# **Rheonics CoaguTrack System** SOFTWARE MANUAL

Coagulation Tracking System Doc. ID: CTK-SM-2502





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# 1 Before you begin

# **1.1** About the manual

This manual provides information on the installation and use of Coagutrack software.

#### **Important Instructions**

This manual assumes that the following conditions apply:

- The sensors have been installed correctly and completely according to the installation.
- The installation complies with all applicable safety requirements.

### **1.2** Contact

Contact the Rheonics team with any inquiry. For sales and delivery-related questions, contact the Sales Team at <u>info@rheonics.com</u>. For installation, integration, and troubleshooting, contact the Support Team at <u>support@rheonics.com</u>.

### 1.3 Who should use this document?

Users of Rheonics Coagutrack system.

### **1.4** Nomenclature

Abbreviation (short form)	Full-term	Meaning
SRV	Symmetric Resonator Viscometer	Viscosity sensor unit
SME	Smart Module Electronics	Sensor electronics

# **1.5** Related Documentation

You can also find them on the website: <u>https://rheonics.com/resources</u> For more information on the sensor, refer to the following documents on Rheonics website. Contact Rheonics Support Team if you cannot find a document online.

# 2 Minimum System Requirements

Operating System: Windows 7 or Higher (Windows 10 recommended)

**Required:** LabVIEW Run-Time Engine 2019. Included in the full installer.

This run-time engine is also available online at:

https://www.ni.com/es-cr/support/downloads/softwareproducts/download.labview-runtime.html#348045

Free Disk Space: 2 GB (For full installation including run-time engines)

RAM: 4GB

# 3 Running the program

Open the Coagutrack application by clicking on its Desktop icon.



When the software is running, you will see the following screen:

	Parameters 🔗	inetics 🦰			Alarm 🌘	17:27:02 30/01/2024
<b>«</b>	Information					
Station 1	Job #	Date		F	Reference Job ID	
Station 1	6		1/30/2024		Test Cheese   5   2	20240130 ~
Station 2	Cheese Type	Desc	ription			
	Test Cheese	~				
Station 3	Main Operator					
	Test Operator	~				
Station 4	Operational Para	meters				
Station 5	Parameters	Туре	Select	Value		Unit
Station 6	Target Cutting Firmness	Viscosity	Visible	+	20	
	Measurement initiation after renneting	Time	Auto		0	seconds
Visualization 🗎	Measurement stop alert	Time	Auto		0	minutes
actory Mode						
Diagnostics 👽						
Config 🗶	2	et <mark>Default Valu</mark>	es for Cheese Type		Clear all	Save

Figure 2 First run of the software

The software uses a database to store data, If it cannot connect to the database, the following message will be shown.

<b>8</b>	×
Unable to connect to the da	atabase
ОК	

Figure 3 Connection error message

# 4 Operating the system

After installing the software, starting the application and successfully connecting to the database, the system can be used.

AT LEAST ONE SME WITH ONE SRV MUST BE CONNECTED TO THE COMPUTER USING ETHERNET CABLE AND POWERED UP IN ORDER FOR THE SYSTEM TO EXECUTE A JOB MEASUREMENT

# 4.1 Navigation

The software has three different interfaces, these interfaces are described in more detail bellow:

#### 4.1.1 Parameters interface

The parameter interface is the first interface the user will see when starting the program, it allows the user to create measurement jobs for each station, as well as to add operators and cheeses to the database.

<b>«</b>	Information					
Station 1	Job #	Da	ate		Reference Job ID	
	6		1/30/2024		Test Cheese   5   202	240130
Station 2	Cheese Type	De	escription			
	Test Cheese	~				
Station 3	Main Operator					
	Test Operator	~				
Station 4						
	Operational Para	meters 6				
Station 5	Parameters	Туре	Select	Value		Unit
	Target Cutting Firmness	Viscosity	∕ <mark>√ Visibl</mark> e		20	
Station 6		1.				
Station 6	Measurement initiation after renneting	Time	Auto	-	0	second
Station 6	Measurement initiation after renneting Measurement stop alert	Time Time	Auto	+		minute
Station 6	Measurement initiation after renneting Measurement stop alert	Time Time	Auto	+	0	minute
Station 6 Visualization 🗎 Factory Mode 🚂 Diagnostics 💱	Measurement initiation after renneting Measurement stop alert	Time Time	Auto			minute

Figure 4 Parameters interface

1. Navigation buttons: It allows the user to navigate between the 2 main interfaces

that the system has, currently it is in the parameters interface so its respective button is highlighted.

