

ARTISAN®
TECHNOLOGY GROUP

Your **definitive** source for quality pre-owned equipment.

Artisan Technology Group
(217) 352-9330 | sales@artisantg.com | artisantg.com

Full-service, independent repair center
with experienced engineers and technicians on staff.

We buy your excess, underutilized, and idle equipment
along with credit for buybacks and trade-ins.

Custom engineering
so your equipment works exactly as you specify.

- Critical and expedited services
- In stock / Ready-to-ship
- Leasing / Rentals / Demos
- ITAR-certified secure asset solutions

Expert team | Trust guarantee | 100% satisfaction

All trademarks, brand names, and brands appearing herein are the property of their respective owners.

Find the *Exfo R5000* at our website: *Click HERE*

EXFO

UV/VISIBLE RADIOMETER 250 – 600 nm

USER'S GUIDE

Model R5000

Table of Contents

1 Introduction 5

2 Control Functions & Features 6

3 Familiarizing Yourself with the EXFO Radiometer 7

4 Using the EXFO Radiometer 10
4.1 Turning on the EXFO Radiometer 10
4.2 Irradiance Measurement 10
4.3 Power Measurement 11
4.4 Peak Measurement 11
4.5 Relative Measurement 12
4.6 Using a Non-standard Light Guide 13

5 Glossary of Symbols/ Safety Precautions 14

6 Technical Specifications 16
6.1 Optical 15
6.2 Electrical 16
6.3 Mechanical 17
6.4 Environmental Conditions 17
6.5 Regulatory Compliance 18
6.6 Feature Summary 20

7 Trouble Shooting Guide 21

8 Accessories 23

9 Warranty 25
9.1 Contact Information 26
9.2 Returning the EXFO Radiometer 26
9.3 Servicing 27

1 Introduction

Congratulations on your purchase of the EXFO Radiometer. This radiometer includes revolutionary technology that elevates the performance and accuracy of hand held radiometers to new heights. It joins the EXFO family of spot cure and illumination systems, offering the same high level of innovation, quality and reliability that customers have come to expect from EXFO.

At the heart of the EXFO Radiometer are two proprietary systems: a non-imaging optical interface that virtually eliminates measurement variation caused by radiance and intensity variations in the light source; and a flat response optical detector system that responds to energy at all wavelengths between 250 and 600 nm. The result is a hand held, robust and versatile radiometer with an accuracy unmatched in the industry.

Standard and optical accessories include optical adapters and band pass filters to adapt the EXFO Radiometer to your specific radiometric application.

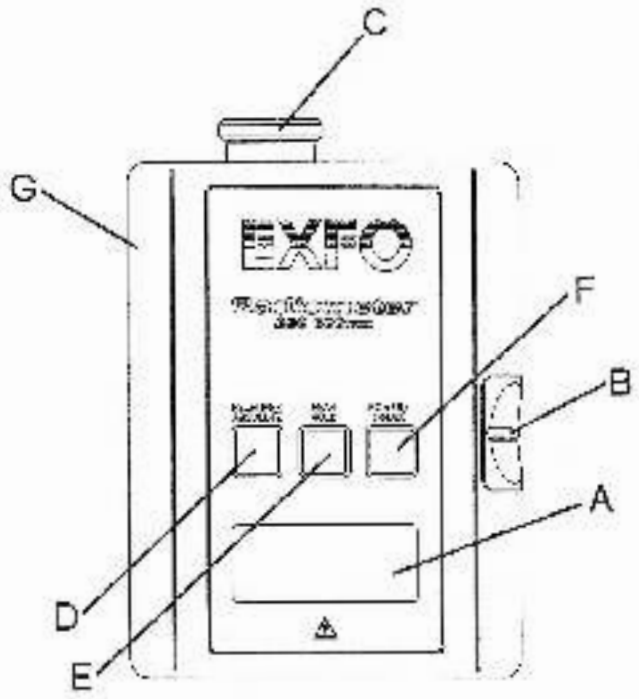
The EXFO Radiometer is a high quality product manufactured in accordance to ISO 9001 and certified to CE, UL and CSA standards.

