Ver. No.: OS202306

TGem One Fluorometer User's Manual



Cat. No.	Product name
OSE-FM-01	TGem One Fluorometer

This product is intended for scientific use only. Do not use for pharmaceutical, clinical treatment, food and cosmetic purposes.

Contents

Chapter 1 Safety Guidelines 1
1.1 Safety operation information 1
1.2 Safe use 1
Chapter 2 Instrument Introduction 3
2.1 Packing content 3
2.2 Use of environmental requirements 3
Chapter 3 Products 4
3.1 Product features 4
3.2 Performance parameters 4
3.3 Instrument Construction 5
3.4 Consumables and precautions for use 5
Chapter 4 Software Operation Instructions 6
4.1 Home Screen 6
4.2 dsDNA test 7
4.2.1 Test screen 7
4.2.2 Standard curve calibration 8
4.2.3 Sample testing and result analysis 9
4.3 Standard curve creation 10
4.3.1 New Standard Curve 11
4.3.2 Standard curve management 11
4.4 fluorescence test 12
4.5 Reagent calculator 13
4.6 Running report 13
4.7 User management 14
4.8 System setting 14
4.8.1 System 15
4.8.2 Upgrade 15
4.8.3 Maintenance 16
Chapter 5 Maintenance, Storage and Transportation 17
5.1 Maintenance 17
5.2 Storage and transportation 17
Chapter 6 After-sales Service 18

Chapter 1 Safety Guidelines

1.1 Important information for safe use

Before using this instrument, please read the USER'S MANUAL carefully to understand the instrument operation precautions and usage.



Please read this manual carefully before operation. The device must be used by experienced person with training in case of inappropriate operation causes accidental injury and electric shocks.



This instrument is only used for scientific research, not for clinical diagnosis.

1.2 Safe use

Before using this instrument, please read the following contents carefully and make sure to have a clear understanding of the following basic safety measures. Any improper operation may cause injury or electric shock.



The instrument is a normal indoor instrument which conforms to Class Ⅰ type B of GB9706.1 standard.



All test samples, quality control products, calibration products, etc., should be regarded as infectious and gloves should be worn when handling them; parts that have been in touch with test samples should be regarded as infectious and gloves should be worn when contacting them.



It is strictly prohibited to disassemble the instrument except for the parts that can be opened by the user as specified in the manual. The operator should not repair the instrument in case of any injury or out-of warranty. If service is required please contact TIANGEN or your local distributor for repair.



The power cord should not be covered with anything when the instrument is in use. Do not place the power cord where people walk. Always hold the plug when plugging and unplugging the power cord. Make sure the plug is fully inserted into the socket when plugging in and do not pull the power cord hard when unplugging.



The instrument should be kept in an area with minimal dust, away from wet areas and direct sunlight. In addition, the installation location should have sufficient ventilation, and be placed away from electromagnetic interference and heat sources. Free from corrosive gases or strong magnetic field interference, and away from heaters, stoves and all other heat sources.



Power off when not in use. If the instrument will not be used for a long period of time, cover it with a cloth or plastic to protect it from dust.

If one of the following cases occur, disconnect the power cord from the jack at once and contact your local distributor or TIANGEN:



- Liquid enters the instrument.
- Instrument was rained on or watered.
- Abnormal operation: such as abnormal sound or smell.
- The instrument is dropped or the outer shell is damaged.
- The function has obviously changed.

Chapter 2 Instrument Introduction

2.1 Packing content

After receiving the instrument, please check that the outer box is intact, without damage or noticeable signs of impact, and check whether the box contains the following items:

Name	Quantity
The instrument	1 unit
Power cord	1 pcs
Transformer	1 pcs
Mouse	1 pcs
Movable USB disk	1 pcs
Instruction manual	1 copy
Warranty card	1 copy
Certificate of conformity	1 copy
Packing list	1 copy

Note: If any of the above mentioned packages and items are missing, broken or incorrect, please keep the original packing box and contact our sales staff in time.

2.2 Use of environmental requirements

(1) Instrument is for indoor use only;

(2) Ambient temperature: 10~40℃;

(3) Relative humidity: ⩽70%;

(4) The instrument input power 24VDC, 2A.

Chapter 3 Products

3.1 Features

Accurate: Absolute quantification of DNA / RNA / Protein samples with test reagents

Sensitive: Detects samples as low as <0.1 pg/μL for rare samples.

Samples saving: Minimum usage of samples can be as low as 1 μL and rapid test of samples within 5 seconds.

User-friendly: 7-inch color LCD, simple and clear touch operation.