- 2. Alarm button: Button used to deactivate the buzzer alarm after its activation.
- 3. Date and hour: Indicator to show the current date and hour.
- 4. **Stations buttons:** Allow the user to navigate between stations, also there is an arrow button to hide the sidebar.
- 5. **Information:** This section contains all the information that the user has to fill in order to create a new measurement job, the controls and indicators are defined as follows:
  - **a.** Job #: Shows the number of the job to be created, this number increases each time a job is created.
  - **b. Date:** Defines the date of the job to be created, by default it will be the current date.
  - c. Main Operator: A list of all the operators available to use this software, the last two options of this list allow the user to create or remove an operator.
  - **d.** Cheese Type: A list of all cheeses available, the last two options of this list allow the user to create or remove a cheese.
  - e. Reference Job ID: A list of all previous jobs created at this station; the reference job data will be displayed on the measurement graph along with the current measurement data.
  - f. Description: A short description of the job to be created.
- 6. **Operational parameters:** A table where the user can define the operational parameters of the job to be created, the parameters are defined as follows:
  - a. Target cutting firmness: Reference firmness value where the cut should be made, if the checkbox is activated a horizontal line with this value will be shown in the measurement graph.
  - **b.** Measurement initiation after renneting: If this is activated and a value is set, then a timer will start to count at the beginning of the measurement and then, when it finishes, the values of firmness and coagulation speed will start to be shown in the graph. Cheese makers normally use this time to introduce the rennet into the milk and mix them.
  - **c.** Measurement stop alert: Parameter to display an alert and stop the measurement after a certain time in minutes.
- 7. **Visualization button:** Button to enter the visualization interface where the measurement jobs performed can be loaded a visualized in graphs.
- 8. **Factory mode button:** Button to enter to the factory mode interface, this interface is password protected and can only be used by rheonics support team.
- 9. **Diagnostics button:** Button to enter to the diagnostics interface where the state of the sensors of each station can be seen, and the configuration of the ethernet port and Wi-Fi can be changed.
- 10. **Configuration button:** A button to open the configuration window.
- 11. **Operational buttons:** With these buttons the user can set the current parameters as default values for the selected cheese, clear all the parameters and information defined so far, and save the current job in order to start a measurement in the kinetics interface.

#### 4.1.2 Kinetics interface

This interface is accessed after creating a job in the parameters interface, in this interface the user can start the measurement of the sensors, start the rennet timer, save cut parameters, view the measured and calculated data, and stop a running measurement.

- 1. **Information:** In this section, the user can see the information of the current job in the station, if this section is empty, it means that there is no job created for the current station.
- 2. **Temperature indicator:** This indicator shows the current temperature of the sensor in the station when a measurement is running.
- 3. **Firmness and Speed Graph:** The measurement of firmness will be shown in this graph as well as the values of the calculated speed, both values in different axis (Firmness on the left axis and Speed on the right axis). The firmness and speed data of the reference job that was selected when the job was created will also be displayed.
- 4. **Plot legend:** An indicator that shows which color and shape corresponds to each measurement value. If the user clicks on the name of the plot, it will be hidden in the graph and vice versa.

	Parameters 🔗 Kinetics 📈	~	Alarm 🌘	15:44:00 21/06/2023
<b>«</b>	Cheese:   Job ID:   Station# : 1   Ma	in Operator: 1	0.0 •	2
Canting 1	0.10-		- 0.0	Firmness 1/4
Station 1	0.08-		- 0.0	Coag. Speed
Station 2	0.06-		- 0.0	Ref. Firmness
Station 2			- 0.0	Ref. Coag. Speed
Station 2	0.04-		- 0.0	
Station 5	0.02-		-5.0E-5	Bannat 5
Station 4	Ш 0.00-		- 0.0 Spee	Renner
Station 4	- 분 - · · · · · · · · · · · · · · · · ·		5.0E-5	Ctaut
Station 5	0.02		0.0	Measurement
	-0.04-		0.0	
Station 6	-0.06-		0.0	Cut
	-0.08 -		0.0	
	0.10-		-0.0	Stop
Visualization	0 0.1 0.2 0.3 0.4	0.5 0.6 0.7 0.8 0.	9 1	Measurement
	6	1 ime(min) 7		
Easters Made Las	Target cutting Firmness Reference Jo	b ID Setting time	Vmax	Real cutting time
Factory Mode	0	00'00"	0	00'00"
Diagnostics 🕅	8			
Diagnostics W	Time from reppeting	Real cutting	Vest	Relative Coagulation
	00'00" 0		0	
Config 🗶	00'00" 0	0	0	0 %

Figure 5 Kinetics interface

5. **Measurement buttons:** Measurement control buttons, the buttons actions are defined as follows:

- a. **Rennet**: Starts the rennet timer, this timer starts counting up to the time defined in the job creation, when it finishes, the measurement will start automatically.
- **b. Start Measurement**: This button starts the measurement directly without using the rennet timer.
- Cut: When this button is pressed, the current values for firmness, speed and time will be saved, and these values will be shown in the indicators below. Additionally, if the system has control relays then the channel corresponding to the station will be activated when the Cut button is pressed.
- d. Stop Measurement: When pressed, the current measurement will stop.
- 6. **Stationary indicators:** This section has two indicators, the first one is the target cutting firmness, this will show the value defined when the job was created, the second one is the reference job id that was also defined during the job creation.
- 7. **Calculated parameters:** This section will show the parameters that are being calculated during the measurement, these parameters are:
  - a. Setting time: Is the time when the milk starts to become a gel. (This parameter will only change if the software has the setting time calculation available)
  - **b. Vmax:** Is the maximum value of the speed (first derivative of firmness), this parameter is also being calculated while the measurement is in progress.
  - c. Real cutting time: Is the time when the cut button is pressed.
  - d. Real cutting firmness: Is the firmness when the cut button is pressed.
  - e. Vcut: Is the speed when the cut button is pressed.
  - f. Relative coagulation speed: It is the division between Vcut and Vmax in percentage.
- 8. **Real time visualization:** This section will show two parameters in real time, the first one is the time from renneting that will show the progress of the rennet timer, and the second one is the firmness that will be showing the current firmness value all the time.

