

# Chartist User's Manual: Lines

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## Line Defined

Lines are secondary chart objects. Lines connect symbols, and their existence depends on the existence of the symbols they connect. When symbols are moved or removed from a chart, any lines that connect to those symbols are modified or deleted accordingly. Lines have the following properties:

**Source:** The identification of the symbol from which the line begins.

**Exit Point:** The side (top, bottom, left, right) of the source symbol to which the line connects.

**Desination:** The identification of the symbol into which the line terminates.

**Entry Point:** The side of the destination symbol to which the line connects.

**Line Style:** The pen style (solid, dash, dot) and thickness of the line. Also the type of route (auto, direct, curve) of the line, the size and number of arrowheads, and the text and location of a label for the line.

**Color:** The color of the line and label text.

Lines that are added to a chart take on the current default properties for lines.

## Adding A Line

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A line may be added between two symbols if there is not already a line between them, running in the same direction, and if the chosen exit and entry points are not used by lines running in the opposite direction. The exit and entry points for the line are determined by how you designate the start and stop points. A line will exit the side of the symbol nearest the initial drawing point. Similarly, a line will enter the side of the symbol nearest the final drawing point.

Click on the sixth Tool Bar button (line with +), press Alt+Ins, or choose the Line Add command. Click and hold the left button with the cursor inside the source symbol, and near the center of the desired exit side. Drag a line to the destination symbol stopping inside the symbol near the center of the desired entry side. Release the button to complete the operation. The line will be routed automatically.

### Routing Lines

Line routing takes place automatically after any change to the chart that affects the layout of lines.

The routing process is denoted by the **R** cursor. Only those lines that need new route calculations are processed. Routing can take significant time when a large chart is first loaded and all line routes have to be calculated.

After any routing failure, the offending line is shown as a thick red direct line, but the line is not deleted automatically. The user can delete the line or rearrange the chart so the line will route.

### Selecting Lines

For some purposes, such as Cutting, Copying, Pasting and Deleting, lines are implicitly selected when the symbols they connect to are selected. However, to edit the properties of lines, or to delete them (and not the connected symbols), lines must be explicitly selected. Whenever lines are explicitly selected, all symbols are deselected.

To select a line:

1. Move the cursor to touch the line, within 1/8" of a unique end point, that is, an end point where it is not combined with another line but outside the connected symbol. Click the left button, or press Enter. This technique is effective if the end point is not

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shared with another line. Use technique 2 below for lines with shared end points.

or,

2. Choose the Line Select menu command. Click on the start symbol of the line, drag a line to the end symbol and click again to complete.

When the line is selected, it is drawn in reverse colors.

When selecting additional lines, hold down the Shift key to retain previous selections.

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### Selecting Lines From Symbols

All of the lines connected to a set of symbols may be selected as follows:

Select the symbols connected to the desired lines. Then choose the Line Pick From Symbol command (Shift+F7). The desired lines will be selected, and the symbols will be deselected.

### Deleting Lines

To delete one or more lines, select them and press Del or choose the Edit Delete command. The selected lines will be deleted.

### Undeleting Lines

Lines that have been explicitly deleted may be restored to the chart if no other additions have been made. Choose the Edit Undelete command (Alt+Backspace). Pull down the Edit menu to see if the Undelete command is available for re-instating chart information.

### Setting Line Style

With the desired line(s) selected, click on the 7th button in the Tool Bar (line with ?), choose Line Style... or press Shift+F4. The Edit Line Style dialog box will be displayed.

If no lines are selected the Line Style command selects style for new lines. The sample line in the Tool Bar is drawn with these style settings.

If multiple lines are selected, the Line Style command displays the common style elements for the selected group of lines.

Style elements that differ in a selected group of lines are not displayed in the dialog box. They may, however, be modified, causing all selected lines to take on the selected styles.

Note that selecting a pen width other than Normal, causes the pen style to be ignored. Windows does not apply styles other than Solid to lines thicker than one pixel.

A line Label is an optional short line of text that is displayed near the source

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or destination of the line, depending on the At dest check box. If one line is selected, type the desired label, if any. in to the Label edit field. When no lines or multiple lines are selected, the Label edit field is disabled. Line labels use the Line Font for the chart. The line font is chosen with the Line Font... command.

When the chart is drawn the label is placed to avoid interference with other chart information. Sometimes the selection and deselection process will interfere with line label drawing. If you cannot see a label that you just added, select the View Refresh command (F5) to redraw the window.

### Route Style Selection

Auto lines make right angle turns.

Direct lines are straight lines from start point to end point.

Curve lines are arcs drawn such that they exit and enter symbols at right angles to their sides. Curves may be simple or compound ("S" shaped), depending on the placement of the symbols.

### Legal Routes

Depending upon the route style selection, and end points, a line may not route legally. If a line cannot be routed legally, it will be drawn as a thick direct red line with one arrowhead. The rules are:

For a Direct route, the line may not pass through the source or destination symbol or run along the side of either symbol.

For an Auto or Curve line, the line route may not be drawn the shape of a question mark (in any orientation or reflection). For example a Curve line that leaves the right side of one symbol and enters the top side of a symbol immediately below it, is not legal.

To correct a failed route, move the symbols, change the route style or delete the line.

### Setting The Line Font

The line font is used for all line labels. When Chartist starts, it chooses the printer's default font as the chart line font. You may change the line font at any time.

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Select the Line Font... command from the menu. The Choose Line Labels Font dialog box will be displayed. This dialog is identical to the Choose Font dialog, except that the Use Line Font check box is disabled. Click on the OK button, or press Enter to complete the operation. All items drawn using the line font will be updated.

The current Line Font selection is shown just above the sample line in the Tool Bar.

### Line Colors

To select the colors for lines, click on the 8th button in the Tool Bar (line with C), or choose the Line Color... command (Alt+F8).

When no lines are selected, the colors for new lines are edited. The colors for new lines are shown in the Tool Bar to the right of the color sample for symbols. When multiple lines are selected, the common color elements are shown. Color elements that differ in the selected group of lines are displayed as gray, unless modified in the dialog.

The radio buttons select the color element of the line to be modified.