AutoCAD Electrical: Advanced Productivity

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Please ensure that all cell phones are turned to silent mode or shut off. Thanks







AutoCAD Electrical

We use AutoCAD Electrical (ACADE) because it is a very efficient way to create electrical/controls designs. Most designers utilize ACADE in different ways in order to get their desired output. This class will focus on four areas of interest in ACADE that will assist users in getting the most out of their software.







Key learning objectives

At the end of this class, you will be able to:

- Create nested projects
- Design more advanced blocks
- Understand unique ways of using peer relationships
- Customize the environment file









What are Nested Projects?

This is a term used to identify a workflow for subdividing large design work into small projects that also have a top level or master project that contains the complete design.



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Ways to break up projects:

- Station level
- Section level (safety, plc, devices)
- Power distribution (480vac, 24vdc)





PROJECT MANAGER

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SS 5.dwg	
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PROJECT 20	
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SS 2.dwg	
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PROJECT 40	
Details	-



Advantages of Nested Project?

- Verification of power distributions
- **Design** approvals
- Modular designs for reuse
- More competitive bidding
- Title block updating at sub-project level
- Purchasing can be sooner



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Challenges:

- Must have clear vision of projects
 - **Reference numbers**
 - Project setup
- Consistency between projects needed
- Lead Designer vision of overall project





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Advanced Blocks





Advanced Blocks

What makes AutoCAD Electrical blocks intelligent?

- Blocks (electrical symbols) with attributes to:
 - Store BOM data
 - Keep track of parent/children relationships
 - Connection points for wire trimming

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Advanced Blocks WDJUMPER attribute

Purpose of the Attribute

- Keeps wire numbers from changing across connections
- Items such as Power Distribution Blocks
- How to use it

- Attribute has to be added to the symbol
- Simple mapping in the attribute to link terminals



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Advanced Blocks Footprints with wire data

Purpose

Many customers have needed to show wire data on a layout components. While the mtext option is available some designers need a to identify terminal points with the wire numbers.

What's needed

- Add attribute named WIRENO + 2 digit number
- Add attribute named TERM + 2 digit number
- Schematic symbols terminals must be defined











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Alternate Use for Peer Relationships





Peer Relationship

What are Peer to Peer Relationships?

- This is a term used to show a relationship between two parent components.
- This is typically for use with pneumatic or hydraulic components.

Setting up a Peer to Peer relationship

- Select the option in Project Properties
- Use Tags Used: Schematic option to link
 Choose WDTAGALT

Insert / Edit Component	All Tags in Use			
		Sort	: 💿 Tag	O D
Component Tag	Tag	Installation	Location	
VAL100 fixed Use PLC Address	PB213A PJ103 PJ115 PLC251 PLC261 PS155 PS155		OP-STA FLOOR FLOOR CABINET CABINET CABINET	
	RECPT153		OP-STA	
Schematic	SOL125			
Tags	XF123		CABINET	
Used: Panel	Show			
	Show parent .	/ stand-alone reference	ces	
External List	Show child ref	ferences		
	Show all com	ponents for all families		
Options	Show all pane	el components (#)		
	Show one-line	components (1-*)		

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RACK 1 SLOT 1 120V AC/DC 8-PT I RACK 1 SLOT 2 120VAC 8-PT OUTI
CUTTING FORCE
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Descriptions
Catalog values
Installation/Location
Ratings
All of the above
Cancel Help

	Compo
Copy Tag	
Option 1 Main component Tag attribute value	
TAG1 Overwrite tag VAL100 with SOL125?	
Option 2 This component includes an "alternate tag" reference. It is carried on an attribute called WDTAGALT. This can be used to establish a peer-to-peer relationship with a component on another drawing type. (ex: instrument dwg <> electrical dwg).	
WDTAGALT Overwrite tag with SOL125?	
Cancel	

Project Properties

Project Settings

Project: C:\Au Cross-Refer Same Drawing

Between Drav %N

Cross-Refer

Peer to P



parent components. ponents.

