

NOVEMBER 2022

Integrating AVEVA Model-Driven MES Forms into AVEVA OMI

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AVEVA

Agenda

- Integrating MDM Forms in OMI
 - Prerequisites
 - Galaxy Configuration
 - OMI Configuration
- Integrating OMI in Work Tasks

Bidirectional Embedding

- Embed Model-Driven MES Work Task Forms into OMI
- Embed OMI/Web Graphics into Work Tasks

The screenshot displays the AVEVA Operations Management Interface (OMI) with the following components:

- Header:** AVEVA Operations Management Interface, Shelbylab\Skuser1, 8/23/2022 11:07 PM, Standard_Style | English (United States).
- Navigation:** Assets, Enterprise, Site, Plant, Plant_Area, Warehouse. Plant_Area: 0 Alarms.
- Area Alarms:** Running, Mode: Enable.
- Work Order Dashboard:** Status filters: NEW, READY, RUNNING, SUSPENDED. Grid of work order cards with details like Item ID, Req. Qty, Case Units, and Release Date.
- Model Driven MES:** Item: FP01(Finished Product 1), Req. Qty: 75.00, Deviation: -37.50, Bad Production: 0.15. A progress bar shows 37.50 units completed. Below is a process flow diagram with five stations: Line1Filler (Unknown), Line1Weigher (Running), Line1Labeller (Running, 95% level), Line1Packer (Run Degraded Speed, 17% level), and Line1Palletizer (Running).

Integrate Operations Management and Operations Control



Operations Management and Operations Control systems work best when they are integrated together

Augment existing OMI Applications and engineering investments with pre-built Model-Driven MES web-based forms found in Work Tasks

Efficient and accurate communication between planning and production, increased production and operational efficiency, increased visibility of current production status.

Prerequisites to Embed MDM Forms in OMI

Prerequisites for Using Model-Driven MES Forms in OMI

Properly configured and integrated per the Model-Driven MES and other Product Installation Guides

AVEVA System Platform 2020 R2*

- Galaxy configured for OS security
- System Management Server (SMS)
- AVEVA OMI installed on view nodes
 - New or existing OMI application

AVEVA Manufacturing Execution System 2020 (MES)*

- MES configured for OS security

AVEVA Model-Driven MES Application Content v5.5

- All included hotfixes installed
- Work Tasks Connector for MES v6.7

AVEVA Work Tasks 2020 U2

- Active Directory security with Token authentication
- System Platform Connector and Extension for Work Tasks
- Work Tasks OMI Application
- Workflow Gateway object
- Galaxy platform deployed to Work Tasks server

Integration covered in Model-Driven MES Installation Guide

*System Platform 2020 R2 SP1 and MES 2020 Patch 02 is also a valid combination

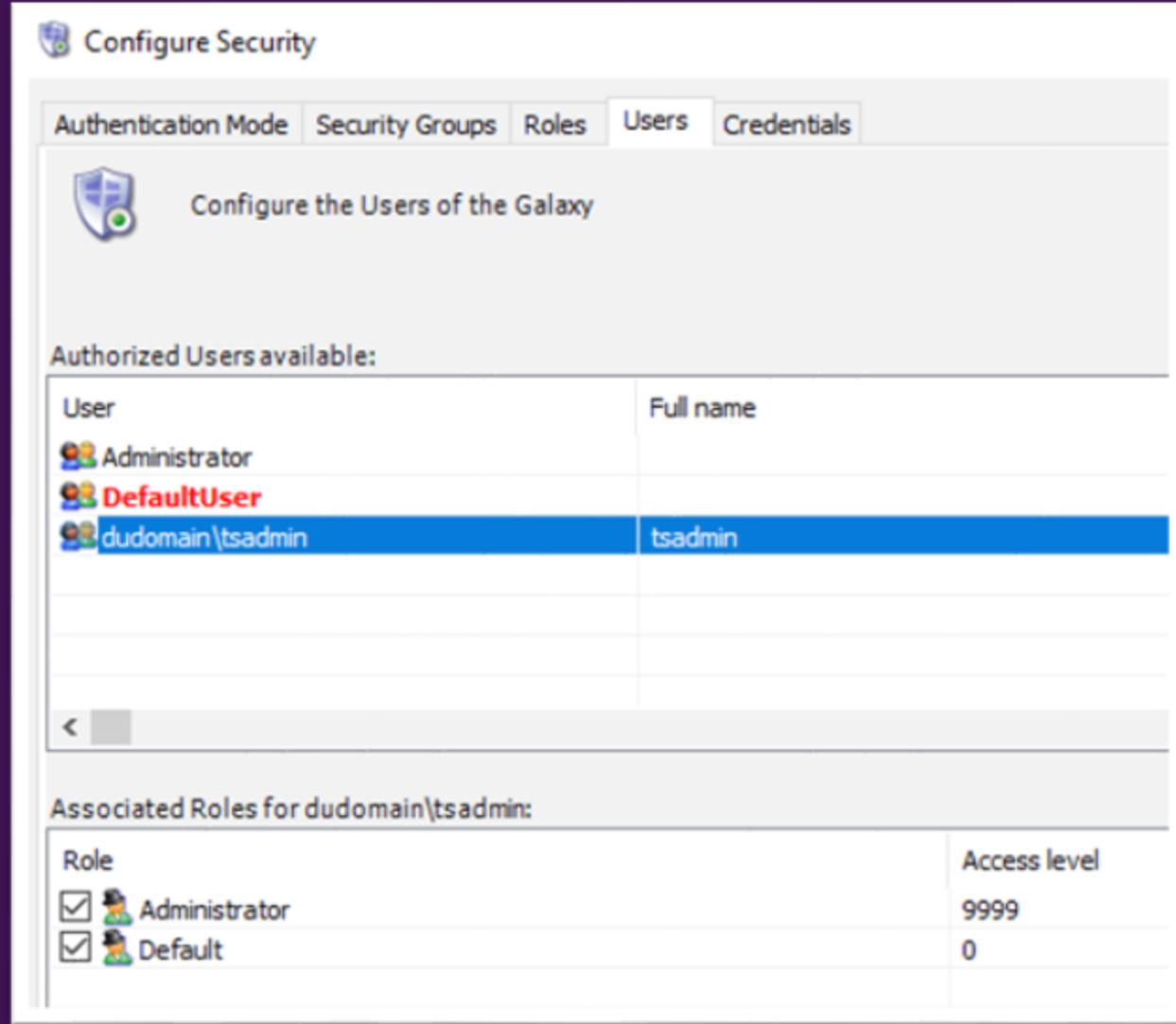
Galaxy and Workflow Gateway Configuration

