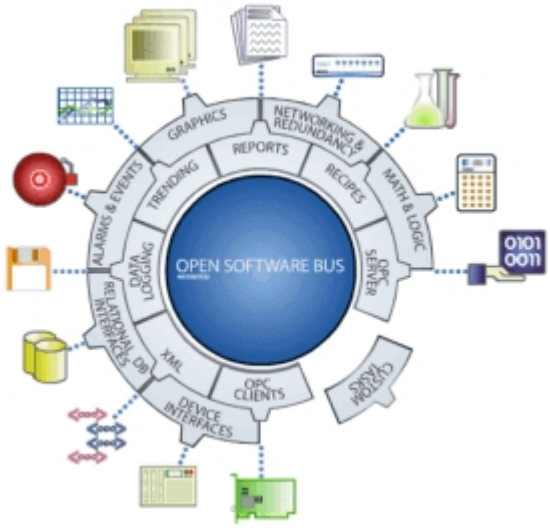

TECNOMATIX UGS The PLM Company

FactoryLink XY-chart module

for

FactoryLink 8.0.1

XY-CHART

Version 8.1
Printed: Sunday, January 30, 2011

Table of Contents

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1. Introduction

Thank you for buying this software! We hope you will enjoy using this product.

1.1. Scope of this document

This manual is written for a technician who is familiar with the FactoryLink® software. This document can be used both as a training manual as well as a reference manual.

> ***Note:*** *Please check the contents of the shipment with the list as described in the next chapter.*

The first section of this manual deals with the installation of software in your FactoryLink workstation. This part is split into a platform independent and a platform specific part. Please read carefully through both parts to make sure the software is installed correctly.

The second part explains the operation principles of the XY-chart facilities in combination with the standard Graphics task. Here all terms and definitions are explained to the reader. It explains terms like "XY-Plot" and "Defining/Undefining points". This part should be read to make sure that the optimum functionality can be achieved.

The third Part explains the exact tables associated with this task. This part can be used as a reference and is also an example of how to use this task with the Graphics task. It shows the entries made for the pre-configured demo which comes with this package. The demo program can be used to get an idea of the functionality of the task without making a complete application.

The last part are the Appendices which contain summarized data.

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2. Contents of shipment

Please check the package you received with the checklist below. Should there be an item missing contact RLD Automation to correct the problem. There is a limit of 90 days after shipment to report problems!

This package includes the following:

❶ 1 media labelled " XY-Chart"
Files:
\XYchartinstall.exe
\xychart.pdf
\rld.opt

❷ 1 FactoryLink demo application.
File: %FLINK%\MPS\EN\XYCHART.MPS (file is present after installation).

❸ 1 authorization sequence for a XYCHARToption.

❹ This manual (Which seems to be present).

You should also have:

☑ The graphics task for FactoryLink®.

Multi Language support:

The XY-Chart task is prepared to support the languages: German, Englisch and French. However just the english language is used for the german and french language selection.

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3. Installation

3.1. Installation of the FactoryLink software

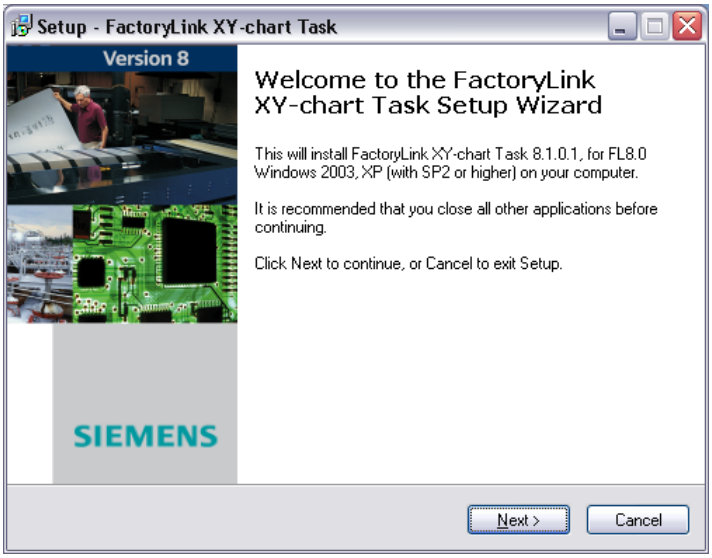
To install the FactoryLink task and its related tables please follow the following steps.

Before installing

Before installing the driver on the system, FactoryLink must have been installed error free. It is very important that all the environment settings are made for the FactoryLink system such as the *FLINK*, *FLOPT* etc.

First:

Run the installation program XYchartinstall.exe from the installation media, and follow the instructions.



Second:

After you installed the software you need to activate the tables in the FactoryLink Configuration Manager (FLCM). The installation automatically appends the *xychart.ac* entry into the *{FLINK}/ac/titles* file[1]. The place of this entry is also the place where the option appears in the FLCM Main Menu. Therefore check the validity of the entry and move it to the place where you want to appear it in the Configuration Manager. The entry must match the *xychart.ac* entry in the following table.

file: {FLINK}/ac/titles:

...
sys.ac
persist.ac
scale.ac
gedant.ac
windhdr.ac
xychart.ac
spool.ac
itimer.ac
...

[1]{FLINK} is the working directory for the FactoryLink programs.

Third:

To make sure all the Configuration Tables (CT's) are generated after a change, the install utility automatically adds the *xychart* entry at the end of the *{FLINK}/ctgen/ctlist* file. The place of this entry is not important. Check if this entry has the same format as in the next table.

file: {FLINK}/ctgen/ctlist: *...* *timer: itimer etimer* *recipe: rcphdr rcpovr* ***xychart: xymbx nchart xydisp xydef xyclr*** *iml: imltags imltrig* *spool: spool* *...*

Fourth:

To enable the help functionality for the XY-chart tables in the Configuration Manager, the installation utility reindexes the 'help-index' for the Configuration Manager. If desired reindexing of the 'help-index' can be started from the command line prompt.

mkhelp ↵

Fifth:

The XYCHART task must, with the FactoryLink Configuration Manager (FLCM), be entered in the System Configuration table. An entry of an existing task which will not be used at run-time can be overwritten or a new entry can be created with (as a minimum) the following data:

Task Name	*Description*	....	*Executable File*
XYCHART	***XY-Chart***		***bin/xychart***

The Task Name and name of the executable file are fixed and should not be altered by the user.

This completes the installation of the FactoryLink (software) parts.

3.2. Installation of the protection

The XY-Chart task is protected via an option file, this file contains authorization sequence codes for modules. The protection is linked to the serial number of the FactoryLink package.

3.2.1. The option file

The installation disk of the XY-chart task contains an option file, named ‘rld.opt’, in the 'opt' directory. This file contains the unique authorization sequence which enables the XY-chart task to run. The install utility automatically copies the authorization sequence into the {FLOPT}/rld.opt file. It is also possible to enter the authorization sequence manually into the {FLOPT}/rld.opt file. For more information on the rld.opt file refer to *Appendix A*.

Note that the task will only run on the FactoryLink system with the same serial number. The *rld.opt* file on the installation media contains, for reference, the serial number of FactoryLink.

3.2.2. Demo installation

It is possible to install the XY-Chart task without an authorization code. Install the task using the installation media. After installation the task will start but only runs in so called 'demo' mode. This means that the XY-Chart task runs on limited resources and runs only for a period of time (one hour). After this period has expired the task will shutdown and can not be restarted before the complete FactoryLink system has been restarted.

After installation of this demo version an authorization code can be ordered and installed which enables the task to run with full functionality. The authorization code must be entered manually in the {FLOPT}/rld.opt file. For more information on entering the authorization code in the rld.opt file refer to *Appendix A*.

The limitations of a demo version of the XY-chart task are:

- one hour of consecutive run-time
- not restartable (FactoryLink must be restarted)

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4. Principle

4.1. Operation principle

The XY-chart task works in conjunction with the FactoryLink Dynamic Color Graphics task to graphically simulate the function of a X versus Y diagram. A XY-chart will be shown to the user by the Graphics task and will therefore be fully integrated in the FactoryLink System. The control of the chart is handled by the XY-chart task. The exchange of information between the two mentioned task is based on mailbox communication. Two mailboxes are used for communication between the two tasks, the user needs only to configure one mailbox, the 'XY-Chart Mailbox'. The other mailbox, 'Graphics Mailbox', is an already predefined database element.

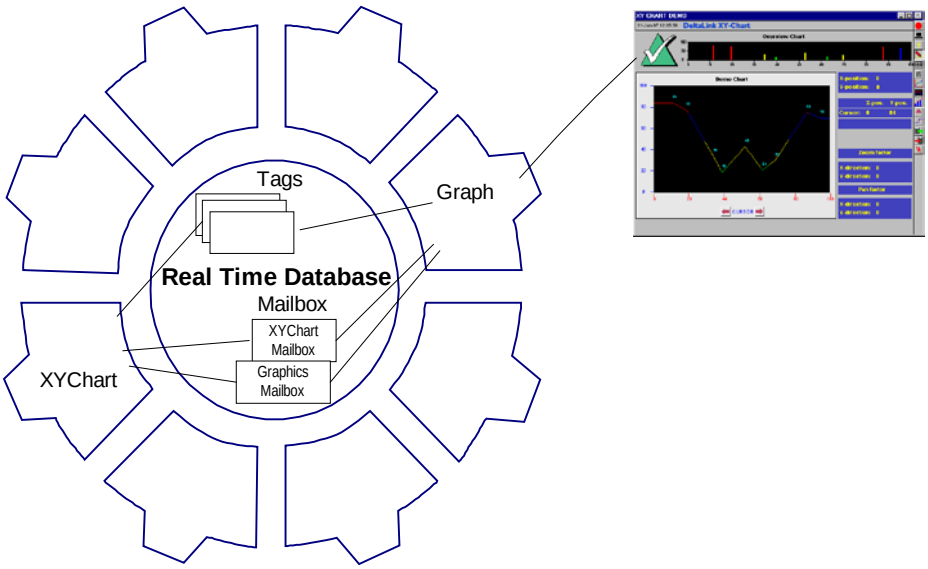

Figure 4.1.1 The Graphics/XY-Chart Principle.

The XY-chart task supports x-y diagrams situated in all of the four quadrants. This means that the values for X and Y axis are not limited to a certain value. Basically one type of diagrams can be created: x-y relationships (mathematical functions). A special case of this type of diagram which can be realised is the scatter diagram. The special requirements for this type of chart will be explained in the next chapter. As it appears to the user a scatter diagram is a XY-chart for which only the points are visible, there will be no lines between successive points.

A XY-chart consists basically of three parts: the chart itself, the XY-plot and the color definition. Figure 4.1.2 shows a visualisation of the three parts.

