

MicroTherm
automation at its excellence

Overview

This presentation describes about an application software platform designed with A series FLIR Thermal Imager from FLIR. This software can be customized based on application & requirement.

MicroTherm helps user to have friendly software with all the desired features to cater to the application with ease & efficiency.

MicroTherm can be coupled with various hard wares like Global Positioning System (GPS), I/O cards, Audio & Visual Alarms, GSM based SMS alarm system etc. to provide desired results to the customer.

MicroTherm Application

Customer – Research Design & Standard Organization (RDSO)

Application – To detect hot spots on overhead catenaries OHE

Conventional method – To scan the line manually using handy Thermal Imager across the line of few hundred Kilometers for every zone.

To list the pole no. of hot spot manually for identification.

*** Very time consuming & cumbersome procedure with chances of human error involved due to manual interface.*

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MicroTherm Based Solution

A series (A325 – 60 Hz) Thermal Imager is installed on roof top of train.



MicroTherm application is coupled with the FLIR Thermal Imager & GPS hard ware.

Application continued

Requirement

- ✓ A series Thermal Imager
- ✓ MicroTherm Application for:
 - a. Hot Spot detection
 - b. Hot spot finder database, GPS hardware with FLIR Camera interface with-in software.
- ✓ GPS Hardware device
- ✓ GPS Database pole nos. and their co-ordinates from INDIAN RAILWAYS

Application continued

Working

Thermal Imaging Camera from FLIR is installed on roof top of train in IP65 enclosure, further covered with metallic housing for dual protection from all type of weather & theft.

Overhead catenaries will be scanned for any hot spot (as per user defined temperature) from moving train using MicroTherm applications, FLIR Camera & other embedded hardware solution.

Application Continued

Function and logging

Following items are logged in report on identification of hot spot by moving train;

Thermal Image of hot spot

GPS Location of hot spot

Date & Time

Division, zone, and nearest OHE pole identification

Application continued

User interface of logging

After instant logging of data, hot spot details will be formatted (User defined) based on:

- ❖ Start pole no.
- ❖ End pole no.
- ❖ Longitude & Latitude
- ❖ Division
- ❖ Section
- ❖ Date & Time
- ❖ Maximum Temperature
- ❖ Hot spot image

Application continued

Highlights

- **GPS Data file received from customer can be easily imported to software by click of a button**
- **Hot Spot will be identified based on Pole no. for easy post scanning rectification.**
- **Dual nearest pole nos will be logged i.e. just previous & next to the hot spot. It results in more appropriate hot spot location and its tracking for maintenance.**
- **Clicking hot spot id results in opening of actual location of hot spot on Google Map (Active web connection required)**
- **Clicking Image link will open the captured hot spot image**

Highlights continued

- **Hot spot data can be filtered based on following:**
 - ✓ **Date & Time**
 - ✓ **Division of Indian Railways**
 - ✓ **Section of Indian Railways**

- **Data can be exported to Excel format along with hot spot images simultaneously & can be provided to concern zones/ authorities for rectification purpose.**

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**Snap of FLIR Camera Mounted on Train
roof top**

Next slide....

Actual Installation snaps

High Speed Thermal Imaging Camera with IP65 protection mounted on Train

Pan & Tilt Unit



Metallic protection to ensure safety from Theft

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MicroTherm Application Formats

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Format of MicroTherm application

Next slide....

MicroTherm - Thermal Automation Software

HotSpot Detector V2.0

Cam Control

Main About

Current settings
Camera: FLIR A3X0
Device: Ethernet

Status

Connect Settings...

