Mechatronic Updates

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Rockwell Automation

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Agenda

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2. Uncontrolled Conveyors Catalog
3. New CITM Aspects
4. Override Core Conveyor Motor
5. Controls Testing Examples – Skid Conveyors
6. Actuators – Solenoid Valve, Clamp, Cylinder
7. Wiring Diagram Updates & 3D Control Panels
8. Function Controller

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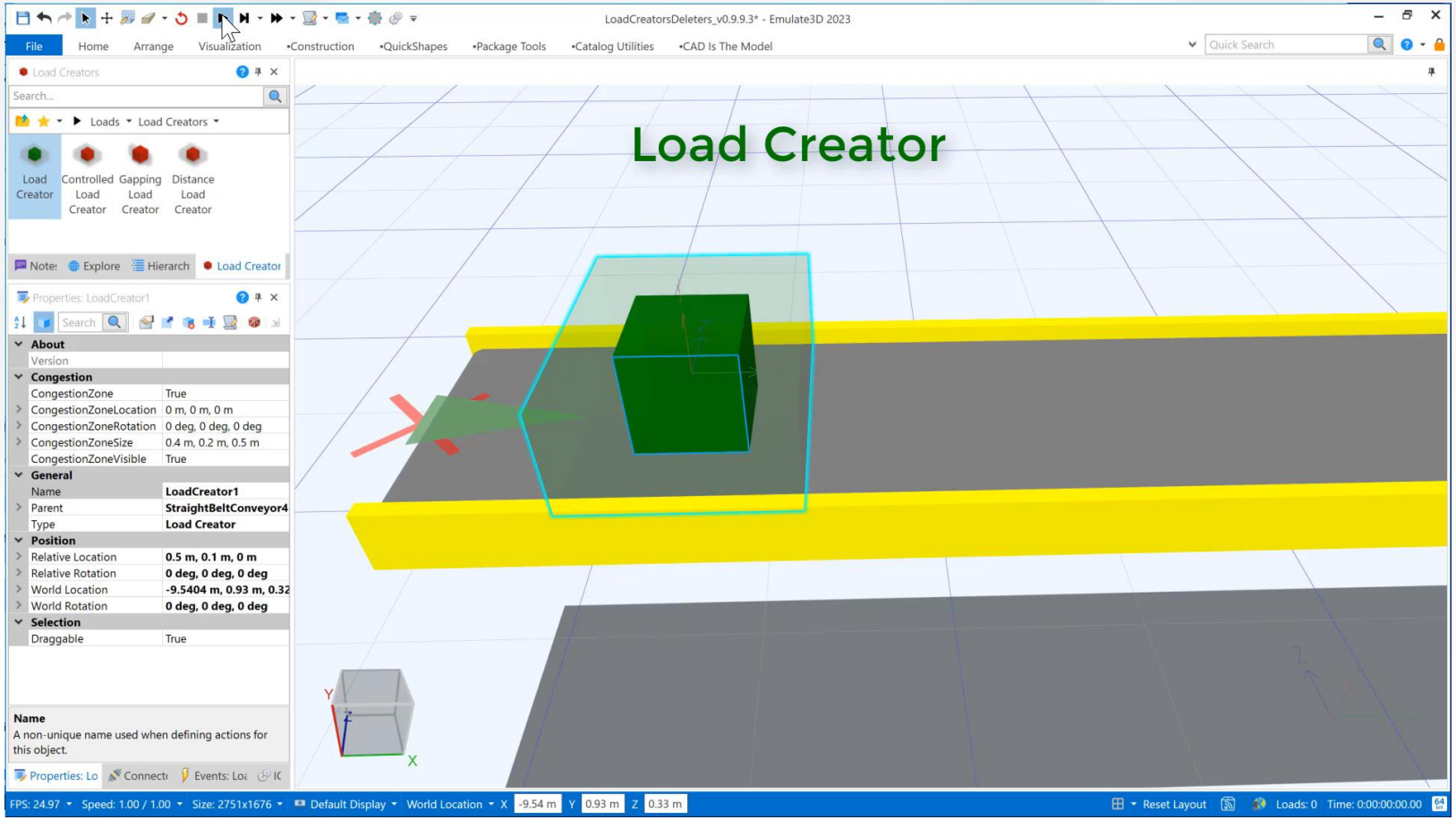
Loads Catalog

- New parametric loads catalog for E3D 2023
- Designed for easy customizability
- New loads, creators, & deleters added for 2024

