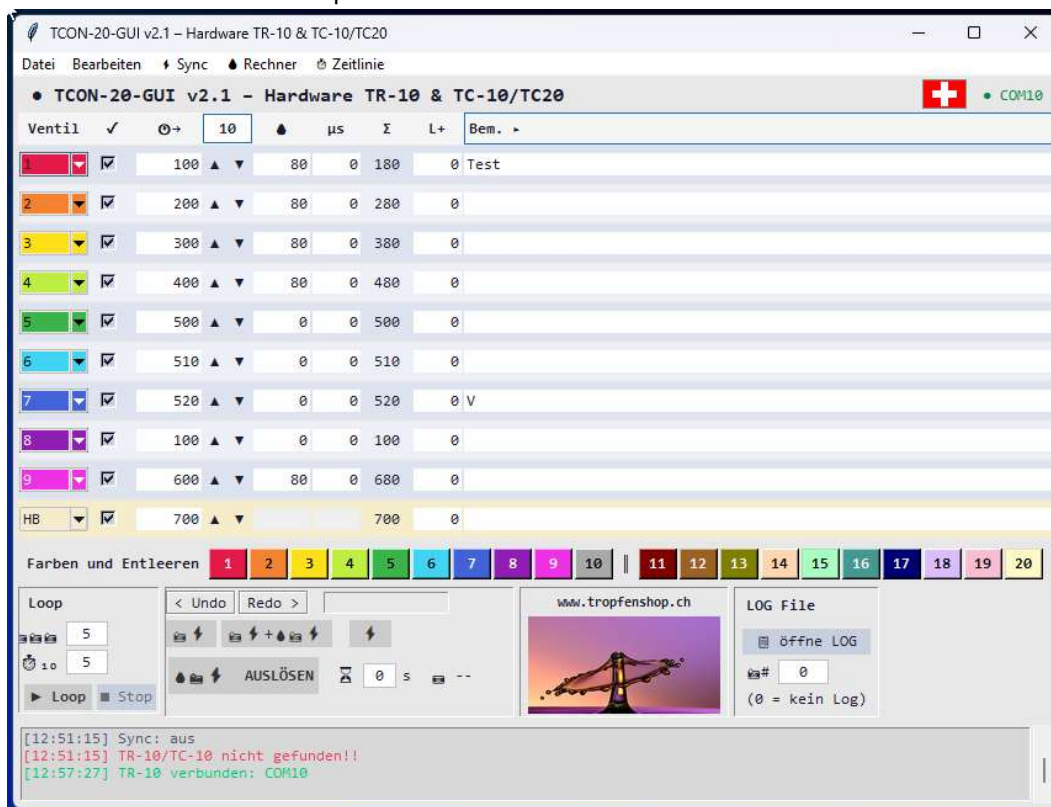


TCON20-GUI v2.1

August 18, 2026 HJ

A graphical user interface (GUI) for the TRICKLER-10/TC10 and TC20 running on Windows .

The **TRICKLER-10** evolved from the “crazyTrickler,” which is no longer available, and from that, in turn, the two devices **TC-10** and **TC20** were developed.



The TC10 + TC20 combination is a new development designed to better meet the specific needs of droplet photographers. The TC10 serves both as an entry-level device for beginners in droplet photography and as a sophisticated tool for droplet photography professionals. The TC20 expands the system to include control outputs 11–20.

This manual focuses primarily on the functions related to the GUI.

General Information:

The **TCON20_GUI** is a **completely in-house development**

Therefore, it is always possible to correct errors or address shortcomings. It is also possible to implement your requested changes on short notice.

The TCON20_GUI replaces the existing Trickler-10_GUI_V4.22. An older TRICKLER-10 (TR10) can also be operated with it.

If you have questions about hardware, operation, or new features, please contact info@hansjuergjenzer.ch or visit www.tropfenshop.ch. You'll find other interesting specialty devices there as well.

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Color coding in the document:

Green markings indicate special help functions

Yellow markings indicate best practices

Red markings are important and must be taken into account

1 Setup

1.1 Installation and startup:

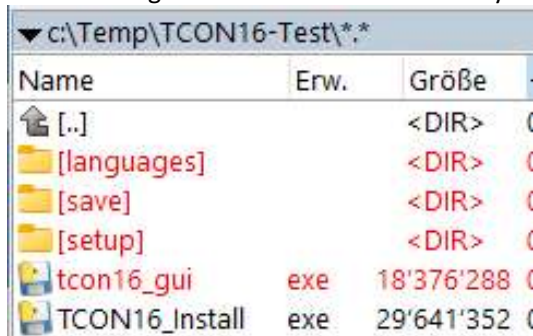
Download the GUI software:

The GUI software can be downloaded for free from the website www.tropfenshop.ch.

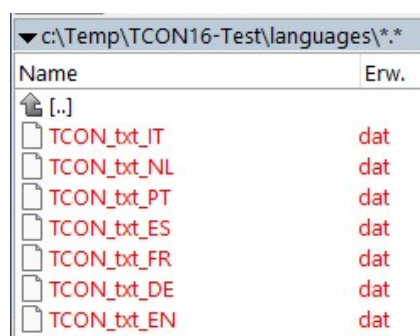
Here is the link: https://tropfenshop.ch/trickler-10_software/.

It is fully functional and can be connected immediately, even to an existing TR-10.