Camera Live Image
No Image Loaded Disable Live Image

50.0
47.0
44.0
41.0
38.0
35.0
32.0
29.0
26.0
23.0
20.0

Auto Adjust Scale 20.0 - 50.0 °C

Events

Details

HotSpots Found : 0
CutOff Temperature (°C): 48
CutOff Area Percentage : 1 [change](#)
USB Device Status :
GPS Locking Status :

Modify Cutoff Parameters

CutOff Temperature (°C): 48.00
CutOff Area Percentage : 1.00
Save Close

HotSpot Detector V... Modify Cutoff Para... Microsoft PowerPol... 1:47 PM

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Format of GPS data from INDIAN Railways

Next slide....

MicroTherm - Thermal Automation Software

Record No.	Division	Section	OHE Mast/ Pole No.	Latitude	Longitude	Altitude
1	bsl	vna/acg	457/18	21.00708388	75.9059357	231.91
2	bsl	vna/acg	457/36	21.00378021	75.9091305	222.32
3	bsl	acg/vna	457/35	21.00374927	75.9091185	225.53
4	bsl	vna/acg	457/34	21.00425748	75.9087564	229.06
9	bsl	acg/vna	457/29	21.00513411	75.9078517	229.01
10	bsl	acg/vna	457/27	21.00558961	75.9073658	229.56
11	bsl	vna/acg	457/28	21.0056194	75.9074008	229.59
12	bsl	vna/acg	457/26	21.00598323	75.9070507	229.46
13	bsl	vna/acg	457/24	21.00622731	75.9068169	229.12
14	bsl	acg/vna	457/23	21.00606631	75.906904	229.44
15	bsl	acg/vna	457/21	21.00642326	75.906566	228.4
16	bsl	vna/acg	457/22	21.00640149	75.906621	228.51
17	bsl	vna/acg	457/20	21.0066639	75.9063769	228.58

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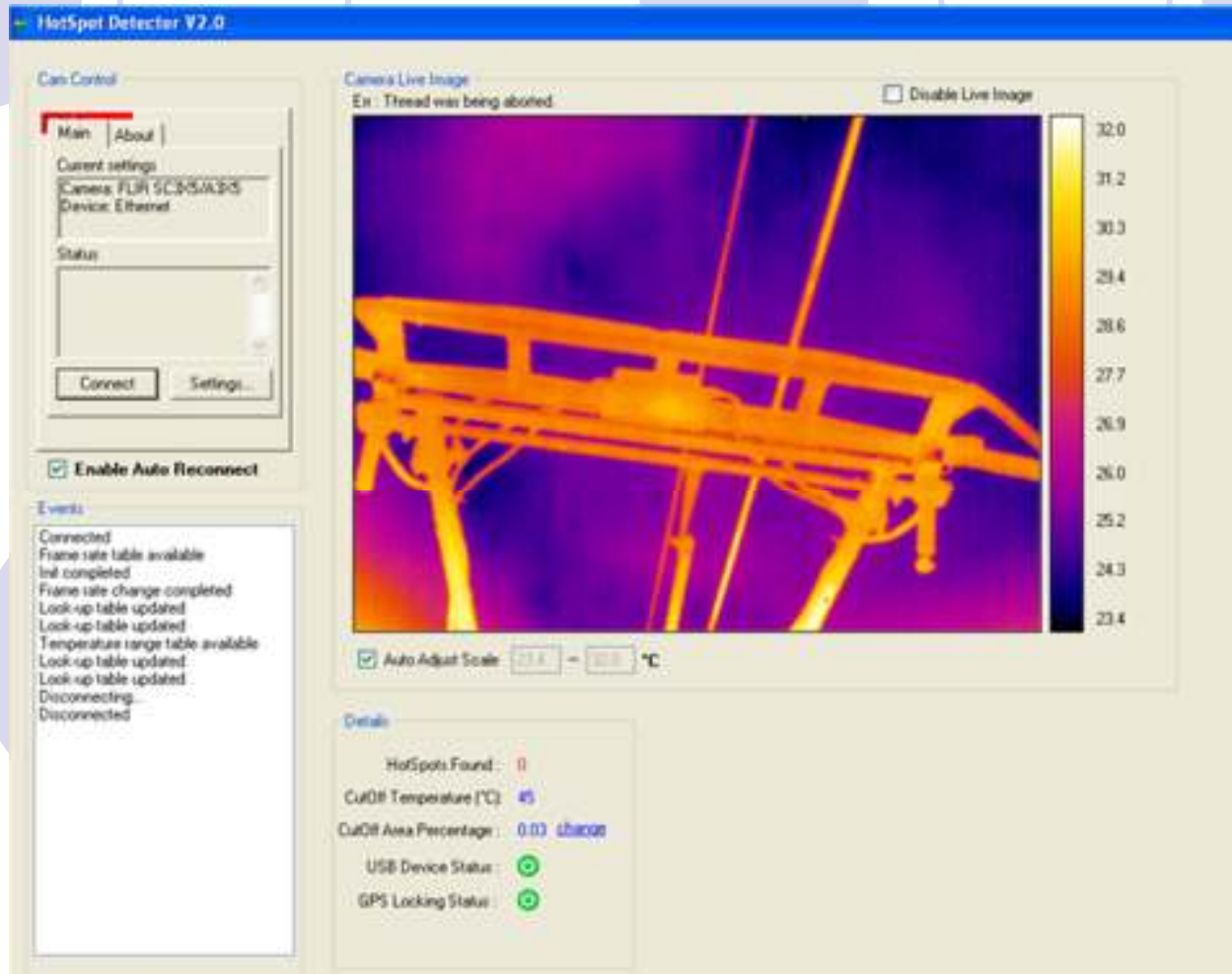
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Captured Sample Image

