Speaker: Andreas Lipowsky /CEO
Chat Moderator: Leonard Immel (Creator of GUI Editor)

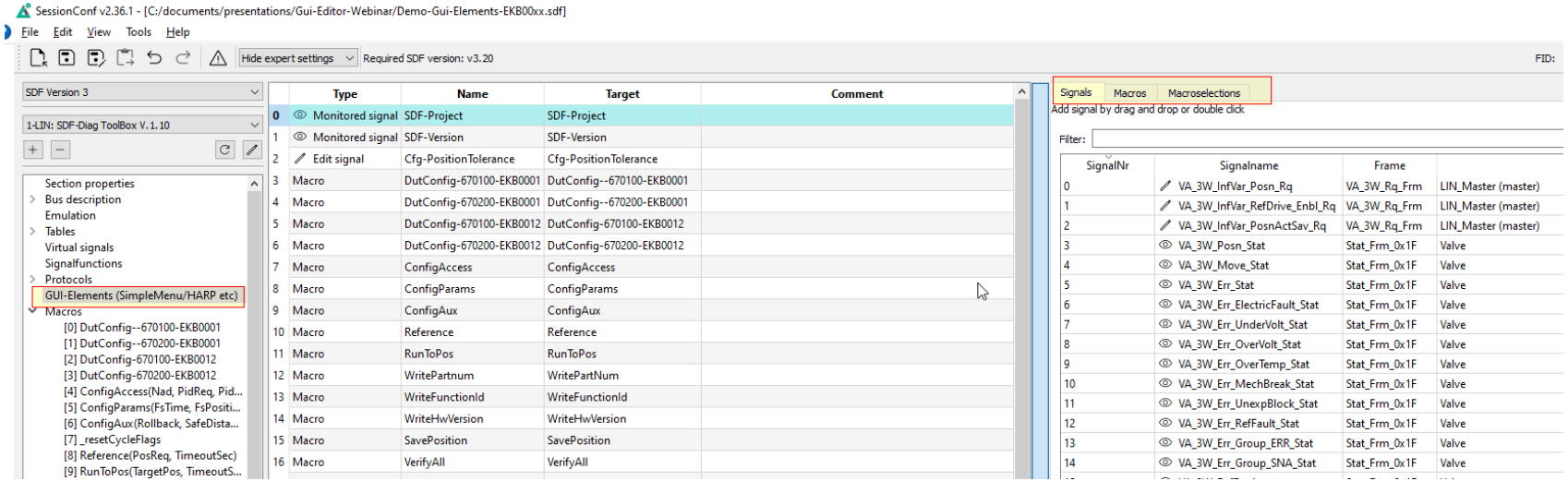
Agenda

- Welcome
- GUI editor concept
- Introduction to the essential steps for creating a Baby-LIN GUI
- Description of widget including new features
- Question and answers

Starting point

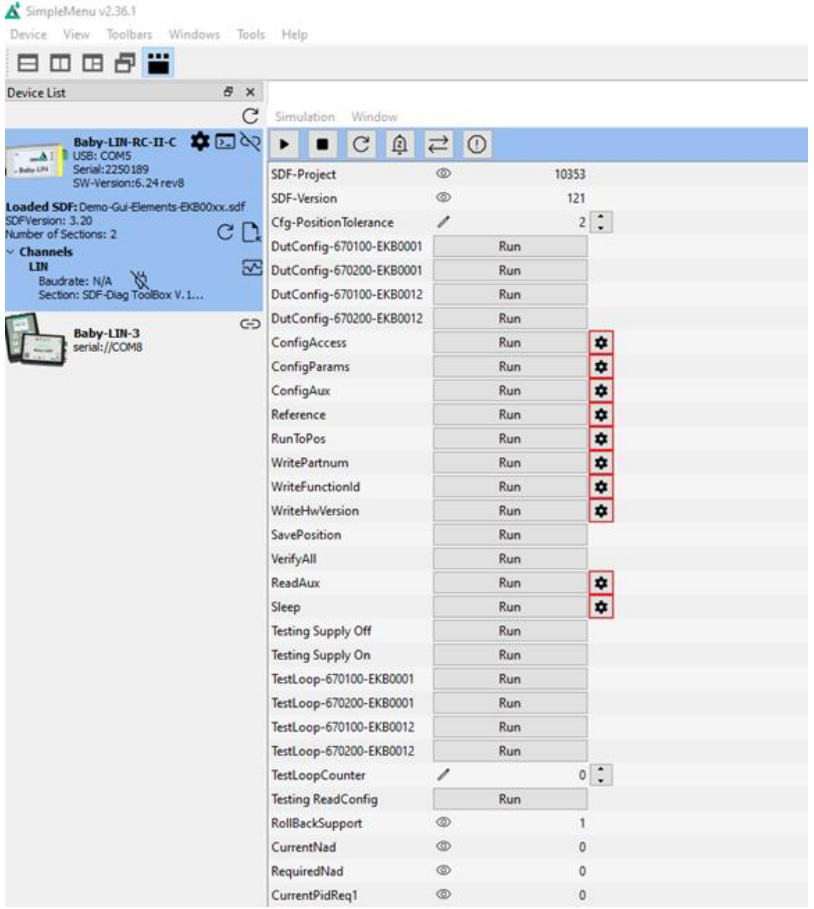
- SDF solutions for LIN- and CAN- applications
- Usage of bus signals, virtual signals, protocols, macros and events
- SDF execution with SimpleMenu frontend or stand alone.

