



Q-Moisture Software

User Manual

0 Abstract.....	1
1 Installation.....	2
2 Getting Started.....	2
3 Main Window.....	3
4 Device Configuration Window.....	4
5 microSD Card Window.....	6
6 Device Info Window.....	7
7 Calibration Data Window.....	7

0 Abstract

Q-Moisture is a Windows application used to control and configure the TMM-1 trace moisture meter. It is available free of charge for TMM-1 customers. Check the TKE website to download the latest version.

Alternatively users can control the TMM-1 via command line. See the documents **TMM-1 Command Line Getting Started** and **Trace Moisture Meter USB API** for details.

1 Installation

The software comes in a self-extracting archive named Q-Moisture-Setup.exe. Start the setup and choose a destination folder for the program. The recommended location is

C:\Program Files\

From this folder start Q-Moisture.exe to run the program.

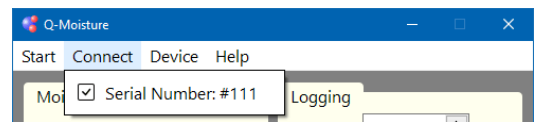
For convenience you may create a program icon that points to Q-Moisture.exe in the Windows start menu or taskbar or desktop.

To remove the software simply delete the installation folder.

2 Getting Started

2.1 Connecting to the TMM-1

Hook the TMM-1 to the computer via a USB cable and wait a few seconds until the display shows the start screen.



Start Q-Moisture and click **Connect** in the menu bar. The dropdown list shows all identified TMM-1 devices. Select one to connect with.

When the connection is established, Q-Moisture downloads all settings and operating states from the TMM-1. Now you can make changes to settings or start a logfile etc.

It is possible to open the Q-Moisture software multiple times, then you can connect to more than one TMM-1 at the same time.

You can disconnect and re-connect the device any time without interrupting what it does.

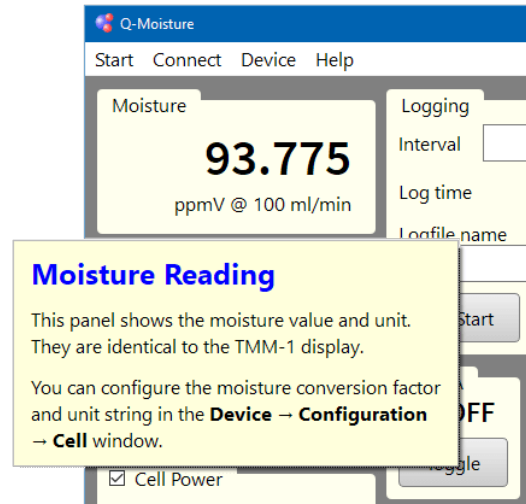
***Notice:** If you leave your computer unattended it might go into a sleep state and turn off the USB power. To ensure uninterrupted operation of the TMM-1, it should have an external DC supply.*

2.2 Driver Installation

If there is no device listed, it might be necessary to install the communication driver. Open the Windows device manager and look for an unknown USB serial port device. Right click on it and choose *Update Driver* → *Search on my computer*. Navigate to the installation folder of Q-Moisture and select the *Driver* folder. Windows should find and install the driver from there.

2.3 Online Help

The program is divided into yellow cards. For each card you can open a help text by clicking on **Help** → **What's this?** and then on the card. This also works in the windows that open from the **Device** menu.



3 Main Window

3.1 Moisture

This panel shows the moisture value and unit. They are identical to the TMM-1 display. You can configure the moisture conversion factor and unit string in the **Device** → **Configuration** → **Cell** window.

3.2 Integral

This panel shows the amount of dissociated water and its unit. They are identical to the TMM-1 display. You can configure the conversion factor and unit string in the **Device** → **Configuration** → **Cell** window.

Press **Start** to reset the counter to zero and begin the integration.

Press **Stop** to hold the integration.

Alternatively you can start/stop the integration with the pushbutton at the TMM-1.

