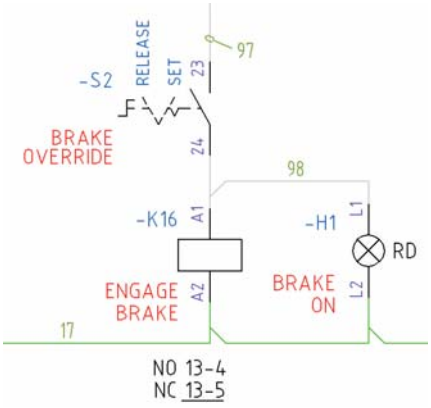
See how quickly AutoCAD Electrical can improve your productivity with a tip from Nate Holt, AutoCAD Electrical Product Architect.

Flipping Schematic Standards with AutoCAD® Electrical

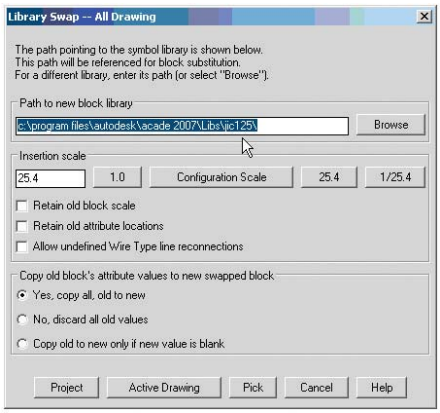
Be in sync with your customers' design standards whether it be a JIC, IEC, JIS, or GB design. AutoCAD Electrical provides symbol libraries, cross-reference settings, wire and device tagging conventions, and much more to meet local design requirements.

The Library Swap Feature

Here is a simple example of what the AutoCAD Electrical Library Swap does. The schematic component symbol set shown here is what might typically appear in an "IEC" style European design package. This partial circuit consists of a selector switch, relay coil symbol, and a pilot light.

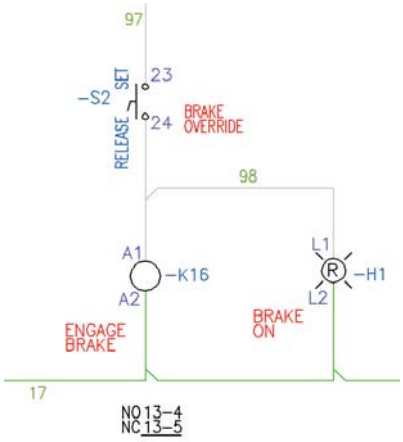


But if this design now needs to be "commissioned" to a target geography, let's say the US market, where the European "IEC" standard might appear unfamiliar, the symbols used above (and in the hundreds of other sheets of the schematic set) need to be replaced. This is where the Library Swap feature plays a key role. Launch the command and select the Library Swap option. This dialog appears as depicted by the graphic below.



Just point the command to an alternate symbol library, dismiss the dialog, and in a minute or two the whole schematic design is flipped to the new symbol set.

Here is the same portion of the circuit after the symbol swap. Note that the schematic symbols reconnect to the wiring, even if the new symbol is narrower or wider than the original. All annotation is preserved but text location and font, in this case, are controlled by the definitions on the new symbols.



Autodesk

AutoCAD Electrical Tips & Tricks

Need More Functionality?

The AutoCAD Electrical Application Programming Interface "API" lets you extend its power and functionality to address your own unique, company-specific design/drafting needs. "We wanted the ability to replace the angled-tee intersection markers with simple wire connection "dot" graphics and vice versa", says Rockwell Automation's Glenn Buttke. "We could do it with the existing AutoCAD Electrical tool-set, but it would be a one-at-a-time process. We asked Autodesk if they could come up with a work-around."