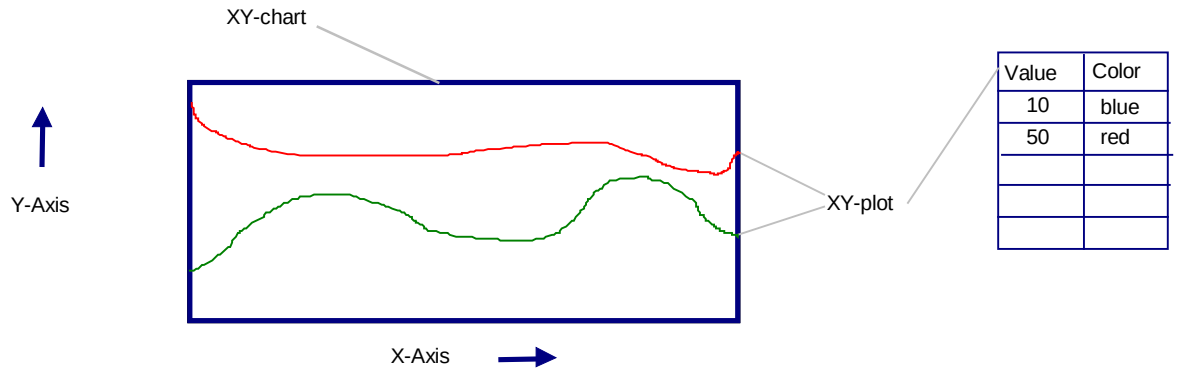

Figure 4.1.2 Basic parts of the XY-chart.

4.2. Chart basic parts

4.2.1. Chart

The ‘chart’ is the first basic part and determines the size of the XY-chart as it is presented to the user. Except the size the following properties are set for the XY-chart: background color, resolution in the X-direction, orientation and controls of the diagram. The chart controls allow the user to perform several actions during runtime. The pan and zoom rate for the X- / Y-direction can dynamically be altered. More or less XY-points can be shown and/or the origin of the X- / Y-axis can be shifted. It is also possible to "freeze" a chart, allowing to change the XY-plot appearance(s) without seeing the changes immediately on the screen.
On a chart one or more XY-plots can be presented. With the chart definition the resolution for every XY-plot is set. The resolution determines how many XY-points as a maximum can be presented on a chart, a resolution of 100 means that there can be 100 (or less) points visible (for every XY-plot) on a chart. Another term directly related to the resolution is the relative X-position. The relative X-position corresponds with the point number (in the X-direction), and will always be greater or equal to zero and less or equal to the resolution. The engineering units of the X-axis can be defined for every XY-plot individually, and are not limited in value due to the principle of relative points. The resolution for the Y-axis is indefinite, but is in practice limited by the screen resolution of your monitor.

4.2.2. XY-plot

The next part is the XY-plot definition, here the relationship between the X- and Y-axis is defined. The appearance of the plot is defined by the color schema, the settings of the line and marker style, the interpolation mode and the engineering units for the X- and Y-axis. Every XY-point can individually be changed, and one or more XY-plots may be presented on one chart.
For a XY-plot there are two special options, the first option is retrieving XY-points from a plot, by placing the value(s) on tag(s). This can for example be used to store XY-points to disk (Database Logger) or to generate a printed report (Report Generator).
The second special option is the one to save a XY-plot to disk, this is an easy to use option for saving/restoring complete XY-plots. The used file format corresponds with that of the Batch Recipe task. Both the XY-Chart and Batch Recipe task are able to read and write this type of files.

4.2.3. Color definition

The last part is the color definition for a XY-plot. The color definition is unique for every XY-plot. All XY-points of a XY-plot may have the same color, or the color can depend on the Y-value of a point. The limit for a color change can be static or dynamic, dynamically the limit for a color change is set by a tag value. The same applies for the color, if needed the color can dynamically be set by a tag value.

4.3. FactoryLink domain selection

The standard domain for the XY-Chart task is the USER domain. The XY-Chart task communicates with the Graphics task which is normally located in the USER domain. **Important:** The XY-Chart and the Graphics task must be in the same domain (either SHARED or USED). The XY-Chart task should be started/stopped by the RunTime-Manager, as any other FactoryLink task.

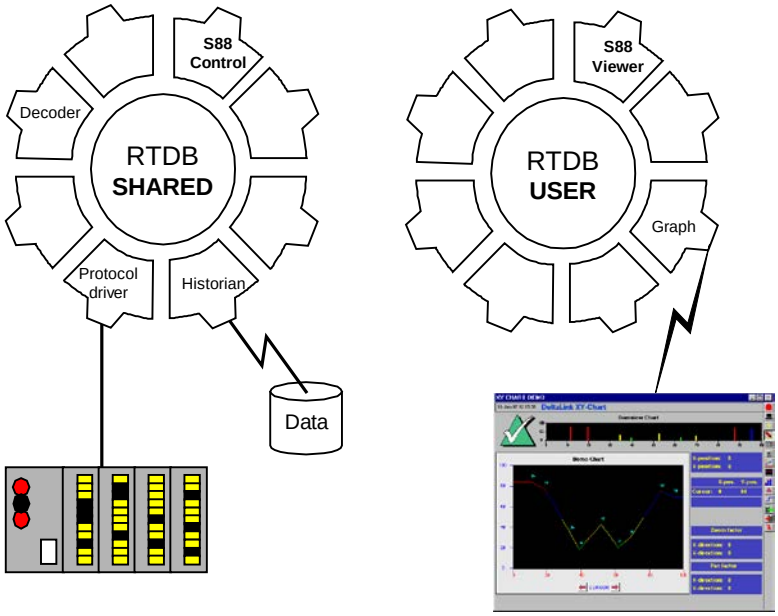

Figure 4.3.1 Standard domain selection.

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5. Configuration tables

The configuration of a XY-chart consists of two steps. First defining a chart with the Application Editor, second setting up a plot for the chart with the configuration tables of the XY-Chart task.

5.1. Application Editor

In the Configuration Manager Main Menu, select **Application Editor**. The background of a XY-chart should be drawn with the Application Editor. The drawn object must be animated as a 'chart'. The 'chart' animation enables a set of generic controls for every XY-plot on a chart. The meaning of the input fields for the 'chart' animation, if it is used in combination with XY-Chart task, are described below.

Note: *For general information about entering data in FactoryLink configuration tables, refer to the FactoryLink Fundamentals Manual.*

Note: *For information about accessing the Application Editor refer to the FactoryLink Application Editor Manual.*

5.1.1. Chart animation

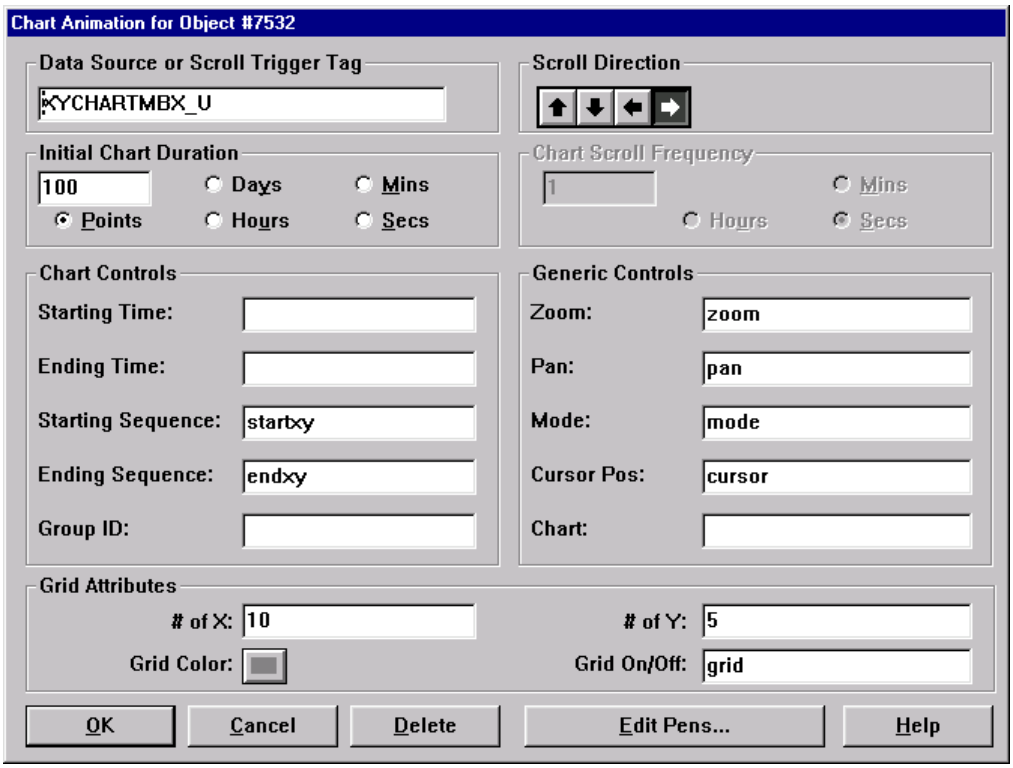

Figure 5.1.1 FactoryLink chart animation.

The 'chart' animation allows the user to define the maximum resolution in the X-directon, the background, a grid and the controls for a XY-chart. There is no need to define a pen for the chart, any defined pen here will be ignored by the XY-Chart task ! The line settings are defined in the configuration tables of the XY-Chart task, with the Configuration Manager, see the next section.

- **Data Source or Scroll Trigger Tag**
  Tag name of the XY-Chart task mailbox element that the developer defines, to be referenced by the Graphics task. The XY-Chart task uses this mailbox to receive requests from the Graphics task. For all XY-Chart animation's the same mailbox tag must be used. The tag name entered here must also correspond with the name of the mailbox tag entered in the panel *XY-Chart Mailbox*.

entry: Required.
entry type: Standard FactoryLink tag name.
valid entry: MAILBOX.

- **Direction**

Direction of the X-axis of a chart on the screen. To select a direction, position the cursor on the arrow that represents the direction and press mouse button.

entry: Required.
entry type: Selection field.
valid entry: Up, Down, Right, Left.

- **Initial Chart Duration**

Length of the X-axis in points. The value entered is the maximum number of points available in the X-direction of the chart (resolution). Use only the ***Points*** style, another style will normally not result in a visualization of the chart.

entry: Required.
entry type: Decimal number.
valid entry: Positive integer 0 .. 3600.

- **Chart Scroll Frequency**

Entry is disabled if the ***Points*** style is selected for the field **Initial Chart Duration**.

entry: Disabled.

- **Starting Time**

Entry is currently not used for a XY-chart.

entry: Not used.

- **Ending Time**

Entry is currently not used for a XY-chart.

entry: Not used.

- **Starting Sequence**

Tag name of an element that has the value of the first X-position visible in the chart. The value is updated in case the pan and/or zoom rate is changed. The actual value can be controlled with entries, in the panel *XY-Chart Displays*, for the X-legend.

entry: Optional.
entry type: Standard FactoryLink tag name.
valid entry: ANALOG, FLOAT, LONGANA.

- **Ending Sequence**

Tag name of an element that has the value of the last X-position visible in the chart. The value is updated in case the pan and/or zoom rate is changed. The actual value can be controlled with entries, in the panel *XY-Chart Displays*, for the X-legend.

entry: Optional.
entry type: Standard FactoryLink tag name.
valid entry: ANALOG, FLOAT, LONGANA.

