

TLC Explorer

Documentation System

1.52610.0001



Getting started

MERCK

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1 Introduction

1.1 Intended Use of TLC Explorer

The TLC Explorer is designed to document and evaluate thin-layer chromatographic plates. It offers a safe, fast and flexible way to visually inspect and digitally record images of TLC plates after their chromatographic development workflow in the laboratory. For detecting different substance classes, the device contains three different LED light sources which illuminate the plates from above in direct-light mode:

- **White light** is used for the detection of visible, colored substances on thin-layer chromatograms.
- **UV-A** (366 nm) is typically used to stimulate fluorescence. Under this illumination, fluorescent substances and objects appear as bright, different colored spots on a dark background.

It can also be used for plates which are pre-coated with the special fluorescence indicator F366. The substances, in this case, appear as dark or colored spots on a bright background. Other fluorescence indicators, like F254, do not fluoresce under this light and therefore do not interfere with the measurement.

- **UV-C** (254 nm) illumination is used almost exclusively for thin-layer chromatograms. Substances which absorb this light appear as dark spots on a bright background, if the plate is pre-coated with an appropriate F254 fluorescent indicator.

Recorded plate images can be evaluated to generate reports or export the data for further processing with other systems.

The TLC Explorer was developed for use in the laboratory and to be operated by trained and skilled users to perform thin-layer chromatography. Only fully dried TLC plates with a maximum size of 20 x 20 cm should be used.

Please note, that any other use than the intended one described above invalidates claims under warranty.

1.2 Safety and Handling Instructions

Operational safety has been a primary objective when developing the TLC Explorer. However, it can only be guaranteed if the device is operated strictly according to the instructions given in this manual. Furthermore, any operation conflicting with the safety instructions given in this manual may invalidate claims under warranty. All personnel responsible for installation, use and maintenance must therefore read the operating manual (see section 1.3) carefully before working with the TLC Explorer and keep it at hand for later reference.

1.2.1 Do NOT Operate the TLC Explorer if ...

Before connecting the TLC Explorer to a power supply, ensure none of the following applies:

- The device has been stored under adverse conditions over a lengthy period of time.
- The device has been damaged in transport or by incorrect handling (e.g. dropped during transport or contact with liquids).
- Any part of housing, front unit, back cover, drawer or Baseplate is wet, damaged or deformed.
- The UV protection inspection window is missing, damaged or deformed.
- The device does not stand on a dry, flat and stable surface.
- The drawer cannot be extended fully or does not close correctly.
- The back cover is not mounted properly, and all four screws fastened.
- Any connector (USB-C, USB-A, Ethernet and WiFi Antenna) or cable is wet, damaged or deformed.

- The power supply is none of the recommended two adapters (USB-C power adapter DELL HA65NM170 or Power bank DELL PW7018LC).
- The device is significantly colder than its environment, such that humidity could condensate and damage electric circuits (please wait until device reaches room temperature).
- The device environment temperature lies outside the specified 15 - 40°C or the relative humidity outside the specified 20 - 80%.
- The device is or has been exposed to acidic, alkaline, solvent vapors or other gasses that may cause corrosion.
- Liquids or other materials have been spilled on or in the device. If so, remove them immediately. Make sure that the device is not damaged and completely dry before using it again.

If you expect any of the issues above apply to your device, do not connect, power up or operate. For questions on how to proceed, please contact the supplier of your TLC Explorer or review the TLC Explorer service site using the link in Figure 1.1:



Figure 1.1: Find the TLC Explorer service page at:
www.sigmaaldrich.com/TLCservice

1.2.2 Installation Requirements

For a safe and reliable operation, please follow the following guidelines when setting up the device in your laboratory:

- The device must be installed on a flat and dry lab bench suitable to support the weight of about 10 kg of the device.
- Do not expose the instrument to any strong vibration or shock.
- Protect the instrument from excessive dust.
- Locate the TLC Explorer, cables, and, if applicable, the power bank, at a safe distance from heating sources (e.g. gas burners, electric heaters or ovens), chemical substances (e.g. solvents) or other devices which could cause damage to them.
- To power the device, use only the USB-C power adapter DELL HA65NM170 or Power bank DELL PW7018LC, and connect them to the USB-C port at the back of the device.
- Connect the power source to a grounded outlet located within 2 meters of the device, following the regulations for the use of electronic devices in your laboratory.
- The line voltage at the user location must meet the specifications stated on the power adapter.
- Do not place the instrument near equipment that generates intense magnetic fields such as electric welding equipment, high frequency furnaces, pole transformers, etc..
- Connect the instrument to power lines that are free from sudden changes or voltage fluctuations.
- In case power motor driven equipment (such as a stirrer or shaker) must be connected to the same power line as your TLC Explorer, ensure that a noise reduction unit is installed.

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- 1 • Ensure that cables are arranged in a way that they neither pose a risk to the staff working with, and around, the device, nor that they are accidentally drawn from their respective sockets.
- 2 • There must be enough space in front of the device to open the drawer completely and handle the Baseplate in a safe and convenient way.
- 3 • Place the device on a height that allows users to conveniently look through the inspection window. Avoid reflections of external light sources on the glass front that disturb the view through the inspection window.
- 3 • The device should only be used in an environment and operated in a manner that meets all official lab safety requirements.

4 1.2.3 Ultraviolet Radiation Exposure

5 Ultraviolet radiation, used in TLC plate evaluation to stimulate fluorescence, can cause damage to eyes and skin. Safety regulations in most countries therefore demand that eyes and skin are protected from hazardous UV radiation. The TLC Explorer incorporates several safety measures to ensure that no UV-A or UV-C light is leaking from the device when used as described in this guide. Under no circumstances try to circumvent these safety measures!

- 6 • Only look at TLC plates under UV illumination through the UV-protection inspection window.
- Ensure the inspection window is not damaged or deformed.
- Before activating UV illumination, check that the drawer and back cover are correctly closed and not damaged.
- 7 • Never operate the illumination unit outside the TLC Explorer.
- Follow general laboratory safety regulations for working with UV light.

1.2.4 General Notes on Handling

- Ensure the device has at least 30 seconds available to completely shut down before unplugging the power supply – similar to your desktop computer.
- Only TLC plates without solvent residue can be documented – please ensure the TLC plate is completely dry after the previous chromatographic development or derivatization step.
- Do not place objects higher than 8 mm on the Baseplate, as it might damage the device when closing the drawer and would be out of focus for image capture.
- Never lift or carry the device by holding the drawer handle. Instead, hold it on the bottom and grab the rubber feet to prevent it slipping out of your hands.
- Close the drawer whenever the device is not in use to avoid damages and contamination.
- When the TLC Explorer is being transported, the TLC Explorer must be closed, the Baseplate removed. No TLC plate should be inserted.
- Only attach FAT32 formatted USB sticks to USB-A ports for backups and updates. Do not use external HDDs nor any other media connected via a cable.
- Except for the replacement of the illumination unit, the TLC Explorer shall only be opened, adjusted, or repaired by specialist personnel authorized by the manufacturer. Noncompliance invalidates any claim under warranty.
- Retain the original packaging, including the inner packaging, to protect the instrument against physical impact if it has to be transported, especially for warranty claims. Please note, that damage caused by improper transport voids all warranty claims.

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1.2.5 User Management and Information Security

It is assumed that the devices are placed in laboratories where physical access is limited to authorized staff only. To give priority to a smooth and efficient laboratory workflow, the TLC Explorer, therefore, features no means to restrict access to specific users or protect data with passwords or encryption. User accounts mainly serve to structure recorded data. There is no administration account with special privileges.

Any person with physical access or network connection to the device can

- create new users
- delete or login as an existing user
- access and delete all stored data
- initiate a restart or shut down of the instrument
- change device settings (incl. connectivity parameters)
- conduct a factory reset.

Depending on how you choose to integrate the TLC Explorer in your IT environment (see Operational User Manual), a large group of users may have access to your device(s). If the TLC Explorer is connected to a LAN or a WiFi network, usually everyone with access to that network can also open the user interface and login as an existing or new user (see section 3.4). If confidentiality is a concern, copy the respective data to your desktop or tablet, and then remove it from the TLC Explorer.

- Plan and test carefully the TLC Explorer connectivity settings to ensure only authorized and trained personnel have access.
- Download or copy your data to a memory stick and then save it at an external storage location. Do not use the TLC Explorer for permanent data storage.

- Only apply verified updates from the manufacturer.
- Only attach USB memory sticks (flash drives) you are certain do not contain malicious software.

1.3 Getting started and Operational User Manual

This 'Getting started' guide is only meant to help in setting up the TLC Explorer for operation and getting started with image capture. Details on processing images of TLC plates and configurations are provided in the Operational User Manual, which can be downloaded by scanning the QR code in Fig. 1.2 or on the official TLC Explorer support site <https://sigmaaldrich.com/TLCservice>. Additionally, the Operational User Manual can be opened from the TLC Explorer's software by clicking on 'Help' in the main menu (three horizontal bars in the upper right corner).



Figure 1.2: Download the Operational User Manual at: [www.sigmaaldrich.com/TLCservice](https://sigmaaldrich.com/TLCservice)

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2 Get to Know Your TLC Explorer

2.1 TLC Explorer Front



Figure 2.1: Identifying elements on the device front

ID	Item	Description
F1	Power button	Place a finger for at least two seconds on icon to start or switch off the device.
F2	Illumination 'Vis'	Switch on/off white light source.
F3	Illumination '366'	Switch on/off UV-A light source.
F4	Illumination '254'	Switch on/off UV-C light source.
F5	Drawer	Open drawer to place TLC plate on Baseplate.
F6	Drawer open indicator	A red light indicates that the drawer is not closed correctly. While the red light is on, no image can be captured, and UV light sources are deactivated.
F7	Inspection window	Allows to inspect illuminated TLC plate by eye (protecting the eye from UV radiation).
F8	Shutter slider	Gently push down the slider to open inspection window.

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2.2 TLC Explorer Back

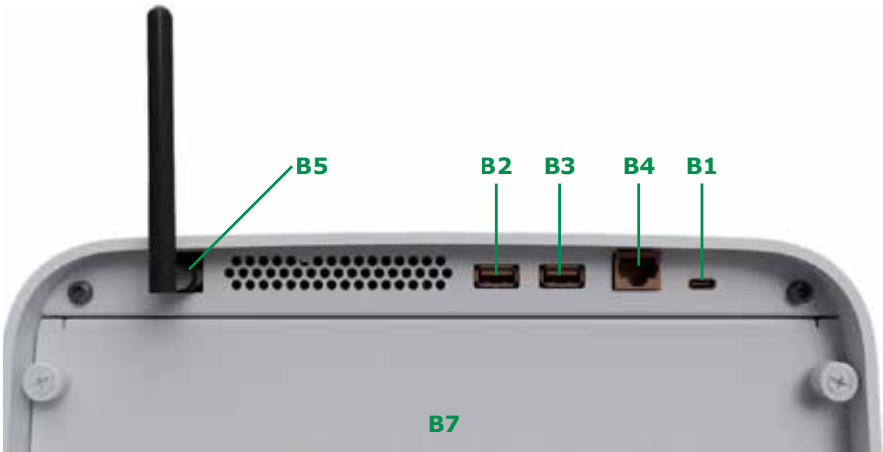


Figure 2.2: Identifying elements on the device back

ID	Item	Description
B1	USB-C port	This USB-C port solely serves to connect the power supply and features no data transfer.
B2	USB-A port	Port to connect memory sticks (flash drive) for data export, backups or software updates.
B3	USB-A port	Port to connect memory sticks (flash drive) for data export, backups or software updates.
B4	Ethernet port	RJ45 port to connect to LAN.
B5	WiFi antenna connector	To mount the WiFi antenna, straighten up the joint at the antenna's base and screw it clockwise into the connector.
B6	Serial number	A sticker with the TLC Explorer's serial number. The QR code below the serial number includes a link to the full device label, which is physically situated on the bottom of the device.
B7	Back cover	Only open to clean device inside or exchange the illumination unit (for details see Operation User Manual).
B8	Illumination unit	Installed behind back cover, the exchangeable illumination unit houses the LED light sources for the different illumination types.

