

FactoryCAD 6.2 Tutorial

February 22, 2000

VisFactory™

Better Factories Faster

from

E A I



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FactoryCAD Tutorial

This tutorial is intended to fulfill the following functions:

- Introduce FactoryCAD and its capabilities
- Train beginners in representative tasks
- Instruct beginners and users familiar with earlier versions in key features of FactoryCAD
- Provide quick look-up of representative step-by-step procedures or facts about FactoryCAD for casual users
- Elaborate on specific features of FactoryCAD directed toward factory layout design inside AutoCAD.
- Foster continued learning through familiarization with the online documentation.

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FactoryCAD Basics

Smart Factory Objects

Graphical objects, also known as entities, are the visible objects (lines, circles, raster images, and so forth) that make up a drawing. Each graphical object has methods that allow an application to perform most of the AutoCAD editing commands, such as Copy, Erase, Move, Mirror, and so forth. These objects also have methods for setting and retrieving extended data (xdata), highlighting and updating, and retrieving the bounding box of the object. Graphical objects have typical properties such as Layer, Linetype, Color, and Handle. They also have specific properties, depending on their object type, such as, Center, Radius, and Area.

—ActiveX Automation User's Guide, AutoCAD help file

The Smart Factory Objects in the VisFactory programs bring unprecedented ease, accuracy, and speed to factory layout drafting. The Smart Factory Objects enable the user to rapidly draft and edit in 2D while simultaneously creating a sophisticated 3D model. The Smart Factory Objects are custom graphical objects.

Custom graphical objects are visible objects (e.g., conveyors, lift tables, guard rails) that are created and displayed according to information and rules that are added to the base AutoCAD package. Each custom graphical object has methods that allow an application to perform most of the AutoCAD editing commands, such as Copy, Erase, Move, and Mirror.

Custom graphical objects are typically much more complex than simple AutoCAD objects, but they are much smaller than the simple AutoCAD objects that would be required to represent the same visible objects. In addition, custom graphical objects behave according to set characteristics and rules. For example, when you stretch a guard rail, additional posts are automatically added at the specified intervals.

Connectors

Many of the Smart Factory Objects, or custom objects, developed for use with FactoryCAD and the other VisFactory programs include “connectors” at strategic points. For example, a hold table on a skid cross aisle transfer conveyor has a connector that can be used to automatically align and position perpendicularly a skid conveyor. When connections are joined, moving one of the connected objects moves all of them as a group. Individual connectors can also be anchored so that connected objects cannot be moved until the anchors are removed.

Connectors can be added to custom objects, such as containers, that do not have default connectors.

Understanding the Interface

FactoryCAD commands appear on pull-down menus, on toolbars, and on right-click menus for Smart Factory Objects. Some commands related to Smart Factory Objects appear only on toolbars and right-click menus.

To display FactoryCAD toolbars

1. Start FactoryCAD within an AutoCAD session.
2. On the **Detail** menu, point to **FactoryCAD Toolbars**. A flyout menu listing available FactoryCAD toolbars appears.
3. Click the desired toolbar name.

The FactoryCAD tutorial introduces a number of industrial Smart Factory Objects. Generally, the text refers to the commands on the menu, but all the industrial objects are accessible through a FactoryCAD toolbar.

To display the FCAD_Industrial_Objects toolbar

On the **Detail** menu, point to **FactoryCAD Toolbars**. A sub-menu appears. Select **FactoryCAD Industrial Objects**. A toolbar with the title **FCAD_Industrial_Objects** appears.



Note: AutoCAD saves toolbar positions and configurations. If you do not immediately notice the toolbar, it may have been docked to an edge of the drawing screen, in which case its title is not displayed.

To display Smart Factory Objects right-click menus

1. While in plan view, select a Smart Factory Object.
2. Click the right mouse button.
A pop-up menu appears containing a VisFactory item.
3. Hold the cursor over **VisFactory**.
A sub-menu containing the Smart Factory Objects commands appears.

Many FactoryCAD routines include command-line prompts and options in addition to a dialog box. Be sure to check the command line for information and prompts while executing a FactoryCAD function.

Getting Help

The tutorial procedures take you through a representative sample of FactoryCAD functionality. For more information on how to use any FactoryCAD feature, consult the online Help system.

To open the FactoryCAD online Help system

- On the **Factory** menu, point to **Factory Layout Software Help**. A sub-menu appears. Select **FactoryCAD**. The FactoryCAD online Help system appears.

-or-

- In a FactoryCAD dialog box with a help button, click **Help**. The FactoryCAD online Help system window appears, opened to a topic related to the dialog box.

Repeating the tutorial

Backup copies of the files needed for both foot-inch and metric versions of the tutorial are copied to subfolders of the \CIMF\BAKTUTOR folder. To repeat the tutorial with a fresh set of files, copy the appropriate version from \CIMF\BAKTUTOR to the \CIMF\TUTORIAL folder.

Setting up FactoryCAD

FactoryCAD runs inside an open session of AutoCAD 2000 or Architectural Desktop 2. To start FactoryCAD, load the Factory menu, and then select FactoryCAD from that menu. See the *Factory Programs Guide* for more information about installing and starting FactoryCAD.