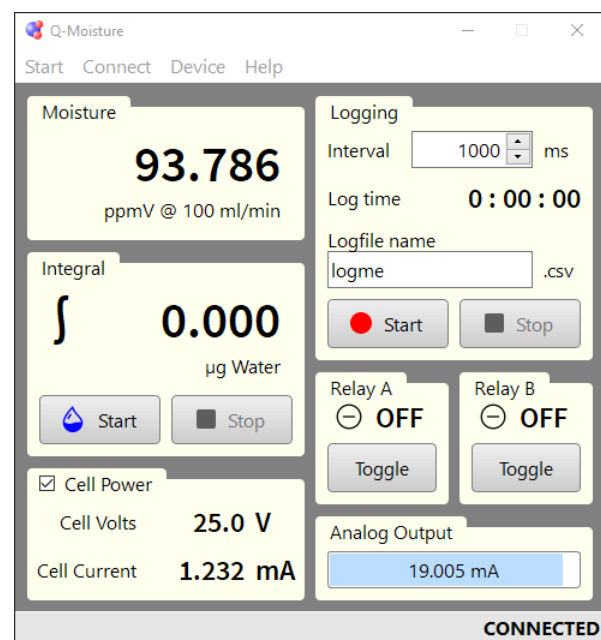
3.3 Cell Power

This panel shows the actual voltage at the cell and the electrical current flowing through the cell. You can configure voltage and current limit in the **Device** → **Configuration** → **Cell** window.

The **Cell Power** checkbox switches the cell power relay (relay C).

3.4 Analog Output

This display shows the signal current through the 4-20 mA analog output. The signal can be derived from various internal signals as configured in the **Device** → **Configuration** → **Outputs** window.



The **bar graph** visualizes the value between 4 and 20 mA.

An external power supply is required to measure the output current. See the TMM-1 operator's manual for details.

3.5 Relay A/B

These panels shows the switching state of Relay A and B. ON means the contacts are closed.

You can configure relay signal sources and switching thresholds in the **Device** → **Configuration** → **Outputs** window.

With the **Toggle** button you can manually switch the relay.

Attention: After toggling manually the relay will keep its state until reconfigured to automatic operation.

3.6 Logging

Here you can start the data acquisition onto microSD card. You can then download the file via the **Device** → **microSD Card** window.

The **Interval** field defines the time between samples that are written to the file.

The **Log time** counter shows the elapsed time since the start of the recording.

The **Logfile name** field allows to set an individual name for the log file. If the name already exists, it will be enhanced by a number suffix. You can set the file format (CSV or TMM) in the **Device** → **Configuration** → **Data Acquisition** window.

The **Start** button starts the recording. The actual filename with suffix appears in the name field while the recording runs.

The **Stop** button terminates the recording.

Alternatively you can start a log with the pushbutton at the TMM-1. In this case the filename will be the one specified in the **Device** → **Configuration** → **Data Acquisition** window.

4 Device Configuration Window

In this window you can configure all features of the TMM-1 and store them as power up default.

Press **Load Settings from Device** to retrieve the current configuration from the TMM-1. Alternatively press **Load Factory Settings** to reset all settings to standard values. Now you can edit the settings as needed.

The **Apply** button uploads all settings to the TMM-1. They immediately take effect.

The **Flash** button uploads all settings and stores them permanently on the internal flash memory of the TMM-1 (not on the microSD card).

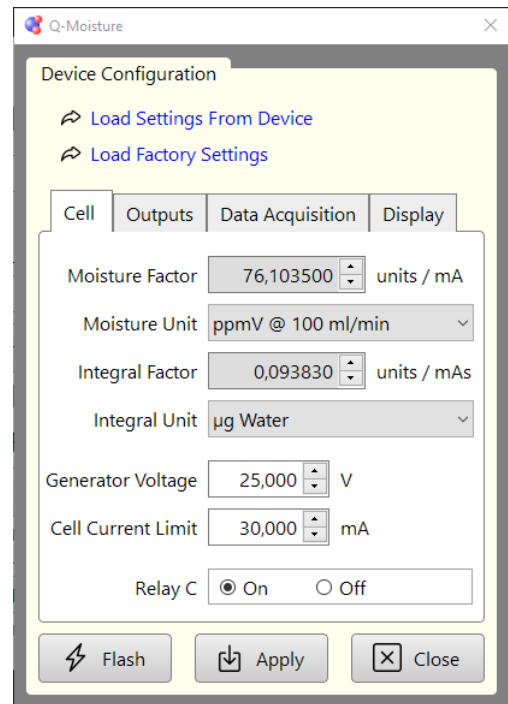
4.1 Cell

Choose one of the predefined moisture measuring units from the **Moisture Unit** combo box. The according conversion factor is loaded to the **Moisture Factor** field. If you select *custom factor* you can manually edit the factor and unit string which will be displayed on the TMM-1.

Choose one of the predefined measuring units for the accumulated amount of water from the **Integral Unit** combo box. The according integral factor is loaded to the **Integral Factor** field. If you select *custom factor* you can manually edit the factor and unit string which will be displayed on the TMM-1.

You can set the output voltage that is applied to the cell in the **Generator Voltage** field and set a **Current Limit**.