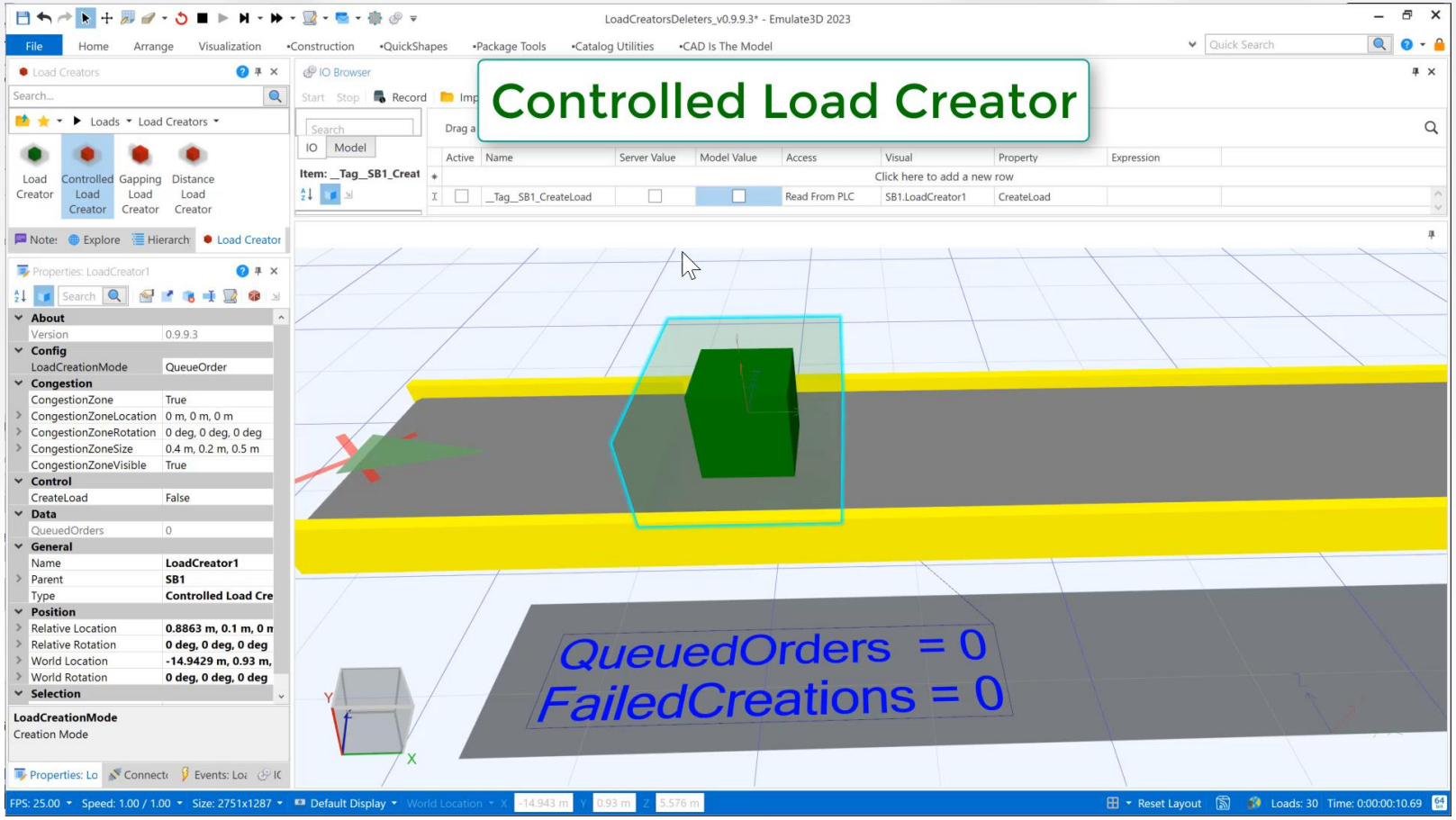
Load Creator & Load Deleter

- Load Creator
  - Load creation attempted at release frequency
  - Rectangular Congestion Zone is adjustable (size, location, visibility)
- Load Deleter
  - Loads deleted after deletion time distribution sample (initially blocking loads option)
  - Rectangular Deletion Zone is adjustable (size, location, visibility)
  - Configurable Load Filters (Accepted Loads, Ignored Loads)



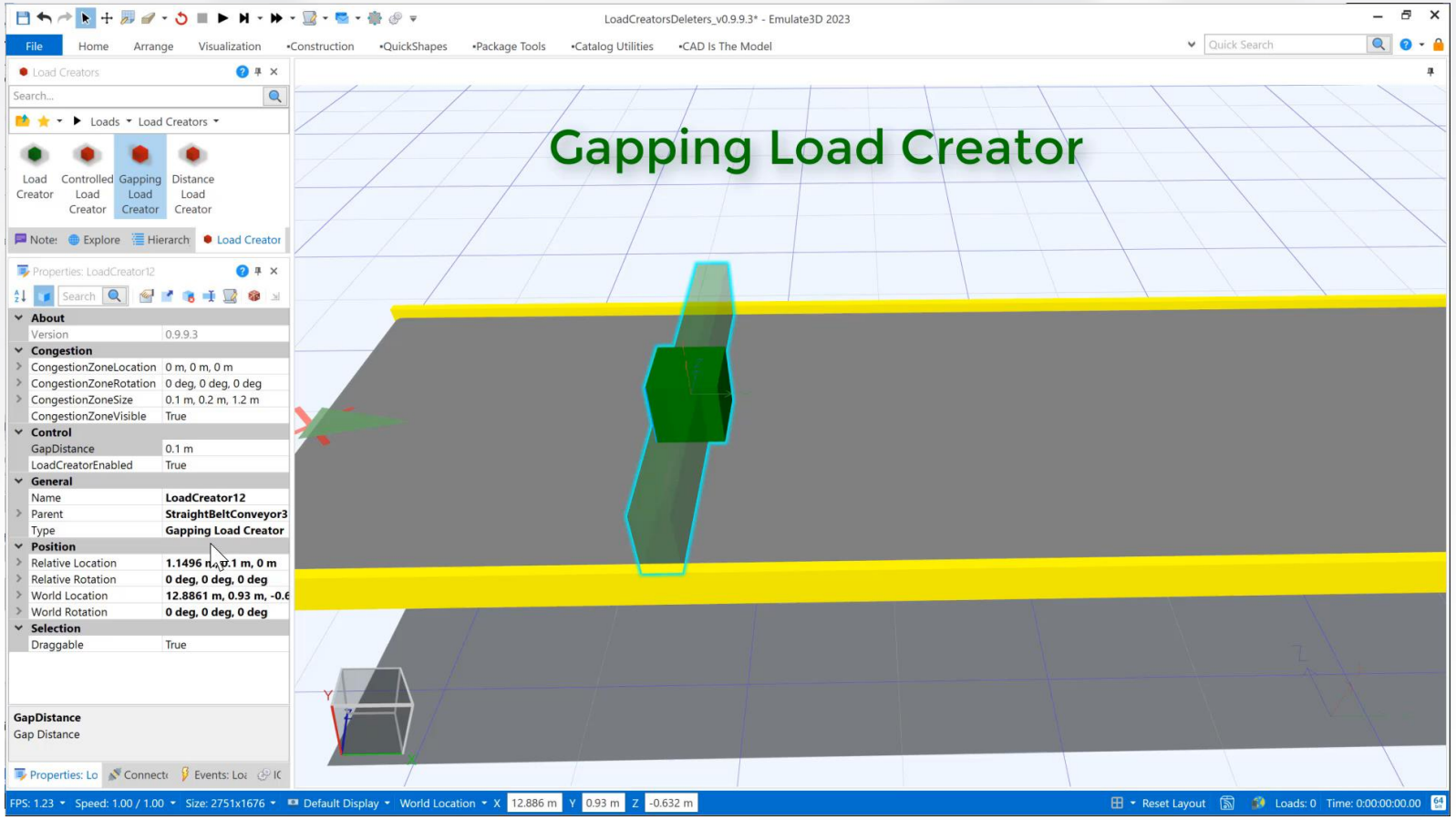
Controlled Load Creator & Controlled Load Deleter

- Controlled Load Creator
  - Load creation attempted when Create Load toggles True
  - Rectangular Congestion Zone is adjustable (size, location, visibility)
  - Failed creations can be queued to complete when the Congestion Zone clears
- Controlled Load Deleter
  - Loads deleted when Delete Loads property toggled True
  - Deletion Zone is rectangular, adjustable (size, location, visibility)
  - Configurable Load Filter (Accepted Loads, Ignored Loads)



