Technical Manual

Quantus™ Fluorometer Operating Manual

INSTRUCTIONS FOR USE OF PRODUCT E6150.



www.promega.com

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Quantus™ Fluorometer

All technical literature is available on the Internet at: www.promega.com/protocols/ Please visit the web site to verify that you are using the most current version of this Technical Manual. Please contact Promega Technical Services if you have questions on use of this system. E-mail: techserv@promega.com

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1. Introduction

1.A. Description

The Quantus™ Fluorometer is a dual-channel fluorometer for your personal quantitation workflow. Designed to provide highly sensitive fluorescent detection when quantifying nucleic acids and proteins, the compact instrument is simple to operate. The Quantus™ Fluorometer is optimized with pre-programmed settings for Promega QuantiFluor® Dye Systems (QuantiFluor® dsDNA, RNA and ssDNA Systems) for nucleic acid quantitation and allows

users the flexibility to create their own methods and quantitation settings for other dyes within the proper excitation and emission wavelengths.

The Quantus™ Fluorometer (Figure 1) is equipped with two fluorescence channels for nucleic acid and protein quantitation.

Red fluorescence channel: Excitation 640nm shortpass (wavelengths up to 640nm), emission 660–720nm;

Blue fluorescence channel: Excitation 495nm shortpass (wavelengths up to 495nm), emission 510–580nm.

1.B. Product Components

Product	Size	Cat.#
Quantus™ Fluorometer	1 each	E6150

For Research Use Only. Includes:

- Quantus™ Fluorometer
- USB Power Supply
- USB Cord
- Outlet Adapter Kit (4 adapters supplied for international compatibility)
- Quick Reference Guide
- Operating Manual
- Product Registration Card

Shipping and Storage Conditions: 5–40°C under noncondensing conditions, up to 75% humidity.

The Quantus™ Software, which can be used to transfer data to a computer, may be downloaded at: **www.promega.com/quantusfluorometersoftware/**

Materials to Be Supplied By User

- thin-walled PCR tubes (Promega Cat.# E4942 or Axygen Cat.# PCR-05-C, available from Fisher or VWR)

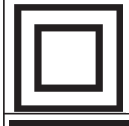


Figure 1. Quantus™ Fluorometer.

1.C. Specifications

Size	22.7 × 11.5 × 4.5cm (L × W × H)
Weight	400 grams
Linear Dynamic Range	Five (5) orders of magnitude, assay-dependent
Detectors	Solid state silicon sensor
Excitation Peak	Red: 627nm Blue: 470nm
Excitation Filters	Red: 640nm shortpass (wavelengths up to 640nm) Blue: 495nm shortpass (wavelengths up to 495nm)
Emission Filters	Red: 660–720nm Blue: 510–580nm
Calibration Type	Single point
Sample Tube	0.5ml PCR tube
Automatic Sleep Mode	After 1 hour of inactivity
Power Requirements	5V, 0.2A Maximum
Operating System Requirements (for optional Quantus™ Software)	Windows® 8, Windows® 7 (32 or 64 bit) .NET Framework 4.0 or later At least one USB port available

1.D. Precautions and Special Instructions

Safety Symbols and Markings		
	Warning. Risk of personal injury to the operator or a safety hazard to the equipment or surrounding area.	Avertissement. Risque de préjudice corporel pour l'opérateur ou d'accident avec l'instrument ou l'entourage.
	It is important to understand and follow all laws regarding the safe and proper disposal of electrical instrumentation. Please contact your local Promega Representative for disposal of the instrument and power supply. Please follow your institutional requirements for disposal of the accessories.	Avertissement. Il est important de comprendre et de respecter toutes les lois relatives à la destruction sûre et correcte des appareils électriques. Veuillez contacter votre représentant Promega local concernant la destruction de l'appareil. Veuillez respecter les exigences de votre établissement concernant la destruction des accessoires.
	Equipment protected by double insulation or reinforced insulation.	Equipement protégé par une double isolation ou par une isolation renforcée.
	Catalog Number	Numéro de catalogue
	Serial Number	Numéro de série

Precautions IMPORTANT SAFETY INSTRUCTIONS. PLEASE SAVE THESE INSTRUCTIONS.		
	If a liquid is accidentally spilled inside the sample compartment, invert the Quantus™ Fluorometer to drain the excess liquid. Then wipe the inside area dry with a clean soft towel or tissue.	En cas de versement involontaire de liquide dans le compartiment de lecture, inversez le fluorimètre Quantus™ pour drainer le liquide résiduel. Ensuite nettoyez et séchez l'intérieur de l'instrument avec un tissu souple.
	Always disconnect the power before cleaning or performing routine maintenance.	Il faut toujours éteindre l'instrument avant de le nettoyer ou d'effectuer de l'entretien de routine.

