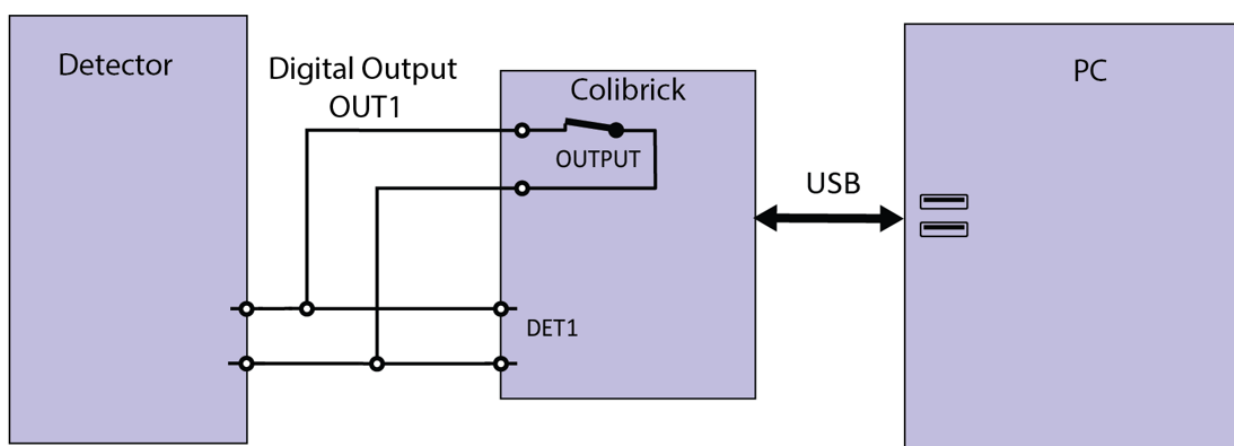


## Analysis of continuous signals via peak generation

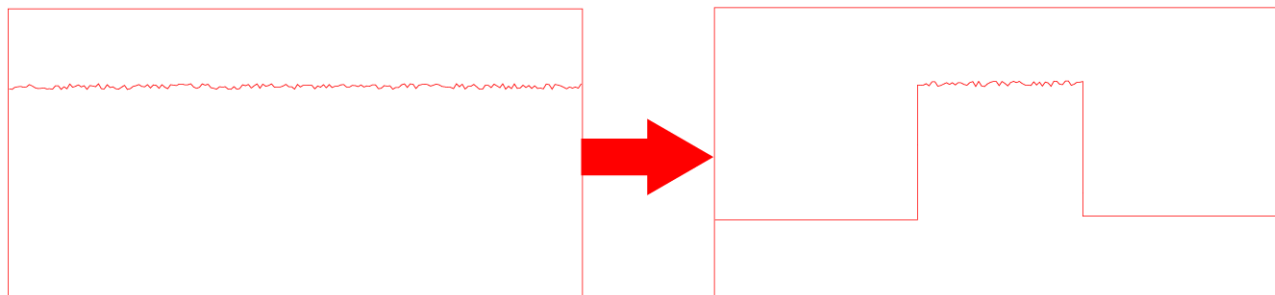
### How to analyze continuous signals with no peaks (e.g., from moisture analyzers)

Continuous analyzers (e.g., moisture or total hydrocarbon analyzers) produce a steady signal without distinct peaks. Quantifying such signals is useful for automatic evaluation of properties such as moisture content. Standard chromatography software struggles with this task because these signals lack a baseline for peak identification and integration.

Clarity enables evaluation of continuous signals by generating artificial peaks. This is achieved by briefly opening the analyzer's signal using a digital output, so the data are collected only during a short interval. This setup can be implemented using a relay contact connected to the detector output, as shown in the diagram below.



The result is a square peak that can be integrated like a regular chromatographic peak.