You can turn off the **Relay C**. This disconnects the cell minus terminal, which may be useful if you don't want the cell to be set under voltage right after power up of the TMM-1.



4.2 Output

Select a relay switching condition in the **Relay A/B On While** dropdown list.

Most switching conditions require a **Threshold** to be defined.

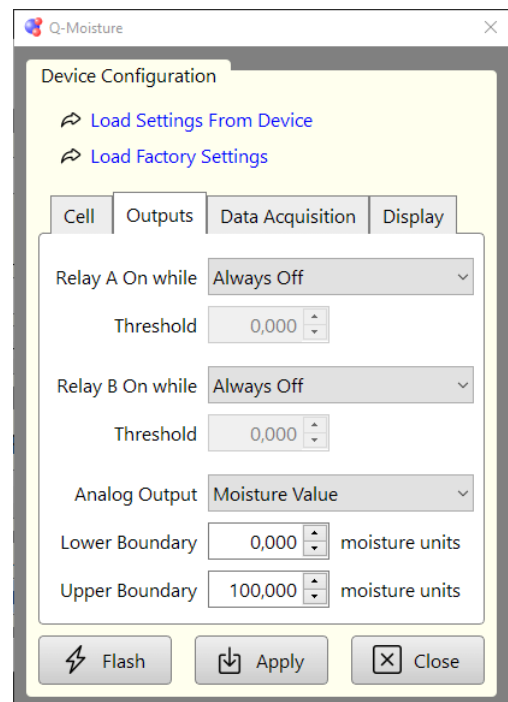
*Notice: If you have toggled a relay manually in the main window, the relay A/B switching condition defined here is no longer in action. Press **Apply** to restore the condition.*

Select a signal source for the 4-20 mA analog output from the **Analog Output** dropdown list.

The **Lower Boundary** field declares the signal value that corresponds to a 4 mA output current. In case *Fixed Current* is selected, the value here directly sets the output current in mA.

The **Upper Boundary** field defines the signal value that corresponds to a 20 mA output current.

It is allowed to have the upper boundary value smaller than the lower boundary to get an inverted output.



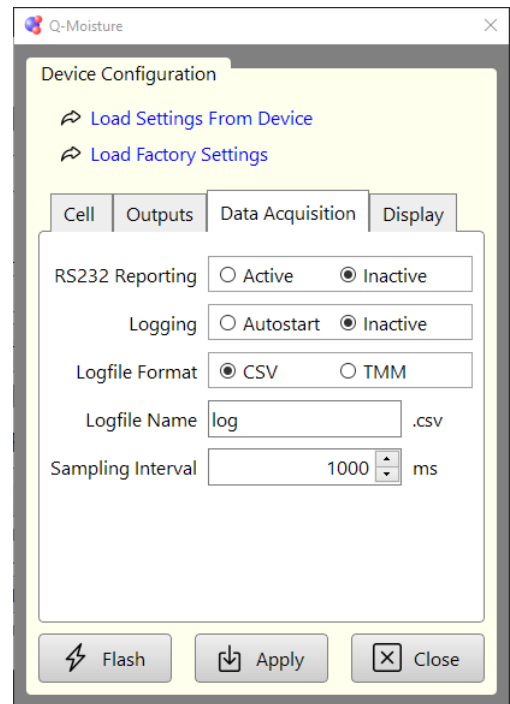
4.3 Data Acquisition

RS232 Reporting activates the emission of sample data through the RS232 port.

Logging: when set to **Autostart**, the TMM-1 will automatically begin logging after power up.

Logfile Format: CSV (comma separated values) is a simple text format that can be opened by any text editor or easily be imported to a spreadsheet program. The **TMM** format is a space saving binary format, which can only be opened by the Q-Moisture software once it supports that format.

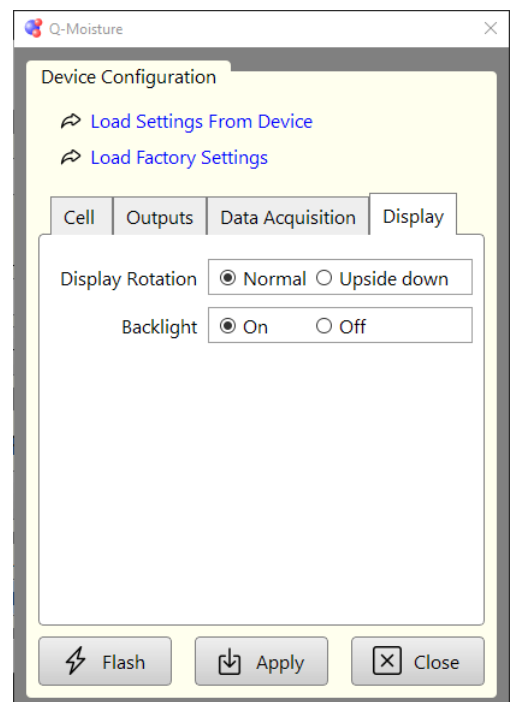
The **Logfile Name** and **Sampling Interval** are used when you start a recording by the pushbutton at the TMM-1 or when it automatically starts a recording after power up.



