KNOT_P01_README

SET UP THE KNOT DATABASE BY RUNNING SQL FILES.

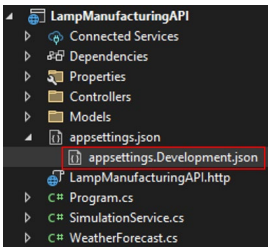
1. Knot database completed with the following sql files.

- Knot_P01_1CreateDbTable: Creating Database, Tables (Configuration, Employees, Stations, Products, BillOfMaterials, Inventory, MaterialTransaction, Bins, Trays, WorkstationJos), View (BinsWithWorkstationjob)
- Knot_P01_2CreateSP: Creating Stored Procedure (SP_SimulationSetup). SP_SimulationSetup is called from Configulataion Tool.
- Knot_P01_3CreateTrigger: Creating Triggers (trigger_WorkstationJob_YieldQuantity, trigger_Bin_IsReplenishmentNeeded)

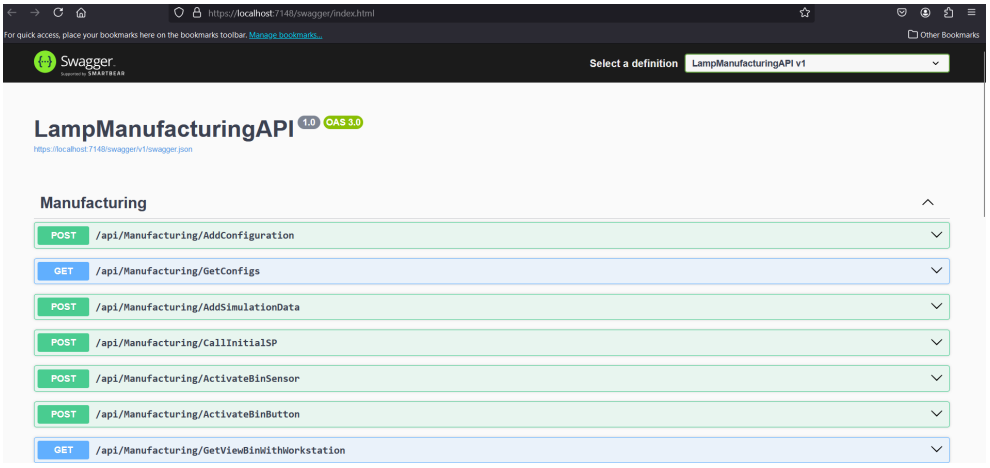
KNOT MANUFACTURING

1. LampManufacturingAPI

- Upon the database setup, Connect the LampManufacturingAPI to the Database.
- Change the connection string of “DefaultConnection” in appsettings.Development.json under appsettings.json