Depending on the application and device, also with a user interface. The GUI elements were previously available for this purpose.



Disadvantages of the previous GUI elements

- Displays only via Simple Menu (exception HARP), therefore no solution for stand-alone applications.
- There were no design options when using the GUI elements in the SimpleMenu.
- Always everything arranged in a vertical list,
  always everything visible,
  always everything in the same text size, text color etc.
- User-friendly GUI could not be realized by this means.



Development goals GUI editor

1. Gui editor is part of session Conf
2. Use of the SimpleMenu option also for existing Generation 2 devices
3. Use as a stand-alone GUI on the new Baby-LIN-3 devices with their own display (Baby-LIN-3-RC/Baby-LIN-3-RCplus)
4. Use as a stand-alone GUI via the web interface of the Baby-LIN-3-MB.

Concept of the new GUI solution

- Creation of GUI by LINWorks SessionConf
- Saving the GUI definitions in the SDF
- Functional replacement for the previous GUI elements (Signal, Macro, etc)
- Additional design elements (widgets)
  text label, image, line, frame, meter and more.
- Free positioning of the widgets
- Extensive setting options for the widget properties
- Different layouts for the various playback paths (SimpleMenu, DeviceDisplay)
- Distribution of information across several panels
- Control widget visibility dynamically from the SDF.

GUI playback paths

- **Standalone solution**
  Gui definition from SDF is loaded into the device and executed locally there.

- **SimpleMenu solution**
  The Gui definitions are only loaded into the DLL (not into the device) and executed on the PC, so Generation 2 devices can also use this playback path with all features.

- **BL-3-MB web interface solution**
  The SDF runs on the device and a contained GUI definition is delivered to a connected WebBroswser and executed there.

Technical background:
As all three delivery methods use the same code base, simple further development and maintenance of these software components is guaranteed.

Basic elements of GUI Editor

- **Screen**
  Is the basic element and defines the resolution of the display device and the possible playback paths
  Multiple screens for different devices possible in one SDF.

