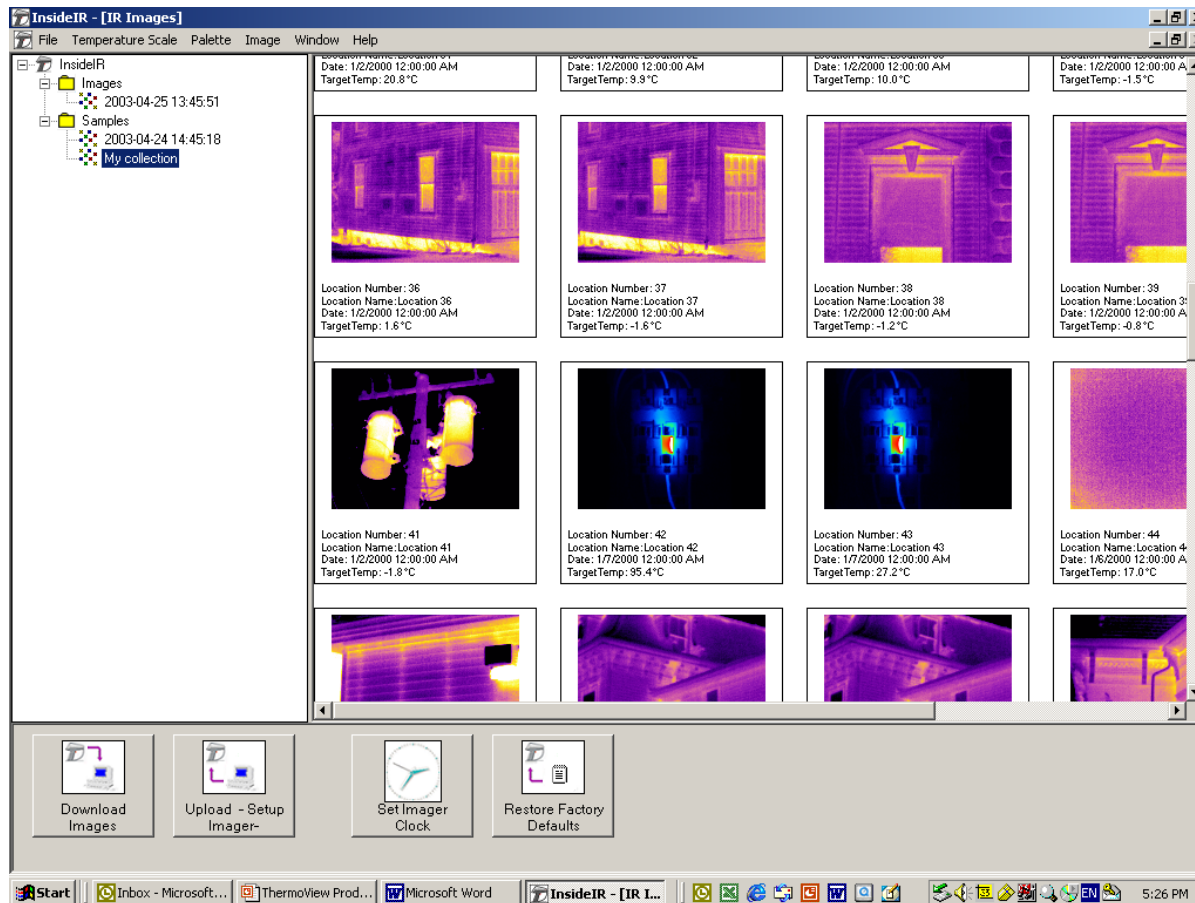


Plus Unique Added Features...