- Start LampManufacturingAPI



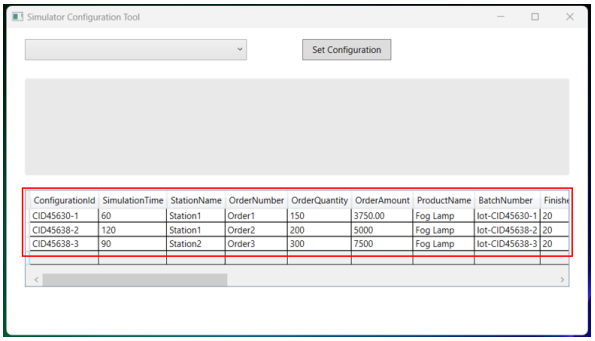
2. Configuration Tool

2.1 Please enter the configuration parameters.

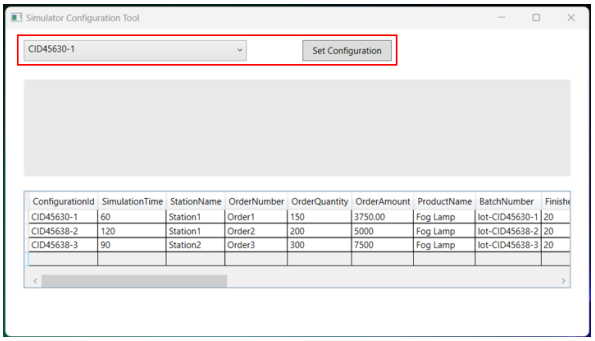
- Parameter example

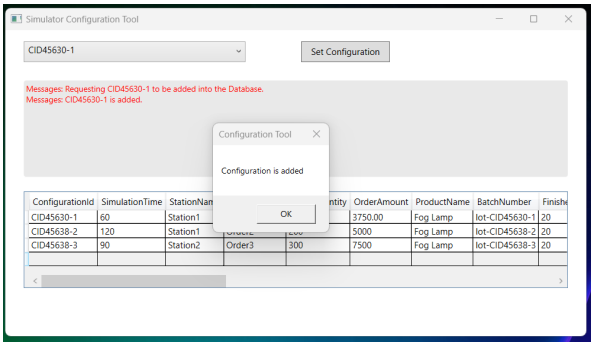
Station Name	Order Number	Order Quantity	Order Amount	Product Name	BatchNumber	Finished Goods Tray MaxQty	Part Name1	Part Name2	Part Name3	Part Name4	Part Name5	Part Name6
Station1	Order2	200	5000	Fog Lamp	lot-CID45638-2	20	Harness	Reflector	Housing	Lens	Bulb	Bezel
Station2	Order3	300	7500	Fog Lamp	lot-CID45638-3	20	Harness	Reflector	Housing	Lens	Bulb	Bezel
Station3	Order4	60	1500	Fog Lamp	lot-CID45638-4	20	Harness	Reflector	Housing	Lens	Bulb	Bezel

ReplQty Part1	ReplQty Part2	ReplQty Part3	ReplQty Part4	ReplQty Part5	ReplQty Part6	Part Threshold Qty	Employee Name	SkillLevel (Yield % per min)
55	35	24	40	60	75	5	Yoda	0.85
55	35	24	40	60	75	5	Darth	0.9
55	35	24	40	60	75	5	Storm	1



2.2 Select the configuration ID and Set Configuration





2.3 Upon the successful setting of Configuration, the configuration tool completes the Configuration Tool and the Stored Procedure completes the other tables with initial data according to the configuration data.

Results Messages

	ConfigurationID	SimulationTime	StationName	OrderNumber	OrderQuantity	OrderAmount	ProductName	BatchNumber	FinishedGoodsTrayMaxQty	PartName1	PartName2	PartName3	PartName4	PartName5	PartName6
1	CID45630-1	60	Station1	Order1	150	3750.00	Fog Lamp	lot-CID45630-1	20	Harness	Reflector	Housing	Lens	Bulb	Bezel
2	CID45638-2	90	Station2	Order2	300	7500.00	Fog Lamp	lot-CID45638-2	20	Harness	Reflector	Housing	Lens	Bulb	Bezel
3	CID45638-3	45	Station3	Order3	60	1500.00	Fog Lamp	lot-CID45638-3	20	Harness	Reflector	Housing	Lens	Bulb	Bezel

	ProductID	ProductName	FinishedGoodsFlag	UnitMeasurementCode	InitialQty
1	43	Fog Lamp	1	ea	0
2	44	Harness	0	ea	0
3	45	Reflector	0	ea	0
4	46	Housing	0	ea	0
5	47	Lens	0	ea	0
6	48	Bulb	0	ea	0
7	49	Bazel	0	ea	0

