UNIT TEST COMPREHENSIVE LIST

# Strategy and Common Tests

## Test numbering

* 1 to 999: Common tests for all VIs
* 1000 to 1999: Non-default settings for all inputs
* 2000 to 2999: VI-specific tests

Note that common tests and non-default input settings are supposed to check for trivial errors on the Python side; for example, missing or incorrectly propagated variables. There should be exactly one test per input (optional terminal, cluster member) in the 1000 series.

Checks for specific value-dependent behavior should be done in the 2000 series. For example, for New.vi, a check is made for proper handling of negative margin sizes.

Property cluster tests must “drill down” in to sub-clusters; for example, testing each member of a Colormap cluster which itself is part of the property cluster.

## Common Tests

1. Response to invalid identifier
2. Default settings
3. Default settings with polar plot (success or error)
4. Default settings with rectangular plot and property cluster (this guards against erroneous values in the cluster)
5. Default settings on X log scale
6. Default settings on Y log scale
7. Default settings on X symlog scale
8. Default settings on Y symlog scale

# Core VIs

## New.vi

(1x series)

1. Polar or rectangular
2. Background color
3. Axis background
4. Left margin
5. Right margin
6. Bottom margin
7. Top margin
8. Aspect ratio
9. X Scale
10. Y Scale
11. Negative value for Left Margin
12. Reversed values for Left and Right Margins
13. Zero value for Aspect Ratio
14. Negative value for Aspect Ratio
15. X Scale symlog
16. Y Scale symlog
17. X scale log for polar axes (5141)

## Close.vi

(0x series; none apply)

1. Valid identifier becomes invalid when closed
2. Invalid identifier produces no error

## Save.vi

0x series: only test 1 (invalid identifier) applies

1. Filename ends with .pdf
2. N/A
3. Filename ends with .png
4. Filename ends with .bmp
5. Filename ends with .tif
6. Filename ends with .tiff
7. Filename ends with .TIFF
8. Filename ends with .jpg
9. Filename ends with .jpeg
10. Filename ends with .gif
11. No file extension (5130)
12. Try to save with same name as existing directory (5131)
13. Try to save with Not-A-Path (5130)

## View.vi

1. Response to invalid identifier
2. Illegal Picture reference (ignore)

# 2D Plotting VIs

## ArrayView.vi

1. Response to invalid identifier
2. Default settings
3. Default settings with polar plot (success or error)
4. Default settings with rectangular plot and property cluster (this guards against erroneous values in the cluster)
5. Default settings on X log scale
6. Default settings on Y log scale
7. Default settings on X symlog scale
8. Default settings on Y symlog scale
9. X Min
10. X Max
11. Y Min
12. Y Max
13. Colormap.Map
14. Colormap.Value Min
15. Colormap.Value Max
16. Colormap.Reverse
17. Display.Alpha
18. Display.Z Order
19. Empty input array
20. Input 2x4 array
21. Input 4x2 array
22. Reversed X boundaries
23. Reversed Y boundaries
24. Input array with NaN
25. Input array 1x3

## Tiles.vi

1. Response to invalid identifier
2. Default settings
3. Default settings with polar plot (success or error)
4. Default settings with rectangular plot and property cluster (this guards against erroneous values in the cluster)
5. Default settings on X log scale
6. Default settings on Y log scale
7. Default settings on X symlog scale
8. Default settings on Y symlog scale
9. X Tile Boundaries
10. Y Tile Boundaries
11. Colormap.Map
12. Colormap.Value Min
13. Colormap.Value Max
14. Colormap.Reverse
15. Line.Style
16. Line.Color
17. Line.Width
18. Display.Alpha
19. Display.Z Order
20. Z Data empty
21. X Tile Boundaries size mismatch
22. Y Tile Boundaries size mismatch
23. X Tile Boundaries has less than 2 elements
24. Y Tile Boundaries has less than 2 elements
25. NaN in X Tile Boundaries
26. NaN in Y Tile Boundaries
27. NaN in Z Data.