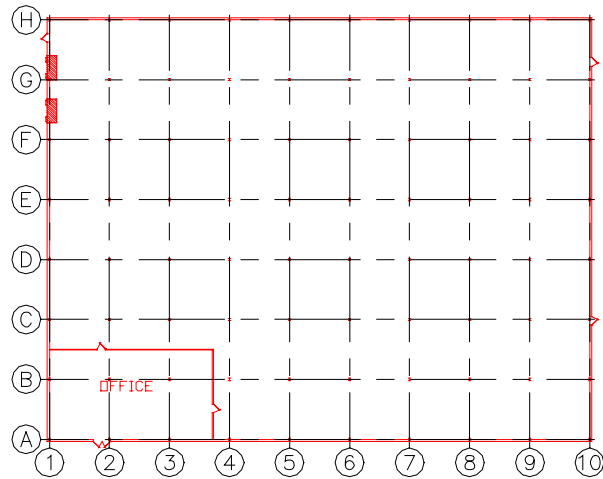
Opening the tutorial drawing

The drawing **FCAD TUTORIAL.dwg** was copied to the CIMFTUTORIAL directory during installation. The drawing contains a set of walls with some doors. Start AutoCAD and open **FCAD TUTORIAL.dwg** now.

Note: The walls and doors were created with the respective FactoryCAD commands. Because many FactoryCAD users use the wall and door custom objects of Architectural Desktop rather than the FactoryCAD routines for those items, this tutorial does not include creating walls and doors. See the FactoryCAD online Help system for a full discussion of walls and doors.

Next, start FactoryCAD. On the **Factory** menu, click **FactoryCAD**. The FactoryCAD program and its menu load.

Drawing a building grid



To create a building grid

1. On the **Arch** menu, select **Make Column Grid**. The **Make Grid** dialog box appears.
2. Click **Pick Corners**. The dialog box temporarily disappears and the command prompt displays

Select Start corner:

Note: The exterior walls have been drawn so that the default grid spacing of 75' fit evenly inside the building. If in Steps 3 and 4 you accidentally select an outside corner, rather than an inside corner, simply cancel the command and start over.

3. Click the inside lower left corner of the building. The command prompt displays

Select Opposite corner:

4. Click the inside upper right corner of the building. The **Make Grid** dialog box appears again, and the grid coordinates you just selected appear in the **Grid Corners** area of the dialog box.
5. In the **Grid Identifier** area, click **Pick Location**. The dialog box temporarily disappears and the command prompt displays

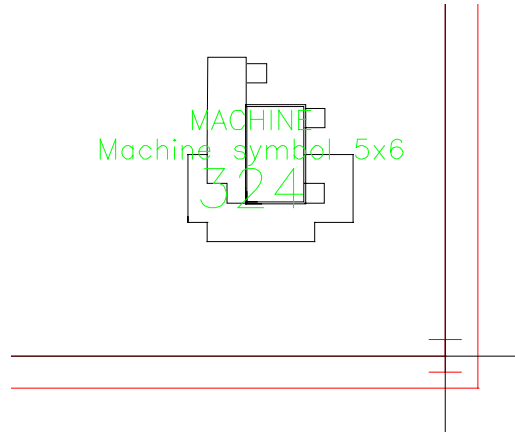
Bubble location:

6. Select a point to the left of the lower left building corner. The **Make Grid** dialog box appears again, and the coordinates of the point you just selected appear in the dialog box.
7. Click **OK**. FactoryCAD draws the building grid.

Pull down the list of layers and notice that FactoryCAD automatically created new layers for the columns and grid: **S-col** and **S-grid**. As you go on with the tutorial, you do not need to change the grid, so click the padlock icons in the layer list now to lock these two layers.

Adding a machine from the block library

FactoryCAD's block manager enables easy, organized storage and retrieval of blocks. Use the block manager now to get a machine for your tutorial layout drawing.

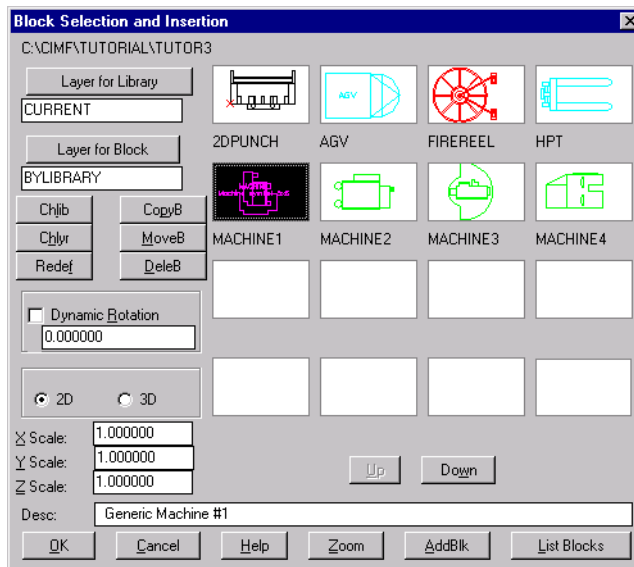


To insert a machine from the block library

1. On the **Block** menu, select **Block Manager**. The **Block Selection and Insertion** dialog box appears.

Note: When FactoryCAD is first installed, the library is automatically set to **CIMFTUTORIAL\TUTOR3**. If that library is not already selected, use **Chlib** to change to the **TUTOR3** library. For complete information on using the Block Manager, click **Help** in the **Block Selection and Insertion** dialog box to open the online Help system.

2. Click the **MACHINE1** icon. The icon highlights and its description appears in the **Desc** field.



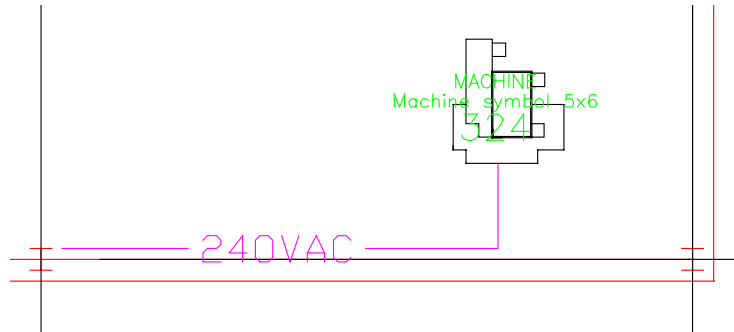
3. Click **OK**. The dialog box closes and the command prompt displays
Insertion point:
4. Select a point in the lower right corner of the factory. After you select a point, the command prompt displays
Enter attribute values
Asset number:
5. Type a three- or four-digit number, and then press **Enter**.