2 Control Functions & Features

Features	Benefits
Provides accurate broadband measurements between 250-600 nm	Versatile measurement capability suitable for many different light sources
Measures power or irradiance	Allows for industry specific measures
Optical interface collects light over a large area	Eliminates beam intensity and radiance dependence
Externally changeable bandpass filters used to select wavelength ranges for measurement	Fast, simple filter changes
Auto-ranging	Maintains precision over full range
Peak Hold Mode measures and displays maximum value	Identification of maximum value in a changing signal
Real-time Mode	Allows for tracking of a varying signal
Relative Mode	References all measurements to a pre-set value
Absolute Mode	References all measurements to NIST traceable units
Fits standard light guides (3mm, 5mm, 8mm)	Automatically senses light guide diameters & accommodates industry standard light delivery systems
CE marked; complies with IEC, Canadian and US Standards	Ready for use worldwide
Calibration traceable to NIST*	Quality assurance
Auto turn on and auto turn off	Extends battery life and makes operation easier

* Using Blank removable filter

3 Familiarizing yourself with the EXFO Radiometer



A) LCD Display:

3 ½ digit display with indicators for low battery, over range, Peak Hold, % (for Relative mode), Power mode and Irradiance mode.

Automatic scaling function -

Power:	Low range:	10 – 990 mW
	High range:	1.0 – 15.00 W
Irradiance:	Low range:	50 – 990 mW/cm^2
	High range:	1.0 – 225 W/cm^2

B) Bandpass Filters:

User selectable and convenient external installation. The standard filter is blank. Refer to the accessories in section 8 for available optional filters.

C) Light Guide Port:

Accepts industry standard light guides and automatically senses 3, 5 and 8 mm light guide diameters. (adapters provided for 3 & 5 mm)

D) Relative/Absolute Mode Keypad:



Enables the user to select either Absolute mode for standard power or irradiance readings, or Relative mode which displays readings as a percentage of an established reference. The display will indicate "%" in Relative mode. Absolute mode is the initial default.

E) Peak Hold Keypad:

Allows the display to indicate the peak value being measured. The display will indicate "P" when this feature is activated.



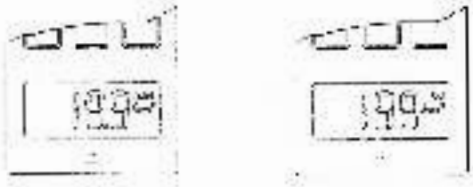
F) Power/Irradiance Keypad:

Provides the user with the ability to select between measuring power in "mW" or "W" or irradiance in "mW/cm^2" or "W/cm^2". When in Irradiance mode, the Radiometer automatically senses 3, 5 or 8 mm light guide diameters when the appropriate adapter is used.

Power



Irradiance



G) Ergonomically Designed Enclosure:

Compact, hand-held, and portable so it may be used where it is needed most.

4 Using the EXFO Radiometer

NOTE: The EXFO Radiometer defaults to the measurement mode it was in when it last automatically turned off.

4.1 Turning on the EXFO Radiometer

The hand held Radiometer is not fitted with an ON / OFF switch. Instead, the Radiometer has been designed with an **auto turn ON and auto turn OFF** feature.

The Radiometer will automatically turn on when it detects an optical signal of 10 mW or greater. When the light source is removed, the display will remain on for 10 seconds. At that point, the display will flash for 5 seconds as a warning of impending turn off. The Radiometer will then turn off.

4.2 Irradiance Measurement:

Insert the light guide into the optical port on the top of the Radiometer and turn on the light source. The display will automatically turn on and display the irradiance in either "mW/cm^2" or "W/cm^2". If the display indicates power, as evident by the lack of the "/cm^2" icon, press the Power/Irradiance button once.

