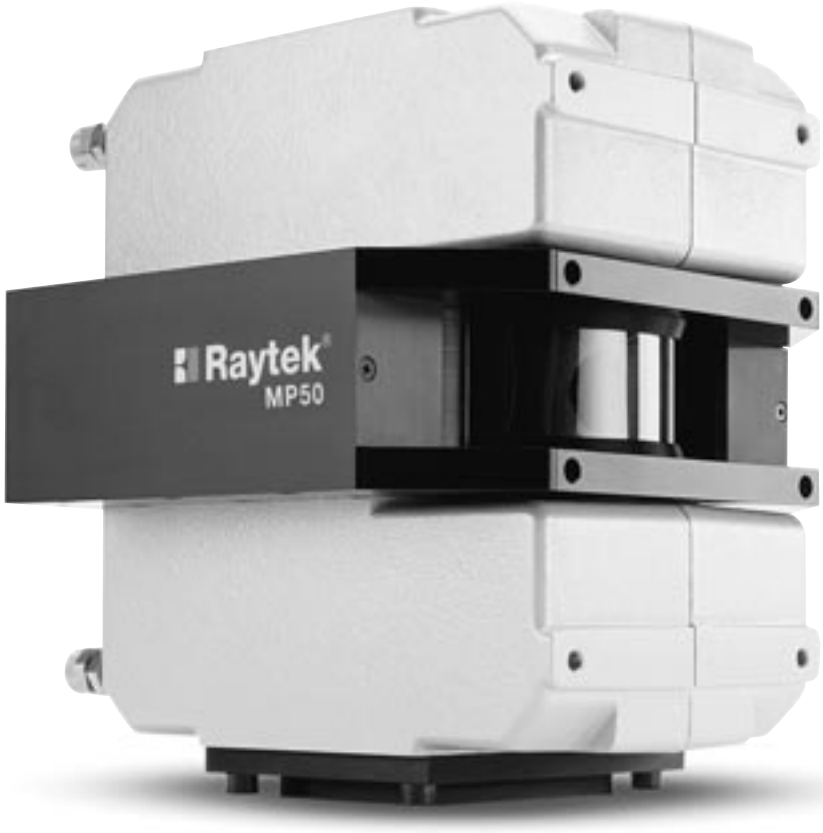
MP50
Datasheet

Thermal Imaging for Industrial Applications



MP50 Process Imager™

The MP50 allows you to visualize and measure the temperature distribution of virtually any process or product

Raytek®

The MP50 Process Imager provides accurate temperature images of moving objects. This multi-point measurement is achieved by a rotating optical system which collects infrared radiation at 256 points within a 90º field-of-view. The motorized mirror scans at rates up to 48 lines per second.

An internal high speed microprocessor calculates the temperature of the individual measurement points of each line of data. The MP50 includes provision for air or water cooling, three configurable analog outputs, and two-way digital communications. DataTemp® MP is an industrial Windows® software package that provides remote configuration of the imager and real-time monitoring of the process.

MP50 Process Imager models are available with a choice of temperature and spectral ranges. The plastics models (P3 and P7) provide temperature measurement on thin film plastic.

The glass model (G5) ensures process quality on flat glass, glass windshields, and tempering lines.

- Real-time thermal imaging
- Fast scan rates up to 48 lines per second
- Wide choice of models and spectral responses
- Thermal imaging for continuous or discrete processes
- 3 analog signal outputs included
- 16 analog output D/A interface card for PC available
- Versatile DTMP™ Windows software
- SoftSector Software (optional) allows measuring up to 16 sectors
- OPC software server interface available
- Rugged NEMA12/IP65 enclosure; built-in provision for air-purge/water-cooling