If you zoom up to the machine, you'll see that the asset number you entered appears on the machine, along with the machine description and type.

Tip: At this point you can pull down the list of layers and see that FactoryCAD has automatically created three new layers: Machine_desc, Machine_num, and Machine_type. The machine's text description, number, and type are on the respective layers. Thus, the text visibility can be controlled by freezing or thawing the corresponding layer.

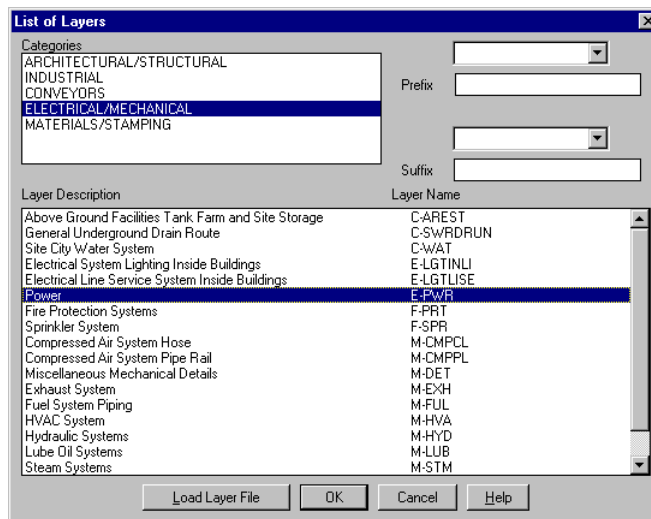
Adding an electrical line

FactoryCAD's layers dialog box displays a list of standard layers and provides an easy means of adhering to drawing layer standards for items such as electrical utility lines. The dialog box can be displayed by selecting **Set Layer Dialog** from the **Layer** menu. You can also display the list just before running the respective command by selecting **Line**, **Polyline**, **Dynamic Text**, or **Multiline Text** from the **EI/Me**, **Arch**, **Ind**, or **Conv** menus.



To draw an electrical line on a standard layer

1. If you are not already zoomed to the lower right corner of the building, zoom in now.
2. On the **EI/Me** menu, select **Polyline**. The **List of Layers** dialog box appears. The **Electrical/Mechanical** category is already selected.
3. In the **Layer Description** list, select **Power**, and then click **OK**.



When you click **OK**, the current layer is set to **E-pwr** and the command prompt displays the first prompt for the AutoCAD **pline** command:

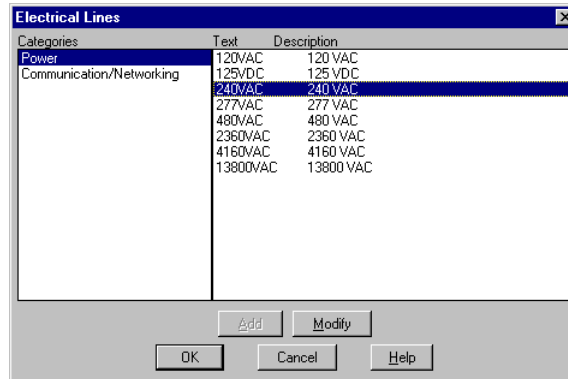
From point:

4. Select points to draw an electrical line from the machine to a location near building column A9.

You can easily label electrical and mechanical utility lines by selecting a label from a standard list.

To label an electrical line

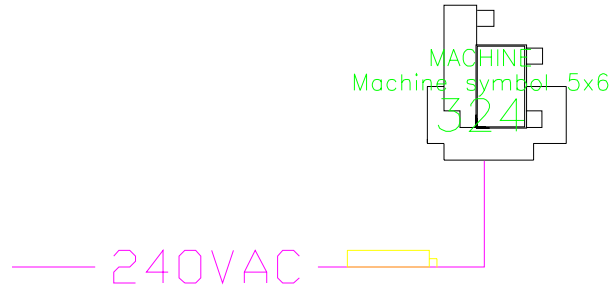
1. On the **E/Me** menu, select **Electrical Lines**. The **Electrical Lines** dialog box appears.
2. In the **Categories** list, click **Power**. A list of predefined electrical lines appears.
3. Click **240VAC**. The 240VAC line highlights.



4. Click **OK**. The dialog box closes, and the command prompt displays
Select line/polyline or (Draw pline/Change values/Rotate last/Undo last):
5. Select a point near the middle of a relatively long segment of the electrical line you drew earlier. A text label is inserted into the line.
6. Press **Enter** to end the command.

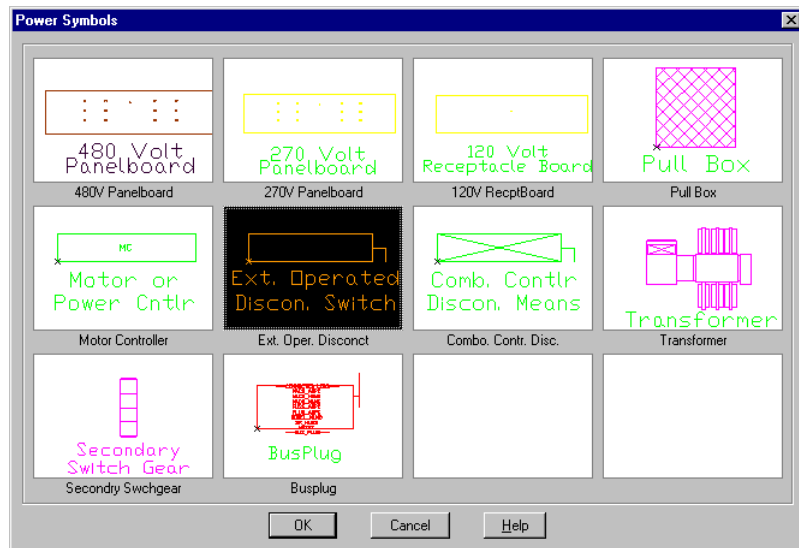
Adding a disconnect switch

Next, add a power disconnect switch symbol along the electrical power line you just drew.