Components Wire Numbers Cross-References Styles Drawing Format
toCAD Electrical 2015 Fundamentals Class Files\Module 13\Module 13.wdp
ance Format
Default "%N" "%S-%N"
Same "%S-%N"
ance Options
signal and contact cross-referencing between drawings
er (example: Schematic -> Pneumatic)
Installation/Location codes when matching the drawing defaults
Setup



Peer Relationship

We can also use this type of relationship in more unique ways:

- Footprints Front view, Rear view (wire data)
- PLC for networking
- *Must add WDTAGALT to blocks





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Customizing the Environment File







Quick changes to help productivity

- Default Library Paths
- Database Paths
- Default Location for Save Project
- Default Symbol Builder Save Location
- Save Location for Saved Circuits

Current Settings

AutoCAD Electrical executables path/support path: Active project: AutoCAD Electrical environment settings file: Active catalog lookup: Alternate catalog mdb file: User subdirectory: I con menu file: Panel icon menu file: Panel footprint lookup mdb file Menu slide files (default path): Insert component from catalog list Pick project/other (default dialog path) Insert schematic component (default dialog path) Insert circuit (default dialog path) User circuits (default path) Insert panel footprint (default dialog path) Insert file->table (default dialog path) Symbol Builder dialog default path for Wblock Script files (default dialog path)

Insert Schematic Component -- block search path sequence

[full path when full path/symbol.dwg name is used] C:Users\scottd/AppData\Roaming/Autodesk\AutoCAD EI C:VautoCAD EI C:VautoCAD Electrical 2015 Fundamentals Class Files\Modi c:\electrical schematic V:\users\public\documents\autodesk\acade 2015\libs\jic1 C:\users\public\documents\autodesk\acade 2015\libs\jic1

Insert Panel Component search path (see Project Prope

Environment file wd.env

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c:\program files\autodesk\autocad 2015\acade\support\en-us\	
c:\autocad electrical 2015 fundamentals class files\module 07\module 07.wdp	
c:\users\scottd\documents\acade 2015\aedata\wd.env	
c:\users\scottd\documents\acade 2015\aedata\en-us\catalogs\default_cat.mdb	
(blank)	
c:\users\scottd\appdata\roaming\autodesk\autocad electrical 2015\r20.0\enu\support\user\	=
ace_nfpa_menu.dat	
ace_panel_menu_nfpa.dat	
c:\users\scottd\documents\acade 2015\aedata\en-us\catalogs\footprint_lookup.mdb	
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(not defined in ".env" file - WD_PICKLIST)	
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Understanding the structure

- Lines with * are ignored
- First characters followed by "," are the environment code (typically WD)
- Path or Action followed by ","
- **Description of line**

*WD_CAT, C:/ElectricalDB/, AE catalog file path



[full path when full path\symbol.dwg name is used C:\Users\scottd\AppData\Roaming\Autodesk\AutoCAD El C:\AutoCAD Electrical 2015 Fundamentals Class Files\Mod ::\electrical schematic \C:\users\public\documents\autodesk\acade 2015\libs\ii C:\users\public\documents\autodesk\acade 2015\libs\jic C:\users\public\documents\autodesk\acade 2015\libs\pr Insert Schematic Component search path (see Project I Insert Panel Component search path (see Project Prop

Environment file wd.env



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c:\users\scottd\documents\acade 2015\aedata\wd.env	
c:\users\scottd\documents\acade 2015\aedata\en-us\catalogs\default_cat.mdb	
(blank)	
c:/users/scottd/appdata/roaming/autodesk/autocad electrical 2015/r20.0/enu/support/user/	=
ace_nfpa_menu.dat	
ace_panel_menu_nfpa.dat	
c:\users\scottd\documents\acade 2015\aedata\en-us\catalogs\footprint_lookup.mdb	
c:\users\scottd\appdata\roaming\autodesk\autocad electrical 2015\r20.0\enu\support\	
(not defined in ".env" file - WD_PICKLIST)	
(not defined in ".env" file - WD_PICKPRJDLG)	
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(not defined in ".env" file - WD_INSFPDLG)	
(not defined in ".env" file - WD_INSTABDLG)	
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(not defined in ".env" file - WD_SCR_DLG)	·
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Default Library Path

WD_LIB line identifies the path included in the project when selecting the Default button. Project Properties Project Settings