MP50 Models and Performance Characteristics

Model Number	Temperature Range	Accuracy[4]	Repeatability[4]	Spectral Response	Optical Resolution 90% Energy (50% Energy)
RAYTMP50LT	20–350°C (68–662°F)	±2ºC (4ºF)	±1ºC (2ºF)	3–5 µm	100:1[3] (300:1[3])
RAYTMP50MT	100–800°C (212–1472°F)	±3ºC (6ºF)	±2ºC (4ºF)	3.8–3.9 µm	100:1[3] (300:1[3])
RAYTMP50G50	100–600°C (212–1112°F)	±0.5% of measured value or ±3ºC (6ºF) whichever is greater	±1ºC (2ºF)	4.5–5.2 µm	100:1[3] (300:1[3])
RAYTMP50G51	200–950°C (392–1742°F)	±0.5% of measured value or ±3ºC (6ºF) whichever is greater	±1ºC (2ºF)	4.5–5.2 µm	100:1[3] (300:1[3])
RAYTMP50P30[1]	30–250°C (86–482°F)	±3ºC (6ºF)	±1ºC (2ºF)	3.36–3.48 µm	33:1 (100:1)
RAYTMP50P31[1]	100–350°C (212–662°F)	±3ºC (6ºF)	±1ºC (2ºF)	3.36–3.48 µm	60:1 (180:1)
RAYTMP50P7[2]	120–450°C (248–842°F)	±3ºC (6ºF)	±2ºC (4ºF)	7.6–8.3 µm	25:1 (75:1)
RAYTMP501M	600–1200°C (1112–2192°F)	±0.5% of measured value or ±3ºC (6ºF) whichever is greater	±2ºC (4ºF)	0.9–1.0 µm	100:1[3] (300:1[3])
RAYTMP502M	400–950°C (752–1742°F)	±0.5% of measured value or ±3ºC (6ºF) whichever is greater	±2ºC (4ºF)	1.6 µm	100:1[3] (300:1[3])

[1] Thin film, polyethylenes, and related materials

[2] Thin film, acrylic, acetate, Teflon®, nylon, PVC, FEP, polyester, and related materials

[3] At focus distance for each spot

[4] At mid-range of specified temperatures

General Specifications

Environmental Area Classification	NEMA 12, (IEC 529, IP 65)
Ambient Operating Temperature without water cooling with water cooling	 0–50ºC (32–122ºF) 180ºC (356ºF) maximum
Internal Operating Temperature	0–60ºC (32–140ºF)
Maximum Temperature	65ºC (140ºF) operating or non-operating
Relative Humidity	10% to 90%, non-condensing
Shock	IEC 68-2-29, 3-axes, 1000 bumps 5 G operating; 25 G non-operating
Vibration	IEC 68-2-6, 3 axes, 10–150 Hz Operating: 0.5G Non-operating: 2.0 G
Scan Motor	40,000 hours MTBF
Air Purge[1] and Water Cooling[2] max water pressure max air pressure	Built-in; included with standard MP50 5 bar (72.5 psig) 3 bar (43 psig)
Size	(200 x 180 x 190 mm) (7.9 x 7.1 x 7.5 inches)
Weight	7.0 kg (15.4 lbs)
Warm-up Time	20 minutes
Field of view (all models)	45º or 90º (selectable)

[1] The air purge system produces a laminar air flow that protects the MP50 window from dust, moisture, and vapors. Purged air exists through side slits near the MP50 window. The air flow rate should be between 100 l/min (3.53 cfm) and 200 l/min (7.06 cfm) through each side, which corresponds to a pressure between 0.5 bar (7.25 psig) and 3.0 bar (43 psig) when using the supplied metric fittings. Use only clean or "instrument grade" air (free from oil contaminants). Do not use cooled air, which could cause condensation on the MP50 window.

[2] Water cooling allows operation in ambient temperatures up to 180ºC (356ºF). **To avoid condensation**, do not use water colder than 15ºC (60ºF). With a water temperature between 15ºC (60ºF) and 30ºC (86ºF) and a flow rate of about 1 l/min (0.26 gallons/min), the housing internal temperature remains below 50ºC (122ºF). Using 30ºC (86ºF) a water flow rate of 2 l/min (0.52 gallons/min) is necessary. Use filtered water to prevent mineral deposits at the hose couplings.

Standard Package Components

MP50 Process Imager Package Includes:

- DataTemp MP Software (CD-ROM)
- User Manual, Protocol Manual, DataTemp MP Manual included on the DTMP CD-ROM
- For RS-485:
  1x 7.5 m (24.6 ft) RS-485
  RS-485/RS-232 converter
  1x SUB-D connector cable,
  25-pin (male) to 9-pin (female)
- RS-485 extension cable (accessory):
  2x housing for SUB-D pin connectors
  1x SUB-D connector (male) 25-pin
  1x SUB-D connector (female) 25-pin
- Power Supply Cable: 1x 7.5 m (26.4 ft)
- Tools:
  1x hex key wrench 2.5mm 1x hex key wrench 5mm
  1x connector (female) 6-pin for digital inputs/outputs
  1x connector (male) 4-pin for analog outputs

