



Promega

Technical Manual

GloMax™ 20/20 Luminometer

INSTRUCTIONS FOR USE OF PRODUCTS E5311, E5321, E5331, E5351
AND E5361.



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PRINTED IN USA.
1/06



Part# TM276

GloMax™ 20/20 Luminometer

All technical literature is available on the Internet at www.promega.com/tbs/. 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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I. Description

The GloMax™ 20/20 Luminometer is an ultrasensitive, compact laboratory instrument for measuring luminescent materials. Specifically, the GloMax™ 20/20 Luminometer accommodates measurement of firefly and *Renilla* luciferase for genetic reporter studies and ATP-based biomass analysis, and so is an ideal platform for reading Promega bioluminescent assays. Additionally, the GloMax™ 20/20 Luminometer will measure chemiluminescence from both horseradish peroxidase and alkaline phosphatase. The touchscreen on the luminometer allows easy setup and operation. The optional automatic dual injectors permit reproducible and convenient measurements of flash-type luminescent reactions. The GloMax™ 20/20 Luminometer also features optional modules for measuring certain fluorescent materials including fluorescein, Hoescht dye, 4-MU, PicoGreen® dye and RiboGreen® dye.

I.A. Inspection

When you receive your luminometer, please inspect the package carefully to make sure all accessories are present. Standard accessories typically include:

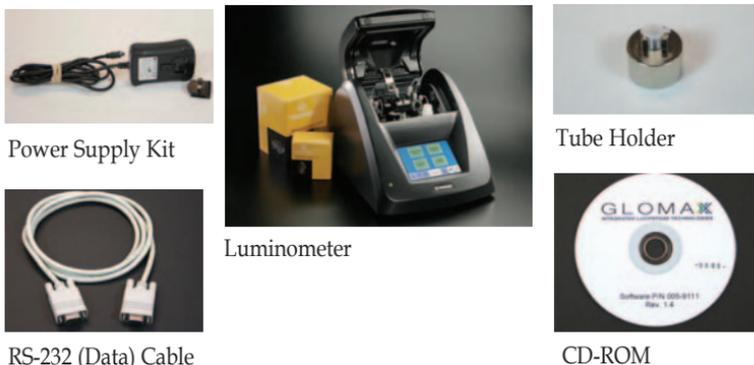


Figure 1. Standard accessories provided with the GloMax™ 20/20 Luminometer (all models) .

Additional accessories for Cat.# E5321 and E5331 also include:



Replacement Tips



Valves



Tubing Holders

Figure 2. Additional accessories for GloMax™ 20/20 Luminometer (Cat.# E5321 and E5331).

I.B. Precautions

The GloMax™ 20/20 Luminometer is intended for indoor use only. Wipe up spills immediately. The GloMax™ 20/20 Luminometer contains sensitive optical components and precision-aligned mechanical assemblies. Avoid rough handling.

For Cat.# E5321 and E5331, handle the injector tips carefully.



Do not perform injections with bent or damaged tips. If the injector tip appears damaged, replace it.

II. Product Components

Product	Size	Cat.#
GloMax™ 20/20 Luminometer	1 instrument	E5311
GloMax™ 20/20 Luminometer with Single Auto-Injector	1 instrument	E5321
GloMax™ 20/20 Luminometer with Dual Auto-Injector	1 instrument	E5331

Includes:

- 1 Luminometer
- 1 1.5ml Microcentrifuge Tube Holder
- 1 GloMax™ Spreadsheet Interface Software CD-ROM
- 1 RS-232 Cable (Data Cable)
- 1 Power Supply Kit
- 1 Protocol (TM276)
- 1 Quick Start Guide (FB081)
- 2 Tubing Holders (Cat.# E5321 and E5331 only)
- 1 pkg. Replacement Valve (Cat.# E5321 and E5331 only)
- 1 pkg. Replacement Injector Tips (Cat.# E5321 and E5331 only)

Items Available Separately

Product	Size	Cat.#
GloMax™ 20/20 Fluorescent Module, UV	1 each	E5351
GloMax™ 20/20 Fluorescent Module, Blue	1 each	E5361

III. Hardware Overview

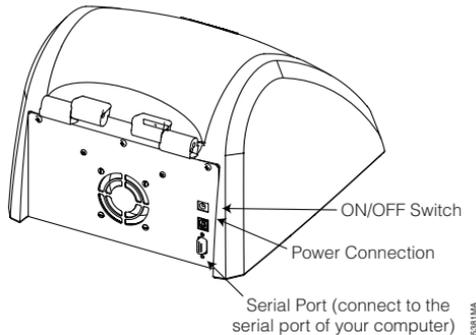


Figure 3. Rear view of the GloMax™ 20/20 Luminometer.