System Platform IDE

AVEVA

Configure Galaxy Security

- Users appear in this list when configured or after logging on to a system
 - **System Platform IDE - Galaxy – Configure Security**
- Workflow Gateway object will sync galaxy users to Work Tasks repository



Configure Security

Authentication Mode Security Groups Roles **Users** Credentials

Configure the Users of the Galaxy

Authorized Users available:

User	Full name
 Administrator	
 DefaultUser	
 dudomain\tsadmin	tsadmin

Associated Roles for dudomain\tsadmin:

Role	Access level
<input checked="" type="checkbox"/>  Administrator	9999
<input checked="" type="checkbox"/>  Default	0

Configure Workflow Gateway

Gateway Configuration – General tab

- **Unique environment name:** Galaxy name
- **Passphrase:**
Set during Work Tasks farm creation
- **Server Address:** Work Tasks server
- **Authentication User Domain:**
Work Tasks server domain
- **Authentication User ID:**
Access to both Work Tasks and MES
- **Authentication User Password**

WorkflowGateway_001 *

Gateway Co

Provision

Workflow Repository Authentication Info

Use AD Provider same as Repository

Providers: Active Directory

User Name: tsadmin

Password:

Inbound Connection Authentication Info

The following Windows user should have access rights on the platform on which the gateway object will be deployed.

Authentication User Domain: DUDOMAIN

Authentication User Id: tsadmin

Authentication User Password:

Authorize & Provision

Configure Workflow Gateway

Gateway Configuration – Advanced tab

- **Enterprise Console Site URL**
 - Remove the leading dashes
 - URL contains the Fully Qualified Domain Name

Gateway Configuration | Attributes | Scripts | Object Information | Workflows

Enter the following information to connect this Galaxy to the AVEVA Work Tasks Server:

Outbound Connector Port:	<input type="text" value="4000"/>
Outbound Connector Binding:	<input type="text" value="TCP"/>
User Provider Name:	<input type="text" value="TestGalaxy"/>
Enterprise Console Site URL:	<input type="text" value="https://...dudomain.com:8001/En"/>
Repository Auth User Id:	<input type="text" value="tsadmin"/>
Repository Auth User Password:	<input type="password" value="*****"/>
Repository Auth User Provider:	<input type="text" value="activedirectory"/>

