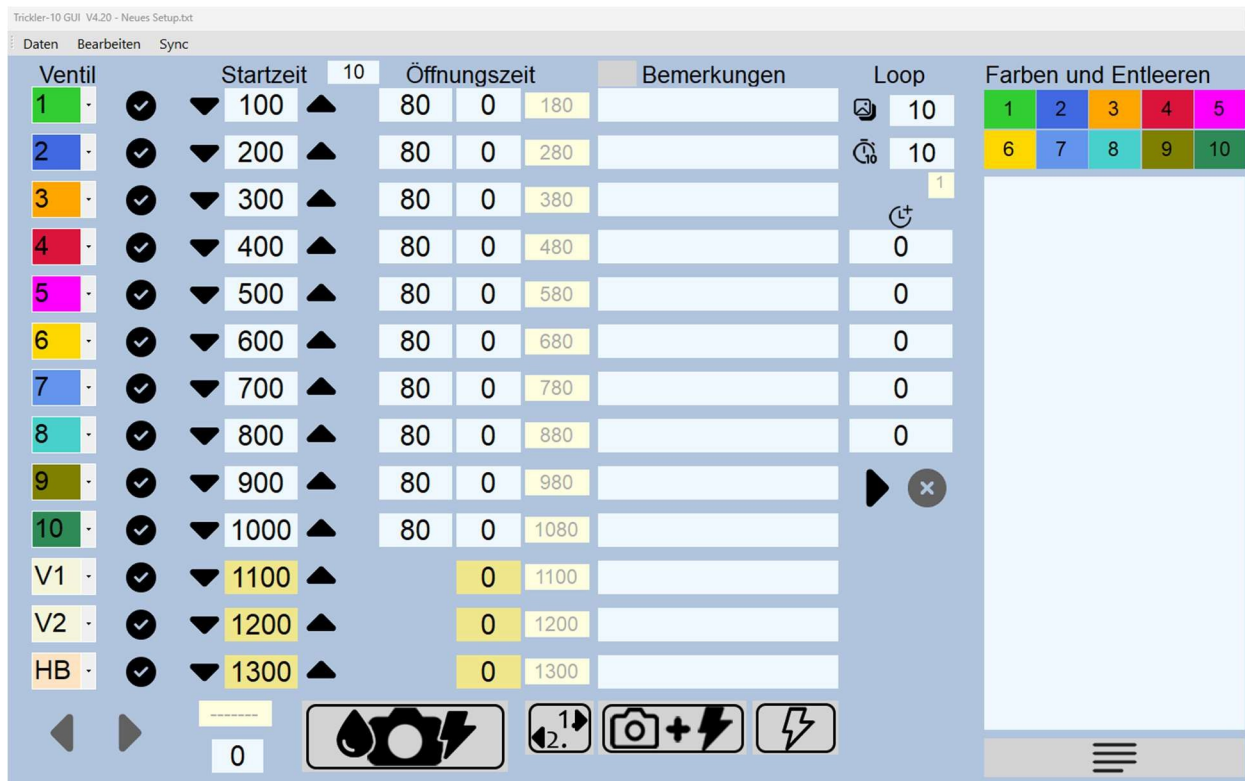


Operating instructions

TRICKLER-10 v4.22

24.5.2025 HJ

A Graphical User Interface (GUI) for the TRICKLER-10 and Windows.



The **TRICKLER-10** was created from the "crazyTrickler", which is no longer available.

The **TR10**, as I would like to call the device in the following, is a new development to meet the special needs of drop photographers even better.

The TR10 is both an entry-level device for beginners in drop photography and a sophisticated instrument for drop professionals.

These instructions are primarily concerned only with the functions relating to the GUI.

In general:

The TR10 is an independent hardware development. There is no connection to the manufacturers or distributors of the old "crazyTrickler".

If you have any questions about hardware, operation or new functions, please contact info@hansjuergjenzer.ch or www.tropfenshop.ch. There are other interesting specialties here.

The connection to the original software developer is re-established, but is not disclosed.

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1 Commissioning

1.1 Installation and Start:

Download the GUI software:

The **GUI DEMO software** can be downloaded free of charge from the TRICKLER-10 homepage.