2.3 TLC Explorer Baseplate

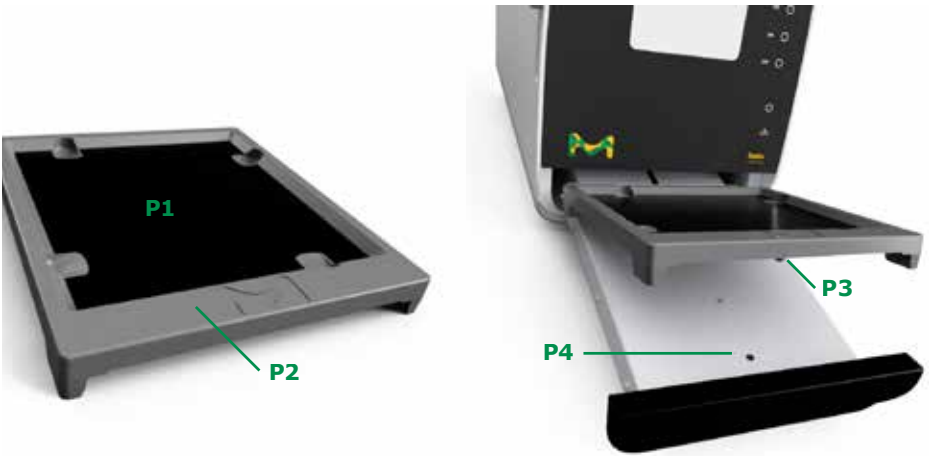


Figure 2.3: Identifying elements on and related to the Baseplate

ID	Item	Description
P1	Plate area	Place TLC plates directly on the black coating.
P2	Frame	No object on the plate area should be higher than the frame height when inserting the Baseplate with the drawer.
P3	Alignment pin	Before closing the drawer, ensure that the pin has entered the socket on the drawer, so that the Baseplate lies flat on the drawer.
P4	Alignment socket	

3 First Use

3.1 Unpacking and Scope of Delivery

Your TLC Explorer is built and inspected according to the relevant guidelines and norms for electronic instruments (for details see Operational User Manual). It left the factory in a safe and secure technical condition. In case you note any damage to the packaging that could have impacted the device, document these and contact your supplier. Do not operate the TLC Explorer if you suspect any of the criteria listed in section 1.2.1 to apply.

It is strongly recommended to retain the packaging material for later transport and/or storage of the device and especially for warranty claims.

After opening the cardboard box, first take out all accessories, including the Baseplate, and the upper protective carton. Ensure all loose parts are removed before proceeding. Turn the box, so that the glass front is facing you, and prepare a suitable space to place the device, for when you have taken it out of the box. Only then lift the TLC Explorer (which has a weight of about 10 kg) by holding it on the bottom under both sides. Remove all transportation fixtures – like the adhesive tape fixing the drawer – and protective foils.

Verify that your delivery includes all the following:

- One TLC Explorer with installed illumination unit (to check illumination unit, see section 3.3 below)
- One Baseplate
- One WiFi antenna
- One USB-C power adapter with eight power cables for different socket types
- One dust cover
- Two stickers with two QR codes – used to connect to the device more easily (see Fig. 3.1)
- This printed 'Getting started' guide and safety instructions

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3.2 Setting Up for Safe Operation

Please carefully read section 1.2.2 about installation requirements before selecting a suitable location for your device. Check that the drawer **F5** can be completely opened, the Baseplate inserted, and TLC plates be seen through the inspection window **F7** in a safe, convenient and ergonomic way for all planned users. Especially consider different body heights and possibly disruptive light reflections on the device's glass front.

Keep an easily accessible copy of this operational user guide near the TLC Explorer, e.g. as a digital document on the tablet or desktop computer you plan to use to control the device.

3.3 Powering Up and a 'First Look' on Your Plate

Choose a power cord **A3** that fits the power outlet, connect it to both the power adapter **A2** and the power grid, and then plug the USB-C connector into the port **B1**. On the front side, you should see the power icon **F1** light up. Gently hold a finger on the power icon for about two seconds, until the icon begins to flash, indicating that the device is booting. After about 30 seconds the icon stops flashing, shines brighter, and the device is ready to operate.

Open the drawer **F5** and insert the Baseplate. The side with the wide edge and logo should be facing outward, i.e. be next to the drawer handle. Verify that the alignment pin **P3** has entered the socket **P4**, and that the Baseplate lies flat on the drawer. To close the drawer, push against the middle of the handle until you feel a slight resistance. The drawer is designed to close the last few centimeters on its own. A special damper system takes care to correctly close the drawer without shifting the plates.

Once the red drawer open light **F6** is off, briefly hold your finger against the circle next to the label 'Vis' **F2** to switch on the white light source inside. Pulling down the shutter slider **F8** and looking through the inspection window **F7**, you should see the illuminated Baseplate.

Switch off the light (touching **F2**), open the drawer and place a TLC plate on the plate area **P1**. Close the drawer again and observe the plate through the inspection window under the featured illumination types (touching **F2**, **F3** or **F4**).

In case your TLC Explorer acts differently than described above, refer to section 5 to identify and resolve the issue before operating the device.

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3.4 Connecting Your Laptop

There are different ways to connect various types of user devices (laptops, desktop computer, tablets or even smart phones) to the TLC Explorer, which can be configured as described in the Operational User Manual. A recommended basic approach is to connect your laptop to the TLC Explorer's own WiFi Network. This approach is quickly set up and allows to download images and data you generate with just a few clicks directly to the device you are using.



Figure 3.1: Easily connect by scanning these two QR codes on the label of your device

On a laptop (or desktop PC featuring WiFi) open the network settings and search for a network name (SSID) starting with 'tlc-explorer' followed by the serial number **B6**. Choose 'WPA/WPA2' as the security setting and enter the password shown on the label for Step 1 (see Fig. 3.1) to establish the connection. It is even simpler to connect tablets or smart phones by scanning the QR code 1 on the sticker provided in the package. You may see a warning that the chosen WiFi has no internet connection – this is correct and by design.

Once the WiFi connection is established, the user interface can be opened in your web browser. Although all common, up-to-date browsers can be used, it is recommended to use Chrome or Firefox for the best user experience.

To open the TLC Explorer user interface, you may either scan the QR code 2 on the sticker or enter “http://tlc” in the browser address bar.

In case the browser has difficulties to find “http://tlc” (e.g. because the device is connected to the internet via a mobile data network in parallel), you can also enter “http://192.168.200.1” instead. Some browsers enforce encrypted connections and may automatically change the entered address to begin with “https://”, to then produce a warning the site may not be secure. The browser cannot know that you are accessing the TLC Explorer in a protected local network, posing far less risk than opening a site from the internet. You may either ignore the warning and proceed, or disable “https-only” in the browser settings, and then manually enter again “http://tlc” in the browser address bar.

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3 First Use - 3.4 Connecting Your Laptop

You should see a welcome screen similar to the following (Fig. 3.2):

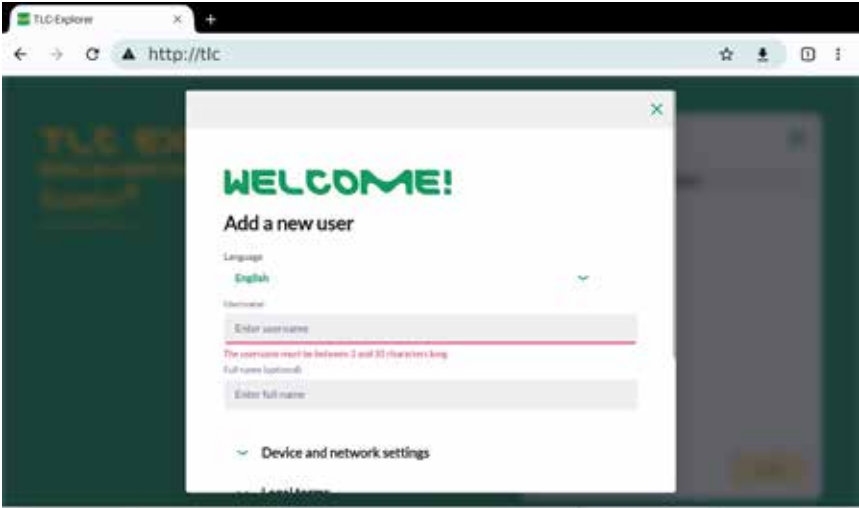


Figure 3.2: First opening of TLC Explorer user interface

Setting a bookmark and/or selecting the menu point 'Add to Home Screen' from the browser menu (often marked as three dots in a column at the upper right browser corner) will significantly simplify opening the site in future.

3.5 Creating a First User

Begin personalizing your TLC Explorer by selecting a language and entering a first username. Since usernames are internally used to name files and directories, not all special characters or symbols are allowed. In case you entered an invalid character, the line under the field will turn red and a warning message will appear underneath.

The full name, which you can enter in the next field, is less restrictive and optional. It may be used to identify the user e.g. as the author of reports.

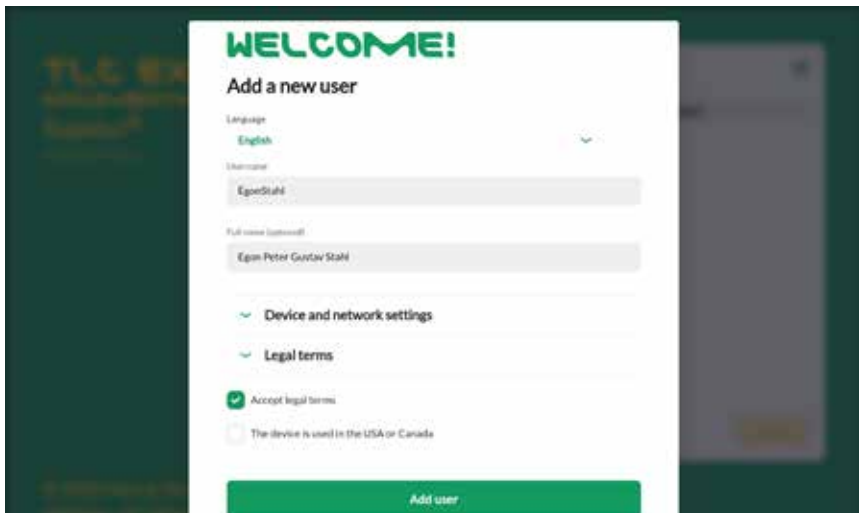


Figure 3.3: Adding a first user

Keep 'Device and Network Settings' for now at their default values. They can be modified any time later at the 'Settings' page.

Expand and carefully read the legal terms before clicking in the box to the left of 'Accept Legal Terms'. Your agreement to these terms is needed for you to operate the instrument and software.

After you have clicked on 'Add User', the initial setup is complete and the device ready to be used. You will be automatically forwarded to the standard welcome screen seen at figure 3.4. Select the user you created and click 'Login' to start capturing images of your TLC plates.

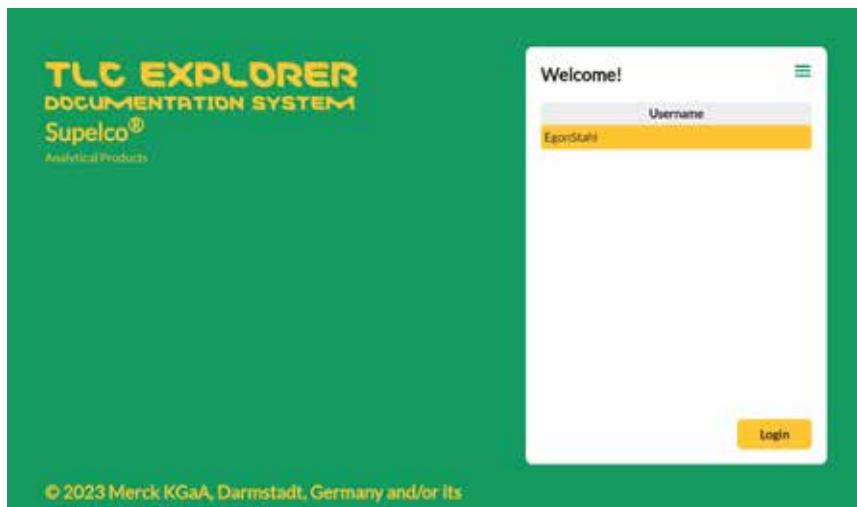


Figure 3.4: Welcome screen with user selection

3.6 Powering Down

Like any desktop computer, the TLC Explorer needs to be properly shut down before unplugging the power supply. Failing to do so may damage the device.

In order to shut down the device correctly, click on the main menu icon (three horizontal bars in the upper right corner), and select 'Shutdown' from the menu that appears. From the dialog depicted in figure 3.5 you may choose to shut down the device, restart (i.e. reboot) the device, or just restart the software application. You may also touch the power icon **F1** for about 2 seconds.

If you chose to restart the device or application, just wait for about a minute until the welcome screen shown in figure 3.4 reappears, and the device is ready again.

