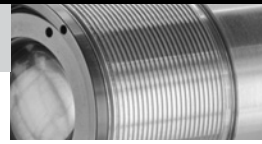
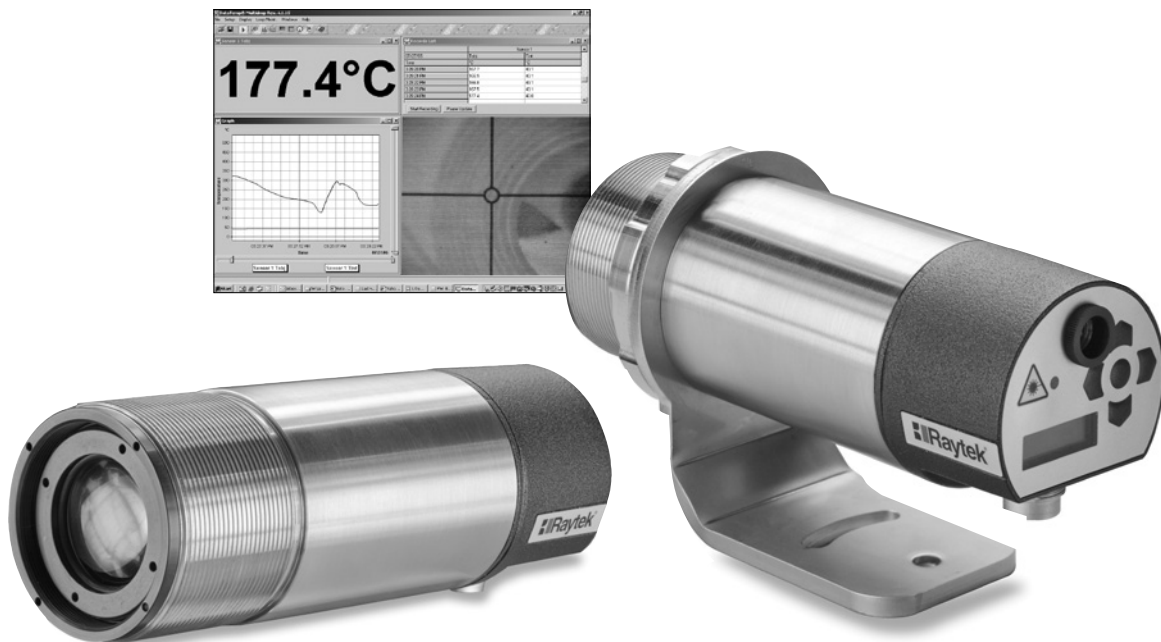


# MM LT, G5, G7, MT & 3M



Noncontact Temperature Measurement for Industrial Applications



## The Marathon™ Series MM

- High resolution up to 100:1 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

**Raytek®**  
A Fluke Company

**M**arathon™ 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) | Optics <sup>(3)</sup> |
|-------------------------------|---|-------------------|------------------------------|-----------------------|
| LTS <sup>(1)</sup>            | -40°C to 800°C (-40°F to 1472°F)  | 8 - 14 µm         | 120 ms                       | 70:1                  |
| G5L                           | 250°C to 1650°C (482°F to 3002°F)   | 5 µm              | 60 ms                        | 70:1                  |
| G5H                           | 450°C to 2250°C (842°F to 4082°F)   | 5 µm              | 60 ms                        | 70:1                  |
| G7                            | 300°C to 900°C (572°F to 1652°F)  | 7, 9 µm           | 120 ms                       | 100:1                 |
| MTS                           | 250°C to 1100°C (482°F to 2012°F)   | 3.9 µm            | 120 ms                       | 70:1                  |
| 3M                            | 100°C to 600°C (212°F to 1112°F)  | 2.1 - 2.5 µm      | 20 ms                        | 70:1                  |
| <b>Accuracy<sup>(2)</sup></b> | ±1% of reading for T <sub>meas</sub> > 100°C, 1°C for T <sub>meas</sub> < 100°C |                   |                              |                       |
| <b>Repeatability</b>          | ±0.5% of reading or ±0.5°C, whichever is greater                                |                   |                              |                       |
| <b>Temperature Resolution</b> | 0.1° K on 4 – 20 mA output  |                   |                              |                       |
| <b>Emissivity</b>             | 0.100 to 1.150 in 0.001 increments  |                   |                              |                       |
| <b>Signal Processing</b>      | 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