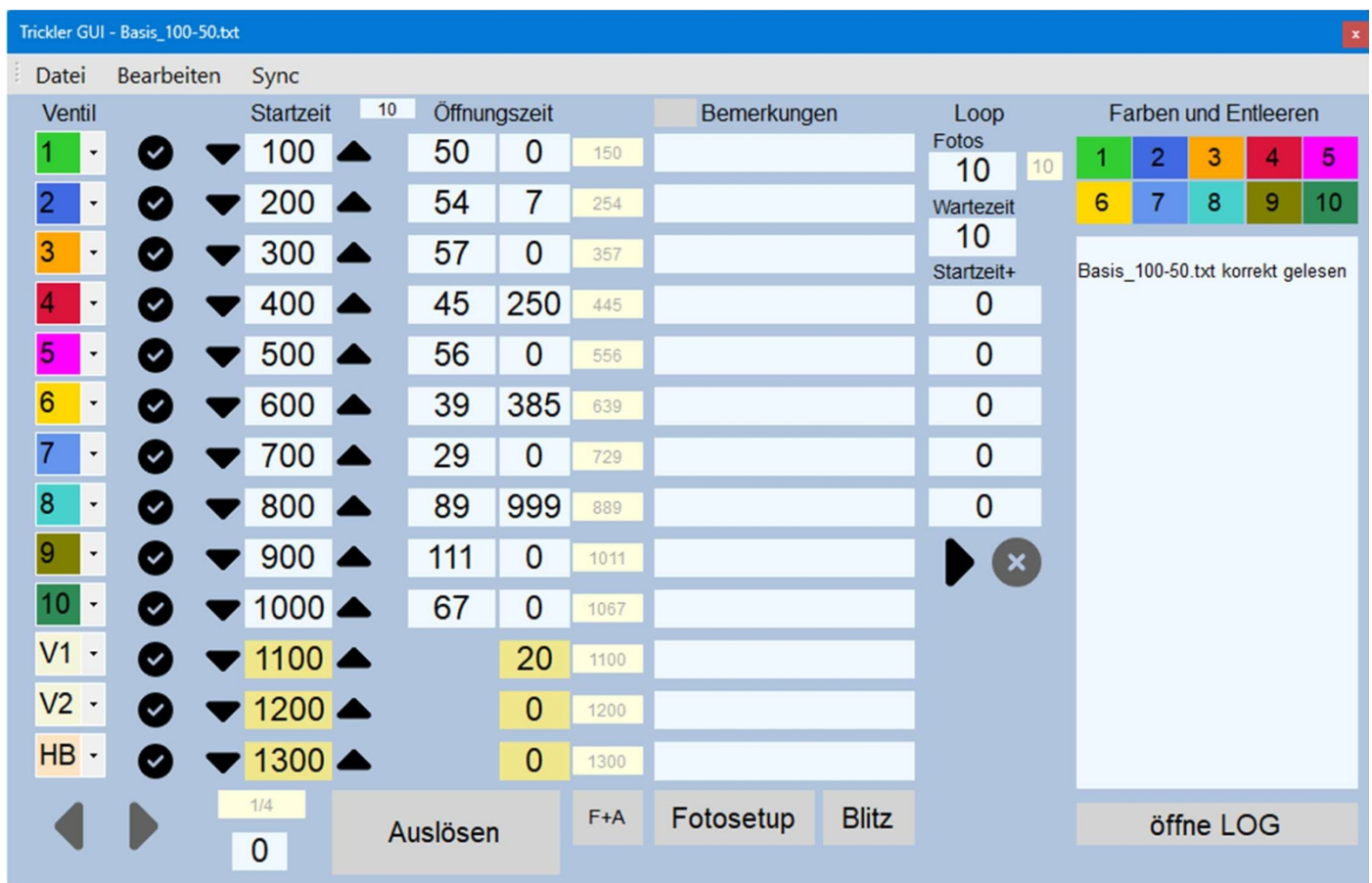
Here is the link: <https://tropfenshop.ch/trickler-10-informationen/> It is fully functional, but cannot be connected to a TR-10.

- After purchasing a TRICKLER-10, you will receive a link to the functional GUI file.

Please create a separate folder for the TRICKLER area and unzip the ZIP file into it. The following files are stored

> GUI-4.x.exe > Languages" folder with the language files.

Connect the TRICKLER-10 to the PC and start the [GUI-4.x.exe](#) within your folder. After the start you will see this window.



The subfolders "save" and "setup" are created in the installation folder at the first start.

A "log file.txt" is created in the "setup" folder. The saved droplet logs are stored there later. When the GUI is closed, the setup for the next start is also stored in the "setup" folder.

1.2 Language of the GUI

The GUI can now also be started in **languages other** than German. Where the SAVE and SETUP folders are stored, there is now also the LANGUAGES folder. This folder must be stored there manually. It contains the language files.

>> The GUI generally uses the file "**TR-10_txt.dat**" to display the texts.

The GUI will no longer start without this file.

To change the language, you can now copy one of the existing text files and rename it to "TR-10.txt". Be sure to copy it first so that the original is retained.

Example: Delete the file "TR-10.txt".

Then copy "TR-10_fr.txt" and rename this copy to "TR-10_txt". Start the GUI.

The texts are now in French.

The original file "TR-10_fr.txt" still exists.

It is up to each user to translate the original German file "TR-10_en.txt" into their own language using an online translator.

1.3 Com Port

After starting, the GUI automatically searches for the COM port and connects to the PC.

If an error message appears in the text window, you can start a new connection attempt by clicking on Edit/Com-Port. The result of the connection attempt is displayed in the status window.

Attention:

Depending on the Windows version, the CH341 driver may need to be loaded. Please note The TRICKLER-10 SHORT INSTRUCTIONS, which are downloaded together with the final GUI.

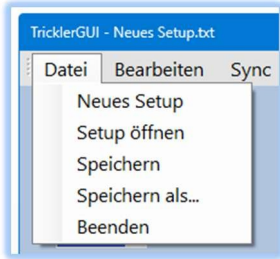
Letztes Setup:
Neues Setup.txt, geladen
crazyTrickler nicht gefunden!!
crazyTrickler nicht gefunden!!
crazyTrickler mit COM5
verbunden.