1. Please create a separate folder for your Tropfen area and save the **TCON20_Install.exe** file there.
2. Run the installer (TCON20_Install.exe)
3. The following will be installed automatically



Name	Erw.	Größe
[..]	<DIR>	
[languages]	<DIR>	
[save]	<DIR>	
[setup]	<DIR>	
tcon16_gui	exe	18'376'288
TCON16_Install	exe	29'641'352

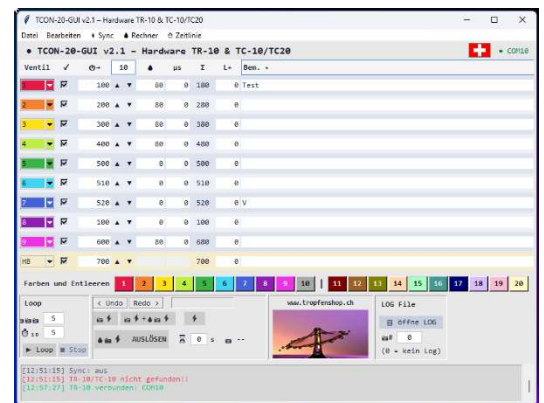


Name	Erw.
[..]	
TCON_txt_IT	dat
TCON_txt_NL	dat
TCON_txt_PT	dat
TCON_txt_ES	dat
TCON_txt_FR	dat
TCON_txt_DE	dat
TCON_txt_EN	dat

4. You can delete the Install.exe file or save it somewhere.
5. Connect the TC-10 to the PC and run **tcon20_gui.exe**
After launching the program, you'll see this window.

- The initial startup configuration is taken from the SETUP.json file in the setup folder.
- After closing the program for the first time, a last setup.json file.
All your customizations are saved and will be automatically available the next time you launch the program.

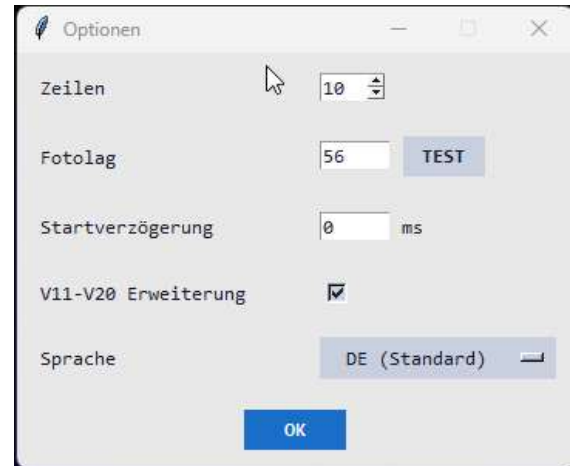
From now on, this `last setup.json` file is read



1.2 GUI Language

The GUI can be launched in **various languages**.

- Open OPTIONS, and under LANGUAGE, select the desired language.
- The following languages are currently available automatically
STANDARD DE CH
German DE
English EN
Spanish ES
French FR
Italian IT
Dutch NL
Portuguese PT
- You can also create your own language file by using a translation program (e.g., DEEPL) to translate the file `tcon_txt_de.txt` into your desired language. Save the new file in the Languages folder. It will automatically appear in the dropdown menu under Languages. This should also make it possible to support languages with different scripts (Greek / Russian / Hebrew / Chinese, etc.)



1.3 COM Port

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

If an error message appears in the text window, you can click Edit/COM Port to attempt a new connection. The result of the connection attempts is displayed in the status window.

The connection is monitored, and the trigger buttons are automatically deactivated if there is no COM connection (buttons = red). If the port reconnects, the buttons automatically return to their functional state.

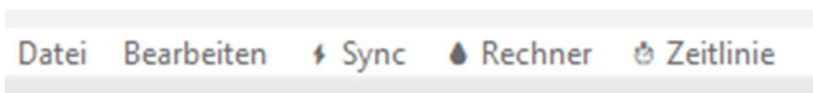
Note: When connecting an older TR-10

*(This applied to the TR-10 GUI. I can't say how it works with the TCON20_gui.
I no longer have an AZ-Arduino.)*

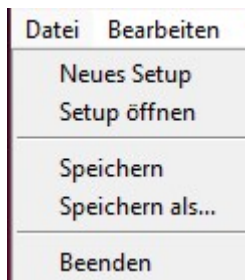
Depending on your Windows version, you may need to install the CH341 driver. Please refer to the TRICKLER-10 QUICK START GUIDE, which is downloaded along with the final GUI.

To ensure a reliable connection, it's best to have as few USB devices connected to the computer as possible—ideally none at all. Once the connection is established, a message will appear in the text window.

2 The Menu Bar



2.1 File Menu



New Setup can be used to start over. This loads the default SETUP.json file.

Open Setup can be used to open any old setup from the “save folder.”

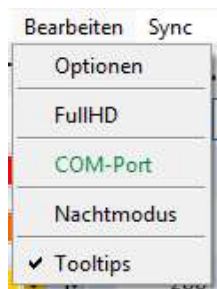
Save Saves the loaded setup with the new settings.

Save As... Saves the current setup under a new name (to be entered).

Exit When you close the GUI by clicking "**Exit**" or the "**X**" in **the upper-right corner**, the GUI saves saves the setup in the “setup” folder as “last_setup.jsyon” and automatically loads it when next time it starts. This way, you can pick up right where you left off “last night.”