- **Group ID**
  Entry is currently not used for a XY-chart.

  entry: Not used.

- **Zoom**
  Tag name of an element whose value changes the span of the X-axis on a chart. Note that the zoom value in the X-direction is common to all the plots on a chart. The value of the tag represents a span expressed as a percentage of the range in the X-direction. The formula used for calculating the span is:

  X-zoom = Initial Chart Duration * (Zoom tag value / 100)

  For example: The zoom tag value is 25, which means a zoom factor of 25 %. The Initial Chart Duration is 200 points. For this XY-chart the number of points displayed will be:
  Initial Chart Duration * 0.25, being 50.
  The zoom factor ranges from 0% until 100%, the effective pan factor depends on the currently set X-zoom factor. If for example the X-zoom factor is 90%, the maximum effective X-pan factor will be 10%. The sum of the X-zoom and X-pan factor will always be less or equal to 100%.

  entry: Optional.
  entry type: Standard FactoryLink tag name.
  valid entry: ANALOG, FLOAT, LONGANA.

- **Pan**
  Tag name of an element whose value changes the offset in the X-direction. Note that the pan value in the X-direction is common to all the plots on a chart. The value of the tag represents an offset expressed as a percentage of the range in the X-direction. The formula used for calculating the offset is:

  X-offset = Initial Chart Duration * (Pan tag value / 100)

  For example: The pan tag value is 25, which means a pan factor of 25 %. The Initial Chart Duration is 200 points. For this XY-chart the minimum X-point number displayed in the chart will be: Initial Chart Duration * 0.25, being 50.
  The pan factor ranges from 0% until 100%, the effective pan factor depends on the currently set X-zoom factor. If for example the X-zoom factor is 90%, the maximum effective X-pan factor will be 10%. The sum of the X-zoom and X-pan factor will always be less or equal to 100%.

  entry: Optional.
  entry type: Standard FactoryLink tag name.
  valid entry: ANALOG, FLOAT, LONGANA.

- **Mode**
  Tag name of an element whose value toggles or triggers the drawing mode of a chart from inactive to active or vice versa. If no tag is specified the drawing mode will always be active. An active drawing mode means that a XY-chart is redrawn immediately after a change of X-pan, X-zoom factor or a XY-plot. Changes for a XY-plot which will cause a redraw are: style, marker, interpolation, visibility, defining or undefining points. A description of these properties is given in the next chapter. The value of the digital tag entered in this field can be interpreted in two ways, a toggle or a trigger. The functionality of the tag is defined with the field **Drawing Mode** in the *XY-chart Displays* panel. For a normal drawing mode the digital tag is a toggle, if the value of the tag is equal to zero, nothing will be drawn in the chart. This gives the possibility to update/change the XY plot(s) for a chart without seeing the changes immediately. For tag value not equal to zero, or if the entry is left blank, the chart is redrawn after any of the above mentioned changes. In case of mode drawing the mode tag is interpreted as a trigger, only forcing the tag value to a value not equal to zero, will result in a redraw of the chart.

  entry: Optional.
  entry type: Standard FactoryLink tag name.
  valid entry: DIGITAL, ANALOG.

- **Cursor Pos**
  Tag name of a real-time database element whose value specifies the location of the cursor on the chart. A value cursor is a line orthogonal on the X-direction that moves in the X-direction. The cursor position can be set by writing a value to the tag or by positioning the mouse cursor on a valid X-position and pressing a mouse button. The position for the cursor is relative to every XY-plot, so the first point visible is always zero, the next point visible is always one etc.

  entry: Optional.
  entry type: Standard FactoryLink tag name.
  valid entry: ANALOG.

- **Chart Color**
  Tag name of the real-time database element containing the value of the chart's background color.

  entry: Optional.
  entry type: Standard FactoryLink tag name.
  valid entry: ANALOG.

- **Grid On/Off**
  Tag name of the real-time database element that controls the absence or presence of a grid on the chart. If the value of the element is 1 (ON), a grid is placed on the chart. If the value of the element is 0 (OFF), no grid is placed on the chart.

  entry: Optional.
  entry type: Standard FactoryLink tag name.
  valid entry: DIGITAL.

- **Grid Color**
  Indicator of the color of the grid if an element is specified in Grid On/Off and the value of that element is 1 (ON), or if a unit for the grid is defined.

  entry: Optional.
  entry type: Selection field.
  valid entry: Standard FactoryLink color.

- **# of X**
  Number of units between each grid line on the horizontal (X) axis.

  entry: Optional.
  entry type: Decimal number.
  valid entry: 0 .. 65535.

- **# of Y**
  Number of units between each grid line on the vertical (Y) axis.

  entry: Optional.
  entry type: Decimal number.
  valid entry: 0 .. 65535.

5.1.2. Chart object ID

Every object on a drawing has an object name and an object ID. Objects are referred to by their Ids, except in PowerVB code. The object name can be changed by the user, the object ID is assigned by the FactoryLink system (on creation of an object) and can not be altered by the user. Whenever referencing to a graphical object, the XY-chart task needs the ID of an object.

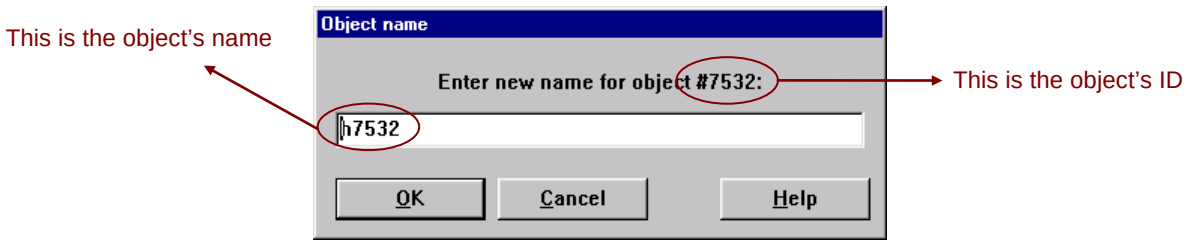

Figure 5.1.2 Chart object name and ID.

The popup dialog for changing the name of an object, shows both the object name and the object ID. See the figure above.

5.2. XY-Chart configuration

In the Configuration Manager Main Menu, select **XY-Chart**. Four tables appear, with the titles of all panels visible for direct access. To access a specific panel position the cursor on a visible area and press the left mouse-button, or use the Next/Prev buttons.

Note: For general information about entering data in FactoryLink configuration tables, refer to Chapter 2 of the FactoryLink Fundamentals Manual.

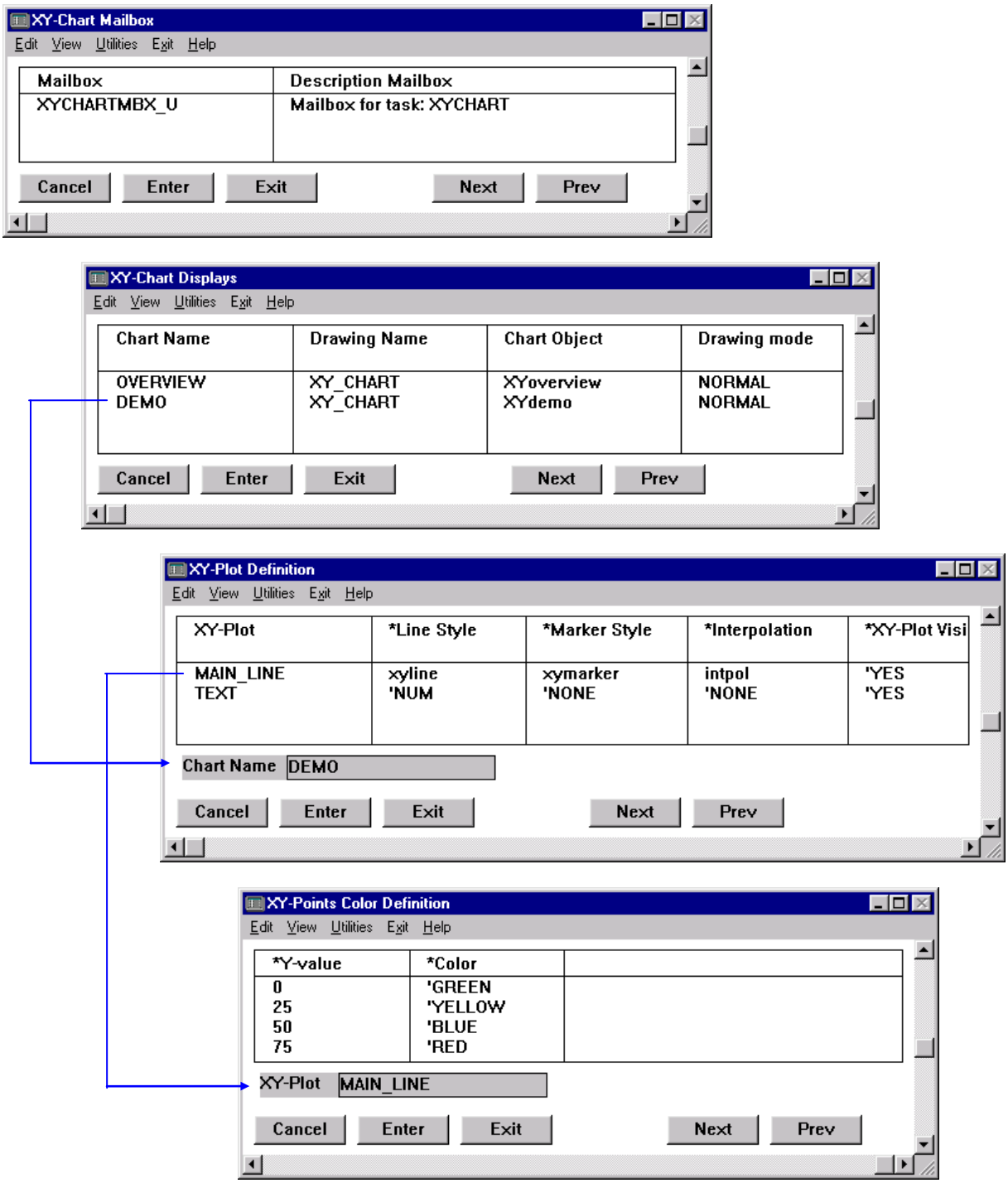

Figure 5.2.1 XY-Chart configuration tables.

