

Audience background

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- ECAD Users
- MCAD Users

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- Project Managers
- Still using WGM 9.x
- Using UWGM 10.x
- ECAD data storage in WC without the WGM

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What we will cover today

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- Data Preparation
- Design Setup / Standardization
- Workgroup Manager for what?
- 10.2 flow
- Hooks

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Discussion of the 1 source database
 problem

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What will happen

A basic low level discussion on the dataset

- WTPART (Gear)
- CAD document

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Association	Display Board	WTPART Attributes; Number, Name, others
PCE	, Display Board	CADDOC - Name, Number
Primary Content	- DESIGNNUMBER.ZIP	Primary Content is a file
Attachment(s)	DESIGN.PDF	

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Data Preparation

- Data Preparation we prefer a separate folder for PCB and Schematic each. Folders beneath for organization are OK.
- Cadence Allegro and Mentor Expedition Flow don't do this; there is a separate folder for PCB data under the main design folder. 10.2 will handle this.
- Altium as well in the future; but a standard project can be built and used going forward to keep them separate with no ill effects.

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Data Setup & Standards

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Data Setup

 Separate folders fab, assy, gerber – whatever works best for your business needs

Standards

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- Recommend Starting templates with example dataset that can be replaced
- Documentation that can be used across the organization

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More Standards

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- Library considerations
 - More standards Mandatory if going to Product Structure
 - -Use the same SCH symbols on all designs
 - -One symbol is one part number
 - -"Version" control symbols, parts, padstacks, sheets, PCB start files

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What will it get us?

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- Data Storage
- Enforced Data Consistency
- Standard process; some probably common with MCAD
 - -Change Management (CM)
 - -Program Management/Control
- Visualization
 - -Comparison
 - -Structured Documentation of differences or needed changes
- ECAD/MCAD collaboration platform

Will it get us anything else?

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- New Part Introduction (NPI) considered or implemented workflow and process
- BOM Compare
- History

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- Where Used
- Product Structure to Feed MBOM and/or MRP system

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A look @ 10.2 M010

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The major updates are: • ECAD collector

- ECAD collector
- BOM generation enhancements
- Manage Design Directory
- Advanced ECAD Check In
- ECAD Generic Non-Separable Design Type
- ADW Gateway Administrator configurations

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Support for Cadence TDO

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Let's quickly walk through a create and check in

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- New Design
- Schematic & Board CAD Doc creation

Folder Contents All	O New Multiple Parts	Open
<u>°</u> %	New Process Plan	New
New Document New Part New Cha	 New Change Notice New Change Request 	Cut New ECAD Design
	New Problem Report New Defect	Paste O Select Design Define Schematic Define Board
(0 objects selected)	 New Variance New Promotion Request 	Check out to workspace Froduct: ESCON Card C400 'Type: ECAD Board 'Type:
	🕲 New Part Request	Revise - Set Attributes
	 New Textual Information Element New Graphic Information Element New Parts List Information Element 	Save As □ Set State ^Authoring Application: Creo Delete Description: PCB, DEMO701 Design
	New Publication Structure New Information Structure	Add to Workspace Add to Constitute Constit Constitute Constitute Constitute Consti
	Sew Folder	Compare • Name: PCB, DEMO701 Process • Number: 00702
15	New ECAD Design	Colass.biz 2014

Let's quickly walk through a "create and check in"

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• Parts and ECAD Docs Created

PT	C" Windchill"					All Types
	Products > ESCON Card C4	00 > Folders > DEMO				
Searc	Actions Folder - 701	R Folder Conten	÷= A11			
ch Broy	Search in selected folde	New Document New P	art New Change Begus	est New Folder, Conv. Add to	Workspace	Actions -
Уse	ESCON Card C400		Number	Name		Version
	DEMO		00701 O0702	SCH, DEMO701 PCB, DEMO701	(i) (i)	A.1 A.1 (Desig
	701		II 00702	PCB, DEMO701	i	A.1
	TEMPLATES		(g) 📄 00703	ASM, DEMO701	(j)	A.1 (Desig

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Check out to work	space	PTC⁻ Live Global	,
• We can see the new ECAD collector	Check Out and Add to Workspace	CAD/Dynamic Documents: Image: None Source: None Wine Mone Wine Mone Win	Attachn Rem Cont I O ot I O ot
17	©claes.biz 2014		