#### 4.1.3 Visualization interface

In this interface the user can load measurement jobs that have data stored in the database in order to visualize them in the graphs and in the table, and can also export an excel report of the measured data.



Figure 6 Visualization interface

- 1. Graphs tab: It is a tab control containing all the graphs available for display.
- 2. **Plot legend:** A list of all jobs loaded to the current graph, the user can check or uncheck the jobs that he wants visible or not.
- 3. Jobs table: A table where all the loaded jobs will be shown.
- 4. Clear Table: This button will remove all the loaded jobs in the table.
- 5. **Transfer File:** This button will be used to retrieve files from the RPS box, this will only work using a client software installed in another computer in the same network. (This feature is only available with a PRO license)
- 6. **Export Data:** When this button is pressed, a CSV file with the data of the selected job will be made and saved.
- 7. **Load Jobs:** This button will open a filter menu where the user can select which jobs will be loaded. As it is shown in Figure 7, the use can filter jobs by station, cheese type, date and job id. If no filter is selected, the software will load all jobs from the database.

😽 Filter Jobs to Load	ł	×
Filter jobs	by	
Station	1	~
Cheese	<empty></empty>	~
Date [	DD/MM/YYYY	
Job ID	0	
*	Load Jo	bs
Figure 7	' Filter mei	าน

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8. Graph of all jobs: This is the last graph of the options in the graphs tab, all measured data from a job will be displayed on this graph. To change the job to be displayed, the user just has to select a different job in the table and the graph will be updated.



Figure 8 Graph of all jobs

#### 4.2 Creating a job

To create a new measurement job, the following steps must be followed:

1. In the Parameters interface, select the station where the measurement job will be performed.

theonics	Parameters	Kinetics	2
«	Information		
Station 1	Job # 252		Date
Station 2	Cheese Type 5 - Emmentaler		Descrip
Station 3	Main Operator 6 - Test Operator	9	
Station 4	Operational Para	meter	s
Station 5	Parameters	Тури	ł.,, (
Station 6	Target Cutting Firmness	Visco	osity

Figure 9 Selecting station

2. Define the relevant information for the job to be created. The job number cannot be modified, it will automatically show the number of the job to be created.

lob #		Date	Reference Job ID	
252		21/06/2023	ytghk   251   20230620	0.8
Cheese Type		Description		
5 - Emmentaler	1			
Main Operator				
6 - Test Operator	101			

Figure 10 Information of the job

Clicking on the arrow in the list of operators will display a list of all available operators. A new operator can be created by selecting the option "Add Operator".

Main Operator	
6 - Test Operator ~	
- 1 - Ale	F
2 - Jose	r
3 - Juan	
4 - Patrick	Ē
5 - Pedro	_
✓ 6 - Test Operator	P
Add Operator	0
Remove Operator	-
Figure 11 Operators' list	
new Operator >	<
tor name	

	~
Operator name	
	ADD

Figure 12 Add operator window

If you need to remove an operator, select the "Remove Operator" option, this will open a window where you can select the operator you want to remove.

🞇 Remove Operator			×
Ale	~	REMOVE	
Figure 13 Remo	ve operat	or windo	w

#### The same can be done with the list of cheeses.

----



In the case of the reference job id, only the list of jobs will be displayed and the user can select the job to be used as reference.

P	armesan   1.62   20220601
-	Parmesan   1.62   20220601
	Parmesan   1.61   20220421
	Parmesan   1.60   20220421
	Parmesan   1.59   20220420
	Roquefort   1.58   20220420
	Parmesan   1.57   20220420
	Parmesan   1.56   20220420
	Parmesan   1.55   20220419
	Parmesan   1.54   20220408
	Parmesan   1.53   20220408
	Parmesan   1.52   20220408
	Parmesan   1.51   20220408
	Parmesan   1.50   20220408
	Parmesan   1.49   20220408
	Parmesan   1.48   20220408
	Parmesan   1.47   20220408

A small description can be added in the description section.

Description	
Test run	
	Figure 16 Description section

3. Define the operational parameters for the job to be created, the values can be increased or decreased using the "+" and "-" buttons. If you click directly on the number in the box, a numeric keypad will open to help you define the desired number for that value.

0	perationa	Parameters
_		

Parameters	Type Select Va		Value				Unit
Target Cutting Firmness	Viscosity	Visible	+	0			
Measurement initiation after renneting	Time	Auto	+	0			seconds
Measurement stop alert	Time	Auto	-	0			minutes

💐 Numeric Keyboard 🛛 🗙							
5.2							
7 8 9 Erase							
4	5	6	Reset				
1	2	3	Accept				
+/-	0	•	Cancel				
Figure 18 Numeric Keypad							

Figure 17 Operational parameters

4. Finally, press the save button to save all the data defined so far in the database and have the station ready to start a measurement.



### 4.3 Using the rennet timer

After creating a job and only if the "Measurement initiation after renneting" parameter has been activated, then the following steps can be followed to use the rennet timer:

1. Click on the Kinetics button at the top to go to the kinetics interface, make sure you are at the station where you created the job, if not, you can switch stations using the buttons on the left.

🗧 Coagutrack 1.9.0.0		
rheonics COAGUTRACK	Parameters	Kinetics 🦟
<b>«</b>	Cheese:   Job ID:	Station# : 1   Main Ope
	0.10-	
Station 1	0.08 -	
Station 2	0.06-	
	0.04 -	
Ctation 2		
Figure	20 Entering kine	etics interface

2. Click the "Rennet" button to start the timer.

Rennet
Start Measurement
Cut
Stop

Figure 21 Rennet button

3. You will see the value of the "Time from renneting" indicator start to increase until it reaches the time you set when creating the job.