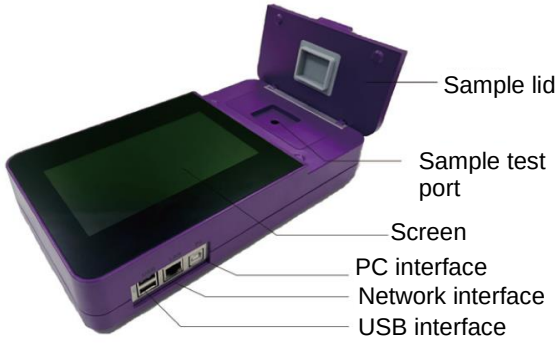
Complete functions: Multiple samples can be tested. Data can be stored, exported, or printed by a printer.

Convenient and humanized: Calculator function for calculating sample concentration, volume, etc.

3.2 Parameters

Attribute	Description
Type of sample to be tested	DNA / RNA / Protein
Light source	Blue/Red LED
Dynamic Range	5 orders of magnitude
Excitation wavelength	Blue 470±20 nm Red 625±20 nm
Emission wavelength	Green 525-570 nm Red 670-725 nm
Detectors	Photodiode
Test speed	⩽5s (single time)
Test flux	1
Sample tube type	0.5 ml transparent single tube
Test limit	0.1pg/μL
Linearity	R^2≥0.995
Screen size	7 inch touch screen
Data storage capacity	10000+USB
External interface	USB (Type A) ×2, USB (Type B) ×1, LAN ×1
Size	286 mm×161 mm×61 mm
Weight	1.5 kg
Input power supply	24 V, 12 A
Power adapter	100-240 V, 50-60 Hz

3.3 Instrument Construction





3.4 Consumables and precautions for use

The instrument is designed for use with 0.5 mL transparent PCR tubes only. To use the instrument, open the sample lid and insert the PCR tube into the sample test port. Close the sample lid and click the test button on the screen for sample concentration test.

Chapter 4 Software Operation Instructions

After the instrument is connected to the power supply and the power switch is turned on, the screen lights up and enters the self-test screen (FIG.4.1) to start checking. When the self-test is completed, the instrument enters the login screen (FIG.4.2) to select guest mode, or login user name account to enter the program.



FIG.4.1 Self-test Screen

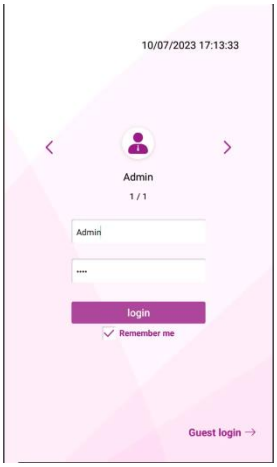


FIG.4.2 Login Screen

4.1 Home Screen

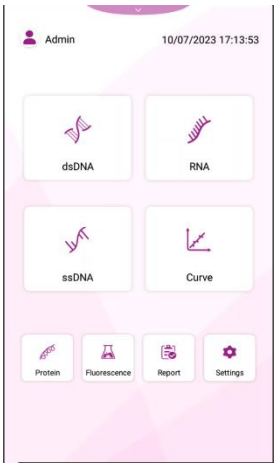


FIG.4.3 Home Screen

Description of icons in the Home Screen

dsDNA	dsDNA (double-stranded DNA) test	Protein	Protein test
RNA	RNA test	Fluorescence	Fluorescence value test
ssDNA	ssDNA (single-stranded DNA) test	Report	Test operation records
Curve	Standard curve creation	Settings	Setup functions
	Drop down calculator function	Admin	User options for switching login account

4.2 dsDNA test

4.2.1 Test screen

Click dsDNA icon in the Home Screen to enter the dsDNA test screen which prompting three types of test (FIG.4.4), and take "dsDNA: high sensitivity" as an example to illustrate the screen operation. Click "Confirm" to enter the test screen (FIG.4.5).

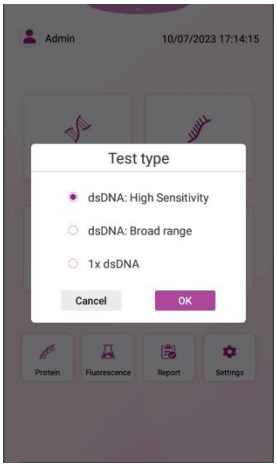


FIG.4.4 Test Items



FIG.4.5 Test Screen

Description of screen icons:

Icon	Description of functions
dsDNA-171419	Modify the name of this assay program
Curve name DNA124155	Different standard curves can be selected.
Sample name S1	Modify the name of the test sample
Unit ng/μL	Selection of different measurement units
Volume 10	Set the sample volume, range 1~20μL
	Click to calibrate or view calibration parameters
	Click to test

Insert the sample tube into the sample test port, close the lid, click the "Detect" button to complete the test. The concentration of the sample and the RFU value are displayed on the left side.