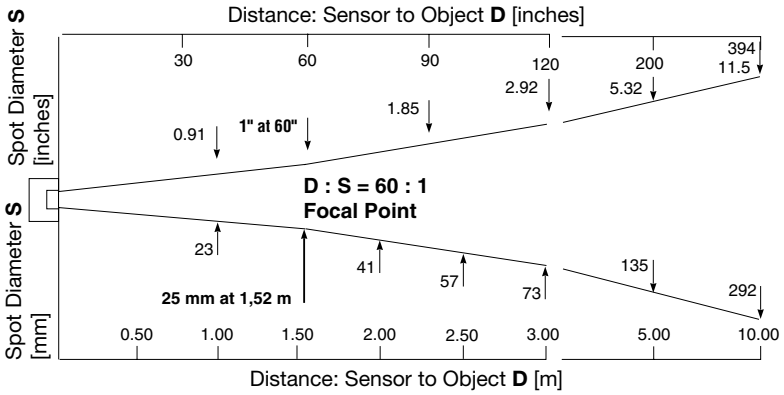
Electrical Specifications

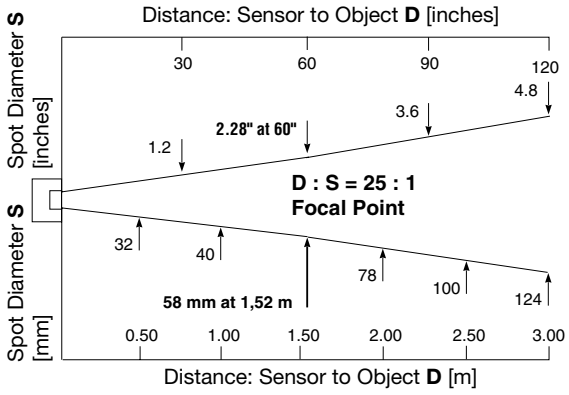
Outputs Analog	 3 user-configurable 0/4-20mA current outputs, collectively isolated. maximum dc resistance 500 ohms
Alarm	Electromechanical relay 30V, 1A
Digital Communications	RS485/RS232 full duplex, non-addressable
Inputs	Trigger + 5VDC pulse (user-supplied) RS485/RS232
Power Requirements	24 VDC ± 25%, 1A
CE Conformance	EN61010-1 EN61326-1

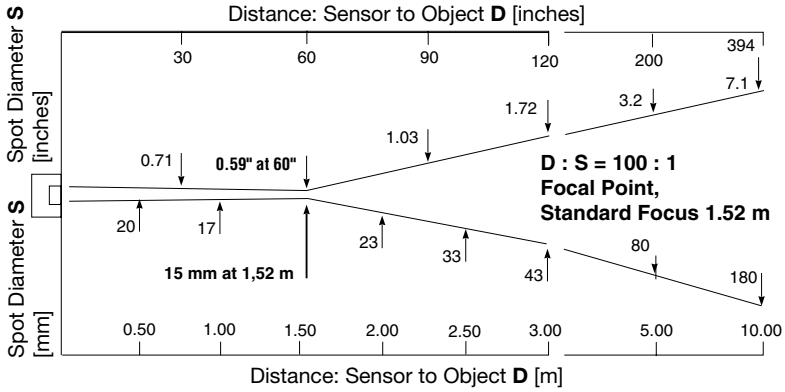
Operating Characteristics

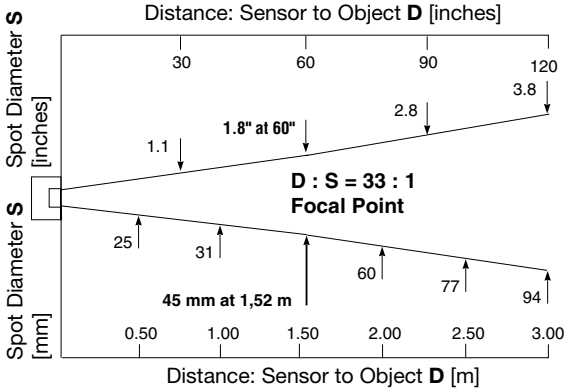
Scan Rate/ Response Time	48 Hz/21 mSec (analog outputs and 45º FOV not operable) 36 Hz/28 mSec (analog outputs and 45º FOV operable)
Focus Distance	1.5m (60 inches) standard; custom focus distances (consult factory)
Emissivity	0.1 to 1.00 digitally adjustable
Number of Samples	256 per scan line (45º or 90º FOV)

