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User guide

Virtual production line

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Foreword

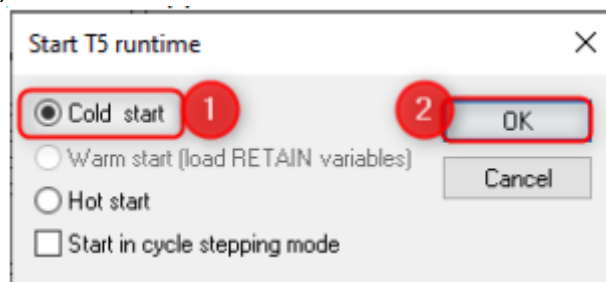
This guide provides the user with an overview of the functionalities offered by the "Virtual production line" project and allows the user to be guided through their experience on the demonstration.

Tools description

To use the production line software it is necessary to have two executables: Supervision.exe and T5.exe. The first allows you to communicate with the various divisions of the company (production, order, etc.). The second makes it possible to simulate the automatons of a production line (actuators, sensors). To start these tools, use the "Installation Guide" documentation.

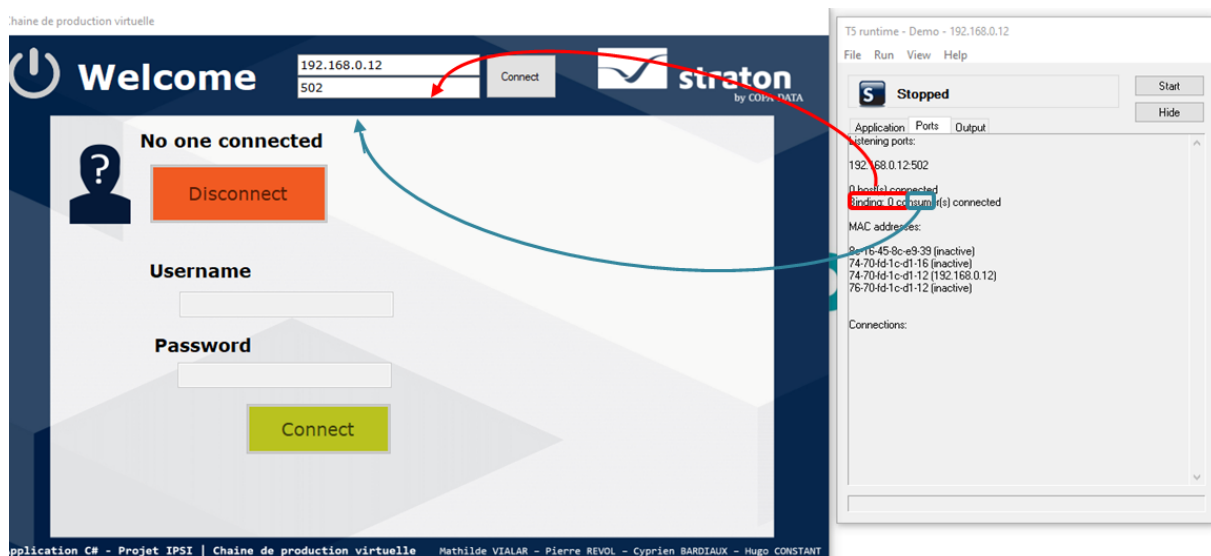
Starting the demonstration

Before starting the HMI application, it is important to reset the Runtime. To do so, on the Runtime window, click on "Start", then select "Cold start":



