

Visual Components

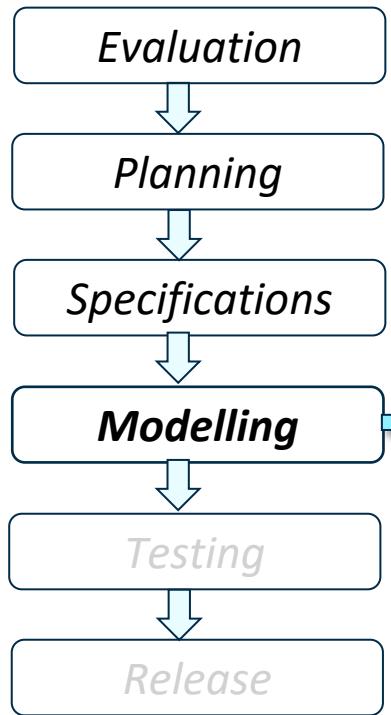
# Library Development

Transfer System 1 (TS1 & TS1 Evo)

21.10.2024

# TS1 Library Development

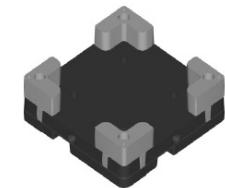
## Current Progress



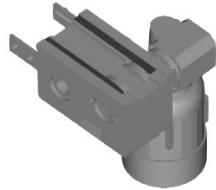
Next...

*TS1 evo  
development*

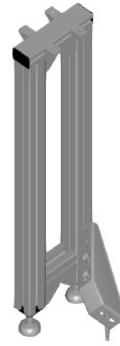
- ✓ Section ST1
- ✓ Drive AS1
- ✓ Return Unit UM1
- ✓ Workpiece Unit
- ✓ Leg Sets
- ✓ Lift Position Unit
- ✓ Position Unit
- ✓ Conveyor Unit
- ✓ Transverse Conveyor
- ✓ Stop Gates
- ✓ Curves
- ✓ Belt Section



Workpiece Unit



Drive AS1



Leg Set SZ1



Return Unit UM1



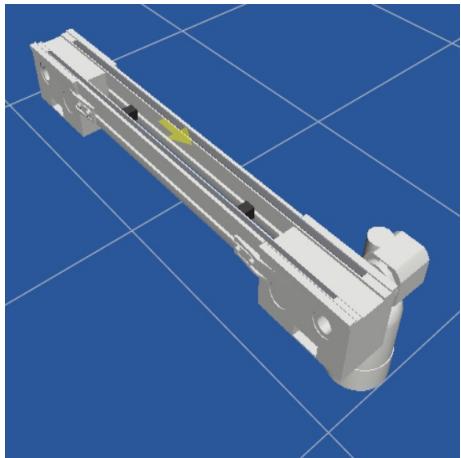
Section ST 1

# TS1 Library in Visual Components Development Plan

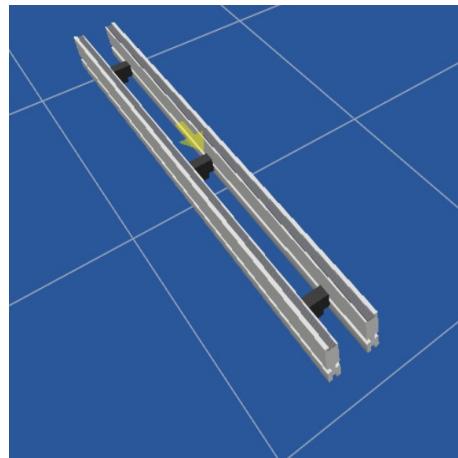
1. **Product Evaluation:** Go through the product catalogue and MTpro library and talk to the product manager to learn more about Transfer System 1.
2. **Planning:** Create a development plan and list the relevant TS1 components to model for Visual Components library development.
3. **Specifications:** Create an Excel sheet for listing the TS1 properties for Visual Components with the help of MTpro properties, TS2 VC library (for reference)and product catalogue.
4. **Component Modelling:** Model the TS1 components in the Visual Components.(Using TS2 library as a reference)
5. **Component Testing:** Check if all parameters and limitations are correctly implemented in the modelled components, and the same will be documented using the Excel sheet.
6. **Demonstrator Models:** Creating some basic simulation models in Visual Components to check functionality for all modelled TS1 components.
7. **Validation Testing:** Validating the TS1 library by creating the real-world use case simulation model.
8. **Documentation:** Documenting development process by making some PPT, excel sheets, screenshots and simulation videos.