Real time visualization						
Time from renneting	Firmness					
00'05"	0					

Figure 22 Timer working

4. When the timer count finishes, the measurement will start automatically.



Figure 23 Measurement started after rennet time

# 4.4 Starting a measurement

If you used the rennet timer then the measurement will start automatically, if not, then use the following steps to start a measurement:

- 1. Click on the Kinetics button at the top to go to the kinetics interface, make sure you are at the station where you created the job, if not, you can switch stations using the buttons on the left. (Figure 20)
- 2. Click on the "Start Measurement" button



Figure 24 Start Measurement button

3. The measurement values will start to be displayed in the graph as well as in the real time indicators, the time between sample can be configured in the configuration window. The red horizontal line represents the target cutting firmness.

	Parameters	Kinetics		Alarm 🌘	17:35:34 21/06/2023
<b>«</b>	Cheese: Parmesa	n   Job ID: 51   Station# : 1	Main Operator: Test Op	perator 24.4 °C	
	15.00 -			= 3.6	Firmness 🔥
Station 1	14.00 -			- 3.2	Coag. Speed
	13.00-			- 3.0	Pof Eirmness
Station 2	12.00-			- 2.8	Ded Gross Groud A
	11.00-			- 2.5	Ref. Coag. speed
Station 3	10.00 -			- 2.2	
	9.00-			- 2.0	2
	- 00.8 Jues			- 1.8 Spe	Kennet
Station 4	E 7.00-			- 12 e	
	6.00-			- 1.0	Start
Station 5	5.00 -			- 0.8	Measurement
	4.00 -			- 0.5	
Station 6	3.00-			- 0.2	Cut
	2.00-			- 0.0	
	1.00-			0.2	Stop
isualization 🗎	0.00-	0.2 0.3 0.4 0.5 Time(m	0.6 0.7 0.8 in)	0.9 1	Measurement
	Target cutting Firmr	ness Reference Job ID	Setting time	Vmax	Real cutting time
actory Mode	13	Parmesan   2.50   20220530	00'00"	0	00'00"
Diagnostics 👽	Real time vis	ualization	Real cutting		Relative Coagulation
	Time from renneti	ng Firmness	firmness	Vcut	Speed (Vcut/Vmax)
Config X	01'00"	3.025	0	0	0 %

Figure 25 Measurement in progress

4. At some point the firmness will reach the target cutting firmness value, at this point the buzzer alarm will be activated indicating that is time to cut the cheese. The button of the station that triggered the alarm will start flashing red and the 'Alarm' button on top will be activated, you can press this button to turn off the alarm if you wish.



Figure 26 Buzzer alarm triggered by station 1

5. The Cut button can be pressed at any time during the measurement, normally it should be pressed once the firmness reaches the target cutting firmness value and the alarm is activated, if you press the "Cut" button, the current values will

Setting time	Vmax	Real cutting time
00'00"	3.6	02'42"
Real cutting firmness 8.2	Vcut 1.2	Relative Coagulation Speed (Vcut/Vmax) 33 %

be saved and displayed in the indicators below.

Figure 27 Cutting values

**Note:** If the system has relay outputs configured then each time the Cut button is pressed the corresponding output for that station will be activated, this can be used to activate an actuator that performs the cheese cutting process.

6. If you want to finish the measurement, just click the "Stop Measurement" button and all the data will be saved in the database so you can check it in the visualization interface. *The relay output of that station will also turn off when the measurement is stopped.* 



Figure 28 Measurement stopped

# 4.5 Automatic measurement stop

If you have enabled the stop measurement alarm option, then the measurement will stop at the time you have defined in minutes. About 10 seconds before the time is up, the "Stop Measurement" button will start blinking.

1. Create a Job, enable the "Measurement stop alert" option and define a value for the stop time in minutes.

Operational Parameters						
Parameters	Туре	Select	Value	Unit		
Target Cutting Firmness	Viscosity	Visible	• 0			
Measurement initiation after renneting	Time	Auto	• 0 •	seconds		
Measurement stop alert	Time	Auto	• 0 •	minutes		

Figure 29 Creating a job with measurement stop alert

2. Go to Kinetics and start a measurement, in the example the stop time is set to 5 minutes so when it reaches 4 minutes and 50 second the alert will start.

rheonics	Parameters	Kinetics /		Alarm 🌘	17:35:34 21/06/2023
<b>«</b>	Cheese: Parmesan   Jo	ob ID: 51   Station# : 1   Ma	in Operator: Test Op	erator 32.3 °C	
Station 1	14.00-			- 20.0	Firmness N Coag. Speed
Station 2	12.00-		~~	- 16.0	Ref. Firmness
Station 3	10.00 -			- 14.0	
Station 4	8.00- III 7.00-	/		- 10.0 Speed	Rennet
Station 5	6.00-			- 6.0	Start Measurement
Station 6	4.00-	A		- 4.0	Cut
/isualization 🗎	3.00-	1 1.5 2 2.5 Time(min)	3 3.5 4	4.5 4.8	Stop Measurement
actory Mode	Target cutting Firmness	Reference Job ID	Setting time	Vmax	Real cutting time
	13	Parmesan   2.50   20220530	00'00"	3.6	00.00.
Diagnostics 👽	Real time visualiz	ation Firmness	Real cutting firmness	Vcut	Relative Coagulation Speed (Vcut/Vmax)
Config X	04'50"	12.42	0	0	0.%