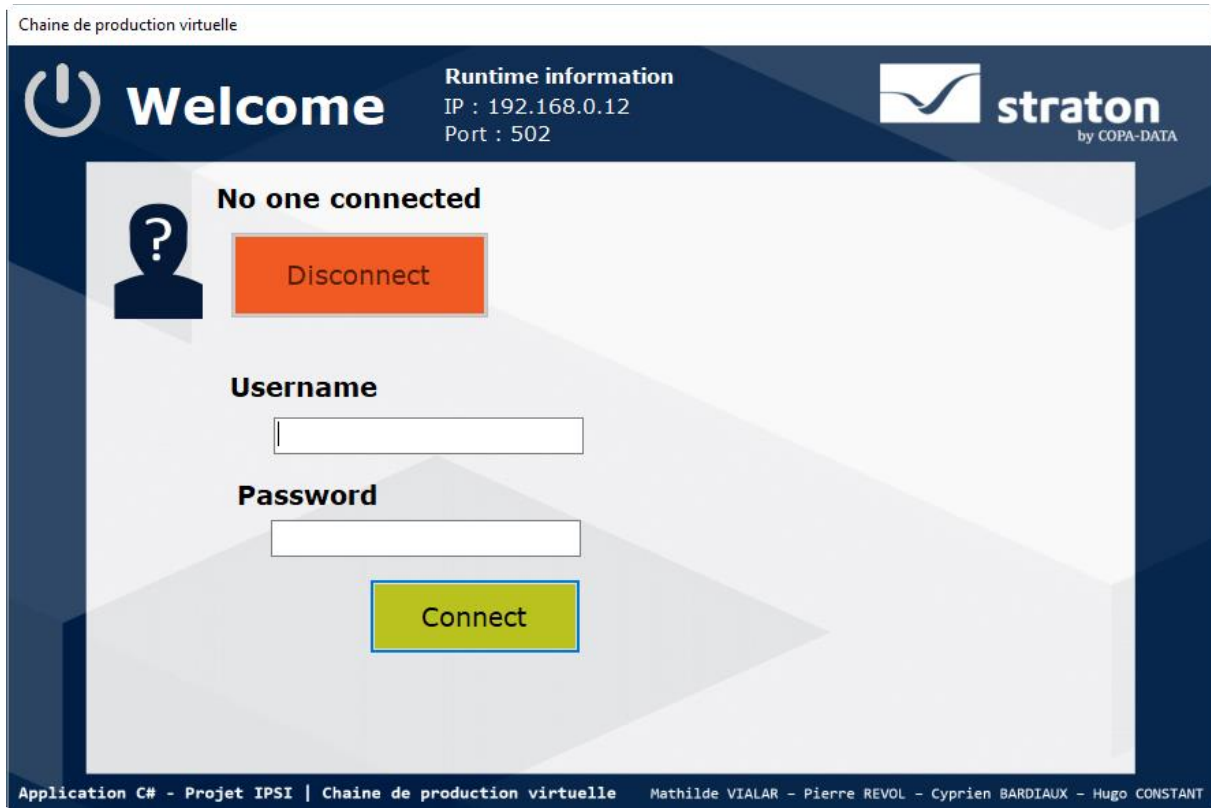
Once the Runtime application is running. Access the Supervision.exe, it is now possible to fully appreciate the demonstration.

On the home screen, start by entering the IP address and the Runtime Port. This step is used to establish a Modbus connection between the HMI application and the straton Runtime:



Once the Modbus connection is established, the user must connect to a "User account":

- **Username** : admin – **Password** : admin
- **Username** : engineer – **Password** : engineer
- **Username** : operator – **Password** : operator




Chaine de production virtuelle

Welcome Runtime information
IP : 192.168.0.12
Port : 502

straton
by COPA-DATA

No one connected

 **Disconnect**

Username

Password

Connect

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Depending on the "User account" on which the user logs in, he will have access to different levels of supervision (Global, Local, Field):



Chaine de production virtuelle

Welcome Runtime information
IP : 192.168.0.12
Port : 502

straton
by COPA-DATA

Admin **Disconnect**

Username

Password

Connect

Global



Admin only

Local



Admin and engineer

Field



Any logged in profile

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For the demonstration, it is recommended to log in as Administrator.

Demonstration's steps

1. Select the Global screen

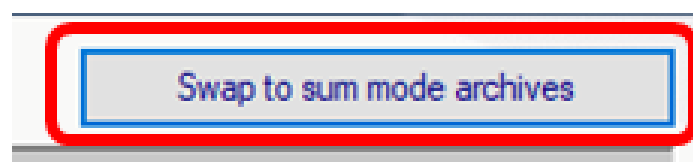
Note :

This screen represents a supervisor employed by a senior manager or executive responsible for taking orders. It first allows, through the calendar on the right, to analyse the archives of previous productions. Then in a second step to send the daily orders to the factories.