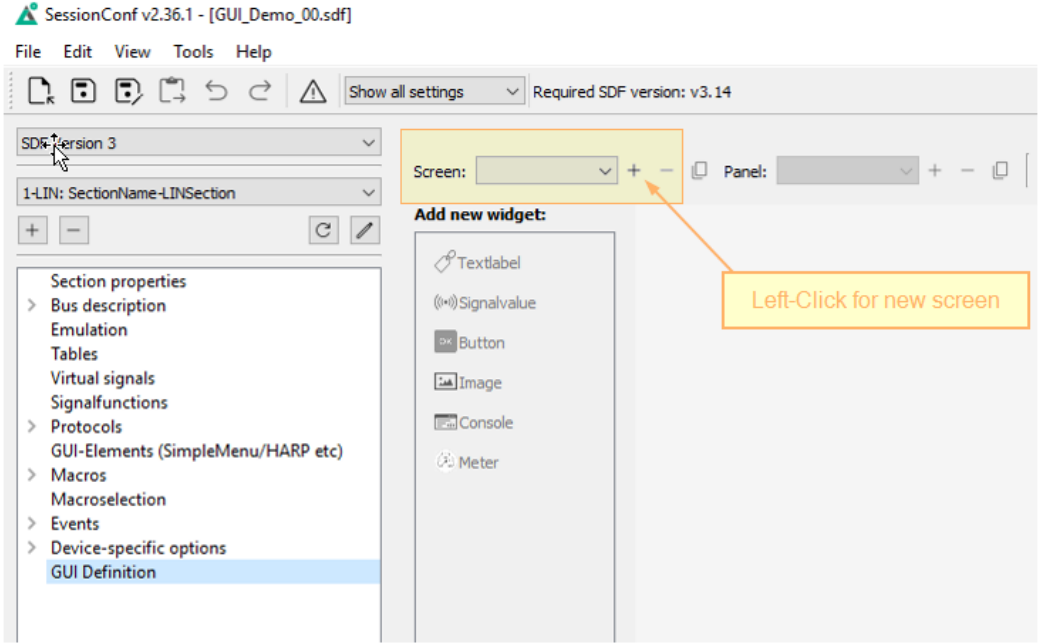
- **Panel**
  One or more panels per screen
  Grouping of visual information on one panel
  Panel selection/switching possible at runtime

- **Ressourcen**
  Resources that can be used for all panels of an SDF, such as fonts, images

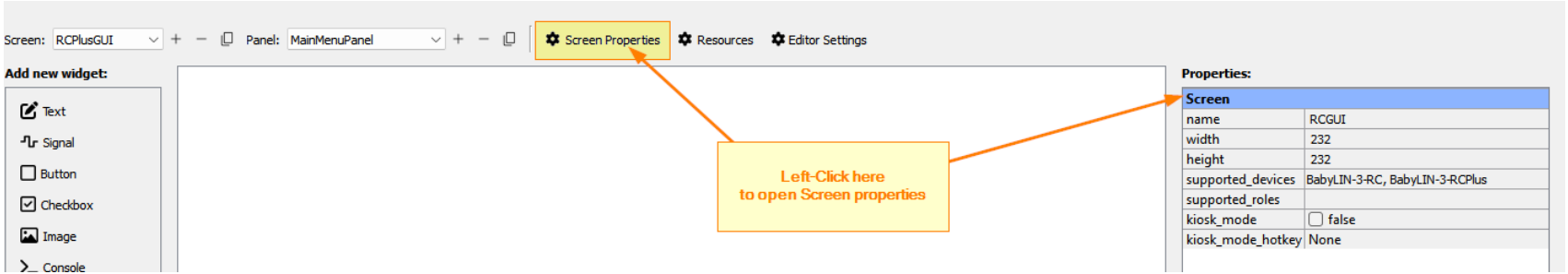
- **Widgets**
  Individual display elements that are positioned on a panel.

Screen

- First element when creating a new GUI.
- Is the basic element and defines the resolution.
- Screens for different devices possible in one SDF.
- Simple Menu and Web-Gui screens do not require any memory on the USB Baby-LIN-3 devices!



Screen properties

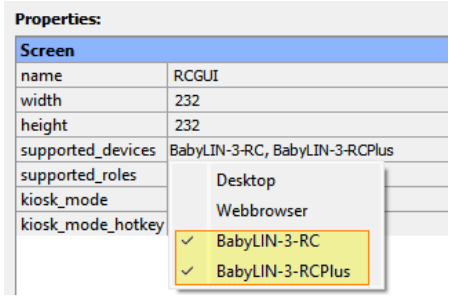


Supported devices

decides on which devices this screen should be executed

Important hint:

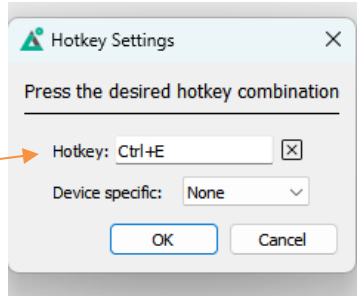
To run a GUI on Baby-LIN-3-RC and Baby-LIN-3-RCplus make sure both device are selected.