Outbound Connection Info | Inbound Connection Info | Synch Security Info

Configure Workflow Gateway

Security Synchronization

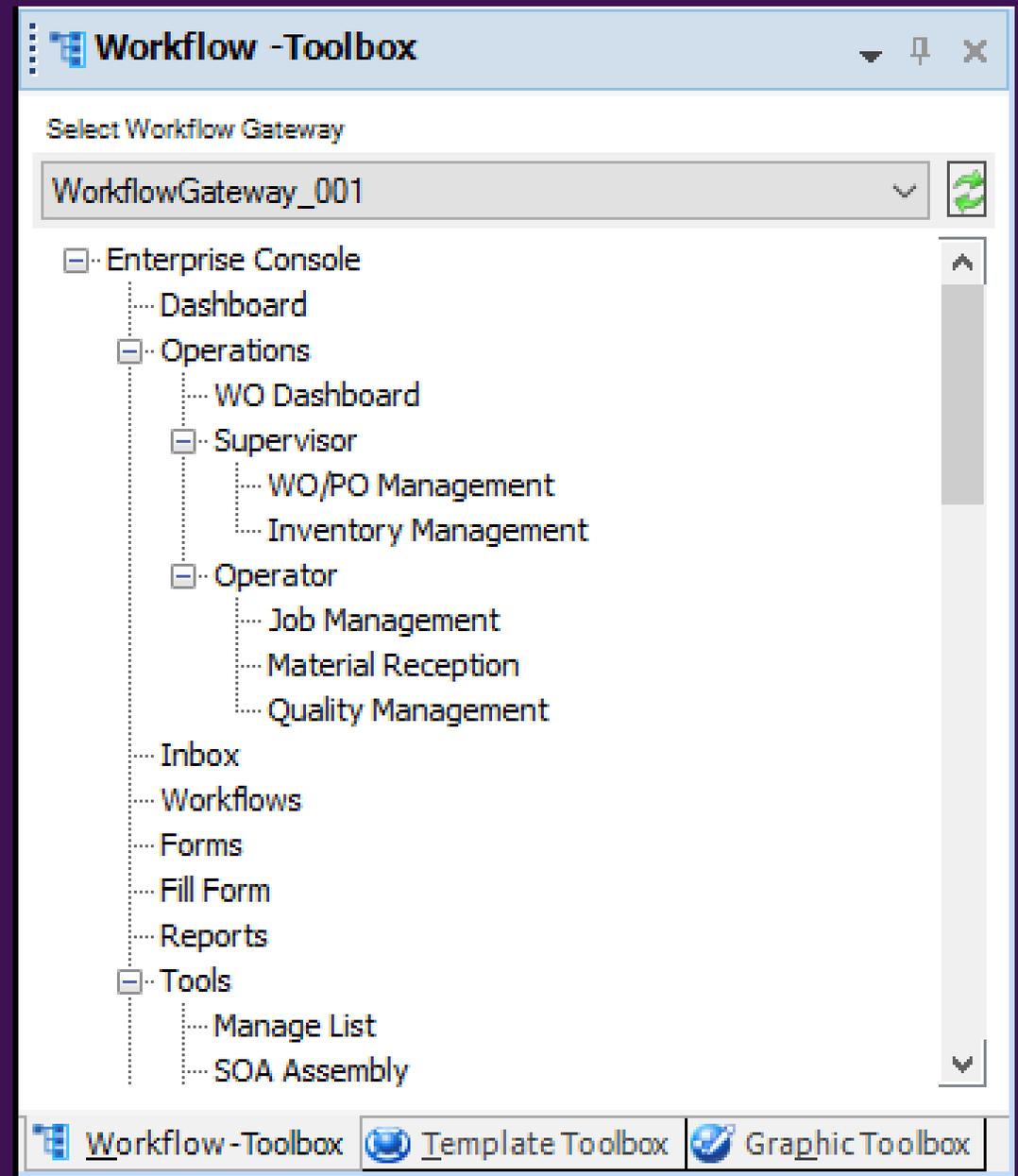
- Manually synchronize initial user list
- Setup sync refresh interval

The screenshot displays the 'Gateway Configuration' interface with the 'Workflows' tab selected. The main content area is titled 'Synchronize Users, Roles and Security Groups to Workflow Server'. Below this title, there is a 'Refresh Interval' field set to '2' (Days) and a 'Synchronize' button. At the bottom of the interface, there are four tabs: 'Outbound Connection Info', 'Inbound Connection Info', 'Synch Security Info', and 'Workflows'.

Configure Workflow Gateway

Verify Connection and Deploy

- **Workflow – Toolbox** displays repository contents
- **Deploy** an instance of the Workflow Gateway



AVEVA OMI Configuration



Enabling OMI for Token Security

- Enable OMI token security by editing the **view.exe.config** file in the OMI application directory
- The application directory could be in multiple locations:
 - Individual OMI deployed application:
C:\Program Files (x86)\ArchestrA\Framework\Bin\ViewAppFramework
 - Preview application launched by the IDE:
C:\Program Files (x86)\ArchestrA\Framework\Bin\ModernEditors\Preview\ViewAppFramework

Editing OMI view.exe.config

Before

```
<!-- Configure the Archestra Identity Manager Service (the OpenId Connect endpoint) by adding the following key value pairs.
  Replace "your_token_server" and "your_client_id" with proper values.

  <add key="TokenServiceBase" value="https://your_token_server/IdentityManager" />
  <add key="ClientId" value="your_client_id" />
  <add key="Scope" value="openid profile system offline_access" />
-->
```