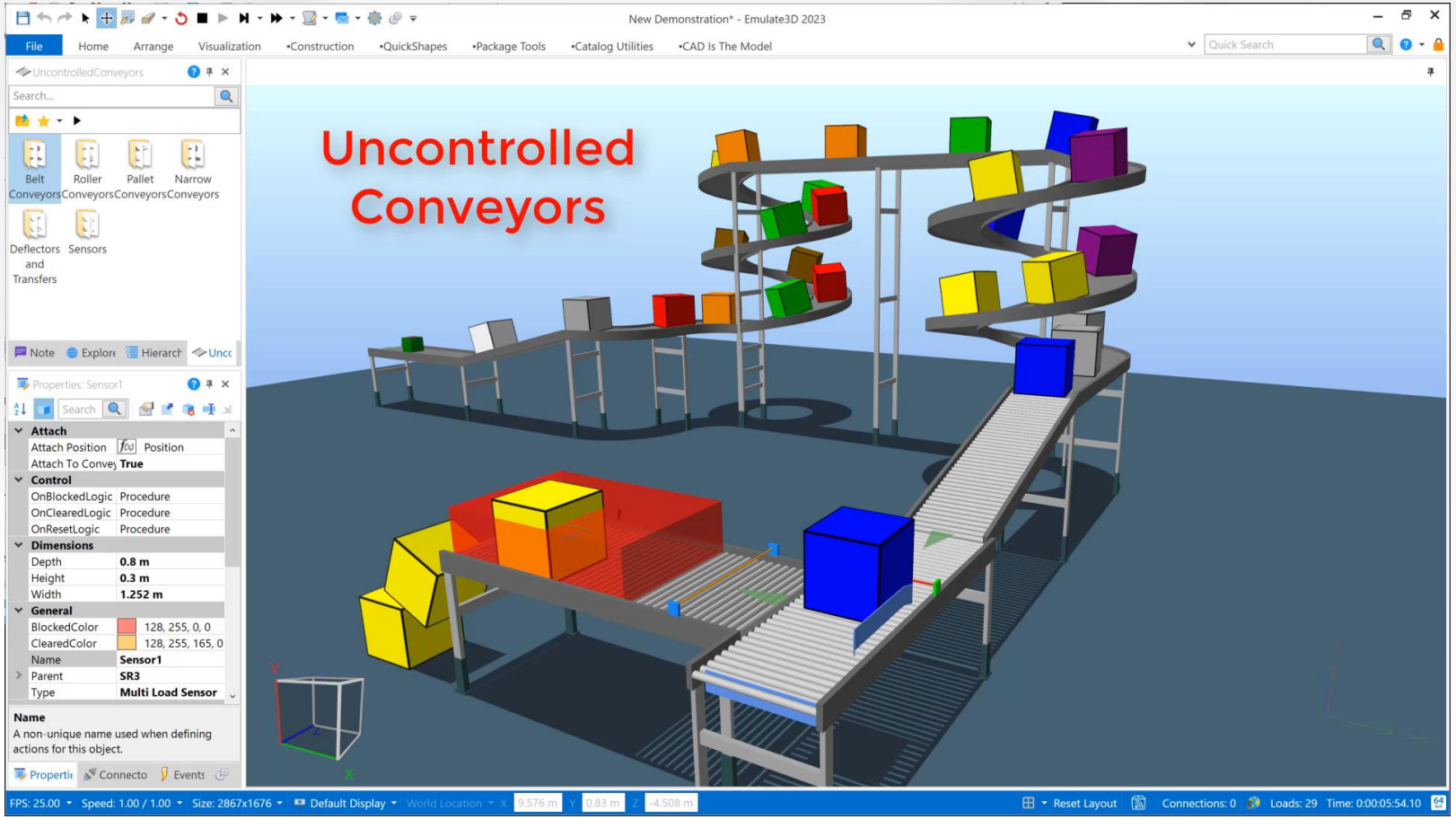
Gapping Load Creator & Distance Load Creator

- Gapping Load Creator
  - Loads created on Conveyor at specified Gap Distance (even complex loads)
  - Congestion Zone is rectangular & adjustable (size, location, visibility)
- Distance Load Creator
  - Loads creation attempted after Conveyor has travelled specified Release Distance
  - Congestion Zone is rectangular & adjustable (size, location, visibility)



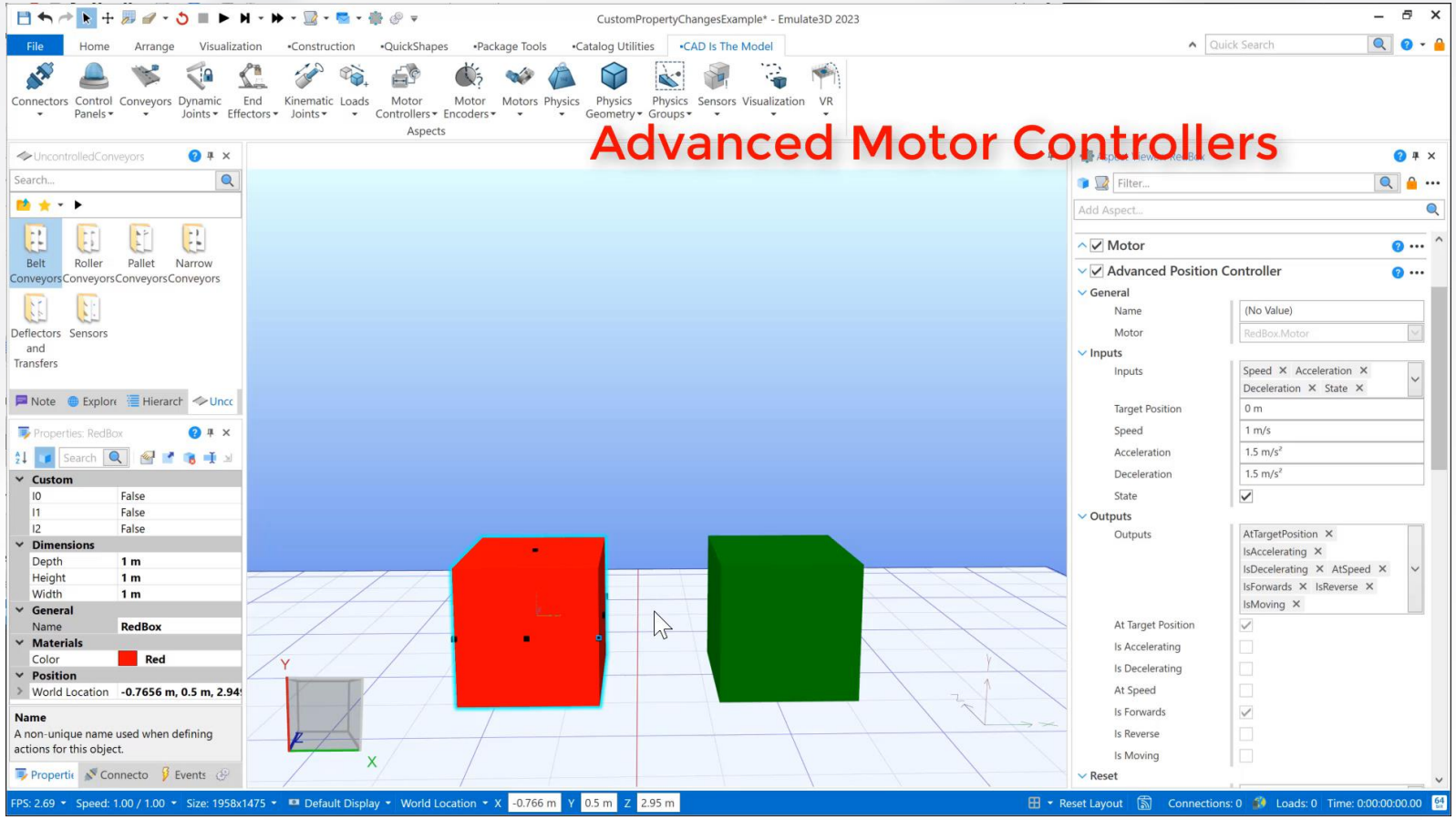
Uncontrolled Conveyors Catalog

- Replaces the Sample Catalog
- Great for Controls Testing
- Users can add their own scripts to customize the components
- Deflectors & Transfers include customizable QuickScript
- Sensors include customizable QuickScript