Precautions (continued)		
	Always disconnect the AC Adapter from the power outlet when not in use.	Toujours enlever l'adaptateur AC de la prise électrique lorsqu'il n'est pas utilisé.

Special Instructions

Notes

1. Failure to operate, store and use the Quantus™ Fluorometer as directed will invalidate the warranty.
2. Direct plug-in power supply acts as a disconnect. To disconnect power, pull power supply from the outlet.

- Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.
- Do not use this device in proximity to sources of strong electromagnetic radiation (e.g., unshielded intentional RF sources), because they may interfere with the proper operation.
- Do not use this instrument for anything other than its intended use.
- If the instrument is used in a manner other than that specified by Promega, the protection provided by the equipment may be impaired.
- Do not disassemble the unit.
- The Quantus™ Fluorometer accepts 0.5ml PCR tubes.
- Do not force larger tubes into the tube holder.
- Use caution around solvents because they may corrode the plastic case of the Quantus™ Fluorometer.
- Do not expose the Quantus™ Fluorometer to temperatures outside the specified range since damage to the unit may occur.
- Avoid bubbles in your sample because bubbles may negatively affect the fluorescence reading.
- Always disconnect the power before cleaning or performing routine maintenance.

1.E. Environmental Requirements

Operations, Shipping and Storage Conditions

Operating Conditions	15–30°C, up to 75% humidity
Operating Altitude	Up to 2,000 meters
Shipping and Storage Conditions	5–40°C under noncondensing conditions, up to 75% humidity
Maximum Relative Humidity	Up to 80% for temperatures up to 31°C, decreasing linearly up to 50% relative humidity at 40°C
MAINS Power Supply	Supply voltage fluctuation up to ±10% of the nominal voltage
Transient Overvoltage	Up to the level of Overvoltage Category II
Temporary Overvoltage	Occurring on the MAINS power supply
Pollution Degree	Pollution Degree 2

- The instrument is intended for indoor use only.
- Install on a sturdy, dust-free, level surface.
- Do not install in a location where there is large temperature variability or high humidity.
- Position the instrument so that it is easy to unplug from the power source.
- Do not place the power supply in areas where it may come in contact with liquid.
- Do not place next to heat sources.
- Do not use near flammable gases or liquids.
- For optimal performance, we recommend equilibrating the instrument to operating temperature before use.

2. Quantus™ Fluorometer Inspection and Setup

Upon receiving your Quantus™ Fluorometer, inspect everything carefully and make sure all items are present and undamaged.

2.A. Setting Up the Quantus™ Fluorometer

1. Position the Quantus™ Fluorometer on a flat surface.
2. Select the appropriate outlet adapter for your wall outlet from the Outlet Adapter Kit provided.

3. Attach selected outlet adapter to the USB Power Supply. Make sure adapter is securely attached to the power supply prior to operation.

   Note: Use only the Outlet Adapter Kit suppled with the Quantus™ Fluorometer.

4. Plug the supplied USB Cord into the USB Power Supply.

5. Plug the mini USB end of the USB Cord into the back of the Quantus™ Fluorometer.

6. Plug the USB Power Supply into a wall outlet. Once plugged into the wall outlet, the Quantus™ Fluorometer will power on.

7. To shut down the Quantus™ Fluorometer, unplug the instrument from the power outlet or the computer to which it is connected.

2.B. Setting Up the Quantus™ Software (Optional)

The Quantus™ Fluorometer is designed to operate as a standalone instrument. Connection to a computer with a Windows® 7 or 8 operating system is not required. However, the Quantus™ Fluorometer can be connected to a computer to capture data.

Note: The computer captures data; it does not operate the instrument.