To insert a disconnect switch

1. On the **E/Me** menu, point to **Electrical Symbols**. A fly-out menu appears.
2. Click **Power**. The **Power Symbols** dialog box appears.
3. Click the **Ext. Oper. Disconct** icon. The icon highlights.

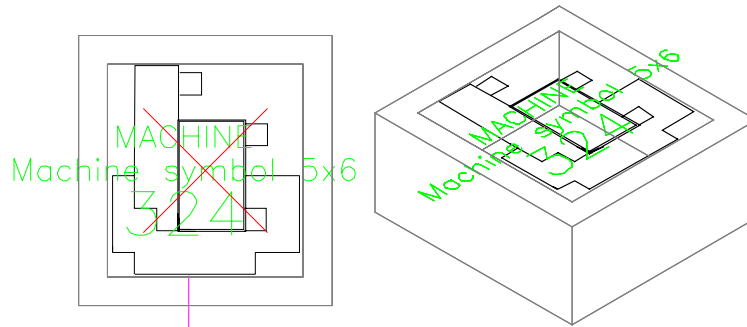


4. Click **OK**. The command prompt displays
Insertion point:
5. Select a point along the 240VAC electrical line. The command prompt displays
Rotation angle <0>:
6. Specify a rotation angle or simply press **Enter** to accept the default response.

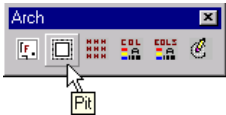
Note: If you pull down the list of layers, you'll see that the layer **E-Igtlise** has been created for the switch.

Adding a pit

Heavy machines can often require special reinforcement beneath them. One way to identify this architectural feature is to draw a pit, which might be filled with reinforced concrete, beneath the machine.



To insert a pit object



Pit is also available on the Arch toolbar.

1. On the **Ind** (Industrial) menu, select **Pit**. The **Pit** dialog box appears.
2. Click **Draw a rectangular pit**. The dialog box disappears and the command prompt displays

First inside corner:

3. Select a point for an inside corner of the pit. The command prompt then displays

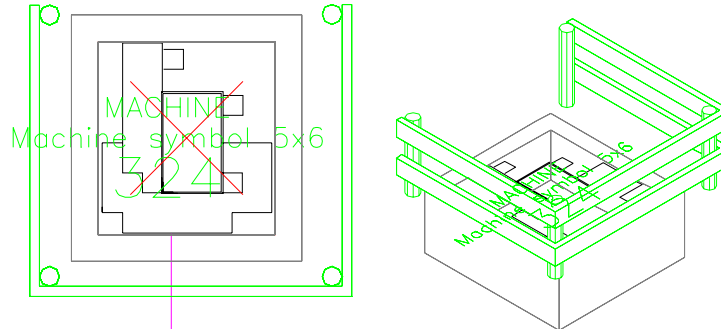
Other corner:

4. Select a point for the diagonally opposite inside corner of the pit. The **Pit** dialog box reappears.
5. Make sure that the **Show X** checkbox is marked, and then click **OK**. FactoryCAD draws the pit.

For more information about the pit object, consult the online Help system.

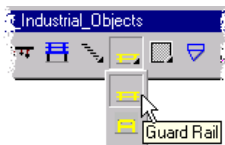
Adding a guardrail

You will often want a guardrail around pits or equipment. You can use the guardrail object to easily add a guardrail.



To add a guardrail

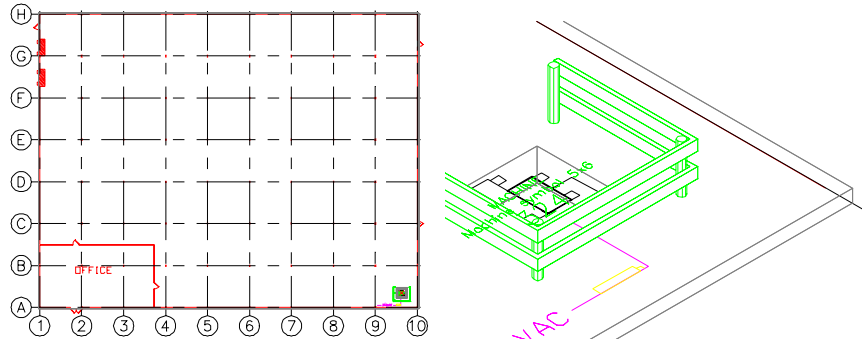
1. On the **Ind** menu, select **Guard Rail**. The **Guard Rail** dialog box appears.
2. Click **OK**. The dialog box closes and the command prompt displays
Pick first point:
3. Select points to form the path along which you want a guardrail. When you have finished selecting points, press **Enter**. FactoryCAD draws the guardrail.



Guardrail is also available on the FCAD_Industrial_Objects toolbar. Guardrail shares a toolbar location with the Handrail icon.

Drawing a floor object

A floor object represents the thickness of the floor, can contain pits, and provides a helpful frame of reference for rendered drawings.



To draw a floor object



Floor is also available on the Arch toolbar.