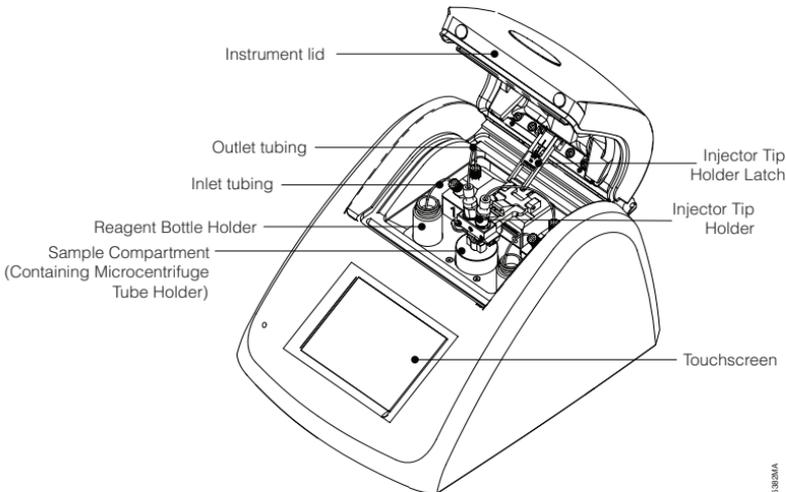


Figure 4. Front view of the GloMax™ 20/20 Luminometer.

IV. Setting Up the GloMax™ 20/20 Luminometer

IV.A. Setup

1. Place the GloMax™ 20/20 Luminometer on a flat, level surface. Allow at least 6 inches (16cm) of vertical clearance to open and close the lid. Position the luminometer so that the touchscreen faces you.
2. Connect the power supply into the back of the luminometer.
3. Plug the power cord into a wall outlet. See Section XI.G for power requirements.
4. Turn the ON/OFF switch to the “ON” position (Figure 3).

IV.B. Software Installation and System Connection

To export data from the luminometer to an Excel spreadsheet, you must first install the GloMax™ Spreadsheet Interface Software. The GloMax™ Spreadsheet Interface Software requires a PC with Microsoft® Windows® 98 or later operating system, an available serial port, and Microsoft® Excel.

1. Insert the software CD-ROM into the CD-ROM drive of your computer. This will initiate the installation program. When installation is complete, the GloMax™ Spreadsheet Interface Software icon will appear on your PC desktop and in the Programs menu.
2. You will need to establish a connection between the luminometer and the PC. Connect the 9-pin RS-232 serial data cable between the luminometer and your PC. The male 9-pin connector attaches to the luminometer, and the female connector attaches to the PC.

Alternatively, connect the luminometer to a printer to print the data as they appear on the touchscreen. A thermal printer (Cat.# E2821) is available separately from Promega.

V. Operating the GloMax™ 20/20 Luminometer

V.A. Touchscreen Basics

The touchscreen monitor on the GloMax™ 20/20 Luminometer permits easy and intuitive measurements for luminescence. The touchscreen is sensitive to the light pressure of a fingertip. After turning the luminometer "ON", the touchscreen will automatically light up with the Home Screen. After 15 minutes without activity or user stimulation, the touchscreen will hibernate to conserve power. To reactivate, lightly touch the screen once. To select a function, touch the button corresponding to the function once.

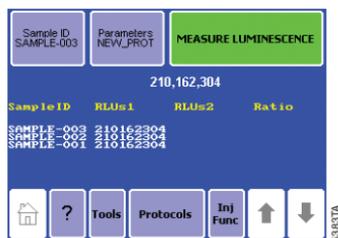


Figure 5. The Home Screen of the GloMax™ 20/20 Luminometer.

V.B. Home Screen

The Home Screen (Figure 5) provides orientation for the multiple functions of the GloMax™ 20/20 Luminometer. From the Home Screen, you may select “Protocols,” “Tools,” “Help,” or “Injector Functions.” You may also measure luminescent samples from the Home Screen by selecting “Measure Luminescence.”

V.C. Navigation

A navigation bar at the bottom of the touchscreen allows you to access menus quickly. Selecting the “Home” key takes you to the Home Screen. The Help menu is also available from the navigation bar. You may select “Tools” to access the “Tools and Settings” options. Select “Protocols” to access Promega protocols, create a new protocol, access a saved protocol or use the default protocol. When applicable, select “Inj Func” to prime and flush the injectors.

