

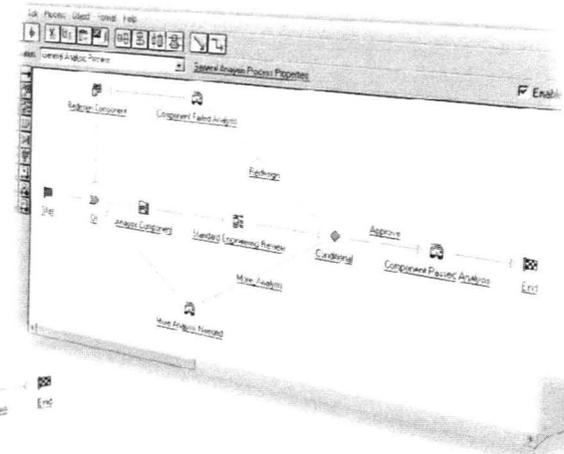
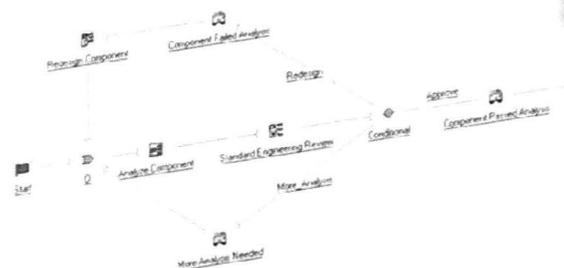
Corey Jones, Dennis Kapatos and Cory Skradski
Make Your Workflows Smarter

Do you have workflows with many manual tasks that slow down your business? Or, do you scale back workflows because there are simply too many manual tasks? Basic workflow robots can automate some common tasks, but not everything. This presentation will show how advanced robots called "expression robots" can be set up to perform everything from simple tasks such as: moving, creating folders, renaming, changing or creating an attribute, and revising, to more complex tasks like: creating a pdf, or even launching a session of Creo Parametric and performing a specific modeling task. Expression robots are able to utilize the Java API and Info*Engine to do almost anything you can imagine! Best of all, these tools are supported by PTC and will work with later releases of Windchill. Limited knowledge of Java, Info*Engine, and XML are required.

- The attendee will learn what task expression robots are capable of performing.
- The attendee will learn what is involved in setting up an expression robot.
- The attendee will gain a basic understanding of simple Info*Engine tasks.



Make your Workflow Smarter



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ESC Design Development Process Support Team



The Engineering Services Contract (ESC) at Kennedy Space Center provides services to NASA for the design and development of flight and ground systems in support of manned space flight. The ESC process support team provides for efficient optimized design and development processes through development, configuration, and implementation of software tools, training, documentation and standards. The team of 7 people supports over 200 engineers and design specialists using Windchill, Pro-E, NX, AutoCAD, and other design and analysis tools.



- Business Need for Workflow Robots
- Workflow Robots
 - Basic Robots
 - Advanced Robots
 - Expression Robots
 - Examples
- Process
 - Overview
 - Setting Up Java Classes
 - Setting Up an Expression Robot
- Resources and Help

Process

Setup a Robot Class on Server
Place Expression Robot in
Workflow
Callout Class from a Robot
Demonstration of a Expression
Robot

Add Expression Robot to
Workflow
Call Java Class from
Robot

Brief Introduction of Info*Engine
Tasks

Calling Info*Engine Task from
Workflow

Demonstration Calling a I*E Task
from a Workflow

Add Expression Robot to
Workflow
Call I*E task from Robot



- **Workflows Improve Business Practices...**
 - Increase productivity and minimize time to market
 - Minimize effort associated with work distribution
 - Optimize distribution of workload among resources
 - Decrease costs
 - Eliminate routing expenses
 - Reduce need for managers
 - Reduce burden on project leads
 - Improve Quality
 - Ensure that quality steps are not skipped
 - Enforced process which minimizes “rushed” jobs which lead to poor execution of work and quality problems