## Contour\_Automatic.vi

1. Response to invalid identifier
2. Default settings
3. Default settings with polar plot (success or error)
4. Default settings with rectangular plot and property cluster (this guards against erroneous values in the cluster)
5. Default settings on X log scale
6. Default settings on Y log scale
7. Default settings on X symlog scale
8. Default settings on Y symlog scale
9. X Coordinates
10. Y Coordinates
11. Levels
12. Min Level
13. Max Level
14. Label Contours
15. Line.Style
16. Line.Color
17. Line.Width
18. Display.Alpha
19. Display.Z Order
20. Z Data smaller than 2x2
21. Z Data empty
22. Levels is 0
23. Levels is negative
24. Levels is > 1000
25. NaN in X Coordinates
26. NaN in Y Coordinates
27. X Coordinates mismatch
28. Y Coordinates mismatch
29. NaN in Z data
30. Min and Max Level reversed

## Contour\_Manual.vi

1. Response to invalid identifier
2. Default settings
3. Default settings with polar plot (success or error)
4. Default settings with rectangular plot and property cluster (this guards against erroneous values in the cluster)
5. Default settings on X log scale
6. Default settings on Y log scale
7. Default settings on X symlog scale
8. Default settings on Y symlog scale
9. X Coordinates
10. Y Coordinates
11. Label Contours
12. Line.Style
13. Line.Color
14. Line.Width
15. Display.Alpha
16. Display.Z Order
17. Z Data smaller than 2x2
18. Z Data empty
19. Levels is empty
20. Levels has one element
21. Levels has duplicate elements
22. Levels has NaNs
23. Levels has out of order elements
24. NaN in X Coordinates
25. NaN in Y Coordinates
26. X Coordinates mismatch
27. Y Coordinates mismatch
28. NaN in Z data

## ContourFilled\_Automatic.vi

1. Response to invalid identifier
2. Default settings
3. Default settings with polar plot (success or error)
4. Default settings with rectangular plot and property cluster (this guards against erroneous values in the cluster)
5. Default settings on X log scale
6. Default settings on Y log scale
7. Default settings on X symlog scale
8. Default settings on Y symlog scale
9. X Coordinates
10. Y Coordinates
11. Levels
12. Min Level
13. Max Level
14. Colormap.Map
15. Colormap.Value Min
16. Colormap.Value Max
17. Colormap.Reverse
18. Display.Alpha
19. Display.Z Order
20. Z Data smaller than 2x2
21. Z Data empty
22. Levels is 0
23. Levels is negative
24. Levels is > 1000
25. NaN in X Coordinates
26. NaN in Y Coordinates
27. X Coordinates mismatch
28. Y Coordinates mismatch
29. NaN in Z data
30. Min and Max level reversed

## ContourFilled\_Manual.vi

1. Response to invalid identifier
2. Default settings
3. Default settings with polar plot (success or error)
4. Default settings with rectangular plot and property cluster (this guards against erroneous values in the cluster)
5. Default settings on X log scale
6. Default settings on Y log scale
7. Default settings on X symlog scale
8. Default settings on Y symlog scale
9. X Coordinates
10. Y Coordinates
11. Colormap.Map
12. Colormap.Value Min
13. Colormap.Value Max
14. Colormap.Reverse
15. Display.Alpha
16. Display.Z Order
17. Z Data smaller than 2x2
18. Z Data empty
19. Levels is empty
20. Levels has one element
21. Levels has duplicate elements
22. Levels has NaNs
23. Levels has out of order elements
24. NaN in X Coordinates
25. NaN in Y Coordinates
26. X Coordinates mismatch
27. X Coordinates mismatch
28. NaN in Z data

## Histogram2D\_Automatic

1. Response to invalid identifier
2. Default settings
3. Default settings with polar plot (success or error)
4. Default settings with rectangular plot and property cluster (this guards against erroneous values in the cluster)
5. Default settings on X log scale
6. Default settings on Y log scale
7. Default settings on X symlog scale
8. Default settings on Y symlog scale
9. X Bins
10. Y Bins
11. X Min
12. X Max
13. Y Min
14. Y Max
15. Normalize
16. Colormap.Map
17. Colormap.Value Min
18. Colormap.Value Max
19. Colormap.Reverse
20. Display.Alpha
21. Display.Z Order
22. X Data and Y Data empty
23. X Bins is 0
24. X Bins is -1
25. Y Bins is 0
26. Y Bins is -1
27. X Data and Y Data mismatched
28. NaN in X Data
29. NaN in Y Data
30. NaN in X Data, Normalize mode
31. X Min and X Max reversed
32. X Min and X Max equal
33. Y Min and Y Max reversed
34. Y Min and Y Max equal
35. No elements fall within range