1. Download the Quantus™ Software located at:
   www.promega.com/quantusfluorometersoftware/

2. Extract the contents of the downloaded file, and run setup.exe. Follow prompts to install the software. If .NET 4.0 framework is not installed on the computer, the software installer will prompt the user to download and install the framework software (available for free from the Microsoft web site).

3. Once the Quantus™ Software is installed, connect the Quantus™ Fluorometer to the computer. When the "Found New Hardware" wizard appears on the screen, select "Install Automatically" then "Continue Anyway". This will install the Quantus™ Fluorometer driver on the computer. Driver installation must be performed only once for each USB port on the computer used to connect to the Quantus™ Fluorometer. A green indicator light will appear in the bottom right corner of each Quantus™ Fluorometer screen when the instrument is connected to the computer.

   Note: To verify that the driver was installed, check the computer Device Manager. Search for the Device Manager location on your computer. Expand "Ports". "Quantus™ Serial Device" should be listed. Contact Promega Technical Services if you need assistance.

3. Operating the Quantus™ Fluorometer

The Quantus™ Fluorometer uses five buttons for simple navigation [one center button to confirm your choice ("Go"), and four surrounding buttons to navigate up, down, left or right through the menus].

The instrument is designed for use with Promega QuantiFluor® Dye Systems for fluorescence-based quantitation of dsDNA, ssDNA and RNA. A protocol for each QuantiFluor® Dye is listed on the Protocol screen. Each of these protocols contains optimized calibration curve settings based on the blank, standard, sample and dye preparation described in Section 3.A. The instrument also may be used with other fluorescent dyes capable of excitation and emission in the proper wavelength range. If you are using a dye other than one of the QuantiFluor® Dyes, a different dye dilution or a different standard or unknown sample preparation method, follow the instructions in Section 3.B to create a user-defined protocol.

The Quantus™ Fluorometer uses a single-point calibration process. The fluorometer must be calibrated prior to the first use of a protocol. If a protocol that has never been calibrated is selected, the Calibration screen will appear. If a protocol has been calibrated, the Home screen will appear, and you can proceed to Section 3.D. Each Quantus™ Fluorometer protocol has calibration values associated with the specific assay reagent. Once the protocol of interest is calibrated, the Quantus™ Fluorometer will save the calibration values for future use and will not require recalibration. However, we recommend performing a calibration with each new lot of dye reagent to ensure the most accurate measurement.

Materials to Be Supplied By User

- thin-walled PCR tubes (Promega Cat.# E4942 or Axygen Cat.# PCR-05-C, available from Fisher or VWR)

3.A. Calibrating the Quantus™ Fluorometer for Use With the QuantiFluor® Dye Systems

Follow this protocol to calibrate the Quantus™ Fluorometer prior to quantitation using the Promega QuantiFluor® Dye Systems. The table below lists the dilution factors used to prepare the standard samples for the various QuantiFluor® Dye Systems when using the standard provided with the system. If using a different DNA or RNA sample as a standard, prepare the standard sample at the final standard calibration (ng/tube) indicated below.

Blank and Standard Sample Preparation

1. Prepare 1X TE buffer by diluting 20X TE Buffer (pH 7.5) to 1X with nuclease-free water. For example, combine 200µl of 20X TE Buffer and 3,800µl of nuclease-free water to prepare 4ml of 1X TE buffer.

2. Prepare the QuantiFluor® Dye working solution with 1X TE buffer as follows. For example, to make a 1:400 dilution, combine 10µl of QuantiFluor® Dye with 3,990µl of 1X TE buffer, and mix.

QuantiFluor® Dye System	Dilution of QuantiFluor® Dye
ONE dsDNA (Cat.# E4871), single-concentration standard curve	no dilution necessary (dye is pre-diluted)
dsDNA (Cat.# E2670), single-concentration standard curve	1:400
RNA (Cat.# E3310), high-concentration standard curve	1:400
RNA (Cat.# E3310), low-concentration standard curve	1:2,000
ssDNA (Cat.# E3190), high-concentration standard curve	1:400
ssDNA (Cat.# E3190), low-concentration standard curve	1:2,000

3. Prepare the nucleic acid standard in a 0.5ml PCR tube. Use the volume of supplied standard and volume of 1X TE buffer indicated in the table below to prepare the standard.