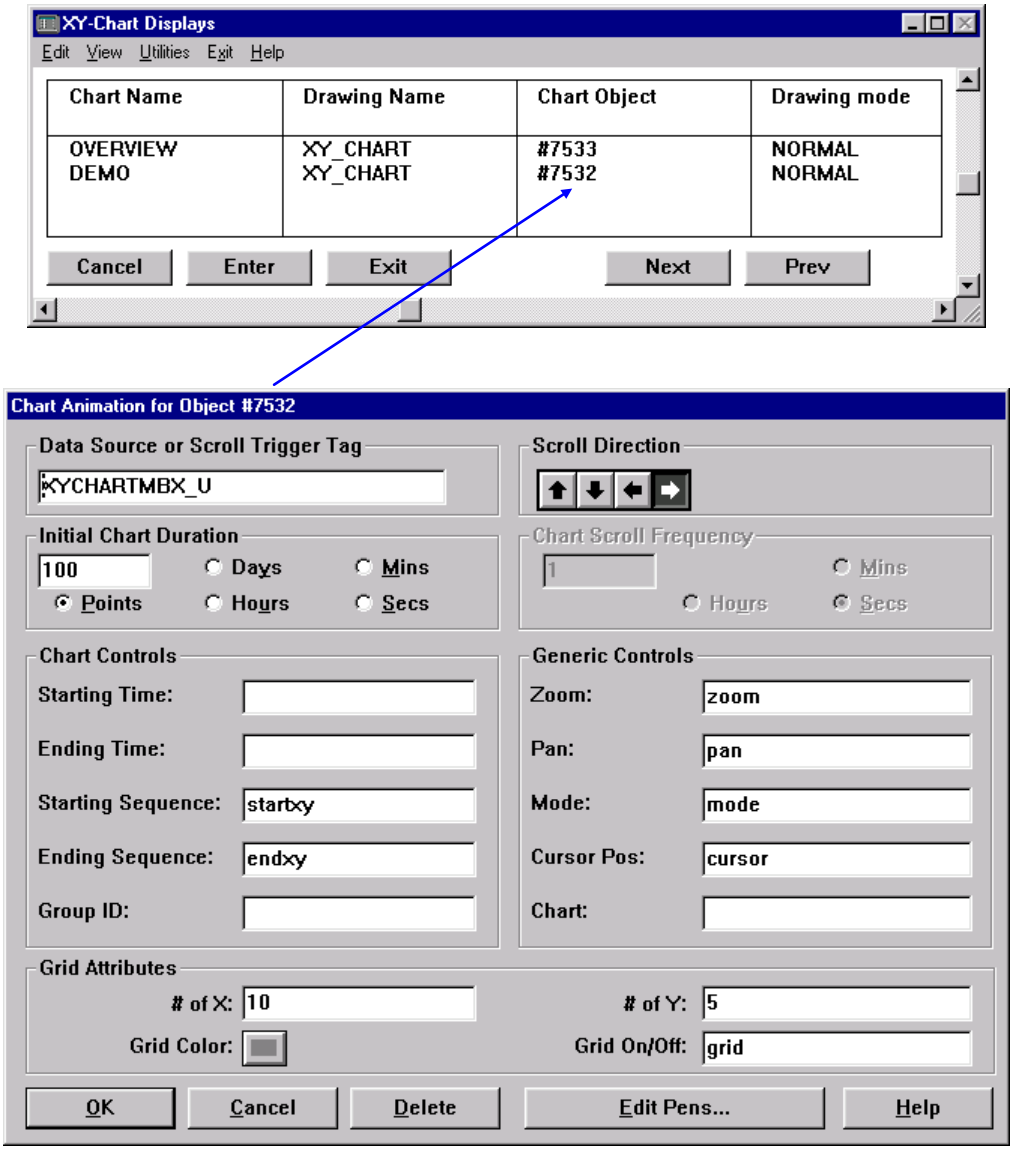

Figure 5.2.2 XY-Chart relation between graphics and table configuration.

5.2.1.Mailbox

From the display of all the panels, select the *XY-Chart Mailbox* panel.

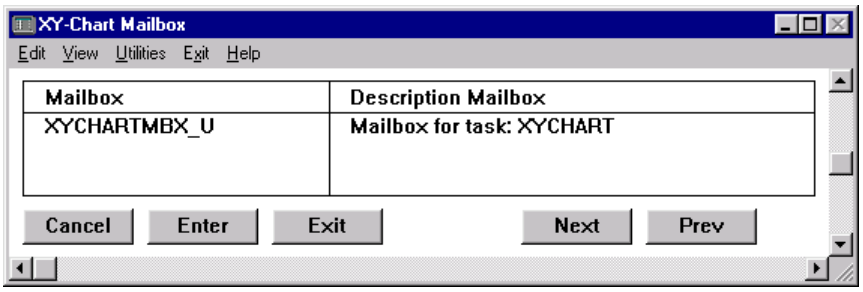

Figure 5.2.3 XY-Chart Mailbox panel.

The XY-Chart Mailbox panel allows the user to initialize one Mailbox Tag for the XY-Chart task. Only one Mailbox is needed for full performance of the task-combination Graphics/XY-Chart. Specify the following information.

- **Mailbox**
  Tag name of the XY-Chart mailbox element that the developer defines, to be referenced by the Graphics task. The Graphics task uses this mailbox to send requests to the XY-Chart task. The name of the mailbox should match with the tag entered in the 'chart' animation(s) defined with the Application Editor.

  entry: Required.
  entry type: Standard FactoryLink tag name.
  valid entry: MAILBOX.

- **Description Mailbox**
  Tag description of the XY-Chart mailbox element.

  entry: Display only.

5.2.2.XY-Chart definition

From the display of all the panels, select the *XY-Chart Displays* panel.

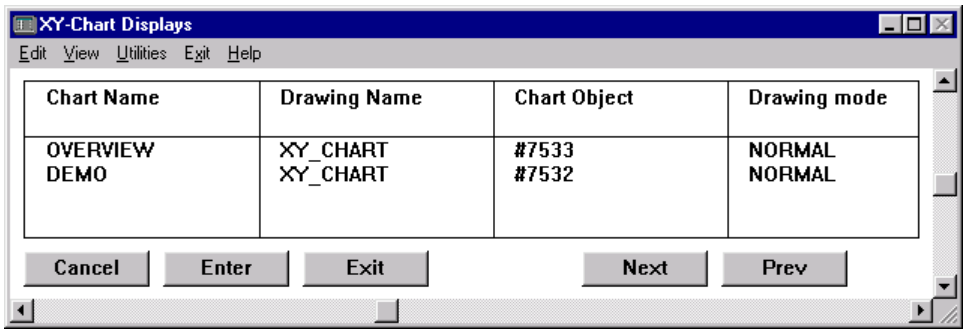

Figure 5.2.4 XY-Chart Displays.

The XY-Chart Displays panel allows the user to specify the (graphic) display/object names on which XY-plot(s) are active. This table also includes entries for global chart functions.

- **Chart Name**
  Logical name of a chart assigned by the user to represent a particular XY-chart. The entry is a selection field for the plot definitions on a XY-chart.

  entry: Required.
  entry type: Alphanumeric string.
  valid type: String of up to 16 characters.

- **Display Name**
  Name of the display (drawing) on which the XY-chart is present. The drawing is created with the Application Editor. The entry should match with a filename of a drawing.

  entry: Required.
  entry type: Alphanumeric string.
  valid type: String of up to 16 characters.

- **Chart Object**
  Object ID of the chart created with the Application Editor. The entry should match with the object ID as it is defined on a drawing.

  entry: Required.
  entry type: Alphanumeric string.
  valid type: String of up to 16 characters.

- **Drawing Mode**
  This entry is used to specify how the mode tag (defined on the chart animation with the 'Application Editor') is interpreted. See also the discussion in the previous chapter. Standard a mode tag is interpreted as a toggle (NORMAL), the XY-chart is redrawn after the user changed an Y-value, forced the 'set point' trigger, changed a zoom or pan factor and the tag value is ON (1). If needed the redrawing can only start on demand by forcing the mode tag to ON (MODE).

  entry, default: Required, NORMAL
  type of entry: Alphanumeric string.
  valid entry: NORMAL, MODE.

- **Clear Chart**
  Tag name of the real-time database element that controls the clearing of the chart. If the value of the element is forced to 1 (ON), the chart is cleared.
  entry: Optional.

entry type: Standard FactoryLink tag name.
valid entry: DIGITAL.

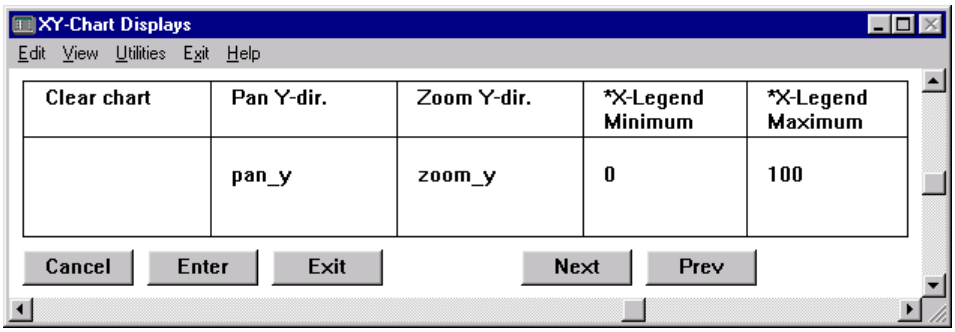

Figure 5.2.5 XY-Chart Displays.

- **Pan Y-dir.**

Tag name of an element whose value changes the offset in the Y-direction. Note that the pan value in the Y-direction is common to all the plots on a chart. The value of the tag represents an offset expressed as a percentage of the range in the Y-direction. The panning for every XY-plot is calculated from the tag value, and the individual Y-min. and Y-max. values (as they are specified for a XY-plot). The formula used for calculating the offset is:

Y-offset = Y-min + (Y-max - Y-min) * (Pan tag value / 100)

For example: The pan tag value is 25, which means a pan factor of 25 %. The Y-min. value is -10, The Y-max value is 110. For this particular XY-plot the the minimum Y-value displayed in the chart will be: Y-min + (Y-max - Y-min) * 0.25, being 20.
The pan factor ranges from 0% until 100%, the effective pan factor depends on the currently set Y-zoom factor. If for example the Y-zoom factor is 90%, the maximum effective Y-pan factor will be 10%. The sum of the Y-zoom and Y-pan factor will always be less or equal to 100%.

entry: Optional.
entry type: Standard FactoryLink tag name.
valid entry: ANALOG, FLOAT, LONGANA.

- **Zoom Y-dir.**

Tag name of an element whose value changes the span of the Y-axis on a chart. Note that the zoom value in the Y-direction is common to all the plots on a chart. The value of the tag represents a span expressed as a percentage of the range in the Y-direction. The zooming for every XY-plot is calculated from the tag value, and the individual Y-min. and Y-max. values (as they are specified for a XY-plot). The formula used for calculating the span is:

Y-zoom = Y-offset + (Y-max - Y-min) * (Zoom tag value / 100)

For example: The pan tag value is 25, which means a pan factor of 25 %. The Y-min. value is -10, The Y-max value is 110. For this particular XY-plot the minimum Y-value displayed in the chart will be: Y-min + (Y-max - Y-min) * 0.25, being 20.
For a zoom tag value of 50, which means a span of 50 %, the span will be: Y-span = 60 = (Y-max - Y-min) * 0.5. So the maximum displayed Y-value is Y-zoom = Y-offset + Y-span = 80.

entry: Optional.
entry type: Standard FactoryLink tag name.
valid entry: ANALOG, FLOAT, LONGANA.