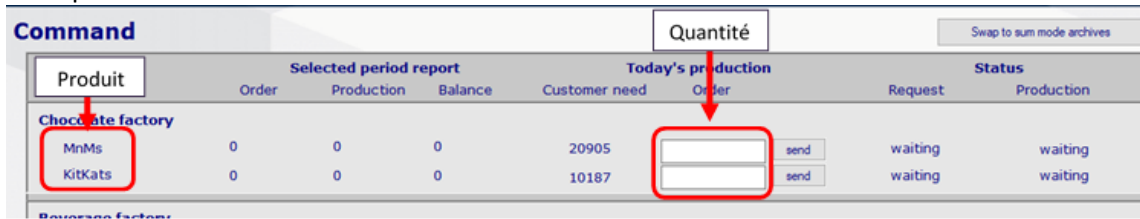
2. Using the calendar on the right, select a specific date or time periods and analyse previous productions:

Note :

It is possible to display the "over / under" quantities produced on average over the selected period of time or in total by cumulating the difference in production for each day. The "Swap to sum / average mode archive" button allows you to switch from one calculation method to another.



- Using your production archives analysis, and based on the customer's need of the day. Indicate the quantities to be manufactured in the "Order" field corresponding to the desired product:

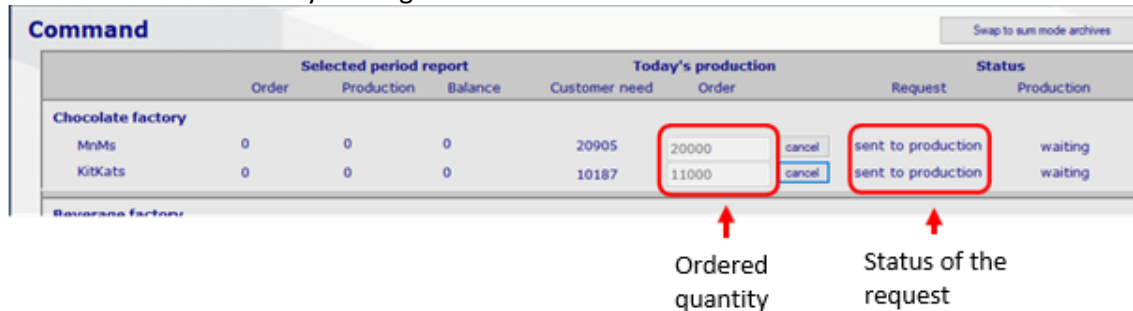


Produit	Selected period report			Customer need	Today's production		Request	Status
	Order	Production	Balance		Order	Production		
Chocolate factory								
MnMs	0	0	0	20905	<input type="text"/>	send	waiting	waiting
KitKats	0	0	0	10187	<input type="text"/>	send	waiting	waiting

Note :

Only the MnMs and KitKat products will be useful after the demonstration.

- Confirm the order by clicking on the « send » button



Produit	Selected period report			Customer need	Today's production		Request	Status
	Order	Production	Balance		Order	Production		
Chocolate factory								
MnMs	0	0	0	20905	20000	cancel	sent to production	waiting
KitKats	0	0	0	10187	11000	cancel	sent to production	waiting