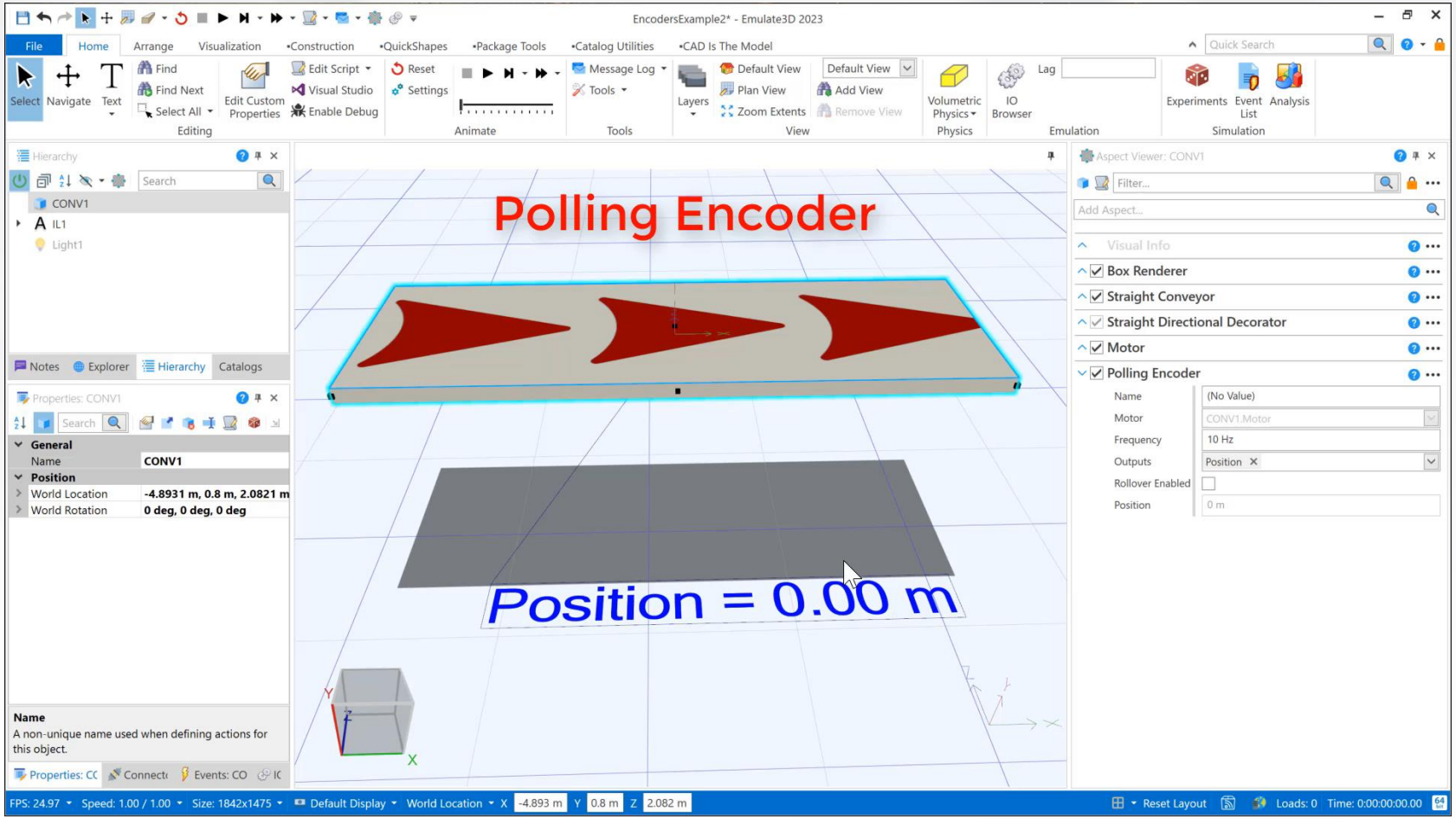
Advanced Motor Controller Aspects

- Advanced Motor Controllers are now included in the CITM Ribbon in E3D 2023+
  - Advanced Position Controller
    - User configurable PLC Inputs & Output
  - Advanced Actuation Controller
    - User configurable PLC Inputs & Output
    - 1 Signal Control (Activate)
    - 2 Signal Control (Extend, Retract)
    - Swap Positions Flag