In order to always achieve a good connection, it makes sense to have as few USB devices as possible on the computer, preferably no other devices at all. Once the connection has been established, a message will also appear in the text window.

If the camera and flashes are already connected, the "Photo setup" or "Flash" button can be used to test whether the connection works.

2 The menu bar

2.1 File Menu



New setup can be used to start again. The times are entered approximately as shown in the picture at 1.1.
The main flash is automatically placed in the bottom line.

Open setup can be used to open any old setup from the "setup folder" to start again.

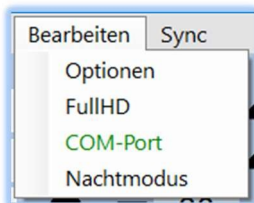
Save updates the loaded setup with the new entries.

Save as... saves the current setup under a new name to be entered.

Exit When closing the GUI via **Exit** or via the **X at the top right**, the GUI saves the setup and loads it automatically at the next start.
So you can pick up immediately where you left off 'last night'.

The setups in the save folder are simple, individual text files and can be viewed and changed with the editor. (not useful)

2.2 Edit Menu



Options:

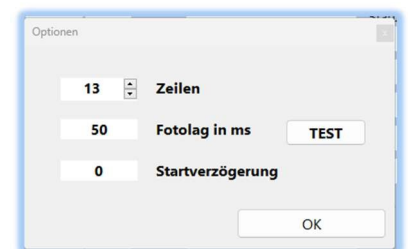
There are three things to adjust here at the moment.

Lines: The user interface is line-oriented. Each line represents a drop or the triggering of a flash. The more drops you need for your image, the more lines you need.

The number of visible lines can be between 5 and 15. 13 lines is standard (10 valves and 3 flashes).

Photolag in ms: The photolag is the time your camera needs from the shutter release impulse to the complete opening of the shutter. This can be set and tested here. Simply connect the camera and a flash to the TR10 and use the "TEST" to determine the correct value. A tutorial and a more detailed explanation of the photo lag follows below.

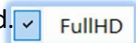
Start delay: A waiting time can be set here that delays the "TRIGGER" button. The time is set in milliseconds. (1000 = 1 second)



FullHD:

The GUI has been optimized for old monitors (which are often used in the basement at the drip table) and also for people who work with a FullHD notebook with a 13" screen. Unfortunately, continuous zooming is not possible - there is only "large" and "small". Try it out to see which size of the GUI fits better.

When FullHD is switched on, the selection is highlighted.



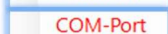
ComPort:

This menu item shows whether the ComPort has recognized a TR10.

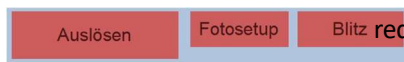
- TR10 Active



- TR10 inactive



If the ComPort is inactive, the buttons



A click on



ComPort switches the port On or Off

Experience:

It is recommended to connect the TR10 to the PC as directly as possible and before starting the GUI.

External USB hubs can lead to the triggering process being aborted.

This is shown by this picture.

The display remains on the status "in progress". Solution:

Disconnect and reactivate ComPort

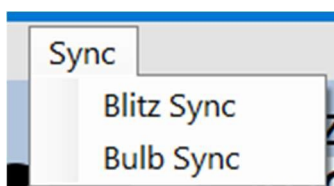


Night mode:

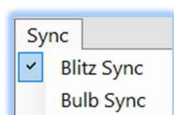
The GUI can be switched from day to night mode. Just try it out and

spare your eyes 🌞 > 🌙

2.3 Sync Menu



Blitz Sync:



If this menu item is activated, the start times of V1 and V2 remain synchronized with the main flash.

All times are always the same as long as only the main flash time is changed.

You can still change the other flash times, this is also taken into account when triggering, but if you then adjust the main flash time again, V1 and V2 are overwritten with the HB time.

This function is intended for using several flashes simultaneously if no external flash control unit is connected to the HB



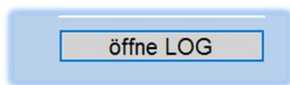
If this menu item is activated, the start times of V1 and V2 change in the same way as the main flash.

For example, if the flash times are set to HB=400, V1=500 and V2=600 and "Bulb Sync" is checked, the other flash times increase by 2ms if the main flash is increased by 2ms. The times would then be HB=402, V1=502 and V2=602.

3 Photo- Log:

The TR10 offers the option of logging the set values for each photo. However, only the values used are recorded.

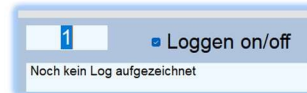
For this purpose, a "YYYY MM DD - Log file.txt" is created in the setup folder the first time the log is used. A new log file is created for each new day.



The 'open LOG' button expands the main window and displays the log there in a text window.

Each camera saves its images under a number, e.g. DCM_123.jpeg. If you now want the log to be recorded, the image number of the next photo must be entered in the field. The check mark can then be set.