4.4 Display

Switch the **Display Rotation** and **Backlight** on this tab.

If the TMM-1 is battery operated or runs unattended the most time you can save power by turning off the backlight.



5 microSD Card Window

This window provides access to the microSD memory card in the TMM-1. You can pull the window larger with the grip at the lower right corner.

The **file list** shows all files in the root directory of the memory card. Click on the **Filename** or **Size** header to sort the list.

Click on file entries to select them for download or deletion.

The **Download** button opens a dialog where you must choose a destination folder for the selected files. After that the download begins.

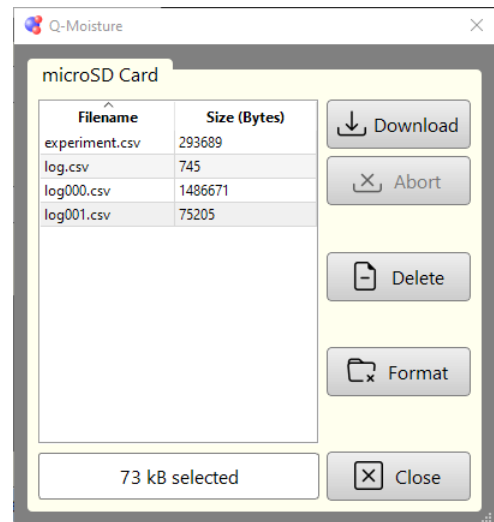
You can abort a running download with the **Abort** button if it takes too long. A truncated file will be stored in this case. Nevertheless you can open this file.

The **Delete** button immediately deletes the selected files from the memory card.

With **Format** you can format the microSD card to FAT32. All Files will be lost!

The **bar graph** shows the amount of selected data and the download progress.

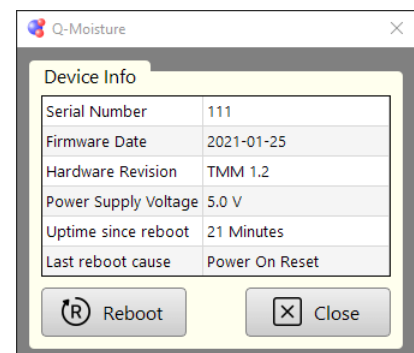
Notice: Formatting does not work if the card is already formatted with NTFS or another non-FAT format. In this case format the card in a computer with FAT32 first. In case of an SDXC card you need a special formatting tool for this purpose.



6 Device Info Window

This window provides some basic data about the connected device.

The **Reboot** button triggers a microcontroller reset on the TMM-1 and disconnects the Q-Moisture software from it. When the device has come back to life you can connect it again.



7 Calibration Data Window

This window shows the calibration data that is stored in the TMM-1. If you edit values they will immediately take effect.

TKE does not recommended to change values as long as the TMM-1 works accurately.

The **Hardware Revision** must match the actual hardware, otherwise malfunction is likely.

Cell I Gain is the cell current gain calibration.

Cell Voltage sets the ADC code values for 5 V and 20 V of the cell voltage measurement.

Cell Umax sets the DAC code values for 5 V and 20 V of the cell voltage generator.

Cell Imax sets the DAC code values for 1 mA and 100 mA of the cell current limiter.

Analog Out sets the DAC code values for 4 mA and 20 mA at the analog output.

The **Default** button loads default values to all input fields. *Notice: The TMM-1 is uncalibrated after pressing Default.* The default values are useful as starting point for the calibration.

The **Flash** button permanently writes all values to the internal flash memory of the microcontroller.

You must enter a **Password** before you can store the values permanently.

Calibration Data	
Serial Number	111
Hardware Revision	TMM 1.2
Cell I Gain	1,009510
Cell Voltage 5V	199
Cell Voltage 20V	796
Cell Umax 5V	778
Cell Umax 20V	3108
Cell Imax 1mA	34
Cell Imax 100mA	2996
Analog Out 4mA	2693
Analog Out 20mA	13595

Buttons: Password, Default, Flash, Close