- ***X-Legend Minimum**

Minimum value for a X-legend of a XY-chart. This value entered here specifies the absolute minimum value of the X-legend, and will be written to the **Starting Sequence** tag (if specified in the chart animation). Activating panning in the X-direction causes a recalculation of the actual X-legend minimum, the result will be written to the **Starting Sequence** tag. The value represents the minimum X-legend value if panning in the X-direction is inactive. The entry can be a numerical value as well as a tag, which allows setting the minimum for the X-legend dynamically.

entry: Optional.
entry type: Numeric value, Standard FactoryLink tag name.
valid entry: Numeric: any value.
Tag: ANALOG, FLOAT, LONGANA.

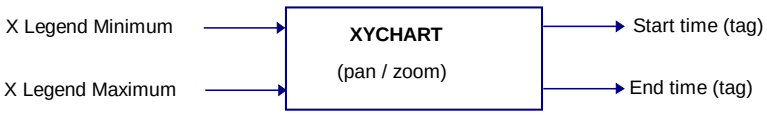

Figure 5.2.6 X-Legend Minimum and Maximum.

- ***X-Legend Maximum**

Maximum value for a X-legend of the XY-chart. This value entered here specifies the absolute maximum value of the X-legend, and will be written to the **Ending Sequence** tag (if specified in the chart animation). Activating panning or zooming in the X-direction causes a recalculation of the actual X-legend minimum, the result will be written to the **Ending Sequence** tag. The value represents the maximum X-legend value if panning and/or zooming in the X-direction are inactive. The can be a numerical value as well as a tag, which allows dynamically setting the minimum for the X-legend.

entry: Optional.
entry type: Numeric value, Standard FactoryLink tag name.
valid entry: Numeric: any value.
Tag: ANALOG, FLOAT, LONGANA.

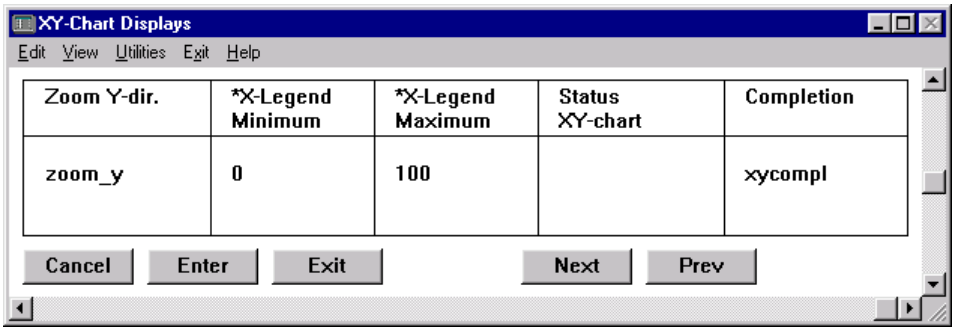

Figure 5.2.7 XY-Chart Displays.

- **Status**

Tag name of the real-time database element that represents the status after every draw, define/undefine, retrieve or file command. A value not equal to zero indicates an error (*see Appendix B*).

entry: Optional.
entry type: Standard FactoryLink tag name.
valid entry: ANALOG.

- **Completion**

Tag name of the real-time database element that is forced to 1 (ON) after every redraw and clearing of the XY-chart.

entry: Optional.
entry type: Standard FactoryLink tag name.
valid entry: DIGITAL.

5.2.3.XY-Plot definition

From the display of all the panels, select the *XY-Plot Definition* panel.

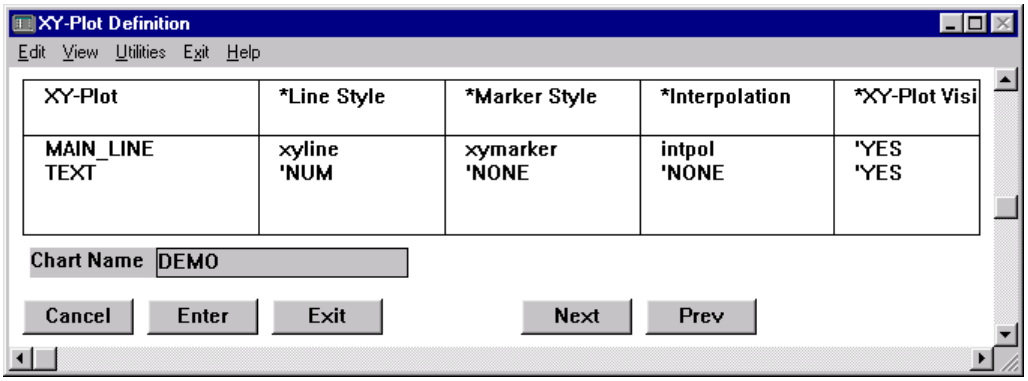

Figure 5.2.8 XY-Plot Definition.

The XY-Plot Definition panel allows the user to specify one or more XY-plot(s) for a chart. The relationship between X and Y is defined, including control options.

- **XY-Plot**
  Logical name for a XY-plot. The entry is a selection field for the color definitions of XY-points on this XY-plot.

  entry: Required.
  entry type: Alphanumeric string.
  valid entry: String of up to 16 characters.

- ***Line Style**
  Line style of the XY-plot used for drawing the XY-points on a XY-chart. There are four line styles solid, dotted, dashed or dash-dot. Except for the line styles there are three other representations of the points, that is as a bar, a number or combined.

  entry: Required / Default: SOLID.
  entry type: Alphanumeric string, Standard FactoryLink tag name.
  valid entry: String: NONE, SOLID, DOT, DASH, DASHDOT, BAR, NUM, NUMBAR.
  Tag: ANALOG.
  description:

String	Tag value	Description
NONE	0	No line style
SOLID	1	Solid line
DOT	2	Dotted line
DASH	3	Dashed line
DASHDOT	4	Dash/dot line
BAR	5	Bar
NUM	6	Numerical
NUMBAR	7	Bar and Numerical

- ***Marker Style**
  Marker style of the XY-plot used for drawing the XY-points on a XY-chart. There are nine marker styles: circle, diamond, box, triangle, plus sign, cross, solid diamond, solid box and x sign. A special diagram is a scatter diagram. A scatter diagram is created by defining no interpolation, a marker style (except NONE) and no line style (see above) for a XY-plot.

  entry: Required / Default: NONE.
  entry type: Alphanumeric string, Standard FactoryLink tag name.
  valid entry: String: NONE, CIRCLE, DIAMOND, BOX, TRIANGLE, PLUS, CROSS, SDIAMOND, SBOX.

Tag: ANALOG.

description:

String	Tag value	Description
NONE	0	None
CIRCLE	1	Circle
DIAMOND	2	Diamond
BOX	3	Box
TRIANGLE	4	Triangle
PLUS	5	Plus
CROSS	6	Cross
SDIAMOND	7	Solid diamond
SBOX	8	Solid box

- ***Interpolation**

Interpolation mode between XY-points. Normally a XY-plot shows a relation between X and Y. A special diagram is a scatter diagram. A scatter diagram is created by defining no interpolation, no line style (see below) and a marker style for a XY plot.
For an interpolation mode (entry is not NONE) the points on XY-plot are 'connected' with the chosen line style, as there are line, power 2, polynomial of third order, square root, step and hold interpolation.

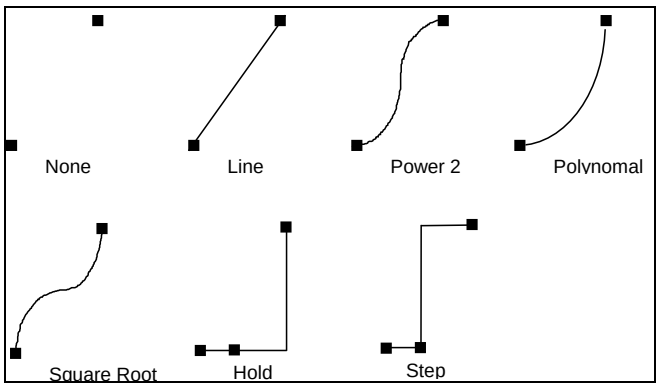

Figure 5.2.9 Interpolation types.

entry: Required / Default: LINE.
type of entry: Alphanumeric string, Standard FactoryLink tag name.
valid entry: String: NONE, LINE, LINE_SEC, LINE_BEGIN, LINE_END, POW2, POW2_SEC, POW2_BEGIN, POW2_END, POLY3, POLY3_SEC, POLY3_BEGIN, POLY3_END, SQRT2, SQRT2_SEC, SQRT2_BEGIN, SQRT2_END, HOLD, HOLD_SEC, HOLD_BEGIN, HOLD_END, STEP, STEP_SEC, STEP_BEGIN, STEP_END.
Tag: ANALOG.

description:

Interpolation	Tag value	Description
NONE	0	No interpolation between points.
LINE	10	Line interpolation, from origin until end of chart.
LINE_SEC	11	Line interpolation, from first defined point until last defined point.
LINE_BEGIN	12	Line interpolation, from origin until last defined point.
LINE_END	13	Line interpolation, from first defined point until end of chart.
POW2	20	Power 2 interpolation, from origin until end of chart.
POW2_SEC	21	Power 2 interpolation, from first defined point until last defined point.
POW2_BEGIN	22	Power 2 interpolation, from origin until last defined point.
POW2_END	23	Power 2 interpolation, from first defined point until end of chart.

Interpolation	Tag value	Description
POLY3	30	Polynomial 3 order, from origin until end of chart.
POLY3_SEC	31	Polynomial 3 order, from first defined point until last defined point.
POLY3_BEGIN	32	Polynomial 3 order, from origin until last defined point.
POLY3_END	33	Polynomial 3 order, from first defined point until end of chart.
SQRT2	40	Square root interpolation, from origin until end of chart.
SQRT2_SEC	41	Square root interpolation, from first defined point until last defined point.
SQRT2_BEGIN	42	Square root interpolation, from origin until last defined point.
SQRT2_END	43	Square root interpolation, from first defined point until end of chart.
HOLD	50	Hold interpolation, from origin until end of chart.
HOLD_SEC	51	Hold interpolation, from first defined point until last defined point.
HOLD_BEGIN	52	Hold interpolation, from origin until last defined point.
HOLD_END	53	Hold interpolation, from first defined point until end of chart.
STEP	60	Step interpolation, from origin until end of chart.
STEP_SEC	61	Step interpolation, from first defined point until last defined point.
STEP_BEGIN	62	Step interpolation, from origin until last defined point.
STEP_END	63	Step interpolation, from first defined point until end of chart.