The setups in the “save” folder are simple, individual text files and can be viewed and edited using a text editor. (not recommended)

2.2 Edit Menu



Edit / Options:

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 rows you’ll need.

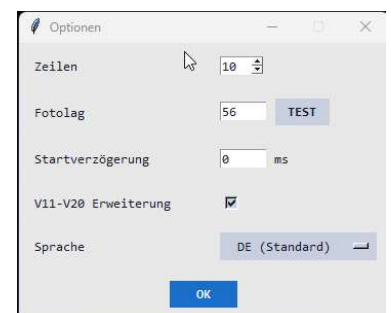
The number of visible rows can range from 5 to 20.

13 lines is the default starting setting (10 valves and 3 flashes).

Exposure Time:

The shutter lag is the time it takes for your camera to go from the trigger signal to the shutter fully opening. You can set and test this here. Simply connect your camera and a flash to the controller and use the “TEST” button to determine the correct value.

A tutorial and a more detailed explanation of the shutter lag follow below.

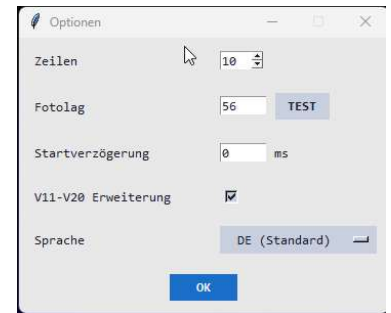


Start Delay:

Here you can set a delay that postpones the “TRIGGER” button
. The time is set in milliseconds. (1000 = 1 second)

V11-20 Extension:

Valves 11–20 can be displayed in the GUI here.
This is not yet relevant for the TC-10. It is only required
if a TC20 is connected.



Language

Already explained in section 1.2

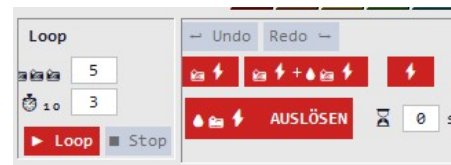
Edit / Full HD:

The GUI has been optimized for older monitors (the kind often used on a makeshift table in the basement) as well as for people working on a Full HD laptop with a 13-inch screen. Unfortunately, continuous zooming isn't possible—there are only “large” and “small” options. Try them out to see which GUI size works best for you. When Full HD is enabled, the selection is highlighted.

Edit / ComPort:

This menu item indicates whether the ComPort has detected a controller.

- TC10 Active **COM Port**
- TC10 Inactive **COM Port**



When the COM port is **inactive**, the buttons are highlighted in red
Clicking on the COM port manually turns the port on or off

Tip:

It is recommended to connect the controller directly to the PC whenever possible.
External USB hubs can cause the trigger process to fail.

Edit / Night Mode:

The GUI can be switched from day mode to night mode.

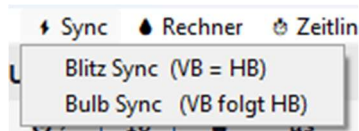
Just give it a try and be gentle on your eyes 😎 > 😊

Edit / Tooltips:

When this feature is enabled, explanations often appear when you hover over title bars and buttons



2.3 Sync Menu



Flash Sync:

If this menu option is enabled, the start times of VB1 and VB2 are synchronized with the main flash. All times are always equal to the HB time. If this is changed, the VB entries also change.

Although you can still change the other flash times—and these changes will be taken into account when the shutter is released—if you then adjust the main flash time again, V1 and V2 will be overwritten with the HB time.

This feature is designed to allow the use of multiple flashes simultaneously when no external flash controller is connected to the HB

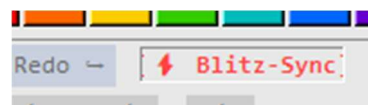
Bulb Sync:

If this menu option is enabled, the start times for V1 and V2 change in tandem with the main flash.

For example, if the flash times are set to HB=400, V1=500, and V2=600, and “Bulb Sync” is checked, VB1 and VB2 will increase by 2 ms if you increase the main flash by 2 ms.

The times would then be HB=402, V1=502, and V2=602.

Display: If a sync is enabled, it is displayed here.

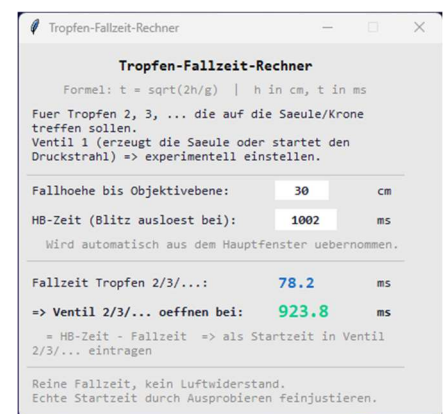


3 Calculator:

The GUI now also offers a drop calculator in a separate window. The window can be placed anywhere on the desktop.