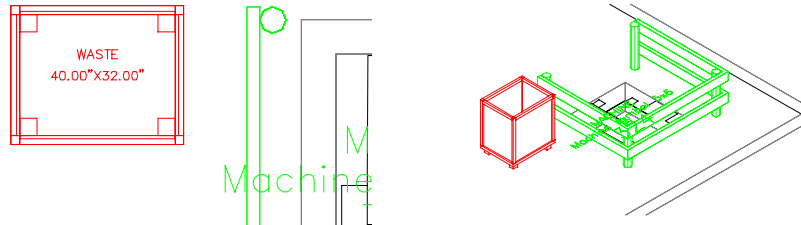
1. Zoom so that the whole building is shown in plan view.
2. From the **Arch** (Architectural) menu, select **Floor**. The **Floors** dialog box appears.
3. Click **Draw Floor Boundary**. The **Floors** dialog box disappears and the command prompt displays
Select first point:
4. Select an outside corner of the building. The command prompt displays
Next point:
5. Select the next outside corner. The command prompt displays
Undo/<Next point>:
6. Select the next outside corner. Note that FactoryCAD automatically closes the boundary with a diagonal line to the first point. The command prompt displays
Close/ Perpendicular Close/Undo/<Next point>:
7. Select the last outside corner. The boundary line adjusts to form a complete perimeter of the building. The command prompt displays
Close/ Perpendicular Close/Undo/<Next point>:
8. Press **Enter** to signal that you have finished drawing the boundary. The **Floors** dialog box reappears.
9. Click **OK**. FactoryCAD creates the floor object.

Note: If you pull down the list of layers, you see that a new layer **Q-genflr** has been created for the floor. FactoryCAD automatically locks the layer to prevent accidentally selecting and modifying the floor object. To modify a floor object, place the cursor over a floor line and right-click. Options for

modifying the floor appear at the command prompt. See the online Help system for details.

Adding a container

Containers are common objects in a factory, and FactoryCAD's container object easily models a variety of container types.



To add a container object



Container is also available on the Material Handling toolbar.

1. From the **Ind** (Industrial) menu, select **Containers**. The **Containers** dialog box appears.
2. In the **Container Text** area at the bottom of the dialog box, type **WASTE** in the first box.
3. Click **OK**. The dialog box closes and the command prompt displays
<Select the base point for the container>:
4. Select a point for the container location. The command prompt then displays
Rotation angle <0>:
5. To specify the rotation angle, drag the cursor and then click, or type a value and then press **Enter**. FactoryCAD inserts the container object.

To resize the container object using grips

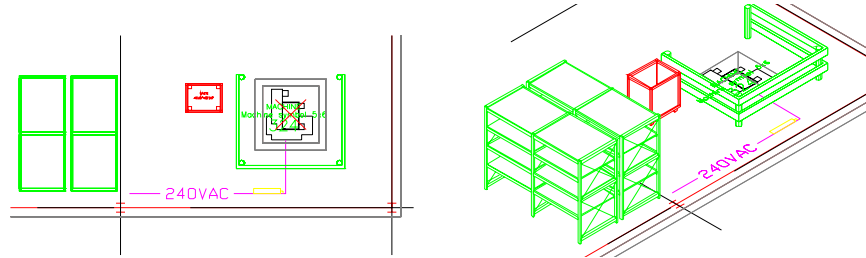
1. Click the object. Blue grips appear at the corners.
2. Click a corner grip. The grip turns red.
3. Drag the grip. Notice that a length and width legend appears at the top left of the drawing screen and is updated as you drag the grip.
4. When the grip is in the desired location, click. The container object and its dimension text update to the new size.

Note: The AutoCAD OSNAP setting must be turned off while resizing the container. SNAP may be turned on.

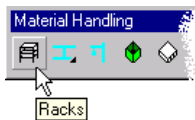
See the online Help system for more information about containers.

Adding a rack

Perhaps one of the most versatile Smart Factory Objects, the rack object not only models a variety of rack types, but has been creatively used to model roof trusses and other regularly repeating geometry.



To insert a rack object

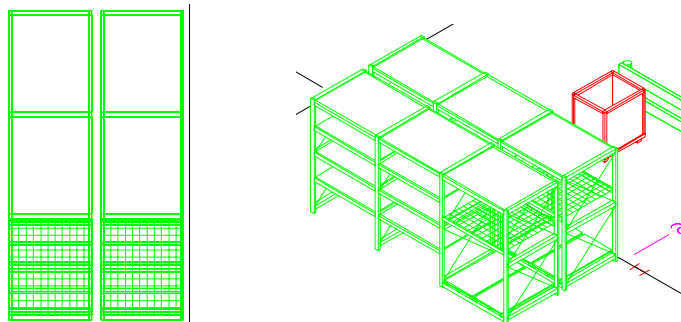


Racks is also available on the Material Handling toolbar.

1. From the **Ind** (Industrial) menu, select **Detail Rack**. The **Racks** dialog box appears.
2. In the **Number of Bays Wide(NW)** box, enter **2**.
3. In the **Bay Span(BS)** box, enter **60**.
4. Click **OK**. The dialog box closes and the command prompt displays
Rack insertion point >
5. Select a point near grid column A9. The command prompt displays
Rotation angle <0>:
6. Type **90**, and then press **Enter**. FactoryCAD inserts the rack object.

To add another bay using grips

1. Click the racks object. Grips appear.
2. Click a grip on the end of the rack. The grip turns red.
3. Drag the grip so it extends at least one bay width from the rack, and then click. FactoryCAD adds another bay to the rack.




2D and 3D views of rack with added bay, modified shelves in first bay

Shelf heights can be adjusted for each individual bay using the **Bay Parameters** tab of the **Modify Racks Object** dialog box.

Note: When in plan view, you can right-click an object to display a menu that includes a **Modify** option. The **Modify** option displays an object's

parameters dialog box. When the view angle is other than plan view, for some objects the right-click menu is not accessible. Regardless of view angle, an object's dialog box can be displayed using the **Modify Object** button on the toolbar containing the object's creation icon.

