

Continuous run (loop)

A continuous run is frequently used in process analyzers to perform automatically repeated analyses of single or multiple sample streams. This datasheet describes how to set up and interrupt a continuous run after finishing a chosen injection.

For the purpose of continuous runs, the sampling is usually performed using an injection valve controlled within the method. For monitoring a single sample stream, a continuously repeated single analysis run can be used, while for multiple sample streams or when calibrating standards, an automatically repeated sequence approach is needed. The individual streams or standards are selected by another multi-position selector valve; the position is defined either in the individual method for each stream or using the Valve as a sampler control module.

Brief description of the procedure

To set up a continuous loop, the *Ext. Start Digital Input* and *Ready Dig. Output* signals should be interconnected. Either a Virtual Digital Input Output Loop or an A/D converter (such as Colibrick) can be used. If using an A/D converter, the INx and OUTxR cables must be physically interconnected. In *System Configuration*, the *Data Inputs & Outputs* section, it is necessary to set both the *Ext. Start Digital Input* and *Ready Dig. Output* to the same *Device* and signal value (*Number*).

Below, you can find step-by-step instructions for connecting either **Virtual Digital I/O Loop** or **A/D Converter**. Furthermore, instructions on how to set up the **continuous run through a single analysis** or **sequence** are provided, as well as several important notes on how to **avoid system and memory overload**.

System Configuration setup

Option 1: Virtual Digital Input Output Loop

Add the *Virtual Digital Input Output Loop* onto the desired instrument via the *System Configuration* and set the inputs and outputs as shown in the picture below.

Data Inputs & Outputs	Device	Number
Ext. Start Dig. Input:	Virtual Digital Input Output Loop	1
Ready Dig. Output:	Virtual Digital Input Output Loop	1

Option 2: A/D Converter (Colibrick)

In this setup, it is necessary to connect inputs to the outputs – please consult this setup with an electrical engineer. Add your A/D converter onto the desired instrument via the *System Configuration* and set the inputs and outputs according to the connection of the INx and OUTxR cables (the picture below indicates the connection of IN1 and OUT1R).

Data Inputs & Outputs	Device	Number
Ext. Start Dig. Input:	Colibrick	1
Ready Dig. Output:	Colibrick	1

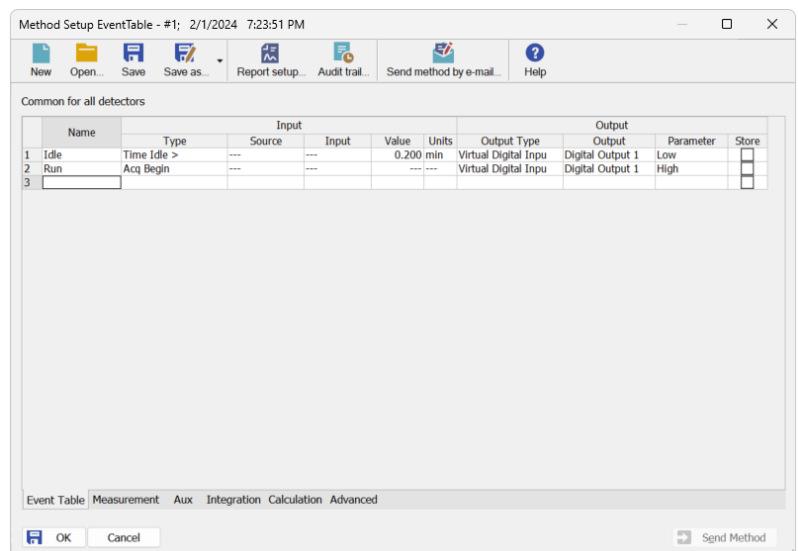
Setting up a continuous run - *Single Analysis* in combination with *Device Monitor*

This approach consists of three steps:

1. Correctly set up method (based on the System Configuration – see above)
2. Start the acquisition
3. Interrupt the continuous loop