Next slide....

MicroTherm - Thermal Automation Software



Date & Time

Start Pole, End Pole, Distance from Start pole, Max. Temp., Division, Section

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MicroTherm - Thermal Automation Software



7/19/2011 12:45:28 PM
"120/62, "120/63", 60.5, 45°C, "DN SL", "HWH"

Date & Time
Start Pole, End Pole, Distance from Start pole, Max. Temp., Division, Section

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Format of Resultant Report

Next slide....

Total HotSpots in DB = 19

HotSpot Data Pole Positions Show Map Hotspot Image

Click Hot spot Id to open geographic location of Hot Spot in Google map

Select: -- Location Acquired Only -- From: 14 Sep 2011 To: 21 Sep 2011 Division: -- All Divisions -- Section: -- All Sections --

Refresh

Export to Excel

* Double click any row to open in Google Maps (requires active internet connection)

HotSpot Details												
HotSpot ID	HotSpotTime	Latitude	Longitude	StartPole	Section	Division	EndPole	Estimated Distance From StartPole in mts.	Min. Temp.	Max. Temp.	HotSpot Image	
4823	7/19/2011 12:45:28 PM	25.43486508	85.85523312	"120/62 IMP 3.10"	"DN SL"	"HWH"	"120/60 IMP 2.36"	303886.4219	24.3656	42.2634	Click to View Image	
4824	7/19/2011 12:47:20 PM	25.43256433	85.85698850	"120/62 IMP 3.10"	"DN SL"	"HWH"	"120/60 IMP 2.36"	303577.0820	23.298	42.1941	Click to View Image	
4825	7/19/2011 4:40:20 PM	24.52039780	86.63968697	"120/62 IMP 3.10"	"DN SL"	"HWH"	"120/60 IMP 2.36"	175198.1266	24.4518	39.6685	Click to View Image	
4826	7/19/2011 4:44:16 PM	24.51726633	86.64327867	"120/62 IMP 3.10"	"DN SL"	"HWH"	"120/60 IMP 2.36"	174697.0868	25.059	36.4129	Click to View Image	
4873	7/19/2011 4:45:03 PM	24.51725750	86.64327300	"120/62 IMP 3.10"	"DN SL"	"HWH"	"120/60 IMP 2.36"	174696.7188	24.9571	36.1412	Click to View Image	
4874	7/19/2011 7:06:37 PM	23.69169600	86.97400517	"120/62 IMP 3.10"	"DN SL"	"HWH"	"120/59 IMP 2.18"	90140.7553	25.5134	29.2218	Click to View Image	
4880	7/19/2011 7:16:13 PM	23.69166339	86.97449767	"120/62 IMP 3.10"	"DN SL"	"HWH"	"120/59 IMP 2.18"	90094.3503	24.8283	29.1134	Click to View Image	
4914	7/19/2011 7:19:56 PM	23.69000197	86.98057680	"120/62 IMP 3.10"	"DN SL"	"HWH"	"120/59 IMP 2.18"	89458.5986	24.495	33.7418	Click to View Image	
4916	7/19/2011 7:22:45 PM	23.67697115	87.00734930	"120/62 IMP 3.10"	"DN SL"	"HWH"	"120/59 IMP 2.18"	86371.9990	24.3872	31.9079	Click to View Image	
4920	7/19/2011 7:25:36 PM	23.66552111	87.01579294	"120/62 IMP 3.10"	"DN SL"	"HWH"	"120/59 IMP 2.18"	85033.4736	23.6406	29.3197	Click to View Image	
4923	7/19/2011 7:33:26 PM	23.62004887	87.10174976	"120/62 IMP 3.10"	"DN SL"	"HWH"	"120/59 IMP 2.18"	74946.6625	25.6414	29.3043	Image	