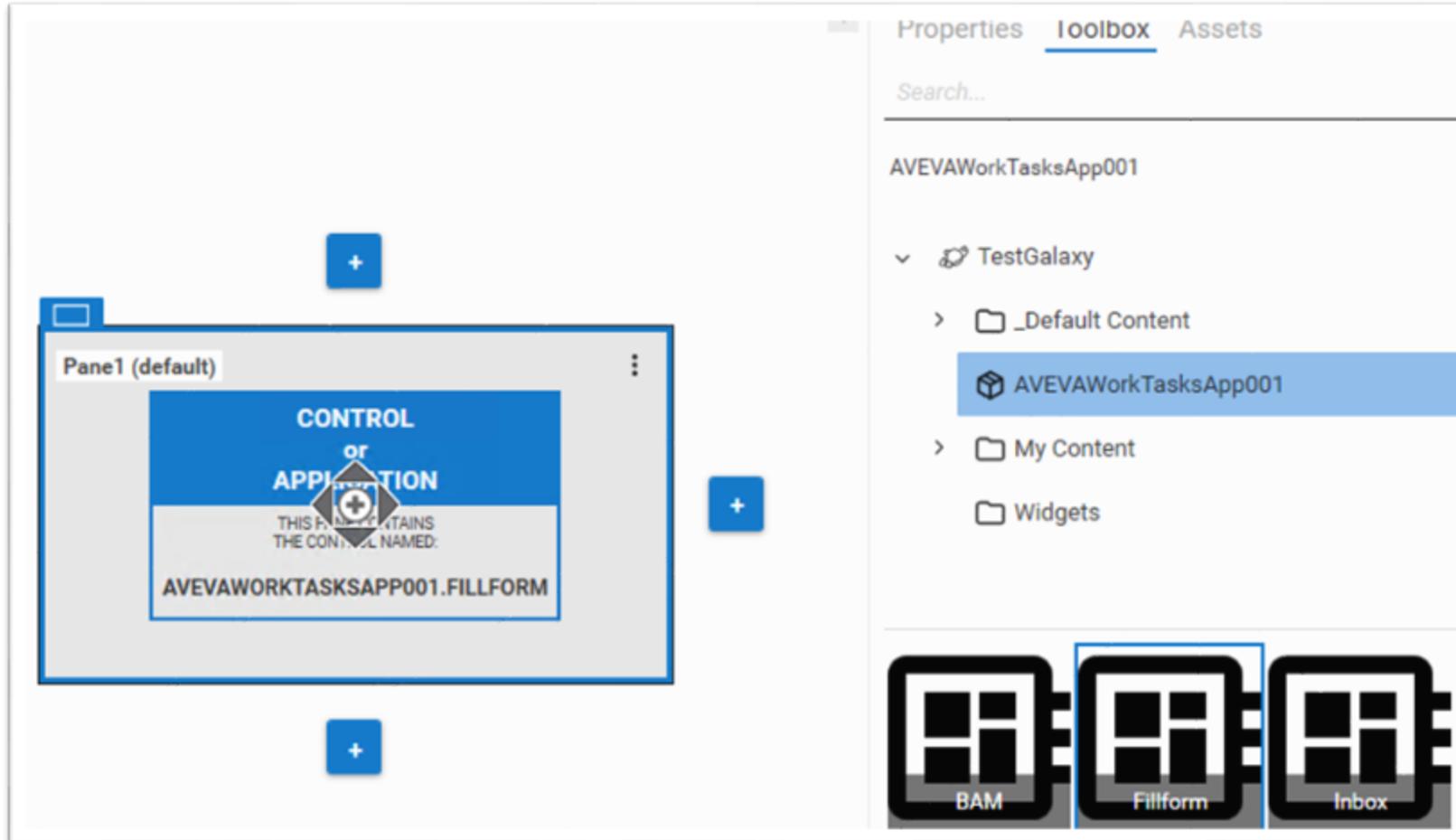
After

```
<!-- Configure the Archestra Identity Manager Service (the OpenId Connect endpoint) by adding the following key value pairs.
  Replace "your_token_server" and "your_client_id" with proper values. -->

  <add key="TokenServiceBase" value="https://MySMSServer.mydomain.com/IdentityManager/connect/token" />
  <add key="ClientId" value="SE_WSP_NG" />
  <add key="Scope" value="openid profile system offline_access" />
```