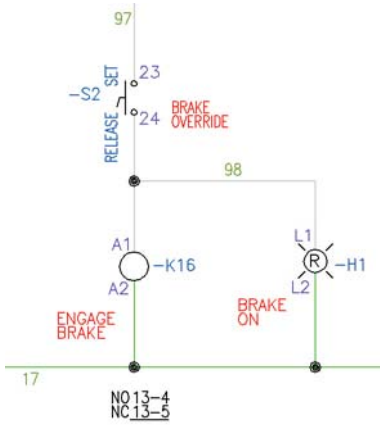
Not a problem. It was so easy it was almost fun. Here's the angled-tee-to-dot version of the custom tool as displayed in AutoCAD's built-in Visual LISP editor. It is written in simple AutoLISP and makes several calls into the AutoCAD Electrical API.

angles_to_dots.lsp

```
(defun c:angles_to_dots ( / ss pt1 ed ben ixx slen)
  ; Get selection set of ALL of the "angled tee marker" symbols
  ; (block name is selected by wild card string "?T0_###"
  ; - examples: "HT0_248" or "UT0_814")
  (setq ss (ssget "_X" '((-4 . "<AND")(0 . "INSERT")
                         (2 . "?T0_###")(-4 . "AND>"))))
  (if (/= ss nil)
    (progn ; Some of these block inserts are present
           ; process the selection set
      (setq slen (sslength ss)) ; get the number of entities
                                ; in the selection set
      (setq ixx 0) ; Will be used as a pointer counter into
                   ; the selection set
      (while (< ixx slen) ; process the selection set, one at a time
        ; Get next INSERT entity from the selection set
        (setq ben (ssname ss ixx))
        (setq ed (entget ben)) ; open this entity
        ; Make sure it is an angle-tee marker symbol. Should have
        ; attribute WDWSEQ on it.
        (if (c:wd_getattrval ben "WDWSEQ") ; look for attrib WDWSEQ
          (progn ; Yes, this must be an angled-tee marker symbol.
            ; Get the insertion point of the tee-marker symbol.
            (setq pt1 (cdr (assoc 10 ed)))
            ; Erase tee symbol and "heal" the wires
            (c:wd_delsym_main ben)
            ; Now insert the "dot" graphic symbol "WDDOT" where
            ; the wires intersect (i.e. the origin point of the
            ; original angled-tee marker symbol)
            (c:wd_insym2 "WDDOT" pt1 nil nil)
        ) )
        ; Increment index pointer to get next entity
        (setq ixx (1+ ixx))
      )
      (setq ss nil) ; Finished, Release the selection set.
  ) )
  (princ) ; cleaner looking return on command line
)
```

"APPLOAD" this utility and run it against each drawing in the project. Out come the angled-tee wire connection symbols, the wires automatically "heal", and then the graphical dot representation pops in to mark the connection.

Here is the result of running it on the US version of the design. Note that simple "dots" have replaced the angled-tee marker symbols.



How it Works

The utility works off of block names. The angled-tee symbols, no matter what their shape or orientation, follow a block naming convention of a "TO_" substring starting at the block name's 2nd character and then followed by a three-digit orientation number. The beginning part of the program builds a "selection set" of all block inserts that wild-card match the name "?TO_###". If any are found then the program begins to loop through the selection set. After confirming that the captured symbol actually is an angled-tee symbol (carries attribute "WDWSEQ"), it saves the symbols XY coordinate location. Next it calls into the AutoCAD Electrical API to erase the symbol and "heal" the resulting gaps in the wiring. And to finish off, it pops in the simple "dot" graphic at the original saved XY coordinate location where the angled-tee marker used to be. Repeat until finished!

Support for Multiple Design Standards

Be more productive by utilizing the standards required by your customers. "The ability of AutoCAD Electrical to switch an existing design's schematic symbol set from one standard to another is pure genius." So says Doug McAlexander, an independent trainer, integrator, and consultant. "I deal almost daily with companies that are coming to the realization that selling globally means designing globally. When it comes to the electrical design documentation, what is expected in the US market is not necessarily acceptable to the European or Asian market, and vice-versa. The ability to flip a single, proven electrical documentation package between different standards to meet the expectations of the target geography is a huge advantage."

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