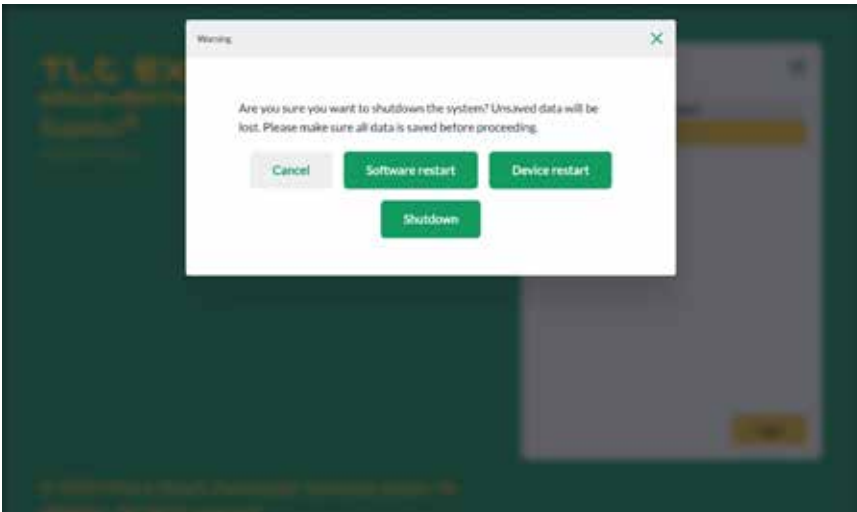


Figure 3.5: Shutdown or restart device

4 Operational Guide

Whether you just want to take a quick look at a TLC plate, capture and export an image of a plate (maybe with some annotations) for some document, or need a quantitative analysis with a complete report – the TLC Explorer lets you do just that.

However, most of the software's features to process and document TLC plates are out of the scope of this 'Getting started' guide. A detailed description of the software can be found in the Operational User Manual.

4.1 Device Preparation

After connecting the TLC Explorer to the power grid (or power bank), a dim white light under the power icon **F1** shows that the device is ready to boot. Place your finger on the icon for about 2 seconds and allow the instrument some 30 seconds – while the icon is flashing – to get ready for operation.

Place a TLC plate on the Baseplate and close the drawer **F5**. Once the red open drawer indicator **F6** turns off, you will note a brief white flash of the circle next to 'Vis' **F2** – the system has just taken a snapshot to show a preview of your plate in the software.

4.2 Visual Inspection

Prerequisites:

- The TLC reader is on; the power icon **F1** is lit up brightly (not flashing nor dimmed).
- The drawer is closed correctly and the red open drawer indicator **F6** is off.
- No user is capturing images at the same time (see also section 4.3).

Select the illumination type you would like to use by briefly holding your finger on the respective button (**F2**, **F3**, or **F4**) until the circle lights up. Then gently push down the shutter slider **F8** to open the inspection window **F7**. Depending on your observation angle, you can push the shutter slider fully or only partly down to see the relevant part of the TLC plate. You can switch to another illumination type by touching the respective button or turn off the illumination by pressing the same button again.

4.3 Image Capture

Prerequisites:

- The TLC reader is on; the power icon **F1** is lit up brightly (not flashing nor dimmed).
- Drawer and inspection window are closed correctly, and the red open drawer indicator **F6** is off.
- One or more TLC plates with a minimum size of 2.5 x 7.5 cm and a maximum size of 20 x 20 cm lie flat on the plate area **P1**.
- Only one user at a time can capture images. While other users may load and process Image Sets in parallel, competing attempts to capture images will cause error messages.

Assuming you have connected a tablet or mobile phone as recommended in section 3.4, you can just click on the desktop icon, or bookmark you saved in your browser, to open the welcome screen seen in figure 3.5. Select your user-name and click on 'Login'.

The page that opens after each login (see Fig. 4.1) lets you either capture new images or load an existing Image Set. At the left – or, for small screen width, on the top – you will see the low-resolution image of the Baseplate that was captured when you closed the drawer. You can refresh it by simply clicking the image.

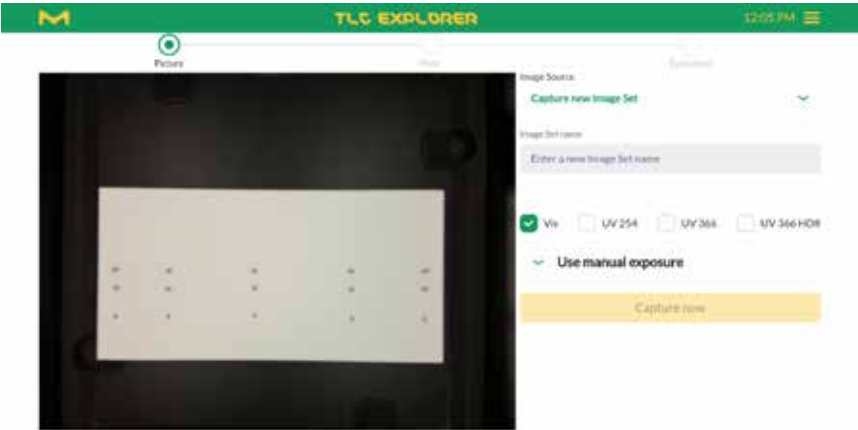


Figure 4.1: Capture images or load existing Image Set

Select the option 'Capture new Image Set' from the drop-down menu and enter a name for the new Image Set in the text field. Because this name will be used as part of image filenames, not all characters are allowed. Furthermore, the name needs to differ from other Image Set names stored for the user. In case an Image Set name is invalid, the software informs you about the reasons.

Checkboxes let you choose which illumination types you wish to use for the image capture. Expanding the 'Use manual Exposure' section allows you to set the exposure time in milliseconds for each of the chosen illumination types. Click on the camera icon to let the system take a low-resolution image with the selected exposure time and shows it as a preview. With the 'Auto' button, you request the system to take a series of images and determine automatically the optimal exposure time for your plate. Please be aware that this process might take several seconds, and only proceed when you see the preview updated.

With a click on 'Capture Now', the instrument starts capturing images. You can see which image is currently being taken, both in the text above the progress bar and on the respective illumination button (**F2** - **F4**) on the device lighting up.

The resulting images of all illumination types are stored together as an 'Image Set'. The system then searches for plates in the images. As soon as all plates are detected, rotated (aligning their bottom edges horizontally), and extracted as separate images for further processing, the user is automatically forwarded to the next step for plate editing.

In case you only intend to use the captured images (or the extracted plate images), you can bypass all further processing by using the file manager to download the images you have just taken from the file manager, which can be opened via the main menu (three horizontal bars in the upper right corner). Alternatively, you can simply click the 'Download image' button at the bottom of the 'Plate' page to save the image currently shown in the preview area. The Image Set can still be loaded and processed any time later on.

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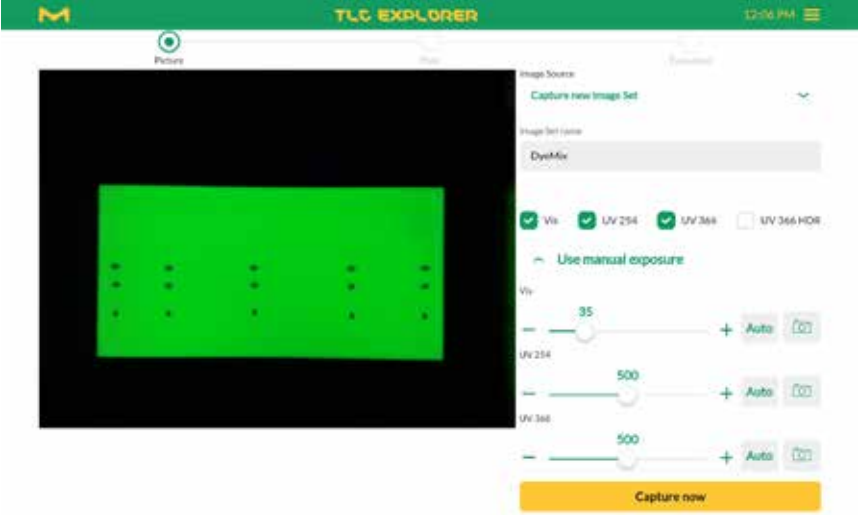


Figure 4.2: Manually set exposure time for selected illumination types.

5 Troubleshooting

5.1 Identifying Errors

An unexpected behavior or error message is sometimes the consequence of a previous unnoticed error. To speed up the search to find an error’s origin and potential solutions, the chart in Fig. 5.1 lists a sequence of checks. Once the issue has been identified, please follow the possible remedies referenced by number to the right of the issue.

Please DO NOT unplug the system from the power supply without properly shutting it down (see section 3.6). Doing so may seriously harm the computer system inside the TLC Explorer and cause additional problems. A safe alternative to shut down and reboot the device is to press and hold the power icon **F1**.

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5 Troubleshooting - 5.1 Identifying Errors

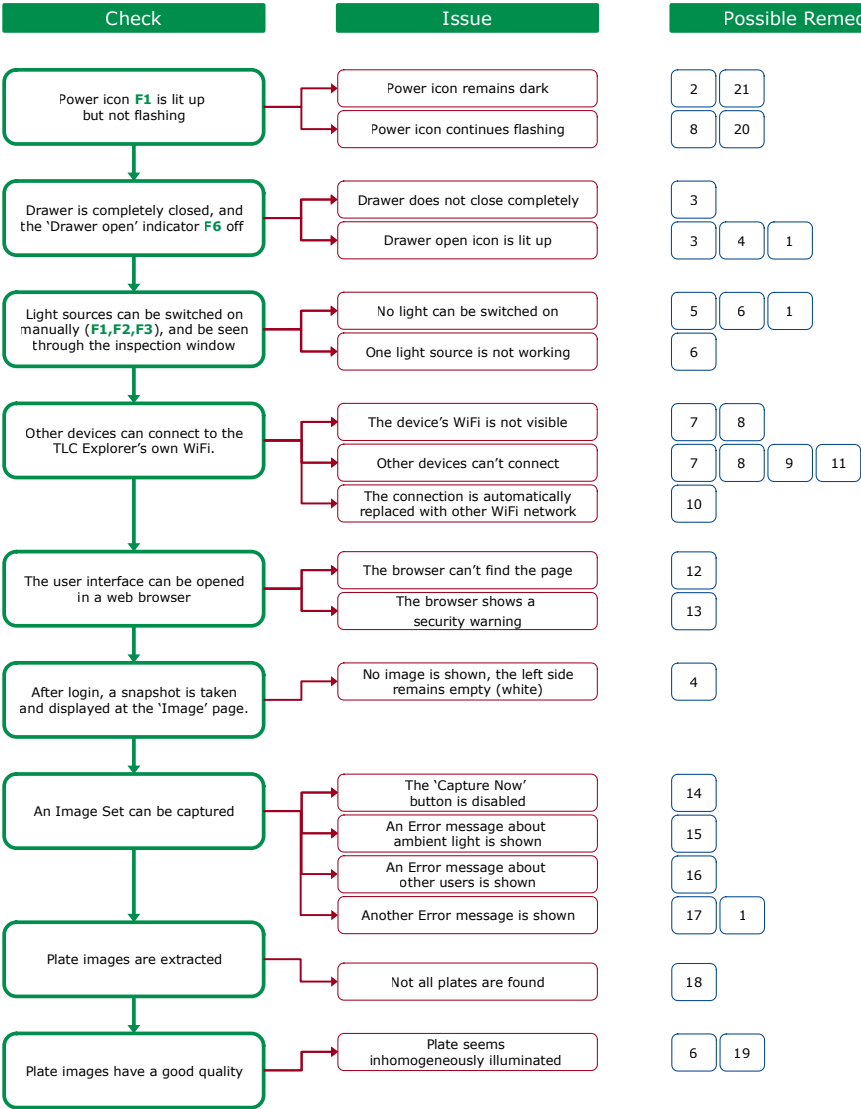


Figure 5.1: Identifying issues and how to address them

5.2 Possible Remedies and Solutions

- 1) To reboot the device, hold a finger on the power icon **F1**, until the icon starts flashing (indicating the device is shutting down). After the icon has stopped flashing and remains in a dimmed state, wait a few seconds and press the icon again to restart the device.
- 2) If the power icon does not light up, the device may not be connected to a working power supply. A simple way to check the power source is to connect a tablet or mobile phone to the USB-C connector that is plugged in the USB-C port at the device back. However, this test only applies to the USB-C power adapters recommended for the TLC Explorer (see Operational User Manual) – third party power adapter and cables may charge a phone but have specifications that are incompatible with the TLC Explorer. In case the power adapter and cable work as desired with other devices, but not the TLC Explorer, you may need to contact the reseller of your device for technical support (see section 6.2).
- 3) In case the drawer does not close completely, verify that the alignment pin **P3** underneath the Baseplate has entered the socket **P4** on the drawer, so that the Baseplate lies flat on the drawer. There should be no objects higher than 8 mm on the Baseplate. If the drawer seems blocked by an object inside the device, you can open the back cover **B7** and remove the obstacle.
- 4) The red drawer open light **F6** is on whenever sensors indicate that the drawer is not closed correctly. While the drawer is open, light sources cannot be switched on and no images can be taken. Check if the drawer really is correctly closed. In rare cases, a software or sensor issue might cause the systems to incorrectly detect the drawer as open. If you suspect this to be the case, reboot the device.