(Logging on/off)



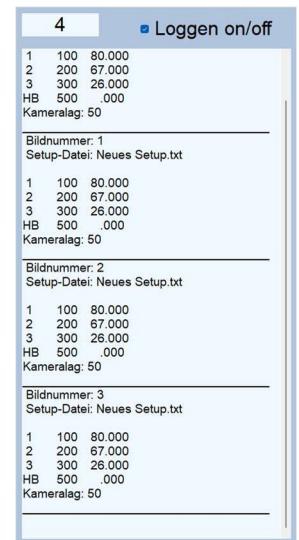
From then on, every time you click on Trigger or

When the trigger input on the TR10 is pressed, a new data record is written to the log file. The screen number is then automatically increased by 1.

The text window is updated as soon as a new picture is taken and the log window is already open. Of course, the log is also logged when you "close" the log again.

Photo setups are also logged.

When you click on the photo setup button, a line with the image number is generated in the LOG.



The current status of the "Logging on/off" checkbox is saved when the GUI is closed and applied again the next time it is opened.

If the GUI is closed and reopened on the same day, the existing daily LOG is used, the screen number is adopted and incremented by 1. This ensures consecutive numbering within a LOG file.

If the GUI is opened for the first time the next day, a new log file is created with the new date. The image number is automatically set to 1.

Experience:

I always work with a direct transfer of the images to the PC. This makes it possible to specify the storage location and the first image number, e.g:

Datum(YYMMTT)-Bildnummer (230419-001)

This means that matching the image number between the camera/storage location and the log number is no longer a problem.

Attention:

If, for some reason, no photo is taken after clicking on "Release" (camera in standby or off, memory card error, etc.), the photo log continues to count anyway. As a result, the image numbers between the log and the photos no longer match. In this case, the image number must be changed manually to the next number that has not yet been photographed.



Neither the TR10 nor the GUI can check whether an image has actually been saved. It is assumed that one has been saved.

4 Control of the valves:

Ventil		Startzeit	10	Öffnungszeit		Bemerkungen
1	✓	80	▲	50 0 130		Stamm
2	✓	100	▲	65 0 165		Schirm 1
3	✓	125	▲	26 0 151		Schirm 2
4	✗	200	▲	80 0 280		

The valves or the individual drops / flashes to be triggered are controlled as follows. Each line in the image above represents a drop/flash that is to be triggered. This means that up to 15 individual independent actions per process or photo are possible.

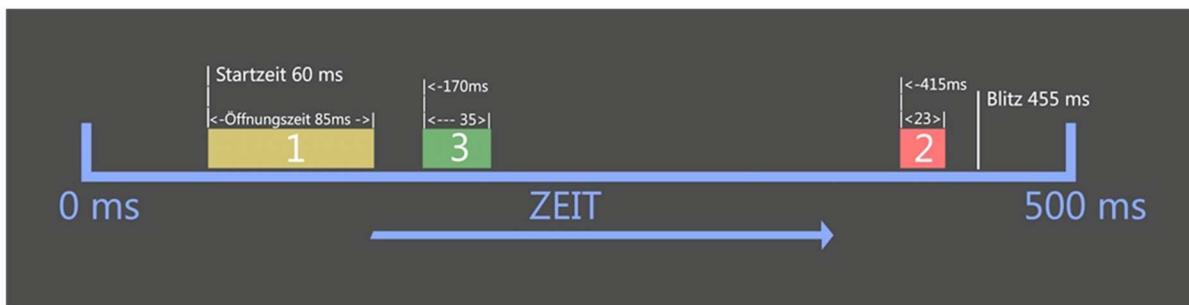
A drop always requires the values valve number, start time and opening time.

- Valve number corresponds to the output number of the TR10.
- Start time is the time between TRIGGERING (+ expiry of the start delay) and the opening of the valve.
- Opening time, how long it stays open.

The individual lines are not numbered as the drops are started when it is 'time'. It is also possible to trigger the first drop with the 7th line. Of course, for the sake of clarity, it makes sense to set the drop sequence from top to bottom.

Visualization of the time sequences

The following image shows the chronological sequence with three drops on the timeline.



Based on the times set above, the procedure is as follows:

1. The timeline starts (after the start delay has elapsed!) at 0 ms. Nothing happens after that.
2. After 60 ms, valve 1 opens and remains open for 85 ms. So not until 85 ms is reached on the timeline, but calculated from the start time of 60 ms. Seen over the entire timeline, valve 1 closes again at 60 ms + 85 ms = 145 ms.
3. Valve 3, which comes next in the time sequence, opens at 170 ms and remains open for 35 ms.
4. Valve 2 opens at 415 ms and closes at 415 + 23 = 438 ms.
5. At the end follows the flash, which I have set to 455ms. Flash times do not have an adjustable opening time, this is fixed at 1 ms.

The advantage of setting the opening time and not the end time is that the droplet size is fixed.

This is because the opening time regulates how much water runs out of the valve, i.e. how big the droplet is. This means that you can simply move the drops with the start time on the timeline without the drop changing its shape and size.

Earlier I said that the processing of the drops happens when it is 'time'. You can see what I mean by that in this picture. Here I have moved the green droplet to the start time 130 ms. As you can see, this would collide with the opening time



of the yellow droplet. However, as this is a different valve, this setting is possible without any problems.

