High Performance Emissivity-Independent 2-Color IR System

Complete Fiber Optic Infrared System Includes Sensor and Rack Mount Monitor

OS1542/OS1543 Series Starts at

$4285

1 YEAR WARRANTY | MADE IN USA | OMEGACARE Extended Warranty Program

DP1541 2-color monitor, $5640, with OS1543 general purpose fiber optic sensor, $5640, shown smaller than actual size.

Mounting bracket included.

- **Exceptional for Induction Heating**
- **Measurements Independent of Emissivity**
- **Optional Signal Processing**
- **Optional Controller Outputs**
- **1 mV/Degree Output Standard**
- **Optional 0 to 10 Vdc, 4 to 20 mA Linear Second Output**
- **Switchable 10 or 100 msec Time Constant**

OS1542 Sensors

- **Silicon Detector**
- **0.9 and 1.06 Micron Filters**
- **Temperatures from 980 to 1800°C**
- **Minimal Effect by Steam or Hot Gas**

OS1543 Sensors

- **Lead Sulfide Detector**
- **1.55 and 2.25 Micron Filters**
- **Temperatures from 450 to 850°C**

This high performance system allows one to view targets that are not optically accessible with standard line of sight instrumentation.

This high performance emissivity independent 2-color system consists of a DP1541 and sensors. The DP1541 is a single-channel, 19 inch rack mount 2-color control system. Three sensors are available; OS1542-L1-R1 or OS1542-L1-R2 or OS1543-L1-R3.

Typical Fiber Optic Probes shown. L2, L3 and L4 are custom assemblies, Consult OMEGA for details. L1 shown with optional bifurcated cable for backlighting.

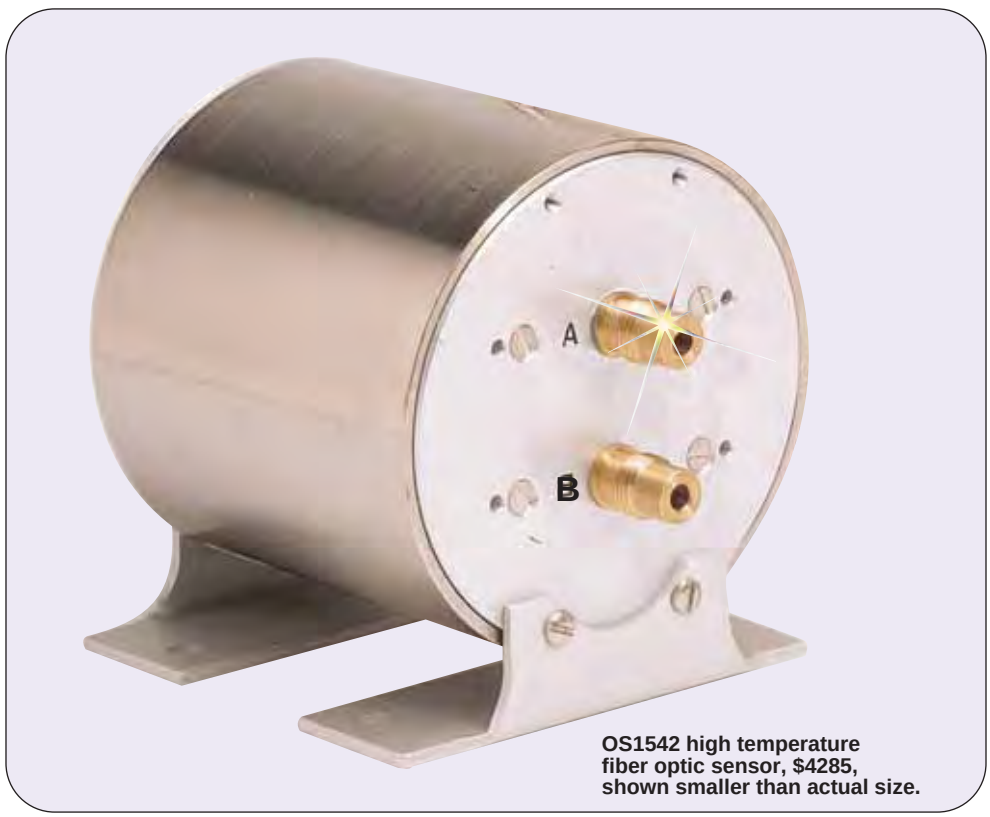
Available Probe Types

L1 Lens Probe (Standard)
L2 Ceramic/Metal Tip
L3 Polymer Bolt
L4 Ejector Pin Probe