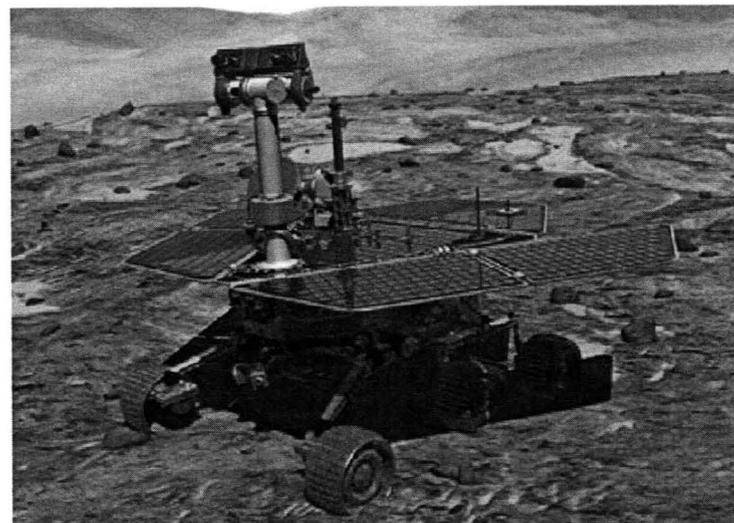
- **...Robots Improve Workflows**
 - Reduce manual steps
 - Improve efficiency
 - Enforce consistency

Workflow Robots

Basic Robots

- Capable of automating a limited set of tasks.
- Require property configuration only.

Basic Robots	Task(s)
Notification Robot	send emails
Method Robot	check out, check in, set state, submit, promote, demote, deny, or drop
URL Robot	communicate with another server
Timer Robot	add a time delay

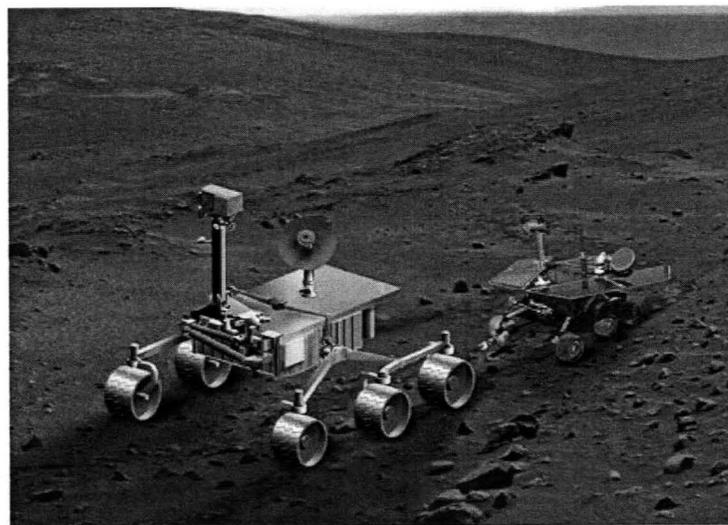


Workflow Robots

Advanced Robots

- Capable of performing sophisticated and complex workflow interactions.
- Utilize the Java API and Info*Engine to provide a high degree of flexibility/versatility/customizability.

Advanced Robots	Task(s)
Application Robot	launch an application
Expression Robot	execute Java expressions
Synchronization Robot (Expression, Object, Class, Event)	synchronize a process to a Windchill event or Java expression



Expression Robots

- **Capabilities:**

- Enable execution of Java expression in a workflow.
- Can be configured to do anything that can be accomplished using Java code.
- Can be used to automate business processes by executing Windchill transactions, updating object attributes or global variables, as well as conducting process logic.

- **Limitations:**

- Execution is synchronous only, that is, the workflow does not continue until the expression has been successfully executed.
- The Java code in an expression robot is limited to 2000 characters, so the robot needs to call Info*Engine tasks or classes on the server for more complex processing.