V.D. Running a Promega Protocol

The GloMax™ 20/20 Luminometer accommodates the measurement requirements for luminescent assays from Promega. Touch “Run Promega Protocol” from the Protocol Menu (Figure 6), and select the protocol that corresponds to your assay system. For example, if you are using the Steady-Glo® Assay for a luciferase gene reporter study, select “Steady-Glo.” The luminometer will open a Steady-Glo® protocol with the recommended measurement settings automatically programmed. Touch “OK” to accept the parameters and return to the Home Screen. You are now ready to measure your samples.

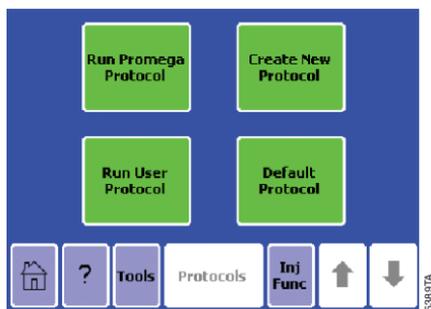


Figure 6. The Protocol Menu.

V.E. Creating a New Protocol

If you touch “Create New Protocol,” the GloMax™ 20/20 Luminometer prompts you to select 0, 1 or 2 injectors depending on the number of injectors installed on your GloMax™ 20/20 Luminometer.

For noninjection protocols, the next screen allows you to adjust the integration time (Figure 7). The integration time is another term for the measurement duration. Touch “Integration,” then use the up and down arrow keys to increase or decrease the integration time. When you are finished, touch “Save As” to save your protocol under a specific name of your choice. Alternatively, touch “OK” to return to the Home Screen to measure your samples. The luminometer will automatically name your protocol “New Protocol” and return to the Home Screen.

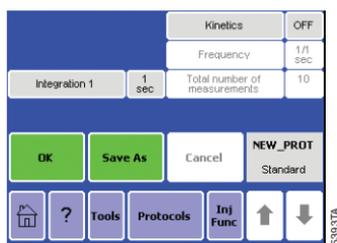


Figure 7. A typical parameters screen for a noninjection protocol.

For single- and dual-injector protocols, the next screen (Figure 8) allows you to adjust the injection volume, the delay between injection and measurement, and the integration time (measurement duration). Select the setting you wish to change, then use the arrow buttons to increase or decrease the value. When you are satisfied with the parameters, touch “Save As” to save your protocol under a specific name of your choice. Alternatively, you can touch “OK” to return to the Home Screen and measure your samples without saving your protocol. The luminometer will automatically name your protocol “New Protocol” and return to the Home Screen.



Remember to prime the injectors before measuring any samples. See Section VI.A

Injector 1 Volume	100 μ l	Kinetics	OFF
Delay After Injector 1	2 sec	Frequency	1/1 sec
Integration 1	1 sec	Total number of measurements	10
<div style="display: flex; justify-content: space-around; margin-bottom: 5px;"> OK Save As Cancel NEW_PROT </div> <div style="display: flex; justify-content: space-around;"> Standard </div>			
<div style="display: flex; justify-content: space-around;"> Home ? Tools Protocols Inj Func Up Down </div>			

53947A

Figure 8. A typical parameters screen for a single-injection protocol.

V.F. Kinetic Measurements

The kinetic measurement feature provides a method for monitoring real-time luminescence. The data point frequency is the rate at which the measurements are taken for a particular luminescent reaction. Access the kinetic measurement options from the Protocol Screen (Figure 8). Touch “Kinetics” to turn Kinetics “ON”. Use the up and down arrow keys to set the frequency of data point collection as well as the number of total data points. The integration time does not apply when the kinetics feature is turned “ON”. Be sure to connect the luminometer to a computer or printer using the RS-232 serial cable to collect the data points during a kinetic protocol. Touch “OK” to save your changes.

! **Note:** Kinetic measurements are not possible for dual-injector protocols.

V.G. Default Protocol

Select “Default Protocol” to measure your sample for an integration of one second without any injections. Touch “Default Protocol” to jump directly to the Home Screen.

V.H. Running a User Protocol

To access a saved protocol, select “Run User Protocol.” The next screen will display protocols previously saved on the luminometer. Identify and touch the name of your protocol. The next screen will display the parameters of the saved protocol for your review and adjustment. Touch “OK” to go to the Home Screen.