QuantiFluor® Dye System	Starting Standard Concentration	Volume of Standard	Volume of Working Solution	Final Standard Calibration (per tube)
ONE dsDNA (Cat.# E4871)	400ng/µl	1µl	200µl	400ng
dsDNA (Cat.# E2670)	100ng/µl	2µl	200µl	200ng
RNA (Cat.# E3310), high-concentration standard curve	100ng/µl	5µl	200µl	500ng
RNA (Cat.# E3310), low-concentration standard curve	100ng/µl	First dilute 1:100 in 1X TE Buffer, then use 10µl	200µl	10ng
ssDNA (Cat.# E3190), high-concentration standard curve	100ng/µl	4µl	200µl	400ng
ssDNA (Cat.# E3190), low-concentration standard curve	100ng/µl	First dilute 1:100 in 1X TE Buffer, then use 10µl	200µl	10ng

3.A. Calibrating the Quantus™ Fluorometer for Use With the QuantiFluor® Dye Systems (continued)

4. Prepare the blank sample for the QuantiFluor® ONE dsDNA System by adding 200µl of QuantiFluor® ONE dsDNA Dye to a 0.5ml PCR tube.

   Prepare the blank sample for all other QuantiFluor® Systems by adding 200µl of QuantiFluor® Dye working solution prepared in Step 2 to a 0.5ml PCR tube.

5. For the QuantiFluor® ONE dsDNA System, add 1µl of the standard to 200µl of QuantiFluor® ONE dsDNA Dye.

   For all other QuantiFluor® Systems, add standard prepared in Step 3 to 200µl of QuantiFluor® Dye working solution prepared in Step 2.

6. Mix three times by pipetting slowly. When using aerosol-resistant pipette tips, do not allow the pipette tip filter to get wet. Alternatively, vortex tubes at a high setting for 10 seconds.

7. **Optional:** Centrifuge tubes at 2,000 × *g* for 5–10 seconds to collect liquid at the bottom of the tube and remove any bubbles present.

8. Incubate tubes at room temperature for 5 minutes, protected from light.

Calibration Protocol

1. Select the desired QuantiFluor® Dye assay from the Protocol screen on the instrument. If this is the first time the protocol has been selected, the Calibration screen will automatically appear. Otherwise, after selecting the desired protocol, navigate to the Calibration screen.

2. Place the blank sample into the tube holder, and close the lid. Select "Read Blank", and the fluorescence in relative fluorescence units (RFU) for the blank sample will be displayed on the screen.

3. Place the standard sample into the tube holder, and close the lid. Select "Read Std", and the fluorescence in RFU for the standard sample will be displayed on the screen.

   Note: Once both the blank and standard samples have been measured, the standard-to-blank ratio is automatically calculated as a quality check to ensure the QuantiFluor® Dye working solution and blank and standard samples were prepared properly. If the standard-to-blank ratio is lower than the minimal accepted ratio, the screen will display "Invalid", and the instrument will not quantitate the unknown samples until the blank and standard samples are prepared properly. The minimum standard-to-blank ratio is:

   - 50 for high-concentration standard curve or single standard curve protocols
   - 4 for low-concentration standard curve protocols
   - 3 for user-defined protocols

   These ratios have been predetermined as a quality check to help ensure a successful measurement.

4. Save the calibration data by selecting "Save". Proceed to Section 3.D.

3.B. User-Defined Protocol for Other Dye Chemistries

Fluorescent dyes other than QuantiFluor® Systems may be used with the Quantus™ Fluorometer, provided they have the proper excitation and emission wavelengths (see Section 1.C). To quantify samples using other dyes, up to three user-defined protocols may be created. User-defined protocols require calibration (Section 3.C).

1. From the Protocol screen, select "New" from the menu list.
2. Enter the name of the protocol by using the up or down buttons. When the desired character is displayed, press the right button to select it, and move to the next box on the screen.
3. Enter the high-concentration standard value by choosing 1–1,000. Select the concentration units and sample volume.