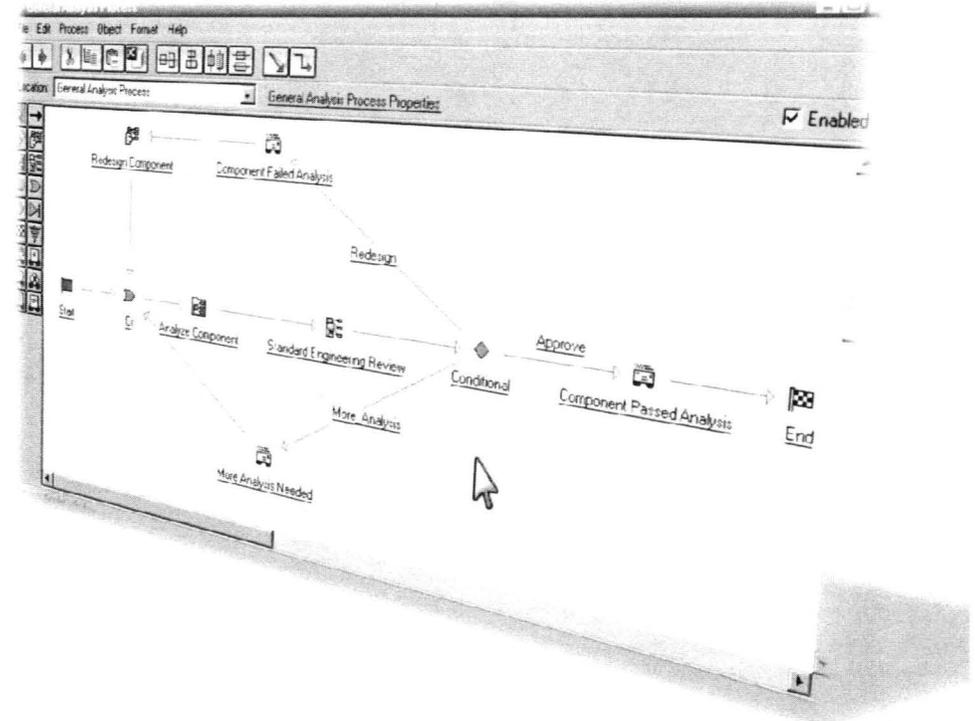
Expression Robot Examples

- A workflow determining an object revision value for a two phase life cycle to change revision from numeric to alpha within a promotion request.
- Creating many folders from reading a file or creating a folder dynamically within a business process.
- Determining the CAD Document's related WTParts are included in a Promotion Request or Change Object.
- Verifying WTParts links with CAD Documents.
- Creating PDF, DXF or other file formats when a object is released.
- Exporting a formatted BOM file when an object is released.