Add Definitions for B	OM, and At	tachments	PTC[°] Live Global
Schematic	BOM Definition (SCH, D	EMO701)	
	Associated Syste	m Definitions	(2 objects)
	BOM Attribute Mapping	BOM DEFN - PADS	Actions 4
		BOM Attribute Mapping BOM Attribute Mapping Viewer	Viewer (BOM DEFN - PADS) - X (BOM DEFN - PADS)
Attachment Definitions (SCH, DEMO701) Content Resolution:	Merge reference design	Attribute Mapping	(3 objects) Search in table
Replace U Merge Content Definition Rules		Windchill Attribute Number Name	Design Attribute Part Number Description
Remove Row Add Row Search i Content Definition Rules 4 Content Definition R		Reference Designator	Reference Designator
SCH CONTENT DEFN - PADS			
(0 objects selected)			
	OK Cancel	}	
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Add Definitions for Attachments PCB

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Attachment Definitions (PCB, DEMO701)		Content Defi	nition Viev	wer (PCB CONTENT DEFN	- PADS) - 🗆
Content Resolution:		Content Definition Vi	ewer (P	CB CONTENT DEFN -	PADS)
Replace Merge					
Content Definition Rules		Content Defini	tion Rul	es ()	2 objects)
= +				search in table	2
Remove Row Add Row		Base Directory	Name	Category	
Content Definition Rules	Actic	\$DesignDir\CAM\FAB	*.zip	Manufacturing	
CB CONTENT DEFN - PADS	<u>i</u>	\$DesignDir\CAM\FAB	*.pdf	Drawing	
(0 objects selected)					
		t			

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ECAD Check In

- PTC' Live Global
- Sets the WLD to a preferred location [YAY!!]
- Runs Attachments, BOM, Attributes, as reqd.

	ation: [C:\PA	DS Projects/p	review\Pwi	>				browse					
hematic	Location: C	:\PADS Projec	ts\preview/	SCH				Browse.					
Include	Associated	Design Data											
Prim	ary Data											(2 obir	ets)
	,										Search in t	able	P
			Number	Name 1	Version	BOM	Viewable	Attributes	Attachments	Design Item		Neutral Fi	le
+	0		00702	PCB, DEMO701	A.1	No Updates 🔽 🚯	•	No Updates 🗸 🛈	No Updates 🗸	preview.pcb	~		
+		1	00701	SCH, DEMO701	A.1	No Updates 🛩	বি	No Updates 💌 👔	No Updates 🛩	preview.sch	~	preview.ed	ŧ
							45						
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Deriv	ved Data											(0 obje	ects)
nment					~								
					-								

ECAD Check In Progress after Apply

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Observe results prior to checkin commit

😑 Primary 🛛	Data				(5 objects
					Search in table
Design	Number	Name	Deliverables	Status	
Schematic	00701	SCH, DEMO701	Viewable	Created	
Schematic	00701	SCH, DEMO701	Design Content	Succeeded	
Board	00702	PCB, DEMO701	Viewable	• Failed	
Board	00702	PCB, DEMO701	Design Content	Succeeded	
Primary Data Che	eck In		Data check in		

At this point Check In / Out is one click

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• Check out - Edit - Check in

Products > ESC	CON Card	C400 > Wor	kspaces						
IT Primary Active W	orkspace:	C400 workir	g - Pick ar	Action -	~				
Object List	As a list			All			-		
File - Edit - Too	ols 🕶								
Remove Upload	Check In	Check Out	Undo Chec	k Out U	✤ pdate	Auto Asso	ciate Revise	라 Add	👸 New Part
		Numb	er t	Name			Actions		Version
		00701		SCH, DEM	MO701		1		A.2
		60 00702		PCB, DEN	40701		Check	Out	A.1

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BOM Creation Detail

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- Mapping @ Design or from System Defn
- Attributes on the fly from design



BOM Management

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• Attach to WTPARTS as required

5earch for Assembly	Part New Assembly Part	Search for Board Part New I	Board Part Remove Export	mport Adva	nced ECAD	Check In: Prog	ress Window		
BOM Name Design	Actions As	oroa ASM, DEMO701	Board	=	Primary D	ata			
1 objects selecte		Search for	r Board Part	De	rsign	Number	Name	Deliverables	Status
Concession and the	Search for Board Par	rt -		Sc	thematic	00701	SCH, DEMO701	Viewable	Created
				Sc	thematic	00701	SCH, DEMO701	Attachment	Collecter
	Keyword :			Sc	thematic	00701	SCH, DEMO701	BOM with Variants	Created
	Context	٩		Sc	thematic	00701	SCH, DEMO701	Design Content	Succeed
	Name: Number: 00702 Revision: Select:	All V O Specify:		Pr	imary Data Che	ck In		Data check in	
	Search Results		Search in tabi	14 - A	/iew Summary			Check 1	in Primary Dat
	Number 00702	Version A.1 (Design)	Name PCB, DEMO701	State In Work					
			6	<mark>о, ок</mark>	Gancel				