! If your saved protocol uses injectors, remember to prime the injectors before measurement. See Section VI.A.

VI. Automatic Injectors

Cat.# E5321 and E5331 include one and two automatic injector systems, respectively. The injector system includes inlet tubing, outlet tubing, inlet valve, outlet valve, injector pump, injector tip, and injector fitting (Figure 9).

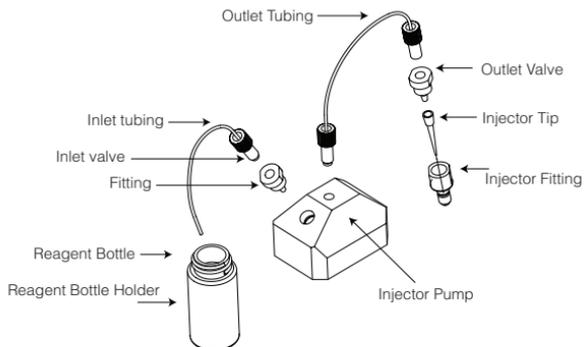


Figure 9. The injector systems for Cat.# E5321 and E5331.

The inlet tubing guides liquid from the reagent bottle to the injector. The valves control the direction of liquid flow. The outlet tubing connects to the injector tip.

Note: The inlet and outlet tubing and the injector tips should be inspected daily for residue, salt deposits and other damage before use. The valves also may need to be replaced over time. Proper care and cleaning of the automatic injector system will prolong the service life of these maintenance parts. See Section XII to learn how to properly replace the valves, tubing and tips for the injector system.

Replacement tubing (Cat.# E5381) is available from Promega.

VI.A. Priming Injectors

Note: The injectors must be primed before use.

1. Touch "Inj Func" from the navigation bar to prime or flush injectors.
2. To prime the injector, insert the inlet tubing into a reagent bottle. You may use a tubing holder to secure the inlet tubing inside the reagent bottle. Attach the blue tubing holder to the mouth of the reagent bottle, then feed the inlet tubing through the tubing holder.
3. Place a waste container underneath the injector tip assembly. If necessary, unlatch the injector tip holder from the instrument lid. By unlatching the injector tip holder from the instrument lid, you can prime and flush the injectors with the lid open (Figure 10).

VI.A. Priming Injectors (continued)

- Alternatively, place a microcentrifuge tube in the tube holder and close the lid with the injector tip seated properly in the injector tip holder. Touch “Prime Injector 1” to fill the injector system with reagent. Each prime sequence pushes 1,000 μ l of reagent through the injector system.

Note: Do not exceed the 1.5ml maximum volume of the microcentrifuge tube.

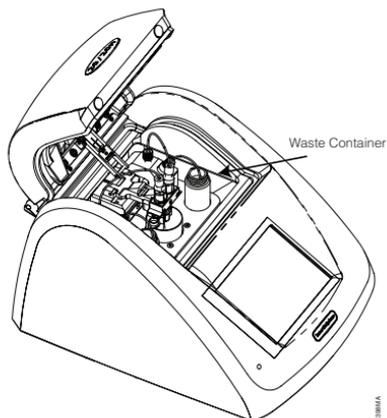


Figure 10. Place a waste container underneath the tips during prime and flush.

VI.B. Flushing Injectors

After use, be sure to flush the injectors thoroughly. Touch “Inj Func” to access the flushing options, then select the injectors you wish to flush. Position a waste container underneath the injector tips to collect the flush solution.

Note: Do not use microcentrifuge tubes as a waste container. The following flush sequence is recommend for each injector:

- 1 time with deionized water
- 1 time with 70% ethanol
- 1 time with deionized water

Each flush cycle uses 3,000 μ l.

For instructions for replacing tips, valves and tubing, please see Section XII.

VII. Measuring Your Samples

The GloMax™ 20/20 Luminometer is a bottom-reading luminometer and does not require a minimum sample volume. The sample compartment of the luminometer accommodates 35mm petri dishes and 1.5ml microcentrifuge tubes with a tube holder.

VII. Measuring Your Samples (continued)

Note: For injection protocols, we recommend using microcentrifuge tubes only.

1. If using a microcentrifuge tube, open the lid of the GloMax™ 20/20 Luminometer and insert the Microcentrifuge Tube Holder.
2. Place your sample in a microcentrifuge tube, and gently place the tube in the microcentrifuge tube holder. Be sure that the microcentrifuge tube cap is open. Alternatively, you can place a petri dish directly into the sample compartment.
3. Close the lid.
4. (optional) Touch “Sample ID” to name your sample (Figure 11). Using the keypad, enter the sample name into the name field. You can enter a maximum of 10 characters. Touch “Save” to save the sample ID.
5. Touch “Measure Luminescence” once to begin the protocol sequence. To abort a measurement in progress, touch the screen once.