You could also set the green drop to the same start time as the yellow drop and also start the red drop at 60 ms.



It doesn't matter as long as there are different valves that trigger the drops.

What works, but does not help, would be to open the red valve again in another line while it is already open. This only extends the total opening time of this valve.



It is of course possible to trigger a valve several times without any problems. To do this, each triggering requires its own line with its own times, and the same number is always selected as the valve.

This would then look something like this:



4.1 Operation and adjustment of the values:

Ventil		Startzeit	Öffnungszeit	Bemerkungen
1	✓	100	80 0 180	Stamm
2	✓	200	67 0 267	Schirm 1
3	✓	300	26 0 326	Schirm 2
4	✗	0	0 0 0	
HB	✓	500	0 500	

--1-- -2- ---- 3 ---- --4a--4b-- --5--

(1) The valve number is set via a drop-down list. Click on the arrow to open it and you can set the corresponding valve or a flash output. After selection, the color changes to the preset valve color in addition to the number.

(2) There is a tick next to it to activate or deactivate the line.

(3) The start time fields can be entered directly using the keyboard or changed using the mouse wheel by clicking in the field.

There are also arrow buttons. These increase or decrease the respective time by the value shown in the small gray field between "Start time" and "Opening time". This value can of course also be changed.

(4a/4b) The opening time is adjusted in the same way, except that there are no arrow buttons. Experience has shown that the opening time values are usually in the range of approx. 20 - 150 ms. You are fast enough with the mouse wheel. The opening time consists of two separate fields.

> (4a) The opening time is set in milliseconds in the left-hand field.

> (4b) You can also set microseconds in the right-hand field.

This allows droplet sizes to be set even more precisely. Values from 0 - 999 μ s are possible.

If you use the mouse wheel for adjustment and skip the 0, the value in field (4a) is also increased or decreased.

Experience has shown that adjusting the start time in the μ s range is rather pointless, which is why you can only make adjustments in the millisecond range. The TR10 really does work electronically to the nearest μ s. However, the more lines are switched on for valves, the more the actual time value deviates from the set time.

However, since we are not working with deliberate time specifications here, but with set values and their change in response to events that actually occur, this inaccuracy is irrelevant. It always remains the same. Unless you suddenly add lines within a session.

On the other hand, the repeat accuracy is very precise.

Experience:

Unfortunately, very inaccurate solenoid valves are often used. This has a negative effect on the repeatability of the drop shape on the images.

For this reason, care should be taken to use high-quality solenoid valves.

Same valve numbers= Several releases of the same valve

(5) The end time of the respective drop is displayed in the small totals window of each line.

The GUI cannot compare the values in the totals window with each other. Therefore, this window is a small help to have a better overview of the valve time overlaps described above with the same valve number. It should only be noted that valves take approx. 20ms to open.

need. The second start time should therefore be increased by at least this value. (However, this depends on the valves used)

Ventil		Startzeit	Öffnungszeit
1	✓	110	80 0 190
1	✓	210	67 0 277

Double-click on an opening time:

It is possible to trigger a single drop without a camera and flash, e.g. to align the position of a valve. To do this, double-click on an opening time. This causes the corresponding valve of this

line is opened for the set time and a drop is triggered.

Remark and comment:

You can use the individual lines for comments to write something about the valves or individual drops, e.g. the position (left, right, center or stem, screen1, screen2). The remarks are also saved.

If you click on the gray field next to "Comments", the area switches and becomes a comment field. Here you can enter text for the entire setup. This text is also saved.



Bemerkungen

Kommentar

5 Photolag and flashes:

For serious drop photography, it is absolutely necessary to use external flashes. Please do not use internal pop-up flashes on the camera!!!

Also be careful with old flashes, as they can conduct the ignition voltage via the flash connection and destroy the TR10.

Experience:

I have achieved good results with YongNuo flash units (YN-560 and its successors). They are inexpensive and easy to adjust. Of course, you can also use flashes of your own preference or those of the camera manufacturer. However, it is **important** that the flashes come from the same production series. This is the best way to ensure identical flash firing times with the same settings. Buying flashes months or years later is therefore not such a good idea. This can lead to optically longer burn-off times.

5.1 Photo lag:

With the TR10, only the flash and not the shutter release time of the camera is set.

The point of drop photography is to capture the shape of the drop.
The flash does this much more accurately than the camera shutter release.

This is why there is a **photo lag** in the Optios window (see 2.2).
The time entered here triggers the camera for each photo at this time (e.g. 56ms) before the main flash.

The exact value that needs to be set must be found out for yourself and depends on the camera.

Ventil		Startzeit	10	Öffnungszeit		Bemerkungen
1	✓	▼ 100 ▲		80 0 180		Stamm
2	✓	▼ 200 ▲		67 0 267		Schirm 1
3	✓	▼ 300 ▲		26 0 326		Schirm 2
4	✗	▼ 0 ▲		0 0 0		
HB	✓	▼ 500 ▲		0 500		

Experience:

It is quite possible that this value will change at some point.