Process

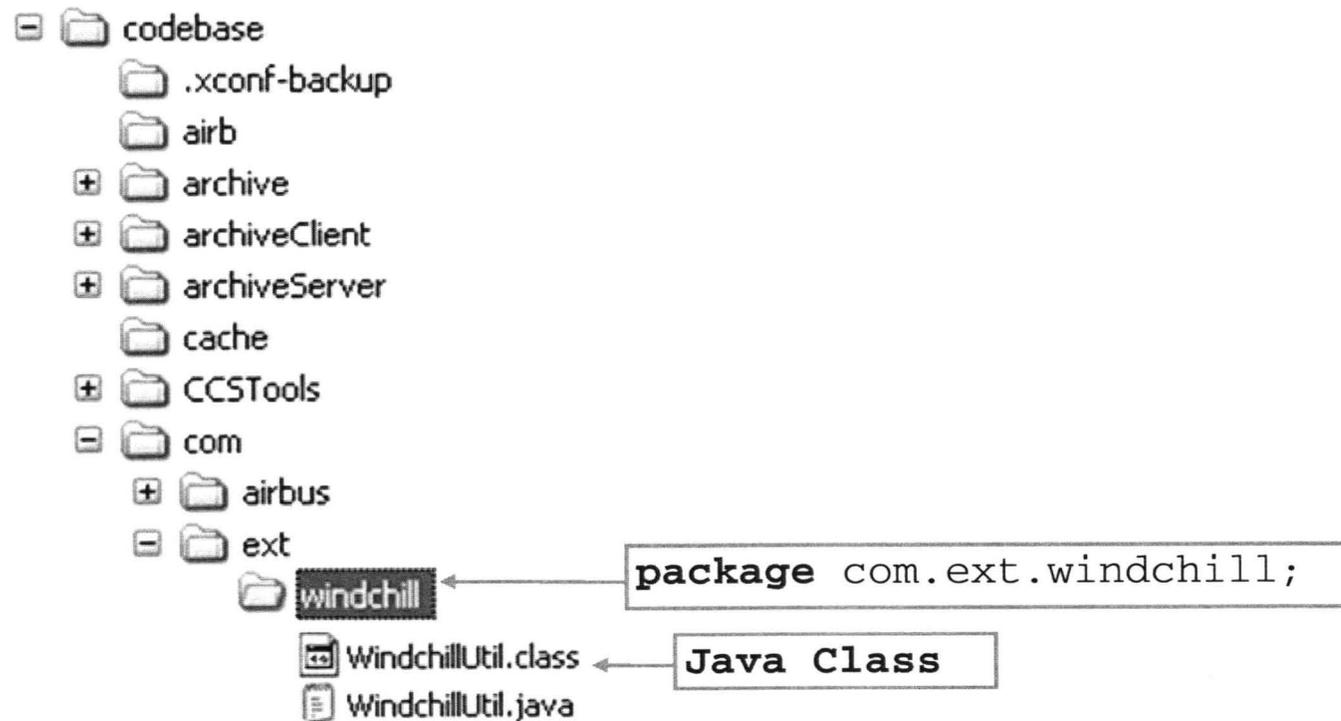
Overview

1. Put Java Classes on Server
2. Checkout Workflow
3. Add Expression Robot to Workflow
4. Define Expression in Robot to Call Java Classes on Server
5. Checkin Workflow



Put Java Classes on Server

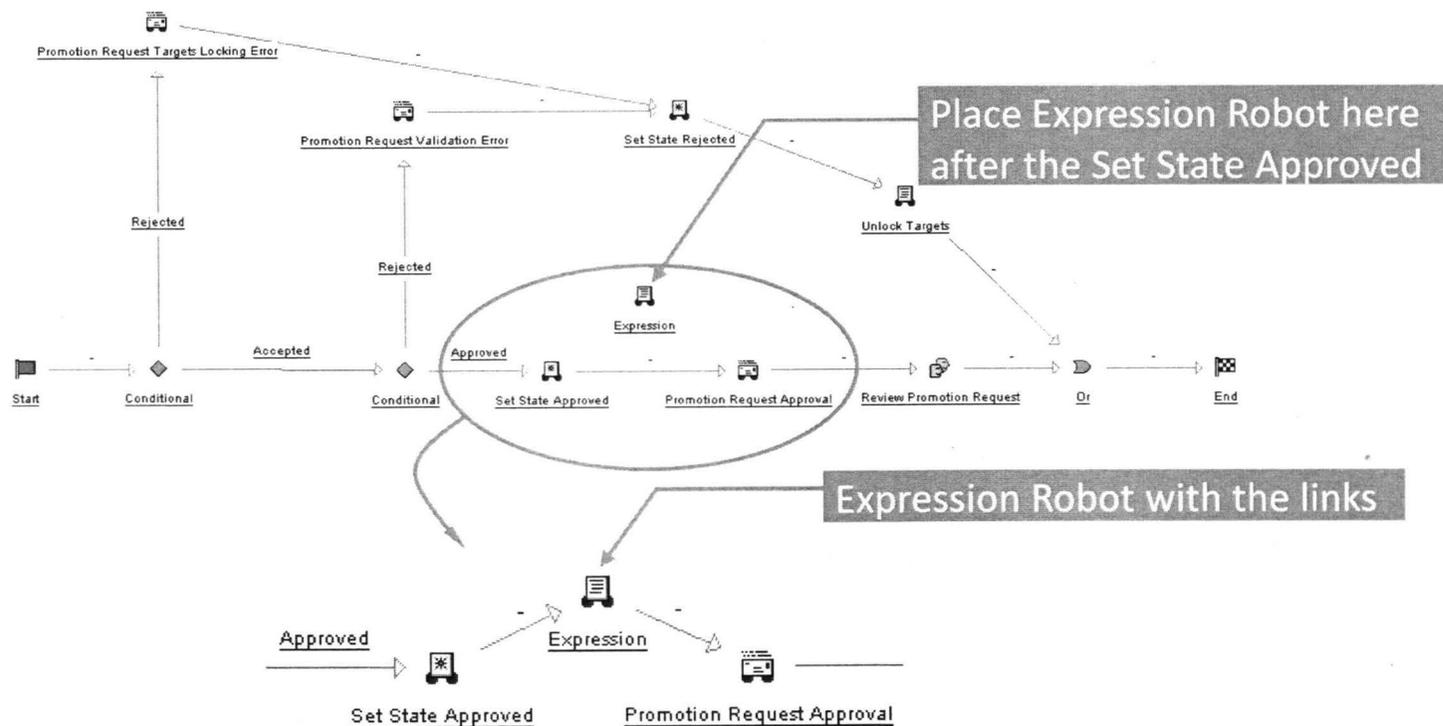
- Put a class file under the code base folder with a folder structure that is equal to the package that is used in the class.