   Note: The standard value is entered when setting up the user-defined protocol. After calibration, you can change the units and volume from the Main screen. Several factors will influence the standard value entered, including the concentration units, mass of nucleic acid per tube and sample volume. The instrument firmware assumes a 200µl final volume. For example, with the concentration units set to ng/ul, the sample volume set to 1µl, and the mass of nucleic acid at 100ng per tube, the standard value entered is 100/200 = 0.5.
4. Choose the appropriate fluorescence channel:
   Red: Excitation 640nm shortpass, Emission 660–720nm
   Blue: Excitation 495nm shortpass, Emission 510–580nm
5. Select "Save".

   Note: To edit or delete a user-defined protocol, select "Edit" next to the protocol name.

3.C. Calibrating the Quantus™ Fluorometer for Use With Other Dye Chemistries

User-defined protocols must be calibrated using blank and standard samples prepared similar to those described in Section 3.A. You may choose another standard, but the instrument assumes the total assay volume in the tube is 200µl. If less than 200µl is used, the sample may not be completely within the light path, causing inaccurate sample readings, and the concentration calculation must be corrected, since the instrument calculates based on a 200µl assay volume.

1. Prepare the blank and standard samples as directed in Section 3.A. Alternatively, you may use a different standard value in the user-defined protocol. We recommend a minimum assay volume of 200µl. Note that the instrument software assumes a linear relationship when calculating results from a single-point setup (blank and standard). Be sure to verify, through a dilution series, that any dye dilution or standard combination is accurate.

3.C. Calibrating the Quantus™ Fluorometer for Use With Other Dye Chemistries (continued)

2. Place the blank sample into the tube holder, and close the lid. Select "Read Blank", and the fluorescence in relative fluorescence units (RFU) for the blank sample will be displayed on the screen.

3. Place the standard sample into the tube holder, and close the lid. Select "Read Std", and the fluorescence RFU for the standard sample will be displayed on the screen.

   Note: Once both the blank and standard samples are measured, the standard-to-blank ratio is automatically calculated. If the standard-to-blank ratio is less than 3, the screen will display "Invalid", and the instrument will not quantitate unknown samples until the blank and standard samples are prepared properly (see Section 3.A). User-defined protocols use a minimum standard-to-blank ratio of 3 as the quality check.

4. Save the calibration data by selecting "Save". Proceed to Section 3.D.

3.D. Quantitating Samples

Note: If quantitating samples of higher concentration than the standard, dilute the sample to ensure it is within the linear range of the standard.

1. Press any button to wake up the Quantus™ Fluorometer. The Home screen will appear, displaying the last protocol used, the last concentration measurement and a list of menu items for navigation.

2. Navigate to the right side of the screen, and select "Protocol" from the menu list on the Home Screen.

3. Select the desired protocol.

4. Navigate to and select the Volume/Units button to enter the volume of sample (i.e., template volume) added to the assay.

5. To enter the sample volume, press the up or down buttons to the desired volume. Choose from 1–10, 15, 20, 25, 50, 100, 150 or 200µl.

   Note: This volume is the amount of sample that was added to the assay.

6. To select the concentration units used to display the data, press the up or down button. Choose ng/µl, ng/ml, µg/ml, mg/ml or Auto.

   Note: If Auto is selected, the instrument will automatically assign units that place the concentration value in the 1.0 to 1,000.0 range.

7. When the desired units are highlighted, press "Enter".

8. When using the QuantiFluor® ONE dsDNA System, mix 1–20µl of unknown sample and 200µl of QuantiFluor™ ONE dsDNA Dye in a 0.5ml PCR tube. Mix well by pipetting or vortexing.

   When using all other QuantiFluor® Systems, mix 1–20µl of unknown samples with 200µl of QuantiFluor® Dye working solution in a 0.5ml PCR tube. Mix well by pipetting or vortexing.

9. Place the unknown sample into the tube holder, and close the lid. The instrument will automatically measure fluorescence when the lid is closed, and the calculated nucleic acid concentration will be displayed.

3.E. Tools

The instrument is set to automatically measure fluorescence of the sample when the lid is closed. This streamlines the workflow. However, this feature may be turned off in the Tools screen.

To display only raw RFU values in either the Blue or Red channels, select the Raw Measurement option in the Tools screen.

3.F. Results History

The Quantus™ Fluorometer will save the last 50 measurements. These measurements are displayed on the History screen. Page up or down using the menu list as needed to view the available history.