BOMID	ParentProductID	ChildProductID	BomQuantity

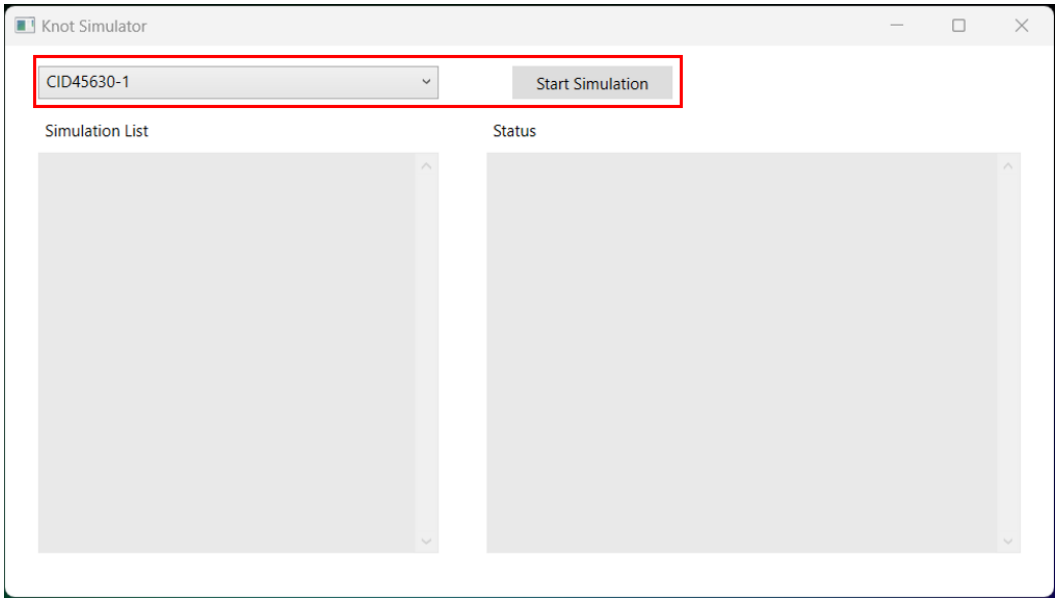
	TransactionID	ProductID	MovementType	BatchNumber	Timestamp	Quantity
1	109	44	PartIn	na	2024-12-12 14:00:12.470	150
2	110	45	PartIn	na	2024-12-12 14:00:12.470	150
3	111	46	PartIn	na	2024-12-12 14:00:12.470	150
4	112	47	PartIn	na	2024-12-12 14:00:12.470	150
5	113	48	PartIn	na	2024-12-12 14:00:12.470	150
6	114	49	PartIn	na	2024-12-12 14:00:12.470	150
7	115	44	PartIn	na	2024-12-12 14:49:08.017	300
8	116	45	PartIn	na	2024-12-12 14:49:08.017	300