# Product Evaluation & Planning

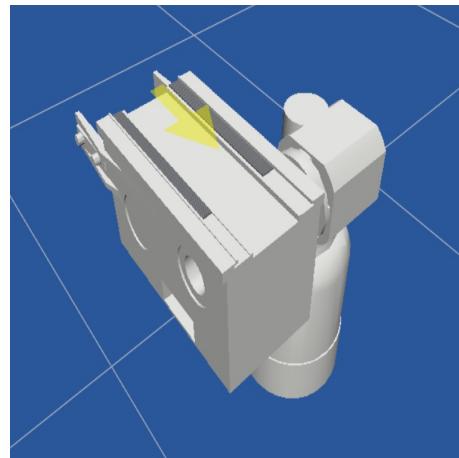
## Planned Components from MTpro



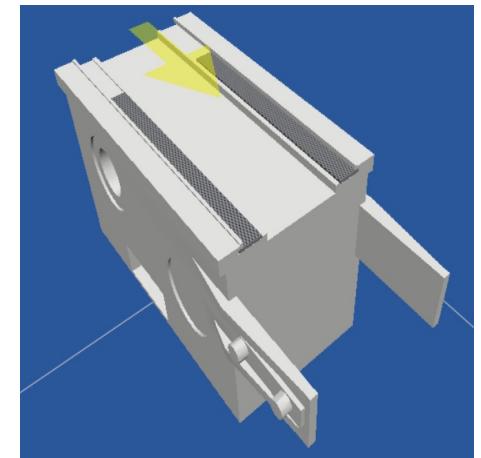
Conveyor Unit



Section ST 1



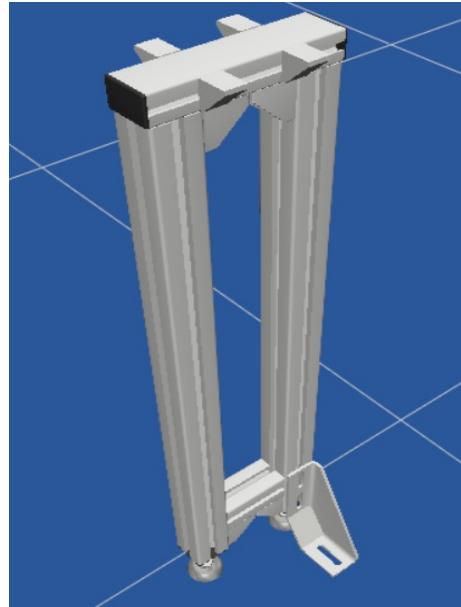
Drive AS 1



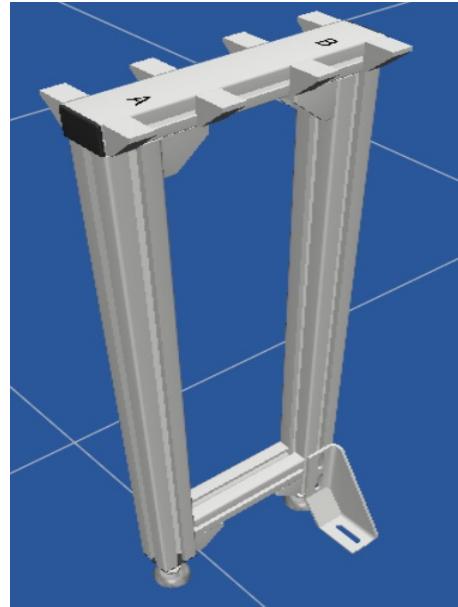
Return Unit UM1

# Product Evaluation & Planning

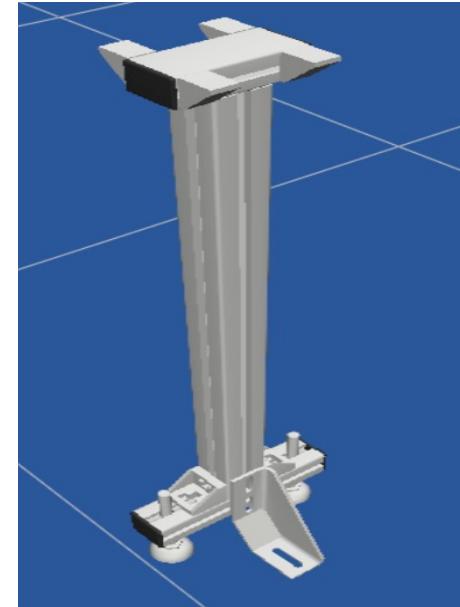
## Planned Components from MTpro



SZ 1



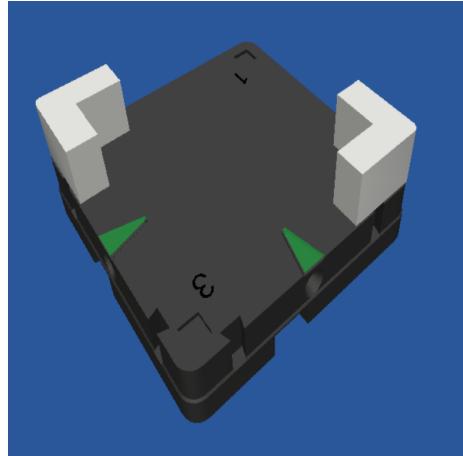
SZ 1(two tracks)