The display will indicate the irradiance for approximately 10 seconds after the light guide has been removed. The display will flash for 5 seconds before powering down. The EXFO Radiometer automatically detects 3, 5 or 8 mm diameter light guides and calculates the irradiance accordingly when the appropriate adapter is used.

4.3 Power Measurement:

Insert the light guide into the optical port on the top of the Radiometer and turn on the light source. The display will automatically turn on. Power measurements are indicated by the units of Watts. If the unit icon includes "/cm^2", momentarily press the Power/ Irradiance button.

The display will indicate power in "mW" or "W" and will remain active for approximately 10 seconds after the light guide has been removed. The display will flash for approximately 5 seconds before powering down.

4.4 Peak Measurement:

To obtain a peak value of a measurement in Irradiance or Power, follow the steps as outlined in sections 4.2 or 4.3. Once the Radiometer is in the correct measurement mode, momentarily press the Peak Hold button. The LCD display will indicate a "P" in the bottom left hand corner. The unit will track all subsequent readings and

display the peak value. Any subsequent measurements that are lower than the Peak mode reading will not be displayed.

4.5 Relative Measurement:

The Relative mode allows the user to display measurements as a percentage of a reference value. Begin by inserting the light guide into the optical port on the top of the Radiometer. Select either Power or Irradiance as described in sections 4.2 or 4.3. Adjust the optical source to the desired reference level, then press the Relative/ Absolute button. The Radiometer will now be in Relative mode. All subsequent measurements will be displayed as a percentage of the reference. A reading of "100%" will indicate that the current measurement is the same value as the reference. A reading of "50%" will indicate that the current measurement is half of the initial reference measurement.

After removing the light guide, the display will remain on for 10 seconds. Inserting a light guide from a different source prior to the display turning off, will provide a measurement which is relative to the initial reading as described above.

4.6 Using Non-Standard Light Guides:

NOTE: If a light guide with an active area diameter other than a 3, 5 or 8 mm is to be used in conjunction with this Radiometer:

1. Select the light guide adapter that is the closest match to the diameter of the light guide to be used.

2. Configure the Radiometer to measure power. (irradiance readings will not be accurate)

3. If irradiance values are desired, divide the power readings by the output area of the light guide being used.

4. The specifications listed in section 6 cannot be guaranteed.

5 Glossary of Symbols/ Safety Precautions



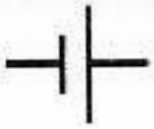
ATTENTION

Consult accompanying documents



WARNING

Eye damage may result from directly viewing Ultraviolet light. Always wear UV protective eyewear/ face shield and protective clothing.



Battery



D.C. Current

SAFETY PRECAUTIONS:



CAUTION!
Never look into the light emitting end of a light guide. The light could severely damage the cornea and retina of the eye if the light is observed directly. Eye shielding must be used at all times as well as protective clothing to protect exposed skin.



WARNING!
Should the EXFO Radiometer be used in a manner not specified by EXFO, the protection provided by the equipment may be impaired.

6 Technical Specifications*

6.1 Optical:

Wavelength Range:		250-600 nm
Maximum Range:	Power:	10 mW – 15.0 W
	Irradiance:	50 mW/cm^2 – 225.0 W/cm^2
Resolution:	Power:	10 mW
	Irradiance:	10 mW/cm^2
Accuracy:		+/- 5% typical, +/- 10% maximum
Auto-raging:	Power:	10 – 990 mW, 1.0 – 15.00 W
	Irradiance:	50 – 990 mW/cm^2, 1.0 – 225 W/cm^2
Removable filters:	Standard:	blank
	Optional:	250-450 nm 320-500 nm 365 nm 320-390 nm 400-500 nm

6.2 Electrical:

Battery Type:	Standard:	9 volt D.C
Battery Life:		2 years, typical (intermittent use)

6.3 Mechanical:

Dimensions:	L x W x H 5.22 x 3.5 x 1.5 inches 13.2 x 8.9 x 3.8 cm
Weight:	0.90 lbs. / 400 g
Includes:	adapters for 3 and 5 mm light guides, carrying case, one Proximity Measurement Adapter ,manual
Warranty:	1 year