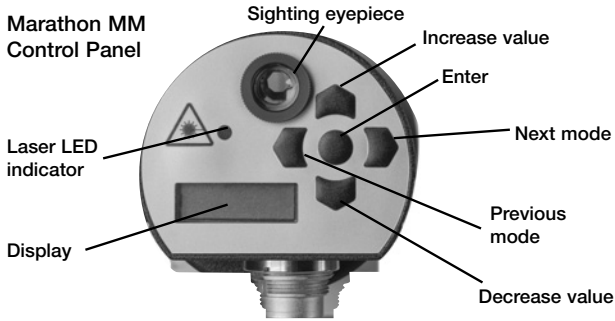
## Electrical Specifications

|                       |  |
|-----------------------|--|
| <b>Power Supply</b>   | 24 VDC ± 20%, 500 mA   |
| <b>Outputs</b>        |  |
| <b>Analog</b>         | 0 - 20 mA, 4 - 20 mA, 14 bit resolution, max. current loop impedance: 500 ohms.  |
| <b>Digital RS-485</b> | 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 |
| <b>Relay</b>          | Contacts max. 48 V, 300 mA, response time < 2 ms, (software programmable)  |
| <b>Display</b>        | 5 digit backlit LCD display  |
| <b>External Input</b> |  |
| <b>Input Voltage</b>  | 0 to 5 VDC functions: trigger, ambient background temperature compensation, or emissivity setting  |