I worked with a LAG of 64ms for 2 years. For reasons that are still unknown, this value changed one day to 125ms. Same camera, identical firmware, same TRICKLER '.

5.2 Tutorial Setting the photo lag :

The first step, of course, is to connect the camera and a flash unit to the TR10.

Set the camera to manual, auto focus off and point the camera at an object and adjust the focus.

In order to be able to take a meaningful photo, close the aperture so that the flashed object is clearly visible in the picture and stands out from the background.

To find out the photolag now, it is recommended to start with a relatively long exposure time (e.g. 1/2s) and a set photolag of approx. 100 ms.

Open the options window (Edit/Options) and click on "TEST"

The flashed object should now be visible in the photo. If this is not the case, the photo lag will be changed until it is clearly visible. Take a few pictures to see if this time is right.

Sometimes only half the image is exposed. This means that the shutter is not yet fully open. Correct the photo lag accordingly.

Now reduce the exposure time again step by step.

If the flash is no longer visible at some point, reduce the photo lag until it fits again. Then reduce the exposure time again and so on.

When you have reached an exposure time of approx. 1/60 - 1/100s and the object being flashed is visible in every picture **and the flash is running on the shortest firing time (=1/128)**, you have set the perfect photo lag for drop photography. This then no longer needs to be changed even with longer exposure times, keyword pre-flash, but more on this later.

The next step is to set the aperture to approx. 13-22 so that you can work in a normally bright room without picking up ambient light. Please note: APS-C max f16 / full format max f22, otherwise there is a risk of lens blurring.

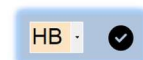
Test: Switch off the flash and take a photo. **The photo should be completely black.**

However, a permanently functioning photo lag is only possible if the camera is operated completely manually. This means manual exposure and no autofocus. This is the only way to ensure that the time between the signal from the hardware and the triggering of the camera is always the same. Some cameras also take longer to release the shutter if the previous image is still shown on the camera display.

5.3 Main flash and V1 / V2:

The main flash time is the most important time of all when photographing drops. This is because it determines the actual timing of the shot. My camera is set to manual mode. With an aperture of 20 and 1/80 sec. I get completely black pictures in daylight without flashes. This is intentional, because the flash firing time is many times shorter and more accurate than the camera shutter (approx. 1/8,000s). You can only "freeze" the drops using the flash's firing time. The flash output is controlled via the flash duration. The lower the set power, the shorter the exposure time in the order of 1/20 000 s at 1/128 flash power

It is essential that your setup always contains a line with a main flash.



If this is not the case, there is an error message **"No main flash set, no drops are triggered!"**. This is because the main flash triggers the camera, so far so simple.

If drops are released after the HB, they will of course be processed, but will certainly not make it into the picture.

A new feature is that the main flash can also be fired several times.

Flash times are always highlighted in yellow to make them easier to recognize.



Flash times do not have an adjustable "opening time". The start time can be microseconds [µs] can be assigned. These µs are always added to the set milliseconds.

5.4 Double exposures:

It is possible to use 2 more flashes with separate outputs (V1 and V2) on the TR10. This provides connections for three flash units with three individually adjustable flash times. This can be used, for example, to compensate for different synchronization times of different flash units in order to avoid double exposures.

However, **targeted double exposures** are also possible, i.e. you can flash the drop shape a few milliseconds before the main flash. This is rarely necessary, but it produces very interesting images.

5.5 Tutorial Double exposures:

You want to take a picture with two different flash times in order to capture the droplet process at two times simultaneously (as shown on the right). To do this, it is necessary to understand that such images can only be created if the exposure time on the camera is extended.

However, this extension naturally occurs later on the timeline.

Attention:

As the camera level is linked to the main flash and has not changed, **the main flash now becomes the pre-flash**. The current "pre-flash" therefore starts the camera. To do this, you must connect your flashes to the TR10 accordingly (V1 / V2). Flashes V1 and/or V2 must then flash after the HB.

In the picture on the right, the blue drop shape is the earlier one, the purple shape the later one. To photograph this, HB flashes with a blue foil first, then V1 with a purple foil.

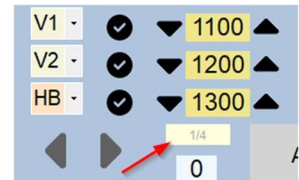
The field next to the shutter release button shows the approximate exposure time that you would have to set on the camera to get everything in the photo, given the set time interval between the two flashes.

Attention:

The time information in this window is only updated if the flash times are adjusted using the mouse wheel or the arrow keys. Manual entries should therefore always be "confirmed" with a mouse wheel movement.

Experience:

I recommend always setting the exposure time one step longer than specified in the time field. So: Time field 1/40= Came 1/30




6 Loop:

The loop automatically creates a series of images and works as follows.



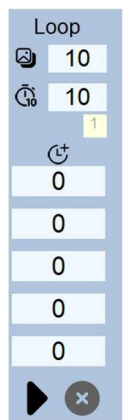
Photos Enter the number of pictures to be taken here.



Waiting This is the pause between pictures. The small window next to  counts down the seconds until the next picture. The waiting time is intended to allow the water in the pool to calm down again.