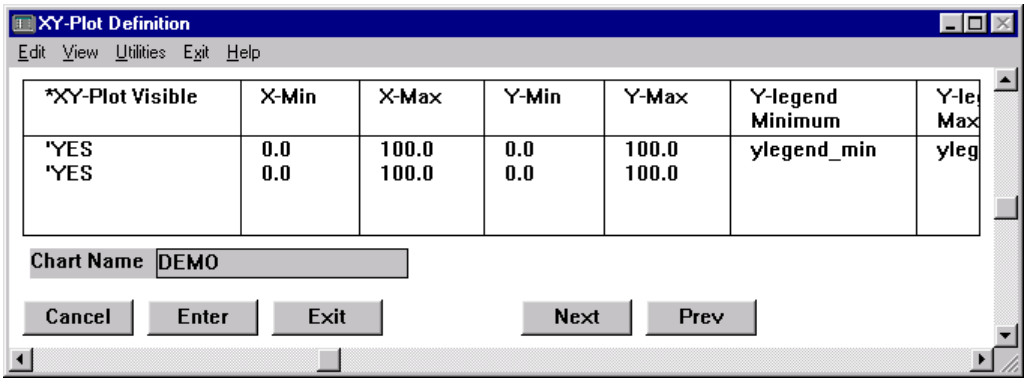

Figure 5.2.10 XY-Plot Definition.

- **XY-Plot Visible**

  Tag name of an element whose value toggles the XY-plot mode from invisible to visible or vice versa. If the value of the tag is equal to zero (OFF), the XY-plot is not drawn in the chart (invisible). For tag value not equal to zero (ON) the XY-plot will be drawn in the chart. Except dynamically a XY-plot can be made permanent visible (YES) or invisible (NO)

  entry: Required / Default: YES.
  type of entry: Alphanumeric string, Standard FactoryLink tag name.
  valid entry: String: NO, YES.
  Tag: DIGITAL.

- **X-Min**

  Minimum X-value for a XY plot (Engineering units). The X-axis of this plot is limited from the value entered in this field to X-max. The X-value of points to be added/removed to/from the plot should be within the range: X-min, X-max. If not an appropriate error message is generated and the point will be rejected.

entry: Required / Default: 0.
entry type: Decimal number.

- **X-Max**
  Maximum Y-value for a XY-plot (Engineering units). The X-axis of chart is limited from X-min to the value entered in this field.

  entry: Required / Default: 100.
  entry type: Decimal number.

- **Y Min**
  Minimum Y-value for a XY-plot (Engineering units). The Y-axis of chart is limited from the value entered in this field to Y-min. The Y-value of points to be added/removed to/from the plot should be within the range: Y-min, Y-max. If not an appropriate error message is generated, however the point will not be rejected.

  entry: Required / Default: 0.
  entry type: Decimal number.

- **Y Max**
  Maximum Y-value for a XY-plot. The Y-axis of chart is limited from Y-min to the value entered in this field.

  entry: Required / Default: 100.
  entry type: Decimal number.

- **Y-Legend Minimum**
  Tag name of the real-time database element that contains the actual minimum value for the Y-direction (Y-offset, see Y-zoom factor). The tag can be used for animating a dynamic legend in the Y-direction.

  entry: Optional.
  entry type: Standard FactoryLink tag name.
  valid entry: ANALOG.

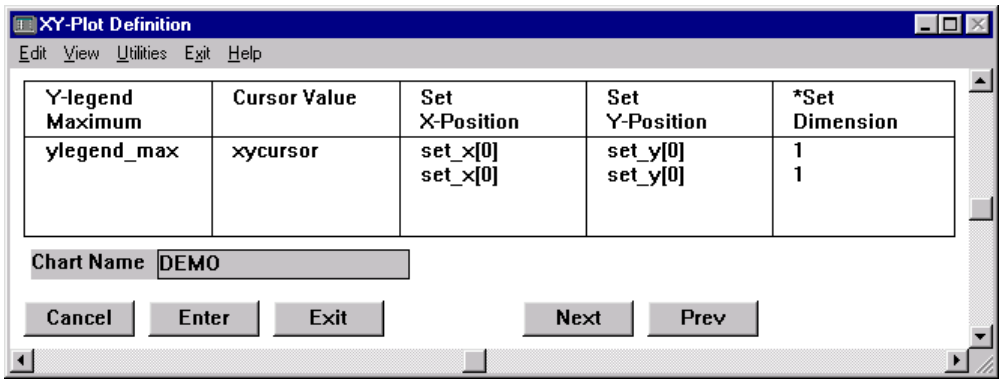

Figure 5.2.11 XY-Plot Definition.

- **Y-Legend Maximum**
  Tag name of the real-time database element that contains the actual maximum value for the Y-direction (Y-zoom, see Y-zoom factor). The tag can be used for animating a dynamic legend in the Y-direction.

  entry: Optional.
  entry type: Standard FactoryLink tag name.
  valid entry: ANALOG.

- **Cursor Value**
  Tag name of the real-time database element used to represent the Y-value of a XY-plot on the actual cursor position.

  entry: Optional.
  entry type: Standard FactoryLink tag name.
  valid entry: ANALOG, FLOAT, LONG ANALOG.

- **Set X-Position**
  Tag name (array) of the real-time database element used to specify the X-values on a XY-plot. For a tag array the first tag is the tag specified here, the length of the tag array considered is specified with the field **Set Dimension**.
  In case no tag is specified or the value of the tag is less then X-min, the X-positions are not relevant. The Y-values are assumed to correspond with relative X-positions starting at zero, increasing by one every next Y-value (only for tag arrays!).

  entry: Optional.
  entry type: Standard FactoryLink tag name.
  valid entry: ANALOG, FLOAT, LONG ANALOG.

- **Set Y-Position**
  Tag name (array) of the real-time database element used to specify the Y-values on a XY-plot. For a tag array the first tag is the tag specified here, the length of the tag array considered is specified with the field **Set Dimension**. As well as adding (defining) you can remove (undefine) a point for a XY-plot.
  Defining a Y-value: value >= Y-min.
  Undefining a Y-value: value < Y-min.

  There are two options for adding/removing (defining/undefining) a XY-point to/from a XY-plot.
  ① Defining/undefining is started if the change flag of the tag from the field **Set Y-Position** is set to 1 (ON) and there is no entry in the field **Set Point**.
  ② There is an entry in the field **Set Point**. Defining/undefining is started if the value of this digital tag is forced to 1 (ON).

  entry: Required.
  entry type: Standard FactoryLink tag name.
  valid entry: ANALOG, FLOAT, LONG ANALOG.

- ***Set Dimension**
  Length of the tag array for X- and Y-Set positions[2].

  entry: Required.
  entry type: Decimal number, Standard FactoryLink tag name.
  valid entry: Number: 1 .. 3600.
  Tag: ANALOG.

- **Clear Points**
  Tag name of the real-time database element that clears all the XY-points if the value is forced to 1 (ON). After a clear command all XY-points are undefined for the XY-plot.

  entry: Optional.
  entry type: Standard FactoryLink tag name.
  valid entry: DIGITAL.

[2]TAG dimension: The task XYCHART uses as a tag array, the array with the first element being the specified tag and the given length. The array dimension given here is **not** cross-checked with the one of the tag-array definition.

- **Set Point**

  Tag name of the real-time database element used to define/undefine a XY-point (array) on a XY-plot. If the element is forced to 1 (ON), value(s) for XY-points are defined/undefined. If an entry is specified, defining/undefining is not started if the change flag of the element **Set Y-Position** is set to 1 (ON).

  entry: Optional.
  type of entry: Standard FactoryLink tag name.
  valid entry: DIGITAL.

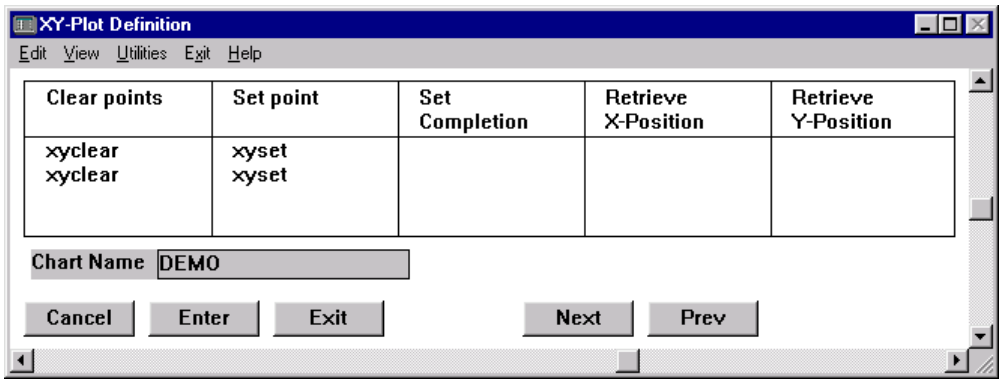

Figure 5.2.12 XY-Plot Definition.

- **Set Completion**

  Tag name of the real-time database element that is forced to 1 (ON) after every define-/undefine command.

  entry: Optional.
  type of entry: Standard FactoryLink tag name.
  valid entry: DIGITAL.

- **Retrieve X-Position**

  Tag name (array) of the real-time database element used to specify the X-values to retrieve Y-values from a XY-plot. For a tag array the first tag is the tag specified here, the length of the tag array considered is specified with the column **Dim** or **Dim Tag**. In case no tag is specified or the value of the tag is less then zero, the X-positions are not relevant. The Y-values are assumed to correspond with relative X-positions starting at zero, increasing by one every next Y-value (only for tag arrays!).

  There are two options for retrieving a XY-point from a XY-plot.
  ① Retrieving is started if the change flag of the tag from the field **Retrieve X Position** is set to 1 (ON) and there is no entry in the field **Retrieve**.
  ② There is an entry in the field **Retrieve**. Retrieving is started if the value of this digital tag is forced to 1 (ON).

  entry: Optional.
  type of entry: Standard FactoryLink tag name.
  valid entry: ANALOG, FLOAT, LONG ANALOG.

- **Retrieve Y-Position**

  Tag name (array) of the real-time database element in which the Y-values from a XY-plot are placed after a retrieve command. For a tag array the first tag is the tag specified here, the length of the tag array considered is specified with the column **Retrieve Dimension**. A defined point returns: Y-value >= Y-min. A undefined point returns: Y-value = Y-min - 1.

  entry: Optional.
  type of entry: Standard FactoryLink tag name.
  valid entry: ANALOG, FLOAT, LONG ANALOG.

- **Retrieve Dimension**
  Length of the tag array for X- and Y-Retrieve positions[3].

  entry: Required.
  entry type: Decimal number, Standard FactoryLink tag name.
  valid entry: Number: 1 .. 3600.
  Tag: ANALOG.