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BOM Result

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- Review Report prior to commit
- Errors and Missing Parts will show

🖶 Variant Name (1 o	E Details		(27 obje	cts) 🔺		
Conflict Warning 80M			Search in table	9	BOM Report (Check in Test Sche	k)
Desi	PART_NUMBER	PART_NAME	Reference Designato		Summary	
	P1005	SURFACE MOUNT CAPACITOR 0.062 X 0.126 INCHE	s c1		(9 parts are not in Windshill, 3)	parts are (Bared out)
· _ · ·	P1006	SURFACE MOUNT CAPACITOR 0.062 X 0.126 INCHE	s c2			
	P2.005	SURFACE MOUNT CAPACITOR 0.062 X 0.126 INCHES	5 3		S variant Name (15	Details (14 objects)
	P1006	SURFACE MOUNT CAPACITOR 0.062 X 0.126 INCHES	S C4		• A Des	INTUNNER INTUNNE Release Desputer Sales Sure Place
	P1006	SURFACE MOUNT CAPACITOR 0.062 X 0.126 INCHES	5 (5	11.1		ATMAC TOTAL TO AND IN MARCHINE AND
	P1006	SURFACE MOUNT CAPACITOR 0.062 X 0.126 INCHES	5 C6		· ·	COMPLETION COMPLETION P2 Not IN WIREPUB NUM. No COMPLETION COMPLETION REC. Not IN WIREPUB NUM. No
	P1005	SURFACE MOUNT CAPACITOR 0.062 X 0.126 INCHE	s (7			4535704 4555706 455 514 Lv Window 1016 74
	P1005	ELECTROLVEC CAP. CASE SEZ 'AA'	68			DECCOUNTER DECCOUNTER US Not In Windows Not
	P1005	ELECTROLYTIC CAP, CASE SIZ "AA"	C9			70 70 07 Not 1 No. 1
	P1004	UGHT FMITTING DIODF	DI			432 F32 95 Not In Weathill Not. No.
	P1004	LIGHT EMITTING DIODE	D2	1211		FE FE CE FEE No No F112 V2 See to Workfridt No No
	MCEC368	CONNITOR RIBBON 36 PM	n	11		F112 F112 UR Not IN WHERE NOT YAR
	P1003	- SV INFAR REGIS ATOR	.01	11.1		PLL UP Set in Westeld N.H. Se
	P1002	PES BODHOLO CENTERS 400				Fill Vill Not in Windowit Not. Yes Fill Vill Not in Windowit Not. Not.
	61002	PES BODY MO CENTERS 400	10			<
	01003	DES BODYAGO CENTERSARD	85			
	P1002	RES BODY MO CENTERS/400	NG NG			
	P1002	RES BODY060 CENTERS400	PD .			

Associations

Automated model item associations

Workspace	C400 Worki	ng 🗸				
Object	List					
Remove asso	a ociation Existi	ng Part Create Ne	W Part for Associat	ion Location Set	E New Name	e
		Number 1	Association type	SCH. DEMO701	A	00701
		10 00702		PCB, DEMO701	Α	00702
		■ @ ₀₀₇₀₂		PCB, DEMO701 PCB, DEMO701	A	00702
	0	⇒ ∰ ₀₀₇₀₂	Image 🔽	PCB, DEMO701 PCB, DEMO701 PCB, DEMO701	A A A	00702 BRD_00702:
	8	□ □ □ 00702 □ □ □ □ 00702 □ □ □ □ 00702 □ □ □ 00702 □ □ □ 00703	Image 🔽	PCB, DEMO701 PCB, DEMO701 PCB, DEMO701 ASM, DEMO701	A A A	00702 BRD_00702:

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Checkin with BOM complete

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 Components added to the workspace when product structure built