The OS1542 and OS1543 fiber optic sensors are designed specifically to work with the DP1541 2-color emissivity-independent monitor and the associated fiber optic cable assembly. The small size of these probes makes them well suited for installations with limited mounting room. They are unaffected by RFI and EMI noise, which also make them excellent for use in hostile environments like induction or microwave heating.

The OS1542 and OS1543 fiber optic sensors operate at 2 wavebands and utilize an energy ratio to calculate temperature. They can, therefore, measure temperature on objects whose emissivity is unknown provided the emissivity at all temperatures is proportional at the 2 wavebands used for the measurement, which is typical.

The OS1542 fiber optic sensor head has a silicon detector filtered at narrow bands centered at 0.90 and 1.06 microns; it is used primarily at high temperatures and is minimally affected by steam and hot gas.



OS1542 high temperature fiber optic sensor, $4285, shown smaller than actual size.

The OS1543 fiber optic sensor head has a lead sulfide detector filtered over wide bands centered at 1.55 and 2.25 microns. It is used as a general purpose head which can measure temperatures down to 250°C. It should not be used where hot steam or gas is present.

The fiber optic cable assembly differs according to certain parameters specific to the application. It allows remote mounting of the OS1542 or OS1543 detector heads away from hot or hazardous areas.

DP1541 two-color monitor, $5640, with OS1543 general purpose fiber optic sensor, $4895, shown smaller than actual size.

Rack Mounted Monitor

The DP1541 two-color temperature monitor measures temperature independently of emissivity, and is unaffected by dust, smoke or other contaminants in the field of view. Only 20% of the field of view is needed to ensure accurate measurements, regardless of the target size. Through the use of a bifurcated fiber optic cable, the energy radiated by the target can be divided between two separate infrared detectors within the sensor head. Each detector, having a different spectral band pass filter, sees a slightly different target energy level. The signals from these two detectors provide the ratio to provide the final temperature readout.

The DP1541 two-color monitor measures temperature independently of changes in target emissivity, provided that the emissivity changes are proportional in both wavelength bands, thus cancelling out the change in emissivity.

The meter also incorporates a special feature called “slope control,” which allows precise emissivity correction for the temperature band of interest. The “slope control” adjustment compensates for non-graybody errors by adding a percentage of the single-color temperature to the two-color temperature to achieve the correct temperature output.

The DP1541 monitor has optional signal processing outputs for datalogging or taking trend analysis. These outputs include Peak Sense and Hold, Signal Averaging, Valley Sense and Hold, Fast Rise, Variable Decay Time Sampling and Sample Timed Hold.

The unique features of the DP1541, along with the OS1542 or OS1543 infrared sensors, make it ideal for applications like wire and rod forming, molten metal, heat treating, crystal growing. The system may be used in applications considered difficult or impossible for conventional direct viewing infrared systems.

The DP1541 is recommended for situations where direct target sighting is impossible due to obstructions, where RF or EMI interference is present, or where nuclear radiation is present (requiring the electronics to be located in a safe area), and in harsh environments.

The DP1541 monitor can be supplied with a trifurcated fiber optic cable that permits “backlighting” with a light source for precise pinpointing of the target location at all times.

Any non-contact temperature measurement can be taken with the proper sensor configuration, along with the DP1541 monitor. Consult OMEGA for the proper system configuration for your application or for available custom configurations. The system will consist of the DP1541 two-color emissivity-independent monitor and either the OS1542 or OS1543 sensor head, along with a 3 m (10') interconnecting cable and the fiber optic cable assembly.