6.4 Environmental Conditions:

Operating Environment Conditions

Installation Category II, Pollution Degree 2

Temperature:	10 to 40 degrees Celsius
Relative Humidity:	30% to 75% (non-condensing)
Atmospheric Pressure:	700 to 1060 hPa
Altitude:	2000 meters (maximum)

Transport and Storage Conditions

Temperature:	-10 to 60 degrees Celsius
Relative Humidity:	10% to 100% (non-condensing)
Atmospheric Pressure:	500 to 1060 hPa

- Specifications are subject to change without notice.

6.5 Regulatory Compliance:

Complies to the following directives/standards

Council Directive 73/23/EEC	Low Voltage Directive
Council Directive 89/336/EEC	EMC Directive

CE Representative

GENTEC Benelux
Chausse de Louvain, 270
B-1410 Waterloo
Belgium

CE

Information to User

FCC Class A Digital Device or Peripheral

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:
(1) this device may not cause harmful interference and
(2) this device must accept any interference received, including interference that may cause undesired operation.

NOTE: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Warning

Changes or Modifications not expressly approved by EXFO Photonic Solutions Division could void the user's authority to operate the equipment.

6.6 Feature Summary:

Features:	Power measurement
	Irradiance measurement
	Automatic light guide (size) detection
	Relative mode
	Over range indication
	Low battery indication
	Peak Hold measurement
	Absolute measurement
	Real-time measurement
	Auto turn on/off
	Replaceable filters

NOTE: Calibration is recommended every 6 months and is available through EXFO Photonic Solutions Division. Please refer to section 9 of the manual.

7 Trouble Shooting

NOTE: There are no serviceable components within the Radiometer. Opening the case will void the warranty.

The display remains blank, unit does not turn on

1. Ensure that the optical power from the Unit Under Test (UUT) is at least 10 mW.

   Ensure that the UUT's lamp is on, the shutter is open, the light guide has good transmission qualities and that the light guide is properly inserted into the Radiometer. If a spare lamp is available, try changing the lamp and re-do the measurement. If the UUT, lamp and light guide are all in working order, return the Radiometer to EXFO Photonic Solutions Division as per section 9.

2. To return the EXFO Radiometer, please refer to the warranty and contact information in section 9.

The display is dim and/or the battery symbol is active

1. Ensure that the Radiometer is within calibration.

2. Ensure that the operational environmental conditions meet those specified in section 6.

3. To return the EXFO Radiometer, please refer to the warranty and contact information in section 9.

The display reading does not vary

1. Ensure that the Radiometer is not in Peak Hold mode. A small "P" in the lower left-hand corner of the display indicates Peak mode. If necessary, momentarily press the Peak Hold button to exit this mode. If the problem persists, allow the Radiometer to auto-power down, then repeat the measurement. If no improvement is observed, return the Radiometer to EXFO as per section 9.

The display reading is abnormally high or low

1. Ensure that the correct light guide adapter is being used. Only those adapters shipped with the Radiometer or purchased from EXFO specifically for the Radiometer are compatible.

2. Verify that the light guide used for measurement purposes has an output diameter of 3, 5 or 8 mm.

3. Ensure that a filter (blank or otherwise) has been correctly installed into the Radiometer.

4. Check that the Radiometer is within calibration.

5. Return the Radiometer to EXFO as per section 9.

8 Accessories

EXFO Photonic Solutions Division carries a full line of replacement parts, supplies and accessories. Our team of light-based technology experts can recommend light delivery solutions for a range of manufacturing, illumination and biomedical applications. We also welcome custom requests for unique light delivery requirements.

Flexible Spectral Measurement:
The EXFO Radiometer can accurately measure power or irradiance over a broad spectral range. Externally exchangeable optical filters allow the unit to focus on specific wavelength bandwidths.

