ControlChart Control Reference

Monitor process stability with SPC control charts (I-MR and X-bar/R).

Reference **Controls** **Charts** ControlChart

Available from FrameworX 10.1.6.

The ControlChart is a Shewhart SPC control chart with two stacked panes: the values (individuals or subgroup means) with their center line and control limits, and below them the dispersion (moving range or subgroup range). Points that break the Western Electric rules are highlighted in the alarm color.

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Requirements

This component is Portable. It runs both on Windows and on Web Pages hosted on any platform.

Clients: works in the Rich Client and in the web client (HTML5), with the same values and layout on both. Verified on FrameworX 10.1.6.

Configuration

1. Go to **Displays / Draw**.
2. In the Components Panel, select **Charts**, then choose **ControlChart**.
3. Click or drag-and-drop the component into the drawing area.
4. Double-click the object to open the configuration window.

Data Binding

- **Live mode** (default): bind **LinkedValue** to a tag; each value change is a sample.
- **Table mode**: set **UseDataTable** to true and point **DataSourceLink** to a Dataset query or table (`@Dataset.Query.Name` / `@Dataset.Table.Name`) or a tag that holds a DataTable (`@Tag.Name`). **ValueColumn** names the column of samples.
- Samples are grouped in time order. **SubgroupSize** 1 gives an I-MR chart (individuals and moving range); 2 to 10 gives an X-bar/R chart (subgroup means and ranges). An incomplete last subgroup is not plotted.

Behavior

- **SampleCount** points (or subgroups) are shown.
- The center line (CL) and the control limits (UCL, LCL) are computed from the points shown; for I-MR, UCL and LCL = CL ± 2.66 × average moving range. To use fixed limits, set **UseFixedLimits** and **CenterLine**, **UpperLimit** and **LowerLimit** (LowerLimit < CenterLine < UpperLimit).
- Computed limits need at least 2 subgroups.
- Western Electric rules, each on by default: **Rule1BeyondLimits** (a point beyond a control limit), **Rule2TwoOfThree** (2 of 3 points beyond 2 sigma on the same side), **Rule3FourOfFive** (4 of 5 points beyond 1 sigma on the same side) and **Rule4EightSameSide** (8 points in a row on the same side of the center line).
- The chart only displays: it writes nothing to tags.

Properties

Property	Description	Default
LinkedValue	Live mode: the measured value.	(empty)
UseDataTable	Read the samples from a table instead of sampling LinkedValue.	false
DataSourceLink	Table mode: the data source (Dataset query or table, or a DataTable tag).	(empty)
ValueColumn	Table mode: column that holds the samples.	Value
SubgroupSize	1 for I-MR; 2 to 10 for X-bar/R.	1
SampleCount	Number of points or subgroups shown.	25
UseFixedLimits	Use CenterLine, UpperLimit and LowerLimit instead of computed limits.	false
CenterLine	Fixed center line.	0

UpperLimit	Fixed upper control limit.	3
LowerLimit	Fixed lower control limit.	-3
Rule1BeyondLimits	Flag a point beyond a control limit.	true
Rule2TwoOfThree	Flag 2 of 3 points beyond 2 sigma on the same side.	true
Rule3FourOfFive	Flag 4 of 5 points beyond 1 sigma on the same side.	true
Rule4EightSameSide	Flag 8 points in a row on the same side of the center line.	true
ShowDispersionChart	Show the lower pane (moving range or range).	true
ShowMarkers	Draw a marker on each point.	true
ShowLimitLabels	Show the CL, UCL and LCL values next to the lines.	true
ShowAxisLabels	Show the axis labels.	true
Decimals	Number of decimals of the limit labels.	3
DataStrokeThickness	Thickness of the data line.	1.5
LabelFontSize	Font size of the labels.	11
LabelFontFamily	Font family of the labels.	Verdana

Colors follow the Display theme by default: each color property has a theme slot. Set an explicit color (#AARRGGBB) only to override the theme. Color properties: **DataStroke** (theme accent), **CenterLineStroke**, **LimitStroke**, **AlarmFill** (flagged points), **GridStroke** and **LabelForeground**.

Example

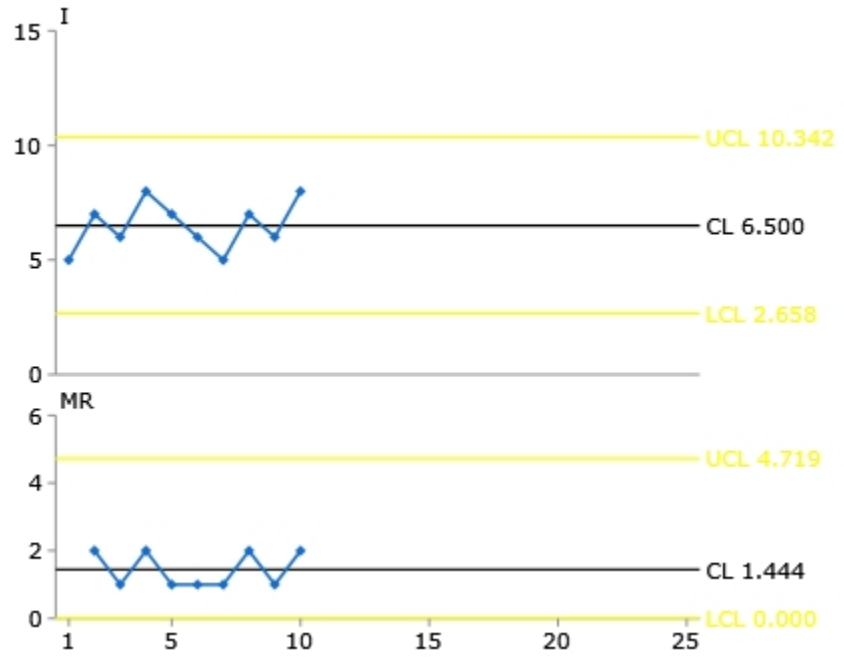
An I-MR chart (**SubgroupSize** 1, **SampleCount** 25) of ten individual measurements: 5, 7, 6, 8, 7, 6, 5, 7, 6, 8. The chart computes:

Pane	CL	UCL	LCL
Individuals (I)	6.500	10.342	2.658
Moving range (MR)	1.444	4.719	0.000

The average moving range is 1.444, so UCL = 6.5 + 2.66 × 1.444 = 10.342. All points are inside the limits and no rule is broken, so no point is flagged. The x axis has room for the 25 points of SampleCount.

Runtime Execution

At runtime the ControlChart adds each new sample, recomputes the limits from the points shown and flags points that break the enabled rules. The image shows the example above in the Rich Client; the web client shows the same values.



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