1 - Set up the template method for continuous run via *Single Analysis*

- *Measurement tab*:
 - Enable *Autostop* with a defined *Run Time*
 - Enable *External Start/Stop – Start Only*, set reaction to *Down*
 - Configure the *Event Table* with two rows:
 - Type: *Time Idle* with your defined idle time between injections (*Value*)
 - Output Type: *Virtual Digital Output Loop*
 - Output: *Digital Output 1*
 - Parameter: *Low*
- and**
- Type: *Acq Begin*
 - Output Type: *Virtual Digital Output Loop*
 - Output: *Digital Output 1*
 - Parameter: *High*

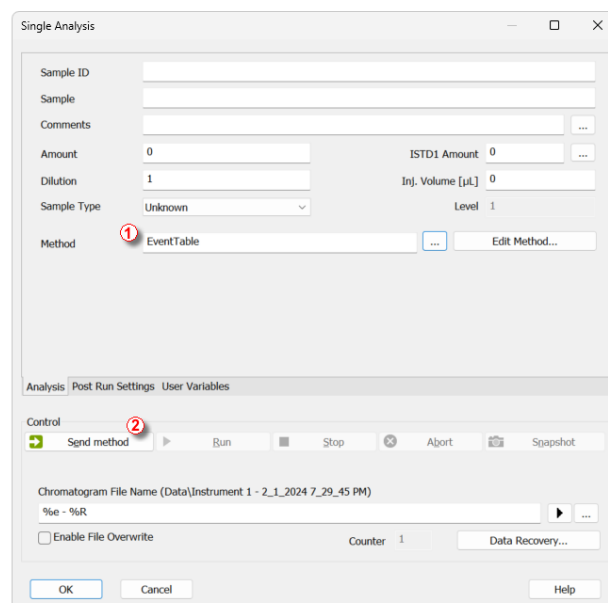


Description



Once this method is sent, after 0.2 min of idle time, Digital Output 1 will be set to LOW. The acquisition will start since the method has *External Start/Stop – Start Only* enabled and reacts to Down (LOW). Right after the start of the acquisition, Digital Output 1 will be set to High. These two rows in the Event Table work in synergy in a continuous run.

2 – Start the acquisition

- Set *Method* ① (with the correctly set up Event Table as described above) for the measurement
- Click on *Send method* ② and close *Single Analysis*
 - After elapsing the idle time, the acquisition begins while the Digital Output is set to HIGH
 - When the current measurement is finished, idle time starts again; after elapsing the idle time, the acquisition starts, and the measurement continues in a loop.



3 – Interrupt the continuous loop

- When you want to interrupt the loop, open the *Device Monitor* and change the relay button from HIGH  to LOW 
 - Since the start in the method is defined as DOWN (precisely, as the voltage changes from HIGH to LOW), manually changing the state to LOW does not create the necessary voltage change and thus interrupts the loop.

Setting up a continuous run - *Sequence* in combination with *command line parameters*

This approach consists of three steps:

1. Prepare method or methods
2. Set up the sequence and start the acquisition
3. Interrupt the continuous loop

1 - Set up the template method(s) for continuous run via *Sequence*

- The method may define different procedures for both samples and standards based on your requirements; however, there are some common parameters necessary:
 - *Measurement tab* – Enable *Autostop* with a defined *Run Time*
 - The actual injection should occur at the same time in all the used methods
- If measuring calibration standards:
 - on the *Calculation tab* of the *Method Setup*, set the calibration name in the *Calibration Cloning In Sequence* section using variables
 - make sure to set the *Calibration Options* accordingly (set the *Recalibrate* option to either *Replace* or *Average*) and define the respective compounds and their amounts

2 – Create the sequence

- Set up the sequence with the methods for your desired samples/standards
 - If recalibration is performed, in *Sequence Options*, section *Calibration and sequence usage*, select the *Clone on first recalibration (safe calibration usage)* option (calibration cloning might not be required in some environments; the user is advised to set up the recalibration as required)
- Via setup columns, show the following columns and set them accordingly for the **last sequence line**:
 - **Run Program** – check the checkbox
 - **Programs to Run** – select Clarity
 - **Parameters to Run** – fill in the command line parameter to restart the sequence: *run_seq=n*, where *n* is the number of the instrument (usually 1)
- Include the print or export of results as desired