4.2.2 Standard curve calibration

When setting up the standard curve for the first time, the system will pop up a box for curve calibration (FIG.4.6), click "Confirm" to enter the calibration screen (FIG.4.7, 4.8). Follow the prompts to read standard 1 and standard 2 respectively, and then the calibration of standard curve can be completed. If recalibrate necessary, you can click icon in the dsDNA test screen and choose to recalibrate the standard curve.



FIG.4.6 Edit File Name



FIG.4.7 Standard Curve Reading

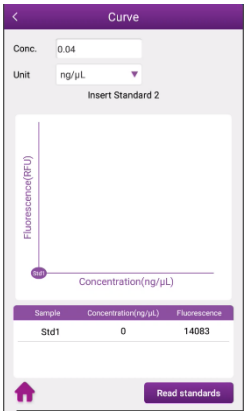


FIG. 4.8 Standard Curve Reading

4.2.3 Sample testing and result analysis

After completing the standard calibration, enter the sample volume, insert the sample into the sample test port and close the lid. Click button to start the sample test. The original concentration of the sample and the fluorescence value (FIG. 4.9) will be displayed on the SCREEN after the test is completed. Slide the screen to the left or click the bottom button to view the sample test result. dsDNA-151916 function button corresponds to modify the test name, delete data, export data, and print data respectively (FIG.4.10).

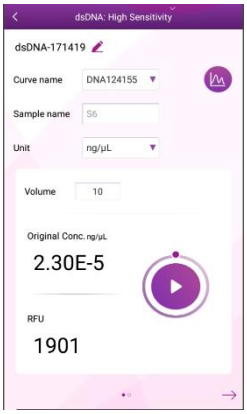


FIG.4.9 Test Screen

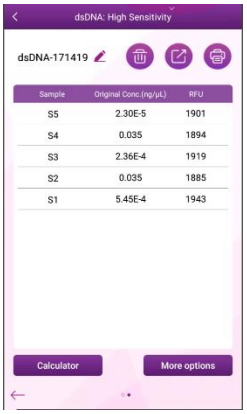


FIG.4.10 Data Display Screen

(1) Molar Concentration Calculator

In FIG.4.10 screen, click to enter the calculation screen (FIG.4.11) to complete the conversion calculation of the sample concentration and molar concentration according to the molecular weight and fragment length of the detected sample.

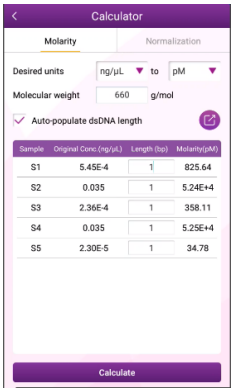


FIG.4.11 Molar Concentration Calculation Screen

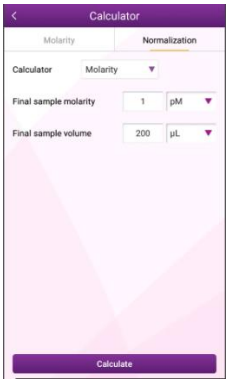


FIG.4.12 Normalized Concentration Calculation Interface

（2）Normalized Concentration Calculator

Select the normalized concentration column in the tab in FIG.4.11 to switch screen (FIG.4.12). The screen allows you to select the type of normalization, such as molar concentration, mass concentration, mass; and you can set the final desired concentration or mass, as well as the final sample volume. After entering the parameters, click the Calculate button to enter the normalization result screen.

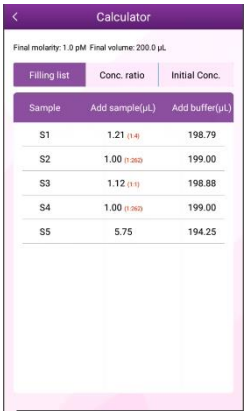


FIG.4.13 Normalization Results Screen

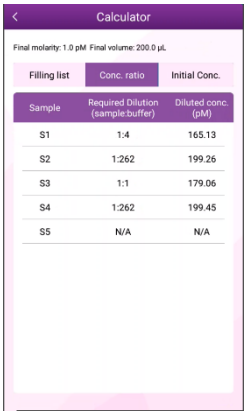


FIG.4.14 Secondary Dilution Screen

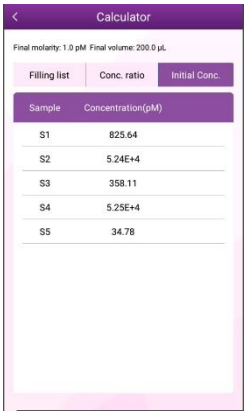


FIG.4.15 Raw Concentration Screen

The normalization result screen can be switched by clicking the upper tab, the first screen shows the volume of sample to be added, the volume of buffer; the second screen, if a second dilution is required, shows the dilution ratio of the second dilution, the concentration after dilution; in the last screen shows the concentration of the original sample.