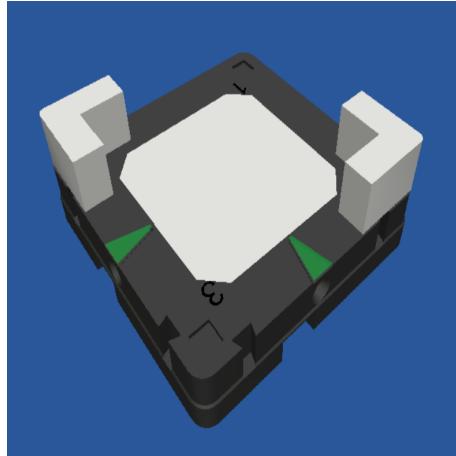
SZ 1/L

# Product Evaluation & Planning

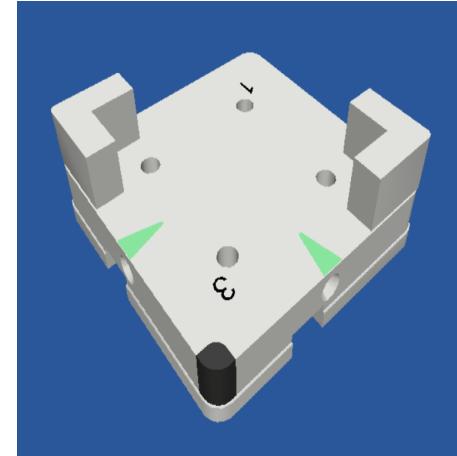
## Planned Components from MTpro



WT 1/K



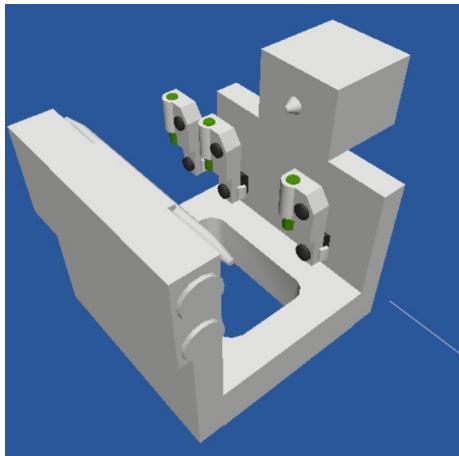
WT 1/S



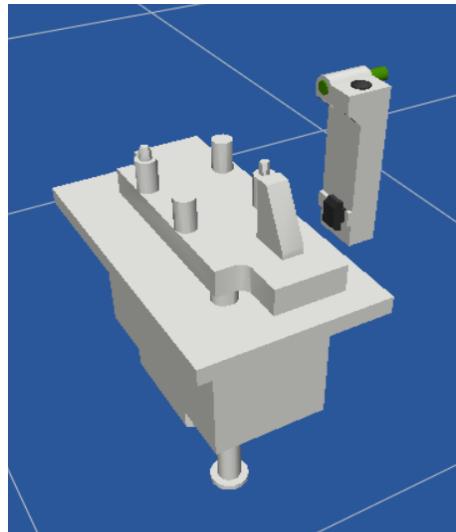
WT 1/P

# Product Evaluation & Planning

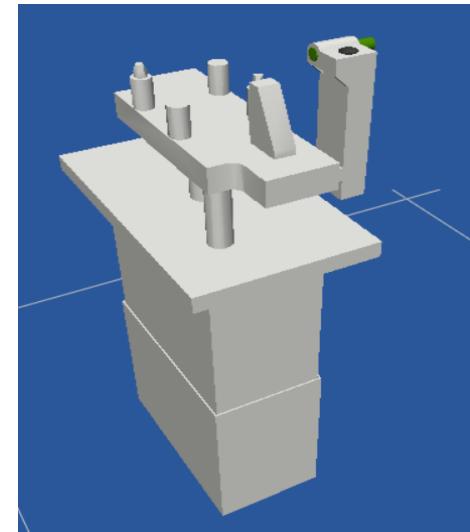
## Planned Components from MTpro



PE 1/P



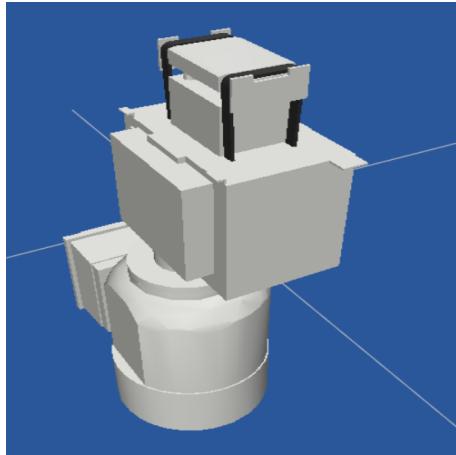
HP 1/P (h=15)



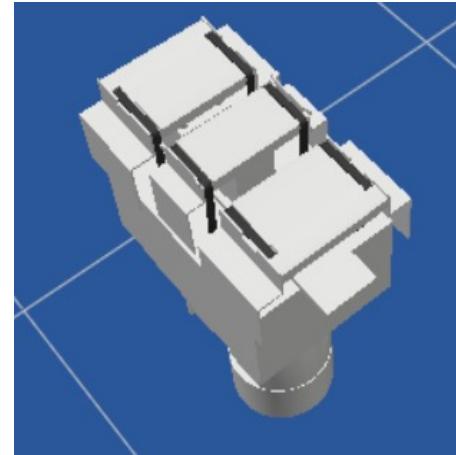
HP 1/P (h=0...50)