To erase the result history, select "Clear" from the menu list.

Results can be transferred to a connected computer as the measurements are read using the Quantus™ Software (see Section 2.B). The default fields transferred include sample ID, protocol name, sample concentration data with units and instrument status (e.g., OK, SAT or LOW). Additional fields also may be transferred by selecting these fields under the Tools icon (top right corner of the software). These additional fields include transfer time (showing the date and time when data were transfered to the software), raw measurement data, blank and standard calibration values, and sample volume. Alternatively, transfer the last 50 measurements from the instrument to the computer by selecting "Transfer" from the History screen on the instrument.

Note: the Quantus™ Instrument must be connected to the computer to transfer data. Otherwise, a connection error will be displayed in the software.

To export results from the Quantus™ Software, select "Save/Save As" at the bottom of the screen. The data will export as a comma separated value (CSV) file, which can be opened for data manipulation and printing.

4. Cleaning and Maintenance

1. Always unplug the instrument before cleaning.
2. Clean the outside of the instrument by wiping with a damp cloth. Remove spills or stains with a cloth dampened with a mild detergent.
3. If liquid is spilled inside the tube holder, invert the Quantus™ Fluorometer to drain the excess liquid. Wipe the inside area dry with a clean soft cloth. If additional cleaning is needed, wipe with a cloth dampened with a mild detergent, remove detergent with a cloth dampened with water and wipe dry.
4. Do not use organic solvents; they may damage the plastic case of the Quantus™ Fluorometer.
5. Do not submerge the Quantus™ Fluorometer in water.
6. Do not disassemble the unit.

5. Troubleshooting

For questions not addressed here, please contact your local Promega Branch Office or Distributor. Contact information available at: **www.promega.com**. E-mail: **techserv@promega.com**

5.A. Common Problems

Symptoms	Causes and Comments
Low or no fluorescence reading	Reagents were not prepared correctly. Ensure that reagents, blank and standard samples are prepared as described in Section 3.A. Check that the reagents have not expired. Check the reagents and standard were stored correctly.
	Fluorometer was not calibrated correctly. Be sure to calibrate any protocol being used for the first time (see Sections 3.A and 3.C). We recommend recalibrating the instrument with each new lot of reagent. Calibration with each use will reduce experimental variation (e.g., due to pipetting).
	The wrong standard concentration was used to calibrate the Quantus™ Fluorometer. Check that the fluorescence is within the range of the standard curve used (e.g., if the unknown samples are low concentration, then use the low concentration standard), and that the standard used is similar to the sample (i.e., if the unknown sample is plasmid DNA, then use a plasmid DNA standard).
	Sample concentration was too low. Redilute sample, and repeat measurement.
	A PCR tube with poor optical clarity was used. Thin-walled PCR tubes have the best optical clarity. Ensure a thin-walled PCR tube was used. We recommend using thin-walled 0.5ml PCR tubes (Promega Cat.# E4942 or Axygen Cat.# PCR-05-C, available from Fisher or VWR) for proper optical clarity.
Quantus™ Fluorometer will not power on	Instrument was not plugged in. Make sure that the instrument is plugged into the USB Power Supply or a computer that is turned on.
	Use an alternative power source. If the fluorometer was plugged into the USB power supply, switch to a computer or vice versa. If switching power sources does not power on the Quantus™ Fluorometer, contact Promega Technical Services.

5. Troubleshooting (continued)

Symptoms	Causes and Comments
Quantus™ Fluorometer powered up but the screen was blank or could not be deciphered or did not respond when buttons are pressed	Unplug USB Cord from the instrument, and plug the cord back in, making sure no buttons are pressed during this time.
Quantus™ Fluorometer was plugged in but the screen was dark	Instrument entered sleep mode. Press any button to wake up the instrument.