	StationID	StationName
1	19	Station1
2	20	Station2
3	21	Station3

	EmployeeID	Name	SkillLevel
1	19	Yoda	0.85
2	20	Darth	0.9
3	21	Storm	1

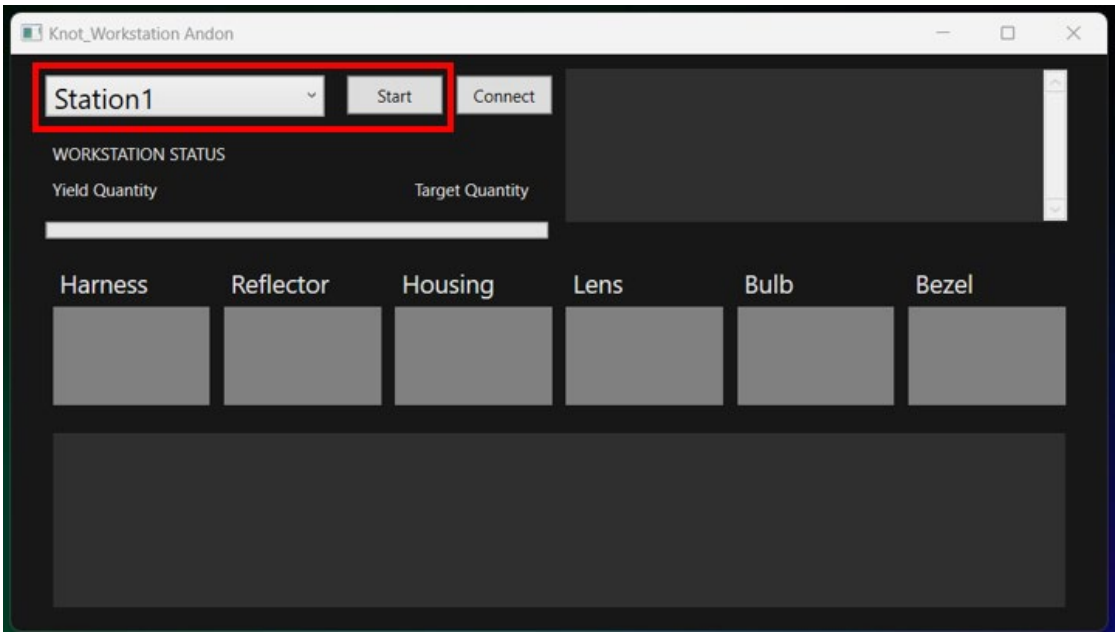
3. Workstation simulation

3.1 Workstation brings the configuration ID from the configuration table.



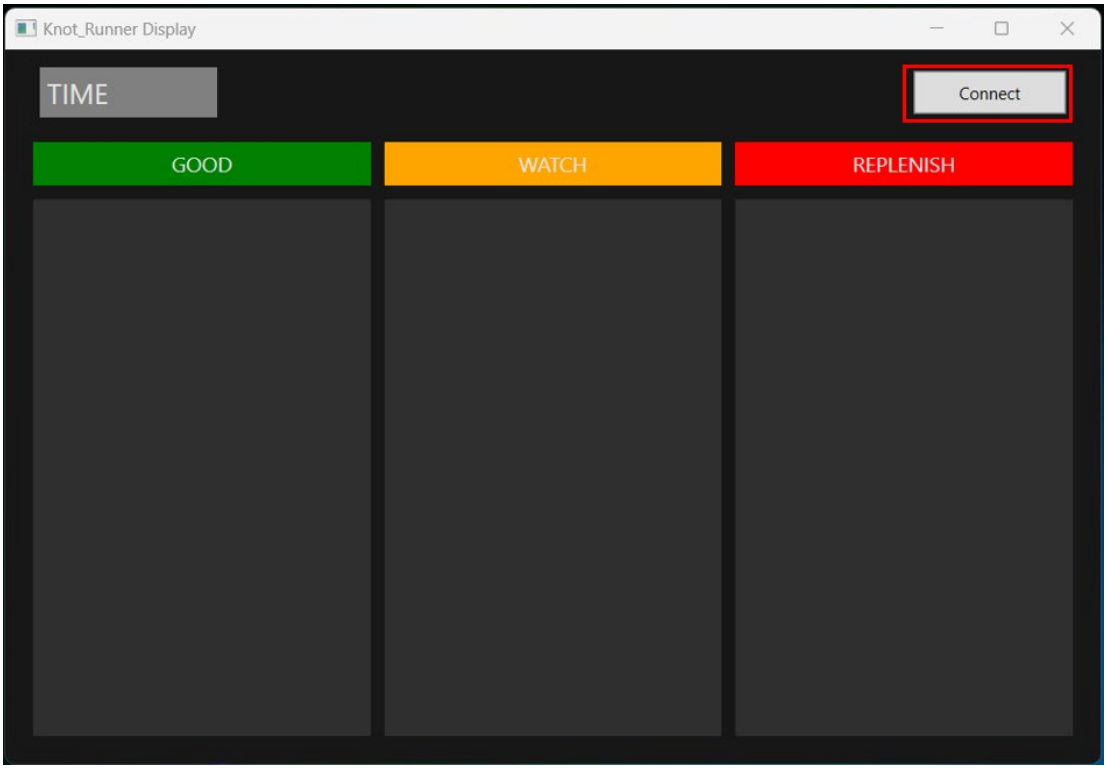