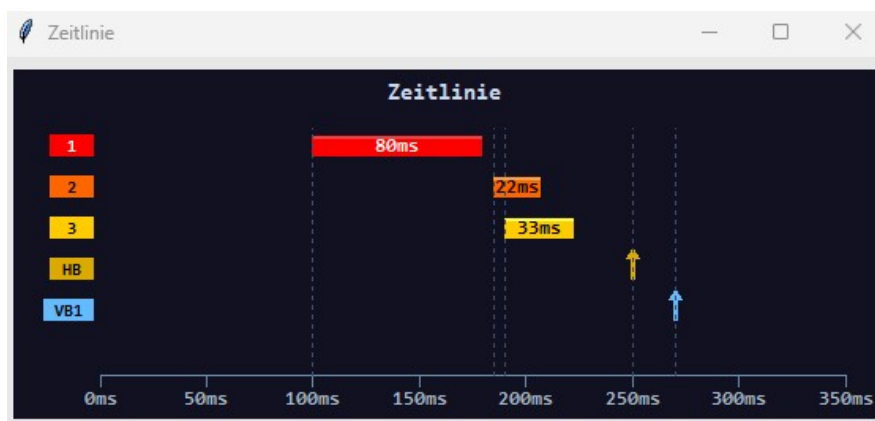
The explanations in the window will have to suffice for now.

I haven’t had any experience with it myself yet, so I don’t want to write instructions here 😊



4 Timeline:

The GUI now also offers the option to view timelines in a separate window. The window can be positioned anywhere on the desktop



The display of the lines and times automatically adjusts to changes in the GUI.

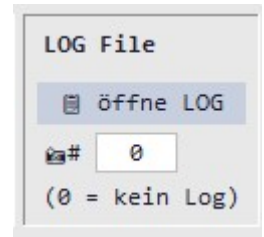
The window’s size can also be adjusted manually (by dragging).

If changes to the number of lines or flash assignments aren’t displayed immediately, simply resize the window slightly.

5 Photo Log:

The GUI allows you to log the settings for each photo.
However, only the values that were actually used are recorded.

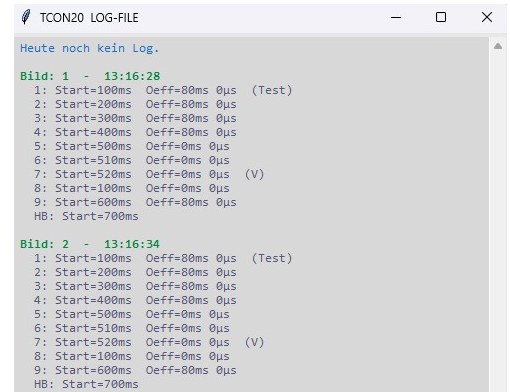
Clicking the “Open Photo LOG” button opens a separate window.
The window can be positioned anywhere on the desktop and resized manually
(by dragging).



To create a LOG entry, an image number entered at  #. (>0)

By setting this starting number, the image numbers be adjusted to match the number of images on the camera or in a storage folder

The first time the log is used in a new session, a “YYYY MM DD – Log-File.txt” is created in the “Setup” folder.
A new log file is created for each new day.



From then on, every time you click the shutter button or activate the trigger input on the controller, a new data entry is written to the log file. The image number is then automatically incremented by 1.
The text window updates as soon as a new image is taken and the log window is already open. Of course, logging also occurs when you “collapse” the log again.

Photo setups are also logged.

Clicking the photo setup button creates a line in the log with the image number.

If the GUI is closed and reopened on the same day, the existing daily log is reused, the image number is carried over, and incremented by 1. This ensures continuous numbering within a log file.

Experience:

I always transfer the images directly to the PC.

This makes it possible to specify the storage location and the first image number.

e.g., Date(YYMMDD)-Image Number (230419-001)

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

Note:

If, for any reason, a photo is not taken after clicking “Shutter” (camera in standby or off, memory card error, etc.), the photo log will continue to increment anyway. As a result, the image numbers in the log and the photos will no longer match.

In this case, the image number must be manually changed to the next number that has not yet been used.

*Neither the TC10 nor the GUI can verify whether an image was actually saved.
It is assumed that one was saved.*

6 Valve Control:

Ventil	✓	⌚→	10	💧	μs	Σ	L+	Bem. ▶
1	✓		100 ▲ ▼	80	0	180	0	Stamm
2	✓		150 ▲ ▼	80	0	230	0	Tropfen oben 1
3	✓		200 ▲ ▼	80	0	280	0	Tropfen oben 2
HB	✓		250 ▲ ▼			250	0	HB Folie gelb
VB1	✓		300 ▲ ▼			300	0	VB1 Folie blau

The valves—or the individual drops/flashes to be triggered—are controlled as follows. Each line in the image shown above represents a drop or flash to be triggered. This means up to 20 individual, independent actions are possible per process or photo. (Specify 20 lines under Edit/Options.)

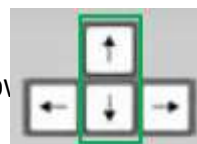
Each drop always requires the valve number, start time, and open time.

- The valve number corresponds to the controller's output number.
- Start time is the time between TRIGGER (+ elapsed start delay) and the opening of the valve.
- Open time: how long the valve remains open.

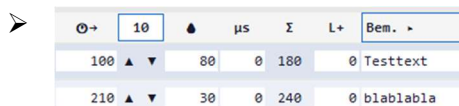
The individual lines are not numbered, since the drips start when it is “time” for them. It is also possible to use the 7th line to trigger the first drip. Of course, for the sake of clarity, it makes sense to set the drip sequence chronologically from top to bottom.