To adjust individual bay parameters

1. On the **FCAD_Industrial_Objects** toolbar, click the Modify Object icon . The command prompt displays

Select Factory Object to modify:

Note: See page 6 for a description of how to display FactoryCAD toolbars.

2. Click the rack object. The **Modify Rack Object** dialog box appears.
3. Click the **Bays Parameters** tab. The Bays Parameters page appears.
4. In the **Bay Number** box, select the bay you wish to modify.
5. Enter your desired settings for the selected bay.

Tip: Detailed instructions regarding the **Bays Parameters** tab are in the online Help system. Click **Help** in the dialog box to display the relevant topic.

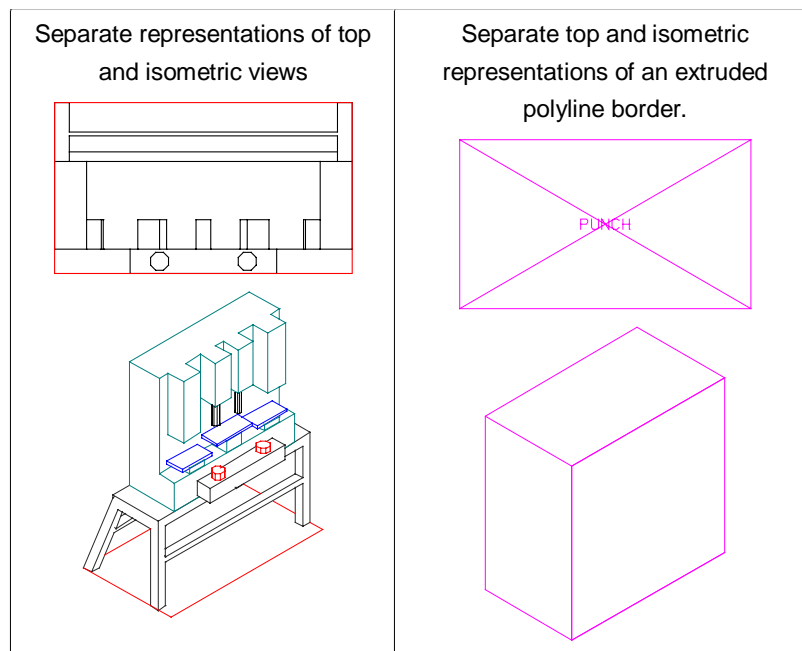
6. Click **OK**. FactoryCAD makes the specified changes to the rack. You can see the effect of shelf height settings by switching to a SW or other 3D view.

Creating a generic tool

You can use the **Generic Tool** object to automatically switch between different representations of an item, as many as one representation each in top, bottom, front, back, left, and right views and another when in an isometric view. The representations are references to blocks that are either stored in the drawing or stored externally as separate .dwg files.

The **Generic Tool** object's ability to reference blocks is valuable in several situations:

- When complex geometry is not needed and would slow down drawing response unnecessarily, the display of the referenced blocks can temporarily be disabled, and then restored later.
- When individual blocks are not available in detailed or final format at the time the layout drawing is being created, a placeholder generic tool object can be created and inserted. When new or updated tool geometry is later available, the generic tool can be modified to use that geometry.




Example 2D and 3D representations managed by a Generic Tool object

To create a generic tool

1. On the **Layers** menu, select **Set Layer Dialog**. The **List of Layers** dialog box appears.
2. In the **Categories** list, select **Industrial**. The **Layer Description** list shows a list of standard industrial layers.
3. Scroll to the bottom of the **Layer Description** list and select **Process Equipment/Phosphate Machines/Booths/Ove**.

Note: If your FactoryCAD is configured to use other than the default generic layer standards file, your list may be different. In that case, select an appropriate layer name.

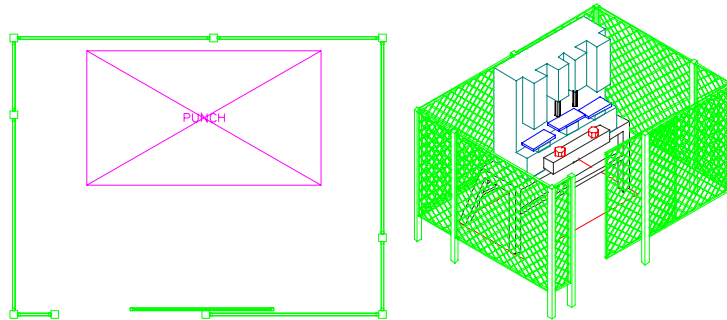
4. Click **OK**.
5. On the **FCAD_Industrial_Objects** toolbar, click the Generic Tool icon . The **Generic Tool** dialog box appears.
6. In the **Tool Name** box, type **Punch**.
7. Click **Top File**. The **2D Top View Block Name** file selection dialog box appears.
8. Look in the **CIMF\Tutorial\Tutor3** folder.
9. Select **2DPUNCH.DWG**, and then click **Open**. The file selection dialog box closes and the file name 2DPUNCH appears in the **Generic Tool** dialog box.
10. Click **3D File**. The **3D Block Name** file selection dialog box appears.
11. Double-click the file **3DPUNCH.dwg**. The file selection dialog box closes and the file name 3DPUNCH appears in the **Generic Tool** dialog box.
12. Click the checkboxes for **Top View** and **3D Block Name** so that they contain a ✓.
13. Click **OK**. The dialog box closes and the command prompt displays
Insertion Point
14. Select a point for the tool. FactoryCAD inserts the generic tool object. At the time of insertion, FactoryCAD determines the smallest rectangular boundary that will enclose the block, and draws that rectangle around the 2D block.