Optical Diagrams







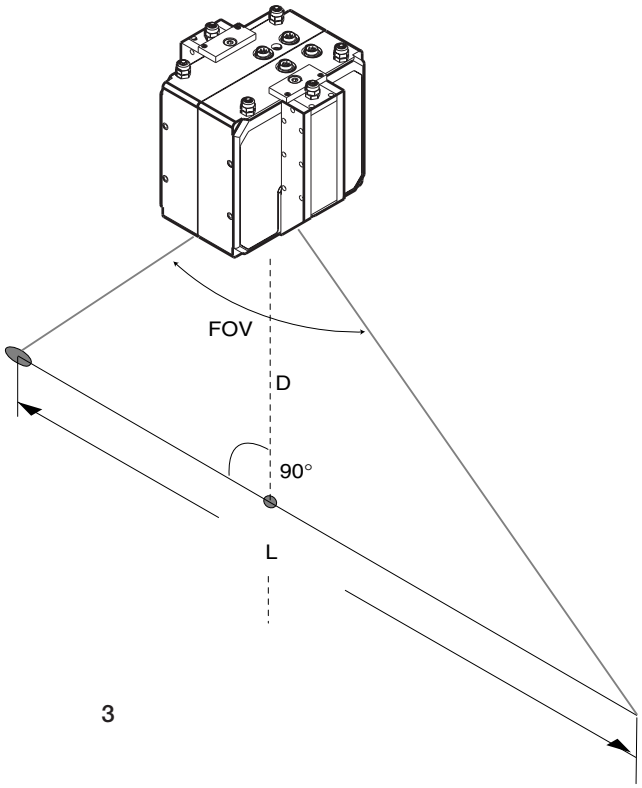


Mounting Considerations

L=Scan line width
D=Distance to target
(measured from front surface of housing)

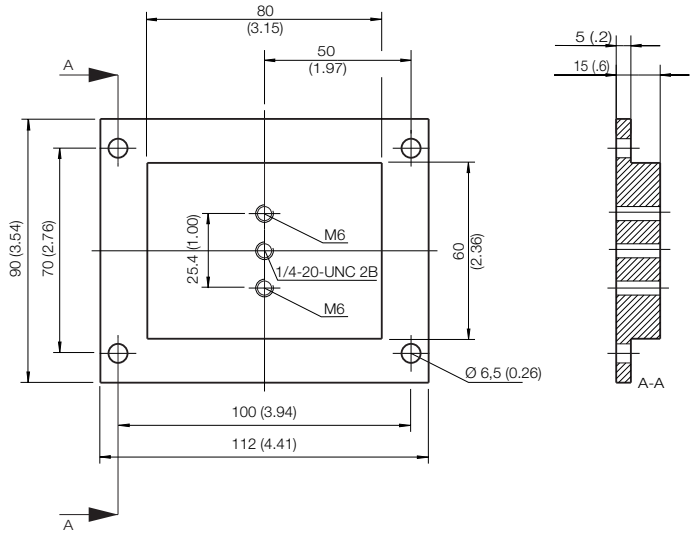
90 deg FOV:
D=L/2-55mm
(D=L/2-2.2 in.)

45 deg FOV:
D=L/0.8284-55mm
(D=L/0.82484-2.2 in.)