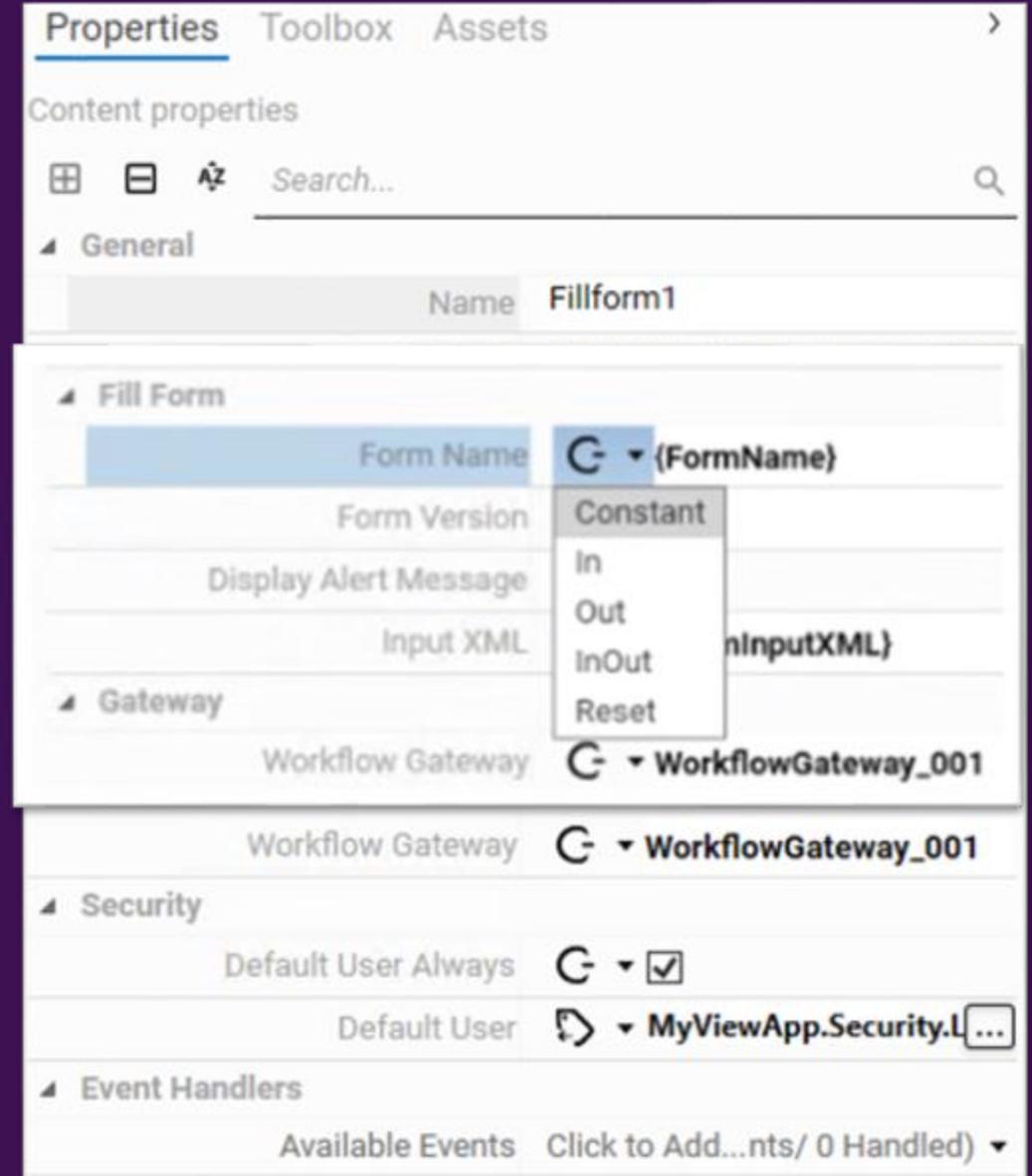
Embedding MDM Forms in OMI

Add Work Tasks FillForm OMI Application in an OMI Layout



Fillform Properties

- **Workflow Gateway:**
Work Tasks Gateway object
- **Form Name:** MDM form name
- **Form Version:** 0 (or alternate version #)
- **Input XML:** Formatted as provided
- **Default User:** Domain\MES_OS)user or the current logged on user view app attribute: MyViewApp.Security.LoggedInUserName passed logged on OMI user to MES WEB API via Work Tasks
- 3 options for setting Form Name, Version, Input XML
- Settings can be Constant or Input



Fillform Properties Options

Hardcode (Constant)

Content properties	
Search...	
General	
Name	Fillform1
Content	AVEVAWorkTasksApp001.Fillfor
Pane	Pane1
Fill Form	
Form Name	MDMJobQueue
Form Version	0
Display Alert Message	<input type="checkbox"/>
Input XML	<SKRootDefinition><hfW
Gateway	
Workflow Gateway	WorkflowGateway_001
Security	
Default User Always	<input checked="" type="checkbox"/>
Default User	MyViewApp.Security.L...

Galaxy Object.Attribute (In)

Content properties	
Search...	
General	
Name	Fillform1
Content	AVEVAWorkTasksApp001.Fillfor
Pane	Historyplayback
Fill Form	
Form Name	Ent100.MDMFormNan...
Form Version	0
Display Alert Message	<input type="checkbox"/>
Input XML	Ent100.MDMFormInput...
Gateway	
Workflow Gateway	WorkflowGateway_001
Security	
Default User Always	<input checked="" type="checkbox"/>
Default User	MyViewApp.Security.L...

Selected Asset in OMI (Constant) wrapped in curly braces

Content properties	
Search...	
General	
Name	Fillform1
Content	AVEVAWorkTasksApp001.Fillfor
Pane	Pane1
Fill Form	
Form Name	{MDMFormName}
Form Version	0
Display Alert Message	<input type="checkbox"/>
Input XML	{MDMFormInputXML}
Gateway	
Workflow Gateway	WorkflowGateway_001
Security	
Default User Always	<input checked="" type="checkbox"/>
Default User	MyViewApp.Security.L...

