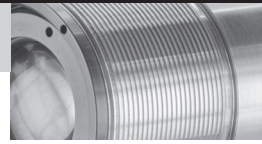
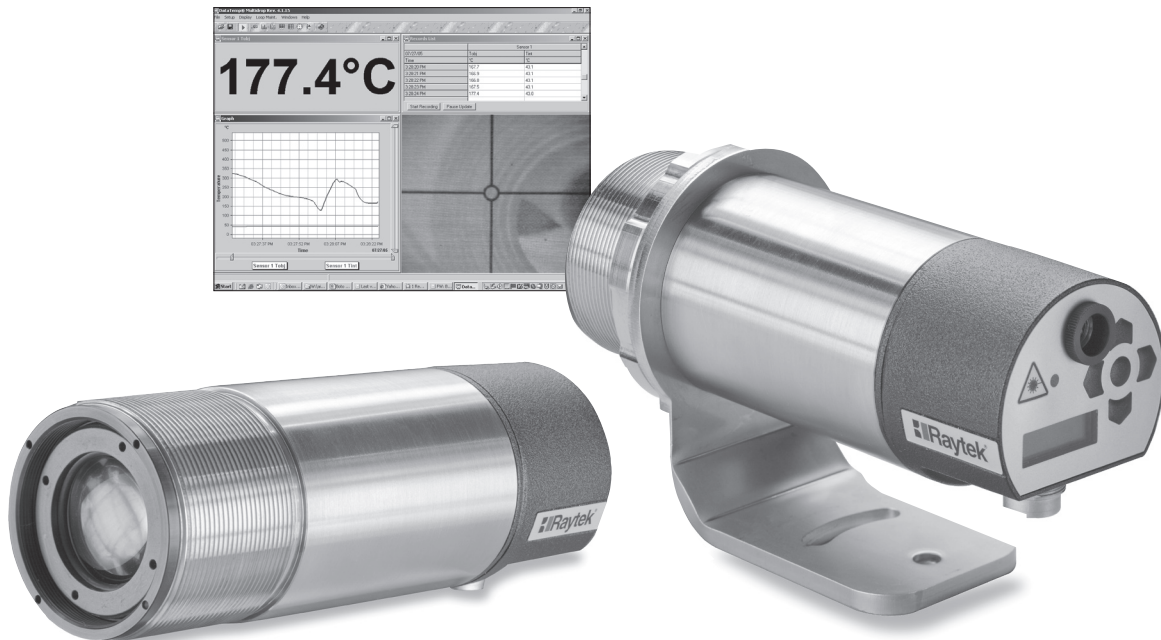


MM LT, MT, G5

Datasheet



Noncontact Temperature Measurement for Industrial Applications



The Marathon™ Series MM

- High resolution 70:1 optics
- Precision focusable optics
- Optical and laser sighting standard
- Available color video sighting
- Real time ambient background temperature compensation
- Easy to use operator interface
- Rugged stainless steel housing
- Simultaneous analog and digital outputs
- Field Calibration Software
- Windows® DataTemp Multidrop software for data acquisition, display and analysis

Marathon™ MM infrared thermometers provide superior accuracy in demanding industrial process applications. The MM features an advanced electro-optical design, digital electronics and an intuitive easy to use push button interface—all combined in a rugged, compact stainless steel housing. The sensor can be easily set up for stand alone operation or configured for a multi sensor network. All Marathon MM Series sensors feature both through-the-lens optical sighting and laser sighting for optimum sensor alignment and set-up. The MM is also available with optional video sighting.

All Marathon Series thermometers include bi-directional, RS-485 serial communications between the sensor (or a local area network of sensors) on the factory floor and a personal computer in the control room. This enables remote setup, monitoring, calibration, and maintenance, especially valuable for installation in hard-to-reach locations.