To substitute an extruded polyline for referenced blocks

1. Select the Punch generic tool object, and then Right-click. A menu appears.
2. Point to **VisFactory**. A submenu appears.
3. Select **Modify**. The **Generic Tool** dialog box appears.
4. Click the checkboxes for **Top View** and **3D Block Name** so that they are empty.
5. In the **Extrusion Depth** box, type 60.
6. Click **OK**. The dialog box closes and the punch generic tool object now appears using a representation of the extruded polyline border, rather than the referenced blocks.

Adding a safety fence

Safety fence around tools is a common requirement. You can use the safety fence object to easily create a range of safety fence configurations, including a variety of door options.



To create a safety fence

1. On the **Ind** (Industrial) menu, point to **Safety Fence**. A sub-menu appears.
2. Select **Safety Fence....** The **Safety Fence** dialog box appears.
3. Click **OK**. The dialog box closes and the command prompt displays
Select first point:
4. Select points to form a path along which you want a safety fence. When you have finished selecting points, press **Enter**. FactoryCAD draws the safety fence.

To add a door to a safety fence

1. Select the safety fence, and then right-click. The safety fence right-click menu appears.
2. Point to **VisFactory**. A submenu appears.
3. Select **Add Door**. The **Add Safety Fence Door** dialog box appears.
4. From the **Door Style** drop-down list, select **Sliding Door**.
5. Click **OK**. The dialog box closes and the command prompt displays
Select safety fence and location:
6. Select a point on the safety fence. A door symbol appears on the selected safety fence.
7. Drag the door symbol around the fence until it is in the desired position, and then click. FactoryCAD draws the door and prompts again

Select safety fence and location:

8. Press **Enter** to end the door insertion routine.

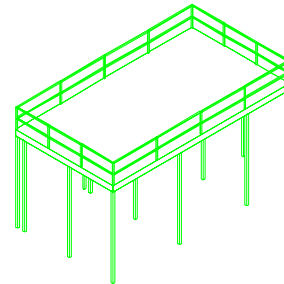
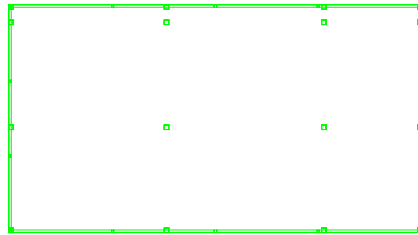
The side of the safety fence the sliding door is initially on depends on which direction you went when you drew the safety fence. The door can easily be moved to the other side via grips.

To change the fence side of a sliding safety fence door


1. Click the door. Three grips appear along the door opening and one on the door.
2. Click the grip on the door. The grip turns red.
3. Drag the crosshairs to the other side of the safety fence, and then release the mouse button. FactoryCAD moves the door to the other side of the fence.

Adding a mezzanine

FactoryCAD's mezzanine object can model an infinite variety of mezzanine constructions. You can use the following steps to create a rectangular mezzanine.



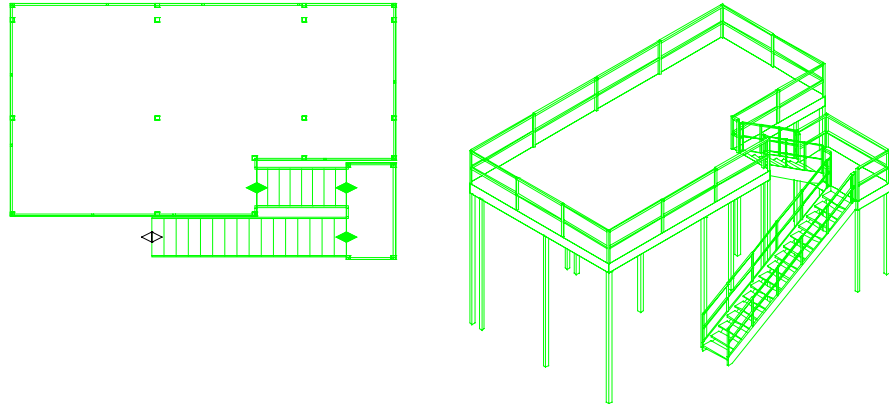
To insert a rectangular mezzanine

1. Zoom to display a plan view of the area in which you want to insert the mezzanine.
2. On the **FCAD_Industrial_Objects** toolbar, click the mezzanine icon . The **Mezzanine** dialog box appears.
3. In the **Mezzanine Outline** area, select **Draw New Rectangle**.
4. Click **OK**. The dialog box closes and command prompt displays
Select First Corner
5. Select a location for the first corner of the mezzanine. The command prompt displays
Select Opposite Corner
6. Select the diagonally opposite corner of the mezzanine. FactoryCAD draws the mezzanine.

Modifying a mezzanine

Mezzanines are highly customizable, ready for you to add stairs, ramps, and ladders; create holes; join with other mezzanines; create gaps in railing; cut out sections; and more.

The following mezzanine example has a section cut out to make room for stairs. Similar mezzanine shapes could have been achieved by adding a second mezzanine object, then joining the two mezzanines into one object.



To find a description of how to cut out a section of a mezzanine

1. Start the FactoryCAD online Help system.
 - On the **Factory** menu, point to **Factory Layout Software Help**. A sub-menu appears. Select **FactoryCAD**. The FactoryCAD online Help system appears.
- or-
- In a FactoryCAD dialog box with a help button, such as the **Mezzanine** dialog box, click **Help**. The FactoryCAD online Help system window appears, opened to a topic related to the dialog box.
2. In the navigation pane at the left of the Help window, click **Search**. The Search tab appears.
3. In the **Type in the keyword to find** box, type **mezzanine**.
4. Click **List Topics**. A list of topics containing the word mezzanine appears in the **Select Topic to display** area.
5. In the list of topics, double-click **Cutting a mezzanine section**. The topic **To cut a mezzanine section** appears.

Note: You could also reach the **To cut a mezzanine section** topic by following links from within the main mezzanine topic.