MDM Form Displayed in OMI

AVEVA Operations Management Interface

Ent100 | Standard_Style | English (United States)

Home | Dudomain\Tsadmin | 9/28/2022 7:19 AM

Assets > Enterprise > Site > Plant > Plant_Area > Ent100

Area State: Running | Area Mode: Enable

Plant_Area: 0 Alarms

Area Alarms: Plant_Area | Set Plant State: Running

Item: Example Item(Not a Real Item) | Req. Qty.: 110 | Deviation: -110 | Bad Production: 0

Op2 Operation | 0 Sequence Number

Queue | Produce | BOM Consume | Utilization | Performance

Details | Edit | Delete | Start | Suspend | Cancel | Complete | Refresh | Help

Filter: Current Filter: Status=[READY, RUNNING, SUSPENDED]; Entity=Ent100; Auto Refresh=60

Item ID	Work Order	Operation	Sequence Num...	Req. Qty.	Status	Entity
Example Item	6	Op2	0	110	RUNNING	Ent100
Example Item	7	Op1	0	1000	READY	

Job Details

Job Description: Op2

Batch Size: 1

Start Qty.: 110 Pieces

Req. Qty.: 110 Pieces

Job Priority: 50

Last Start Time: 6/2/2022 10:00:00 AM

Due Date: 6/7/2022 12:00:00 AM

MDM Input XML Parameters

FORM NAME	CONTEXT	INPUT XML Format
MDMWorkOrderManagementForm	Not applicable	
MDMJobManagementForm	Work Order ID and/or Entity Name	<pre><SKRootDefinition> <hfWold>WoX</hfWold> <hfEntName>Blender1</hfEntName> </SKRootDefinition></pre>
MDMJobQueue	Work Order ID and/or Entity ID	<pre><SKRootDefinition> <hfWo_Id>WoX</hfWo_Id> <hfEntityID>12</hfEntityID> </SKRootDefinition></pre>
MDMJobProduce	Entity ID Work Order ID Operation ID Sequence Number	<pre><SKRootDefinition> <ParameterWold>Wo1</ParameterWold> <ParameterOperId>Blending</ParameterOperId> <ParameterSeqNo>0</ParameterSeqNo> <hfEntID>12</hfEntID> </SKRootDefinition></pre>

MDM Input XML Parameters

FORM NAME	CONTEXT	INPUT XML Format
MDMJobConsume	Entity ID Work Order ID Operation ID Sequence Number	<pre><SKRootDefinition> <ParameterWold>Wo1</ParameterWold> <ParameterOperId>Blending</ParameterOperId> <ParameterSeqNo>0</ParameterSeqNo> <hfEntID>12</hfEntID> </SKRootDefinition></pre>
MDMInventoryForm	Entity ID	<pre><SKRootDefinition> <hfEntityId>12</hfEntityId> </SKRootDefinition></pre>
MDMUtilizationForm	Entity ID	<pre><SKRootDefinition> <hfEntityID>12</hfEntityID> </SKRootDefinition></pre>

MDM Input XML Parameters

FORM NAME	CONTEXT	INPUT XML Format
MDMPerformanceMonitorForm	Entity ID	<pre><SKRootDefinition> <hfEntityID>12</hfEntityID> </SKRootDefinition></pre>
MDMQualityManagementForm	Entity Name	<pre><SKRootDefinition> <hfEntName>Blender1</hfEntName> </SKRootDefinition></pre>

Tech Tips

- OS security must be enabled across all involved AVEVA software
- Carefully follow the MDM Installation Guide
 - FQDN is mandatory in certain configuration areas (but not all)
 - Hotfixes included with MDM installation are required for some MDM content to work properly
- Work Tasks documentation contains generic instructions for installing and configuring the Workflow Gateway, OMI Applications, and supporting components
- Work Tasks upgrades and hotfixes require running a separate upgrade utility manually. Details are in the instructions.
- If running System Platform 2020 R2 Sp1, you MUST install MES 2020 p02.
 - Patch installer is located on the System Platform 2020 R2 Sp1 installation media only.
- MES 2020.x is not supported with System Platform 2023
 - MES 2023 (Q1 2023*), Work Tasks 2023 (Q4 2022*), and MDM v6 (Q2 2023*) will be minimum versions for use with SP 2023

**Estimated release timeframe at the time of this presentation. Subject to change.*



Reference

Tech Note TN000033860 for step-by-step instructions and more details

<https://softwaresupportsp.aveva.com/#/okmimarticle/docid/tn000033860>

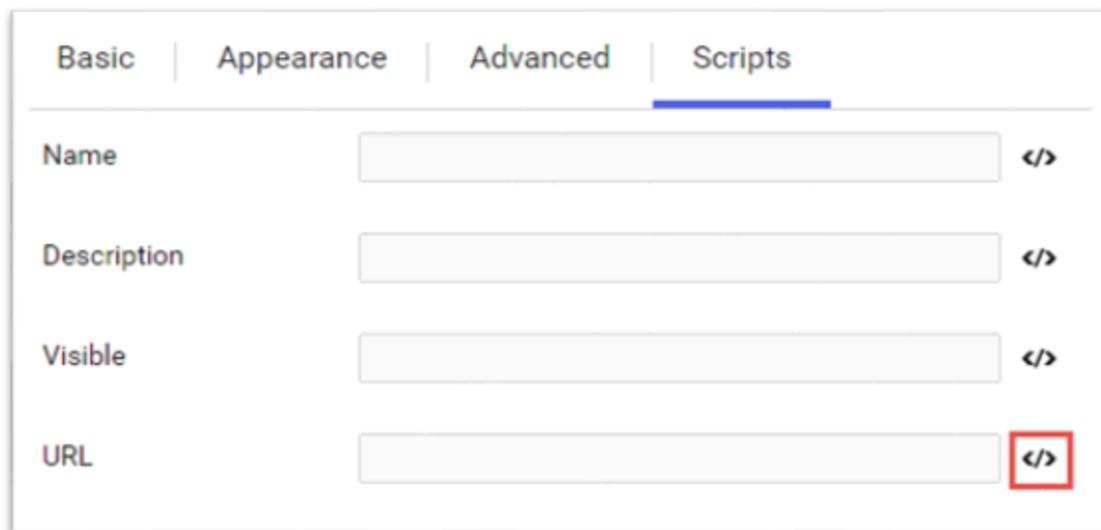
Model-Driven MES v5.5 Installation Guide