Figure 30 Stop alert 10 seconds before the stop time

3. Finally, the measurement will stop 5 minutes after the start of the measurement, as this is how it was configured.

rheonics COAGUTRACK	Parameters	Kinetics		Alarm 🏩	17:35:34 21/06/2023
<b>«</b>	Cheese: Parmesan   .	Job ID: 51   Station# : 1   Ma	ain Operator: Test Op	erator 32.3 °C	
Station 1	14.00 - 13.00 -			- 20.0	Firmness
Station 2	12.00-		مر	- 16.0	Ref. Firmness
Station 3	10.00- 9.00-		1	- 14.0 - 12.0	Report
Station 4	8.00- III 7.00-	/		- 10.0 Speed	Ctart
Station 5	6.00-			- 6.0	Measurement
Station 6	4.00-	A		- 4.0 - 2.0	Cut
Visualization 🗎	2.00-	1 1.5 2 2.5 Time(min)	3 3.5 4	4.5 5 -0.5	Stop Measurement
actory Mode	Target cutting Firmness	Reference Job ID	Setting time	Vmax	Real cutting time
	13	Parmesan   2.50   20220530	00'00*	3.6	00.00.
Diagnostics 👽	Real time visuali	zation	Real cutting	Voit	Relative Coagulation
	05'00"	12.54	0	0	0 %

Figure 31 Measurement stopped at the configured time

# 4.6 Visualizing a measurement job

To view the data of a job in the database, follow the steps below:

1. Click on the Visualization button to enter the visualization interface, in this case it is not necessary to select a station.



Figure 32 Entering visualization interface

2. Click the "Load jobs" button at the bottom.

	V.
Export Data	📔 Load Jobs
Figure 33 Loc	ad jobs button

3. The filter jobs windows will be displayed, you can filter jobs by station, cheese, date or job ID, in this example I will select the station number 1 as a filter.



4. The loading bar will be shown indicating that the system is loading jobs from database.



5. All the measurements jobs from station 1 have been loaded and a list of the parameters for each job is shown in the table below.

	Para	meters o	Kinetics	~			Alarn	n 🅼 20 21/	):49:11 06/2023
~	s	1E+7-			1			1 177	
Station 1	E	9E+6-						1.176	
	E	8E+6-						1.175	
Station 2	beed	7E+6-						1.174	$\overline{\mathcal{N}}$
	g. Sp	6E+6-						1.173	
Station 3	Coa	5E+6-						1.172	$\sim$
	4	4E+6-						1.171	$\sim$
Station 4	cele	3E+6-						1.170	$\sim$
	Ac	2E+6-						1.169	$\sim$
Station 5	du.	1E+6-						1.168	$\sim$
	Ten	0-						1.167	
Station 6	AII	-1E+6- 0 10	20 30 40	50	60 70 "ime(min)	80 90	100 110	120 130	
ualization 🗎	Stati	on Cheese Name	Date	Job ID	Setting Time	Vmax	Real Cutting Time	Real Cutting Firmness	Vcut
	1	Test2	19/01/2023	177	02' 57"	2.95	03' 30"	0.88	-0.28
tory Mode	1	Test2	19/01/2023	176	00' 00"	0.01	00' 54"	0.00	-0.00
		Test2	19/01/2023	175	00' 00"	0.00	01' 09"	0.00	0.00
agnostics 💔	01	Test2	19/01/2023	174	00' 00"	0.01	01' 33"	0.01	-0.00
				k	1				-

Figure 36 Jobs loaded

To display the data of a job in the graphs, you have to activate the checkbox of that specific job in the first column of the table.



Figure 37 Jobs added to the graph

The last graph will show the four parameters of one job at the same time, you can change the job being displayed in the graph by selecting another job in the table, in the following example, all the plots of the job 83 from station 1 are being shown in the graph.



Figure 38 Plots of Job 83 from station 1

6. Finally, to export data from one or more jobs you just have to check the checkboxes of all the jobs you want to export, and then click the 'Export Data' button.

Station	Cheese Name	Date	Job ID	Setting Time	Vmax	Real Cutting Time	Real Cutting Firmness	Vcut	í
<b>⊠</b> 1	Test2	19/01/2023	177	02' 57"	2.95	03' 30"	0.88	-0.28	1
⊠ 1	Test2	19/01/2023	176	00' 00"	0.01	00' 54"	0.00	-0.00	1
⊠ 1	Test2	19/01/2023	175	00' 00"	0.00	01' 09"	0.00	0.00	1
<b>⊠</b> 1	Test2	19/01/2023	174	00' 00"	0.01	01' 33"	0.01	-0.00	1.
•	lear Table		I	Tran		Export Dat	ta 📔 Lo	ad Jobs	+

Figure 39 Exporting jobs

Upon pressing this button, two outcomes are possible:

USB not connected: if an USB stick is not connected to the box, then the exported CSV file will be saved in a shared folder that can be accessed through any computer connected to the same network, you have to open windows explorer and type the following path: \\IPaddress\Coagutrack\_Shared, then you will see the shared folder with all the exported files so far.