Notes:

Do not open the instrument lid while a run is in progress.

Touching any part of the screen during measurement will abort the reading.

The GloMax™ 20/20 Luminometer will report the Relative Luminescence Units (RLU) on the Home Screen. If you are running a Dual-Luciferase® Reporter (DLR™) protocol, the ratio for each set of measurements will also appear. The GloMax™ 20/20 Luminometer will display the status of the last 20 measurements. Use the arrow keys located in the navigation bar to scroll through recent measurements.

Note: Measurements are not saved after power down.



Figure 11. You may name your sample from the Sample ID screen.

VIII. Saving Your Protocol

If you wish to store your protocol for future use, touch “Save As” from the Parameters Screen. The Save As screen contains a keypad to name your protocol. Enter the name of your protocol in the Name field. You can enter a maximum of 10 characters for your protocol name. Touch “Save” to store the

protocol. You can access the saved protocols from the “Run User Protocol” feature in “Protocols.” You may save up to 18 protocols at one time.

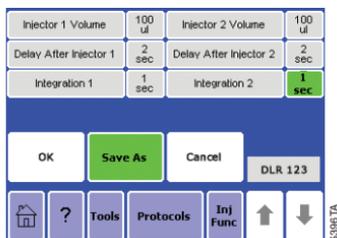


Figure 10. You can customize and save your protocol for future use.

IX. Tools

Use the Tools menu to access “Settings and Diagnostics.” Touch the “Tools” key to reach the menu.

IX.A. Settings

Contrast

The screen contrast adjustment is located under the Settings menu. Use the left and right arrow keys to increase the brightness of the touchscreen. Touch “Home” when finished to return to the Home Screen.

Reset

The reset key is located under the Settings menu. It automatically power cycles the luminometer. The power cycle erases any unsaved protocols and the data on the Home Screen. The reset key is an easy way to restart the luminometer after inserting a Fluorescence Module or the Light Standard.

Lid Start

The lid start feature is also located under the Settings menu. When lid start is enabled, the luminometer begins measurement immediately after closing the lid. Touch “Lid Start” once to enable the lid start feature. Return to the Tools menu to disable the “Lid Start” feature.

IX.B. Diagnostics

Touchscreen Calibration

Access the screen calibration procedure from the Diagnostics menu. Although the touchscreen is calibrated at the factory, it may need recalibration over time. Contact Promega Corporation for more information on screen calibration.

Device Configuration

The “Device Configuration” key contains information on the firmware version and other useful information for troubleshooting instrument-related problems.

IX.C. Using the Light Standard

The optional Light Standard is a simple way to check the health status of the GloMax™ 20/20 Luminometer before beginning measurement. The Light Standard contains three varying light levels to check the linearity and sensitivity of the GloMax™ 20/20 Luminometer.

1. To use, turn the luminometer OFF.
2. Remove the Microcentrifuge Tube Holder from the sample compartment.
3. Insert the Light Standard into the sample compartment (Figure 13).
4. Turn the luminometer “ON”. **On the first use** of the Light Standard, the Module Identification Screen will appear. Identify the Light Standard. The luminometer will automatically power “OFF”. The GloMax™ 20/20 Luminometer will automatically identify the Light Standard for subsequent Light Standard checks. If this is the first use, you will need to turn the luminometer back “ON” to proceed.
5. The GloMax™ 20/20 Luminometer will automatically begin the Light Standard protocol. Afterward, the luminometer status will appear on the touchscreen. If the status is “Good,” remove the Light Standard and proceed with measurement. Otherwise, contact Promega for information.

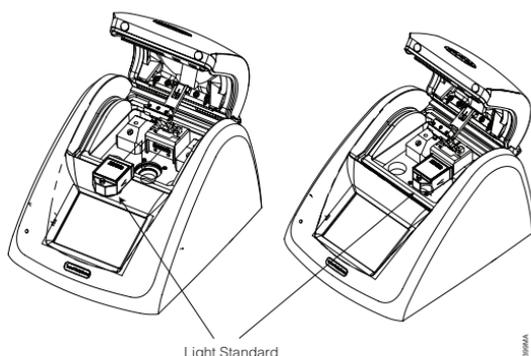


Figure 13. Inserting the Light Standard into the Sample Compartment.