# Product Evaluation & Planning

## Planned Components from MTpro



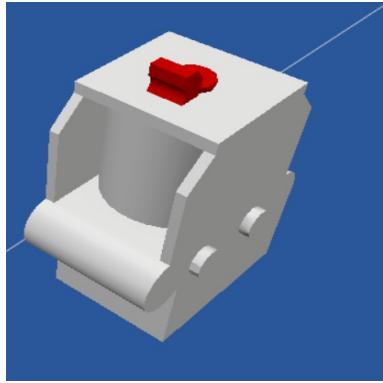
HQ 1/U



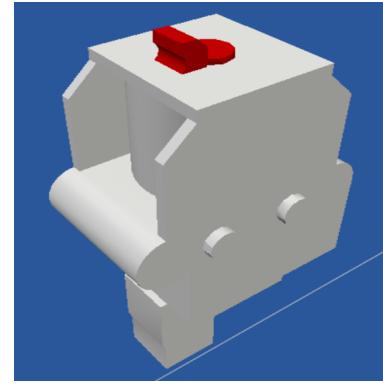
EQ 1/TR

# Product Evaluation & Planning

## Planned Components from MTpro



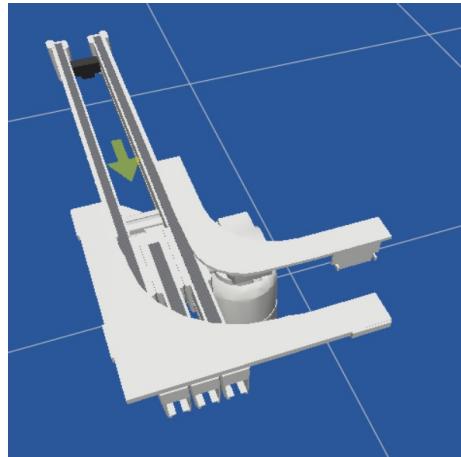
VE 1



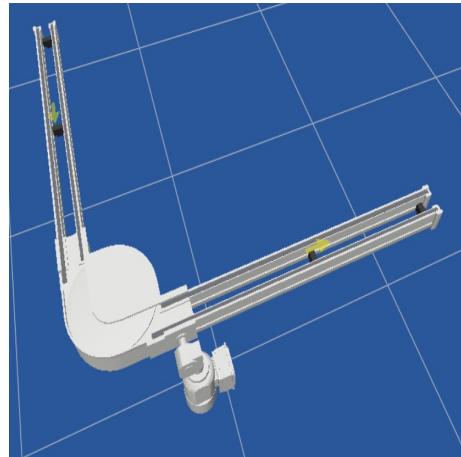
VE 1/V

# Product Evaluation & Planning

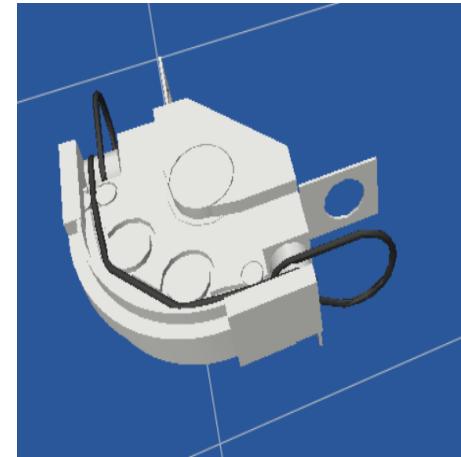
## Planned Components from MTpro



CU 1/90



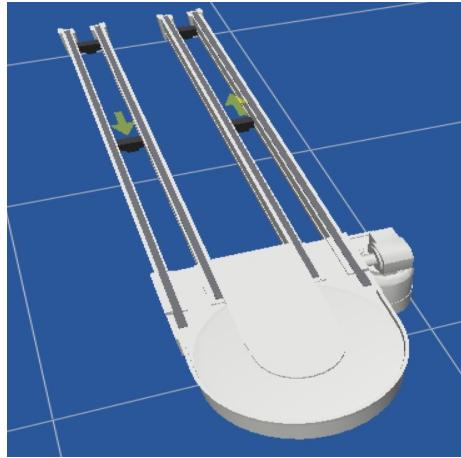
KU 1/90



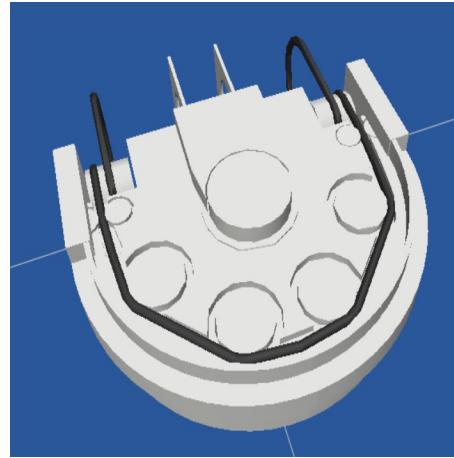
KU 1/O-90

# Product Evaluation & Planning

## Planned Components from MTpro



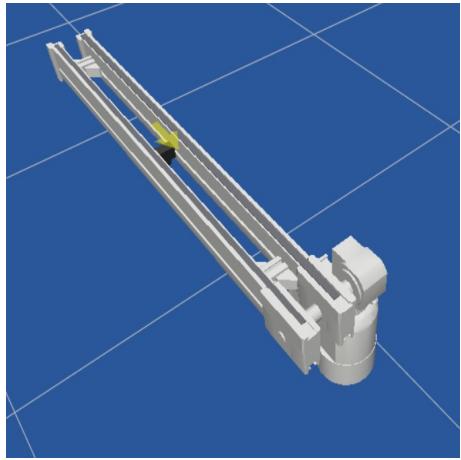
KU 1/180



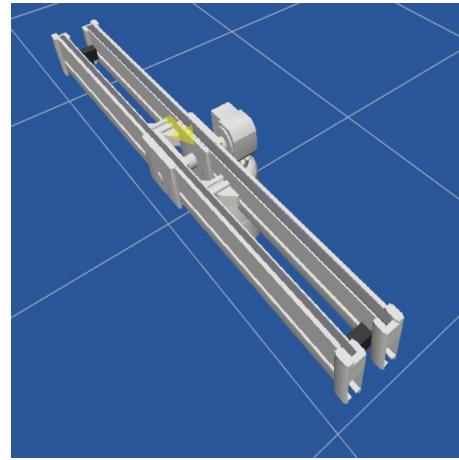
KU 1/O-180

# Product Evaluation & Planning

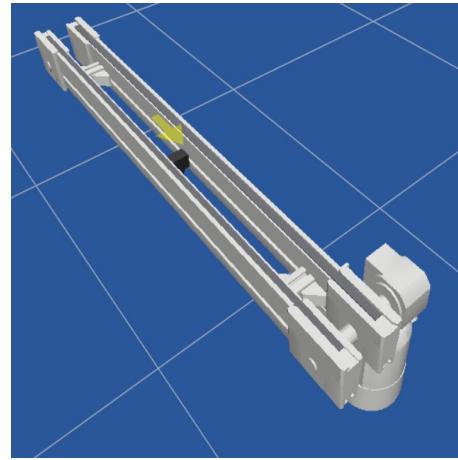
## Planned Components from MTpro



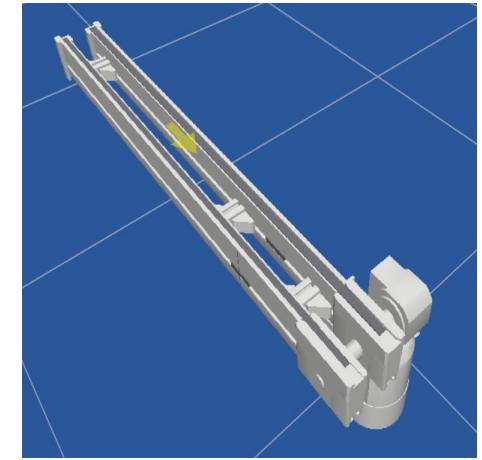
BS 1



BS 1/M



BS 1/T



BS 1/S

# Specifications

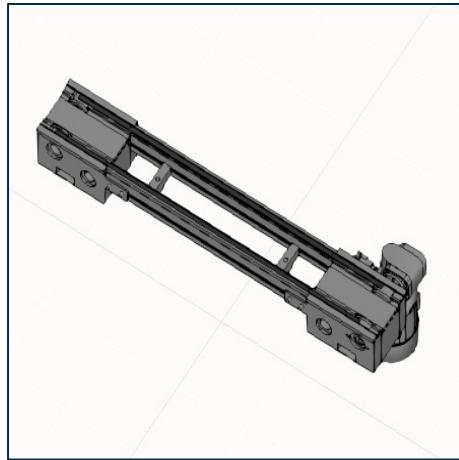
## TS1 products properties and limitations