192.168.1	00.57\Coagutrad	:k_Sh	ared					
ds	*		Name ^		Date modified	Туре	Size	
	*		Station1-Job 17.csv		25/06/2024 12:51	Microsoft Excel C	4	КВ
			Figure 40 Associate	the changed for	lder			

Figure 40 Accessing the shared folder

• **USB connected:** if an USB stick is connected to the box, then a window will appear where you can select on which USB drive you want to save the data, either way, a copy of the file will be saved in the shared folder.

	Select Fold	ler					×
s	elect the	drive(s) for	saving the rep	port:	_		
	ADA	TA UFD	(F:)	$\checkmark$	•	Export	
					8	Cancel	
-							
ese	Name	Date	Job ID	Setting	Vmax	Real	-
		Eigure 2 2002.06.01 22.33.13.cm · Fie for format year 1 Creeses Name; Parmeasi Date; 5/23/2022 3 db Dj 1.76 Date; Scalar Real Cutting Time; L32 · 00 Van; 4.34 Real Cutting Time; L32 · 00 Description; Time; Firmeres; Preper Time; Firmeres; Preper 14:17:47.0 e006107:30	A1 Selecting US	SB drive to sav	e data		
		14:17:48;0.180501;30 14:17:49;0.180501;30 14:17:50;0.180501;30 14:17:51;0.225626;30 14:17:52;0.225626;30	778999;1.650568;64.697622 778999;0.450229;64.697622 778999;4.517592;76.658344 784000;4.517593;28.609547 784000;4.65741;28.609569				

pt Let 10 The proves and the provided and the provid

Figure 42 CSV exported file

# 4.7 Using the configuration window

1. First, press the config button located in the bottom left corner.

Factory Mode
Diagnostics 👽
Config 🗶

Figure 43 Configuration button

2. The configuration window will be opened, in this window you can set the background color for the graphs, the sampling time in seconds, the units of the temperature indicator, the language of the interface, the scale of the kinetics graph axes, and the calculation method and level for smoothing kinetics plots.

😽 Configuration			×
General	Kineti	cs Graph	Calculations
Graphics background White	Firmness axis	Speed axis	Smoothing method cubic spline fit
Sampling time (s)	Min 0	Min -1	Smoothing level
Temperature unit	Max 1	Max 1	
Language English			
			Accept Cancel

Figure 44 Configuration window

3. Selecting another color for the background of the graphs will modify all the graphs from Kinetics and Visualization.



Figure 45 Black color background for the graphs

- 4. Selecting another sampling time will change the time between samples during the measurement in kinetics, you can only set a number between 3 to 30 seconds of sampling time.
- 5. Changing the temperature unit will change the units of the temperature indicator in Kinetics, as seen in the following image:

Temperature unit	~	-	0.0 °C
Temperature unit °F	~	→ [	<b>32.0 °F</b>

Figure 46 Changing the temperature unit

6. Enabling autoscale on the graph axes will cause the graph to automatically choose the scale that makes all the data visible. You can also turn it off and enter the minimum and maximum values you want.



Figure 47 Changing the axes scale

7. For the calculations, sometimes the change of values from one point to another can make the plots look a bit noisy, so a smoothing process is available, the more smoothing percentage you enter, the smoother the graph will look, but this may lead to some data not being displayed correctly at some points, so it is recommended to set lower smoothing values.

**Note:** Only change this value before starting a measurement.

Calculations	
Smoothing method	
cubic spline fit	~
Smoothing level	
10%	

Figure 48 Smoothing calculation config

# 4.8 Using the diagnostics interface

The diagnostic interface is used to check the status of the 6 stations and also there are configurations that can be made to connect to the Internet through an ethernet connection or Wi-Fi network.

To enter the interface, click on its respective button:



Figure 49 Diagnostics interface button

The diagnostics interface is as shown in the following image:

rheonics COAGUTRACK	Parame	ters 👌	Kinetics				Alarm	15: 25/0	46:11 5/2024	
*	Ether	n <mark>et Setti</mark> r	gs	WiFi Co	onnect	ion	Server S	Status		
Station 1	1 Type	of connectio	n	2 Availab	le Netwoi	'ks	4 IP Addr	ess		
Station 2	IP Ac	DHCP	×	Passwo	WiFi rd	~	Status	10.100.0.10		
Station 3	Subn	192.168.4. iet mask	16			۲		Connected		
Station 4	255.255.255.0				Connect 🔶			Client Section		
Station 5	192.168.4.1			Upload License			oad License	Ð		
Station 6	A	pply change	s 📕	Interne	et statu	IS	Clie	nts Config.	181	
Visualization					Connec	ted	Rem	ote Support	Ð	
	Statio	n status (	6							
	Station	SMET IP	viscosity	Temperature	Status	Connection	Relay channel	Relay timeout	State	
Factory Mode	1	10.100.0.16	0	0 °C	0000	Connected	1	0 s	OFF	
	2	10.100.0.17	0	0 °C	0000	Connected	2	0 s	OFF	
Diagnostics 👀	3	10.100.0.18	0	0 °C	0000	Connected	3	0 s	OFF	
	4	10.100.0.19	0	0 °C	0000	Connected	4	0 s	OFF	
	5	10.100.0.20	0	0 °C	0000	Connected	5	0 s	OFF	
Config X	6	10.100.0.21	0	0 °C	0000	Connected	Not assigned	0 s	OFF	