## Histogram2D\_Manual

1. Response to invalid identifier
2. Default settings
3. Default settings with polar plot (success or error)
4. Default settings with rectangular plot and property cluster (this guards against erroneous values in the cluster)
5. Default settings on X log scale
6. Default settings on Y log scale
7. Default settings on X symlog scale
8. Default settings on Y symlog scale
9. Normalize
10. Colormap.Map
11. Colormap.Value Min
12. Colormap.Value Max
13. Colormap.Reverse
14. Display.Alpha
15. Display.Z Order
16. X Data and Y Data empty
17. X Bin Edges has 0 elements
18. X Bin Edges has 1 element
19. Y Bin Edges has 0 elements
20. Y Bin Edges has 1 element
21. X Data and Y Data mismatched
22. NaN in X Data
23. NaN in Y Data
24. NaN in X Data, Normalize mode
25. No elements fall within bins

## Streamline

1. Response to invalid identifier
2. Default settings
3. Default settings with polar plot (success or error)
4. Default settings with rectangular plot and property cluster (this guards against erroneous values in the cluster)
5. Default settings on X log scale
6. Default settings on Y log scale
7. Default settings on X symlog scale
8. Default settings on Y symlog scale
9. X Coordinates
10. Y Coordinates
11. Colormap Value
12. Density
13. Arrow Size
14. Line.Style
15. Line.Color
16. Line.Width
17. Colormap.Map
18. Colormap.Value Min
19. Colormap.Value Max
20. Colormap.Reverse
21. X Component empty
22. Y Component empty
23. NaN in X Component
24. NaN in Y Component
25. NaN in Colormap Value
26. Mismatched Y Component
27. Mismatched X Coordinates
28. Mismatched Y Coordinates
29. Mismatched Colormap Value
30. Density is 0
31. Density is -1
32. Arrow Size is 0
33. Arrow Size is -1
34. Line.Style is dashed
35. X Coordinates not uniformly spaced
36. Y Coordinates not uniformly spaced
37. Input dimension 2
38. Input dimension 4

## VectorField

1. Response to invalid identifier
2. Default settings
3. Default settings with polar plot (success or error)
4. Default settings with rectangular plot and property cluster (this guards against erroneous values in the cluster)
5. Default settings on X log scale
6. Default settings on Y log scale
7. Default settings on X symlog scale
8. Default settings on Y symlog scale
9. X Coordinates
10. Y Coordinates
11. Colormap Values
12. Color
13. Arrow Scale
14. Colormap.Map
15. Colormap.Value Min
16. Colormap.Value Max
17. Colormap.Reverse
18. Display.Alpha
19. Display.Z Order
20. X Component empty
21. Y Component empty
22. NaN in X Component
23. NaN in Y Component
24. NaN in Colormap Values
25. Mismatched Y Component
26. Mismatched X Coordinates
27. Mismatched Y Coordinates
28. Mismatched Colormap Values
29. Arrow Scale 0
30. Arrow Scale -1

# 1D Plotting VIs

## Line

1. Response to invalid identifier
2. Default settings
3. Default settings with polar plot (success or error)
4. Default settings with rectangular plot and property cluster (this guards against erroneous values in the cluster)
5. Default settings on X log scale
6. Default settings on Y log scale
7. Default settings on X symlog scale
8. Default settings on Y symlog scale
9. X Data
10. Legend Title
11. Line.Style
12. Line.Color
13. Line.Width
14. Marker.Style
15. Marker.Color
16. Marker.Size
17. Display.Alpha
18. Display.Z Order
19. Empty Y Data
20. NaN in Y Data
21. NaN in X Data
22. Mismatched X and Y Data sizes
23. Line.Style solid
24. Line.Style dashed
25. Line.Style dotted
26. Line.Style dash-dot
27. Line.Style invisible
28. Marker.Style circle
29. Marker.Style square
30. Marker.Style triangle
31. Marker.Style diamond
32. Marker.Style star
33. Marker.Style invisible