A	B	C	D	E
Component	Variant	VC Property	MTpro Limitation	Default
Conveyor Unit		Material		
		ConveyorLength	1000 - 12000 (mm)	
		ConveyorWidth	80,120,160 (mm)	
		ConveyorHeight		
		ConveyorSpeed	6, 9, 12, 15, 18 (m/min)	
		Direction	Forward, Backward, Alternating	
		Max. profile length	400-6000	
		Max. distance between CrossConnector	400-1000	
		ReturnUnitType		
		SectionType		
		WT Dimensions		
		WT_Weight	0.5-3 Kg	
		WT_Type		
		ConveyorMedium		
		BeltMaterial		
		Advanced:ConveyorCapacity		
		Advanced:Accumulate		
		Advanced:SpaceUtilization		
		Advanced:RetainOffset		
		Advanced:SegmentSize		
		Drive:DriveType	AS 1	
		Drive:GearMotor	with motor/gear, without motor/gear, without motor/with gear	
		Drive:MotorArrangement	Right, Left, Center	
		Drive:Frequency	50, 60	
		Drive:Voltage	200(+/-10%), 400(+10%/-12%)	
		Drive:Speed	6, 9, 12, 15, 18 (m/min)	
		Drive:ConnectionType	Terminal Box, Cable/plug	
		Drive:MotorMounting	0, 90, 180, 270	
		Coordinates (World) [x,y,z]		
		Coordinates (World) [Rx,Ry,Rz]		
Section	ST 1	Material		
		ConveyorLength	200-6000	
		ConveyorWidth	80,120,160	
		ConveyorHeight		
		ConveyorSpeed		
		Direction	Forward, Backward, Alternating	
		Length_WT		
		Max. distance between CrossConnector	400-1000	
		ReturnUnitType		
		SectionType		

MappingTableMTproVC\_TS1.xlsx

# Component Modelling

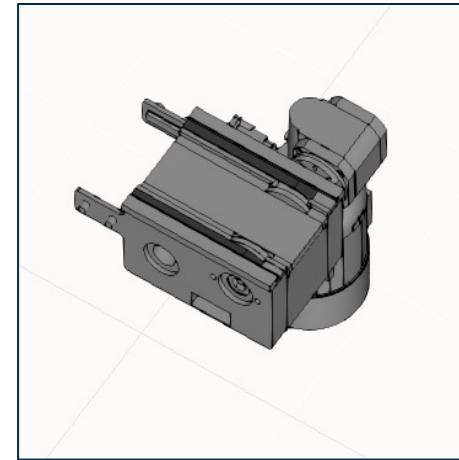
## Modelled components



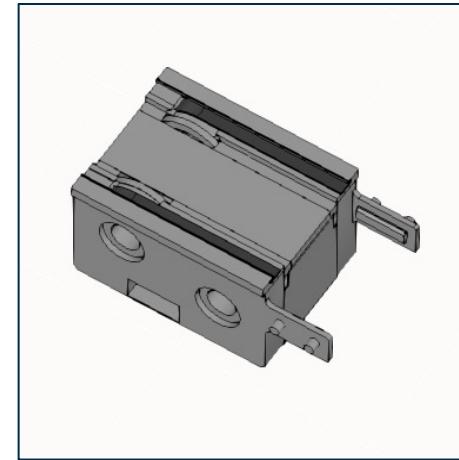
Conveyor Unit



Section (ST 1)



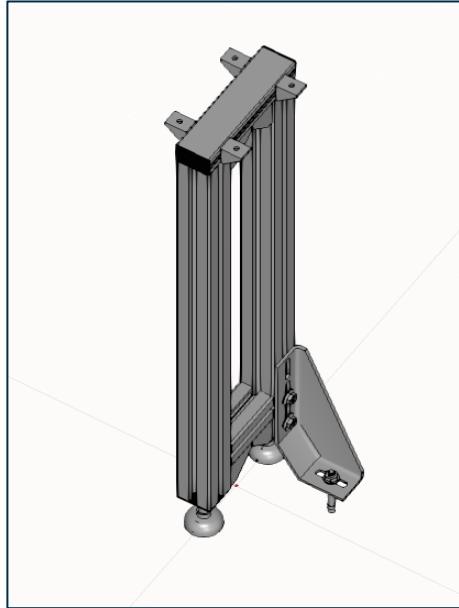
Drive (AS 1)



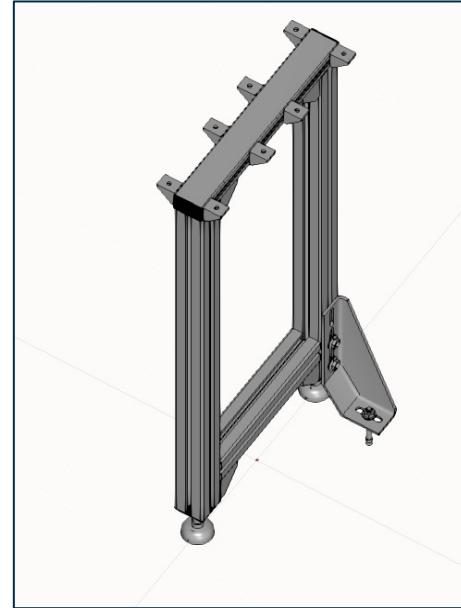
Return Unit (UM1)