Products > ESCON Card C400 > Workspaces							
🛋 Primary Active Workspace: C400 working - Pick an Action - 🛛 💌							
Object List As a list		▼ All	-				
File - Edit - Tools -							
Remove Upload Check In	Check Out Undo Check	🐐 🦓	ciate Revise Add	New Part New CAD Document			
	Number †	Name	Actions	Version Last Modified			
	00701	SCH, DEMO701	017 🛃	A.5 2014-06-12 21:18 PDT			
	00702	PCB, DEMO701	(i)	A.1 2014-06-12 20:13 PDT			
	00702	PCB, DEMO701	1 📑 🗾	A.1 2014-06-12 20:55 PDT			
	00703	ASM, DEMO701	(i)	A.2 2014-06-12 21:18 PDT			
	87C256	32K X 8 BIT CMOS EPRO	i	A.1 2014-06-11 11:31 PDT			
	AM100415	1024 X 1 IMOX II ECL BIP	1	A.1 2014-06-11 11:31 PDT			
	〇〇 CD4001B	Quad 2-input NOR Gate	(i)	A.1 2014-06-11 11:31 PDT			

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Checkin with BOM complete Products > ESCON Card C400 > Folders > DEMO > 701 Actions · @ Electrical Part - 00703, ASM, DEMO701, A.2 (Design) Details Structure Related Objects Changes History Where Used Traceability AML/AVL Product Analytics ship Explorer 🛛 UDI Subm 🔰 🧯 Editing Check Out/In Clipboard Viewing New/Add To Filter 🕹 Insert Existing 😐 Ber

	110.113	·		- 43	1	wichta -	N	të		
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Find in Structure 🗿 🔻 🔬										*
Identity 🔺		Classific	ation	Visualizati	on Uses	Occurrence	es 🛛 Attributes			
4 🛞 00703, ASM, DEMO701, A.2 (Design)	<u>^</u>	d Insert	Existing	😚 Insert N	lew 🕺 Inse	art Multiple New	- Remove I	🖒 Edit Usao	Attributes	
@ 00702, PCB, DEMO701, A.2 (Design)		Nur	nber 🔺	Name			Version	Quantity	Reference Designator	Find Nur
87C256, 32K X 8 BIT CMOS EPROM/LATCH, J		(2) 007	02	PCB, DI	EMO701		A.2 (Design)	1		
AM100415, 1024 X 1 IMOX II ECL BIPOLAR F		870	256	32K X 8	BIT CMOS E	PROM/LATCH	A.1	2	U1-U2	
CD4001B, Quad 2-input NOR Gate, A.1		🕼 AM	100415	1024 X	1 IMOX II ECI	L BIPOLAR RAM	A.1	2	U3-U4	
CD4069, HEX INVERTER CIRCUITS, A.1		(i) (i)	4001B	Quad 2	-input NOR	Gate	A.1	1	U5	
MGEG26R, CONNCTOR; RIBBON; 26 PIN, A.		()	4069	HEX IN	VERTER CIRC	UITS	A.1	1	U6	
P1002, RES, 10K, 1/8W, A.1		MG	EG26R	CONNO	TOR; RIBBO	N; 26 PIN	A.1	1	Л	
P1003, +5V LINEAR REGULATOR, A.1		P10	02	RES, 10	K, 1/8W		A.1	5	R1-R2,R5-R7	
P1004, LIGHT EMITTING DIODE, A.1		P10	03	+5V LIN	NEAR REGULA	ATOR	A.1	1	Q1	
P1005, CAP, ELECT, 10uf, A.1		P10	04	LIGHT E	MITTING DIC	DE	A.1	2	D1-D2	
P1006, CAP, BYP, .1uf, A.1		P10	05	CAP, EL	ECT, 10uf		A.1	2	C8-C9	
< III >>		•								۰. ۲
(15 objects)									Displayin	g 1 - 14 of

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Recently Accessed

In Work 🕜

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View of attachment on schematic

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Acti	ons 🕶 🗐 📰 🔣	ECAD - S	Schematic	- 00701, A.5	8 📑				
De	ails Structure	Content	Related Obj	ects Changes	History Tra	ceability	Relationship Explorer		
Prim:	ary Content Attachn Primary Content	nents Re	presentation	s/Annotations					
	File Name †		Actions	Category	File Size	Li	ast Modified	Modifier	
M	00701.dld		۰	General	0.11 KB	2	014-06-12 20:55 PDT	Peter Product N	/lanager
1	00701.rul		۰	General	0.14 KB	2	014-06-12 20:55 PDT	Peter Product N	Aanager
1	00701.zip		Ŷ	Design Data	109.94 KB	2	014-06-12 21:18 PDT	Peter Product N	/lanager
	Attachments ■ Attachments ■								
	File Name †	Actions	Status	Downle	oad Automatically	Category	File Size	Last Modi	ified
3	preview.pdf	٩	Current	Yes		Drawing	62.92 KB	2014-06-1	2 21:18 PD

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Manage Design Directory

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• Check out to a new workspace