1**2****3****4****5****6****7**

- 1 5) For safety reasons, the TLC Explorer only allows the switching on of light sources if the drawer is correctly closed and the back cover **B7** correctly installed. Also, while another user is capturing images, manual light switches **F2**, **F3**, **F4** are deactivated.
- 2 6) If one or all light sources are not working, or the illumination appears to be dark on one side, the illumination unit might need to be replaced. The procedure takes only a few minutes and is explained in detail in the Operational User Manual. In case a replaced illumination unit remains dark after the replacement procedure, verify that the unit's power connector is plugged in (see Operational User Manual), and the back cover **B7** has been correctly closed.
- 3 7) Issues with the WiFi configuration may also be resolved by connecting to the device using an Ethernet connection. You can then access the settings page and correct the configuration via the Ethernet connection.
- 4 8) To reset all network settings to their default values, please follow the instructions given below in section 5.3.1. You should then be able to connect to the TLC Explorer's own WiFi network by following the steps described in section 3.4.
- 5 9) The network administrator may have installed security measures on the network configuration, or your device settings, preventing your device(s) from connecting to the TLC Explorer. If in doubt, please ask your network administrator.
- 6 10) Some mobile devices will give preference to network connections that have internet access, which the TLC Explorers own WiFi network does not have. It might, therefore, be necessary to open your mobile device's WiFi settings and disable the 'Auto-connect' for saved networks that have internet access – those which are also available apart from the TLC Explorer.
- 7

- 11) Please note that each TLC Explorer broadcasts a WiFi signal with a different name (usually including its serial number) which is possibly protected by a different password. In case your laboratory works with multiple TLC Explorer devices, it is necessary to use the QR code on the sticker for the specific device to connect (as long as the default network settings have not been changed).
- 12) The TLC Explorer tries to inform all devices in the same network that it can be reached with the URL "http://" followed by the device name (see section 3.4). However, some networks may not support this feature and require users to address the device by its IP, e.g. "http://192.168.200.1". This may also be necessary, if mobile devices in parallel feature an internet connection via mobile data and try to find the URL "http://" followed by the device name in the world wide web.
- 13) Some browsers enforce encrypted connections and may automatically change the entered address to begin with "https://", to then produce a warning that the site may not be secure. The browser cannot know that you are accessing the TLC Explorer in a protected local network, posing far less risk than opening a site from the internet. Alternatively, you may disable "https-only" in the browser settings (see also section 3.4).
- 14) The 'Capture Now' button is only enabled if a unique and valid Image Set name has been entered and the system is not busy with image capture. An extended delay may occur if a user has pressed an 'Auto' button multiple times in the 'Use manual Exposure' section to find the optimal exposure time. This process may take a while, especially for UV-light sources, because a series of images has to be captured and processed.

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- 1 15) To ensure no stray light is impacting the image quality – e.g. due to an open inspection window **F7** –, the camera checks if the Baseplate is completely dark with no light source on before starting the image capture process. This check can be disabled on the 'Settings' page, though it is recommended to enable it.
- 2 16) Only one user at a time can capture images. While other users may load and process Image Sets in parallel, competing attempts to capture images will cause error messages.
- 3 17) If the available storage space is insufficient to save captured images, an error message will appear. Please transfer all data not currently needed for processing to other devices and delete their copy on the TLC Explorer. At the bottom right corner of the file manager (reached via the main menu in the upper right corner), you can see the 'Remaining free space'. Please have at least 250 MB free to ensure the system runs smoothly.
- 4 18) The software searches for TLC plates as bright rectangular shapes with a minimum size. To get multiple plates detected automatically, place them a few millimeters apart, so that the device detects at least 2 mm of the black coating around each plate.
- 5 19) If the plate appears correctly illuminated through the inspection window **F7**, but in homogeneously illuminated in the plate image, an incorrect illumination correction might have been applied. It is possible to deactivate the correction step, or to recalibrate the calculation. For details, please refer to the Operational User Manual.
- 6 20) As an ultima ratio, all user data, settings and software updates can be deleted by performing a factory reset, as described below in section 5.3.2.
- 7 21) Contact the reseller of your TLC Explorer for technical support.

5.3 Resetting the TLC Explorer

5.3.1 Resetting Network Connection

In case some changes to network settings, or a forgotten WiFi password, hinder you from connecting to the TLC Explorer, the network settings can always be reset to the factory default.

To reset the network connection, touch and hold any **two** (not all three!) illumination buttons (**F2**, **F3**) while the TLC Explorer is starting, i.e. as long as the power icon **F1** is flashing. You should then be able to connect to the device using the QR codes shown in Fig. 3.1.

5.3.2 Factory Reset

Initiating a factory reset should be done with care, as it **erases all users with their data as well as all settings**, including network settings. A factory reset also re-installs the software version with which the device was delivered and erases all other software versions from the device.

To start a factory reset, touch and hold all three illumination buttons (**F2**, **F3**, **F4**) while the TLC Explorer is starting, i.e. as long as the power icon **F1** is flashing.

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6 Cleaning, Maintenance, and Decommissioning

6.1 Cleaning

It is recommended to clean the TLC Explorer – and especially the Baseplate – with a damp lint-free tissue on a regular basis. To remove more resilient dirt, the cleaning tissue may also be used damp with a mixture of alcohol and water at the ratio of 1:1.

Before starting the cleaning process, shut down the device (see section 3.6) and unplug the USB-C power supply **B1**. Only then remove the Baseplate from the drawer to wipe it clean on all sides. In case silica particles from TLC plates, or dust, are on the drawer, or in the housing, both drawer and housing can be cleaned in the same manner – be sure not to touch the illumination unit. Alternatively, the back cover **B7** can be opened, and the dirt inside the device removed by carefully using a hand vacuum cleaner at low power and a tissue.

Please note: Spilled liquid or other material should be removed immediately (see also section 1.2.1)!

6.2 Contact Technical Support

For questions about warranty, warranty related issues, or questions specific to your device, please contact the reseller of your TLC Explorer. Similarly, if in doubt about how to proceed when facing one of the situations listed under 'Do NOT Operate the TLC Explorer if ...' in section 1.2.1, please contact the reseller of your device or a local supplier via www.sigmaaldrich.com.

For generic technical questions and software updates, please visit the official TLC Explorer support site using the link provided in Fig. 6.1 below.



Figure 6.1: Find the TLC Explorer service page at:
www.sigmaaldrich.com/TLCservice

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6.3 Ordering Accessories and Replacement Parts

Currently, the TLC Explorer product portfolio includes the following products which can be ordered separately as additional equipment or replacement parts:

Cat. No.	Name	Description
1.52610.0001	TLC Explorer	TLC Documentation system, including the parts listed in section 3.1 as scope of delivery.
1.52613.0001	Illumination Unit	Replacement part which is only needed in case a light source in your TLC Explorer has broken. The unit houses LEDs and optics for all illumination types, i.e. visible light as well as UV light, and can only be exchanged as a whole.
1.52612.0001	Baseplate	An additional Baseplate can simplify and speed up the workflow, since one Baseplate can be prepared while a second one is recorded in the TLC Explorer (see section 2.3).

Cat. No.	Name	Description
1.52611.0001	Power bank	Powers the TLC Explorer independent of a power grid – e.g. for the use away from a mains power source.
1.52618.0001	Dust cover	Replacement cover to protect your TLC Explorer against dust.

Common TLC consumables like TLC plates, solvents and stains, as well as tools used in the TLC process (e.g. developing chambers) are available on the website of Sigma Aldrich at www.sigmaaldrich.com.



Figure 6.2: Find TLC consumables and tools at: www.sigmaaldrich.com

6.4 Decommissioning, Storage, and Disposal

1

If you decide to decommission your TLC Explorer, you can either store it for later use or return it to the reseller or distributor of your TLC Explorer.

2

There are no batteries in the TLC Explorer. You, therefore, do not need to remove any batteries before storing, shipping or returning the device.

3

However, there might still be sensitive data on the internal storage. It is strongly recommended to initiate a factory reset (see section 5.3.2) to remove any user data before decommissioning your TLC Explorer.

4

The device should also be cleaned of all visible residue and encrusted material. In case the device was in contact with hazardous chemicals or infectious/bio-hazardous materials, it must be decontaminated accordingly. Please note that the reseller can refuse to collect a decommissioned device if it has not been correctly decontaminated.

5

To store the device, remove any TLC plates and check that no USB stick is plugged in. Do not leave the Baseplate or any accessories inside the housing, but rather pack them separately next to the housing. Ideally, use the original packaging, including the inner packaging, to protect the device while in storage. Ensure that the storage place is dry, with a relative humidity between 20 - 80%, and the temperature remains within a range of 15 - 40 degrees Celsius.

6

In accordance with European Union directive 2012/19/UE on the management of waste electrical and electronic equipment (WEEE), it is strictly forbidden to dispose the TLC Explorer in unsorted municipal or household waste. Instead, it should either be brought to an official collection and recycling center for electrical and electronic waste or returned to the reseller of your TLC Explorer.

7

For further information on take-back programs offered in your region, please visit www.sigmaaldrich.com/EN/en/life-science/quality-and-regulatory-management/recycling.

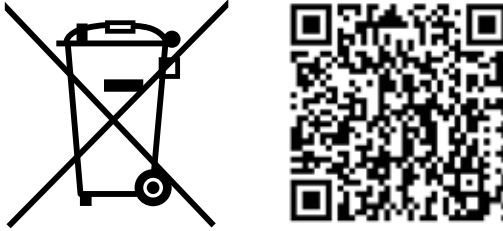


Figure 6.3: Only dispose device at official collection and recycling center or return it to your reseller.

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7 Appendix

7.1 Device Measurements and Specifications

1	(External) Power supply	USB-C Power Supply Unit / 65W
2	Power supply	External Power Supply Unit (HA65NM170) is provided with separate Power supply cord(s) (1.8 m long) fitting type B, G, N, I, D, E/F plugs (the plug must comply with local regulations)
3	Power requirements	100 V – 240 V, 50/60 Hz for the external power supply unit
4	Power consumption	Standard working condition: 18.8 W; standby mode: 0.83 W
5	Measuring technology	Documentation system for TLC plates by using video densitometric measurement.
6	Wavelength range	The TLC Explorer provides the standard illumination for detecting TLC plates (see also section 12.2): • Visible light (VIS) • UV-C - WL: 254nm • UV-A – WL: 366nm
7	Camera	RGB sensor with 3280 × 2464 active pixels; one pixel captures an area of approx. 85 × 85 µm on the TLC plate
	Communication interfaces	• USB: 2 × USB-A (for the direct connection of a USB Stick) • Ethernet: LAN • WLAN IEEE 802.11 b/g/n (2.4 GHz)
	Protection (IP) class	IP2X (for the main enclosure)
	Ambient Condition: Temperature	• The device can be operated in a temperature range from 15°C to 40°C. • The temperature for storage and transportation should be between 0°C and 40°C.

7 Appendix - 7.1 Device Measurement and Specifications

Ambient Condition: Relative humidity	• The device can be operated in a humidity range from 20%RH to 80%RH, non-condensing conditions shall be ensured. • The humidity for storage and transportation should be in a range from 15%RH to 95%RH, non-condensing conditions shall be ensured.
Ambient Condition: Altitude	< 2000 m
Dimensions	374 x 312 x 290 mm length x width x height
TLC plates sizes	Usage of TLC plates with a size of 20 cm x 20 cm and smaller
Weight	approx. 10.4 kg
Instrument safety	Complies with Low voltage Directive 2014/35/EU IEC 61010-1 ANSI/UL EN 61010-1 CSA-C22.2 No. 61010-1-12
EMC	Complies with EMC Directive 2014/30/EU EN/IEC 61326-1 / EN 301 489-1 FCC
RF	Complies with RED 2014/53/EU EN 300 328, FCC Contains: FCC ID 2ABCB-RPICM4 IC:20953-RPICM4

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7.2 Table of Hazardous Substances' Name and Concentration (only for China)

Component Name	Hazardous substances' name					
	(Pb)	(Hg)	(Cd)	(Cr ⁶⁺)	(PBB)	(PBDE)
Housing	O	O	O	O	O	O
Optics	O	O	O	O	O	O
Electronics	O	O	O	O	O	O

O: Indicates that this toxic or hazardous substance contained in all of the homogeneous materials for this part is below the limit requirement in SJ / T11363-2006.

X: Indicates that this toxic or hazardous substance contained in at least one of the homogeneous materials used for this part is above the limit requirement in SJ / T11363-2006.