Optional Filters	Part #s
250-450 nm	019-01029
320-500 nm	019-01032
365 nm	019-01028
320-390 nm	019-01031
400-500 nm	019-01030
Blank	019-01027

- Unit accuracy may change when using optional filters due to normal transmission losses.

Adapters

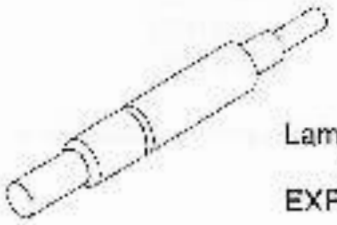
Optical accessories provide solutions to a wide range of situations. Optical accessories include the standard, Proximity Measurement Adapter and the optional Lamp Output Adapter. These adapters expand the range of measurement geometries that can be accommodated.

Standard and Optional Adapters:

Proximity Measurement Adapter (standard):

EXFO Part # 019-01034





Lamp Output Adapter (optional):

EXFO Part # 019-01033

9 Warranty

EXFO Photonic Solutions Division warrants, to the original purchaser for a period of one (1) full year, calculated from the date of purchase, that the equipment sold is free from defects in material and workmanship.

In the event of a claim under this guarantee, the equipment is to be sent postage and carriage paid, including a short description of the fault to EXFO Photonic Solutions Division. Equipment returning to EXFO will not be received without an official Return Authorization, issued by EXFO Photonic Solutions Division.

In the case of damage caused by wear and tear, careless handling, neglect, by the use of force or in the case of interventions and repairs not carried out by an EXFO Authorized Service Center, the guarantee ceases to be valid. This guarantee may not form the basis for any claims for damages, in particular not for compensation of consequential damages.

Warning

There are no serviceable parts within the EXFO Radiometer. Opening the Radiometer case will void the warranty.

9.1 Contact Information:

Service information may be obtained by contacting EXFO Photonic Solutions Division :

Toll free:	1-800-668-8752	*USA & Canada*
Tel:	1-905-821-2600	
Fax:	1-905-821-2055	
Email:	info@efos.com	

EXFO Photonic Solutions Division
2260 Argentia Rd.
Mississauga, ON
Canada, L5N 6H7

Website: www.efos.com

9.2 Returning the EXFO Radiometer:

1. Please make note of the problem encountered, the steps followed to isolate the problem and the result of any trouble shooting steps taken.

2. Telephone EXFO to obtain a Return Authorization number so that repairs may be completed quickly and efficiently.

3. Enclose details of the problem with the unit and return both to EXFO for servicing. The unit should be returned in its original packaging if possible.

4. Include a phone number and contact person who may be reached for any additional service related questions.

For further information and to order, contact EXFO Photonic Solutions Division. Refer to address and contact information on page 25 of the manual.

9.3 Servicing:

To clean the hand held EXFO Radiometer, use a damp cloth with a mild detergent to wipe down the unit.

If you have any problems with your EXFO Radiometer, please contact EXFO directly for assistance and/or directions on how to return the unit to us for servicing.

Calibration:

The Radiometer calibration is traceable to NIST and is required to be performed every 6 months to ensure valid measurement.

Send the EXFO Radiometer to EXFO in the original packaging and clearly mark the purpose of return.

EXFO Photonic Solutions Division
2260 Argentia Rd.
Mississauga, ON
Canada, L5N 6H7

User Notes



Artisan Technology Group is an independent supplier of quality pre-owned equipment

Gold-standard solutions

Extend the life of your critical industrial, commercial, and military systems with our superior service and support.

We buy equipment

Planning to upgrade your current equipment? Have surplus equipment taking up shelf space? We'll give it a new home.

Learn more!

Visit us at **artisantg.com** for more info on price quotes, drivers, technical specifications, manuals, and documentation.

Artisan Scientific Corporation dba Artisan Technology Group is not an affiliate, representative, or authorized distributor for any manufacturer listed herein.

We're here to make your life easier. How can we help you today?

(217) 352-9330 | sales@artisantg.com | artisantg.com

ARTISAN® TECHNOLOGY GROUP