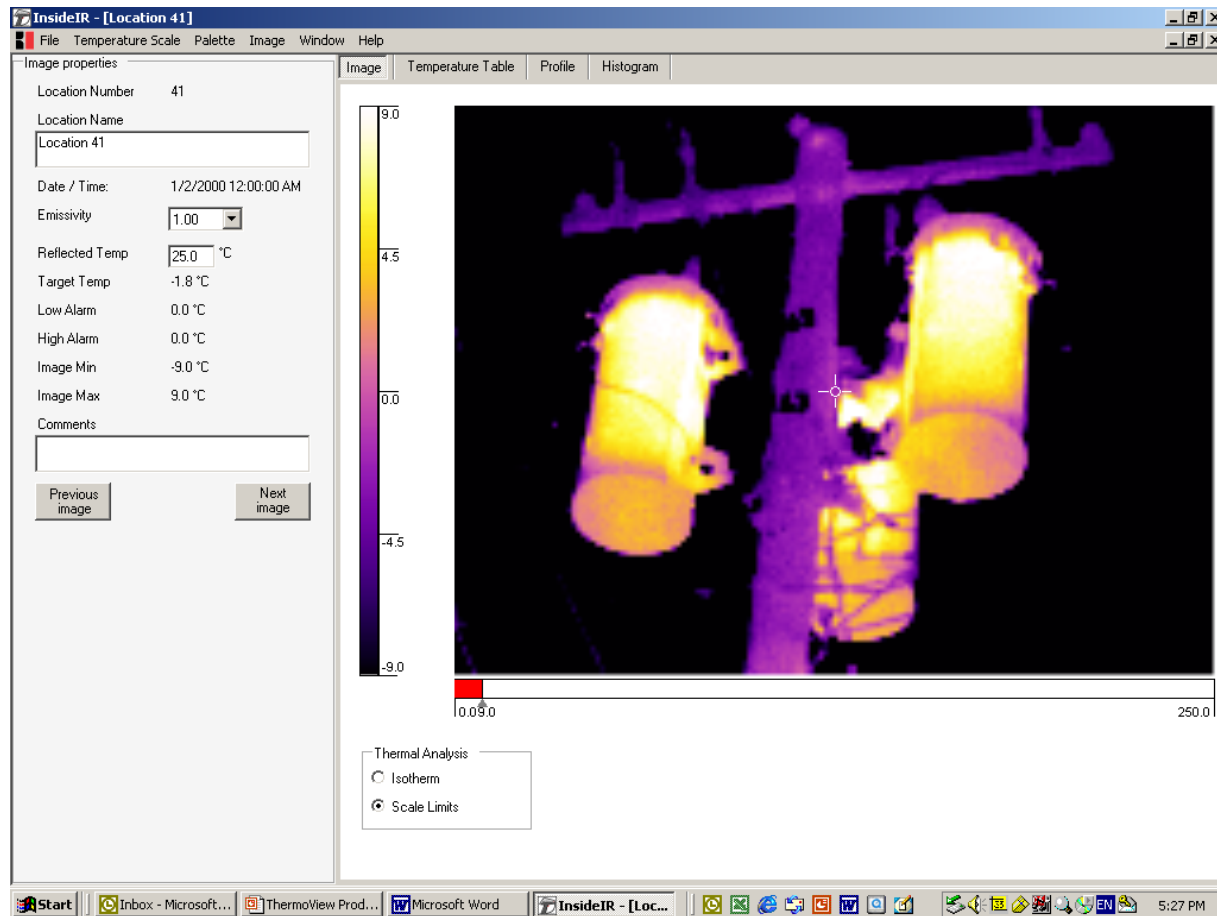
- Instant temperature constantly indicated, depicted by crosshatch at the center of the image
- Docking station accessory: automatic data download/upload, automatic battery recharge, hassle free connection
- 100 thermal images storage capacity
- Sighting: single dot laser
- Fully featured thermal analysis InsideIR™ software package

InsideIR software highlights

Image storage and organization



InsideIR software highlights Image analysis and sharing





Introducing the Raytek PhotoTemp™ MX6 Infrared Thermometer



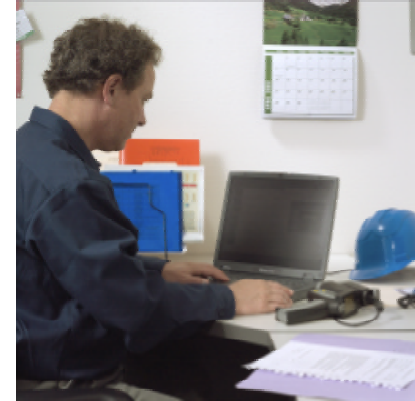
PhotoTemp MX6

Measure. Photograph. Document.