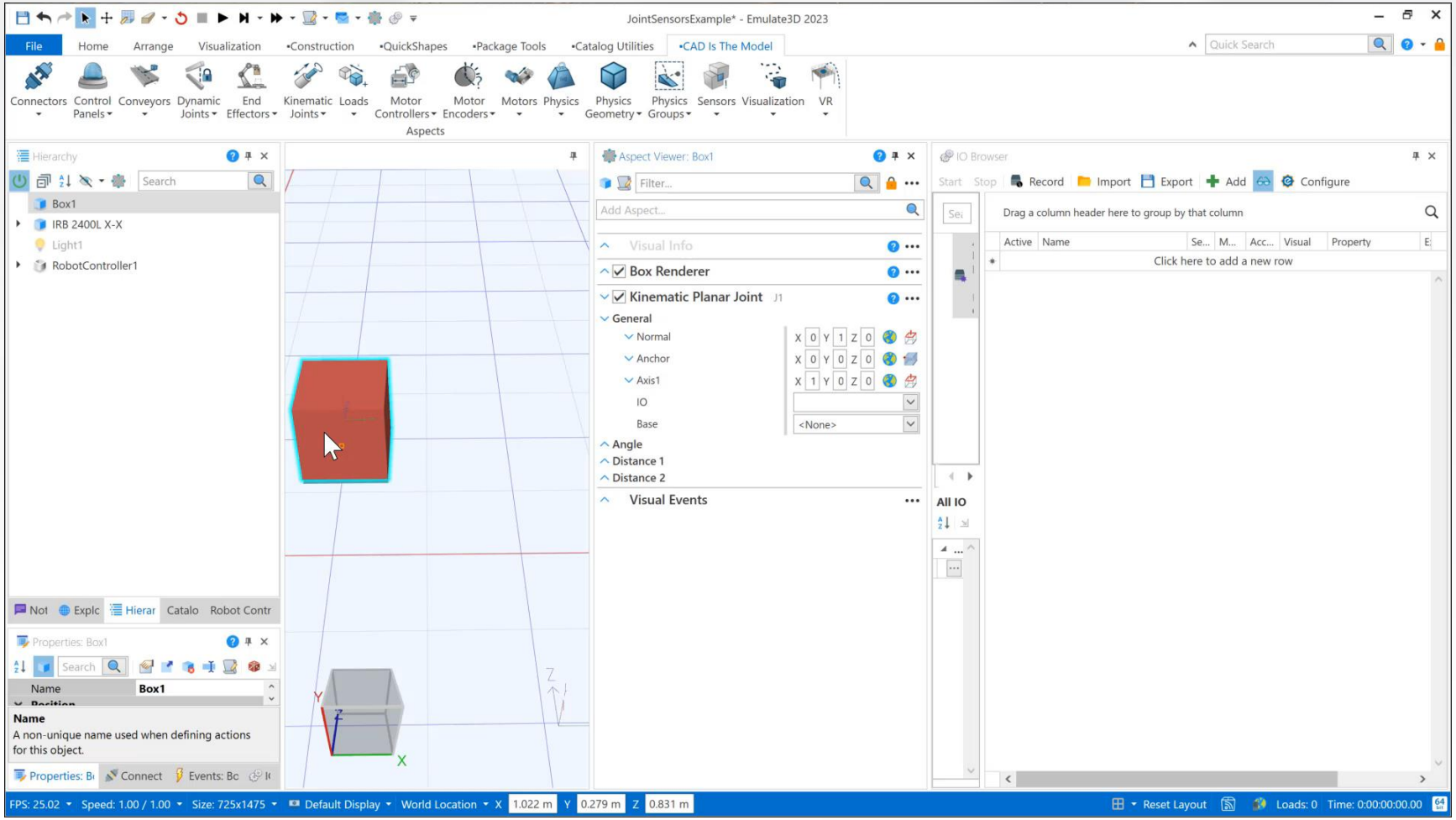
Motor Encoder Aspects

- Polling Encoder
  - added Position Rollover functionality
- Counting Encoder
  - New encoder aspect
  - Count (int) is scalable & rolls over at limits



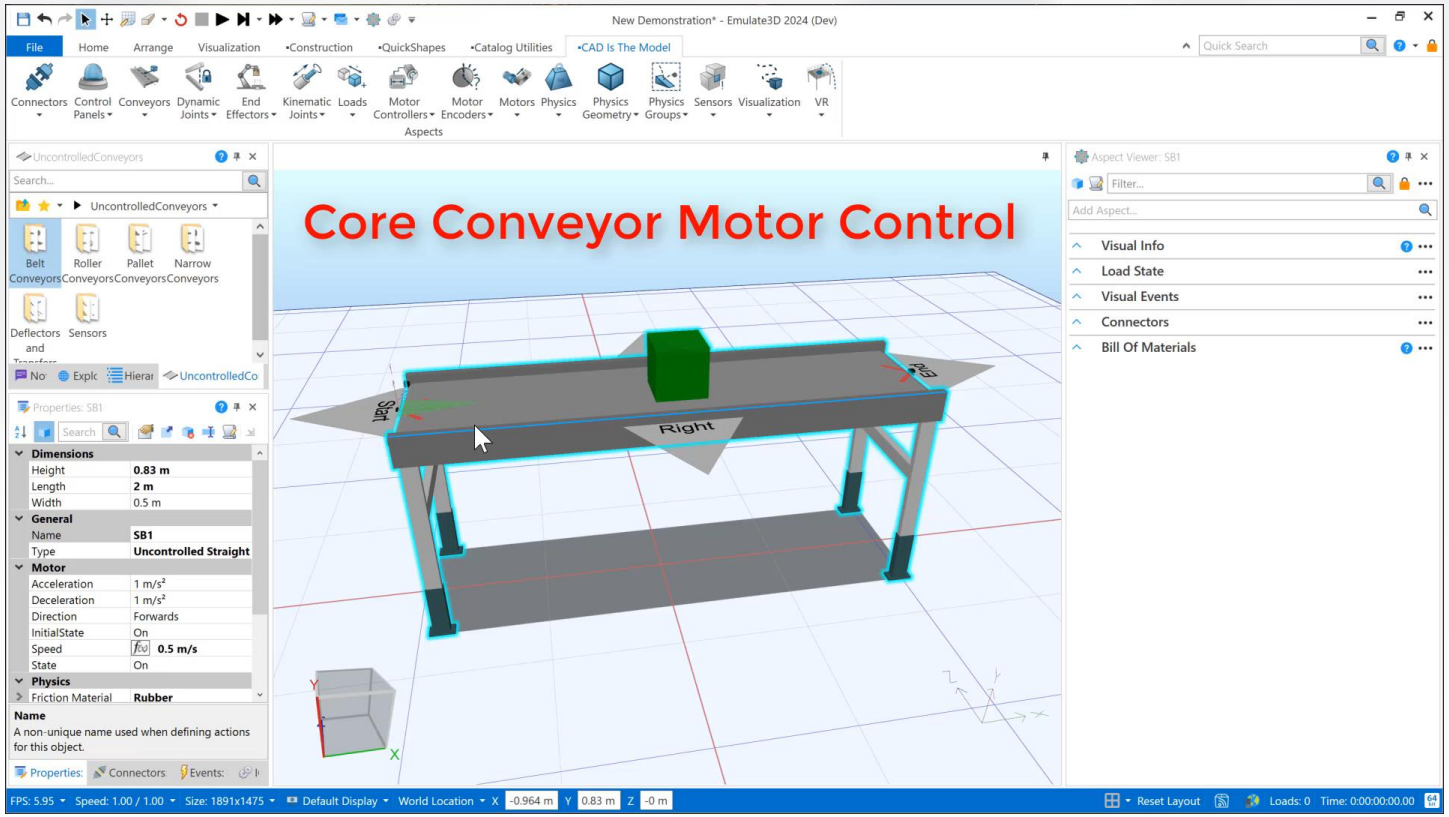
Kinematic & Dynamic Joint Sensor Aspects

- Works on all Kinematic & Dynamic Joint Sensors
- Detects when the specified Joint Value is within the chosen sensing range
- Outputs are configurable:
  - IsBlocked
  - IsCleared
  - JointValue
- Outputs are updated even when the Model is stopped
- Aspect Name updates Bindable Item Name
- Can be added to Robot Joints