Process

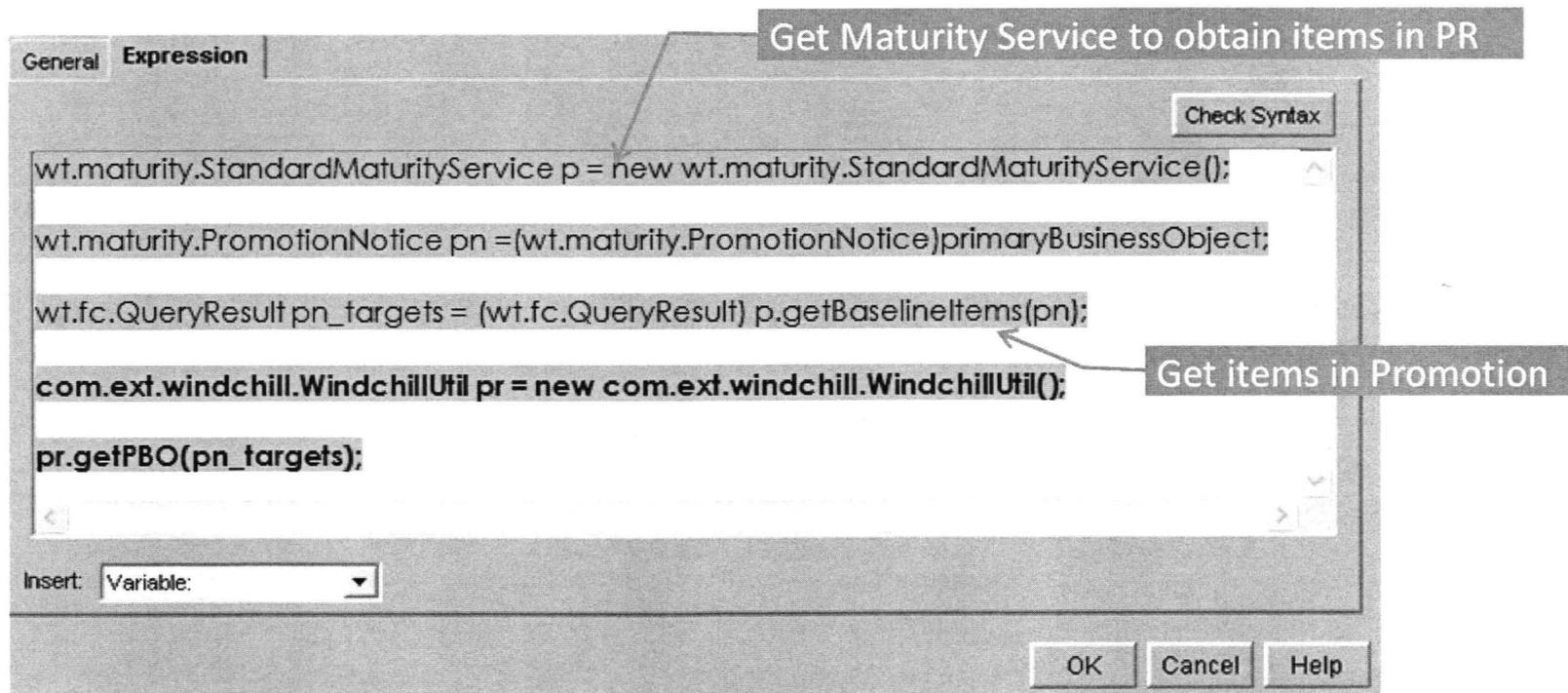
Add Expression Robot to Workflow

- The expression robot is added to either a Change Object or Promotion Request workflow. Usually to robot is place just after the promotion objects are set to Released.



Callout Class from a Robot

- For all Expression Robots, a StandardMaturityService is required and the robot needs to retrieve the primary business object and its query. The first three lines of code shown below are required in all promotion expression robots in order to retrieve the contents and the last 2 lines calls the class on the server.