Start time+ This is intended to gradually increase the start time for each image by the entered value in ms. They always refer to the start time on the left of the same line. Start time+ is only possible in the **"Valve" lines 5-9**. If you want to work with this, you must enter the drop values that are to be increased in one of these lines. Start time+ fields, can also contain minus values and are then deducted.



One click on ▶ and the process begins. The four buttons, trigger, play, photo setup and flash, are locked during the loop process. However, it is possible to switch on valves, change the start or flash times during the loop.


The values are then always used for the next loop image.

The set drop values are changed in the individual lines during the loop, but are reset again after the loop has ended. The photo log can log all changed values.

 aborts the loop immediately.

7 Colors and Emptying:

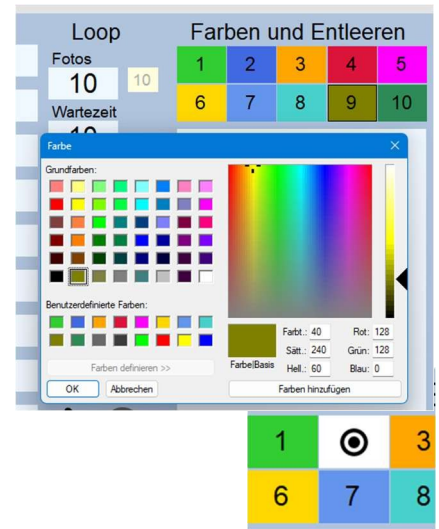
A **color** can be assigned to each of the 10 valves. Simply right-click on one of the color buttons and set the desired color using the normal Windows color dialog. It is recommended to select the same color as the water in the valve.

If you want to **drain** all the water from a **water tank** or open a valve for an indefinite period of time, simply **left-click** on the corresponding button. The button is given a symbol  and the valve is opened. The maximum opening time is 60 seconds. The valve then closes automatically to protect the electronics in the TR10.

The "Color and Empty" buttons can now also be operated with the **external trigger**.

1. Select a color button with the **middle mouse button** (wheel). A symbol is displayed.
2. This valve can now be operated with the external trigger. Press = valve OPEN / release = valve CLOSED.

This helps to bleed the valves from below with a syringe. It is advantageous if a foot switch is used for this. Then both hands are still free.



8 Status / Message window

Certain status messages from the GUI are displayed here.

9 Photo setup and flash

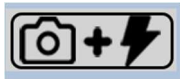


Photo setup: To set up flashes or the camera position, a flash photo without drops can be taken here. The three entered flash times (V1/V2/HB) are taken into account.

The photo setup can be started with the external trigger. To do this, **right-click** on the PHOTOSETUP. The button turns green.

As long as the button is green, the external start input on the TR-10 always triggers the photo setup. To switch back, click on the photo setup again with the right mouse button. The function is reset to normal operation.



Flash: Only the flashes are fired here. All at the same time, even if different times are set.

Experience:

Several flashes "in parallel"

- Adapters / distributors can also be built for the flash connections, so that 5 or 6 flashes can be used simultaneously as the main flash.
- I work with a Yongnuo YN560-TX flash controller on the HB connection. This allows me to program three flash circuits (e.g.: left 1BL, right 1BL and 4BL at the rear). The flash intensity can be adjusted easily and centrally via the controller without having to fiddle around with each flash).



And another free tip💡


No more empty batteries or rechargeable batteries in the flashes with these devices: **REVOLT AA battery dummy approx. € 23.-**

Set with 2 power supply units (3-12VDC adjustable), 4 power feed and 12 dummy elements. This is sufficient for 4 flashes (4xAA =6V) or 2 flashes (6V) and the controller (3V)

10 Trigger:

The button is disabled for the duration of the droplet drain.



 starts the dripping process very quickly, which is why a variable waiting time (in ms) can be set before the start. This waiting time is intended to allow the monitor to focus on the drop process before it starts. The setting here is

- Edit/Options 0= no waiting time 1000= 1 sec waiting time.

Experience:

It has been shown time and again that a release directly on the drop frame would be interesting. This is why the RED socket was added to the TR-10. This has the same function as the TRIGGER button.

This allows you to align the valve, trigger it with an external hand switch, view the result on the monitor, correct the alignment and trigger it again until everything is correct. Then tighten the valve holder. FOR MORE INFORMATION see SHORT INSTRUCTIONS



10.1 Waiting time AFTER the droplet drain

Are you also an impatient "dripper" — ?

Do you keep pressing the release button too quickly before the water has calmed down?



You can enter a waiting time in seconds in the  window. Example

18 The process is then as follows

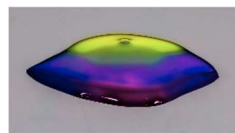
- Trigger
 - The sequence starts, the trigger button is locked
 - The sequence is complete, the trigger button remains locked
 - The number window counts down 18 seconds to 0
 - The release button is enabled again
- This time entry is not saved in the setup.
 - This time entry is overwritten with 0 when a LOOP is started.
At the end of the loop, the previously set value is used again.
 - The waiting time does not work when the F+A function is switched on (10.2)


10.2 Triggering+ Recording the Photo setup

Something for advanced users


In crown photography, it can also be useful to record the arrangement of the horizontal colors.