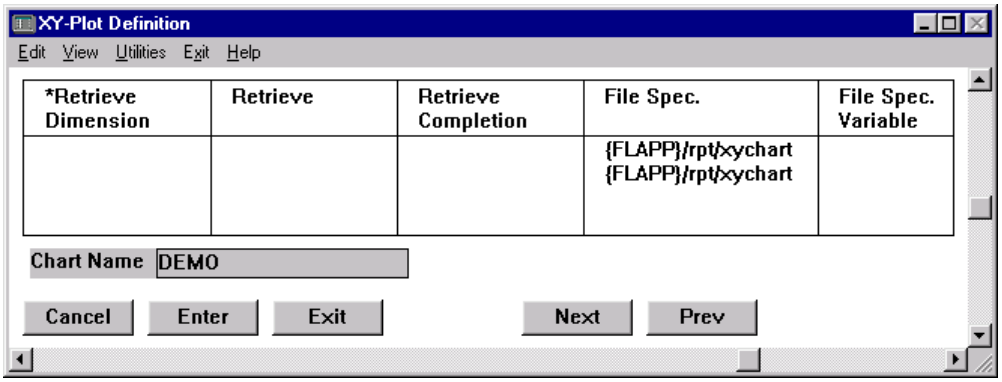

Figure 5.2.13 XY-Plot Definition.

- **Retrieve**
  Tag name of the real-time database element used to retrieve a XY-point (array) on a XY-plot. If the element is forced to 1 (ON), value(s) for XY-points are retrieved (tag(s) for Y-values are updated accordingly to the specified X-positions). If an entry is specified, retrieving is not started if the change flag of the element **Retrieve X-Position** is set to 1 (ON).

  entry: Optional.
  entry type: Standard FactoryLink tag name.
  valid entry: DIGITAL.

- **Retrieve Completion**
  Tag name of the real-time database element that is forced to 1 (ON) after every retrieve command.

  entry: Optional.
  entry type: Standard FactoryLink tag name.
  valid entry: DIGITAL.

- **File Spec.**
  A XY-plot can be saved to or restored from a file, called a XY-plot save file. The format of the XY-plot save file is compatible with the format of Batch Recipe[4] files. The File Specifier is a variable specifier that uses the value of the **File Spec. Variable** to form a path/file name for a binary XY-plot save file that contains a specific plot. The default directory for a XY-plot save file is {FLAPP}/LOG. The following environment variables can be used in a definition of a path/file name: {FLINK}, {FLAPP}, {FLOPT}, {FLNAME}, {FLDOMAIN} and {FLUSER}.

  entry: Optional.
  entry type: Alphanumeric string.
  valid entry: String of up to 128 characters.

[3]TAG dimension: The task XYCHART uses as a tag array, the array with the first element being the specified tag and the given length. The array dimension given here is **not** cross-checked with the one of the tag-array definition.
[4]Batch Recipe is an optional USDATA FactoryLink task.

- **File Spec. Variable**
  Variable specifier that is used to form with the **File Spec.** a full path/file name for a XY-plot save file.
  Note: For general information about variable specifiers in FactoryLink configuration tables, refer to the FactoryLink Fundamentals Manual.

  entry: Optional.
  entry type: Standard FactoryLink tag name.
  valid entry: DIGITAL, ANALOG, FLOAT LONGANA, MESSAGE.

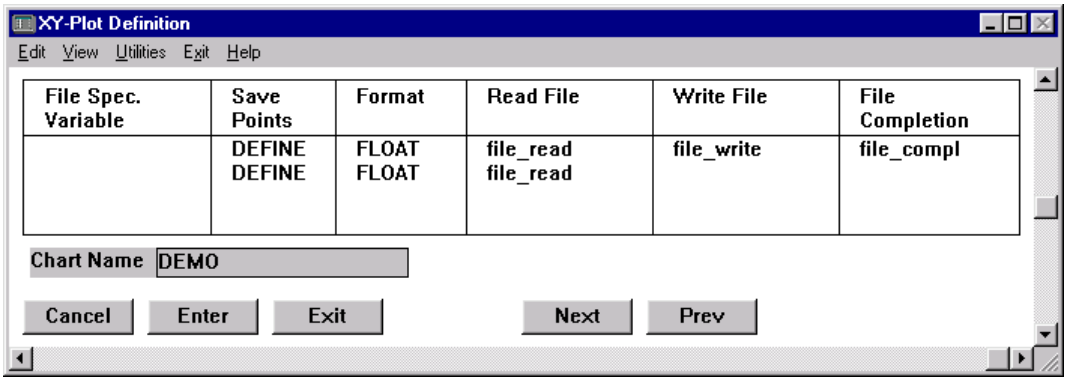

Figure 5.2.14 XY-Plot Definition.

- **Save Format**
  The specifier is used to instruct the XY-Chart task how many XY-points should be written in a XY-plot save file. All the points of a XY-plot can be written to a file, or just the defined ones. If a XY-plot save file is read, all the points found in the file will be defined points in the XY-plot.

  entry: Optional.
  entry type: Alphanumeric string.
  valid entry: ALL, DEFINED.

- **Format**
  The specifier is used to instruct the XY-Chart task which format for the X- and Y-positions is used in a XY-plot file. This format is used for both reading and writing a save file.

  entry: Optional.
  entry type: Alphanumeric string.
  valid entry: ANALOG, FLOAT, LONGANA.

- **Read File**
  Tag name of the real-time database element used to read XY-points from a save file. If the element is forced to 1 (ON), value(s) for X and Y points are read from the file.

  entry: Optional.
  entry type: Standard FactoryLink tag name.
  valid entry: DIGITAL.

- **Write File**
  Tag name of the real-time database element used to write XY-points to a save file. If the element is forced to 1 (ON), value(s) for X and Y points are written to the file.

  entry: Optional.
  entry type: Standard FactoryLink tag name.
  valid entry: DIGITAL.

- **File Completion**
  Tag name of the real-time database element that is forced to 1 (ON) after every file command (read or write).

  entry: Optional.
  entry type: Standard FactoryLink tag name.
  valid entry: DIGITAL.

5.2.4.Color definition

From the display of all the panels, select the *XY-Points Color Definition* panel.

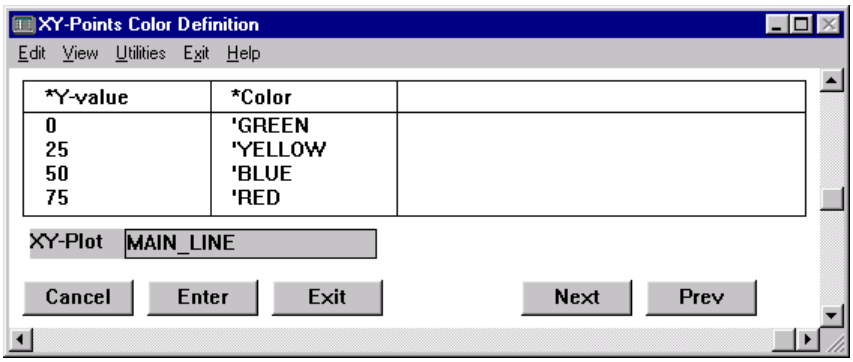

Figure 5.2.15 XY-Points Color Definition.

The XY-Points Color Definition panel allows the user to specify one or more colors to be used for drawing a XY-plot on a chart.

- **Y-value**
  The value entered in this field is used in combination with the color field. If the value in the Y-direction >= value entered, the defined color is used for drawing the XY-point.

  entry: Required.
  entry type: Decimal number, Standard FactoryLink tag name.
  valid entry: Number: any decimal value.
  Tag: DIGITAL, ANALOG, FLOAT, LONGANA.

- **Color**
  The color entered in this field is used in combination with the value entered in the previous field.

  entry: Optional.
  entry type: Alphanumeric string, Standard FactoryLink tag name.
  valid entry: String: RED, ORANGE-RED, ORANGE, YELLOW-ORANGE, YELLOW, GREEN-YELLOW, YELLOW-GREEN, PALE-GREEN, GREEN, LIME-GREEN, SEA-GREEN, AQUAMARINE, CYAN, LIGHT-BLUE, SKY-BLUE, MEDIUM-BLUE, BLUE, MIDNIGHT-BLUE, CORN-BLUE, ORCHID, MAGENTA, PINK, CORAL, FIREBRICK, INDIAN-RED, SIENNA, BROWN, SANDY-BROWN, KHAKI, LIGHT-OLIVE, MED-OLIVE, DARK-OLIVE, SPRING-GREEN, FOREST-GREEN, DARK-GREEN, DARK-AQUAMARINE, TURQUOISE, CADET-BLUE, SLATE-BLUE, STEEL-BLUE, NAVY-BLUE, BLUE-VIOLET, VIOLET, DARK-ORCHID, RED-VIOLET, PLUM, MAROON, DARK-MAROON, BLACK, DARK-GRAY4, DARK-GRAY, DARK-GRAY3, DARK-GRAY2, DARK-GRAY1, GRAY6, GRAY5, GRAY, GRAY4, GRAY3, GRAY2, GRAY1, LIGHT-GRAY4, LIGHT-GRAY, LIGHT-GRAY3, LIGHT-GRAY2, LIGHT-GRAY1, WHITE
  Tag: ANALOG
  description:

Color	Tag value	Color	Tag value
RED	0	SPRING-GREEN	32
ORANGE-RED	1	FOREST-GREEN	33
ORANGE	2	DARK-GREEN	34
YELLOW-ORANGE	3	DARK-AQUAMARINE	35
YELLOW	4	TURQUOISE	36

Color	Tag value	Color	Tag value
GREEN-YELLOW	5	CADET-BLUE	37
YELLOW-GREEN	6	SLATE-BLUE	38
PALE-GREEN	7	STEEL-BLUE	39
GREEN	8	NAVY-BLUE	40
LIME-GREEN	9	BLUE-VIOLET	41
SEA-GREEN	10	VIOLET	42
AQUAMARINE	11	DARK-ORCHID	43
CYAN	12	RED-VIOLET	44
LIGHT-BLUE	13	PLUM	45
SKY-BLUE	14	MAROON	46
MEDIUM-BLUE	15	DARK-MAROON	47
BLUE	16	BLACK	48
MIDNIGHT-BLUE	17	DARK-GRAY4	49
CORN-BLUE	18	DARK-GRAY3	50
ORCHID	19	DARK-GRAY2	51
MAGENTA	20	DARK-GRAY1	52
PINK	21	GRAY6	53
CORAL	22	GRAY5	54
FIREBRICK	23	GRAY4	55
INDIAN-RED	24	GRAY3	56
SIENNA	25	GRAY2	57
BROWN	26	GRAY1	58
SANDY-BROWN	27	LIGHT-GRAY4	59
KHAKI	28	LIGHT-GRAY3	60
LIGHT-OLIVE	29	LIGHT-GRAY2	61
MED-OLIVE	30	LIGHT-GRAY1	62
DARK-OLIVE	31	WHITE	63

Appendix A. The rld.opt file

In order to run the task permanently with full functionality either an authorisation sequence or a protection hardware key with the task option is needed. This appendix describes the authorisation sequence together with the option file.

The authorisation sequence of every independent module must reside in the {FLOPT}/rld.opt file in order to take effect. In case the task has been ordered with an authorisation sequence then this sequence resides on the install diskette (in the /opt/rld.opt file) and will be automatically added to the {FLOPT}/rld.opt file with the installation. In case the task has been previously installed from a demo diskette and the authorisation sequence has been purchased later then the sequence must be added manually to the {FLOPT}/rld.opt file.