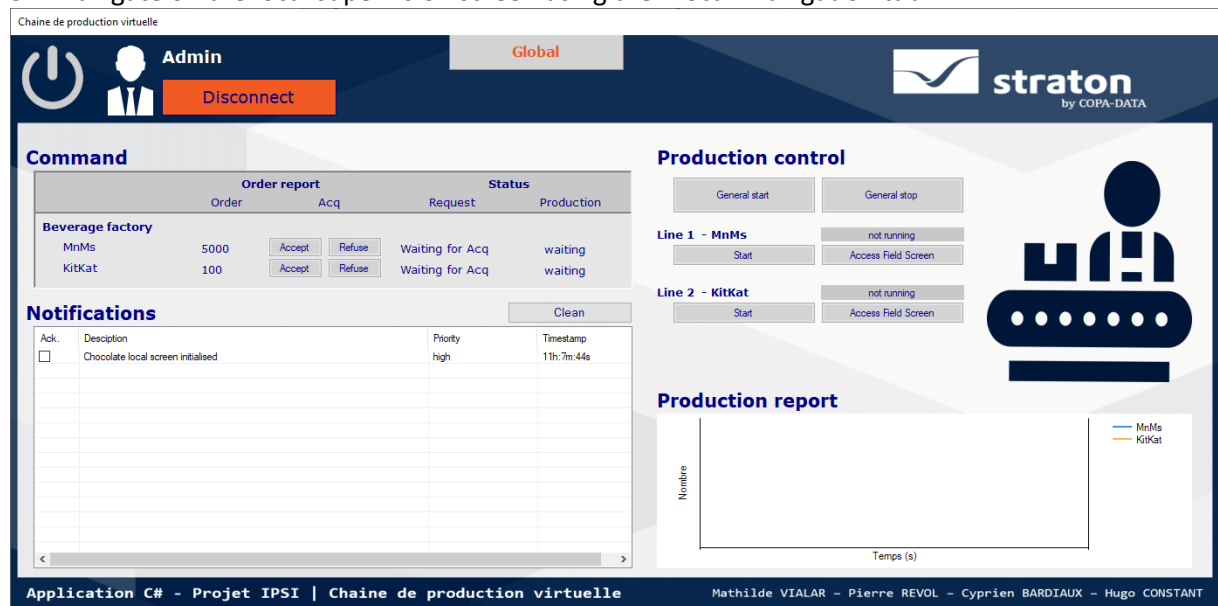
Ordered quantity Status of the request

The request is then sent to the production manager for validation. He can process this request from the local supervision screen.

Note:

As long as the request is not validated locally, it is possible to cancel it in order to modify it by clicking on the "cancel" button.

- Navigate on the local supervision screen using the "Local" navigation tab:



Chaine de production virtuelle

Admin Global Disconnect straton by COPA-DATA

Command

	Order report		Status	
	Order	Acq	Request	Production
Beverage factory				
MnMs	5000	Accept Refuse	Waiting for Acq	waiting
KitKat	100	Accept Refuse	Waiting for Acq	waiting

Notifications Clean

Ack.	Description	Priority	Timestamp
<input type="checkbox"/>	Chocolate local screen initialised	high	11h:7m:44s

Production control

General start General stop

Line 1 - MnMs not running Access Field Screen

Start

Line 2 - KitKat not running Access Field Screen

Start

Production report

Nombre

Temps (s)

— MnMs
— KitKat

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This supervision screen represents the access to information and commands offered to a production manager of a plant. This one can manage the validation / refusal of requests coming from the global supervision, but also send the start / stop directives of specific production lines. A graph also offers the ability to quickly monitor the state of production.

6. From this screen, you can validate or reject the request:

Chaine de production virtuelle

Admin Global Disconnect

Command Validation ou refus

	Order report		Status	
	Order	Acq	Request	Production
Beverage factory				
MnMs	20000	Accept Refuse	Waiting for Acq	waiting
KitKat	11000	Accept Refuse	Waiting for Acq	waiting

Notifications Clean

Ack.	Description	Priority	Timestamp
<input type="checkbox"/>	Chocolate local screen initialised	high	13h:48m:17s

Note :

If the request is refused, it is possible to return to the global screen in order to edit a new one.

7. As part of this demonstration, it is needed to confirm at least the request of the MnMs product:

Command

	Order report		Status	
	Order	Acq	Request	Production
Beverage factory				
MnMs	20000	Confirmed Refuse	Accepted	waiting
KitKat	11000	Accept Confirmed	Refused	waiting

Once the request is validated, it becomes an order and thus unlock its release into production.