## Scatter

1. Response to invalid identifier
2. Default settings
3. Default settings with polar plot (success or error)
4. Default settings with rectangular plot and property cluster (this guards against erroneous values in the cluster)
5. Default settings on X log scale
6. Default settings on Y log scale
7. Default settings on X symlog scale
8. Default settings on Y symlog scale
9. Legend Title
10. Areas
11. Colormap Values
12. Marker.Style
13. Marker.Color
14. Marker.Size
15. Line.Style
16. Line.Color
17. Line.Width
18. Colormap.Map
19. Colormap.Value Min
20. Colormap.Value Max
21. Colormap.Reverse
22. Display.Alpha
23. Display.Z Order
24. Empty X/Y Data
25. NaN in X Data
26. NaN in Y Data
27. NaN in Areas
28. NaN in Colormap Values
29. 0 in Areas
30. -1 in Areas
31. Mismatched X Data array
32. Mismatched Areas array
33. Mismatched Colormap Values array
34. Marker.Size 0
35. Marker.Size -1

## Bar.vi

1. Response to invalid identifier
2. Default settings
3. Default settings with polar plot (success or error)
4. Default settings with rectangular plot and property cluster (this guards against erroneous values in the cluster)
5. Default settings on X log scale
6. Default settings on Y log scale
7. Default settings on X symlog scale
8. Default settings on Y symlog scale
9. X Coordinates
10. Bar Widths
11. Bar Bottoms
12. Legend Title
13. Bar Color
14. Line.Style
15. Line.Color
16. Line.Width
17. Display.Alpha
18. Display.Z Order
19. Empty Bar Lengths
20. NaN in Bar Lengths
21. NaN in X Coordinates
22. NaN in Bar Widths
23. NaN in Bar Bottoms
24. Negative value in Bar Widths
25. 0 value in Bar Widths
26. Negative value in Bar Lengths
27. Mismatched X Coordinates
28. Mismatched Bar Widths
29. Mismatched Bar Bottoms

## Errorbar.vi

1. Response to invalid identifier
2. Default settings
3. Default settings with polar plot (success or error)
4. Default settings with rectangular plot and property cluster (this guards against erroneous values in the cluster)
5. Default settings on X log scale
6. Default settings on Y log scale
7. Default settings on X symlog scale
8. Default settings on Y symlog scale
9. X Errors only
10. Y Errors only
11. Color
12. Line Width
13. Cap Size
14. Display.Alpha
15. Display.Z Order
16. X/Y Data empty
17. Mismatched X Data
18. Mismatched X Errors
19. Mismatched Y Errors
20. NaN in X Data
21. NaN in Y Data
22. NaN in X Errors
23. NaN in Y Errors
24. X Errors entry negative
25. Y Errors entry negative
26. Line Width zero
27. Cap Size zero
28. Bar color matches last-plotted color

## Histogram\_Automatic.vi

1. Response to invalid identifier
2. Default settings
3. Default settings with polar plot (success or error)
4. Default settings with rectangular plot and property cluster (this guards against erroneous values in the cluster)
5. Default settings on X log scale
6. Default settings on Y log scale
7. Default settings on X symlog scale
8. Default settings on Y symlog scale
9. Bins
10. Data Range.Data Min
11. Data Range.Data Max
12. Legend Title
13. Color
14. Cumulative
15. Normalize
16. Line.Style
17. Line.Color
18. Line.Width
19. Display.Alpha
20. Display.Z Order
21. Data is empty
22. Bins is 0
23. Bins is -1
24. Bins 1
25. NaN in Data
26. NaN in Data, cumulative mode
27. NaN in Data, normalize mode
28. Data Min bigger than Data Max
29. Data Min equal to Data Max
30. Data Min/Max range includes no points

## Histogram\_Manual.vi

1. Response to invalid identifier
2. Default settings
3. Default settings with polar plot (success or error)
4. Default settings with rectangular plot and property cluster (this guards against erroneous values in the cluster)
5. Default settings on X log scale
6. Default settings on Y log scale
7. Default settings on X symlog scale
8. Default settings on Y symlog scale
9. Bins
10. Legend Title
11. Color
12. Cumulative
13. Normalize
14. Line.Style
15. Line.Color
16. Line.Width
17. Display.Alpha
18. Display.Z Order
19. Data is empty
20. Bins is empty
21. Bins has only one element
22. NaN in Data
23. NaN in Data, cumulative mode
24. NaN in Data, normalize mode
25. NaN in Bins
26. NaN in Bins, resulting in only one bin
27. Bins range includes no data points
28. Bin edges out of order
29. Repeated bin edges