5.B. Error Messages

Codes or Messages	Causes and Comments
Incomplete (on Calibration screen)	The protocol was not calibrated. Calibrate the protocol from the Calibration screen. See Section 3.A or 3.C.
Invalid (on Calibration screen)	The expected standard-to-blank ratio was not met. Check the preparation of standard and blank samples to ensure that they were prepared correctly. Prepare new blank and standard samples if necessary. Measure fluorescence again. Press "Save" after measuring the fluorescence of the new standard and blank samples to retain the calibration values.
Valid (on Calibration screen)	The standard-to-blank ratio was within the parameters expected by the instrument. Press "Save" to retain the calibration values, and proceed to measure fluorescence of the unknown samples.
Lower than Blank (on the Main screen)	The unknown sample was lower than that of the blank sample. LOW will appear on the History screen, but the raw RFU values will still be displayed. This indicates no sample was present in the tube holder or there was a problem with sample preparation.
Saturated (on the Main screen)	Fluorescence was beyond the linear range of the instrument. SAT will appear on the History screen for both the concentration and raw RFU value. Dilute the sample or standard, and measure fluorescence again.
Higher than Standard	The unknown sample was over 10% higher than that of the standard sample. The raw RFU values will still be displayed on the history screen.

Codes or Messages	Causes and Comments
Results not transferred to the computer	Quantus™ Software was not installed on the computer, or the USB Cord was not connected. Make sure that the Quantus™ Software is installed and the instrument is connected to the computer with the provided USB Cord. See Section 2.B for software installation instructions. A green indicator light will appear in the bottom right corner of each Quantus™ Fluorometer screen when the instrument is connected to the computer.
	The Transfer option in the History screen was not selected. Select the Transfer option on the History screen to transfer the 20 most recent measurements to the computer.
	Device driver was not installed. Check the computer Device Manager to verify that the driver was installed during software installation. Search for the Device Manager location on your computer. Expand "Ports". "Quantus™ Serial Device" should be listed. Contact Promega Technical Services if you are still experiencing issues.

6. Appendix

6.A. Updating Firmware

Perform a firmware update only when instructed by Promega Technical Serivces. Follow the instructions located at:
www.promega.com/quantusfluorometerfirmware/

6.B. Warranty and Service

The Quantus™ Fluorometer comes with a 1-year warranty upon purchase of the instrument. Users who return a completed Product Registration card within 90 days of purchase will receive an additional 1 year of warranty free of charge. Additional 1-year warranty may be purchased (Cat.# SA4040).

Warranty coverage includes all parts, labor and shipping to and from our depot repair locations. The warranty does not include repair or replacement necessitated by accident, neglect, misuse, unauthorized repair or modification of the instrument.

If a problem arises with the instrument, please contact Promega Technical Services for support. If further action is required, you will be given repair options and assigned a return authorization number. Promega is not responsible for instrumentation returned without an authorization number.

6.C. Certificate of Decontamination

Disinfection and decontamination are required prior to shipping the instrument and instrument accessories for repair. Returned instruments must be accompanied by a signed and dated Certificate of Decontamination attached to the outside packaging of the instrument.

To disinfect and decontaminate: Unplug the instrument, then wipe the outside surfaces with a cloth dampened with a mild detergent. Do not submerge the instrument in water.

Failure to confirm disinfection and decontamination will result in decontamination charges before the instrument is serviced.

Select (A) or (B):

A. I confirm that the returned items have not been contaminated by body fluids or toxic, carcinogenic, radioactive or other hazardous materials.

B. I confirm that the returned items have been decontaminated and can be handled without exposing personnel to health hazards.

Circle the type of material used in the instrument: Chemical Biological Radioactive**

Briefly describe the decontamination procedure performed:

Date:_____

Return Authorization Number:_____

Institution:_____

Signature:

Name (block capital letters):

** The signature of a Radiation Safety Officer is also required if the instrument was used with radioactive materials.

This instrument is certified by the undersigned to be free of radioactive contamination.

Date:_____

Institution:_____

Signature:

Name (block capital letters):

6.D. Related Products

Product	Size	Cat.#
Quantus™ NGS Starter Package	1 each	E5150
QuantiFluor® ONE dsDNA System	100 reactions	E4871
	500 reaction	E4870
QuantiFluor® dsDNA System	1ml	E2670
QuantiFluor® RNA System	1ml	E3310
QuantiFluor® ssDNA System	1ml	E3190
0.5ml PCR Tube	200 tubes	E4942

6.E. Summary of Change

The following change was made to the 6/17 revision of this document:

Revised the QuantiFluor® dye protocols.

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