# Component Modelling

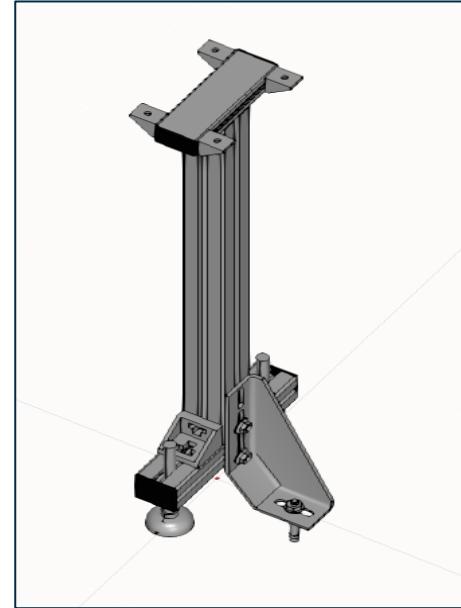
## Modelled components



Legset (SZ 1)



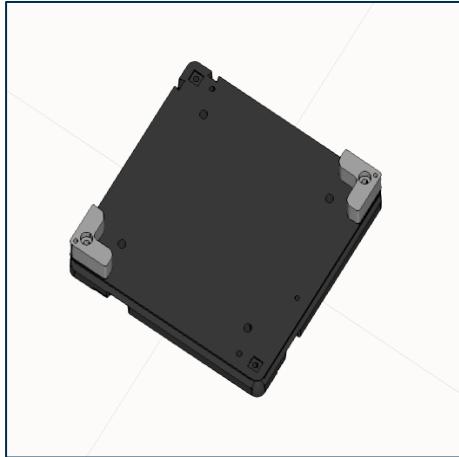
Legset (two tracks)



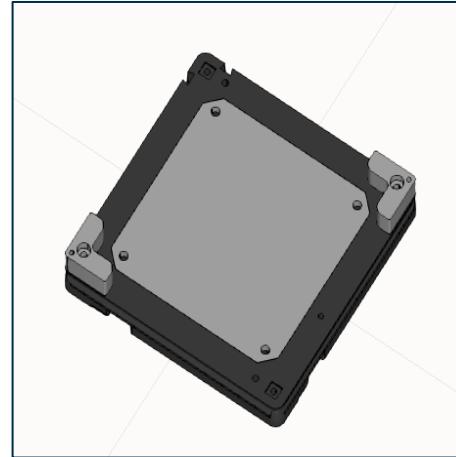
Legset (SZ 1/L)

# Component Modelling

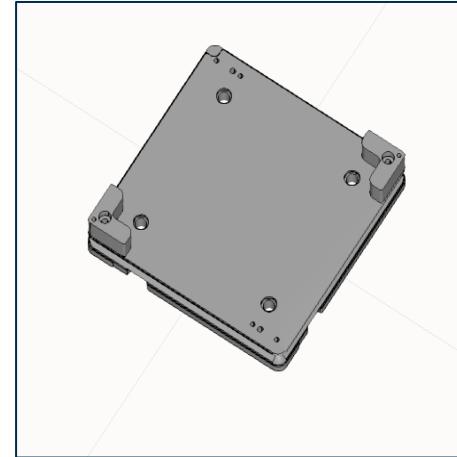
## Modelled components



Workpiece Pallet  
(WT 1/K)



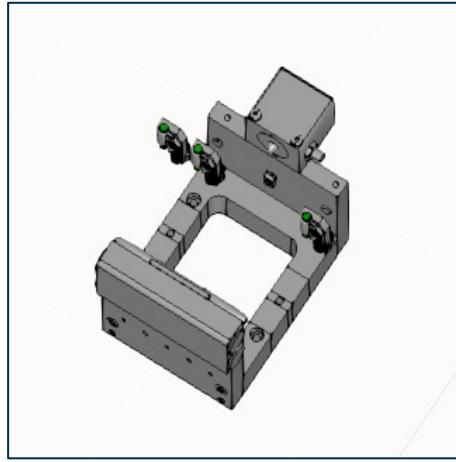
Workpiece Pallet  
(WT 1/S)



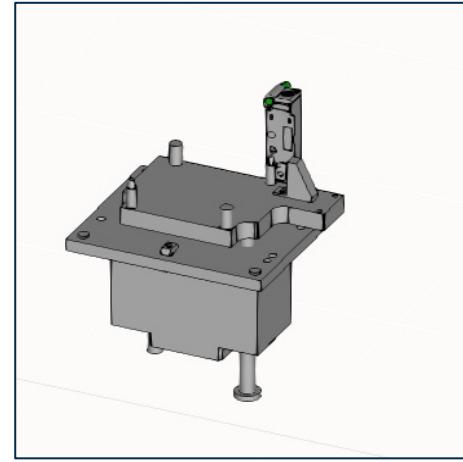
Workpiece Pallet  
(WT 1/P)

# Component Modelling

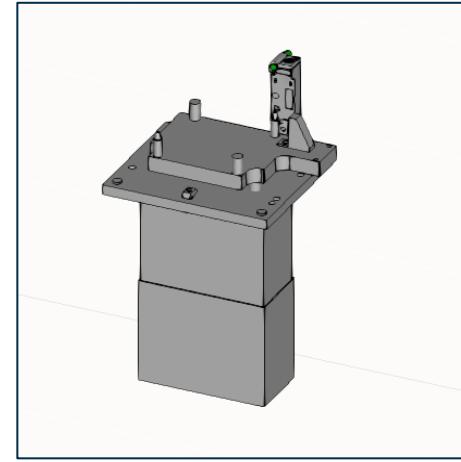
## Modelled components



Position Unit (PE 1)



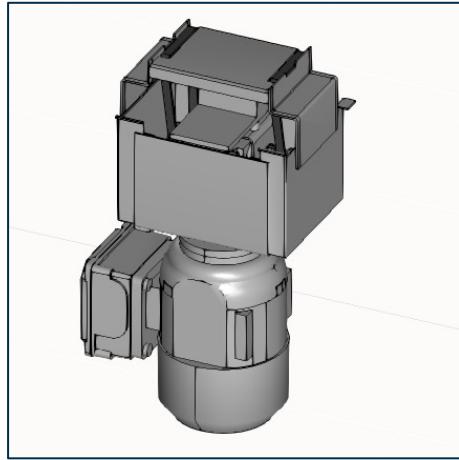
Lift Position Unit (HP  
1/P h=15)