# Annotations

## Colorbar

1. Response to invalid identifier
2. Default settings
3. Default settings with polar plot (success or error)
4. Label
5. Ticks
6. Tick Labels
7. Single tick
8. Ticks with NaN
9. Mismatched ticks and tick label sizes
10. Tick labels given with ticks not given
11. Called when no colormapped object available

## IsValid

1. Valid ID
2. Invalid ID

## Legend

1. Response to invalid identifier
2. Default settings
3. Default settings with polar plot (success or error)
4. Position
5. Position Top Right
6. Position Top
7. Position Top Left
8. Position Left
9. Position Bottom Left
10. Position Bottom
11. Position Bottom Right
12. Position Right
13. Position Center
14. Called with no labeled object: no legend

## Text

1. Response to invalid identifier
2. Default settings
3. Default settings with polar plot (success or error)
4. Default settings with rectangular plot and property cluster (this guards against erroneous values in the cluster)
5. Default settings on X log scale
6. Default settings on Y log scale
7. Default settings on X symlog scale
8. Default settings on Y symlog scale
9. Relative Coordinates
10. Text.Color
11. Text.Background Color
12. Text.Font Size
13. Text.Font Style (italic)
14. Text.Rotation Angle
15. Display.Alpha
16. Display.Z Order
17. Text empty
18. NaN X Position
19. NaN Y Position
20. Off-plot X position clips text to box (linear scale)
21. Size xx-small
22. Size x-small
23. Size small
24. Size medium
25. Size large
26. Size x-large
27. Size xx-large
28. Size 42
29. Size -10
30. Size 0 (uses default)
31. Style bold

## Title

1. Response to invalid identifier
2. Default settings
3. Default settings with polar plot (success or error)
4. Default settings with rectangular plot and property cluster (this guards against erroneous values in the cluster)
5. Text.Color
6. Text.Background Color
7. Text.Font Size
8. Text.Font Style
9. Text.Rotation Angle
10. Title empty

## HLine

1. Response to invalid identifier
2. Default settings
3. Default settings with polar plot (success or error)
4. Default settings with rectangular plot and property cluster (this guards against erroneous values in the cluster)
5. Default settings on X log scale
6. Default settings on Y log scale
7. Default settings on X symlog scale
8. Default settings on Y symlog scale
9. X Min
10. X Max
11. Line.Style
12. Line.Color
13. Line.Width
14. Display.Alpha
15. Display.Z Order
16. Y is NaN
17. X Min is -1
18. X Max is 10
19. X Min is larger than X Max

## VLine

1. Response to invalid identifier
2. Default settings
3. Default settings with polar plot (success or error)
4. Default settings with rectangular plot and property cluster (this guards against erroneous values in the cluster)
5. Default settings on X log scale
6. Default settings on Y log scale
7. Default settings on X symlog scale
8. Default settings on Y symlog scale
9. Y Min
10. Y Max
11. Line.Style
12. Line.Color
13. Line.Width
14. Display.Alpha
15. Display.Z Order
16. X is NaN
17. Y Min is -1
18. Y Max is 10
19. Y Min is larger than Y Max

## XLabel

1. Response to invalid identifier
2. Default settings
3. Default settings with polar plot (success or error)
4. Default settings with rectangular plot and property cluster (this guards against erroneous values in the cluster)
5. Text.Color
6. Text.Background Color
7. Text.Font Size
8. Text.Font Style
9. Text.Rotation Angle
10. Label empty

## YLabel

1. Response to invalid identifier
2. Default settings
3. Default settings with polar plot (success or error)
4. Default settings with rectangular plot and property cluster (this guards against erroneous values in the cluster)
5. Text.Color
6. Text.Background Color
7. Text.Font Size
8. Text.Font Style
9. Text.Rotation Angle
10. Label empty