The screenshot shows an 'Expression' editor window with the following code:

```
wt.maturity.StandardMaturityService p = new wt.maturity.StandardMaturityService();  
wt.maturity.PromotionNotice pn =(wt.maturity.PromotionNotice)primaryBusinessObject;  
wt.fc.QueryResult pn_targets = (wt.fc.QueryResult) p.getBaselineItems(pn);  
com.ext.windchill.WindchillUtil pr = new com.ext.windchill.WindchillUtil();  
pr.getPBO(pn_targets);
```

Annotations in the image:

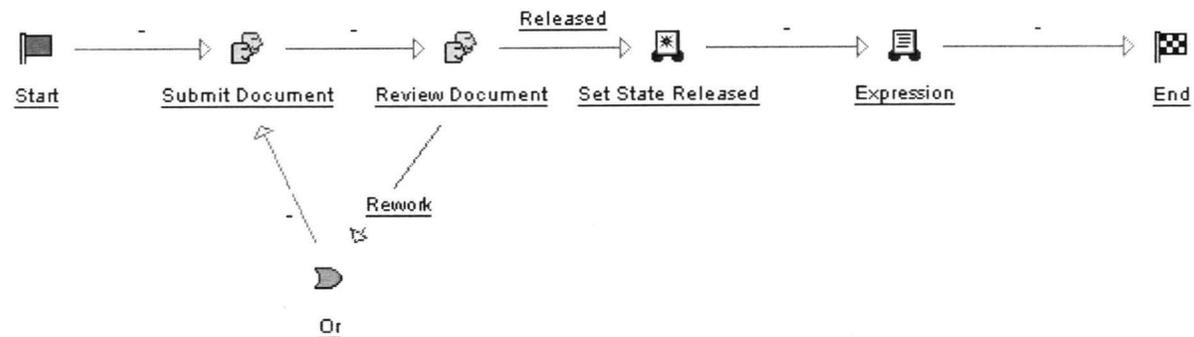
- A callout box labeled "Get Maturity Service to obtain items in PR" points to the first line of code.
- A callout box labeled "Get items in Promotion" points to the third line of code.

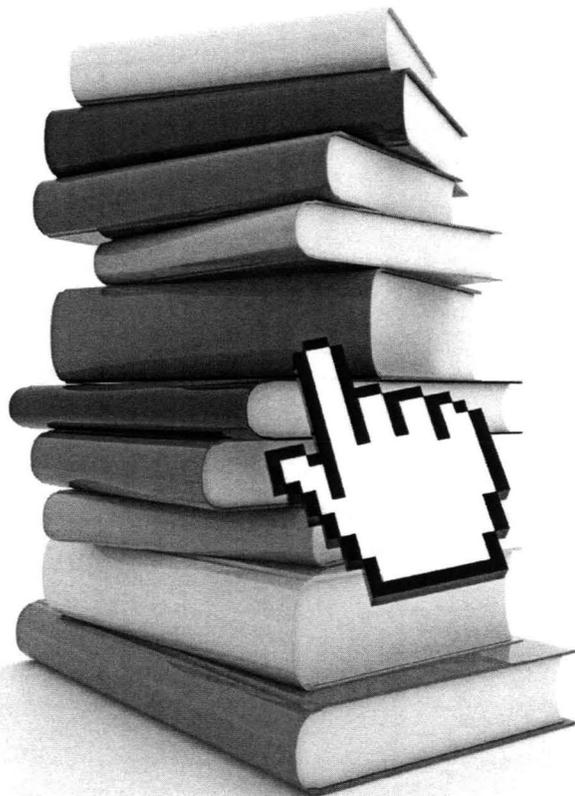
Buttons visible in the window include "Check Syntax", "OK", "Cancel", and "Help". An "Insert" dropdown menu is set to "Variable:".

Demonstration

Demonstration of a Expression Robot

- Add Expression Robot to Promotion Request
- Call Java Class from Robot
- Run Promotion Request





- Adapter Guide:
[WCAdapterGuide.pdf](#)
- User Guide:
[IEUsersGuide.pdf](#)
- Felco Solutions Website:
<http://www.felcosolutions.com>