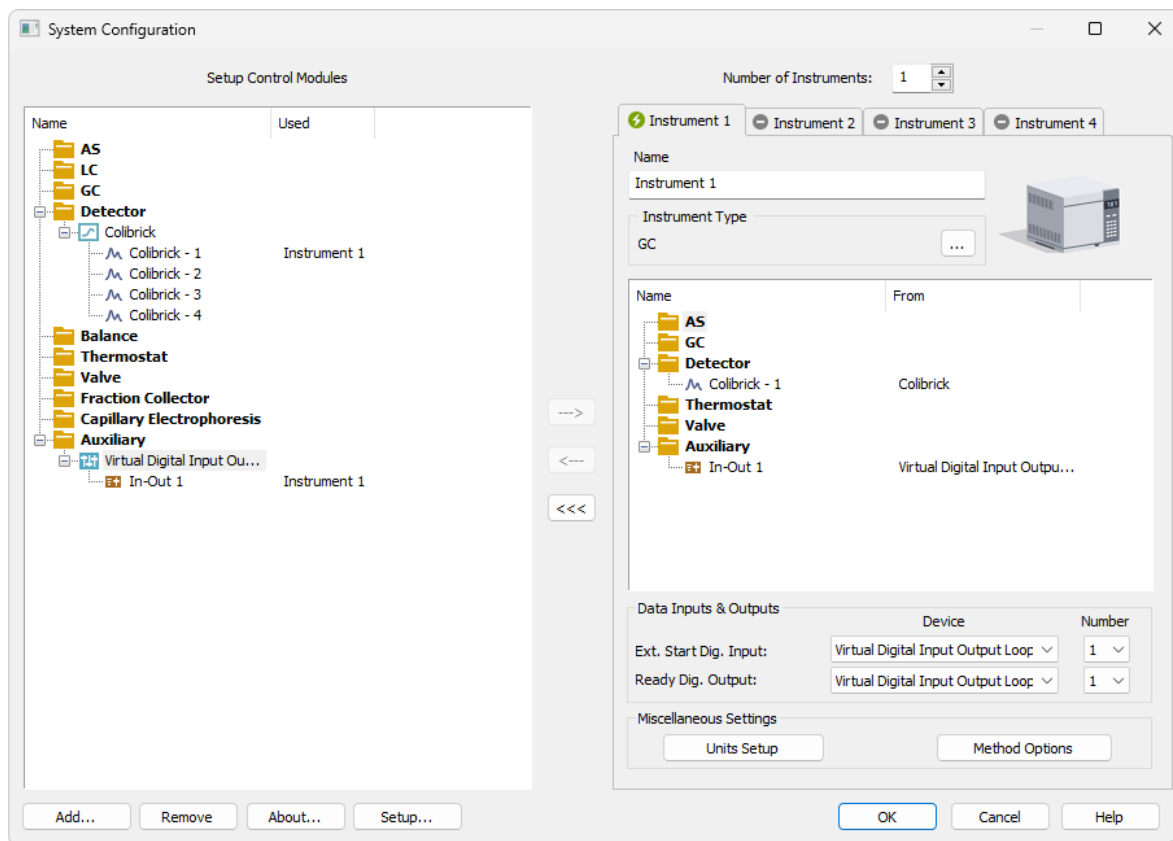


This approach requires a detector with an analog output, since a Colibrick A/D converter is used for data acquisition and for generating the square peaks. Quantification of the property (e.g., humidity) is then performed using either calibration or a user column expression.

When configured correctly, the peak width is constant and corresponds to the duration of the digital output pulse. The peak's area or height is proportional to the measured property (e.g., humidity).

## Step 1 – Generation of peaks

- In System Configuration, configure both the Colibrick and the Virtual Digital Input Output Loop using Add button. Set the Virtual loop as *Ext. Start Dig. Input* and *Ready Out Dig. Output*.



- On the *Measurement* tab, set *Autostop Run Time* to stop the analysis after the pulse. In our case, the pulse will happen at 0,3 min so the Autostop 0,6 min should be ideal.
- In the Event Table, define the times for opening (i.e., switching to the **High** state) of the relay contact (Out1r) connected in parallel to the signal input (DET1) to a suitable time interval. The first row of the *Event Table* is used just to ensure the initial state (relay closed); the next one defines the time for the actual measurement using the *Pulse* parameter.

Method Setup Demo1 (MODIFIED)

New Open... Save Save as... Report setup... Audit trail... Send method by e-mail... Help

Common for all detectors

	Name	Type	Input				Output Type	Output		
			Source	Input	Value	Units		Output	Parameter	Store
1	INIT	Run Begin	---	---	---	---	Colibrick	Digital Output 1	Low	<input type="checkbox"/>
2	Start peak	Run Time >	---	---	0.300	min	Colibrick	Digital Output 1	Pulse	<input type="checkbox"/>
3										<input type="checkbox"/>

Event Table Measurement Acquisition Aux Integration Calculation Advanced

OK Cancel Send Method

**Note:** If the pulse is too short, two *Run Time* rows changing the *Output* state to **High** and **Low** in the desired time interval can be used.