<https://gcsresource.aveva.com/support/Wonderware/MES/MDM/55/MDM%20Installation%20Guide.pdf>

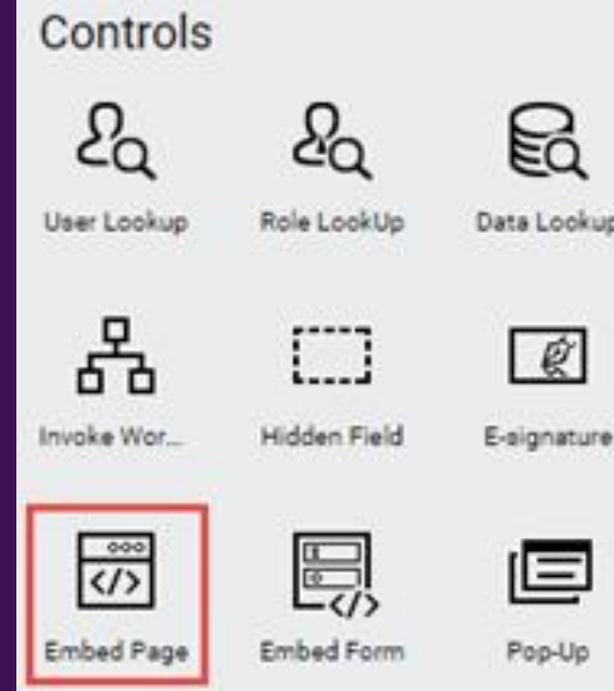
Integrating OMI Web Inside Work Tasks

Embed a Web Page

- Create a new form or modify an MDM form in Work Tasks Enterprise Console – Forms
- Drag an Embed Page control onto the form
- Edit the control's Properties
- Go to the Scripts Tab and edit the URL parameter

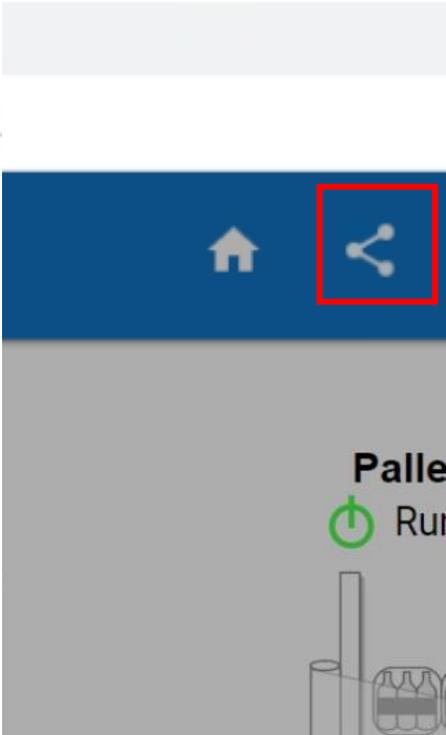
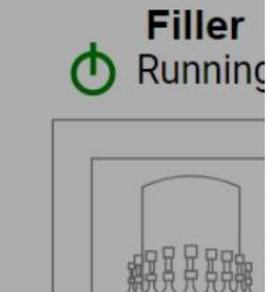


The screenshot shows the 'Scripts' tab of a control's properties editor. It features four input fields: 'Name', 'Description', 'Visible', and 'URL'. Each field has a code icon (</>) to its right. The 'URL' field's code icon is highlighted with a red square, indicating it is the focus of the instruction.



```
<iFrame src="https://MDDemo.WNDC.local/InTouchWeb/?  
iframe=true&symbol=L10overview" id="symbol" width="640px" height="480px"  
onload="postMsg()"></iFrame>  
<script type="text/javascript">  
function postMsg(){  
    var iframe=document.getElementById('symbol');  
    var obj={};  
    for (var i=0;i<iframe.attributes.length;i++) {
```