Using Keyboard Keys

The following special functions are programmed for the UP and DOWN arrow keys in the valve row section:



If the cursor is in a checkbox for the Active/Inactive row, you can use the arrow key to switch between rows. The value from the current checkbox is transferred directly to the next one. This makes it possible to quickly enable or disable multiple rows in succession.



If the cursor is in one of the other input fields, you can move up or down between fields. The target field is already fully highlighted so that you can enter new data immediately.

Visualization of Time Sequences with Detailed Information as an EXAMPLE

The following image shows the timeline with three markers on the timeline.



Based on the times set above, the sequence looks as follows:

1. The timeline starts (after the start delay has elapsed!) at 0 ms. Nothing happens at first.
2. After 60 ms, Valve 1 opens and remains open for 85 ms. This does not mean until 85 ms is reached on the timeline, but rather calculated from the start time of 60 ms. Viewed over the entire timeline, Valve 1 therefore closes again at $60 \text{ ms} + 85 \text{ ms} = 145 \text{ ms}$.
3. Valve 3, which is next in sequence, opens at 170 ms and remains open for 35 ms.
4. Valve 2 opens at 415 ms and closes at $415 + 23 = 438 \text{ ms}$.
5. Finally, the flash follows, which I've set to 455 ms. Flash durations do not have an adjustable opening time; this is fixed at 1 ms.

The advantage of setting the opening time rather than the end time is that it ensures a consistent droplet size.

This is because the opening time controls how much water flows out of the valve—in other words, how large the droplet is. This way, you can easily move the droplets along the timeline using the start time without changing their shape or size.

Earlier, I mentioned that the drops are rendered when it's "time."

You can see what I mean in this image.



Here, I've moved the green drop to a start time of 130 ms. As you can see, this would conflict with the opening time of the yellow drop. But since this is a different valve, this adjustment is possible without any issues.

You could also set the green drop to the same start time as the yellow one and still have the red drop start at 60 ms. It doesn't matter as long as different valves trigger the drops.



What would work but serve no purpose is to open the red valve again in a different line while it's already open. This would only extend the total opening time of that valve.



It is perfectly possible to trigger a valve multiple times. To do this, each trigger must have its own line with its own times; the same valve number is always selected. This would look something like this:



6.1 Operation and adjustment of values:

Ventil	✓	🕒→	10	💧	μs	Σ	L+	Bem. ▶
1	✓		100	▲ ▼	80	0	180	0
2	✓		150	▲ ▼	80	0	230	0
3	✓		200	▲ ▼	80	0	280	0
HB	✓		250	▲ ▼			250	0

Valve

The valve number is set using a drop-down list. Clicking the arrow opens the list, allowing you to select the corresponding valve or a flash output. After selection, not only does the number change, but the color also changes to the preset valve color.



Next to it is a checkbox to enable or disable the row.



After double-clicking in the field, you can enter values directly using the keyboard or adjust them with the mouse wheel. There are also arrow buttons. These increase or decrease the respective time by the value shown in the white field between “Start Time” and “Opening Time.” This value can also be changed.



μs

The opening time is adjusted in exactly the same way, except that there are no arrow buttons there. Experience shows that opening time values usually range from about 20 to 150 ms. The mouse wheel is fast enough for this.

The opening time consists of two separate fields.

> In the left field, the opening time is set in milliseconds.

> In the right field, you can also set microseconds.

This allows for even finer adjustment of droplet sizes. Values from 0 to 999 μs are possible.

If you use the mouse wheel to adjust the setting and skip the 0, the value in the ms field is also increased or decreased.

Experience has shown that adjusting the start time in the μs range is rather pointless, so you can only adjust it in the millisecond range. The controller operates electronically with μs precision. However, the more rows of valves that are activated, the more the actual time value deviates from the set time.

However, since we are not working with predetermined time specifications here, but rather with set values and their adjustment based on actual events, this inaccuracy is irrelevant. It remains constant, unless you suddenly add rows within a session.

In contrast, the repeatability is very precise.

Experience:

Unfortunately, very imprecise solenoid valves are often used. This tends to have a negative impact on the repeatability of the droplet shape in the images.

Therefore, care should be taken to use high-quality solenoid valves.

Σ

The summary window displays the end time of each drop (start time + opening time).

Σ a) The total duration of a trigger event is visible in the timeline.

Σ b)

Identical valve numbers = multiple activations of the same valve

The GUI cannot compare the values in the Sum window with one another.

Therefore, this window also serves as a helpful tool for keeping a better track of valve time overlaps when the valve numbers are the same.

The only thing to keep in mind is that valves take about 20 ms to open. Therefore, the second start time should be increased by at least 20 ms. (However, this depends on the valves used.)



Ventil	Start	End	Sum
1	100	80	180
1	210	80	290

Double-click on an opening time 💧 :

It is possible to trigger a single drop without a camera or flash, e.g., to align the position of a valve. To do this, double-click on an opening time. This opens the corresponding valve in that row for the set time and triggers a drop.

Triggering a single drop with an external trigger:

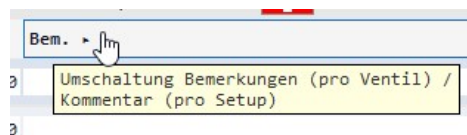
Clicking [ right] on an opening time highlights it in green.

A maximum of 4 valves can be selected. Selecting the 5th valve will deselect the first one.

Right-clicking again removes the selection.