IX.D. Removing the Light Standard

1. To remove the Light Standard from the GloMax™ 20/20 Luminometer, turn the luminometer “OFF”.
2. Grasp and lift the red knob located in the center of the Light Standard to unlock it from the sample compartment.

X. GloMax™ 20/20 Luminometer Fluorescent Module

The Fluorescent Module (Cat.# E5351 and E5361) enables measurement and analysis of common fluorophores. The following Fluorescent Modules are available for different excitation and emission wavelengths:

Blue: excitation, 465-485nm; emission, 515-575nm

UV: excitation, 365-395nm; emission, 440-470nm

The type of Fluorescent Module required for a particular assay depends on the excitation and emission wavelengths of the fluorophore or dye. The Fluorescent Module is designed for easy installation and removal. Store the Fluorescent Module in the product case when not in use. Keep liquids, dust and debris away from direct contact with the Fluorescent Module.

X.A. Installing the Fluorescent Module

1. Turn OFF the GloMax™ 20/20 Luminometer.
2. Align the metal pins of the Fluorescent Module with the module port inside the luminometer (Figure 14).

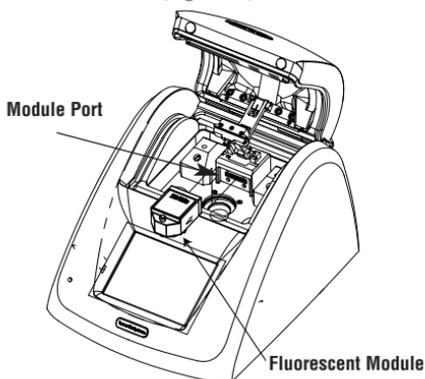


Figure 14. Aligning the Fluorescent Module with the module port.

3. Slide the Fluorescent Module forward and press down to lock it into place.
4. Turn ON the GloMax™ 20/20 Luminometer.
5. If this is the first-time use of the Fluorescent Module, you must identify the type of module. Touch the button that corresponds to the name of the module. If you are not sure of the identification of your module, contact Promega Technical Services.
6. The GloMax™ 20/20 Luminometer will automatically turn OFF.

7. Turn ON the luminometer with the module properly installed. The controls specific to the Fluorescent Module will automatically appear on the touchscreen.
8. Subsequent installation of the Fluorescent Module will automatically launch the proper touchscreen controls.

X.B. Touchscreen Controls

Home Screen: From the Home Screen you can access “Help”, “Tools”, “Calibration”, “Mode”, or “Measure Fluorescence.” Touch the “Help” button to access a variety of help topics.

Mode: There are two measurement modes for the Fluorescent Module. The Raw Fluorescent mode provides a simple method to measure the fluorescence of a sample without calibration. The Direct Fluorescent mode requires a calibration with one standard and one blank. The Direct Fluorescent mode reports readings in one of several units (i.e., $\mu\text{g/ml}$, ng/ml , pg/ml , ppb , ppt or FSU). With a valid calibration, it is not necessary to generate a standard curve in order to determine the actual concentration of the sample.

Calibration: Touch “Calibration” to calibrate the Fluorescent Module with a known standard. Select the units of measurement that correspond to the units of your standard. For example, if your standard is 200ng DNA/ml , select the ng/ml option. Next, enter the final concentration of your standard. We recommend selecting a standard with a concentration similar to a typical sample concentration. Subsequent sample readings reflect the actual concentration.

Measurement: Analysis with the Fluorescent Module requires the minicell cuvette. The maximum volume of the minicell is $250\mu\text{l}$. The minimum volume is $100\mu\text{l}$. Insert the minicell cuvette into the Fluorescent Module. Close the lid and touch the green “Measure Fluorescence” button on the touchscreen. After a 5-second measurement time, the result will appear on the touchscreen next to the Sample ID.

X.C. Removing the Fluorescent Module

1. Turn OFF the GloMax™ 20/20 Luminometer.
2. Unlock the module by pulling up on the red knob. The module will disengage from the luminometer.
3. Carefully remove the Fluorescent Module and store it in the product case.

XI. 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

XI.A. Injectors

<u>Symptoms</u>	<u>Causes and Comments</u>
Injector not priming	Tubing is clogged from reagent residue. Flush the injector with water. If flushing fails to resolve the problem, replace the tubing and valves (Section XII).
Injections not accurate	Air bubbles in the injector system. Flush the injector system three times with deionized water. If flushing fails to resolve the problem, replace the inlet and outlet valves (Section XII.D).
Luminometer not reporting measurements	Integration time is set to "0" seconds. Touch "Parameters" on the touchscreen and increase the integration time.
Luminometer has injectors but not running injection protocol	Injectors are not primed. Prime injectors before starting an injection protocol (Section VI.A).