Owning Object



Example script

```
1 // sets the URL for the embedded page to open InTouchWeb in Process Graphics tab
2 // Date Created: 3-8-2019
3 // Author: Nick Nicholas
4 // Version: 1.0
5 // Modified to include share url
6
7 $('#E7frameEmbedPage').removeAttr("sandbox");
8
9 var entName = control.findById("H1").value;
10
11
12 if(entName && entName != "")
13 {
14 //nn test
15   if( entName.startsWith("Line")) {
16
17     var AreaNum = entName.substr(4,1);
18     var formsURL = "https://mddemo.wwdc.local/InTouchWeb/?iframe=true&symbol=L" + AreaNum + "Overview";
19
20   }
21   else {
22
23     var AreaNum = entName.substr(entName.length - 1);
24     var formsURL = "https://mddemo.wwdc.local/InTouchWeb/?iframe=true&symbol=P" + AreaNum + "Overview";
25   }
26 }
27
28 console.log ("+++++ URL == " + formsURL);
29
30 return formsURL;
31
32 //changed from https://mddemo.wwdc.local/InTouchWeb/api/symbol/L1Overview
33 // to https://mddemo.wwdc.local/InTouchWeb/?iframe=true&symbol=L1Overview
```

embITWebGraphics (

Basic | Appearance

Name

Description

Visible

URL

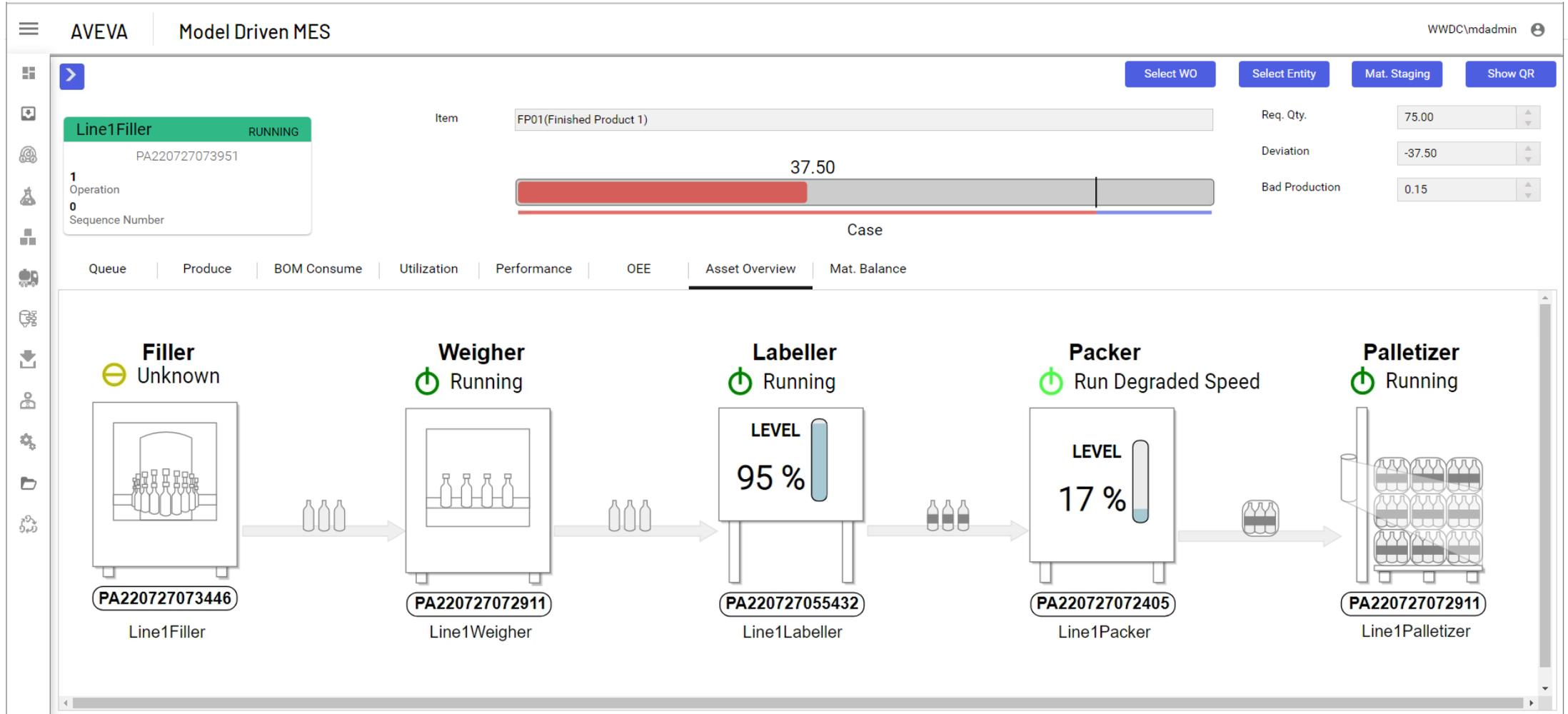


um + "Overview";

lum + "Overview";



OMI Asset Overview in Work Tasks





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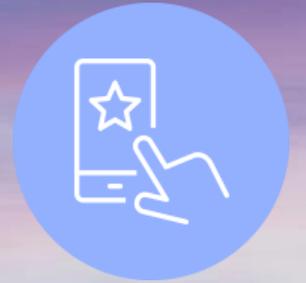
Questions?

Please wait for the microphone.
State your name and company.



Please remember to...

Navigate to this session in the mobile app to complete the survey.



Thank you!

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