Note: Since the software functions of these assays, dsDNA, ssDNA, RNA, and Protein, are identical, only the software functions of the dsDNA assay are described in detail in this operation manual.

4.3 Standard curve creation

In Home Screen, click Curve icon to enter the standard curve screen (FIG.4.16). Click ⊕ icon, and you will be prompted to select the type of standard curve and the name of standard curve (FIG.4.17). Click "Confirm" to create a new standard curve (FIG.4.18).

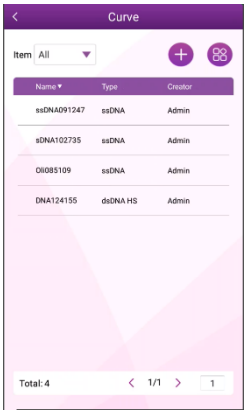


FIG.4.16 Standard Curve Screen

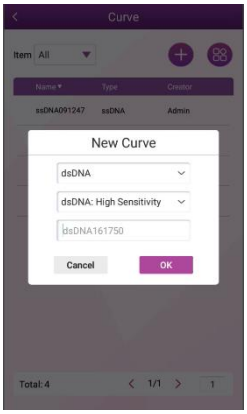


FIG.4.17 Curve Type Selection

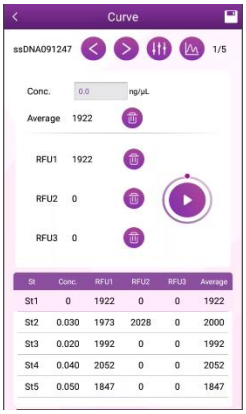


FIG.4.18 Curve Building Interface

4.3.1 New Standard Curve

Description of screen icons in FIG.4.18:

Icon	Description of functions
	Click to view previous sample point data
	Click to view next sample point data/add a new sample point
	Click to enter parameter setting
	Click to fit the current standard curve
	Option to delete data

At least five sample concentrations should be added to establish the standard curve, and the average of the fluorescence values of up to three tests can be used for curve fitting for each sample; when more than three tests are performed, the first fluorescence value will be overwritten, and at least one fluorescence value can be used for curve fitting.

4.3.2 Standard curve management

Standard curve screen (FIG.4.16) Click  button to enter the standard curve management screen (FIG.4.19). You can delete, import and export standard curves (FIG.4.20).



FIG.4.19 Standard Curve Management Screen

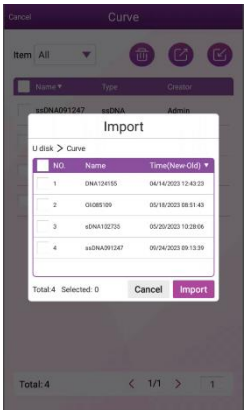


FIG.4.20 Standard Curve Import Screen

4.4 Fluorescence test

In Home Screen, click 

icon to bring up the option box with three test types: Blue 470 nm, Red 625 nm, and Blue&Red.

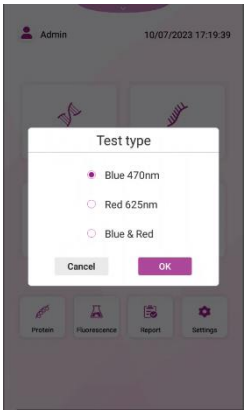


FIG.4.21 Fluorescence Type Selection

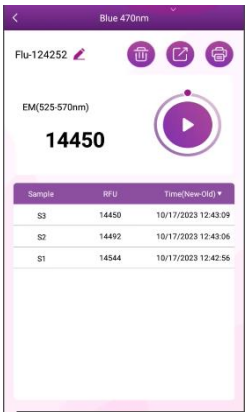


FIG.4.22 Blue Light Test



FIG.4.23 Blue & Red Light Test

Blue 470 nm and Red 635 nm are single wavelength test, Blue & Red are dual wavelength test. Single wavelength test screen is basically the same, take Blue 470 nm fluorescence test screen as an example, click  button to start the sample test, the original fluorescence value is displayed after the completion of the test, and the data of multiple measurements are displayed at the bottom of the screen; the same can be deleted through the upper right corner of the screen several buttons to delete, export and print the data.