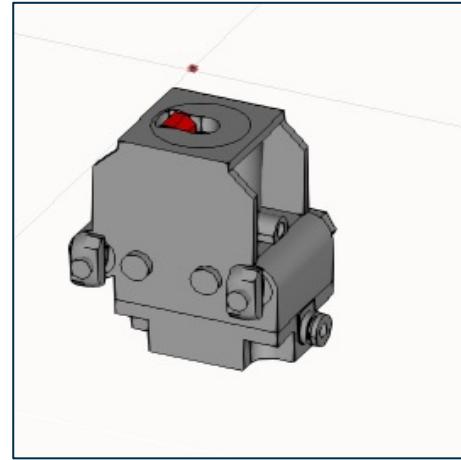
Lift Position Unit (HP  
1/P h=0...50)

# Component Modelling

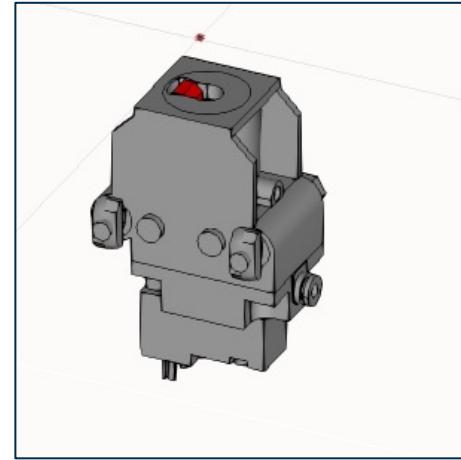
## Modelled components



Lift Transfer Unit (HQ  
1/U)



Stop Gate (VE 1)



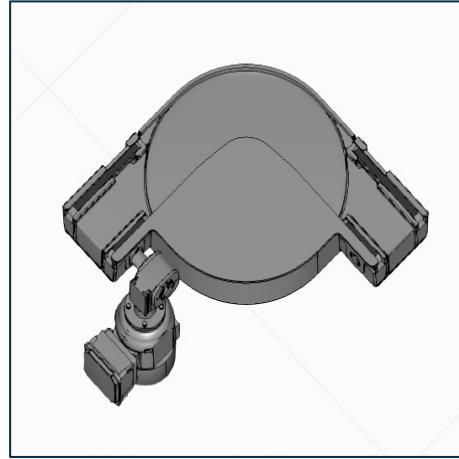
Stop Gate (VE 1/V)

# Component Modelling

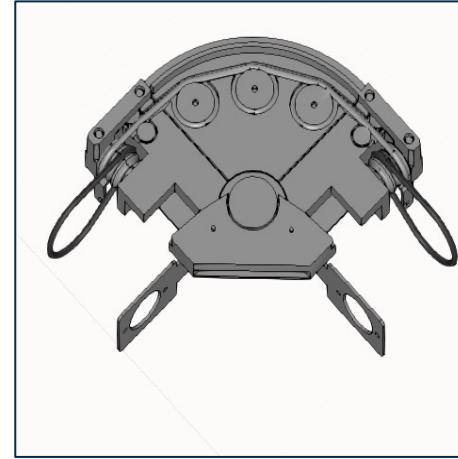
## Modelled components



Curve CU 1/90



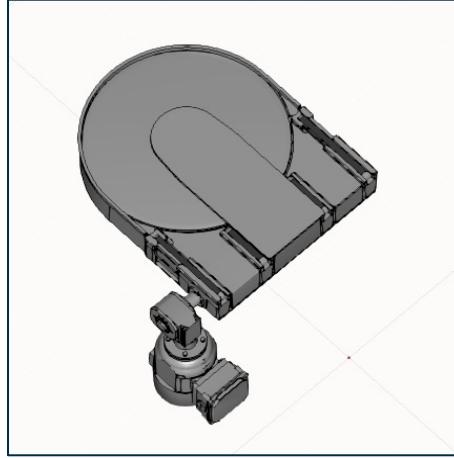
Curve KU 1/90



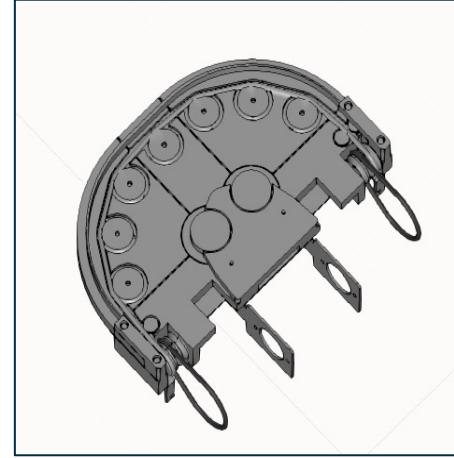
Curve KU 1/90 (KE  
1/O-90)

# Component Modelling

## Modelled components



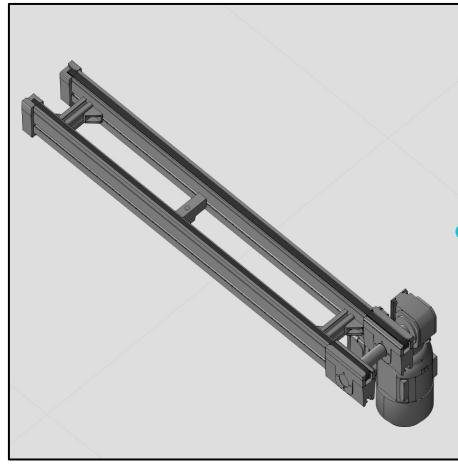
Curve KU 1/180



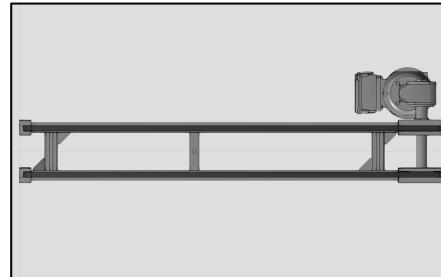
Curve KU 1/180  
(KE 1/O-180)