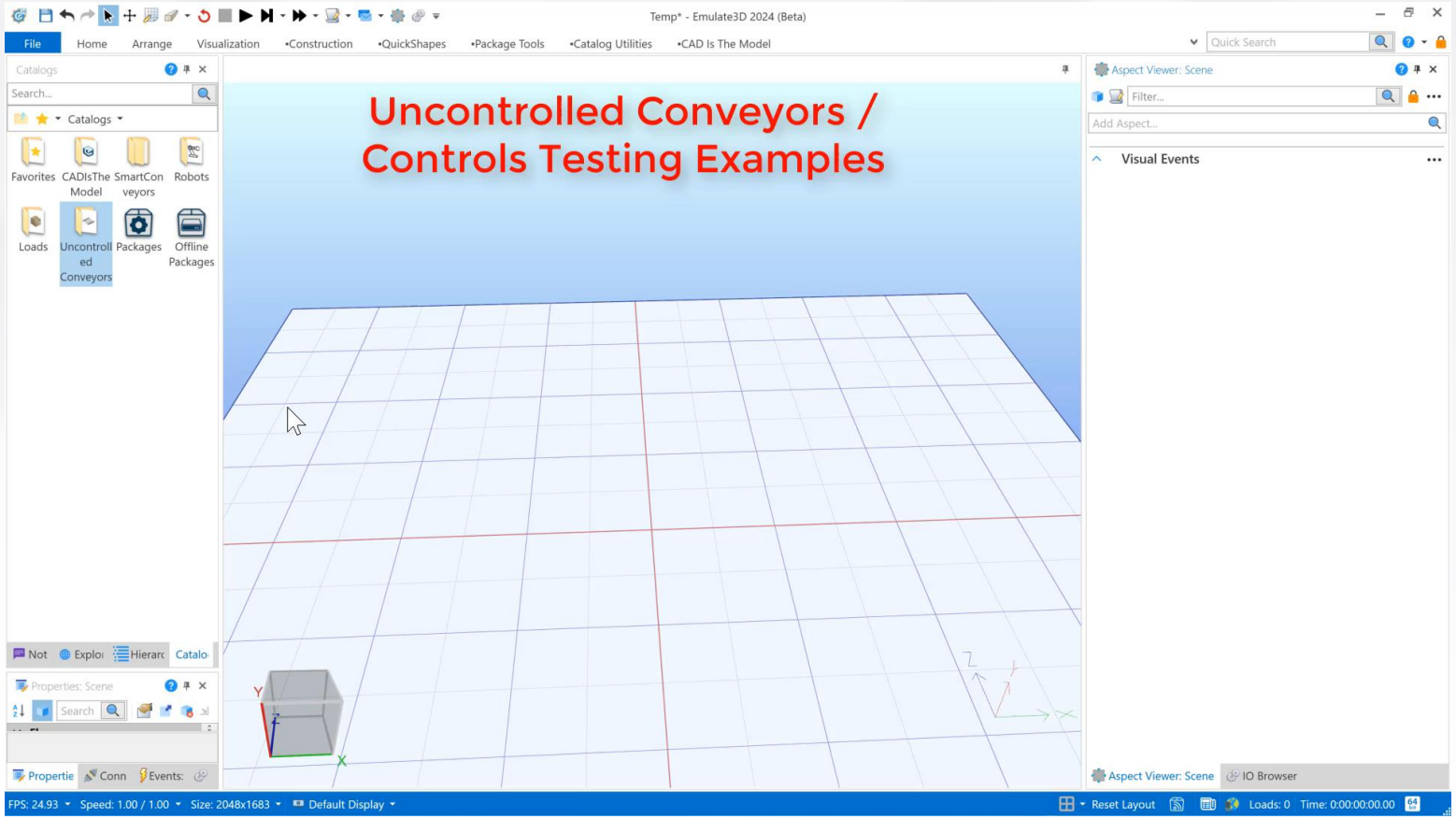
Override Core Conveyor Motor (2024+)

- Override a Core Conveyor Motor with a Motor Aspect
  - Take advantage of CITM Aspects to easily control Core Conveyors
- Add any Motor Controller
  - Generic Controller
  - Advanced Actuation / Position Controllers
  - ArmorStart 284E, PowerFlex 525, 755, & 755T Drives
- Create more complex assemblies by adding Aspects (Kinematic Joints, Kinematic Joint Sensors)
- Example configurations in Uncontrolled Conveyors catalog



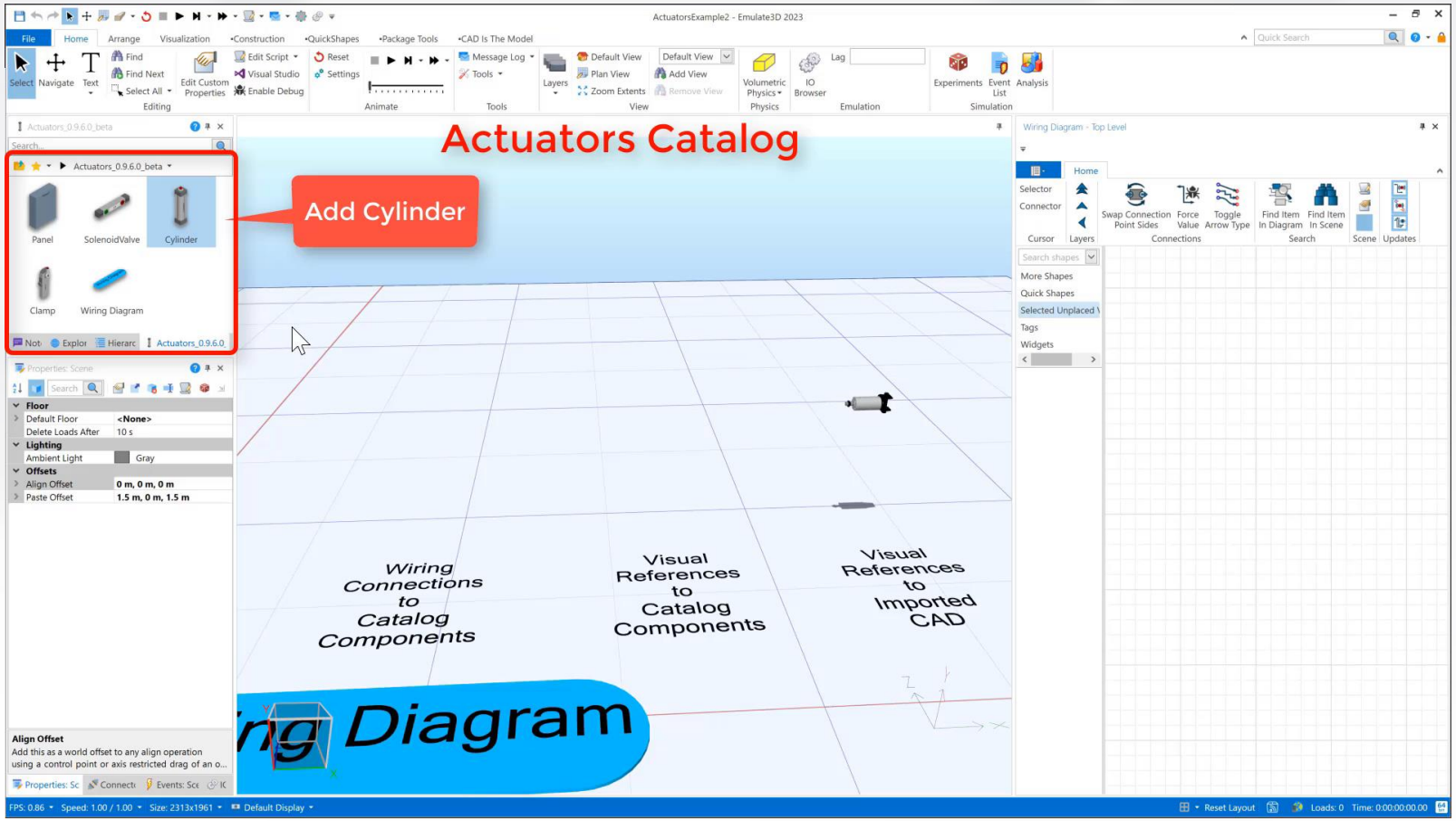
Uncontrolled Conveyors – Controls Testing Examples