Status	Run	SV	EV	I/V	Sample ID	Sample	Sample Amount	ISTD1 Amount	Sample Dilut.	Inj. Vol. [µL]	File Name	Sample Type	Lvl	Method Name	Report Style	Open	Open Calib.	Print	Run Program	Program To Run	Parameters
1	<input checked="" type="checkbox"/>	1	1	1			1.000	0.000	1.000	0.000	%q_%R_%3n	Standard	1	Standard		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
2	<input checked="" type="checkbox"/>	2	2	1			1.000	0.000	1.000	0.000	%q_%R_%3n	Standard	2	Standard		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
3	<input checked="" type="checkbox"/>	3	3	1			1.000	0.000	1.000	0.000	%q_%R_%3n	Standard	3	Standard		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
4	<input checked="" type="checkbox"/>	4	4	1			1.000	0.000	1.000	0.000	%q_%R_%3n	Unknown		Sequence		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
5	<input checked="" type="checkbox"/>	5	5	1			1.000	0.000	1.000	0.000	%q_%R_%3n	Unknown		Sequence		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
6	<input checked="" type="checkbox"/>	6	6	1			1.000	0.000	1.000	0.000	%q_%R_%3n	Unknown		Sequence		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	C:\Clarity\Bin\Clarity.exe	run_seq=1
7	<input type="checkbox"/>															<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		

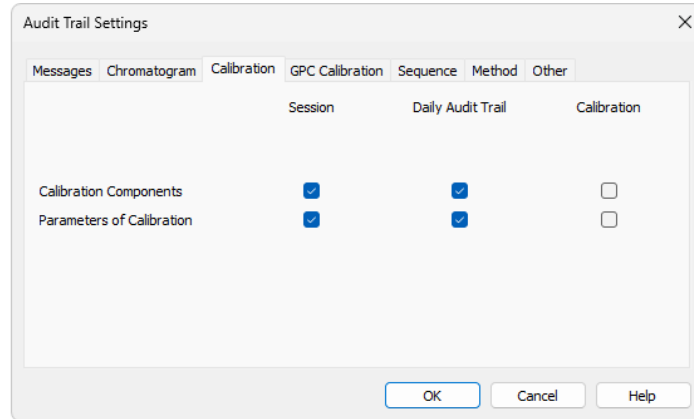
3 – Interrupt the continuous loop

- Interrupt the loop by stopping the sequence
- If the sequence is interrupted on the last line, the loop will not be stopped – it is necessary to stop the sequence on another line or abort it at the start of another sequence loop

Important: How to avoid system/memory overload in the continuous run

- It is not recommended to use the same sequence table to run more than a few hundred analyses – the sequence validity check performed before each run takes more time with each run completed and may cause observable delays after a few hundred runs
- It is convenient to save the measured chromatograms to **subfolders** based on, e.g., the date of measurement so that there are not thousands of chromatograms in one folder
 - This can be done by setting the chromatogram file name as a path, e.g., **%D/%v_%R**. Chromatograms with this file name set will be saved to a subfolder named by the date in dd_mm_yyyy format (**%D**), and the chromatogram itself will be labeled by the vial number (**%v**) and date and time in the current system format (**%R**)
- To lower the memory demands, the number of messages in the *Audit Trail* should be reduced. The following settings are recommended:

- Open the *Audit Trail* via the *Window – Station Audit Trail* menu. Then open the *Audit Trail Settings* by either clicking the wrench icon  or *View – Properties*
- In the *Audit Trail Settings*, on the *Calibration* tab, disable the two checkboxes under *Calibration*



- And on the *Sequence* tab, disable the checkbox under *Sequence*