- Data listed in the table represents best information available at the time of publication
- Product to be operated under Environmental Conditions as defined in the Product Manual to maintain the declared EFUP
- Consumables or parts may have their own label with an EFUP value less than the system. Periodic replacement of those consumables or parts to maintain the declared EFUP is done in accordance with the declared EFUP is done in accordance with the Product Maintenance Procedures

7.3 China SRRC-approved ID

CMITT ID: 2023DJ15480

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TLC Explorer

记录系统

1.52610.0001



入门

MERCK

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1 简介

1.1 TLC Explorer的用途

TLC Explorer旨在记录和评估薄层色谱板。它提供了一种安全、快速且灵活的方式，以在实验室的薄层色谱展开流程后，对TLC薄板图像进行目视检查和数字化记录。为了检测不同的物质类别，该设备包含三种不同的LED光源，从上方以直射光模式照亮薄板：

- **白光**用于检测薄层色谱上可见的有色物质。
- **UV-A** (紫外线A, 366纳米) 通常用于激发荧光。在这种照明下，荧光物质和物体在深色背景上显示为明亮的不同颜色的斑点。
它也可用于以特殊荧光指示剂F366预涂的薄板。在这种情况下，这些物质在明亮的背景上显示为黑色或彩色斑点。其他荧光指示剂，如F254，在这种光线下不会发出荧光，因此不会干扰测量。
- **UV-C** (紫外线C, 254纳米) 照明几乎专门用于薄层色谱图。如果薄板预先涂有适宜的F254荧光指示剂，那么吸收这种光的物质会在明亮的背景上显示为黑点。

可评估所记录的薄板图像，以生成报告，或以导出数据供其他系统进一步处理。

TLC Explorer专为实验室使用开发，并由训练有素的用户操作进行薄层色谱分析。只应使用完全干燥、最大尺寸为20x20厘米的TLC板。

请注意，上述目的用途之外的任何其他使用将使保修索赔无效。

1.2 安全和操作说明

设计和开发TLC Explorer时，操作安全一直被作为首要的目的。然而，只有严格按照本手册中的指示操作设备才能保证安全。此外，任何与本手册所述的安全说明相冲突的操作都可能使保修索赔无效。因此，所有负责安装、使用和维护的人员，在使用TLC Explorer之前必须仔细阅读本操作手册（参见第 3.4 节），并将其放在手边以供日后参阅。

1.2.1 在以下情况下请勿操作TLC Explorer

将TLC Explorer连接到电源之前，请确保没有以下情况：

- 设备在不良条件下已存放了很长一段时间。

- 设备在运输过程中损坏或因操作不当损坏 (例如在运输过程中掉落或与液体接触)。
- 外壳、前装置、后盖、抽屉或底板的任何部分潮湿、损坏或变形。
- UV (紫外线) 防护检查窗缺失、损坏或变形。
- 设备未放置在干燥、平坦且稳定的表面上。
- 抽屉无法完全抽出或无法正确关闭。
- 后盖安装不正确, 且所有四颗螺丝都被拧紧。
- 任何连接器 (USB-C、USB-A、以太网和WiFi天线) 或电缆受潮、损坏或变形。
- 电源非来自两种推荐的适配器 (USB-C电源适配器DELL HA65NM170或充电宝DELL PW7018LC)。
- 设备显著冷于其环境温度, 因此湿气可能会冷凝并损坏电路 (请等待直至设备达到室温)。
- 设备环境温度超出指定的15 - 40°C范围或相对湿度超出指定的20 - 80%范围。
- 设备正在或已经暴露于酸性、碱性、溶剂蒸汽中或其他可能导致腐蚀的气体中。
- 液体或其他材料已溅洒到设备上或溅入设备内。如果是这样, 请立即将其清除。再次使用前, 请确保设备未损坏且完全干燥。

如果您认为您的设备可能有上述任何问题, 请不要连接、启动或操作。如果对如何继续操作有疑问, 请联系TLC Explorer供应商, 或使用图1.1中的链接查看TLC Explorer服务站点:



图1.1: TLC Explorer的服务网页位于:
www.sigmaaldrich.com/TLCservice

1.2.2 安装要求

为了安全和可靠的操作，请在实验室设置该设备时遵循以下指南：

- 设备必须安装在平坦、干燥且适合支撑约10公斤的设备重量的实验室工作台上。
- 勿使仪器遭受任何强烈的振动或冲击。
- 保护仪器免受过多灰尘影响。
- 将TLC Explorer、电缆和充电宝(如果适用)放置在距热源(例如燃气燃烧器、电加热器或烤箱)、化学物质(例如溶剂)或其他可能对它们造成损坏的设备的安全距离处。
- 要给设备供电，请仅使用USB-C电源适配器DELL HA65NM170或移动电源(充电宝)DELL PW7018LC，并将它们连接到设备背面的USB-C端口。
- 按照您实验室中电子设备的使用规定，将电源连接到距离设备2米以内的接地插座。
- 用户所在地的线路电压必须符合电源适配器上规定的规格。
- 请勿将仪器放置在电焊设备、高频炉、杆式变压器等产生强磁场的设备附近。
- 将仪器连接到没有突然变化或电压波动的电源线上。
- 如果动力电机驱动设备(例如搅拌器或摇床)必须与TLC Explorer连接到同一电源线，请确保安装降噪装置。
- 确保电缆的排列方式正确，使其既不会对使用设备或在设备周围的员工构成风险，也不会被意外从各自的插座中拔出。
- 设备前面必须有足够的空间，以能完全打开抽屉并可安全方便地操作底板。
- 将设备放置在一定的高度，使用户能方便地通过检查窗口往里观察。避免在前板上的外部光源反射光，它们会干扰对检查窗口的观察。
- 设备只能在满足所有官方实验室安全要求的环境和方式下使用和操作。

1.2.3 紫外线辐射暴露

为刺激荧光在TLC薄板评估中使用的紫外辐射线, 会损伤眼睛和皮肤。因此, 大多数国家的安全法规要求保护眼睛和皮肤免受有害的紫外线辐射。TLC Explorer采用了多项安全措施, 以确保当按照本指南所述方法使用时, 设备不会泄漏UV-A或UV-C光线。在任何情况下都不得试图规避这些安全措施!

- 仅在紫外线照明下通过紫外线防护检查窗口观察TLC板。
- 确保检查窗口没有损坏或变形。
- 在启动紫外线照明之前, 请检查抽屉和后盖正确关闭且未损坏。
- 切勿在TLC Explorer之外操作该照明装置。
- 遵循使用紫外线灯的一般实验室安全规定。

1.2.4 一般操作注意事项

- 确保在拔下电源之前设备至少有30秒钟以使其完全关机——与您的台式计算机类似。
- 只能没有溶剂残留的TLC板才可记录——请确保TLC板在之前的色谱展开或衍生化步骤后完全干燥。
- 请勿在底板上放置高于8毫米的物体, 因为这种情况在关闭抽屉时可能会损坏设备, 并使图像捕捉失焦。
- 切勿通过握住抽屉把手的方式提起或搬运设备。相反, 将它握在底部并抓住橡胶脚, 以防止它从手中滑落。
- 不使用设备时请关闭抽屉, 以避免损坏和污染。
- 运输TLC Explorer时, 必须关闭TLC Explorer, 移除底板。不应插入任何TLC板。
- 只将FAT32格式的USB记忆棒插入USB-A端口以进行备份和更新。请勿使用外部的HDD通过电缆连接的任何其他媒介。
- 除更换照明装置外, TLC Explorer只能由制造商授权的专业人员打开、调整或维修。不遵守将使任何保修索赔无效。
- 保留原始包装, 包括内包装, 以保护仪器在必须运输时免受物理撞击; 对保修索赔, 尤其要如此。请注意, 因运输不当造成的损坏将使所有保修索赔无效。

1.2.5 用户管理和信息安全

设备应放置在实验室中,只有授权工作人员才能接触。因此,为了优先考虑流畅和高效的实验室工作流程,TLC Explorer没有使用任何方法限制访问特定的用户,也没有使用密码或加密方法保护数据。用户帐户主要用于构建记录数据。没有任何有特殊权限的管理帐户。

任何对设备有物理接触或网络连接的人都可以

- 创建新的用户
- 删除或以现有用户身份登录
- 访问和删除所有存储的数据
- 重新启动或关闭仪器
- 更改设备设置(包括连接参数)
- 恢复出厂设置。

根据您的选择将TLC Explorer如何整合入您的IT环境中的方式(请参阅《操作用户手册》),很多用户群可能有权访问您的设备。如果TLC Explorer连接到LAN或WiFi网络,通常有权访问该网络的每个人也都可以打开用户界面并以现有用户或新用户身份登录(请参阅3.4分节)。如果有保密方面的担心,请将相应数据复制到台式机或平板电脑,然后将其从TLC Explorer中删除。

- 小心计划和测试TLC Explorer的连接设置,以确保只有经过授权和培训的人员才能访问。
- 将数据下载或复制到记忆棒,然后将其保存在外部存储位置。不要使用TLC Explorer进行永久数据存储。
- 只使用来自制造商的经过验证的更新。
- 只连接您确定不含有恶意软件的USB记忆棒(闪存驱动器)。

1.3 入门和操作用户手册

这本“入门”指南仅旨在帮助对TLC Explorer进行运行设置,并提供图像捕获的入门知识。有关处理TLC薄板图像和配置的详细信息,请参阅《操作用户手册》,该手册可通过扫描图1.2中的二维码下载,或在TLC Explorer官方支持网站<https://sigmaaldrich.com/TLCservice>上下载。此外,可通过单击主菜单中的“帮助”(右上角的三个水平条),从TLC Explorer软件打开《操作用户手册》。



图1.2: 下载《操作用户手册》网站:
[www.sigmaaldrich.com/TLCservice](https://sigmaaldrich.com/TLCservice)

2 了解您的TLC Explorer

2.1 TLC Explorer前板



图2.1:认识前板上的元素

ID	物项	说明
F1	电源按键	将手指放在图标上至少两秒钟以启动或关闭设备。
F2	照明“Vis”	打开/关闭白色光源。
F3	照明“366”	打开/关闭UV-A光源。
F4	照明“254”	打开/关闭UV-C光源。
F5	抽屉	打开抽屉以将TLC板放置在底板上。
F6	抽屉打开指示灯	红灯表示抽屉未正确关闭。当红灯亮起时,无法捕获图像,并且UV光源被停用。
F7	检查窗	使能用眼睛检查照亮的TLC板(保护眼睛免受紫外线辐射)。
F8	快门滑块	轻轻按下滑块即可打开检查窗口。

2.2 TLC Explorer后板

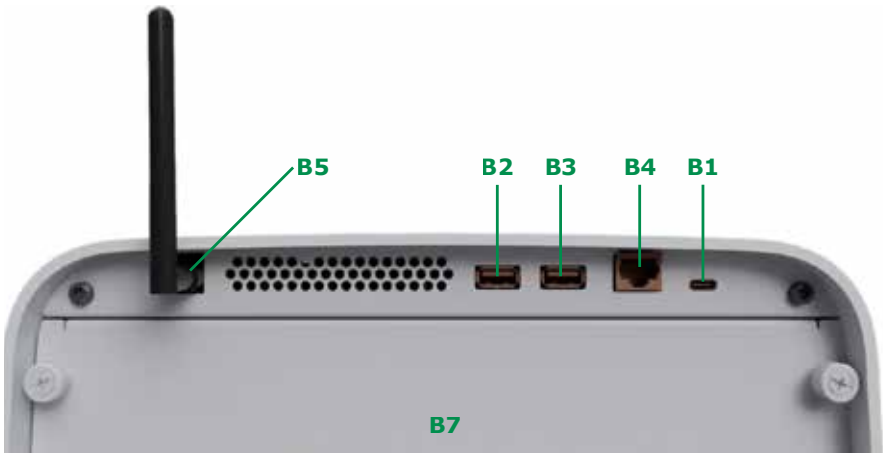


图2.2: 认识设备背面上的元素

ID	物项	说明
B1	USB-C端口	该USB-C端口仅用于连接电源, 不具有数据传输功能。
B2	USB-A端口	连接记忆棒 (闪存驱动器) 以进行数据导出、备份或软件更新的端口。
B3	USB-A端口	连接记忆棒 (闪存驱动器) 以进行数据导出、备份或软件更新的端口。
B4	以太网端口	用于连接LAN的RJ45端口。
B5	WiFi天线连接器	要安装WiFi天线, 请将天线底座处的接头拉直, 然后将其顺时针方向拧入连接器。
B6	序列号	带有TLC Explorer序列号的贴纸。序列号下方的二维码包含一个转至该设备完整标签的链接, 标签的物理位置在设备底部。
B7	后盖	仅在清洁设备内部或更换照明装置时打开 (详细信息请参阅《操作用户手册》)。
B8	照明装置	可更换的照明装置安装在后盖后面, 其装有不同照明类型的LED灯。