When '80' is selected, the external trigger initiates a drip cycle on these valves. No flash, camera, or log entry.

Notes and comments:



You can use the individual lines for **notes** to jot down information about the valves, individual drops, or flashes. For example, the position (left, right, center, or trunk), Umbrella 1, Umbrella 2, red flash, blue flash, etc.

SFB Technique (Splash From Below)

Especially when the valves are used as air pressure triggers, this greatly aid in understanding the processes.

These notes are also saved in the LOG file.

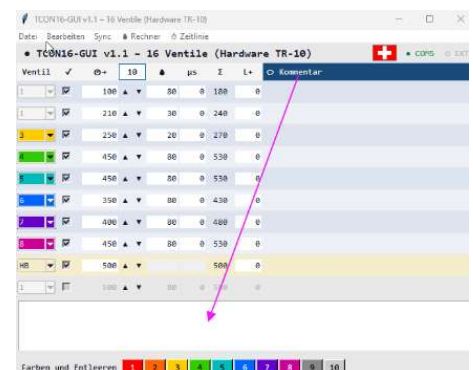
Switching between “Note” and “Comment”

Clicking [Note] in the title bar activates the comment field.

It appears between the last valve row and the trigger area at the bottom.

Here you can enter text regarding the entire setup.

This text is also saved.



7 Photo setup and flashes:

For serious droplet photography, it is absolutely essential to use external flashes.

Please do not use the camera's built-in pop-up flashes!!!

Be careful with old flashes as well; they can conduct the trigger voltage through the flash connector and destroy the controller.

Experience:

I've achieved good results with YongNuo flash units (YN-560 and its successors). They're affordable and easy to adjust. Of course, you can also use the flashes of your choice or those from the camera manufacturer.

However, it's **important** that all flashes used simultaneously come from the same production batch.

This is the best way to ensure identical flash durations at the same settings.

Buying additional flashes months or years later is therefore not a good idea. This can result in visually extended flash durations overall.

7.1 Photo magazine:

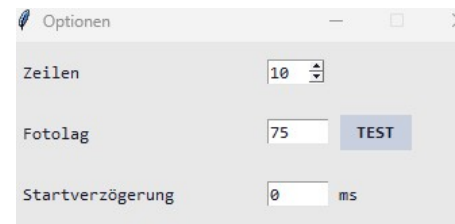
The GUI is used to set only the flash, not the camera's shutter speed.

The goal of droplet photography is to capture the shape of the droplet. The flash does this much more accurately than the camera shutter, unless you have a camera with a shutter speed of $<1/15,000$ s 🥳🎉.

That's why there's the **"Photo Lag" option** in the Options menu.

The time entered here triggers the camera for each photo by this amount (e.g., 75 ms) before the main flash. This ensures that the aperture is fully open.

You'll have to figure out exactly which value you need on your own. It depends on the camera.



Experience:

It's entirely possible that this value will change at some point.

I worked with a LAG of 64 ms for two years. For reasons that remain unknown to this day, this value changed to 125 ms one day. Same camera, identical firmware, same controller. Currently, it's back at 75 ms 🚫🔴.

7.2 Tutorial: Setting Up Photo Lag:

First, of course, connect the camera and a flash unit to the TR10.

Set the camera to manual mode, turn off autofocus, aim the camera at an object, and adjust the focus.

To take a clear photo, close the aperture enough so that the object illuminated by the flash is clearly visible in the image and stands out from the background.

To determine the photo delay, it's best to start with a relatively long exposure time (e.g., 1/2 s) and a photo delay setting of about 100 ms.

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

The object you've flashed should now be visible in the photo. If it isn't, adjust the exposure until it's clearly visible. Take a few pictures to see if this exposure is right.

Sometimes only half the image is exposed. This means the shutter isn't fully open yet. Adjust the exposure accordingly.

Now reduce the exposure time again step by step.

If the flash is no longer visible at some point, reduce the exposure time until it's right again.

Then reduce the exposure time again, and so on.

Once you've reached an exposure time of about 1/40–1/80, the subject lit by the flash is visible in every image, and the flash is set to its shortest duration (=1/128), you've set the perfect exposure compensation for droplet photography. This setting doesn't need to be changed even with longer exposure times—keyword: pre-flash—but more on that later.

As the next step, you can set the aperture to approximately f/13–f/22, which allows you to work in a normally lit room without capturing ambient light. Note: APS-C max f/16 / full-frame max f/22; otherwise, you risk lens blur.

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

However, a consistently reliable photo lag is only possible if you operate the camera entirely in manual mode. This means manual exposure and no autofocus. Only then will the time between the signal from the hardware and the camera's shutter release always remain the same. Some cameras also take longer to trigger the shutter if the previous image is still displayed on the camera screen.

7.3 Main Flash and V1 / V2:

The main flash duration is the most important factor of all in droplet photography. This is because it determines the actual moment the photo is taken. My camera is set to manual mode.

At an aperture of f/20 and 1/40 sec., I get completely black images in daylight without flashes. This is intentional, because the flash duration is many times shorter and more precise (approx. 1/20,000 s) than the camera shutter speed. Only through the flash duration can you "freeze" the droplets.

Flash output is controlled by the duration of the flash. The lower the set output, the shorter the exposure time—on the order of 1/20,000 s at 1/128 flash output.