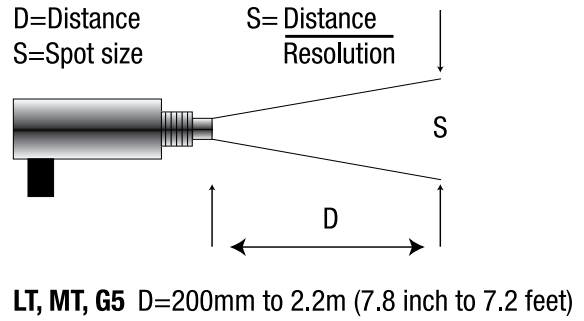
## Environmental Specifications

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

# Easy to Use Interface

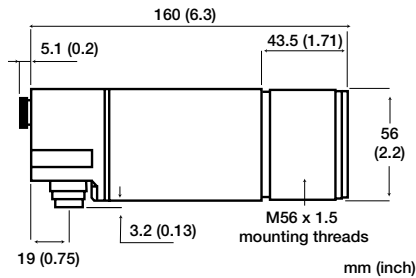


# Focusable Optics

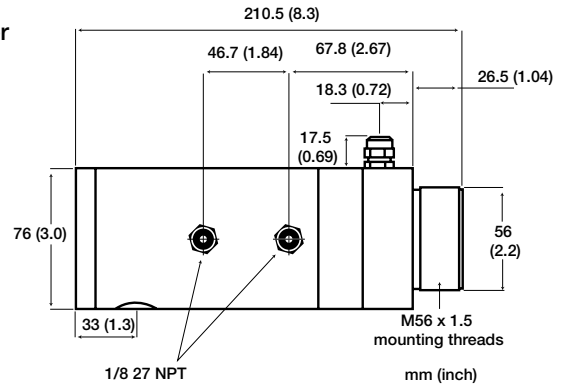


# Physical Dimensions

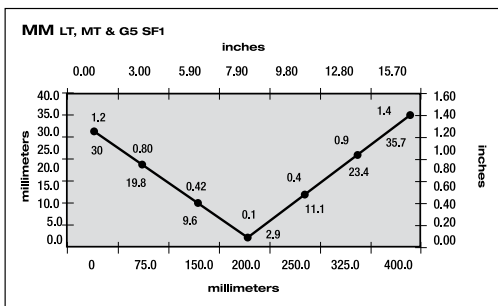
MM Housing



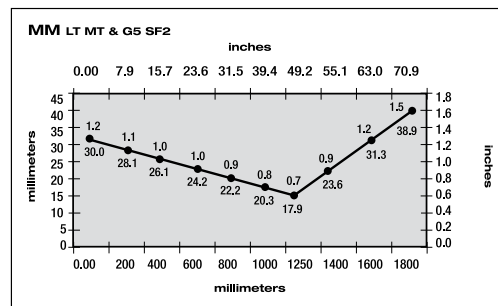
MM with Air/Water Cooled Housing



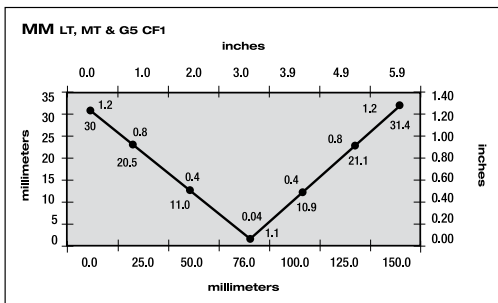
# Nominal Optical Specifications



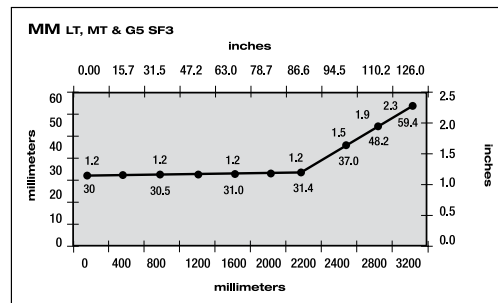
Standard Focus 1



Standard Focus 2

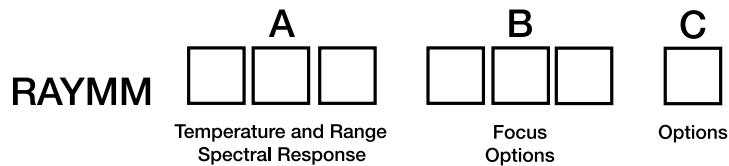


Close Focus 1



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                       |  |
| <b>Code A</b>               | <b>Temperature Range</b>   |
| LTS                         | Low Temp: -40°C to 800°C (-40°F to 1472°F) / 8 to 14 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   |
| G7S                         | Glass Surface: 300°C to 900°C (572°F to 1652°F) / 7.9 microns, 120 mSec Response Time  |
| MTS                         | Medium Temp: 250°C to 1100°C (482°F to 2012°F) / 3.9 microns, 120 mSec Response Time   |
| 3ML                         | Low Temp: 100°C to 600°C (212°F to 1112°F) / 2.1-2.5 microns, 20 mSec Response Time  |
| <b>Code B</b>               | <b>Focus Option</b>  |
| 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')   |
| <b>Code C</b>               | <b>Options must be specified at the time of order</b>  |
| L                           | Laser Sighting – Standard Model  |
| V                           | Video sighting option (in addition to optical sighting) <b>Note:</b> Video sighting replaces the laser sighting feature          |
| W                           | Coolable Housing, includes Lens Air Purge Collar <b>Note:</b> For ambient temperatures exceeding 175°C (350°F), See ThermoJacket |
| <b>Typical Model Number</b> | <b>RAYMMLTSSF3V</b> Specifies a LT model with standard focus 3 optics, video sighting option.                                    |

## Accessories

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

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

### Flow Regulators

Water flow regulator (water cooling) (XXXTXWR)  
 Air purging flow/regulator assembly with air filter (XXXTXAR)  
 Cooling air flow regulator (high capacity) (XXXTXCAFR)

### ThermoJacket Housing

Rated to 315 °C (600 °F)  
 ThermoJacket housing; for Marathon MM (RAYTXXTJ4)  
 Mounting flange for ThermoJacket (XXXTXMF)\*\*  
 Adjustable mounting base (XXXTXMB)\*\*  
 Adjustable pipe adapter assembly (XXXTXAPA) \*\*  
 Mounting flange for use with sighting tubes (XXXTXMST)\*\*

*\*\* 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) (XXX2CDPSS)  
**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)

## The Worldwide Leader in Noncontact Temperature Measurement

### Raytek Corporation Worldwide Headquarters

Santa Cruz, CA USA  
 Tel: 1 800 227 8074 (USA and Canada, only)  
 1 831 458 3900  
[solutions@raytek.com](mailto:solutions@raytek.com)

### European Headquarters

Berlin, Germany  
 Tel: 49 30 4 78 00 80  
[raytek@raytek.de](mailto:raytek@raytek.de)

### China Headquarters

Beijing, China  
 Tel: 8610 6438 4691  
[info@raytek.com.cn](mailto:info@raytek.com.cn)

To find a Raytek office near you, please visit [www.raytek.com](http://www.raytek.com)

### Worldwide Service

Raytek offers services, including repair and calibration.  
 For more information, contact your local office or e-mail [support@raytek.com](mailto:support@raytek.com)

[www.raytek.com](http://www.raytek.com)



© 20012 Raytek Corporation (3111731 Rev E) 4/2012  
 Raytek, the Raytek logo and DataTemp are registered trademarks of Raytek Corporation.  
 Windows is a registered trademark of Microsoft Corporation.  
 Specifications subject to change without notice.



Raytek is an ISO 9001 certified company