• Move the workspace to desired Design Directory



Manage Design Directory

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- Check out to a new workspace
- Move the workspace to desired Design Directory

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ew Location:			
PADS Projects\preview\SCH			
love Design			
lick Move Design to select a ne GCH" as the top directory name esign Directory Path selection I	w Design Directory Path. Th from a previous session an by default.	he Workgroup Manager Id it will be appended to	has recalled your
lever et a			
Edit Top Directory name (maj	y include relative path)		
CH			

Inherent ECAD Data Problem

Product Structure

CAD Documents

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Hook Implementation

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- The hook launches a stand alone script/bat/exe
- Steps:
 - -Create and test the standalone script
 - -Create Hook ECAD Definition
 - -Link the script to the ECAD Definition
 - -Attach the Definition to the PCB

Standalone Script

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fab_zip.bat

@echo off echo Starting Pre Update Hook execution REM Select a case of the hook: use or skip result of Built-In action if Not DEFINED BUILT IN EXECUTION GOTO ON ERROR EXIT if %BUILT_IN_EXECUTION%==BuiltInExecutionResult:False GOTO SKIP_BuiltIn if %BUILT_IN_EXECUTION%==BuiltInExecutionResult:True GOTO USE_BuiltIn GOTO ON ERROR EXIT :USE BuiltIn echo BUILT IN IS INCORRECT FLOW IN THIS PREUPDATE ACTION GOTO ONEXIT :SKIP BuiltIn echo SKIP BUILT IN: Create Fabrication ZIP file from all files in %DESIGN DIR%\CAM\FAB echo Removing any existing zip files if EXIST "%DESIGN_DIR%\CAM\FAB*.zip" del "%DESIGN_DIR%\CAM\FAB*.zip" if EXIST "%DESIGN_DIR%\CAM\FAB*.zip" GOTO ON_ERROR_EXIT "%ZIP_EXEC%" "%DESIGN_DIR%\CAM\FAB\%DESIGN_ITEM%_FAB.zip" "%DESIGN_DIR%\CAM\FAB*.*" GOTO ONEXIT :ONEXIT echo Pre Update Hook finished successfully. exit /B 0 :ON ERROR EXIT echo Error occurred during Pre Update Hook execution exit /B 1

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Link the Script to the Definition

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Hook Definition (HOOK, FAB	zip file creation)			0
Action: Pre Update				
Skip Built-In Function				
Command List			(1 objects)	
🐺 🐮 😑 💠		Search in table	۰ 🖩 ۹	
L Name	Command			
1 FAB_ZIP	C:\Program Files\PTC\wgm\hooks\fab	zip.bat 🕈	4	
(0 objects selected)				
,				
•	m			- F
			UK Ca	ancei

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ZIP file created by the hook

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W	indchill						All Ty				
Þ	Products >	ECAD DEMO > F	olders > PREVIEW 0	1							
R Na	Actors E CAD - Content - 0000013589, A.4 3										
vigat	Primary Content Attachments Representations/Annotations										
٩	Primary	Content									
	Attachments										
	File Name	t S	tatus	Download Automatically	Category	File Size					
	art01.pho	۰ 🕸 (Current	Yes	Manufacturing	39.84 KB					
	art01.rep	\$ (Current	Yes	Manufacturing	0.75 KB					
	preview_gb	or.zip 🔿 🕸 🤇	Current	Yes	Manufacturing	1.47 KB					
	Represe	entations/Anno	otations								
	la 🕲 🔁	😏 🖪 Action	ns •								
	Name	Thumbnail	Description	Details		Locked By	Owne				
	1			AD Structure Default							
	(0 objects sele	ected)									

PTC Live Global; June 17, 2014 ECAD Data with 10.2

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scott@claes.biz 248.739.2596



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Reference material

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Document Types

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CAD Document Type	Purpose
ECAD - Schematic	Store Schematic design in Windchill
ECAD - Board	Store PCB design in Windchill
🙀 ECAD – Derived Data	Store ECAD Data in Windchill; Has a Number and Name - Controlled Object
Model Item – ECAD Component	Used by Build Services to create Product Structure
ECAD – BOM Attribute Map	Defines what design attributes to extract/map to Windchill – used to build Model Item Structure and Model Item Link Attributes
ECAD – Content Definition	Defines design files to collect and store on Parent CAD Document (Schematic or Board)
ECAD – Hook Definition	Defines a set of custom programs to execute when running "Generate Data" action
ECAD – BOM Filter Definition	Allows filtering of objects from BOM input prior to processing
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