XI.B. Touchscreen

<u>Symptoms</u>	<u>Causes and Comments</u>
Touchscreen blank or not responsive	Sample has saturated luminometer. Turn the luminometer "OFF." Wait 5 seconds, and then turn the luminometer "ON." Prime the injectors if necessary.
Fingerprints on touchscreen	Turn the luminometer "OFF," then use a laboratory tissue dampened with 70% ethanol to clean the touchscreen.

XI.C. Software

<u>Symptoms</u>	<u>Causes and Comments</u>
Excel does not open.	Excel is not installed on the PC. Make sure Microsoft® Excel is installed on your PC. The GloMax™ Software cannot find Excel on the PC. Open Excel from the Programs menu on the PC and then open the GloMax™ Spreadsheet Interface Software.

XI.C. Troubleshooting (continued), Software

Symptoms	Causes and Comments
Both green lights are on, but data fail to appear in Excel	The wrong COM port is selected. Click "Stop," then click on the COM button to change the COM port. Luminometer is not connected to the PC. Check the RS-232 connection between the luminometer and the PC. In some cases, another program may have reserved the COM port and locked out the GloMax™ Spreadsheet Interface Software.
New data not reporting to Excel	There is an editing process occurring within an Excel spreadsheet cell. Save the data currently displayed in Excel, then restart the GloMax™ Luminometer and begin collecting new data. In the future, wait until all the data are collected before editing the Excel spreadsheet.
The software does not install.	The PC allows only administrators to install new software. Log in as Administrator, then install the software or contact your internal computer support desk.
The software does not open.	The software was not installed properly. Log in as Administrator. Remove the software and re-install.

XII. Appendix

XII.A. General Care

Proper care for the GloMax™ 20/20 Luminometer ensures accurate measurements and preserves sensitivity.

- Do not spill liquids into the sample compartment. Wipe up any spills immediately.
- Periodically wipe off the outside of the instrument with a cloth dampened in deionized water or 70% ethanol. Do not use solvents or abrasive cleaners. Take caution when cleaning the touchscreen. Use a laboratory tissue dampened with 70% ethanol to remove fingerprints.
- Do not open the lid while a measurement is in progress. This action may damage the light detector.

XII.B. Changing Injector Tips

1. Gently remove the injector tips from the injector tip holder. Grasp the injector tip assembly and lift up.

2. Twist the tip fitting counterclockwise to release the tip assembly from the tubing (Figure 15).
3. Untwist the tip fitting to release the tip.
4. Discard tip.
5. Insert a new tip into fitting.
6. Twist the fittings clockwise to complete the injector tip assembly.
7. Twist the assembled fitting with the new tip clockwise onto the tubing.
8. Insert the tip into the injector tip holder.

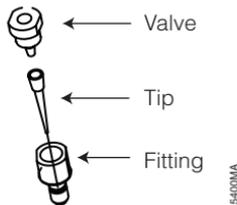


Figure 15. Injector Tip Assembly.

XII.C. Removing or Replacing Injector Tubing

1. Grasp the injector tubing fitting located on the top of the injector pump.
2. Disconnect the inlet and outlet tubing from the injector syringe by twisting the fitting counterclockwise.
3. Remove the injector tip assembly (Figure 15). Do not discard.
4. Discard the used injector tubing.
5. Twist the fitting of the replacement tubing to secure the tubing onto the pump.
6. Replace the injector tip assembly.

XII.D. Removing or Replacing Valves

1. Disconnect the valve from tubing by twisting in a counterclockwise direction (Figure 16).
2. Discard used valve.
3. Connect a new valve to the tubing by twisting in a clockwise direction.

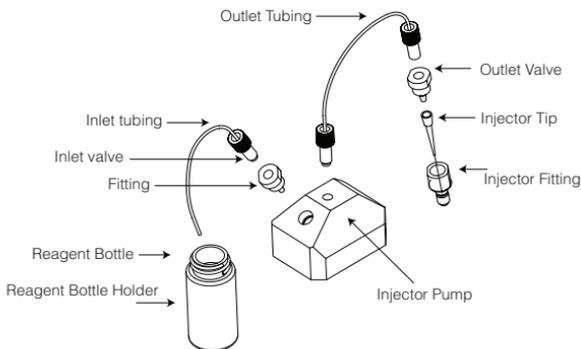


Figure 16. The injector system.