## Circle

1. Response to invalid identifier
2. Default settings
3. Default settings with polar plot (success or error)
4. Default settings with rectangular plot and property cluster (this guards against erroneous values in the cluster)
5. Default settings on X log scale
6. Default settings on Y log scale
7. Default settings on X symlog scale
8. Default settings on Y symlog scale
9. Color
10. Line.Style
11. Line.Color
12. Line.Width
13. Display.Alpha
14. Display.Z Order
15. X Position NaN
16. Y Position NaN
17. Radius NaN (NO CIRCLE!)
18. Radius 0
19. Radius -1

## Rectangle

1. Response to invalid identifier
2. Default settings
3. Default settings with polar plot (success or error)
4. Default settings with rectangular plot and property cluster (this guards against erroneous values in the cluster)
5. Default settings on X log scale
6. Default settings on Y log scale
7. Default settings on X symlog scale
8. Default settings on Y symlog scale
9. Color
10. Line.Style
11. Line.Color
12. Line.Width
13. Display.Alpha
14. Display.Z Order
15. X Position NaN
16. Y Position NaN
17. Width NaN
18. Width 0
19. Width -0.25
20. Height NaN
21. Height 0
22. Height -0.25

# Config and Setup

## Grids

1. Response to invalid identifier
2. Default settings
3. Default settings with polar plot (success or error)
4. Default settings with rectangular plot and property cluster (this guards against erroneous values in the cluster)
5. Default settings on X log scale
6. Default settings on Y log scale
7. Default settings on X symlog scale
8. Default settings on Y symlog scale
9. Line.Style
10. Line.Color
11. Line.Width

## Limits

1. Response to invalid identifier
2. Default settings
3. Default settings with polar plot (success or error)
4. X Min
5. X Max
6. Y Min
7. Y Max
8. X Min bigger than X Max
9. Y Min bigger than Y Max
10. Attempt to set X limits on polar plot
11. X limit 0 on log plot
12. X limit -1 on log plot
13. Y limit 0 on log plot
14. Y limit -1 on log plot

## XTicks

1. Response to invalid identifier
2. Default settings
3. Default settings with polar plot (success or error)
4. Default settings with rectangular plot and property cluster (this guards against erroneous values in the cluster)
5. Default settings on X log scale
6. N/A
7. Default settings on X symlog scale
8. N/A
9. Tick Labels
10. Text.Color
11. Text.Background Color
12. Text.Font Size
13. Text.Font Style
14. Text.Rotation Angle
15. NaN entry in Tick Locations
16. N/A
17. Repeated tick values
18. Out-of-order tick values
19. Mismatched tick and tick label array sizes

## YTicks

1. Response to invalid identifier
2. Default settings
3. Default settings with polar plot (success or error)
4. Default settings with rectangular plot and property cluster (this guards against erroneous values in the cluster)
5. N/A
6. Default settings on Y log scale
7. N/A
8. Default settings on Y symlog scale
9. Tick Labels
10. Text.Color
11. Text.Background Color
12. Text.Font Size
13. Text.Font Style
14. Text.Rotation Angle
15. NaN entry in Tick Locations
16. N/A
17. Repeated tick values
18. Out-of-order tick values
19. Mismatched tick and tick label array sizes

## Size

1. Response to invalid identifier
2. Default settings
3. Default settings with polar plot (success or error)
4. DPI only
5. DPI plus explicit size
6. Width is 0
7. Width is 0.5
8. Width is -1
9. Width is 1.1
10. Height is 0
11. Height is 0.5
12. Height is -1
13. Height is 1.1
14. DPI is 0
15. DPI is -1
16. DPI is 10
17. DPI is 11

# Other VIs

## Config

1. Display all terminals in indicators (checks for accidental loss of terminal)

## Init

1. Check for no error

# Special Features

## Colormaps

1. Default (rainbow)
2. Rainbow
3. Hot and Cold
4. White to Black
5. White to Blue
6. White to Green
7. White to Red
8. Fire
9. Water
10. Earth
11. Air
12. Pastel
13. Banded
14. Stepped

## Color Cycle

1. Full cycle plus one, line plots
2. Full cycle plus one, scatter plot
3. Full cycle plus one, bar plot
4. Full cycle plus one, histogram plot
5. Verify manual color in middle of line-plot cycle is skipped

## Math Text

1. Simple LaTeX expression
2. Broken expression comes through as literal
3. Non-ASCII characters are replaced by “?”