Important factors to be considered in determining the fiber optic assembly best suited for your application are: the distance from fiber optic lens to the surface being measured; the size of the surface; the temperature range to be measured; the ambient temperature around the fiber optic cable; the length of the fiber optic cable needed; how the surface is being heated, and the atmospheric conditions between the sensor and the product.

Specifications for DP1541 Monitor

Temperature Range: 250 to 2575°C (480 to 4665°F); LED shows out-of-range conditions

Accuracy: ±1% rdg

Repeatability: ±0.5% rdg

Resolution: 1°C/F

Ambient Temperature: 10 to 50°C (50 to 122°F)

Power: 115 Vac standard (230 Vac optional)

Power Dissipation: 50 W max

Output: 1 mV/degree

Display: 3¾ digit, max rdg 3999

Time Constant: 10, 100 msec, (10 to 63.2%)

Spectral Response: 0.90 and 1.06 microns or 1.55 and 2.25 microns (center bands)

Fiber Optic Cable: Glass or quartz fiber with heavy duty SS jacket standard, 0.070 cable Dia., 149°C (300°F) max ambient temperature

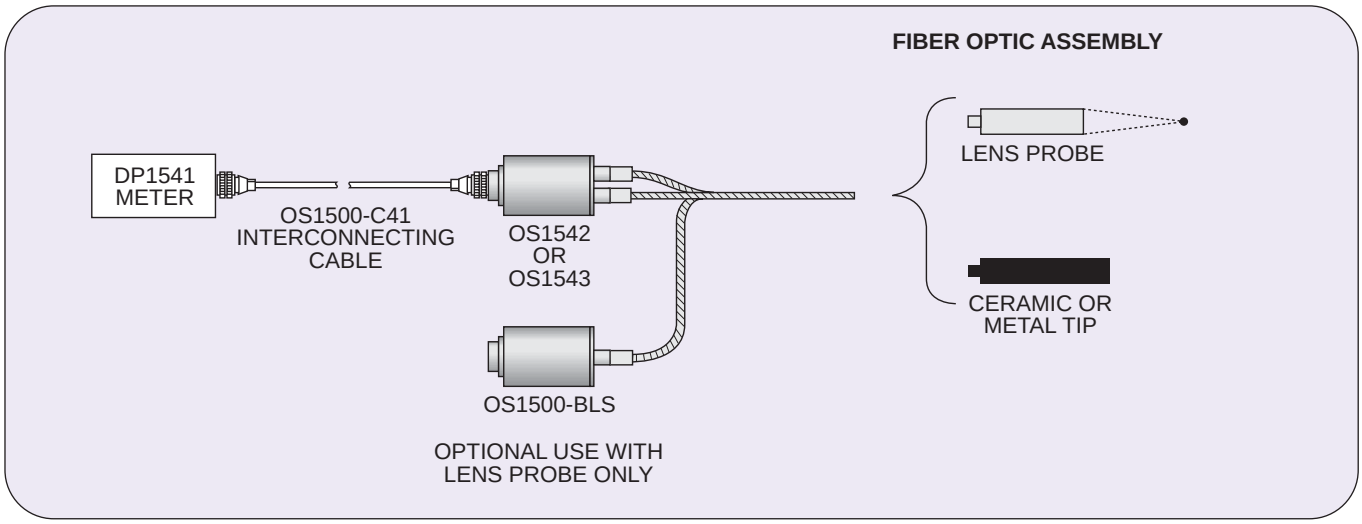
Optional Controller Outputs: 2A SPDT relay or 20A SSR @115 Vac

Signal Processing Adjustment: 0.5 to 10 sec hold and decay times

Dimensions: 13.34 H x 48.26 W x 30.48 cm D (5.25 x 19 x 12")