2.3 TLC Explorer底板

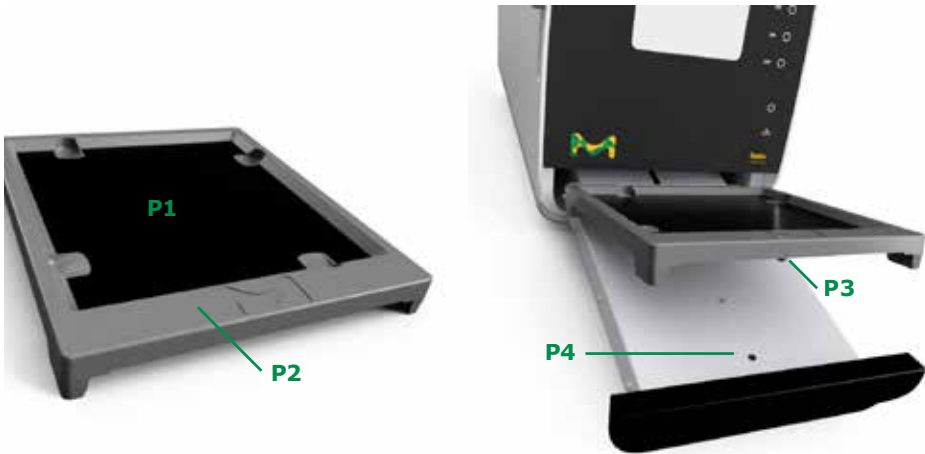


图2.3:认识位于底板及与其相关的元素

ID	物项	说明
P1	薄板区域	将TLC薄板直接放在黑色涂层上。
P2	框架	当随抽屉插入底板时，薄板区域上的物体不得高于框架高度。
P3	定位销	在关闭抽屉前，确保该销钉已进入抽屉上的插口，以便底板能平放在抽屉上。
P4	定位插口	

3 首次使用

3.1 开箱和交付范围

您的TLC Explorer依据电子仪器的相关指南和规范制造和检查(详细信息请参见《操作用户手册》)。在出厂时技术状态安全牢靠。如果您发现包装有任何可能已影响到设备的损坏,请记录下来并联系您的供应商。如果您怀疑有任何在1.2.1分节中列出的标准,请勿操作TLC Explorer。强烈建议保留包装材料,以供以后运输和/或存储设备,尤其是保修索赔。

打开纸箱后,首先取出所有配件,包括底板和上保护盒。在继续之前,请确保所有可拆部件均已移除。转动箱子,使玻璃正面面向您,并准备一个适宜的放置设备的地方,供从箱子中取出设备时使用。然后握住TLC Explorer(重约10公斤)两侧下面的底部,将其抬起。移除所有运输固定装置(例如固定抽屉的胶带)和保护箔纸。

确认您的货物包含以下所有物品:

- 一台安装有照明装置的TLC Explorer(要检查照明装置,请参见以下3.3分节)
- 一个底板
- 一条WiFi天线
- 一个USB-C电源适配器,带有八条电源线,适用于不同的插座类型
- 一个防尘盖
- 两张带有两个二维码的贴纸-用于更易于连接到设备上(见图3.1)
- 这本印刷版“入门”指南和安全说明

3.2 安全操作设置

在为您的设备选择合适的位置之前，请仔细阅读1.2.2分节中的有关安装要求。检查抽屉**F5**是否可以完全打开、底板是否插入，以及所有计划用户能否以安全、方便且符合人体工程学的方式，可以通过检查窗口**F7**看到TLC板。特别要考虑不同的身高以及设备玻璃正面可能产生的光反射干扰。

在TLC Explorer附近保存一份可容易访问的操作用户指南副本，例如，作为一份数据文档，存储在您计划用以控制设备的平板电脑或台式计算机上。

3.3 启动及对您的薄板的“先看权”

选择适合电源插座的电源线**A3**，将其连接到电源适配器**A2**和电网，然后将USB-C连接器插入端口**B1**。在前正面，您应该看到电源图标**F1**亮起。用手指轻轻按住电源图标约两秒钟，直到图标开始闪烁，表示设备正在启动。大约30秒后，图标停止闪烁，变得更亮，设备就准备好运行了。

打开抽屉**F5**并插入底板。有宽缘和徽标的一面应朝外，即靠近抽屉把手。确认定位销**P3**是否已进入插口**P4**，并且底板是否平躺在抽屉上。要关闭抽屉，请按把手的中间，直到感觉到轻微的阻力。抽屉旨在最后几厘米自行关闭。特殊的阻尼系统可确保正确关闭抽屉，而不会移动薄板。

一旦红色抽屉打开灯**F6**熄灭，将手指短暂地放在标签“Vis”**F2**旁边的圆圈上，以打开内部的白色光源。拉下快门滑块**F8**并通过检查窗口**F7**观察，您应看到照亮的底板。

关闭该灯（触摸**F2**），打开抽屉，将一块TLC板放在板区域**P1**上。再次关闭抽屉，在各特征性照明类型下（触摸**F2**、**F3**或**F4**），通过检查窗口观察薄板。

万一您的TLC Explorer的行为与以上所述不同，请参阅5分节，以在操作设备之前识别和解决问题。

3.4 连接您的笔记本电脑

有多种方法可以将各种类型的用户设备(笔记本电脑、台式电脑、平板电脑甚至智能手机)连接到TLC Explorer,其可以按照《操作用户手册》所述进行配置。推荐的一个基本方法是,将您的笔记本电脑连接到TLC Explorer自己的WiFi网络。这种方法可以快速设置,而且只需点击几下即可将您生成的图像和数据直接下载到您正在使用的设备。



图3.1:通过扫描设备标签上的这两个二维码即可轻松连接

在笔记本电脑(或具有WiFi功能的台式电脑)上,打开网络设置并搜索以“tlc-explorer”开头、后跟序列号**B6**的网络名称(SSID)。选择“WPA/WPA2”作为安全设置,然后输入步骤1标签上显示的密码(见图3.1)以建立连接。通过扫描包装所提供的贴纸上的二维码1,连接平板电脑或智能手机更简单。您可能会看到一条警告,说所选的WiFi没有互联网连接——这是正确的,且是设计使然。

建立WiFi连接后,即可在您的网页浏览器中打开用户界面。尽管所有常用的最新浏览器都可使用,但建议使用Chrome或Firefox,以获得最佳用户体验。

要打开TLC Explorer用户界面,您可以扫描贴纸上的二维码2或在浏览器地址栏中输入“http://tlc”。

1

2

3

4

5

6

7

如果浏览器难以找到“http://tlc”（例如，由于设备通过移动数据网络并行连接到互联网），作为替代，您也可以输入“http://192.168.200.1”。一些浏览器强制执行加密连接，并可能自动更改所输入的地址至以“https://”开头，然后生成一个警告说该网站可能不安全。浏览器无法知道您正在受保护的本地网络中访问TLC Explorer，这比打开互联网站点所带来的风险要小得多。您可以忽略警告并继续，也可以禁用浏览器设置中的“仅https”，然后在浏览器地址栏中再次手动输入“http://tlc”。

您应该会看到与以下类似的欢迎屏幕 (图3.2)：

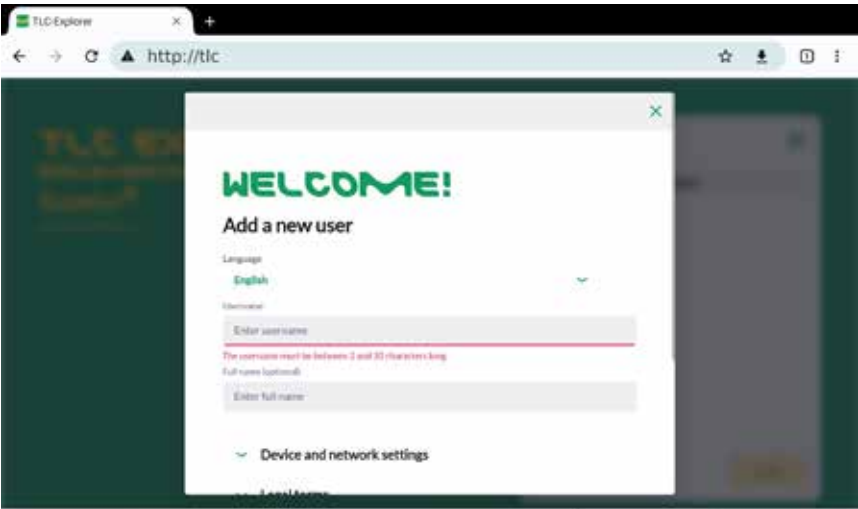


图3.2: 首次打开TLC Explorer用户界面

设置书签和/或从浏览器菜单（通常在浏览器右上角标记为一列三个点）中选择菜单点“添加到主屏幕”，将显著简化将来打开网站的步骤。

3.5 创建第一个用户

通过选择语言并输入第一个用户名开始个性化设置您的TLC Explorer。由于用户名在内部用于命名文件和目录,因此所有的特殊字符或符号并非都允许使用。如果您输入了无效字符,字段下方的线条将变为红色,并且下方将显示一条警告消息。

您可以在下一个字段输入全名,对全名较少限制,而且是可选的。它可用于识别用户,例如,作为报告的作者。

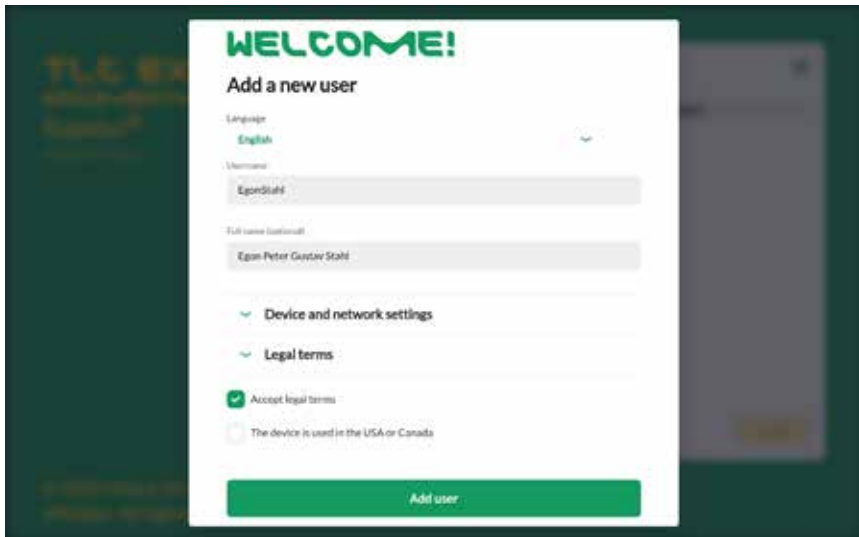


图3.3: 添加第一个用户

现在将“设备和网络设置”保留为默认值。以后可以随时在“设置”页面修改它们。

在单击“接受法律条款”左侧的框之前, 请展开并仔细阅读法律条款。您需要同意这些条款才能操作仪器和软件。

在您已单击“添加用户”后, 初始设置完成, 设备即可使用。您将自动转到标准欢迎屏幕, 如图3.4所示。选择您创建的用户, 然后单击“登录”开始捕捉您的TLC板的图像。

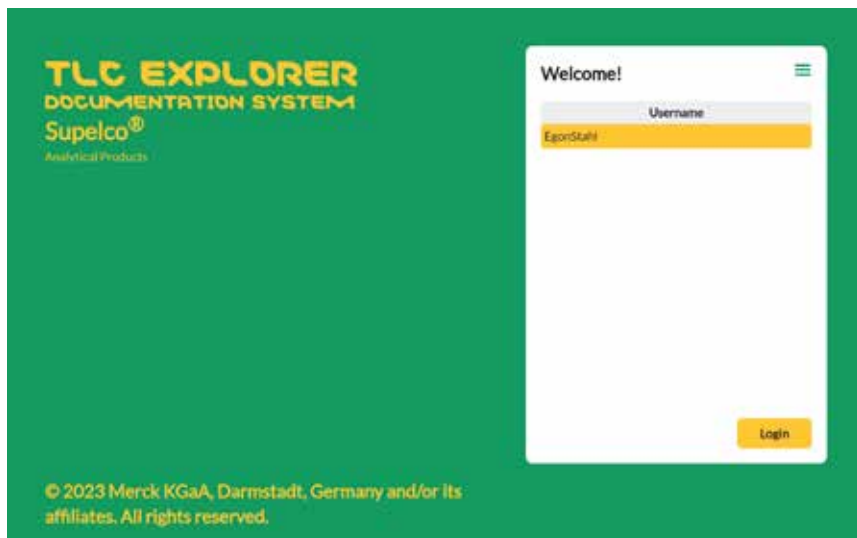


图3.4: 带有用户选择的欢迎屏幕

3.6 断电

与任何台式计算机一样，TLC Explorer需在正确关闭后才可拔掉电源。否则可能会损坏设备。

为了正确关闭设备，请单击主菜单图标（右上角的三个水平条），然后从显示的菜单中选择“关闭”。从图3.5所示的对话框中，您可以选择关闭设备、重新启动（即重启）设备或仅重新启动软件应用程序。您也可以触摸电源图标**F1**约2秒钟。

