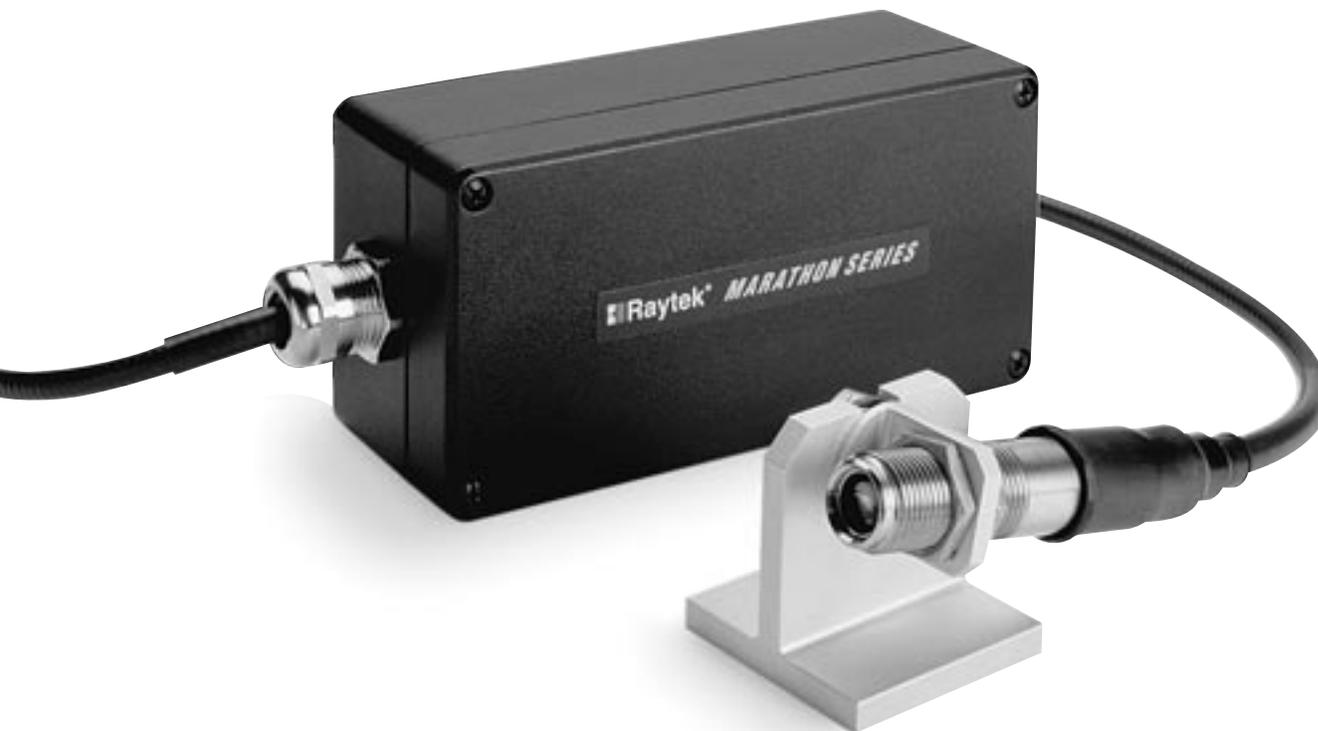


FA1/FA2

Datasheet



Noncontact Temperature Measurement for Industrial Applications

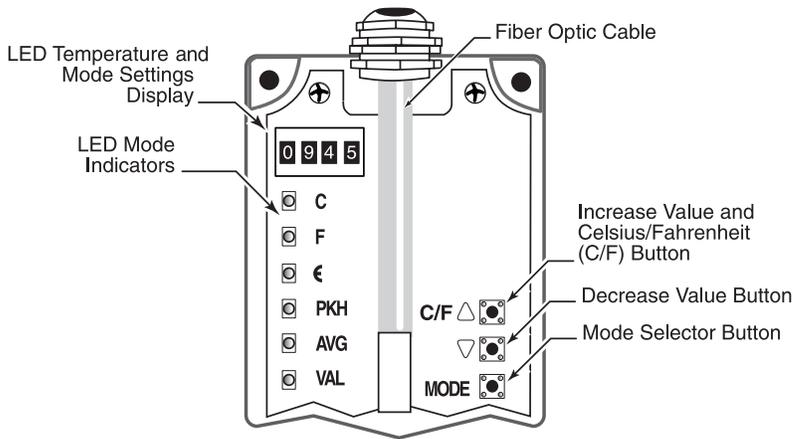


The Marathon Series™ FA1/FA2

Rugged fiber optic measurement systems, with advanced digital electronics and broad temperature ranges for application in the most demanding environments.