4. Workstation Andon

4.1 Select the station and Click the Start



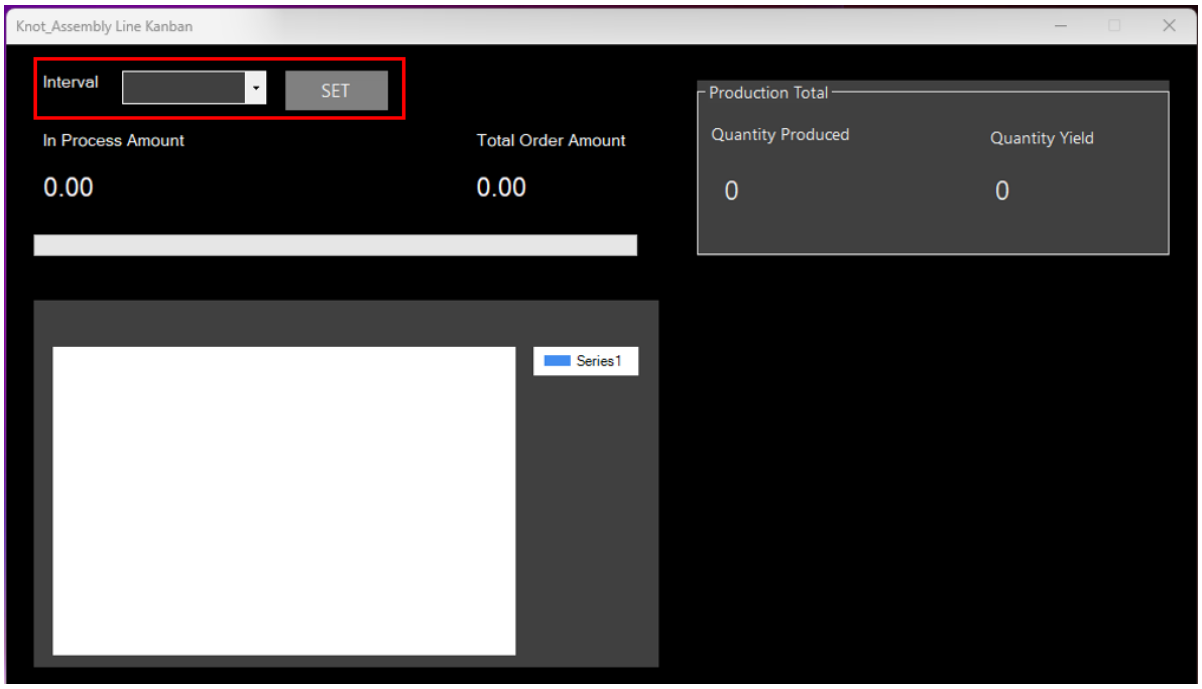
5. Runner display

5.1 Click ‘Connect’ Button.



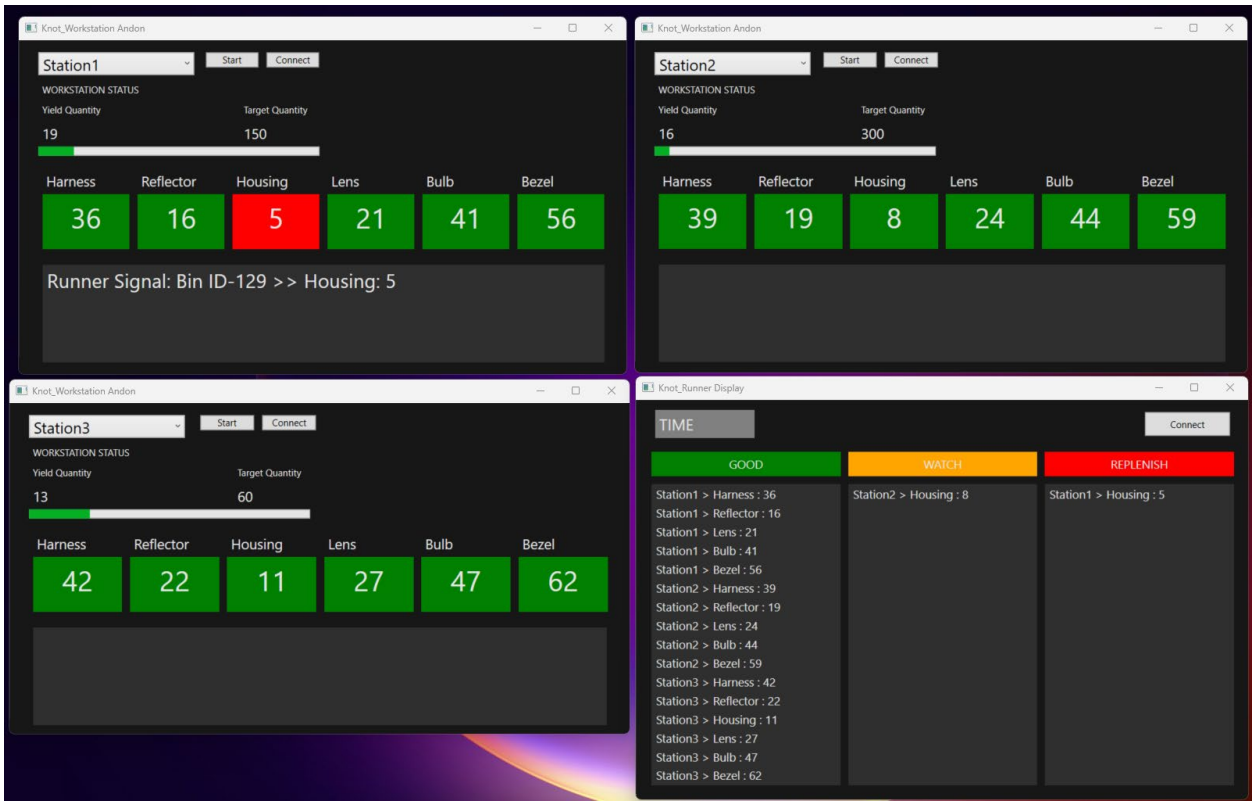
6. Assembly line Kanban

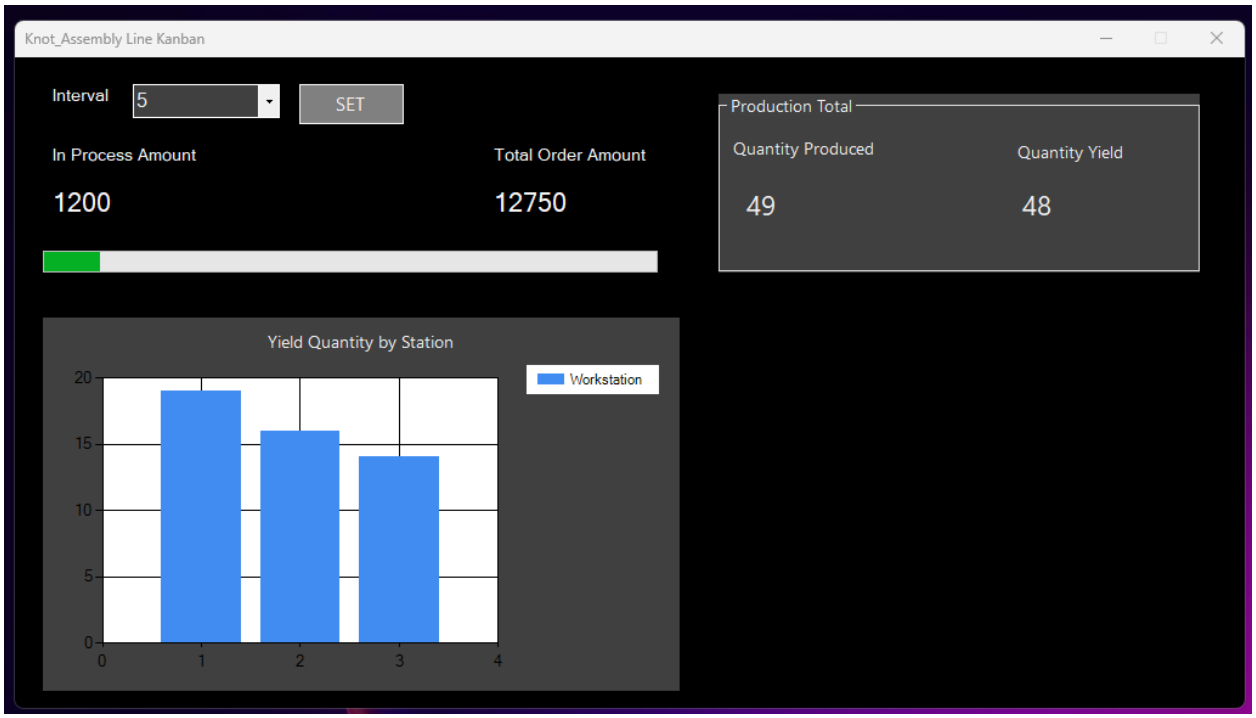
6.1 Select a refresh interval and click ‘Set’ Button.



7. Real-time Updates

Runner Display, Workstation Andon, and Assembly Line Kanban are updated as simulation running.




Knot_Assembly Line Kanban
Interval
5
SET
In Process Amount
1200
Total Order Amount
12750
Production Total
Quantity Produced
49
Quantity Yield
48
Yield Quantity by Station
Workstation
20
15
10
5
0
0
1
2
3
4