如果您选择重新启动设备或应用程序，只需等待大约一分钟，直到再次出现图3.4所示的欢迎屏幕，设备即再次准备就绪。

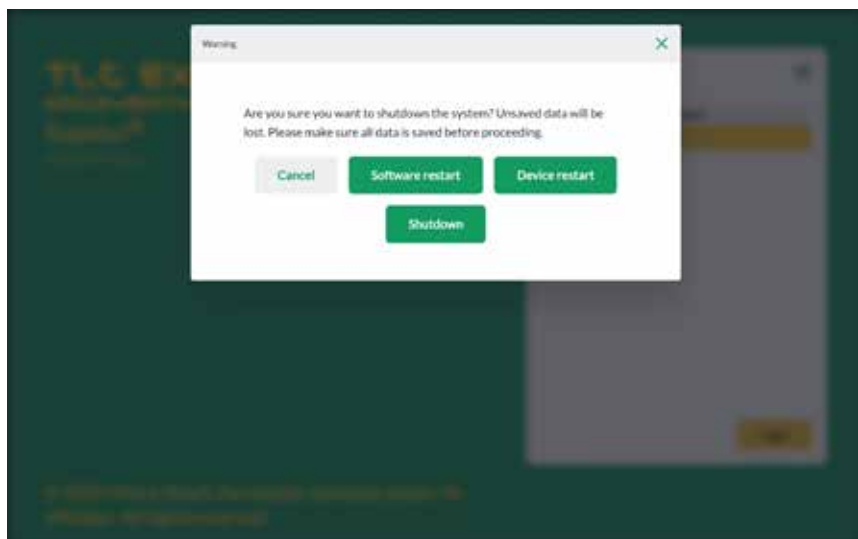


图3.5: 关闭或重启设备

4 操作指南

无论您只是想快速查看一下TLC板,为一些文档捕获和导出薄板图像(可能带有一些注释),还是需要一份完整报告的定量分析——TLC Explorer都能让您应付裕如。

然而,该软件处理和记录TLC板的大部分功能超出了本“入门”指南的范围。该软件的详细说明可以在《操作用户手册》中找到。

4.1 设备准备

将TLC Explorer连接到电网(或充电宝)后,电源图标**F1**下方的微白色灯光显示设备已准备好启动。将您的手指放在图标上约2秒,然后让仪器等待约30秒——当图标闪烁时——以进行操作准备。

将TLC板放在底板上并关闭抽屉**F5**。一旦红色打开抽屉指示灯**F6**关闭,您会注意到“Vis”**F2**旁边的圆圈短暂闪烁白色——系统刚刚拍了一张快照,以在软件中显示您的薄版的预览。

4.2 目视检查

先决条件:

- TLC读取器已打开;电源图标**F1**亮起(不闪烁或变暗)。
- 抽屉正确关闭,红色打开抽屉指示灯**F6**熄灭。
- 没有用户同时捕捉图像(另请参见4.3分节)。

通过将手指短时按在相应的按钮(**F2**、**F3**或**F4**)直至圆圈亮起,选择您要使用的照明类型。然后轻轻按下快门滑块**F8**,打开检查窗**F7**。根据您的观察角度,您可以完全或部分向下推按快门滑块以查看TLC板的相关部分。

您可以通过触摸相应的按钮切换到另一种照明类型,或通过再次按相同的按钮关闭照明。

4.3 图像捕捉

先决条件：

- TLC读取器已打开；电源图标**F1**亮起（不闪烁或变暗）。
- 抽屉和检查窗正确关闭，且红色打开抽屉指示灯**F6**熄灭。
- 将一块或多块最小尺寸为2.5x7.5厘米、最大尺寸为20x20厘米的TLC的板平放在板区域**P1**上。
- 一次只有一名用户能捕捉图像。尽管其他用户可以平行加载和处理图像集，但竞争尝试捕获图像将导致错误消息。

假定您已经如推荐3.4分节那样连接了平板电脑或手机，则只需单击桌面图标或您保存在浏览器中的书签即可打开如图3.5所示的欢迎屏幕。选择您的用户名并单击“登录”。

每次登录后打开的页面（参见图4.1）可让您捕捉新图像或加载现有的图像集。在左侧（或者，对于小屏幕宽度，在顶部），您将看到当您关闭抽屉时捕捉到的底板的低分辨率图像。您只需单击图像即可刷新它。

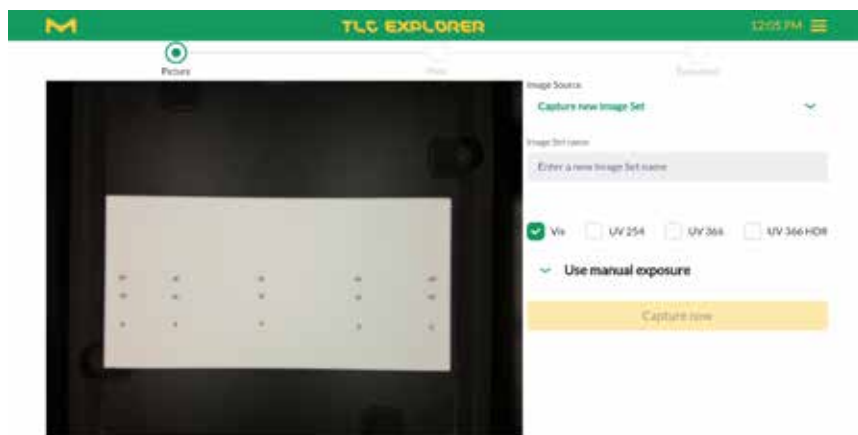


图4.1：捕捉图像或加载现有的图像集

1

从下拉菜单中选择“捕捉新图像集”选项，然后在文本字段中输入新图像集的名称。由于此名称将用作图像文件名的一部分，因此并非所有字符都可允许使用。再者，该名称需要与为该用户存储的其他图像集名称不同。如果图像集名称无效，软件将告知您原因。

2

复选框让您可以选择您想用于图像捕捉的照明类型。展开“使用手动曝光”部分，让您可以为每个选定的照明类型设置曝光时间（以毫秒为单位）。单击相机图标，让系统以选定的曝光时间拍摄低分辨率图像并将其作为预览显示。使用“自动”按钮，您可以请求系统拍摄一系列图像并自动为您的薄板确定最佳曝光时间。请注意，此过程可能需要几秒钟，并且仅当您看到更新的预览时才继续。

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单击“立即捕捉”，仪器开始捕捉图像。在进度条上方的文本中以及在设备上亮起的相应的照明按钮（**F2-F4**）上，您可以看到当前正在拍摄哪个图像。

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所有照明类型的最终图像都作为“图像集”存储在一起。然后系统在图像中搜索薄板。一旦所有薄板已被检测、旋转（水平对齐其底部边缘）并提取为单独的图像供进一步处理，用户即自动转到下一步进行薄板编辑。如果您只想使用捕捉的图像（或提取的薄板图像），您可以通过使用文件管理器下载您刚从文件管理器中获取的图像来绕过所有的进一步处理；文件管理器可以通过主菜单（右上角的三个水平条）打开。或者，您可以简单地单击“薄板”页面底部的“下载图像”按钮来保存当前在预览区域中显示的图像。以后仍可以随时加载和处理图像集。

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图4.2: 手动设置所选照明类型的曝光时间。

5 故障排除

5.1 识别错误

意外行为或错误消息有时是之前未被注意到的错误的结果。为了快速查找错误的根源和可能的解决方案,图5.1中的图表列出了一系列检查。一旦确定问题后,请按照问题右侧用号码指引的可能补救措施进行操作。

在没有正确关闭系统的情况下,切勿拔下系统电源(参见3.6分节)。这样做可能会严重损害TLC Explorer内的计算机系统并导致其他问题。一个关闭和重新启动设备的安全替代方法,是按住电源图标**F1**。

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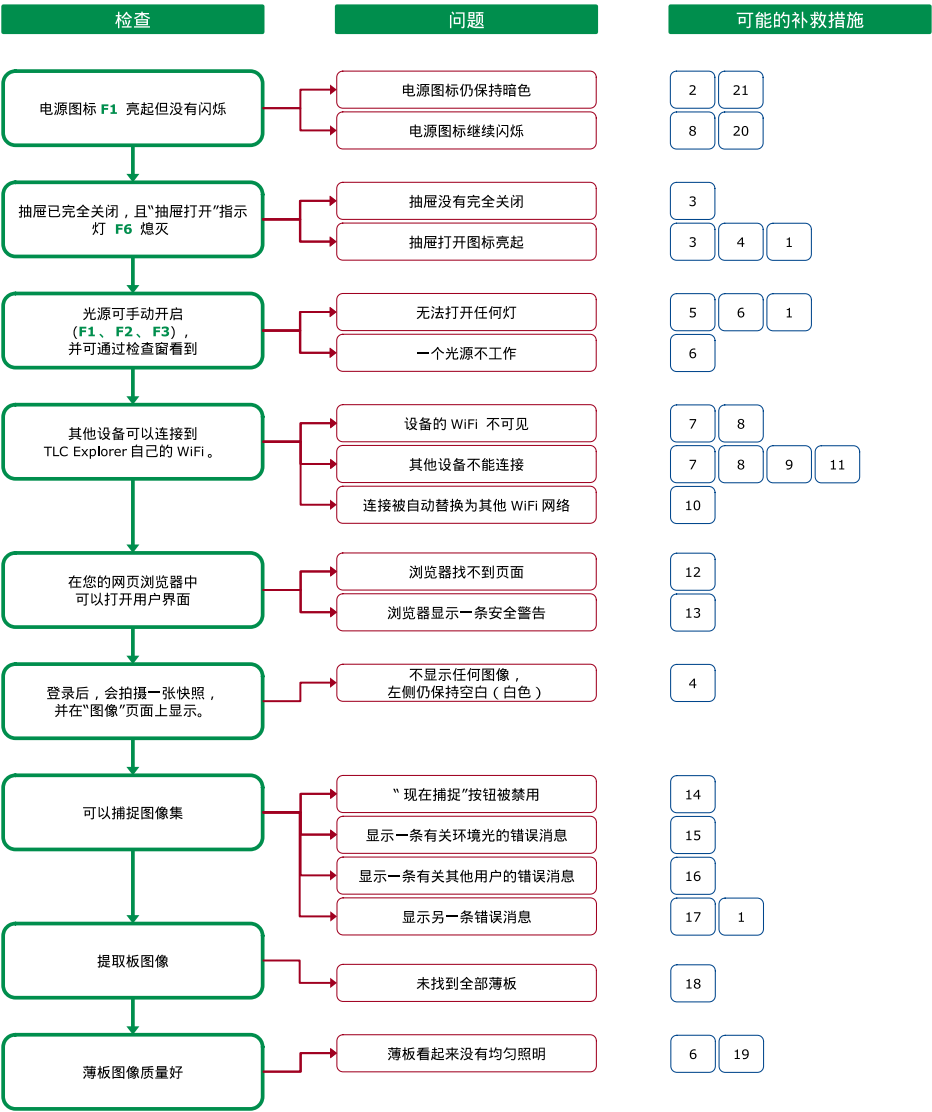


图5.1: 识别问题以及如何解决它们

5.2 可能的补救措施和解决方案

- 1) 要重新启动设备, 请用手指按住电源图标**F1**, 直到图标开始闪烁(表示设备正在关闭)。当图标停止闪烁并保持暗淡状态后, 等待几秒钟, 然后再次按该图标以重新启动设备。
- 2) 如果电源图标没有亮起, 则设备可能未连接到工作电源。一个检查电源的简单方法是, 将平板电脑或手机连接到插入设备背面USB-C端口的USB-C连接器。然而, 这个测试仅适用于TLC Explorer推荐使用的USB-C电源适配器(请参阅《操作用户手册》)——第三方电源适配器和电缆可以为手机充电, 但其规格与TLC Explorer不兼容。如果电源适配器和电缆可以与其他设备配合使用, 但不能用于TLC Explorer, 则您可能需要联系设备的经销商以获得技术支持(参见6.2分节)。
- 3) 如果抽屉未完全关闭, 请检查底板下方的定位销**P3**是否已插入抽屉上的插孔**P4**, 因而使底板平放在抽屉上。底板上不应有高于8毫米的物体。如果抽屉似乎被设备内部的某物体堵塞了, 您可以打开后盖**B7**并清除障碍物。
- 4) 当传感器指示抽屉未正确关闭时, 红色抽屉打开灯**F6**将会亮起。尽管抽屉打开, 但无法打开光源并且无法拍摄图像。检查抽屉是否真的已正确关闭。在极少数情况下, 软件或传感器问题可能会导致系统错误地将抽屉检测为打开。如果您怀疑是这种情况, 请重新启动设备。
- 5) 出于安全考虑, TLC explorer只在抽屉正确关闭且后盖**B7**正确安装的情况下才允许打开光源。另外, 当另一用户正在捕捉图像时, 手动灯光开关**F2**、**F3**、**F4**被停用。
- 6) 如果一个或所有光源不工作, 或者一侧的照明看起来很暗, 则可能需要更换照明装置。该过程只需几分钟, 详细说明见《操作用户手册》。如果更换后, 已更换的照明装置仍保持暗淡, 请确认装置的电源连接器已插入(请参阅《操作用户手册》), 并且后盖**B7**已正确关闭。
- 7) WiFi配置问题也可以通过使用以太网连接连接到设备来解决。然后, 您可以通过以太网连接访问设置页面并纠正配置。
- 8) 要将所有网络设置重置为默认值, 请按照下面5.3.1分节中给出的说明进行操作。之后, 通过3.4分节中所述的步骤, 您应该能够连接到TLC Explorer自己的WiFi网络。