- **Measure** temperature up to 932°C (1600°F)
 - 0.75% accurate
 - Precise double-bright True Spot sighting
 - Store data for 100 locations
- Simultaneously make digital **photographs** with date and time included in image
- **Document** your inspection in easily created visual reports for better effectiveness

Using PhotoTemp MX6

An Easy 1-2-3 Process



- Measure and photograph equipment or processes with PhotoTemp MX6
- Download the data and photos to a computer via USB data link
- Analyze data and create reports with the included DataTemp MX software

Introducing PhotoTemp MX6

- Take digital photos with temperature measurements
- Create & share visual reports of temperature inspections
- True Spot™ double-bright laser sighting shows measurement area
- Download to PC
- Up to 100 stored photos+measurements



PhotoTemp: Built on Precision MX Family Features

- True Spot accurate circular laser sighting
- High, 60:1 optical resolution to measure smaller objects from further (50:1 CF)
- 100 location data logging with customizable names
- Software for storing and analyzing temperature trends
- Customizable emissivity table of common materials
- Close Focus and Subzero models



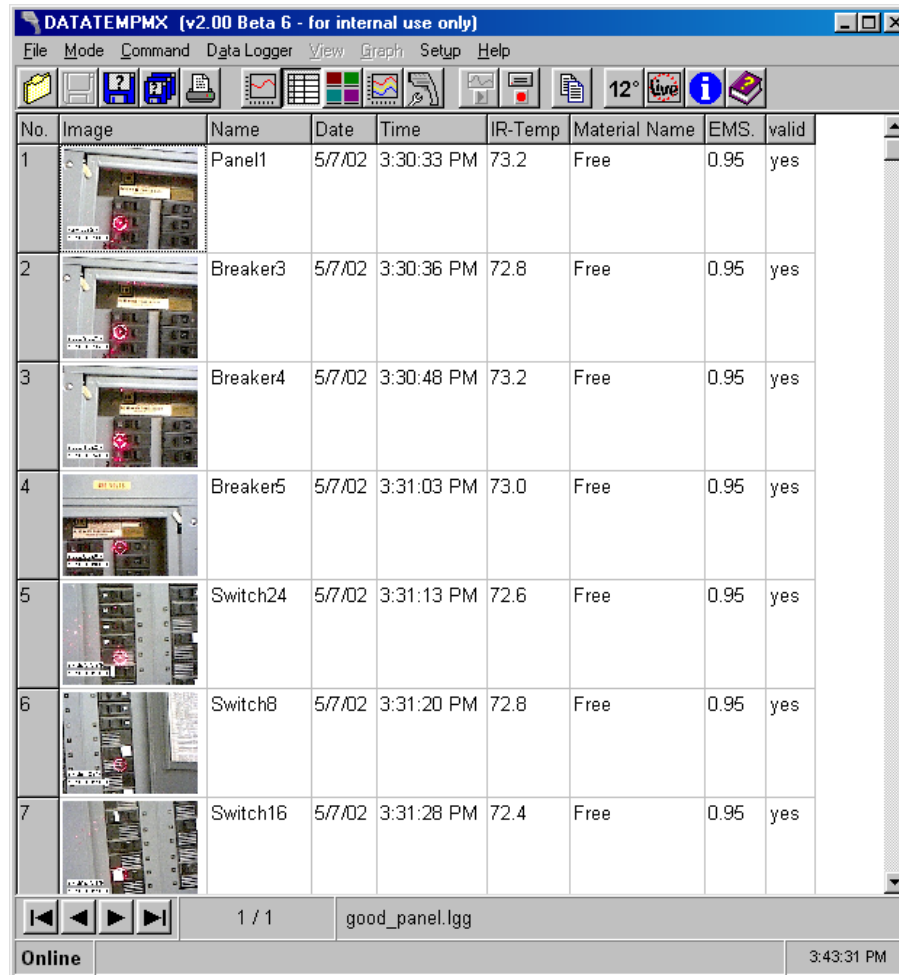
PhotoTemp MX6 Features

- Photos taken at trigger release after sighting with True Spot circle
- Up to 26 (640x480 pixels) or 100 (320x240 pixels) photos
- Photos associated with location name and temperature data on PC










DTMX Software

Logger Data – Tabular Format



The screenshot shows the DATATEMPMX software interface (v2.00 Beta 6 - for internal use only). The main window displays a table of temperature logger data. The table has columns for No., Image, Name, Date, Time, IR-Temp, Material Name, EMS, and valid. The data is as follows:

No.	Image	Name	Date	Time	IR-Temp	Material Name	EMS	valid
1		Panel1	5/7/02	3:30:33 PM	73.2	Free	0.95	yes
2		Breaker3	5/7/02	3:30:36 PM	72.8	Free	0.95	yes
3		Breaker4	5/7/02	3:30:48 PM	73.2	Free	0.95	yes
4		Breaker5	5/7/02	3:31:03 PM	73.0	Free	0.95	yes
5		Switch24	5/7/02	3:31:13 PM	72.6	Free	0.95	yes
6		Switch8	5/7/02	3:31:20 PM	72.8	Free	0.95	yes
7		Switch16	5/7/02	3:31:28 PM	72.4	Free	0.95	yes

The interface also includes a menu bar (File, Mode, Command, Data Logger, View, Graph, Setup, Help), a toolbar with various icons, and a status bar at the bottom showing "Online", "1 / 1", "good_panel.lgg", and "3:43:31 PM".

DTMX Software

Logger Data – Image View

The screenshot displays the DATATEMPMX software interface (v2.00 Beta 6 - for internal use only). The main window shows a grid of seven small images, each representing a different component of an electrical panel with its corresponding temperature reading:


- Panel1: 73.2°F
- Breaker3: 72.8°F
- Breaker4: 73.2°F
- Breaker5: 73.0°F
- Switch24: 72.6°F
- Switch8: 72.8°F
- Switch16: 72.4°F

A larger window titled "Breaker3" is open, providing a detailed view of the breaker. It shows a red circular temperature indicator and a timestamp: "Breaker3: 72.8 °F" and "5/7/02, 3:30:36 PM".

The interface includes a menu bar (File, Mode, Command, Data Logger, View, Graph, Setup, Help), a toolbar with various icons, and a status bar at the bottom showing "Online", "1 / 1", "good_panel.lgg", and "3:45:37 PM".

Easily Create Reports


Paste Photos & Data in Reports



Electrical Maintenance Report

Acme Infrared Service, Inc.

Report Date: 17 May 2002



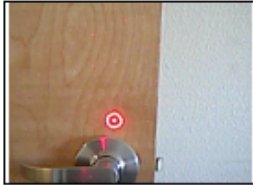
Report No.	<input type="text" value="X4709"/>	Image Date:	<input type="text" value="5/17/02 3:30:36 PM"/>
Job Number:	<input type="text" value="262"/>	Equipment No.	<input type="text" value="Y1809"/>
Location Name:	<input type="text" value="Breaker3"/>		
Location Description:	<input type="text" value="This breaker controls the main motor for mixer 3."/>		
Temperature Units:	<input type="text" value="°F"/>	User Name:	<input type="text" value="Chris Schmidt"/>
Ambient Temp:	<input type="text" value="79"/>	Background:	<input type="text" value="86"/>
Wind Speed:	<input type="text" value="17"/>	From direction:	<input type="text" value="SW"/>
Sky condition:	<input type="text" value="N/A"/>	Distance to object:	<input type="text" value="300mm/12"/>
Rated load	<input type="text"/>	Measured load:	<input type="text"/>
Emissivity:	<input type="text" value="ε = 0.95"/>	Temperature:	<input type="text" value="72.8"/>
Material Type:	<input type="text" value="Free"/>		
Repair Priority:	<input type="text" value="L M H U"/>	Repair Check Date:	<input type="text" value="7 July 2002"/>

Comments:

This breaker displays intermittent temperature rise when the motor is running under load. Retest during the next maintenance cycle in July.

Raytek Maintenance Company


Electrical Maintenance Report



Report Date: 4/23/02
 Temperature Unit: °C
 User: Raytek Corp
 Target Object Description: A wooden door with European handle.

Data:
 Location:
 Date and Time: 1/1/04 12:17:08 AM
 Target Temperature: **72.4 °C** (Min/Max/Avg: 72.2/73.4/72.6 °C)
 Probe Temperature: -25 °C
 Material: Free (ε = 0.95)
 Low Alarm:
 High Alarm:

Comments: This is one of the nicest doors whose temperature I have ever measured.
 Conclusions: **No maintenance needed!**



Questions?