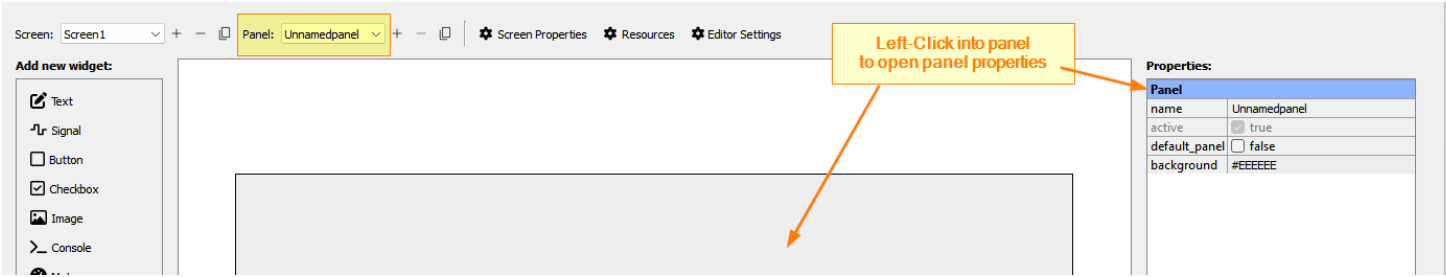
Kiosk Mode

If this is checked, the SDF will open in SimpleMenu without showing the device List and old GUI definitions.

A hotkey can be assigned to stop KioskMode. To assign a hotkey for SimpleMenu, just enter key or key combination on PC keyboard.



Panel



- One or more panels per screen.
- Definition of visual information by arranging corresponding widgets on a panel.
- A first panel is automatically created when a screen is defined.
- The panel name, the background color and the default_panel property can be set in the panel properties
- As long as there is only one panel, the default_panel property doesn't matter.
- If there are several panels, the default_panel property controls which panel is displayed at the start (property "active"). If the default_panel property is not set for any panel, the 1st panel is set to "active"="true".
- The property "active" is not editable in SessionConf as it will be defined during runtime, to mark the actual displayed panel. This is an exclusive property per screen, so only one panel can be active at the same time.
- In GUI-editor, each currently shown panel will have the active property set.

Ressources

These are resources that can be shared by all panels.

- 4 fixed defined text fonts
- Import of Images (PNG)
- Import of custom fonts (ttf)

Further resource types might be added in the future.