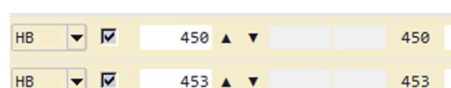
It is absolutely essential that your setup always include a line with a main flash.



Flash lines are always highlighted in yellow so they're easier to spot.

If this is not the case, an error message will appear: **"No main flash set; no drops will be triggered!"** This is because the main flash triggers the camera—simple as that. If you trigger drops after the main flash, they will of course be processed, but they will definitely not make it into the image.

You can also set multiple flashes.



7.4 Double exposures:

It is possible to use two additional flashes with separate outputs (VB1 and VB2) on the controller.

This means there are three connections for three flash units, each with individually adjustable flash durations. This allows you, for example, to compensate for different sync speeds among various flash units to avoid double exposures.

Of course, you can also connect one flash controller and two individual flashes—or even three flash controllers.

However, **intentional double exposures** are also possible. This means you can trigger a pre-flash to capture the shape of the droplet a few milliseconds before the main flash. You don't need this very often, but it produces some really interesting images.

7.5 Double Exposure Tutorial:

You want to take a photo with two different flash timings to capture the droplet's movement at two different points in time simultaneously (as shown on the right). To do this, it's important to understand that such images can only be created by extending the camera's exposure time.

However, this extension naturally occurs later on the timeline.

Note:

Since the camera trigger is linked to the main flash and hasn't changed, **the main flash now becomes the pre-flash**. The current "pre-flash" thus triggers the camera.

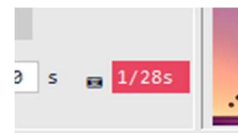
To do this, you must connect your strobes accordingly to the controller (VB1 / VB2).

The VB1 and/or VB2 flashes must then fire after the main flash.



In the image on the right, the blue teardrop shape represents the earlier one, and the purple shape represents the later one. To photograph this, the HB flashes first with a blue sheet, followed by V1 with a purple sheet.

The field next to the shutter button shows the approximate exposure time, which you would need to set on the camera to get everything in the photo.



Tip:

I recommend always setting the exposure time one stop longer than what's indicated in the time field.

So: Time field 1/40 = Camera 1/30

8 Loop:

The loop automatically takes a series of photos and works as follows.



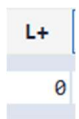
Photos: Enter the number of photos to be taken here.



Wait: Enter the pause between photos here.

The small window next to it counts down the seconds until the next photo.

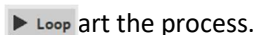
The wait time is intended to allow the water in the tank to settle again.



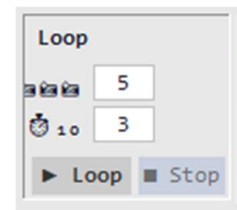
Start Time L+ This is intended to incrementally adjust the start time for each frame by the entered value in ms. These values always refer to the start time on the left of the same row.

Both positive and negative values can be entered.

Click “



art the process.



The four buttons—Trigger, Play, Photo Setup, and Flash—are disabled during the loop process. However, it is possible to activate additional valves or adjust the start or flash times during the loop. The values are then used in the next loop frame.

Although the set drip values are changed in the individual lines during the loop, they are reset once the loop ends. The Photo Log can record all changed values.



Immediately terminates the loop. The "Stop" function is only active after a "Start" command.

LOG File for LOOP

As soon as values are entered under **L+**, the LOG file displays the starting value. The modified (cumulative) value used are displayed in the LOG file.

```
Bild: 103 - 15:45:06
1: Start=100ms → 94ms Oeff=80ms 0µs (Testtext)
2: Start=210ms → 219ms Oeff=30ms 0µs (blablabla)
3: Start=250ms Oeff=20ms 0µs
HB: Start=450ms
VB1: Start=486ms
```

9 Colors and Draining:

A **color** can be assigned to each of the 10 valves.

Simply right-click on one of the color buttons and select the desired color using the standard Windows color dialog.

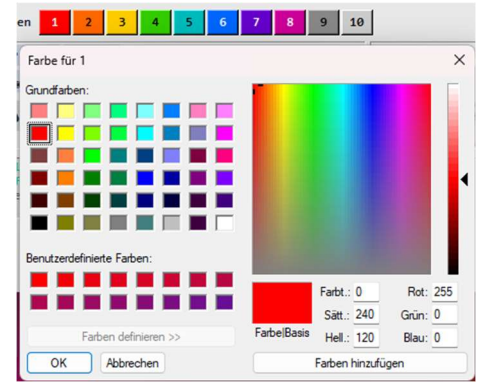
It is recommended to select the color that matches the water in the valve.

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 will display an icon



and the valve opens. Clicking again closes the valve.

The maximum opening time is 60 seconds. The valve then closes automatically to protect the electronics in the controller.



Triggering drainage with an external trigger:

The “Colors and Drain” buttons can also be activated using the **external trigger**.

1. Use the **middle mouse button** (scroll wheel) to select a color button.

An icon will appear.

2. You can now operate this valve using the external trigger.

Press = Valve OPEN / Release = Valve CLOSED.

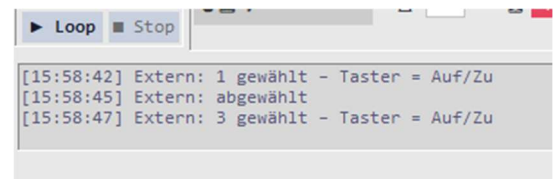
This helps when bleeding the valves from below with a syringe.