# Component Modelling

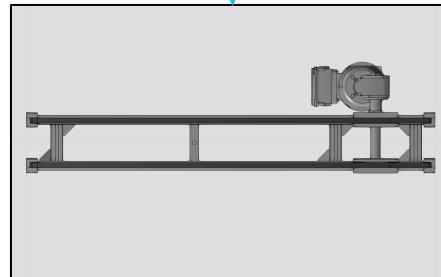
## Modelled components



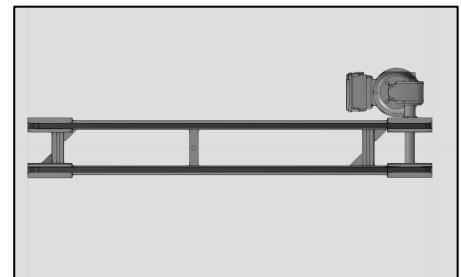
Belt Section



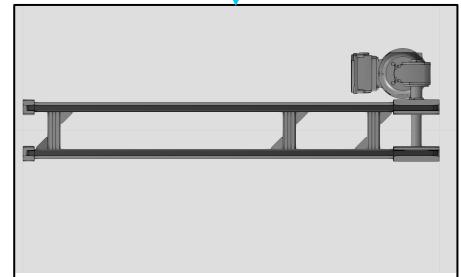
BS 1



BS 1/M



BS 1/T



BS 1/S

# Component Modelling

## Belt Section

Component	Variant	Status	General Comments
Belt Section	BS 1	<ul style="list-style-type: none"><li>Completed modelling in VC and tested out component properties</li></ul>	<ul style="list-style-type: none"><li>Material assigning (excluding belt material) to be modelled.</li></ul>
	BS 1/M	<ul style="list-style-type: none"><li>Completed basic modelling of features and properties</li><li>Change in motor position yet to be modelled</li></ul>	
	BS 1/T	<ul style="list-style-type: none"><li>Completed modelling in VC and tested out component properties</li></ul>	
	BS 1/S	<ul style="list-style-type: none"><li>Completed basic modelling of features and properties.</li><li>Properties and features to be added : No. of segments, Uniform section length toggle, Length of section.</li></ul>	

# Testing of TS1 Components

## Testing Plan

### 1. Component Testing

- Check if properties and limitations are properly implemented.
- Check for proper visualization.

### 2. Testing by building Demonstrator Models

- Test the basic component behavior.
- Test the signals and interfaces or connections.

### 3. Testing by building a Complex model

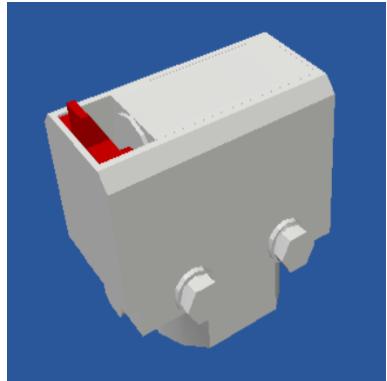
- Validate all the components visualization and behavior.

# Testing of TS1 Components

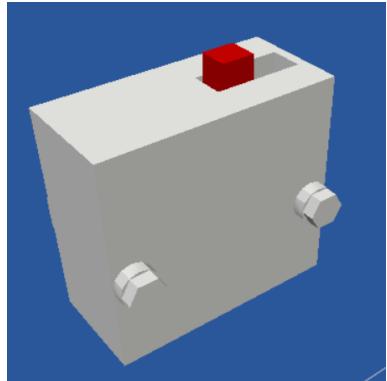
## Planned Demonstrator Models

- Model 1 with conveyor unit, section, return unit, drive, and legset.
- Model 2 with lift position unit, position unit and stop gate.
- Model 3 with lift transverse unit.
- Model 4 with curves and belt sections.

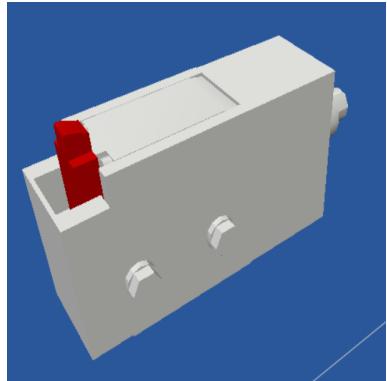
## Planned Components



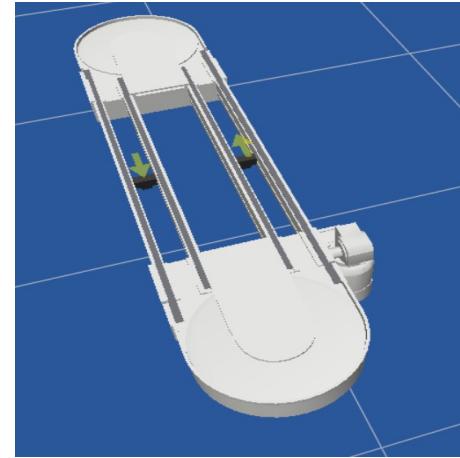
VE 1/D-15



VE 1/20-E



VE 1/D10-E

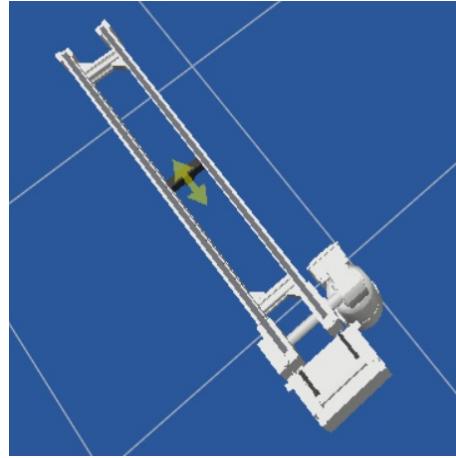


KU 1/360

## Planned Components



EQ 1/T



EQ 1/T-E