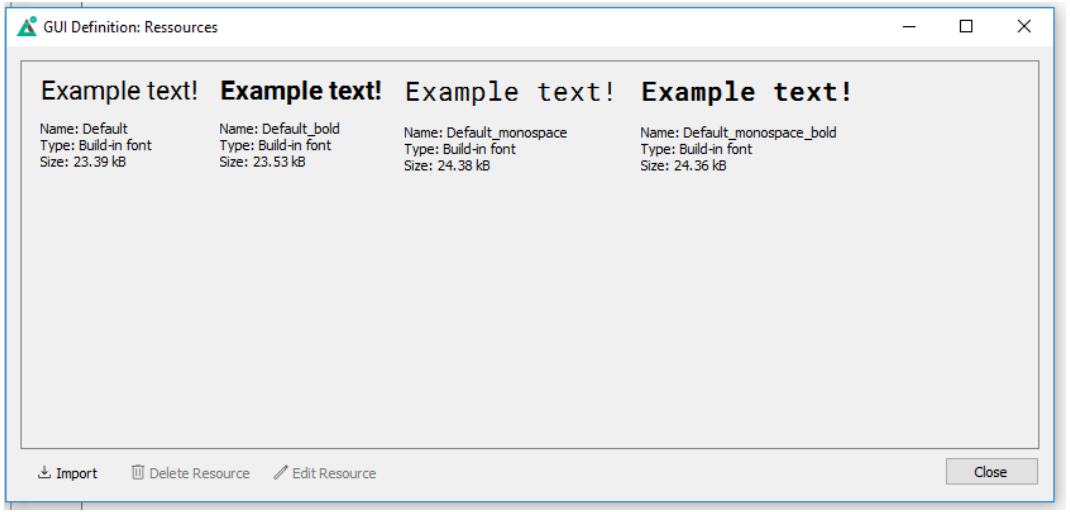


Image Import

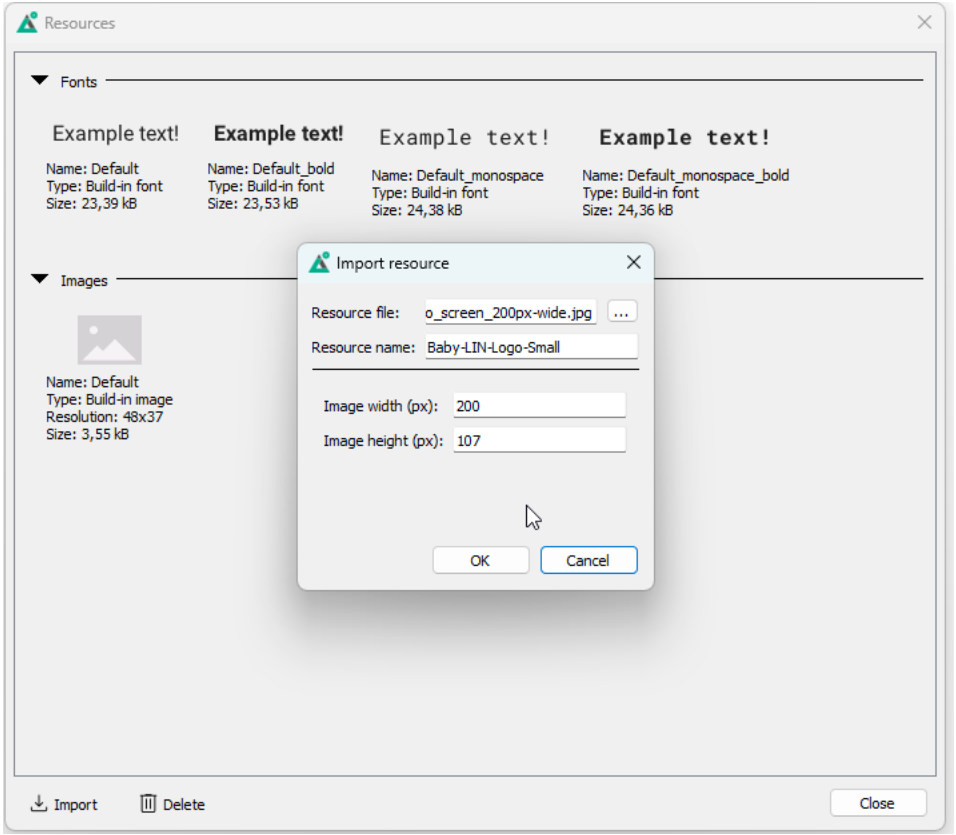
Actually pictures must be imported in the resolution suitable for the selected screen resolution.

Resizing during positioning an image widget on a panel is not yet supported.

So, resize you image with an external picture editing program so have the right size.

Keep in mind that the Baby-LIN-3-RC/Rcplus display has a total reolutopm of 232 x 232 pixel.

So, it can make sense to hold 2 versions of a picture in your resources, in case you GUI provides screens for desktop and device displays.



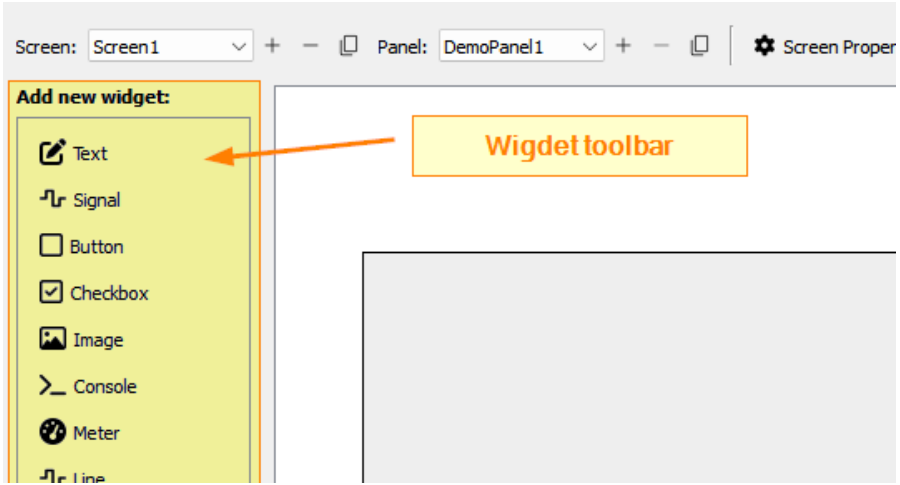
Widgets

After defining the screen and panel, widgets can be placed on the actual select panel.