*WD_LIB, xxx, AE catalog file path

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WD_INSCOMPDLG,C:/,to override starting path for INS SCHEM COMP browse button	036 1413
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*WD_USERCKIDIR,C:/ETECUTICAL Schematic/,default folder for "USER CKIS	
*PLC_ADDRES5_FORMAT,I:00%10%2;I:%1%2/00;;0:00%10%2;O:%1%2/00;;,default PLC address formats for	

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Project: C:\ 🖼 Library an

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ings	Components	Wire Numbers	Cross-References	Styles	Drawing Format	
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y and	Icon Menu Pa	aths				
So	hematic Librari	ies				Add
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	/C:/users/p	ublic/documents.	/autodesk/acade 20	015/libs/ji	c125	Browse
-	C:/users/pu	blic/documents/	autodesk/acade 20	15/libs/jic	:125/1-	Remove
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ns						
		Tag	/ Wire Number Sort	Order:		
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Electrical Code Standard:						
		Def	fault (National Electri	ical Code)	-
				ОК	Cancel	Help
			_	-		



Default Insert Component

- WD_INSCOMPDLG line identifies the default path when selecting browse from the Schematic Icon Menu
- WD_INSFPDLG for Footprint Icon Menu

	Insert Component		
	NFPA: Schematic Symbols	Menu 😥 Views 🕶 Display: 10	
<pre>************************************</pre>	NFPA: Schematic Symbols NFPA: Schematic Symbols Push Buttons Selector Push Buttons Selector Teminals/ Fuses/ Switches Teminals/ Limit Switches Teminals/ Limit Switches Power Supplies Image: Preselements Power Supplies Preselements <t< td=""><td>Image: Menu Image: Views Display: 10 Image: Date modified Image: Cancel Image: Cancel Image: Cancel Image: Cancel Image: Date modified Image: Cancel Image: Can</td></t<>	Image: Menu Image: Views Display: 10 Image: Date modified Image: Cancel Image: Cancel Image: Cancel Image: Cancel Image: Date modified Image: Cancel Image: Can	
*PLC_ADDRESS_FORMAT,I:00%10%2;I:%1%2/00;;0:00%10%2;0:%1%2/00;;,default PLC address formats for	Vertical No edit dialog Scale schematic: 1.000 Type it: No tag Scale panel: 1.000	Browse Always display previously used menu OK Cancel Help	



Catalog Database Location

WD_CAT line identifies the path to the electrical databases



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	ТҮРЕ	RATING	MISCELLANEOUS1
PROTECTOR, STANDARD MAGNETIC TRIP, 140M (F-FRAME)	3-POLE CIRCUIT BREAKER	45AMPS	RATED OPERATIONA
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PROTECTOR, STANDARD MAGNETIC TRIP, 140M (H-FRAME)	3-POLE CIRCUIT BREAKER	125AMPS	RATED OPERATIONA
PROTECTOR, STANDARD MAGNETIC TRIP, 140M (H-FRAME)	3-POLE CIRCUIT BREAKER	125AMPS	RATED OPERATIONA
PROTECTOR, STANDARD MAGNETIC TRIP, 140M (H-FRAME)	3-POLE CIRCUIT BREAKER	125AMPS	RATED OPERATIONA
PROTECTOR, STANDARD MAGNETIC TRIP, 140M (H-FRAME)	3-POLE CIRCUIT BREAKER	125AMPS	RATED OPERATIONA
PROTECTOR, STANDARD MAGNETIC TRIP, 140M (H-FRAME)	3-POLE CIRCUIT BREAKER	125AMPS	RATED OPERATIONA
PROTECTOR, STANDARD MAGNETIC TRIP, 140M (H-FRAME)	3-POLE CIRCUIT BREAKER	125AMPS	RATED OPERATIONA
PROTECTOR, STANDARD MAGNETIC TRIP, 140M (H-FRAME)	3-POLE CIRCUIT BREAKER	125AMPS	RATED OPERATIONA
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Filter by WDBLKNAM value: AN1Z		Search Data	abase: Primary 🔻
		ОК	Cancel



New Project Path

WD_PROJ line identifies the default path a new project will be saved to.