8. The production manager can then send the directive to start the production of the product by clicking on the "Start" button in the "Production control" part:

Production control


General start General stop

Line 1 - MnMs not running

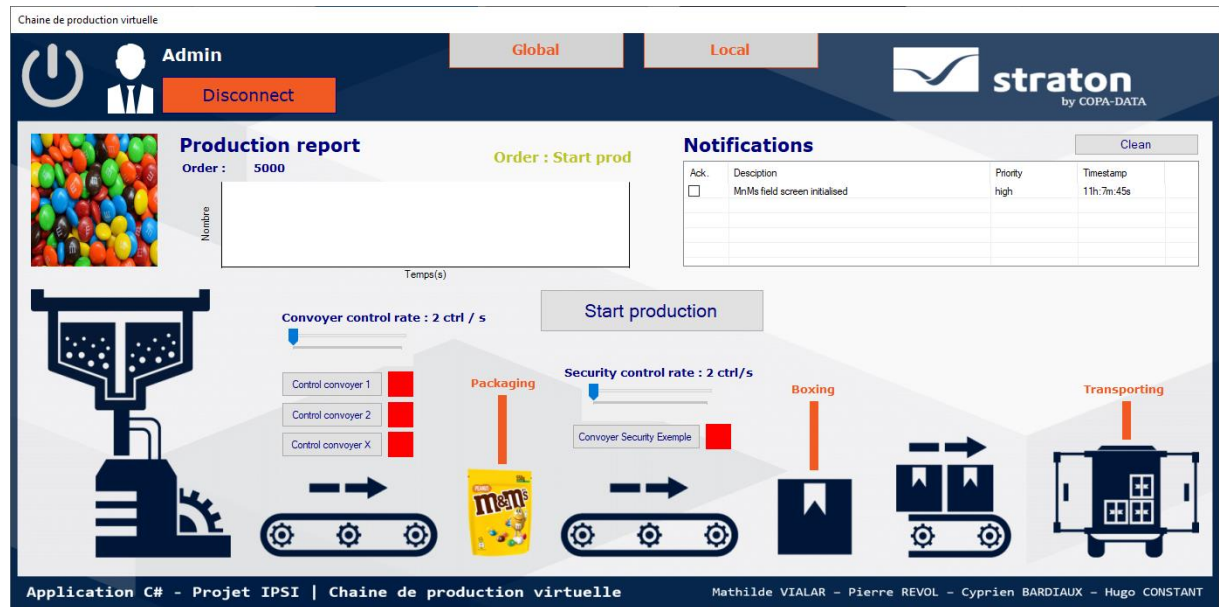
Stop Access Field Screen

Line 2 - KitKat not running

Start Access Field Screen

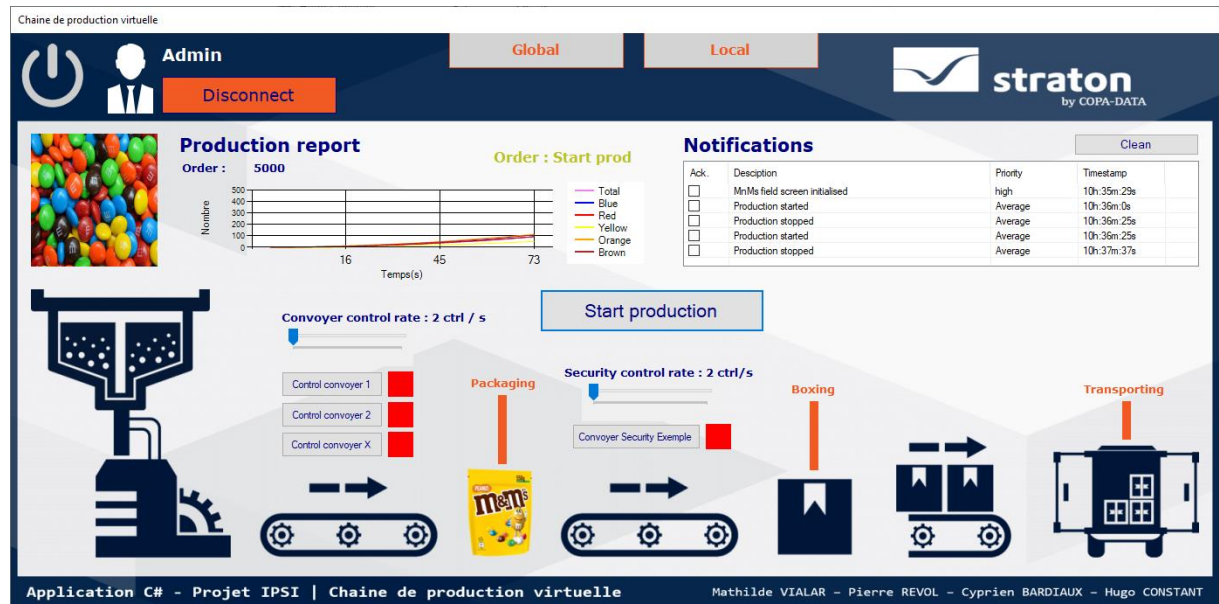


9. Navigate on the field supervision screen using the "Access Field Screen" button of the MnMs product:

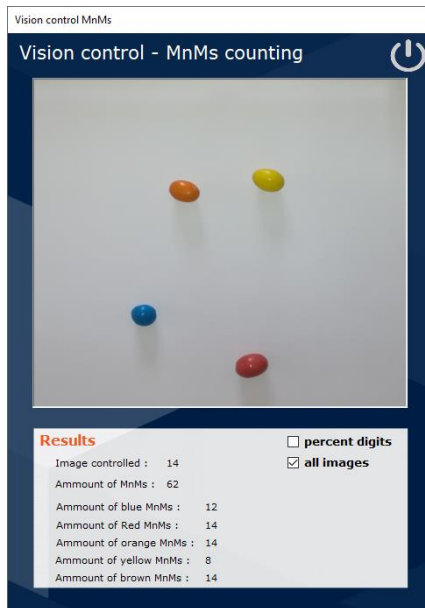


This supervision screen represents what a field operator would see. This has the ability to control the proper functioning of the production line (on / off), control rate (related to production rate) while enjoying an overview of the state of production.

10. Click on the "Start production" button to start production:



11. Click on the "Conveyor control 1" button to display the visualization window of the "counting MnMs" type vision control:



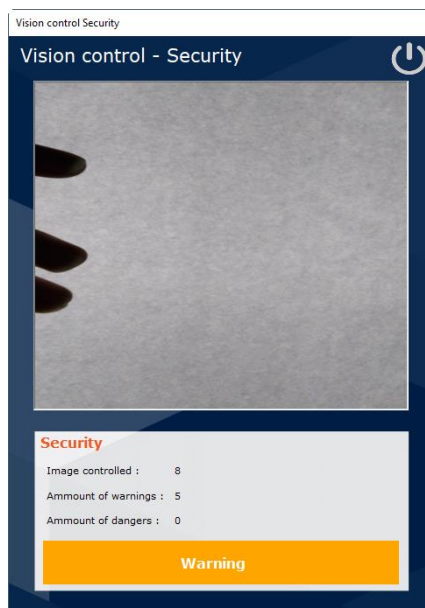
This screen displays the quantity of MnMs produced in total and by colour.

By selecting "percent digits" the quantities of MnMs per colour are displayed as a percentage.

By selecting "all images", the displayed values will relate to the complete production of MnMs since the start of production.

By default, the displayed values correspond to those of the displayed image.

12. Click on the "Conveyor Security Example" button to display the "security" type control vision visualization window:



This screen displays the statistics of the Security control as well as the result of the displayed image.

A "warning" corresponds to the presence of a foreign body present in the image.

A "danger" corresponds to the presence of a foreign body advanced on the image (in our case, a foreign body exceeding by more than 1/3 of the width of the image).

A "danger" stops production.

Throughout the navigation on the demonstration, "Notification" tabs are displayed, allowing a user to control the actions performed from the supervision:

Event list					Clean
Ack.	Description	Priority	Timestamp		
<input type="checkbox"/>	Global screen initialised	high	15h:7m:21s		
<input type="checkbox"/>	MnMs order sent	low	15h:9m:6s		
<input type="checkbox"/>	KiKat order sent	low	15h:9m:7s		

Note :

It is possible to delete an event by selecting it then clicking on the "Clean" button.