- Skid Conveyor Examples
  - Basis for custom components
  - Only use CITM Aspects
  - No scripts (users can add their own)
  - Smart Visual Hierarchy & IO Browser Property Names
  - Top-level of each component is a stationary Visual with no Joints
  - Power Roll Bed child with a Motor Aspect and Override Core Conveyor Motor enabled
  - Additional Visuals and Aspects can be added for more degrees of motion
  - A Kinematic Fixed Joint affixes Power Roll Bed to move with another Joint



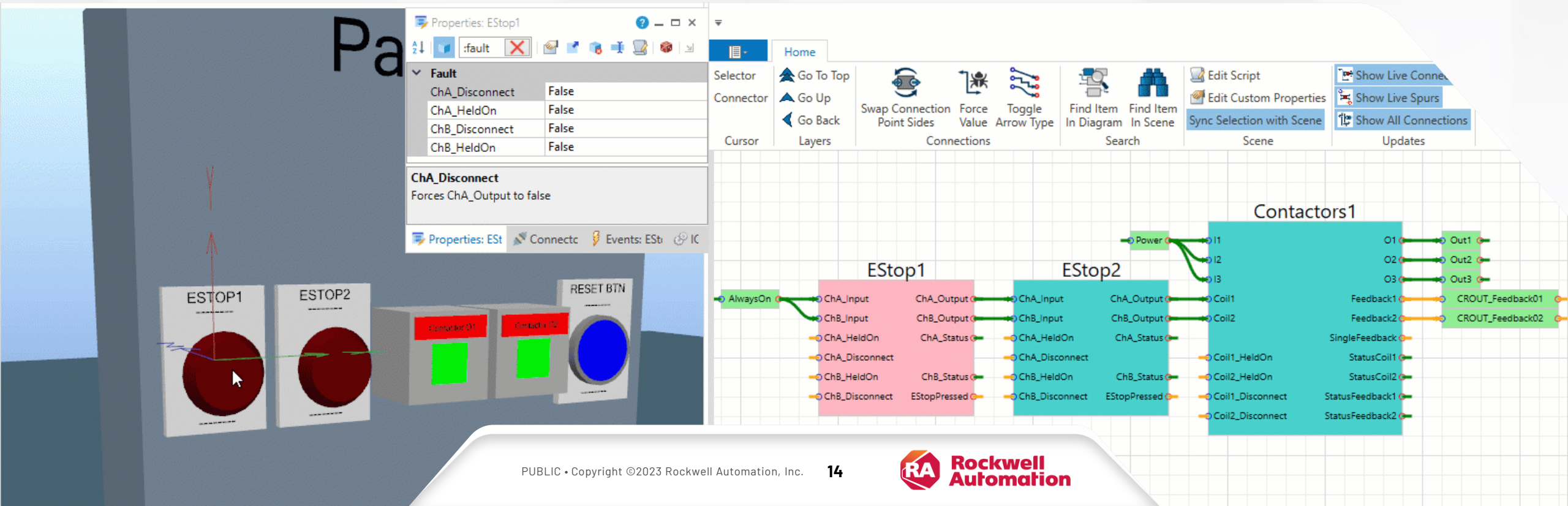
Actuators Catalog

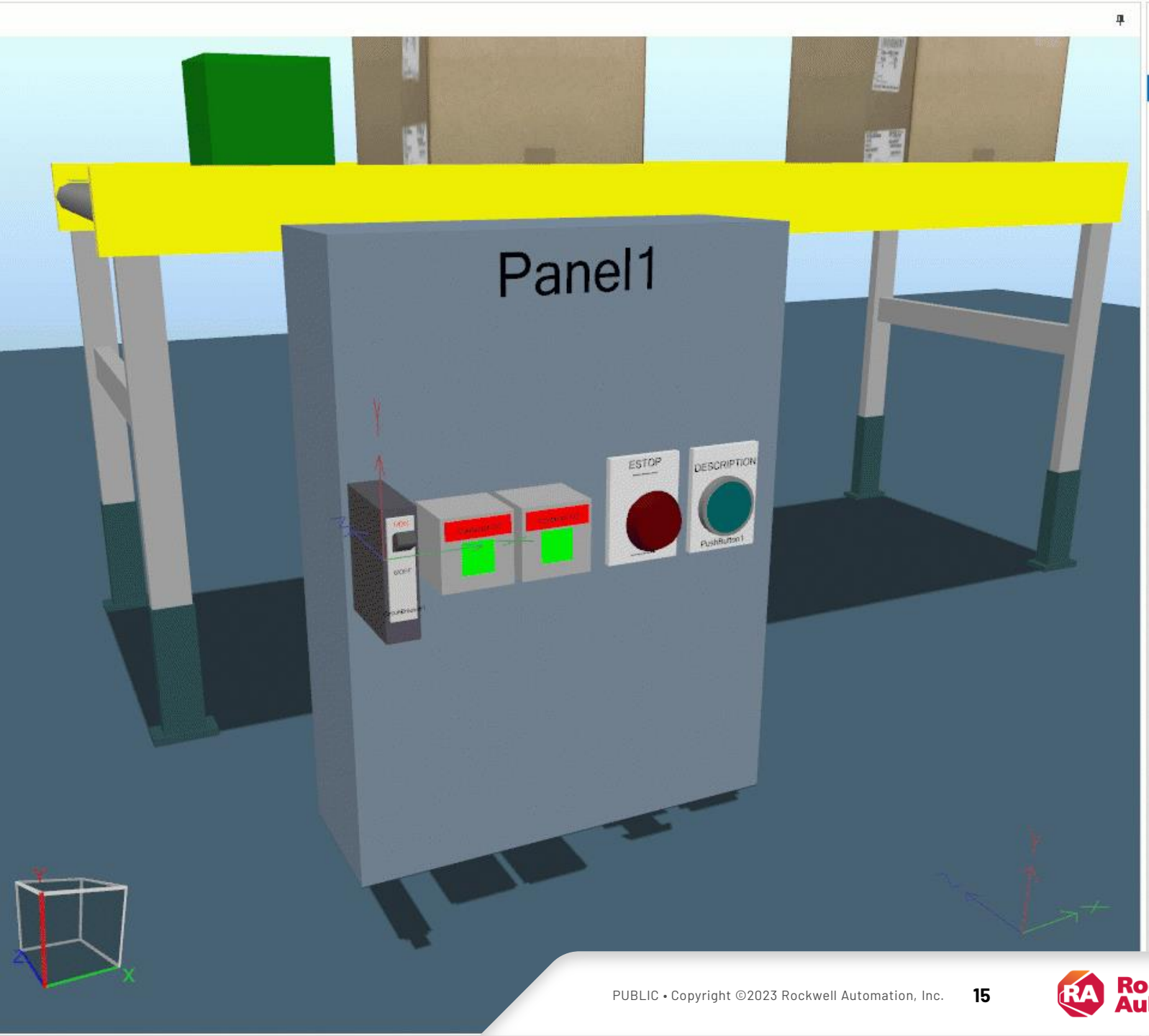
- Solenoid Valve (18 configurations)
  - Ports/Ways (2-5) , Positions (2-3)
  - Operation (normally closed, normally open, spring return, center closed, center open, center pressure
  - Can actuate other components via Visual Reference or Wiring Diagram Connection
- Clamp
  - Initial Angle, Rotation, Scale, and Colors are configurable
- Cylinder
  - Bore, Stroke, and Colors are configurable
- Imported CAD
  - Add Aspects (Joint, Motor, Advanced Actuation Controller) to actuate by Solenoid Valve