Measurement Specifications

Models	Temperature Range
FA1A	475 to 900°C (887 to 1652°F)
FA1B	800 to 1900°C (1472 to 3452°F)
FA1C	1200 to 3000°C (2192 to 5432°F)
FA2A	250 to 800°C (482 to 1472°F)
FA2B	400 to 1700°C (752 to 3092°F)
Spectral Response	
FA1	1.0 μm (Si detector)
FA2	1.6 μm (InGaAs detector)
Accuracy	+/- (0.3%Tmeas + 2°C)
Repeatability	±1°C
Temperature Resolution	±0.05°C (±0.1°F)
Response Time	10 mSec; selectable to 10 sec
Emissivity	0.1 to 1.0 in 0.01 increments
Signal Processing	Peak Hold, Valley Hold, Averaging



FA1/FA2 User Interface

The Marathon fiber optic infrared thermometers (FA1/FA2) are fiber optic thermometers measuring temperatures from 250–3000°C (482 to 5432°F). These thermometers consist of a rugged fiber optic cable plus optical head assembly connected to an electronics housing containing the detector, processing electronic, internal user interface/LED display, and termination connections for field-wiring. FA1/FA2 thermometers permit measurement of targets in harsh industrial environments that are otherwise inaccessible.

FA1/FA2 thermometers maintain their high accuracy over the ambient operating temperature range from 0 to 60°C (32 to 140°F).

The fixed-focus optical head consists of a small stainless steel cylindrical housing and lens assembly capable of withstanding ambient temperatures up to 200°C (392°F) and is NEMA-4 rated. The optical head accommodates an air-purge accessory to prevent lens contamination. The fiber optic cable is protected by metal armor and sealed with a Viton® jacket to prevent wicking of water or oils. The assembly accommodates a small bend radius for threading through tight spaces.

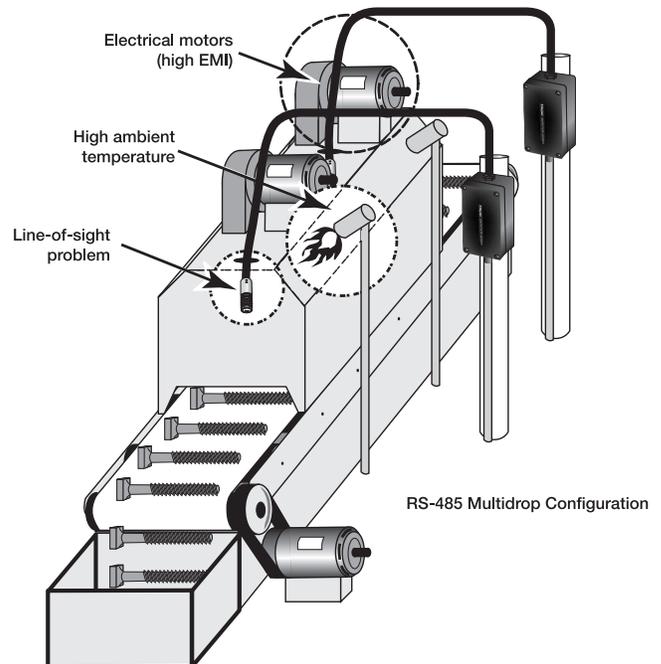
Included is Marathon Support Software — a suite of Windows® programs allowing remote parameter setting, data acquisition, graphic display of data, and RS-485 multidrop network configuration.

Optical Specifications

Models	D:S (Min)*	Focus Distance		SF
		CF1	CF2	
**FA1A	20	100mm (4 in)	300mm (12 in)	∞
FA1B	100	100mm (4 in)	300mm (12 in)	∞
FA1C	100	100mm (4 in)	300mm (12 in)	∞
**FA2A	20	100mm (4 in)	300mm (12 in)	∞
FA2B	40	100mm (4 in)	300mm (12 in)	∞

*At 95% energy Recommend: Target diameter Spot size diameter ≥1.4

**Available with laser sighting



RS-485 Multidrop Configuration

Marathon FA sensors use fiber optic technology to overcome extreme environmental conditions that may be encountered on the process. With the detector and signal processing electronics located remotely in a rugged die cast enclosure, the fiber optic sensing head and cable can be installed into areas with high electromagnetic fields, extreme temperatures (up to 200°C), and into areas with limited space, where the line-of-sight to the target precludes more remotely mounted integrated sensors.