- 9) 网络管理员可能已在网络配置或您的设备设置上安装了安全措施,从而阻止您的设备连接到TLC Explorer。如果有怀疑,请询问您的网络管理员。
- 10) 某些移动设备会优先使用可访问互联网的网络连接,而TLC Explorers自己的WiFi网络不能访问互联网。因此,可能有必要打开移动设备的WiFi设置,禁用对已保存的、可访问互联网的网络的“自动连接”——那些除了TLC Explorer之外也可使用的网络。
- 11) 请注意,每个TLC Explorer都会以不同的名称(通常包括其序列号)广播WiFi信号,该名称可能受不同密码的保护。如果您的实验室使用多台TLC Explorer设备,则有必要使用特定设备粘纸上的二维码进行连接(只要默认网络设置未更改)。
- 12) TLC Explorer尽力通知同一网络中的所有设备:它可以通过跟设备名称的URL“http://”访问(参见3.4分节)。但是,某些网络可能不支持此功能,并要求用户通过设备的IP(例如“http://192.168.200.1”)来寻址设备。如果并行移动设备通过移动数据具有互联网连接并尝试在万维网上查找后跟设备名称的URL“http://”,则这也可能是必要的。
- 13) 一些浏览器强制执行加密连接,并可能自动更改所输入的地址至以“https://”开头,然后生成一个警告说该网站可能不安全。浏览器无法知道您正在受保护的本地网络中访问TLC Explorer,这比打开互联网站点所带来的风险要小得多。或者,您可以在浏览器设置中禁用“仅https”(另参见3.4分节)。
- 14) 只有当输入了唯一且有效的图像集名称,并且系统不忙于图像捕捉时,“现在捕捉”按钮才可使用。如果用户在“使用手动曝光”部分中多次按下“自动”按钮来查找最佳曝光时间,则可能会出现较长的延迟。此过程可能需要一些时间,特别是对于紫外光源,因为一系列图像须捕捉和处理。
- 15) 为确保没有杂散光影响图像质量(例如,由于检查窗口F7打开),相机会在开始图像捕捉过程之前检查底板是否在没有光源打开情况下完全黑暗。可以在“设置”页面上禁用此项检查,但建议启用它。
- 16) 一次只有一名用户能捕捉图像。尽管其他用户可以平行加载和处理图像集,但竞争尝试捕获图像将导致错误消息。

- 17) 如果可用的存储空间不足以保存捕捉的图像,则会显示错误消息。请将所有当前处理不需要的数据转移到其他设备,并在TLC Explorer上删除其副本。在文件管理器的右下角(通过右上角的主菜单访问),您可以看到“剩余可用空间”。请至少保留250MB的可用空间,以确保系统运行流畅。
- 18) 软件将TLC板作为明亮的矩形并具有最小尺寸的性状搜索。要使多个薄板被自动检测,请将它们分开几毫米放置,以便设备检测到每个板周围至少2毫米的黑色涂层。
- 19) 如果通过检查窗口F7观察,薄板看似被正确照亮,但在板图像中照明不均匀,则可能是应用了不正确的照明校正。可以停用校正步骤,或重新校准计算。详情请参阅《操作用户手册》。
- 20) 作为最后的解决办法,所有用户数据、设置和软件更新都可以通过执行出厂重置来删除,如以下5.3.2分节中所述。
- 21) 请联系TLC Explorer的经销商以获得技术支持。

5.3 重置TLC Explorer

5.3.1 重置网络连接

如果网络设置发生某些更改或忘记了WiFi密码,妨碍您连接到TLC Explorer,则记住网络设置始终可以重置至出厂默认设置。

要重置网络连接,请在TLC Explorer启动时(即只要电源图标F1闪烁),触摸并按住任意**两个**(不是全部三个!)照明按钮(F2、F3)。然后您应该能够使用图3.1中所示的二维码连接到设备。

5.3.2 恢复出厂设置

启动恢复出厂设置时应小心谨慎,因为它会删除所有用户的数据以及所有设置,包括网络设置。恢复出厂设置还会重新安装设备交付时的软件版本,并删除设备中的所有其他软件版本。

要开始恢复出厂设置,请在TLC Explorer启动时(即只要电源图标F1闪烁),触摸并按住所有三个照明按钮(F2、F3、F4)。

6 清洁、维护和退役

6.1 清洁

建议定期使用湿润的不起毛纸巾清洁TLC Explorer,尤其是底板。为了去除顽固的污垢,也可以使用以酒精和水按1:1比例混合的混合液湿润的清洁纸巾。

在开始清洁程序之前,请关闭设备(请参阅3.6分节)并拔下USB-C电源**B1**。然后才从抽屉中取出底板,将其各面擦拭干净。如果抽屉上或外壳上有来自TLC板的二氧化硅颗粒或灰尘,则抽屉和外壳都可以用相同的方式清洁——确保不要触摸照明装置。或者,也可以打开后盖**B7**,使用手持低功率吸尘器和纸巾小心地清除设备内部的污垢。

请注意:溢洒的液体或其他材料应立即清除(另见1.2.1分节)!

6.2 联系技术支持

有关保修、保修相关问题或特定于您的设备的问题,请联系TLC Explorer的经销商。同样,当遇到1.2.1分节中“在以下情况下请勿操作TLC Explorer”项下列出的情况之一时,如果对如何继续操作有疑问,请通过www.sigmaaldrich.com联系您的设备经销商或当地供应商。

对于一般技术问题和软件更新,请使用下面图6.1中提供的链接访问TLC Explorer官方支持网站。



图6.1: TLC Explorer的服务网页位于:
www.sigmaaldrich.com/TLCservice

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6.3 订购配件和备件

目前，TLC Explorer产品组合包括以下产品，可以作为附加设备或替换零件单独订购：

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目录号	名称	说明
1.52610.0001	TLC Explorer	TLC记录系统, 包括在3.1分节中作为交付范围列出的部件。
1.52613.0001	照明装置	更换部件只有当您的TLC Explorer中的光源损坏时才需要。装置配备适用于所有照明类型的LED和镜片, 例如可见光灯和紫外光灯, 而且只能整体更换。
1.52612.0001	底板	附加一块底板可以简化和加快工作流程, 因为在TLC Explorer中记录一块底板的同时, 可以预备另一块底板 (参见2.3分节)。

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目录号	名称	说明
1.52611.0001	充电宝 (移动电源)	独立于电网之外为TLC Explorer供电——例如, 供在远离主电源的情况下使用。
1.52618.0001	防尘盖	更换防尘盖可保护您的TLC Explorer免受灰尘影响。

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常用TLC耗材(例如TLC板、溶剂和染色剂)以及TLC过程中使用的工具(例如展开舱)可在Sigma Aldrich网站上获取, 网址:
www.sigmaaldrich.com。



图6.2: 在以下位置查找TLC耗材和工具: www.sigmaaldrich.com

6.4 退役、储存和处置

如果您决定停用TLC Explorer, 您可以将其存放起来以供以后使用, 也可以将其退还给TLC Explorer的经销商或分销商。

TLC Explorer中没有电池。因此, 在存放、运输或退回设备之前, 您无需取出任何电池。

但是, 内部存储器上可能仍然存储有敏感数据。强烈建议您在停用TLC Explorer之前启动恢复出厂设置(参见5.3.2分节)以删除任何用户数据。

还应清除设备上所有可见的残留物和硬壳化材料。如果设备接触危险化学品或传染性/生物危害性材料, 则必须进行相应的净化消毒。请注意, 如果未正确净化消毒, 经销商可拒绝接收退役的设备。

要存储该设备, 请取出所有TLC板并检查确认没有插入USB记忆棒。请勿将底板或任何附件留在外壳内, 而应将它们在外壳旁边单独包装。最好使用原始包装(包括内包装), 以在存储时保护设备。确保储存场所干燥, 相对湿度在20-80%之间, 温度保持在15-40摄氏度范围内。

根据欧盟关于废弃电气电子设备(WEEE)管理指令2012/19/UE, 严禁将TLC Explorer与未分类的城市或家庭垃圾一起处置。相反, 应将其送到

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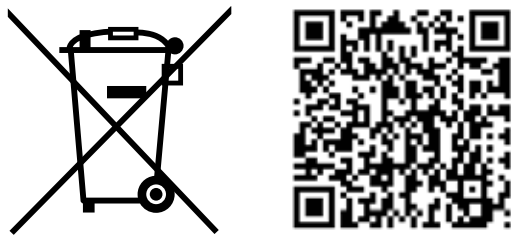
1

官方的电气和电子废物收集和回收中心, 或返回给TLC Explorer的经销商。

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有关您所在地区提供的回收计划的更多信息, 请访问www.sigmaaldrich.com/EN/en/life-science/quality-and-regulatory-management/recycling。

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图6.3: 仅在官方收集和回收中心处置设备或将其退还给经销商。

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7 附录

7.1 设备尺寸和规格

(外部) 电源	USB-C电源装置/65W
电源	外部电源装置 (HA65NM170) 配有单独的电源线 (1.8米长), 适合B、G、N、I、D、E/F型插头 (插头必须符合当地规格)
电源要求	外部电源装置为100伏–240伏、50/60赫兹
电能消耗	标准工作情况: 18.8瓦; 待机模式: 0.83瓦
测量技术	TLC板记录系统使用视频光密度测量。
波长范围	TLC Explorer提供标准照明用于检测TLC板 (另请参见12.2分节): · 可见光 (VIS) · 紫外光C-波长: 254nm · 紫外光A-波长: 366nm
照相机	RGB传感器有3280×2464有效像素, 一个像素在TLC板上捕获约85×85 μm的区域。
通信接口	· USB: 2 × USB-A (用于直接连接USB记忆棒) · 以太网: LAN (局域网) · WLAN IEEE 802.11 b/g/n (2.4 GHz)
防护等级 (IP)	IP2X (用于主机外壳)
环境条件: 温度	· 设备可在15°C至40°C的温度范围内运行。 · 储存和运输温度应在0°C至40°C之间。
环境条件: 相对湿度	· 设备可在相对湿度20%至相对湿度80%的湿度范围内运行, 并应保证无冷凝条件。 · 储存和运输的湿度应在15%相对湿度至95%相对湿度范围内, 并应保证无冷凝条件。
环境条件: 海拔	< 2000米
尺寸	374x312x290毫米 长x宽x高
TLC板尺寸	使用尺寸为20厘米x20厘米或更小的TLC板

1	重量	约10.4千克
2	仪器安全	符合 低电压指令2014/35/EU IEC 61010-1 ANSI/UL EN 61010-1 CSA-C22.2 No. 61010-1-12
3	EMC	符合 EMC指令2014/30/EU EN/IEC 61326-1 / EN 301 489-1 FCC
4	RF	符合 RED 2014/53/EU EN 300 328, FCC 包含： FCC ID 2ABCB-RPICM4 IC:20953-RPICM4
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7.2 有害物质名称和浓度表

成分名称	有害物质名称					
	(铅)	(汞)	(镉)	(铬6+)	(多溴联苯)	(多溴联苯醚)
外壳	O	O	O	O	O	O
光学镜片	O	O	O	O	O	O
电子产品	O	O	O	O	O	O

- O: 表示该有毒或危害物质在该部件所有均质材料中的含量均在SJ/T11363-2006规定的限量要求以下。
- X: 表示该有毒或危害物质至少在该部件使用的一种均质材料中的含量超出SJ/T11363-2006中的限量要求。
- 表中列出的数据代表发布时可获取的最佳信息
 - 产品要在产品手册中定义的环境条件下运行, 以维持声明的EFUP
 - 耗材或部件可能有自己的标签, 其EFUP值小于系统值。以维持声明的EFUP, 定期更换那些耗材或零件是按照声明的EFUP进行的, 是按照产品维护程序进行的

7.3 中国SRRC批准的无线电ID

CMITT ID: 2023DJ15480

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我们尽我们的知识和能力,向客户提供有关应用技术和监管事务的信息和建议,但不承担任何义务或责任。我们的客户在任何情况下都应遵守现行法律和法规。这也适用于第三方的任何权利。我们的信息和建议并不能免除客户检查我们的产品是否适合预期用途的责任。

德国达姆施塔特Merck KGaA的生命科学业务在美国和加拿大以MilliporeSigma名称运营。

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