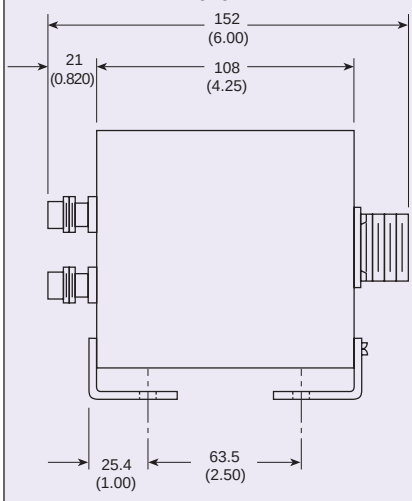
Weight: 5.44 kg (12 lb)

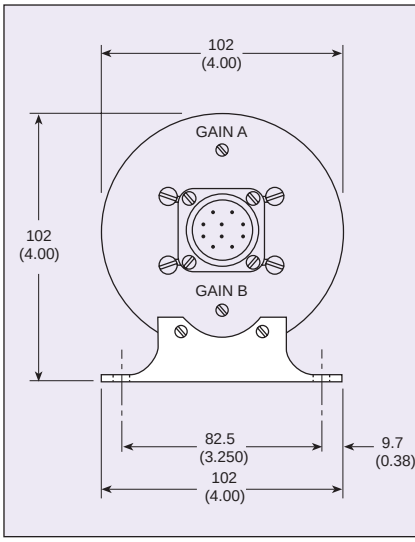
OMEGACARE℠ extended warranty program is available for models shown on this page. Ask your sales representative for full details when placing an order. OMEGACARE℠ covers parts, labor and equivalent loaners



- **Many Different Assemblies Available**
- **Small Spot Sizes Down to 0.004"**
- **Ceramic/Metal Tip Probe for Induction Heating Where Probe is Close to Surface Available**
- **Trifurcated Fiber Cable for Two Color Measurements and Back Lighting of Target Area**

Dimensions: mm (in)





Rackmount Monitor

To Order *(Specify Model Number)*		
Model No.	**Price**	**Description**
DP1541-(*)	**$5640**	Single channel 48 cm (19") rackmount two-color monitor, slope control, 1 mV/ degree output, 3¾ digit display; (for use with OS1542 or OS1543 sensors)

***** *Specify analog output: "F" for 1 mV/°F, or "C" for 1 mV/°C.*
Comes with complete operator's manual.
Consult OMEGA for information on custom systems.

MOST POPULAR MODEL HIGHLIGHTED!

To Order *(Specify Model Number)*				
Model No.	**Base Price**	**Temperature Range**	**Spot Size @ Focal Dist.**	**Cable Length**
OS1542-L1-R1-4	**$4285**	1050 to 1800°C (1925 to 3270°F)	1.2" @ 36"	1.2 m (4')
OS1542-L1-R2-4	**4285**	980 to 1650°C (1850 to 3000°F)	0.18" @ 14"	1.2 m (4')
OS1543-L1-R3-4	**4895**	450 to 850°C (847 to 1562°F)	0.076" @ 6"	1.2 m (4')

Note: *The OS1542 and OS1543 operate solely with the DP1541 thermal monitor.*
Comes with interconnecting cable for use with DP1541 monitor, fiber optic lens assembly, fiber optic cable and complete operator's manual.
Ordering Example: DP1541-C-MA-VS, *19 inch rack mount monitor with °C display and 1 mV/°C analog output, 4 to 20 mA second output, and valley sense and hold, $5640 + 125 + 330 =* ***$6095. OCW-3,*** *OMEGACARE℠ extends standard 2-year warranty to a total of 5 years ($350) $5640 + 350 =* ***$5990.***

We make running changes when technical advances allow. Check at time of ordering for additional features.

Optional Second Output

Order Suffix	Add'l. Price	Description
-V	**$75**	0 to 10 Vdc
-MA	**125**	4 to 20 mA

Signal Processing Outputs

Order Suffix	Add'l. Price	Description
-PS	**$330**	Peak sense and hold
-SA	**330**	Signal averaging
-VS	**330**	Valley sense and hold
-ST	**330**	Sample timed hold
-FR	**330**	Fast rise variable decay

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