Figure 50 Diagnostics Interface

- 1. Ethernet Settings: This section allows the user to configure the ethernet port of the computer where the software is installed, this is very helpful when the software is installed on an RPS where you don't have access to the network settings. There are two types of connections, 'DHCP' is used when the network you are connected to does not require any special configuration to connect to the Internet, otherwise you can switch to 'Static' and enter the IP, mask, and gateway of your network. This section is helpful when you need to see what IP the box has in order to connect to its webserver or check the shared folder, and this section will only be available if a ethernet cable is connected to the port.
- 2. **WiFi Connection:** This section allows the user to select a Wi-Fi network, enter the password and connect to that network, again this is very helpful when the software is installed on a RPS where you don't have access to the network settings. There is a indicator that shows the IP of the WiFi connection so you can use it to connect to the webserver or check the shared folder.
- 3. Internet Status: This indicator shows whether the computer is connected to the internet either by ethernet or Wi-Fi.
- 4. **Server Status:** Shows which server the current client software is connected to, shows the IP of the server and the connection status, if the current client is installed on the same RPS as the server then localhost will be shown as IP
- 5. **Client Section:** In this section you are able to upload a license file and open the remote support.
  - **Upload License:** With this button you can search for a license file provided by Rheonics and upload it to the system.

	Type or connection	Avair	adie ivetworks		IF ACICI	ess	
1	Chestie		01000000000000	×	K F	localhost	
12	← 🔅 + ↑ 🦲 « Data » Coagutrack_Shared	~ O	Search Cosgutrack_Shared	p	Status		
3	Organize * New folder			0		Connected	
	Coagutrack_Sha * Name		Date modified	Type			
4	Rheonics_Coagu	21180442.lic	6/21/2024 6:04 PM	LICT	Client S	ection	
5	📙 RheonicsInksigh :: 💻 This PC				Upl	oad License	6
6	<ul> <li>30 Objects</li> <li>Desktop</li> <li>Documents</li> </ul>				Clie	nts Config.	181
-	Downloads Music				Rem	ote Support	Ð
n	Fictures						
	Service Colores (Colores Colores Color				elay channel	Relay timeout	State
e L	File name: CoagLicense_2024062	1100442.lic ~	License (*.lic)	¥.	1	0.5	OFF
-			UPLOAD Cance		2	0.5	OFF
-	1 2 10100010 0	0.00	1 0000 1 000000	1	2	0	O.C.C.

Figure 51 Uploading a license file

 Remote Support: This button that can be used to open the TeamViewer window to send the ID and password to Rheonics Support when needed, it is recommended not to change the default ID and password that appears on TeamViewer window.



Figure 52 Remote support

6. Station status: This table shows the current state of the 6 stations, it shows the IP of each connected sensor as well as its viscosity value, temperature and status code, also shows the status of its connection. In addition to the sensor data, it also shows which control relay channel is assigned to each station, as well as the opening timeout value and the current state of the channel. (timeout = 0 means that the channel will never be turned off after activation, the channel will also be turned off when the measurement is finished regardless of the timeout value)

# Station status

Station	SMET IP	Viscosity	Temperature	Status	Connection	Relay channel	Relay timeout	State
1	10.100.0.16	0	25.06 °C	0200	Connected	0	0 s	OFF
2	10.100.0.17	0	24.46 °C	0200	Connected	1	0 s	OFF
3	10.100.0.18	0	24.32 °C	0200	Connected	2	0 s	OFF
4	10.100.0.19	0	24.78 °C	0200	Connected	3	0 s	OFF
5	10.100.0.20	0	0 °C	0000	Not connected	5	0 s	OFF
6	10.100.0.21	0	0 °C	0000	Not connected	Not assigned	0 s	OFF

Figure 53 Station status table

# 5 Special Features

The Coagutrack software has different types of versions, some with more or less features and all of them defined through the license file.

Feature	Standard	PLUS	PRO
Add or remove new cheese types	Х	Х	Х
Add or remove operators	Х	Х	Х
Create measurement Jobs	Х	Х	Х
Start/ Stop measurement Jobs	Х	Х	Х
Calculate Cut values	Х	Х	Х
Visualize job data	Х	Х	Х
Export CSV files	Х	Х	Х
Cutting alarm		Х	Х
Cut relay output		Х	Х
Multiple clients		Х	Х
Webserver			Х
PDF exported reports			Х
Transfer files from RPS to another computer			Х
Communication protocols (Modbus, OPC, Profinet, etc)			x

# 5.1 Coagutrack PLUS features

### 5.1.1 Cutting alarm

The cutting alarm is a feature that is activated once the firmness reaches the target cutting firmness, an alarm indicator on top will turn on and the station button will start to blink, plus the buzzer alarm installed in the RPS will start to sound indicating that it is time to cut.



Figure 54 Cutting alarm active

### 5.1.2 Cut relay output

The PLUS version has a system of relays that are associated with each of the stations. Every time the cut button is pressed during a measurement, in addition to the calculations, the relay corresponding to said station will also be activated.