To add stairs to a mezzanine

1. In plan view, select a mezzanine object and right-click. The mezzanine right-click menu appears.
2. Point to **VisFactory**. A submenu appears.
3. Click **Add Stairs**. The **Stairway** dialog box appears.
4. Click **OK**. The dialog box closes and a stair icon appears attached to the mezzanine. The command prompt displays
Connect <select insert point>
5. Move the stairs to your desired location. As long as you stay near the mezzanine edge, the stairs snap to the edge of the mezzanine.
6. When the stairs are in the desired position, click the left mouse button. FactoryCAD draws the stairs.

Note: The stairs object will not draw stairs that exceed the maximum change in elevation allowed by OSHA for a single flight of stairs. If a greater change in elevation is needed, add a landing at the end of the stairs object, and then add another set of stairs.

To add a landing to a stairs object

1. In plan view, select a stairs object, and then right-click. The stairs right-click menu appears.
2. Point to **VisFactory**. A submenu appears.
3. Click **Add Landing**. The right-click menu disappears and a landing object appears at the pointer location.
4. Move the landing to your desired location. When you are near the connector at the end of a stairs object, the landing snaps into place.
5. When the landing is in the desired position, click the left mouse button. FactoryCAD draws the landing.

To add stairs to a landing

Follow the same procedure as for adding stairs to a mezzanine. Note that you can have FactoryCAD automatically adjust the stairs to meet a specific height by entering a value in the **Ending Elevation** box of the stairway dialog box.

Appendix A — Movie files

The following movie files are included on the VisFactory installation CD. To play one of the movies, browse the CD to find the desired file name, and then double-click the file's icon.

auto_conv_1.avi	Shows the use of Smart Factory Objects to construct and modify an automotive floor conveyor system. In a 2D top view, a skid conveyor is inserted, a cross aisle transfer and lift table are snapped on, and another skid is added. Switches to 3D view, drags a grip to lengthen the last skid, drags another grip to simultaneously shorten the cross aisle transfer conveyor and move the connected skid conveyor.
belt conveyor.avi	Shows simultaneous 2D and 3D views as a belt conveyor section is inserted, and then lengthened using a grip. Drive side is changed using the right-click menu and object dialog box. A new section is added using the right-click menu and object dialog box. The conveyors are rendered.
bridge_crane.avi	Shows simultaneous 2D and 3D views as a two-rail bridge crane system is created between building columns. The crane is dropped into the drawing and modified using grip points. The right-click menu and object dialog box is used to switch the crane from below the rails to above the rails.
buff_calc3.avi	Shows selection of generic tools and connecting floor conveyors, then shows the use of the Production Throughput Optimization Calculator to compute required buffer size, buffer allocation, and throughput.
cabinets.avi.	Shows simultaneous top and front views as a cabinet is inserted and modified. Grips are used to stretch the cabinet width and automatically add doors. The right-click menu and object dialog box are used to change the cabinet height and alternate the door swing. The front view is changed to a SW view to show the 3D appearance of the cabinet.
container.avi	Shows simultaneous 2D and 3D views as a series of containers are inserted and modified. Solid wall, mesh, and no wall containers are inserted. A tote with different dimensions and elevation is inserted. Containers are repositioned and resized using grips.
convanim.avi	Shows construction of an overhead power and free conveyor, including modification to add a vertical curve section, followed by animation of a carrier and load along the track.
CostEst0006.avi	Shows simultaneous 2D and 3D views of modification of a mezzanine/platform, addition of a guard rail, then cost estimation: extracts information, compiles estimate, looks at computed costs.
CostEst0009.avi	Similar to CostEst0006.avi except final phase is a little shorter.
GMdemo_short_7Mg.avi	Simultaneous fly-through and animation of rendered layout with engines on roller package conveyor. Created in VisMockUp.

grc.avi	Shows simultaneous 2D and 3D views as a gravity roller conveyor straight section is dropped in, then lengthened using grips. Note the automatic addition of standard length sections. Adds a curve section using the right-click menu and object dialog box. Adds a new straight section with Wheel Rollers option; renders the conveyors to show render view.
guardrail.avi	Shows simultaneous 2D and 3D views of the creation of a guard rail, modifies the length by dragging a grip, modifies rail type (2 rails to 3 rails) using the right-click menu and object dialog box.
jib_crane.avi	Shows simultaneous 2D and 3D views of creation of jib crane, modification of jib length and swing arc by dragging a grip.
mezzanine.avi	Shows 2D creation of a rectangular mezzanine, cut-out of a section, and addition of stairs. Switches to 3D view, adds landing and stairs. Modifies bottom stairs to extend to floor level.
overhead.avi	Shows simultaneous 2D and 3D views of the creation of an overhead power and free conveyor, including vertical curve and addition of bias bank section.
platform.avi	Shows 2D creation of dual-sided platform and modification of one side using grips. Switches to 3D view, uses the right-click menu and object dialog box to show railing. Note that by design, the inside platform edge does not have a railing.
racks.avi	Shows simultaneous top and front views as a rack is created. Shows modification of shelf height in one bay of a rack using the right-click menu and object dialog box. Switches front view to SW view to show 3D rack.
safety_fence.avi	Shows simultaneous 2D and 3D views of creation of safety fence around a tool. Modifies fence using grips. Uses right-click menu and door dialog box to add a door. Uses right-click menu and object dialog box to change the fence pattern.
vblr conveyor.avi	Shows simultaneous 2D and 3D views of the creation of v-belt live roller conveyor sections. Initial straight segment length is modified using grips. Display of a motor is added using the right-click menu and object dialog box. A new curved segment is added using the right-click menu and object dialog box. The curve section is dragged to a new location, and a new straight section is automatically added to lengthen the system accordingly. The views are then rendered.

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