The format of the rld.opt file consists of two parts. The first part is the comment header. This part remains always at the beginning of the file. Every line of the comment part starts with an '*' character. The second part contains the authorisation sequences of every independent module. Every line must hold one sequence code and must apply to a strict format.

An example of the option file looks like this:

Protection file: *rld.opt*

```
*
* Copyright 1998 RLD Automation All Rights Reserved
*
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*
*
* FactoryLink Serial Number: 13413980
*
* RLD Automation module option:
*
* MODULE = taskname
* .      = <space>
* X      = authorization code supplied by RLD Automation
*
* MODULE.XXXX.XXXX.XXXX.XXXX.XXXX.XXXX.XXXX.XXXX.XXXX
XYCHART  2F0D 8CF8 E8DF 6318 FDDE 8604 6B96 BDA7 2154
```

In case a full installation diskette with authorisation diskette has been ordered then the header in the option file on the diskette contains the serial number of FactoryLink. The task will run only on the FactoryLink package with this serial number. If the serial number is not listed in the {FLOPT}/rld.opt file due to a previous demo installation then this number can be added in the header of this file.

The authorisation code must exactly match the format as listed in the header. If this is not the case the module will not recognise the authorisation sequence and start up in demo mode.

The format of an authorisation sequence line is as follows:

MODULE<s><s>XXXX<s>XXXX<s>XXXX<s>XXXX<s>XXXX<s>XXXX<s>XXXX<s>XXXX<s>XXXX<CR><LF>

The **MODULE** field contains the module name in this case XYCHART. This field must always be 8 characters long. If the module name is shorter then 8 characters then the name must be filled out with spaces to 8 characters.
After the MODULE field one space must be entered.

After the space field 9 records must be specified with the authorisation code. One record is build up of one leading space (ASCII 0x20) and four sequence codes. The sequence codes must be entered exactly as specified by RLD Automation.

After the authorisation code records a carriage return (ASCII 0x13) and linefeed (ASCII 0x10) must follow.

There may be no empty lines between the specification of more than one module. To add an authorisation sequence a normal editor can be used. If all modules with the right authorisation codes are specified according to the format described above then the modules will start with full functionality.

Appendix B. Command line parameters

The XYCHART task accepts several command line parameters, these can be configured with the configuration manager in the 'System Configuration' table, column 'Program Arguments'. An argument consists out of first a minus sign ('-'), followed by the a letter specifying the option. After the letter an optional number can be present, if this is supported by the option.

Option	Description
-d*n*	Debug option, the level of debug information is set with the number *n*. The range of this number is from 1 until 9. If no number is specified the default level will be 1. The debug output will be visible in the 'window' of the protocol driver, i.e. normally the window of the run time manager.
-v*n*	Debug option, the level of debug information is set with the number *n*. The range of this number is from 1 until 9. If no number is specified the default level will be 1. The debug output will be visible in the 'window' of the program 'dbgview'. This program the 'debug viewer' can be installed from the installation media, just select the debug option during installation.
-l*n*	Same as the previous option, difference is the output device. For this option an ASCII log file is generated, being the file: {FLAPP}/{FLNAME}/{FLDOMAIN}/log/s_3964r.log
-p*n*	Zoom and Pan resolution for the X-direction. Pan and zoom factor in the X-direction are (dynamical) adjusted with tags, these tags are defined in the chart animation with the Application Editor. The allowed type of the tags include 'FLOAT', however internally in the Graphics task this value is converted to a long integer (truncation). This can cause improper zoom and pan actions. The value after the -p option defines the correction factor for zooming and panning in the X-direction. So the percentage to zoom is the tag value divided by the correction value, the percentage to pan is the tag value divided by the correction value. E.g. the program argument -p100 defines a correction factor of 100. If a value 0f 500 is written to the X-zoom tag, the actual zoom percentage will be: 500 / 100 = 5%.

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Appendix C. Error codes

The error code is returned to the user in a user-defined status tag. These error codes will also be printed with the message of the XYCHART task in the run-time manager. The errors can be generated from within different parts of the task which will be listed here:

Error #	FactoryLink errors
401	Internal error
402	Out of memory
403	Operating system error
404	Initialization not successful
405	Initialization not successful
406	Incorrect function
407	Incorrect argument
408	Incorrect data
409	Bad tag
410	Null pointer assignment
411	Change flag not set
412	Procedure table full
413	Bad procedure name
414	Bad user name
415	Bad option
416	Incorrect checksum
417	No options
418	No key
419	Bad key
420	No port available
421	Port busy
422	FL already active
423	No lock
424	Lock failed
425	Lock expired
426	Wait failed
427	Termination flag set
428	Q-size to big
429	Q-size changed
430	No tag list
431	Tag list changed
432	Wake up failed
433	No signals
434	Signaled
435	Not a mailbox
436	No messages
437	Access denied
438	Attribute failure
439	Invalid attribute
440	Attribute not defined
441	Application exists
442	RTDB does not exist
443	No task bit
444	Not a lite task
445	Semaphore operation error
446	Mailbox limit exceeded
447	Incompatible tag types for requested operation
448	Tag type does not support change flag
450	Float is not-a-number
451	Float is positive infinity
452	Float is negative infinity
453	Source and destination tags are equal
454	Illegal move from source/destination domain
455	Unable to move mailbox tags
456	User instance license exceeded
457	User instance unavailable

Error #	XY-Chart errors
501	Y-value < minimum
502	Y-value > maximum
503	X-value < minimum
504	X-value > maximum
505	Error retrieving GRAPH Mailbox
506	X-Pan value < 0%
507	X-Pan value > 100%
508	X-Zoom value < 0%
509	X-Zoom value > 100%
510	Dimension tag array <= 0
511	Invalid chart definition
512	Error reading command line
513	Unknown window for chart
530	Y-Pan value < 0%
531	Y-Pan value > 100%
532	Y-Zoom value < 0%
533	Y-Zoom value > 100%
550	Error opening xyplot save file
551	Error closing xyplot save file
552	Error reading xyplot save file
553	Error writing xyplot save file
554	Incorrect size/format of xyplot save file
555	Filename to long for xyplot save file
556	Maximum number of format specifiers exceeded
557	Unknown format specifier
558	Incorrect tag type for format specifier
559	Tag format specifier undefined

Appendix D. Messages

If an error condition occurs in the XY-Chart task during Run-Time mode, a message to that effect will appear on the runtime manager graphics screen to the right of "XYCHART". The error messages that may be displayed are as follows:

Running in DEMO mode

The task did not found the protection code or key, when starting up. The code or key could not be present or damaged. Check also, for the protection key, if the device driver is correctly loaded. This is a non fatal error, however the task continues running in DEMO mode. The DEMO has some limitations: timed for 60 minutes, a maximum of three plots. After shutdown the task can not be restarted without stopping the complete FactoryLink application.

Demo shutdown, licensed to run 60 minutes

The task did not found the protection code or key, when starting up and continued running in DEMO mode. The DEMO has some limitations: timed for 60 minutes, a maximum of two charts and three plots. After shutdown the task can not be restarted without stopping the complete FactoryLink application.

Demo restart prohibited, restart FactoryLink

The task did not found the protection code or key, when starting up. The code or key could not be present or damaged. Check also, for the protection key, if the device driver is correctly loaded. This is a fatal error. After shutdown the task can not be restarted (if the protection key is missing or defect) without stopping the complete FactoryLink application.

Out of RAM

There is not enough RAM memory to load the complete configuration and/or task. This is a fatal error.

Can't open CT file

The task was unable to open the configuration table file, generally because it does not exist. This is a fatal error.

Error reading CT index

An error occurred reading the index of the CT file. This is a fatal error.

Error reading CT header

An error occurred reading the header of a table in the CT file. This is a fatal error.

Error reading CT table %d, record %d

An error occurred reading a record in a particular table in the CT file. The number of the table and record are displayed. This is a fatal error.

Error (%d) reading CT trigger for %s

An error occurred during loading a trigger. This is a fatal error. The error number and informative string are displayed.

No plot for chart '%s' specified

There is no XY-plot found for the displayed chart. This is a fatal error.

No graphics definition for chart '%s' specified

There is no matching definition found for the displayed chart in the graphic configuration files. This is a fatal error.

Incompatible Mailbox tags for chart '%s'

The chart definition in the graphics and XY-CHART have different mailboxes. This is a fatal error.

No graphics definition found for '%s'

An error is encountered in the definition of a chart. The error is normally generated if a chart definition for the XY-Chart task does not correspond with a chart object as it is defined with the GEDANT. This is a fatal error.

Invalid division type for chart '%s'

'Initial Chart Duration' is not set to the type points. This is a fatal error.

Invalid tag type for %s mailbox

A mailbox tag was expected but not found, there is a tag of a different type. This is a fatal error.

More then one Mailbox tag specified for XYCHART

There is more then one mailbox defined for the task XYCHART. This is a fatal error.

Error (%d) reading data

An error occurred reading a tag value. The error number is displayed.

Error (%d) change wait data

An error occurred waiting on a changed tag value. The error number is displayed.

Error (%d) writing data

An error occurred writing a tag value. The error number is displayed.

Error (%d) initialising XY-chart facilities

An error occurred during the initialization of the XY-chart facilities of FactoryLink. The error number is displayed, this is a fatal error.

Error (%d) activating chart %s on window '%s'

An error occurred during the initialization of a chart. The error number, the chart name and the window name are displayed.

Error (%d) inactivating chart %s on window '%s'

An error occurred during the de-activation of a chart. The error number, the chart name and the window name are displayed.

Error (%d) updating legend chart %s

An error occurred during updating a legend variable. The error number and the chart name are displayed.

Error (%d) zooming chart %s

An error occurred during zooming of a chart. The error number and the chart name are displayed.

Error (%d) panning chart %s

An error occurred during panning of a chart. The error number and the chart name are displayed.

Error (%d) clearing chart %s

An error occurred during clearing a chart. The error number and the chart name are displayed.

Error (%d) cursor value chart %s

An error occurred during updating the output value for the cursor position. The error number and the chart name are displayed.

Error (%d) setting value chart %s

An error occurred during defining/undefining XY-points for chart. The error number and the chart name are displayed.

Error (%d) retrieving value chart %s

An error occurred during retrieving xy-points for a chart. The error number and the chart name are displayed.

Error (%d) drawing chart %s

An error occurred drawing a chart. The error number and the chart name are displayed.

Error (%d) reading save file for chart %s

An error occurred during reading a XY-plot save file. The result of the read operation may be inconsistent! The error number and the chart name are displayed.

Error (%d) writing save file for chart %s

An error occurred during writing a XY-plot save file. The result of the write operation may be inconsistent! The error number and the chart name are displayed.

Unknown chart, %s, %s, %s

The task XYCHART received from the graphics task information for an unknown chart. The drawing name, object name and the window name are displayed.

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