Highlights:

- **Optional color video sighting**
- **High resolution optics**
- **Precision focus optics**
- **Rugged stainless steel housing**
- **Real time ambient background temperature compensation**
- **3 different spectral responses to meet every demanding application**
- **Laser sighting in addition to through the lens optical sighting**
- **Measures from -40°C to 2250°C (-40°F to 4082°F) depending on model**
- **Capture transient events as fast as 20 ms**
- **Simultaneous analog and digital outputs**
- **Programmable isolated relay output**
- **Bi-directional RS485 communications**
- **Supports up to 32 Marathon Series sensors on a multipoint network**
- **Windows® DataTemp Multidrop Software (NT4, Windows 2000, XP compatible)**
- **Field Calibration Software**

Specifications

Model	Temperature Ranges	Spectral Response	Response Time (95% response)
LTS ⁽¹⁾	-40°C to 800°C (-40°F to 1472°F)	8 - 14 μm	120 ms
G5L	250°C to 1650°C (482°F to 3002°F)	5 μm	60 ms
G5H	450°C to 2250°C (842°F to 4082°F)	5 μm	60 ms
MTS	250°C to 1100°C (482°F to 2012°F)	3.9 μm	120 ms
Accuracy ⁽²⁾	±1% of reading for T _{meas} > 100°C, 1°C for T _{meas} < 100°C		
Repeatability	±0.5% of reading or ±0.5°C, whichever is greater		
Optics ⁽³⁾	70:1		
Temperature Resolution	0.1° K on 4 – 20 mA output		
Emissivity	0.100 to 1.100, in 0.001 increments		
Signal Processing	Peak hold, valley hold, averaging, ambient background temperature compensation		

(1) 2k Accuracy temperatures 0°C to 40°C (32°F to 104°F)

(2) Accuracy @ Ambient 23°C ± 5°C (73°F ± 9°F)

(3) Measured @ focal distance

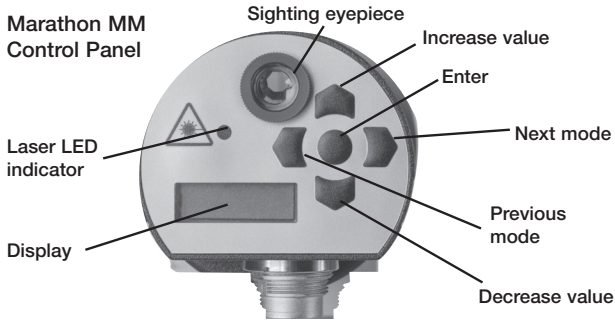
Electrical Specifications

Power Supply	24 VDC ± 20%, 500 mA
Outputs	
Analog	0 - 20 mA, 4 - 20 mA, 14 bit resolution, max. current loop impedance: 500 ohms.
Digital RS-485	Networkable to 32 sensors, Baud rate: 300, 1200, 2400, 9600, 19200, 38400, 57600 (default), 115200. Data format: 8 bit, no parity, 1 stop bit, 4-wire mode (full-duplex) or 2-wire mode (half duplex), selectable via control panel or software, 2-wire: max. 57600 Baud
Relay	Contacts max. 48 V, 300 mA, response time < 2 ms, (software programmable)
Display	5 digit backlit LCD display
External Input	
Input Voltage	0 to 5 VDC functions: trigger, ambient background temperature compensation, or emissivity setting

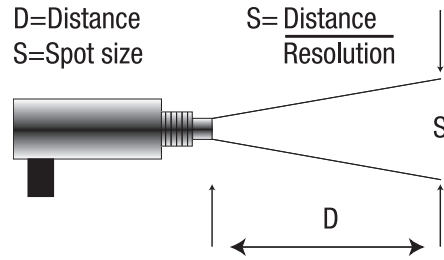
Environmental Specifications

Environmental rating	NEMA-4 (IEC 529, IP 65)
EMI	CE compliant to IEC 61326, performance criteria B
Relative Humidity	10% to 95% non-condensing
Storage Temperature	-20°C to 70°C (-4°F to 158°F)
Ambient Temperature	5°C to 65°C (41°F to 150°F) without cooling
with video option	5°C to 55°C (41°F to 131°F)
with air cooling	10°C to 120°C (50°F to 250°F)
with water cooling	10°C to 175°C (50°F to 350°F)
with Thermo jacket	water cooled 10°C to 315°C (50°F to 600°F)
Vibration	MIL-STD-810D (IEC 68-2-6) 2G's, 10 - 150 Hz, 3 axis
Mechanical Shock	MIL-STD-810D (IEC 68-2-27) 5G's, 11 ms duration, 3 axis
Weight	0.7 kg (24.7 oz)