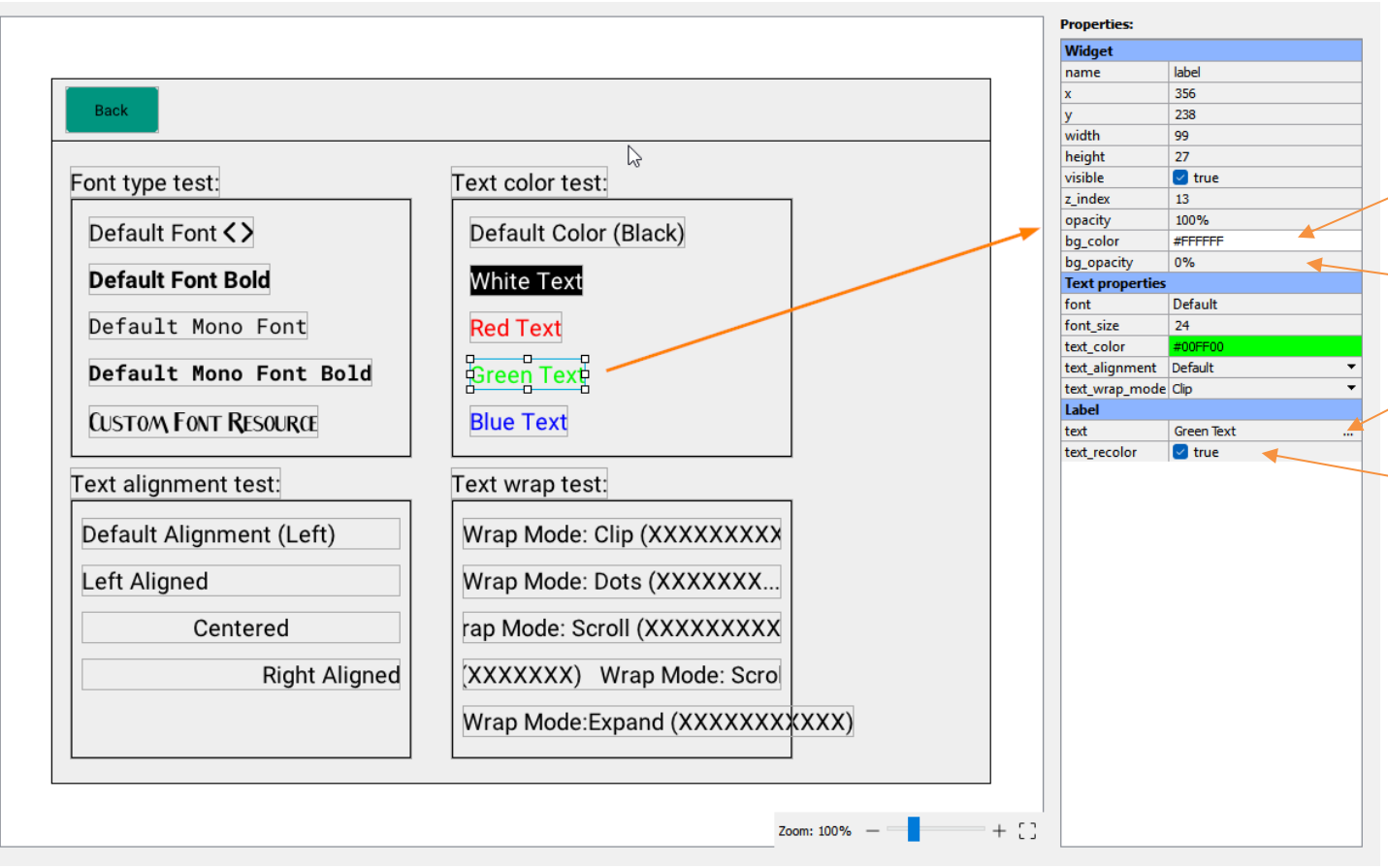
By clicking on a widget in the widget toolbar on the left , it is placed on the panel and can be moved to the desired position.

Clicking the same widget in the toolbar multiple times adds a “Stacked Widget indicator” to the widget indicating the number of existing overlayed widgets. Here the 4 indicated that 5 text labels had been added.