Wiring Diagram Improvements

- Multiple Simultaneous Wiring Diagram Views
- Performance Improvements
- New Widgets: Exclusive Or, Index





Panel1

Home

Selector
Connector
Cursor

Open Layer in New Window
Layers

Swap Connection Point Sides
Force Value
Toggle Arrow Type
Connections

Next Instance
Previous Instance
Sync Selection
Find Item In Diagram
Search

EStop1
Power
ChA_Input
ChB_Input
ChA_HeldOn
ChA_Disconnect
ChB_HeldOn
ChB_Disconnect
ChA_Output
ChB_Output
ChA_Status
ChB_Status
EStopPressed
StopChannelA
StopChannelB

Contactors1
Power
I1
I2
I3
CROUT_Output01
CROUT_Output02
Coil1
Coil2
Coil1_HeldOn
Coil2_HeldOn
Coil1_Disconnect
Coil2_Disconnect
O1
O2
O3
Feedback1
Feedback2
SingleFeedback
StatusCoil1
StatusCoil2
StatusFeedback1
StatusFeedback2

BooleanAnd5
R_Boolean1
R_Boolean2
R_Boolean3
W_AndResult

SB1
IsMotorOn

CROUT_Feedback01
CROUT_Feedback02

PushButton1
Power
LightPower
NO1_Input
ButtonPressed
NO1_Output
SafetyReset

CircuitBreaker1
CircuitBreakerOn
NO1_Input
NO1_Output
Power

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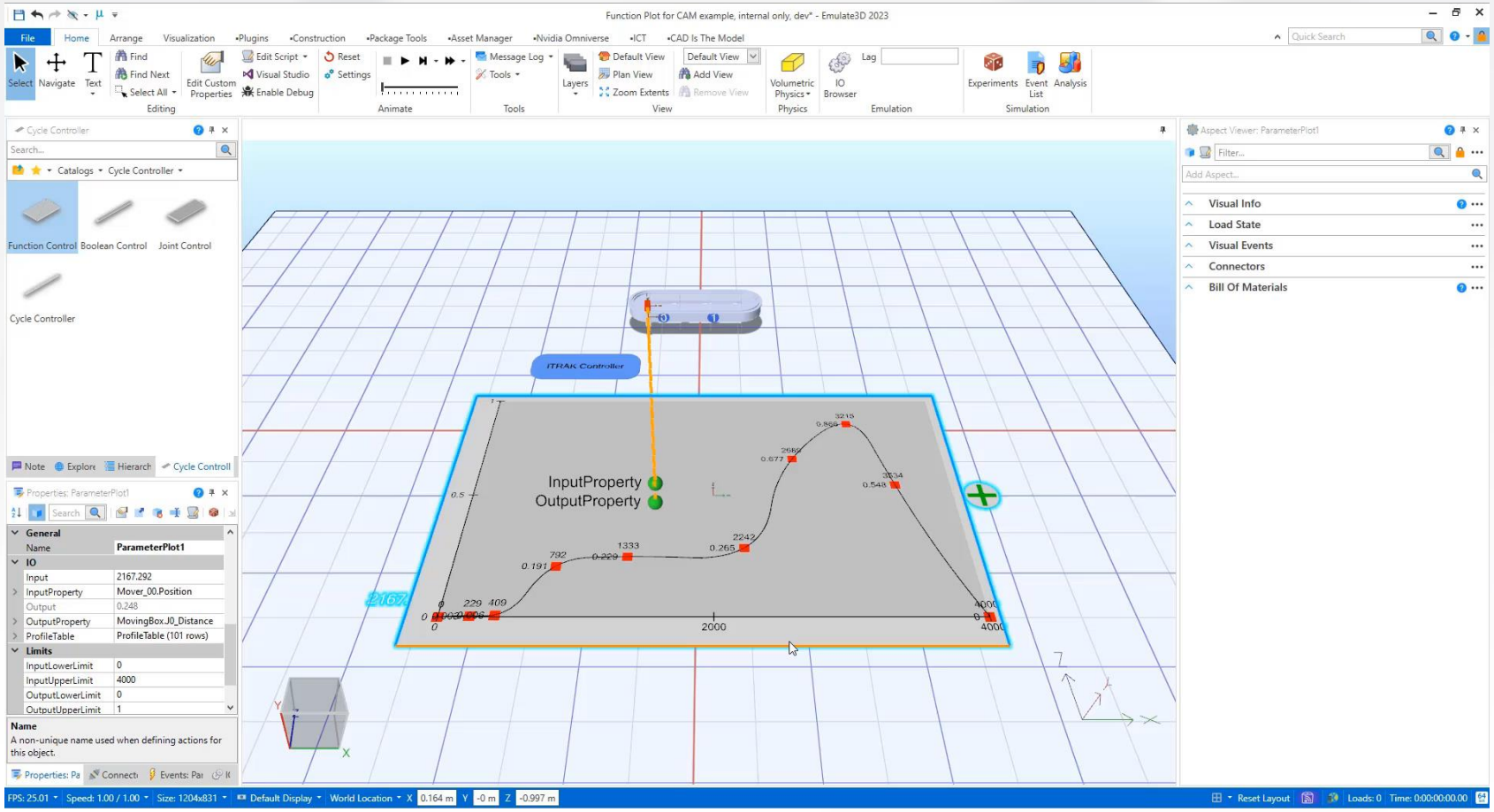
3D Control Panels Catalog

- Replaces Wiring Components from Wiring Catalog
- Improved all catalog components
- Changed Custom Property naming (R_, W_)
- Added Panel Door which opens & closes. Components snap inside. Connectors are configurable (x/y spacing, borders)
- Added LED components with user configurable colors array.
- Added Relay component
- Wiring API used to update Properties on Wiring Diagram Rails

Function Controller

- Component available in Cycle Controller Catalog & Tanks & Pipes Catalog
- Bind an Input to an Output using a user defined function
- Drag plot points around to create the function
- Interpolate output values using a curve or table
- Input value can optionally be set to the Model Time by snapping on a Cycle Controller
- Use to create a custom cam profile or acceleration profile



THANK YOU!
Any Question?

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