Figure 55 Activating the cut relay

You can also go to diagnostics interface to check which relay channels are associated to each station and their current states

	Statio	n status							
	Station	SMET IP	Viscosity	Temperature	Status	Connection	Relay channel	Relay timeout	State
Factory Mode	1	10.100.0.16	17.921448	17.92 °C	0000	Connected	1	0 s	ON
	2	10.100.0.17	0	0 °C	0000	Not connected	2	0 s	OFF
	3	10.100.0.18	0	0 °C	0000	Not connected	3	0 s	OFF
Diagnostics 🗸	4	10.100.0.19	0	0 °C	0000	Not connected	4	0 s	OFF
	5	10.100.0.20	0	0 °C	0000	Not connected	5	0 s	OFF
Config 🗶	6	10.100.0.21	0	0 °C	0000	Not connected	Not assigned	0 s	OFF

Figure 56 Relay channels states

### 5.1.3 Multiple clients

With the PLUS version you can have several client software connected to the same server, for this in the Diagnostics interface a button will be active to configure the IPs of the clients that can connect to the server.



Figure 57 Clients Config. button enabled

Pressing this button will open the window where the user can add or remove the computer IPs that are allowed to connect to the current server, this button will only be enabled in the main RPS where the server is installed. The customer can register the number of IPs allowed by the purchased license; the following example shows a case where the license allows 4 computers to connect to the current server:

😸 Clients configuration		×
Available Clients	Registered IPs	
4	192.168.2.3	
	192.168.2.4	
	192.168.2.5	
	192.168.2.6	
Save 💾		
Close 😣		

Figure 58 Configuring IPs to connect to the server

# 5.2 Coagutrack PRO features

#### 5.2.1 Webserver

The PRO version has a webserver that can be accessed from a web browser through any computer connected to the same network. The user can go to the Diagnostics module to check which IP is needed to connect, either via Ethernet or WiFi.



Figure 59 Looking for the IP address to connect

Then using this IP address, you must go to your web browser and write the URL with the format 'IP\_Address\Coagutrack', if everything is ok then you should see the following webpage:

ه 😔 🗖 🚯 🙆	agutrack Webserver				
← C ▲ Not se	cure   192.168.4.18/Coap	putrack/			- 🌒
			Coagutrack System		Q.
Station 1 Station 2	Station 3 Station 4	Station 5			
Job Information		1.0	Coopulation Speed	1.0	+
Station	1			0.9	
Job ID	34				
Active	false	0.8		0.8	
Measuring	false				
Date	6/25/2024, 11:52:50 AM	0.7		0.7	
Ref Job ID	33	0.6		0.6	
Cheese Type	Feta			0	
Operator	Coagutrack Op	50 0.5		0.5	
Description		4		ando	
Target Cut Firmness Check	false	0.4		0.4	
Target Cut Firmness Value	0	0.3		0.3	
Rennet Time Check	false				
Rennet Time Value	0	0.2		0.2	
Stop Alert Check	false	01		0.1	
Stop Alert Value	0				
		0.4		0	
			3 Trace from increding (oils)		
					۲

Figure 60 Webserver Main interface

The webserver serves exclusively to display the measurement data of each station, no other actions can be performed.



Figure 61 Measurement in progress

### 5.2.2 PDF reports

The PRO version has PDF reports that can be exported along with the CSV data files, for this you only have to go to Visualization, select a job, click on Export Data and the result will be a CSV file and a PDF report. The PDF report will contain job information, graphs and a table with all the measured data.



Figure 62 Exporting PDF report

› Coagutrack_Shared	
Name	Date modified
🖬 Station1-Job 17.csv	25/06/2024 12:51
Station1-Job 17.pdf	25/06/2024 12:51
🖬 Station1-Job 32.csv	26/06/2024 15:32
👃 Station1-Job 32.pdf	26/06/2024 15:32

Figure 63 PDF exported file stored

Job	Information
Job ID	32
Station	1
Start time	11:04:32 AM 6/25/2024
Finish time	11:10:02 AM 6/25/2024
Operator	Coagutrack Op
Description	
Chees	e information
Cheese name	Parmesan
Target cutting firmness	0.00
Rennet time	0 seconds
Stop time	0.00 minutes
Baseline calculation method	
Baseline threshold	0.00
Setting time calculation method	
Setting time Coef. Var.	0.00
Calculat	ted parameters
Setting Time	00' 00"
Vmax	0.45
Real cutting time	00' 00"
Real cutting firmness	0.00
Real cutting speed	0.00
Relative coagulation speed (Vcut/Vmax)	0.00 %

Figure 64 PDF report sample

#### 5.2.3 File transfer

The PRO version has a functionality to transfer files from the RPS to another computer on the same network through a client software installed on it, first you must go to Visualization, there you will see that the 'Transfer File' button enabled.



Figure 65 Transfer File button enabled

After pressing the button, a window with a list of available files to transfer will appear, you can select any file(s) and click the 'Transfer selected files' button to start the transfer.

File	Date created (UTC)	Size	
M	Station1-Job 17.csv	Jun 25 17:51	3.068 KB
M	Station1-Job 17.pdf	Jun 25 17:51	363.006 KB
	Station1-Job 32.csv	Jun 26 20:56	7.889 KB
	Station1-Job 32.pdf	Jun 26 20:56	204.838 Ki
			_

Figure 66 File transfer selection window

A window will appear for the user to choose the folder location for the transferred files, then the process will start and finish with the following message:



Figure 67 File transfer completed

#### 5.2.4 Communication protocols

Please refer to the CTK-PRO manual for more information about the available protocols.

#### Rheonics CoaguTrack Software Manual Doc. ID: CTK-SM-2502

Doc. ID: CTK-SM-2502 February 2025

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