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Format of Import Data

Next slide....

MicroTherm - Thermal Automation Software

HotSpot Details										
HotSpot ID	HotSpotTime	Latitude	Longitude	Start Pole	Section	Division	EndPole	Estimated Distance From StartPole in mts.	Max. Temp.	HotSpot Image
4823	7/19/2011 12:45:28 PM	25.43486508	85.85523312	203/3 0	"DN SL "	"HWH"	"120/60 IMP 2.36"	303886.4219	42.2634	Click to View Image
4824	7/19/2011 12:47:20 PM	25.43256433	85.85698850	203/3 2	"DN SL "	"HWH"	"120/60 IMP 2.36"	303577.0820	42.1941	Click to View Image
4825	7/19/2011 4:40:20 PM	24.52039780	86.63968697	203/3 4	"DN SL "	"HWH"	"120/60 IMP 2.36"	175198.1266	39.6685	Click to View Image
4826	7/19/2011 4:44:16 PM	24.51726633	86.64327867	203/3 4-1	"DN SL "	"HWH"	"120/60 IMP 2.36"	174697.0868	36.4129	Click to View Image
4873	7/19/2011 4:45:03 PM	24.51725750	86.64327300	203/3 6	"DN SL "	"HWH"	"120/60 IMP 2.36"	174696.7188	36.1412	Click to View Image
4874	7/19/2011 7:06:37 PM	23.69169600	86.97400517	204/2	"DN SL "	"HWH"	"120/59 IMP 2.18"	90140.7553	29.2218	Click to View Image
4880	7/19/2011 7:16:13 PM	23.69166339	86.97449767	204/4	"DN SL "	"HWH"	"120/59 IMP 2.18"	90094.3503	29.1134	Click to View Image
4914	7/19/2011 7:19:56 PM	23.69000197	86.98057680	204/6	"DN SL "	"HWH"	"120/59 IMP 2.18"	89458.5986	33.7418	Click to View Image

Micro System Engineers

A brief about SI

MicroTherm is an application platform developed by MicroSystem Engineers. A company based in Indian silicon valley extension at Gurgaon. We specialize in offering artificial intelligent solutions, tailor-made automated working platforms and custom-defined solutions. We had legacy of a decade of working in engineering industry with diversified clientele of repute.

We work to visualize any feasible idea into reality for customer need and application. Our solutions help our customer in saving the costs, minimizing the process, ensuring perfection, minimizing losses and waste and ensuring the safety for human.



Thank you