It's best to use a foot switch for this. That way, both hands remain free.



10 Status / Message Window

Certain status messages are displayed here by the GUI.



11 Camera Setup and Flash



Photo Setup:

To set up the flashes or the camera position, you can take a flash photo here without any droplets. The three entered flash times (VB1/VB2/HB) are taken into account.



Photo Setup with External Trigger:

Right-click [📷] to toggle the button (green)

As long as it is activated, the photo setup can also be triggered using the external trigger.



Flash:

This button triggers all flash outputs simultaneously, regardless of the set times.

This allows you to test the flash function without taking a photo, without a drop, and without a log entry

Experience:

Multiple flashes “in parallel”

- You can also build adapters or splitters for the flash connections, allowing you to use 5 or 6 flashes simultaneously as the main flash.
- I’m using a Yongnuo YN560-TX flash controller connected to the HB port. This allows me to program three flash groups (e.g., left 1 flash, right 1 flash and Back 4BL). The flash output can be easily and centrally adjusted via the controller without having to fiddle with each individual flash).



And here’s another free tip: 😊

No more dead batteries in your flashes with these devices: **REVOLT AA Battery Dummy**

Set includes 2 power supplies (3–12 VDC adjustable), 4 power input cells, and 12 dummy cells.

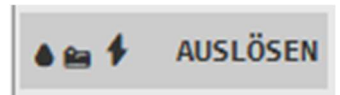
That’s enough for 4 strobes (4xAA = 6V) or 2 strobes (6V) and the controller (3V)

Experience:

Power supplies with adjustable voltage work better than those with only 6 VDC. The strobes draw quite a bit of current when turning on. If the power supply drops slightly below 5 V during this process, the strobe won’t fire consistently. Therefore, a setting of about 7.5V (with 4x AA) is better. However, this depends on the flashes you’re using; you’ll have to test this yourself. I’m not responsible for any damage to your flashes 😊 .

12 Trigger:

The button is disabled while the drip cycle is in progress.



TRIGGER starts the dripping process immediately, which is why a customizable wait time (in ms) can be set before it begins. This wait time is intended to allow you to look away from the monitor and focus on the dripping process before it starts. The setting is located here >> Edit/Options/Start Delay 0 = none, 1000 = 1-second wait time.

Experience:

It has become apparent time and again that triggering directly at the drip frame would be useful. That is why the RED jack was added to the controller. It has the same function as the TRIGGER button.



This way, you can align the valve, trigger it with an external pushbutton, view the result on the monitor, correct the alignment, and trigger it again until everything is correct. Then tighten the valve mount.

Or you can use the **motorized valve alignment MMV** [set: MMVC + MMV](#) 🥰 🙌

12.1 Waiting time AFTER the drop has fallen

Are you also an impatient “dripper” 😡 ?

Do you keep pressing the trigger too quickly before the water has settled?



You can enter a wait time of 0 seconds in the window .

Example: 12 s The process then works as follows:

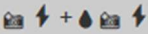
- Trigger
 - The process starts, and the trigger button is locked
 - The cycle is complete; the trigger button remains locked
 - The number display counts down from 12 to 0
 - The trigger button is unlocked again
- This time setting is not saved in the setup.
- This time setting is ignored when starting a LOOP.

12.2 Photo setup with additional trigger

Something for advanced users

In crown photography, it can be useful to also record the arrangement of the underlying colors. This is actually the only way to assign the resulting crown to a starting point.



First  is triggered, followed by a **normal trigger** with drops. This captures two images, which are also stored in the log in this manner (if enabled).

Right-click [] on this button (the button turns green) to enable external startup.

13 Undo / Redo:

If, while wildly adjusting the values, you realize that the setting before the last one better, you can use the **Undo** button to go back up to 5 adjustment steps. After clicking “Trigger,” a complete data set is temporarily saved, but only if any of the values have been changed.



As soon as you trigger the shot again after changing a value, the UNDO button indicates



So even if you’ve taken 10 pictures with a particular setting, you can click “Undo” to jump back to the previous setting. (Only for those who can keep track of it all 😊)

You can only click **Redo** if you’ve previously used Undo.



14 Useful tips:

- Why are **up and down “arrows”** 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 in the image moves upward as you increase **the start time**, or is captured lower and lower in the image the lower the start time is. With the **flashes**, however, it’s exactly the opposite: 😬
Give it a try.
- Start and opening times do not allow decimal numbers. You can enter them, but they won’t be taken into account.

Tip:

- It’s always quite useful not to set the **start time of the first drop** to 0. I like to start it at 100. That way, you have some “wobble room” later on in case it would be better to start a little earlier. Then you just need to decrease the first time rather than increasing all subsequent ones by the same amount.
- The TRIGGER or LOOP **wait time** should always be set to a sufficient value. Impatience is absolutely counterproductive here. Even a water surface that looks calm can still be churning beneath the surface. The wait time depends heavily on the container used and the amount of water.

15 Change History

❖ TCON16_GUI v1.1 June 9, 2026

Release of the new GUI
Delivery to TR-10 owners

❖ TCON20 GUI v2.1 August 1, 2026

Expansion of the GUI to include control outputs 11–20 and correction of minor bugs.