Dual-wavelength test screen is slightly different, click button to start fluorescence test, after the test is completed to display the raw fluorescence value of the two channels, the rest of the function is basically the same as single-wavelength test screen.

4.5 Reagent calculator

Pull button above the Home Screen for the reagent calculator screen:

Buffer Configuration Calculator: You can input the number of samples to be tested, the number of specimens, and you can choose whether to prepare the samples outside the compartment or not; after inputting the corresponding parameters, it will automatically calculate the required dyes and buffer volume.

Sample Test Range Calculator: By selecting the test type, unit of measurement, and original sample volume, the detectable range can be automatically calculated.

The two calculator screens can be switched by swiping left or right, and swiping up on the bottom icon to return to the previous screen.



FIG.4.24 Buffer Preparation Calculator



FIG.4.25 Sample Test Range Calculator

4.6 Running report

In Home Screen, click Report icon to enter the report screen, and you can perform a keyword search in the search box to quickly find a lab report.



FIG.4.26 Reporting Screen



FIG.4.27 Quick Search

Click the report to view the historical experimental data, and click the sample again to view the detailed experimental data.



FIG.4.28 Historical Experiment Data

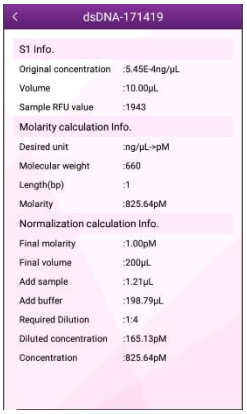


FIG.4.29 Detailed Experiment Data

4.7 User management

Click Admin icon in Home Screen to set up user settings, administrator can manage ordinary users, add, delete, change the number of ordinary users and password; ordinary users can only change their own password. The initial password of administrator is 0000, you can also choose to switch users, click the user switch to enter the login screen, choose other accounts to login.

4.8 System setting

Click Settings icon in the Home Screen to go to the Settings screen (FIG. 4.30);

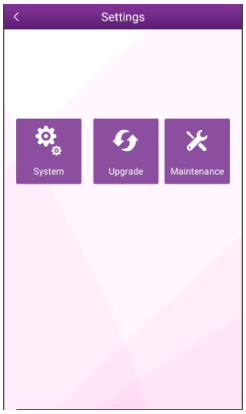


FIG.4.30 Settings Screen

4.8.1 System

Click  icon to enter the system settings:



FIG.4.31 System Settings

In this screen you can adjust the setting language and switch between Chinese and English modes. Set the date, screen brightness, sleep mode and restore factory settings.

4.8.2 Upgrade

Click  icon to enter the upgrade screen, the screen displays the version number of the software and hardware, insert the USB disk and then click the software or hardware to upgrade.



FIG.4.32 Upgrading Screen

4.8.3 Maintenance

Click  icon and enter the password to access the maintenance screen (manufacturer used screen);

Chapter 5 Maintenance, Storage and Transportation

5.1 Maintenance

The instrument should be stored in a dry environment, protected from moisture and corrosion, and away from strong electromagnetic field interference sources.

The instrument has been installed and debugged when shipped from the factory, users should refrain from disassemble it at will. When the instrument is abnormal or not working correctly, it should be contacted with the MANUFACTURER in time.

The power switch should be turned on and off sparingly in succession.

The power supply voltage must comply with the specified range.

5.2 Storage and transportation

The instrument should be stored in a well-ventilated room with a temperature of 10℃~40℃, relative humidity of not more than 80%, and no corrosive gas.

Transportation should be protected from severe shock, vibration and moisture.

Chapter 6 After-sales Service

1. The warranty period for this product is one year. We provide free maintenance and after-sales service for machine failure under regular use during the warranty period. Please contact the sales staff for after-sales service.

2. The following conditions, even in the warranty period, do not provide free maintenance, replacement, or return:

(1) Failure or damage due to natural disasters such as fire, earthquake, flood, wind, lightning, etc.,as well as abnormal voltage, public hazards, and erosion by chemical substances;

(2) Malfunctions or damages caused by use under adverse conditions (oil smoke, dust, moisture, direct sunlight, etc.) or failure to use or maintain the unit by the requirements of this instruction manual;

(3) Failure or damage due to human causes such as dropping, moving, transportation, entry of foreign objects or products not manufactured by us.

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