Common for all detectors										
	Name	Type	Input				Output Type	Output		
			Source	Input	Value	Units		Output	Parameter	Store
1	INIT	Run Begin	---	---	---	---	Colibrick	Digital Output 1	Low	<input type="checkbox"/>
2	Start peak	Run Time >	---	---	0.300	min	Colibrick	Digital Output 1	High	<input type="checkbox"/>
3	Stop peak	Run Time >	---	---	0.400	min	Colibrick	Digital Output 1	Low	<input type="checkbox"/>
4										<input type="checkbox"/>

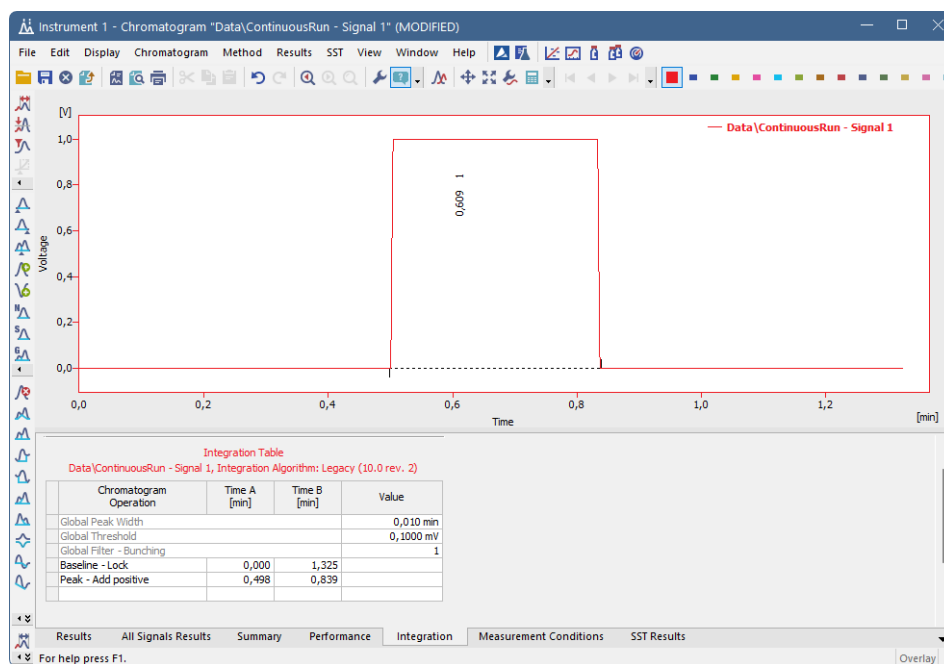
**Note:** After the Single Analysis is finished, the same method is automatically sent again. If a *Time Idle* event is defined, Clarity waits for the specified time before starting the next measurement. This allows repeated measurements to be performed automatically at regular intervals.

Common for all detectors										
	Name	Type	Source	Input	Value	Units	Output Type	Output	Parameter	Store
1	Start run	Time Idle >	---	---	1.000	min	Command	Start Acq	---	<input type="checkbox"/>
2	INIT	Run Begin	---	---	---	---	Colibrick	Digital Output 1	Low	<input type="checkbox"/>
3	Start peak	Run Time >	---	---	0.300	min	Colibrick	Digital Output 1	Pulse	<input type="checkbox"/>
4										<input type="checkbox"/>

If you want to perform a predefined number of measurements, you can use the *Sequence* as well. In this case, *Time Idle* should not be used.

## Step 2 – Integration of the generated peaks

- To integrate square peaks in Clarity, you need use specific integration workflow. The suggested integration parameters are the following:
- Use *Baseline Lock* to suppress integration
- Manually apply *Peak – Add Positive* in the relevant area



## Step 3 – Calibration

- In the case you want to calibrate the square peaks, some adjustments have to be made.
- Change the *Response Base* in the *Calibration Summary Table* to *H* (Height).

Instrument 1 - Calibration Nomenclature <-- ESTD (MODIFIED)

File Edit Display Calibration View Window Help

Automatic Calibration on All Signals

Calibration Summary Table (ESTD - Nomenclature - Signal 1)

Used	Compound Name	Reten. Time	Left Window	Right Window	Peak Color	LOD	LOQ	Response Base	Manual Resp. Factor	Level 1			
										Response	Amount	Resp. Fact	Rec No.
1	Moisture	0.310	0.200 min	0.200 min		0.000	0.000	H	0.0000	1246.038	0.000	0.0000	1/1

**Note:** Conversion from voltage to analyzer units can be set in the Detector Units dialog (System Configuration - DataApex Colibrick Setup – Set Units...). If the zero signal does not equal the physical zero (e.g., with current loops), configure an Offset in the same dialog. See datasheet [D180 Using offset to read current loop outputs](#) for details on using offset with current loop outputs.

DataApex Colibrick Setup

Device: DEMO Mode

Channel 1

Name: Colibrick - 1 ☐ Inversion of Signal ☒ Bipolar ☐ Synchronize Start with Digital Input

Digital Input 1: Digital Input 1

**Set Units...**

Detector Units

Quantity: Moisture Units: %

Offset: 4 mV ☐ Autoprefix

Coefficient: 1 % / 1 mV

OK Cancel Default Units Help

Channel 2

Name: Colibrick -

Set Units...

Channel 3

**Advanced Tip:** Via using multiple digital outputs and multichannel colibrick, it is possible to connect outputs from several analyzers during the run and get readings of their values within a single run as different signals.