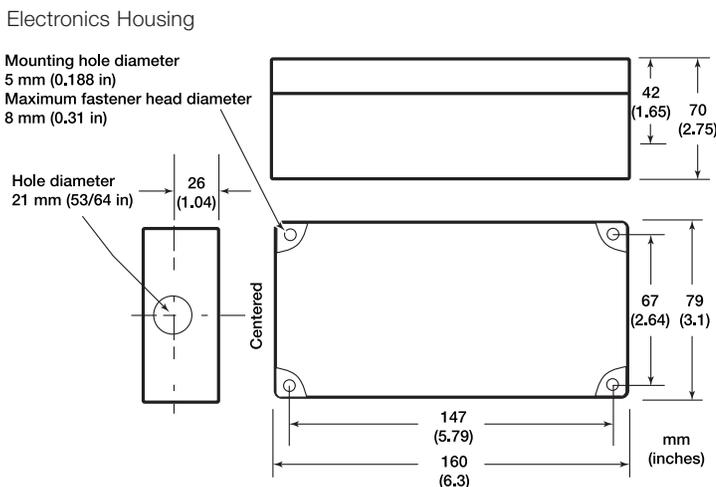
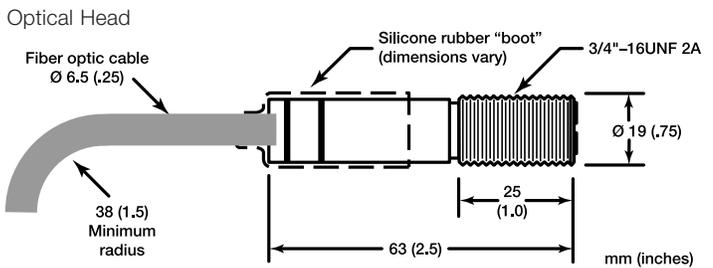
Electrical Specifications

Outputs	0/4-20 mA; RS-485, 2-wire/4-wire, networkable to 32 sensors Relay (48V, 300 mA, response time < 2 mSec)
Power Supply	24 VDC, 500 mA, ±20%
Compliance	CE low voltage directive

General Specifications

Environmental Rating	NEMA-4 (IEC 529, IP 65)
Ambient Operating Temperature Range	0 to 200°C (32 to 392°F)
Fiber cable/optical head	0 to 60°C (32 to 140°F); with cooling platform 0 to 150°C (32 to 300°F)
Electronics housing	0 to 60°C (32 to 140°F); with cooling platform 0 to 150°C (32 to 300°F)
Storage Temperature Range	
Electronics Housing	-20 to 70°C (-4 to 158°F)
Relative Humidity	10% to 95% non-condensing
Shock (electronics housing)	MIL-STD-810D (IEC 68-2-27)
Vibration (electronics housing)	MIL-STD-810D (IEC 68-2-6)
Weight	
Electronics housing	0.71 kg (25 oz)
Optical head	0.10 kg (3 oz)
Fiber Cable Protection	Rated to 200°C; stainless steel armor; Viton coated; NEMA-4; provision for conduit to protect fiber cable

General Dimensions



FA1/FA2 Highlights

- **Low temperature limits**
FA1: 475°C (887°F)
FA2: 250°C (482°F)
- **High accuracy ±0.3% of temperature**
- **High optical resolution to 100:1**
- **Focus distances down to 100mm (4 in)**
- **Fiber optic assembly withstands 200°C (392°F) NEMA-4 rated**
- **Fast response time down to 10 milliseconds**
- **0/4-20 mA analog output**
- **RS485 serial output; networkable in any combination of 32 Marathon sensors**
- **Advanced signal processing: Peak Hold, Valley Hold, Average**
- **Background radiation compensation**
- **Internal LED display and Marathon user interface**
- **Programmable relay output: dual temperature set-points and "failsafe"**
- **Windows Marathon Support Software (operates under WIN 3.1/95/98/NT)**

Accessories Options

All systems are shipped with a mounting bracket for the optical head, an operator's manual, and all applicable software packages.

- **Furnace rooftop mounting/purging system** available with either flange (XXXFORFMF) or gravity-held base (XXXFORFMC)
- **Stainless steel air-purge collar** for optical head with integrated stainless steel sighting tube, 150mm (6 inch) long, 25mm (1 inch) diameter (XXXFOHAPA)
- **24VDC 1.1A power supply** with universal 110/220VAC input (XXX2CDCPSS)
- **Smart RS-485 to RS-232 interface converters** with built-in smart switching allowing for use in either 2-wire or 4-wire mode, in either multi drop or stand-alone mode
- *Optional fiber optic cable lengths: 1, 3, 6, or 10m (3.2, 10, 19.2, or 32 ft)
- *Optional **NIST traceable** certificate of calibration
- *Optional **water-cooled** platform for electronics housing to enable operation in environments up to 150°C (300°F)
- *Optional **laser sighting** for alignment of FA1A & FA2A sensors

*Options must be specified at time of order

New! Raytek Laser Sighted FA

NEW! Laser Illumination for Optical Alignment

The most recent enhancement to the Marathon FA sensors—optional laser sighting—is now available on FA1A and FA2A models. Unlike most laser-sighted sensors, which identify the measurement target with a single laser dot, the FA laser actually illuminates the portion of the target being measured with a red 'glow'. This is accomplished by having the laser go through the same optical channel as the infrared, using the infrared optics to focus the laser light.

Laser sighting allows the FA sensing head to provide targeting when installed into tight locations that do not accommodate larger, through-the-lens visually sighted instruments. The laser illumination is particularly useful when measuring small targets, or larger targets in low ambient light conditions.



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Raytek Automation Products: Noncontact Temperature Measurement Solutions For Industrial ApplicationsSM

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