XII.E. Warranty and Service

The GloMax™ 20/20 Luminometer comes with a one-year warranty from Promega. Additional warranty is available. For more information contact Promega Technical Services. Contact information is available on the web at: www.promega.com. E-mail: techserv@promega.com

To obtain service during the warranty period, please take the following steps:

1. Contact Promega Technical Services.
2. Carryout minor adjustments or tests as suggested by your Technical Services contact.
3. If it is determined that the instrument should be returned for repair, Promega Technical Services will arrange for service by an authorized GloMax™ service agent. You will be issued a Promega return authorization number.



Note: YOU MUST OBTAIN an Promega return authorization number before returning a luminometer for service.

4. Before returning the luminometer, you will be responsible for cleaning it and providing a Certificate of Decontamination (see Section XII.F).

XII.F. Certificate of Decontamination

Disinfection and decontamination are required before shipping the instrument and instrument accessories for repair. Instruments returned for service must be accompanied by a signed and dated Certificate of Decontamination, which must be attached to the outside packaging of the instrument.

1. Clean the interior of the luminometer according to the instructions in Section XII.A.
2. Clean the injectors according to instructions in Section VI.B. (Tips and tubing may be replaced as described in Section XII).

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

Select either (A) or (B):

- A. I confirm that the returned items have not been contaminated by body fluids or by 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: _____

Place: _____

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: _____

Place: _____

Signature: _____

Name (block capital letters): _____

XII.G. Specifications

Performance Specifications

Detection Limit: Better than 700 molecules of luciferase

Linear Dynamic Range: Greater than 8 decades

Sample Adaptor: Holds 1.5ml microcentrifuge tube

Detector: Photomultiplier Tube (PMT)

Spectral Response Range: 350-650nm

Peak Wavelength: 420nm

Injectors: One or Two Automatic Injectors (optional)

Injection Volume: Selectable between 25 and 300 μ l (\pm 3 μ l)

%CV: less than 2%

Technical Specifications

Data Output: 100% ASCII format through a 9-pin RS-232 serial cable at 9600 baud

User Interface: Requires Windows[®] 98 or later operating system

Power: 0.5A @ 100-240V, 50-60Hz (universal)

Dimensions: 12.92 D \times 10.44 W \times 8.42" H (32.82 x 26.52 x 21.39cm)

Weight: 8.1 lb. (3.65kg)

Operating Temperature: 60-105 $^{\circ}$ F (15-40 $^{\circ}$ C)

Warranty: One year

Approvals: CE

XI.H. Related Products

Luminometers and Accessories

Product	Size	Cat.#
GloMax™ 20/20 Light Standard	1 each	E5341
GloMax™ 20/20 Fluorescent Module, UV	1 each	E5351
GloMax™ 20/20 Fluorescent Module, Blue	1 each	E5361
GloMax™ 20/20 Test Tube Holder, 1.5ml Tubes	1 each	E5371
GloMax™ 20/20 Replacement Tubing (2), Valves (4), Tips (30)	1 each	E5381
GloMax™ 20/20 Replacement Valves	8 sets	E5391
GloMax™ 20/20 Replacement Injector Tips (2 × 30)	1 each	E5401
GloMax™ 20/20 Replacement Power Supply	1 each	E5411
Thermal, Serial Printer and Cable, Universal Power	1 each	E2821
GloMax™ 96 Microplate Luminometer	1 instrument	E6501
GloMax™ 96 Microplate Luminometer with Single Reagent Injector	1 instrument	E6511
GloMax™ 96 Microplate Luminometer with Dual Reagent Injector	1 instrument	E6521

Luciferase Assay Systems

Product	Size	Cat.#
Dual-Glo™ Luciferase Assay System	10ml*	E2920
Dual-Luciferase® Reporter Assay System	100 assays*	E1910
Chroma-Glo™ Luciferase Assay System	10ml*	E4910
Steady-Glo® Luciferase Assay System	10ml*	E2510
Bright-Glo™ Luciferase Assay System	10ml*	E2610
Glo Lysis Buffer, 1X	100ml	E2661
Luciferase Assay System	100 assays*	E1500
Renilla Luciferase Assay System	100 assays*	E2810

*Available in additional sizes.

Notes

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All prices and specifications are subject to change without notice.

Product claims are subject to change. Please contact Promega Technical Services or access the Promega online catalog for the most up-to-date information on Promega products.