This is the only way that the resulting crown can actually be assigned to an initial base.



The  button has been added for this purpose. By clicking on this button, the PHOTSETUP can be linked to the TRIGGER.



If  is grayed out, only a normal process is started with TRIGGER.

If  is highlighted in green, a photo setup  is first recorded with TRIGGER and then a trigger  is activated.

This means that two images are recorded and stored in the LOG (if activated).

11 Undo / Redo:

The two buttons at the bottom left of the GUI window are the Undo and Redo buttons. If you realize while wildly adjusting the values that the setting before last was better after all, you can use the undo button ◀ to go back up to 5 setting steps. become.



After clicking on "Trigger", a complete data set is saved temporarily, but only if something has been changed somewhere in the values.

No individual value adjustments are saved (as is usually the case).

So even if you have taken 10 pictures with one setting, you can jump back to the previous setting by clicking on Undo. (Only for those who can keep track of it 🤔 —)

Redo ▶ can only be clicked if Undo ◀ was also used previously.

12 Useful tips:

- Why are "arrows" **up and down** used for the **start time buttons**?
 - On the one hand, of course, to show where the time is increased or decreased.
 - Another reason, however, is that a falling drop moves upwards in the picture when you move the **start time** increases or is photographed further and further down the lower the start time is. With the **flashes**, however, it is exactly the opposite 🤔 — Try it out.
- Start and opening times do not allow decimal points. You can enter them, but they will not be taken into account.

Experience:

- It is always useful not to set the **start time of the first drop** to 0.
I like to start it at 100 first, so you have 'room' at the end if it would be better to start a little earlier. You then only have to reduce the first time and not increase all subsequent times by the same value.
- The TRIGGER or LOOP **waiting time** should always be selected sufficiently.
Impatience is absolutely counterproductive here.
Even an optically calm water surface can still swirl underneath. The waiting time depends heavily on the container used and the amount of water.

13 Review

❖ Changes from GUI v4.9 to v4.10

The LOG file now contains the date. When the GUI 4.10 is started for the first time, a LOG file with the following appearance "YYYY MM DD - Log file.txt" is created.

The status of the "Log on/off" checkbox is now saved when the GUI is closed and applied again the next time it is opened.

If the GUI is closed and reopened on the same day, the existing daily LOG is used, the screen number is adopted and incremented by 1. This ensures consecutive numbering within a LOG file.

If the GUI is opened for the first time the next day, a new log file is created with the new date. The image number is automatically set to 1.

The reason for these adjustments:

- You no longer have to think about "Logging on/off". If set, the LOG file automatically remains in operation.
- The LOG file will never be very large if it is not edited.
- The daily log can simply be assigned to the corresponding image backup.

Attention:

If existing SETUP files are to continue to be used, precautions must be taken. The saved setup files are stored in the SETUP folder. The NEW setup file now contains the screen number and log on or off. You must therefore create two new lines at the bottom of the old SETUP file that you still want to use so that they are loaded correctly.



```
False
False
0
50
10
False
True
19
{\rtf1\ansi\ansicpg1252\deff0\nouicompat\deflang1031{\fonttbl{\f0\fnil Arial;}}
{\*\generator Riched20 10.0.26100}\viewkind4\uc1
\pard\f0\fs35\par
}
```

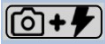
- > The first value (True) whether the log is on or off.
- > The second value corresponds to the image number.

Please insert at the exact position as marked in the picture above and save.

If the lines are missing, there is an error message and the setup is not loaded. You only have to do this once, the GUI saves from then on, then it is already correct.


❖ Changes from GUI v4.10 to v4.11

The **photo setup** can now also be started with **the external shutter release**.

1. Click on  with the right mouse button. The button turns green.
2. As long as the button is green, the external start input on the TR-10 always triggers the photo setup.
3. To switch back, click on the photo setup again with the right mouse button. The button returns to its original color.

❖ Changes from GUI v4.11 to v4.22

The "**Color and Empty**" buttons can now also be operated with the external trigger.

1. Use the MIDDLE mouse button (wheel) to select a color button. A symbol  is displayed.
2. This valve can now be operated with the external trigger. Press =
valve OPEN / release = valve CLOSED.
This helps to bleed the valves from below with a syringe. It is advantageous if a foot switch is used for this. Then both hands are still free. 🍷

The GUI can now also be started in **other languages**.

Where the SAVE and SETUP folders are stored, there is now also the LANGUAGES folder. This folder contains the language files.

> The GUI generally uses the file "TR-10_txt.dat" to display the texts. The GUI will no longer start without this file.

You can now copy one of the existing text files and rename it to "TR-10.txt". Be sure to copy it first so that the original is retained.

Example: Delete the file "TR-10.txt".

Then copy "TR-10_fr.txt" and rename this copy to "TR-10_txt". Start the GUI.

The texts are now in French.

The original file "TR-10_fr.txt" still exists.

It is up to each user to translate the original German file "TR-10_en.txt" into their own language using an online translator.

Because of this multilingualism, some button TEXTS have been replaced by symbols.