Easy to Use Interface



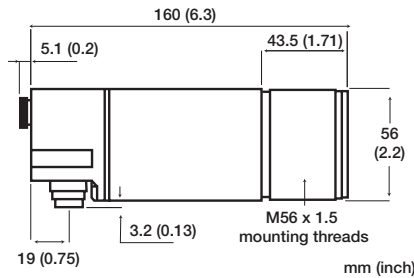
Focusable Optics



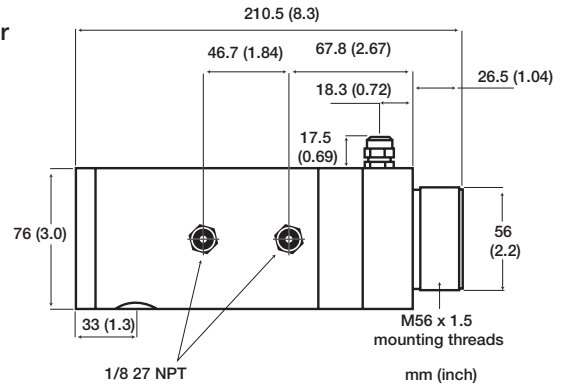
LT, MT, G5 D=200mm to 2.2m (7.8 inch to 7.2 feet)

Physical Dimensions

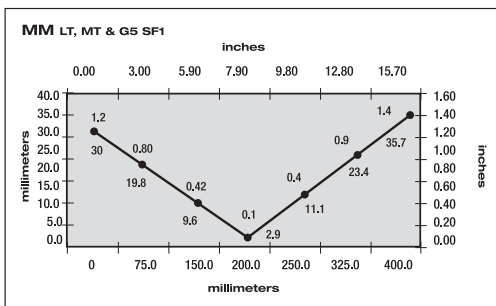
MM Housing



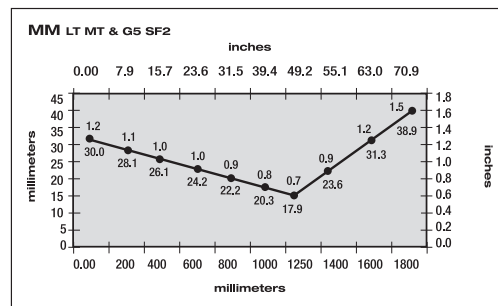
MM with Air/Water Cooled Housing



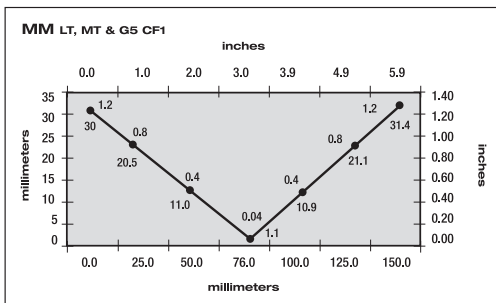
Nominal Optical Specifications



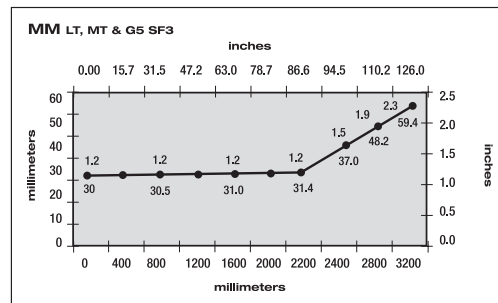
Standard Focus 1



Standard Focus 2

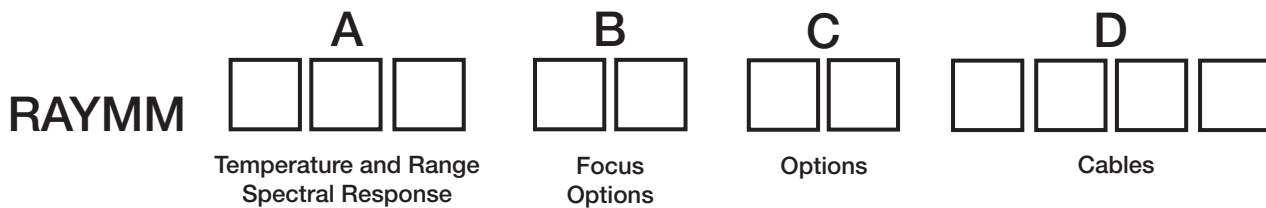


Close Focus 1



Standard Focus 3

LT, MT, and G5 D:S ratio measured at 90% energy. Other focus options available. Close Focus 1 only available on LT units.