	Create New Project
	Name:
	Location:
	c:\ Browse
	Create Folder with Project Name
	c:\
	Copy Settings from Project File: C:\AutoCAD Electrical 2015 Fundamentals Class Files\Module 01\Module 01.wdp Browse
	Descriptions
**************************************	OK - Properties OK Cancel Help
WD_PROJ,C:/,AutoCAD Electrical default project data folder ^WD_PROJ,%WD_DIR%/proj/,AutoCAD Electrical default project data folder *WD_PICKPRJDLG.x:/some_path/.to_override_starting_subdir_for_"PICK_PROJ"_button	

*WD_PICKPRJDLG,x:/some path/,to override starting subdir for "PICK PROJ" button *WD_OPEN_DWG,(command "_.ZOOM" "_E"),AutoLISP prog or expression to autoexecute when dwg opened from PROJ dlg *WD_ZIP,c:/program files/winzip/winzip32.exe,full path/name of zipping utility executable *WD_ZIP,c:/program files/WinRAR/rar.exe, full path/name for alternate zipping utility

*WD_PROMPT_SAVE, 1, set to 1 to trigger "Save changes" prompt when using open dwg next/prev arrows buttons



Symbol Builder Save Location

 WD_WBLOCKDLG line identifies the default path a new block is saved to.

	Close Block Editor: Save Symbol			
	Symbol		Base point	
	Block Wblo	ock	Specify on screen	
	Orientation:	(H) Horizontal 🔹	Pick point X: 0.0000	
	Catalog lookup		Y· 0.0000	
	Symbol name:	(DV) Generic 🔹	7. 0.0000	
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	Contact:	<not applicable=""></not>		
***************************************	Unique identifier:	_002		
* Symbol Insertion and Library Paths	Symbol name:	HDV1_002	Name (.png)	HDV1_002
WD_LIB,C:/Electrical_Schematic;\%SL_DIR%/jic125;%SL_DIR%/jic125/1-;%SL_DIR%/pneu_iso125;%SL_DIR%/pid;%SL_DIR%/h	File path:		File path:	
WD_PNL,%SL_DIR%/panel, panel layout symbol library base folder *WD_CIRCBUILDER_ENAM."ace_circuit_builder.xls".circuit_Builder_spreadsheet_file_name	c:\		C:\Users\scottd\AppD	ata\Roaming\Autodesk'
WD_INSCOMPDLG,C:/,to override starting path for INS SCHEM COMP browse button *WD_INSCOMPDLG,x:/some path/,to override starting path for INS SCHEM COMP browse button *WD_INSEPDLG.x:/some path/.to override starting path for INS PNL COMP browse button	16 error(s) found in the s	symbol Details		
*WD INSCKTDLG.x:/some path/.to override starting path for INS CKT file selection dialog VD_WBLOCKDLG,c:/,to override starting subdir for Black Box Bldr WBlock option		ОК	No	Cancel Help
*WD_PICKLIST,%WD_DIR%/%WD_LANG%/catalogs/wd_picklist.mdb,ins component from catalog list file *WD_USERCKTDIR,x:/some path/,default folder for "USER CKTS" *PLC_ADDRESS_FORMAT,I:00%10%2;I:%1%2/00;;0:00%10%2;0:%1%2/00;;,default PLC address formats for "Quick pick"				



Saved Circuit to Icon Menu Save Location

WD_USERCKTDIR line identifies the default path a new circuit is saved to. Save Circuit to Icon Menu



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🍰 Menu 😥 Views	▼ Add ▼
User Circuit 3 User Circuit 4 User Circuit 5 User Circuit 6 User Circuit 7	
User Circuit 10 User Circuit 11 User Circuit 12 User Circuit 13 User Circuit 14	
current screen image Zoom < Pick <	
tic\MvCircuit.dwg	
Cancel Help	Help



Showtime...







Review of key learning objectives

- Create nested projects
- Design more advanced blocks
- Understand unique ways of using peer relationships
- Customize the environment file





The goals of all Electrical Engineers/Designers are to be more efficient and make the designs look more professional. Hopefully the discussed topics are found to be of use in your work environment.

We can be reached at: Scott.dibben@d3tech.net Thomas.smith@d3tech.net







If you have any questions please feel free to grab our business cards or come find us after the class.

Thanks and have a good afternoon!





Session Feedback

- Via the Survey Stations, email or mobile device
- AU 2014 passes given out each day!
- Best to do it right after the session
- Instructors see results in real-time







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