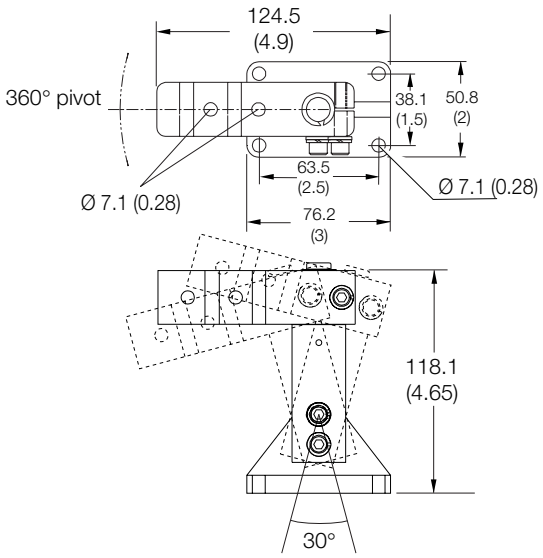


Accessories

Mounting Base for Tripod
XXX TMP50ACMP

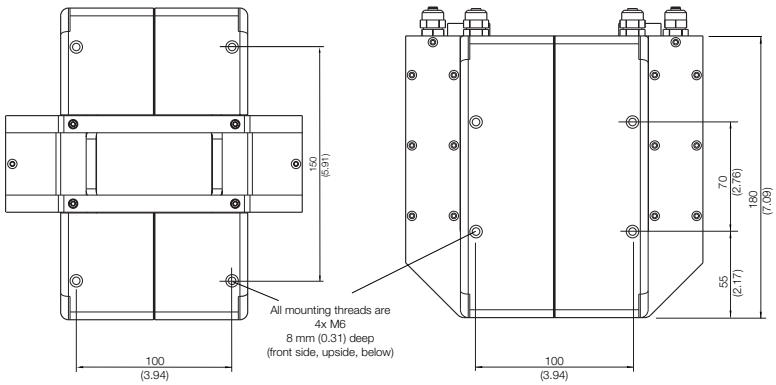


Adjustable Mounting Bracket
XXXTMP50ACMB

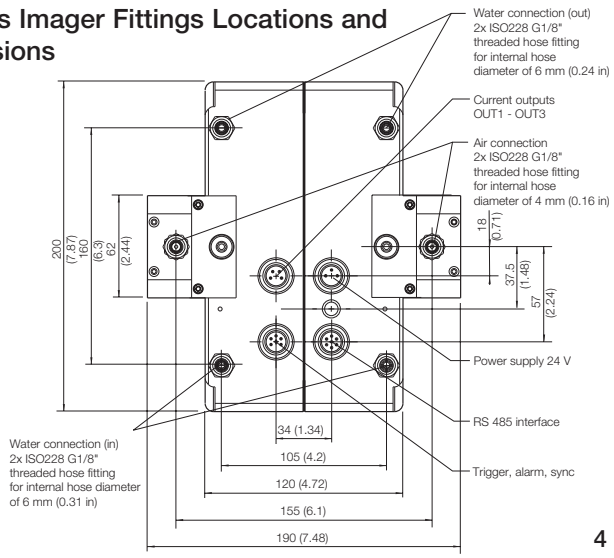


Mountings and Fittings

Process Imager Mounting Locations and Dimensions
(Mounting dimensions are the same for top and bottom view)



Process Imager Fittings Locations and Dimensions



DTMP Software

Software DTMP	CD ROM (includes DTMP software, DTMP Operators Manual, MP50 Operators Manual, and MP50 Protocol Manual)
Signal Processing	MAX, MIN, AVG, Peak/Valley Hold, Alarm Setpoints

Minimum Requirements

- 600 MHz or higher Pentium III
- 128MB RAM
- Mouse
- SVGA monitor
- 4MB video RAM
- 800 x 600 resolution minimum with 64K colors (high color 16-bit, higher resolution required for multiple linescanners)
- 2 GB hard drive
- Windows® NT4.0 or Windows® 2000 and Internet Explorer®5.0 or newer

The following are preferred, but not mandatory:

- Ethernet or other network connection
- Internet connection for downloading information and upgrades
- Sound card: SoundBlaster 16 compatible; for .wav file alarm
- Equinox serial port card (SST-2I for one or two linescanners, or SST-4I with cable for up to 4 linescanners)

Accessories

XXXTMP50OPC	Provides an OPC "server" allowing interface between DTMP software (2.50 or higher) and software clients complying with the OPC interface standard. Allows temperature points and temperature arrays to be accessed by OPC compatible clients even over a network.
XXXTMP50SSS	"Soft Sector" Software. Runs with DTMP 2.50 (or higher). Provides software capability to sub-divide thermal images from MP50 into as many as 16 sectors. Compatible with OPC software option.
XXXTMP5016DAC	Digital-to-analog output card, 16-channels 0/4-20mA; requires PCI-bus PC; requires Soft Sector software (must be ordered separately) and DTMP 2.50 (or higher).
XXXTMP50ACPS	Industrial power supply, 100-240VAC to 24VDC/1A
XXXTMP50ACPS1	"Demo Kit" style power supply, 90-264VAC to 24VDC/1A
XXXTMP50ACPSCB	Power supply extension cable (80ºC max)
XXXTMP50AC485CB	RS485 extension cable (available in 1m increments)
XXXTMP50ACCC	Protective carrying case for MP50 and accessories
XXXTMP50ACMB	Adjustable mounting base (fits XXXTMP50ACMP only)
XXXTMP50ACMP	Mounting plate to adjustable base or tripod
XXXTMP50ACM1	Operator's Manual (extra copies)
XXXTMP50ACPM	MP50 Protocol Manual (extra copies)

Options

XXXTMP50LS	Line laser sighting option for use in dark environments, transportable applications, or when visual confirmation of aiming is required.
XXXTMP50CERT	Calibration certificate
RAYTMP50XX02	MP50 without air-purge collar (add -02 to model number)

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Raytek Automation Products: Noncontact Temperature Measurement for Industrial Applications℠

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