Model	Description
RAYMM	
Code A	Temperature Range
LTS	Low Temp: -40°C to 800°C (-40°F to 1472°F) / 8 to 14 microns, 120 mSec Response Time
MTS	Medium Temp: 200°C to 1100°C (392°F to 2012°F) / 3.9 microns, 120 mSec Response Time
G5L	Glass Surface: 250°C to 1650°C (482°F to 3002°F) / 5.0 microns, 60 mSec Response Time
G5H	Quartz Surface: 450°C to 2250°C (842°F to 4082°F) / 5.0 microns, 60 mSec Response Time
Code B	Focus Option
SF 1	Standard Focus 1 Optics focused @ 200mm (8")
SF 2	Standard Focus 2 Optics focused @ 1.25m (49")
SF 3	Standard Focus 3 Optics focused @ 2.2m (87")
CF 1	Close Focus Optics focused @ 76mm (3")
VF 1	Variable Focus Optics focused range 200mm to 2m (7.8" to 7.2')
Code C	Options must be specified at the time of order
L	Laser Sighting – Standard Model
V	Video sighting option (in addition to optical sighting) Note: Video sighting replaces the laser sighting feature
W	Coolable Housing, includes Lens Air Purge Collar Note: For ambient temperatures exceeding 175°C (350°F), See ThermoJacket
Typical Model Number	RAYMMLTSSSF3V Specifies a LT model with standard focus 3 optics, video sighting option.

Accessories

Air purge collar (XXXMMACAP) *
 Swivel bracket (XXXTXXACSB) *
 Adjustable bracket (XXXMMACAB)
 Right angle mirror (XXXMMACRA)
 Pipe adapter (Compatible with Sighting Tubes) (XXXMMACPA) *
 Adjustable pipe adapter assembly (Compatible with Sighting Tubes) (XXXTXXAPA) *

*Compatible with standard unit and "W" option (not ThermoJacket)

Flow Regulators

Water flow regulator (water cooling) (XXXTXXWR)
 Air purging flow/regulator assembly with air filter (XXXTXXAR)
 Cooling air flow regulator (high capacity) (XXXTXXCAFR)
 ThermoJacket Housing Rated to 315 °C (600 °F)

ThermoJacket housing; for Marathon MM (RAYTXXTJ4)

Mounting flange for ThermoJacket (XXXTXXMF)**

Adjustable mounting base (XXXTXXMB)**

Adjustable pipe adapter assembly (XXXTXXAPA) **
 Mounting flange for use with sighting tubes (XXXTXXMF)**

** For use with ThermoJacket only

Sighting Tubes

300mm (12 in.) SIGHTING TUBE, ceramic (up to 1500°C) (XXXTSTC12)
 300mm (12 in.) SIGHTING TUBE stainless steel (up to 800°C) (XXXTST12)
 300mm (12 in.) SIGHTING TUBE, carbon steel; 45 degree end-cut with slotted weep hole at base. (BEESIGHTT)

Power Supply (24VDC, 110/220VAC input) and Marathon Terminal Block mounted in a NEMA 4 (IP65) enclosure (RAYMAPB)

Power Supply 24VDC 1.1A Switching power supply with universal input (110/220V) (XXX2CDCPSS)

Spare Marathon Terminal Block Accessory (XXXMATB)

Spare Marathon Terminal Block in a NEMA-4 enclosure (XXXMATBN4)

RS485/RS232 CONVERTER

DB25 connector to Terminal Strip Interface Converter, for direct wiring between a serial interface and the Marathon terminal block (XXX485CVT)

Raytek Automation Products: Noncontact Temperature Measurement for Industrial ApplicationsSM

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