A properties menu with the specific setting options is displayed on the right for each selected widget.



Textlabel widget



Properties:

Widget	
name	label
x	356
y	238
width	99
height	27
visible	true
z_index	13
opacity	100%
bg_color	#FFFFFF
bg_opacity	0%
Text properties	
font	Default
font_size	24
text_color	#00FF00
text_alignment	Default
text_wrap_mode	Clip
Label	
text	Green Text ...
text_recolor	true

New Properties

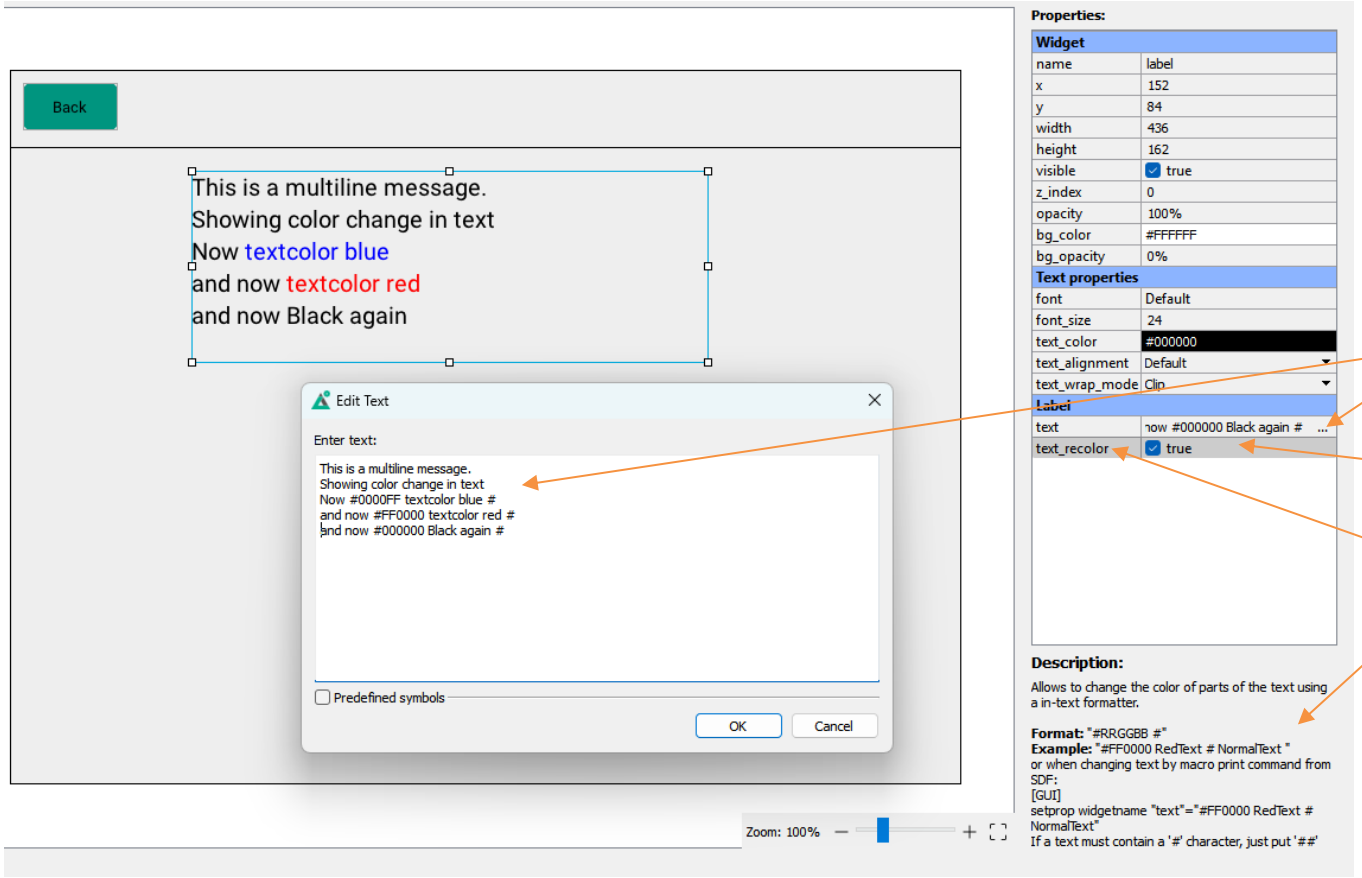
Background color

Background opacity

Extended label text editor

text_recolor
to change color within text

Textlabel widget – text_recolor property



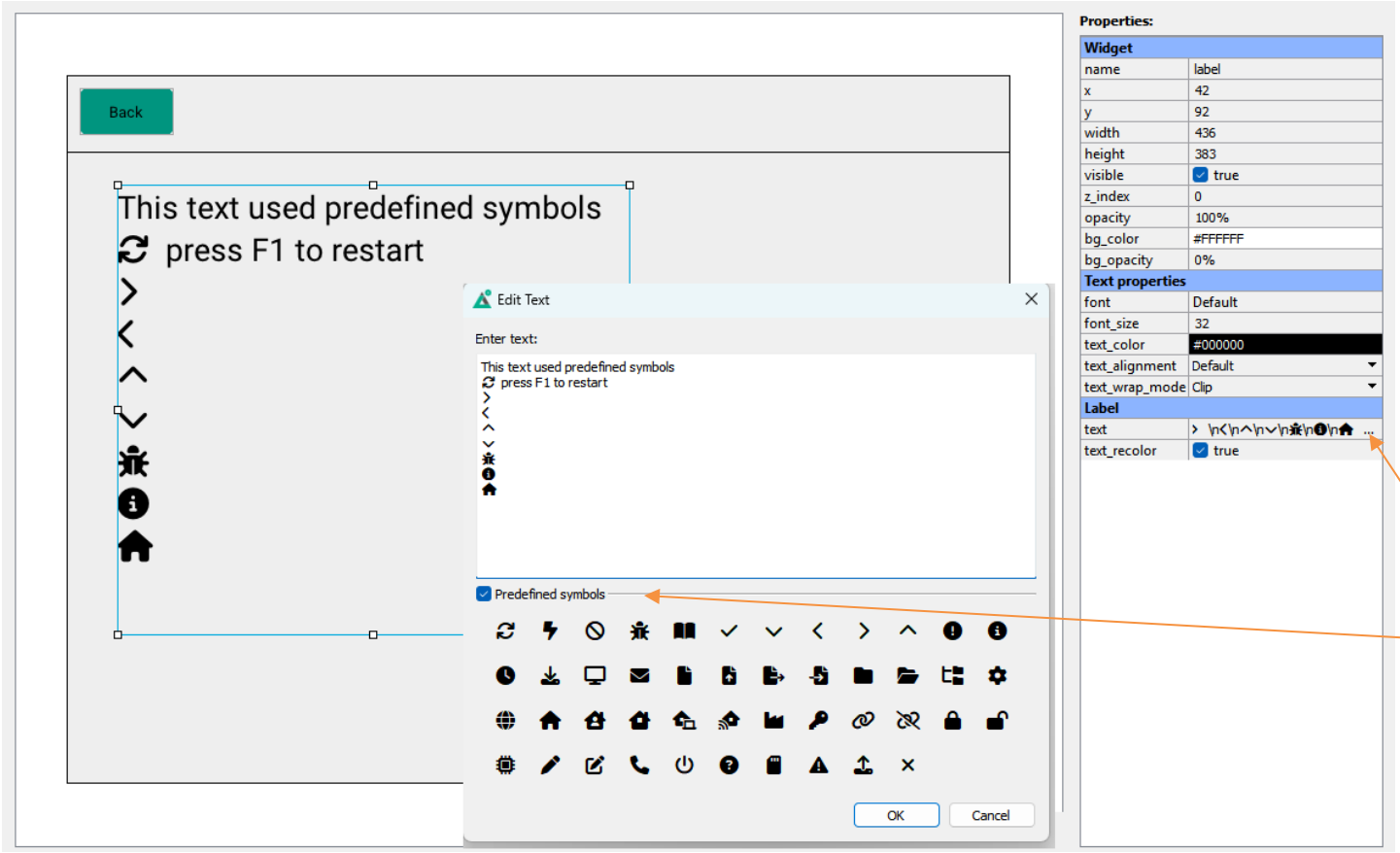
Property text_recolor to change color within text.

Color changes are entered via Text editor

Check this to allow recoloring

Left-Click here shows this help text

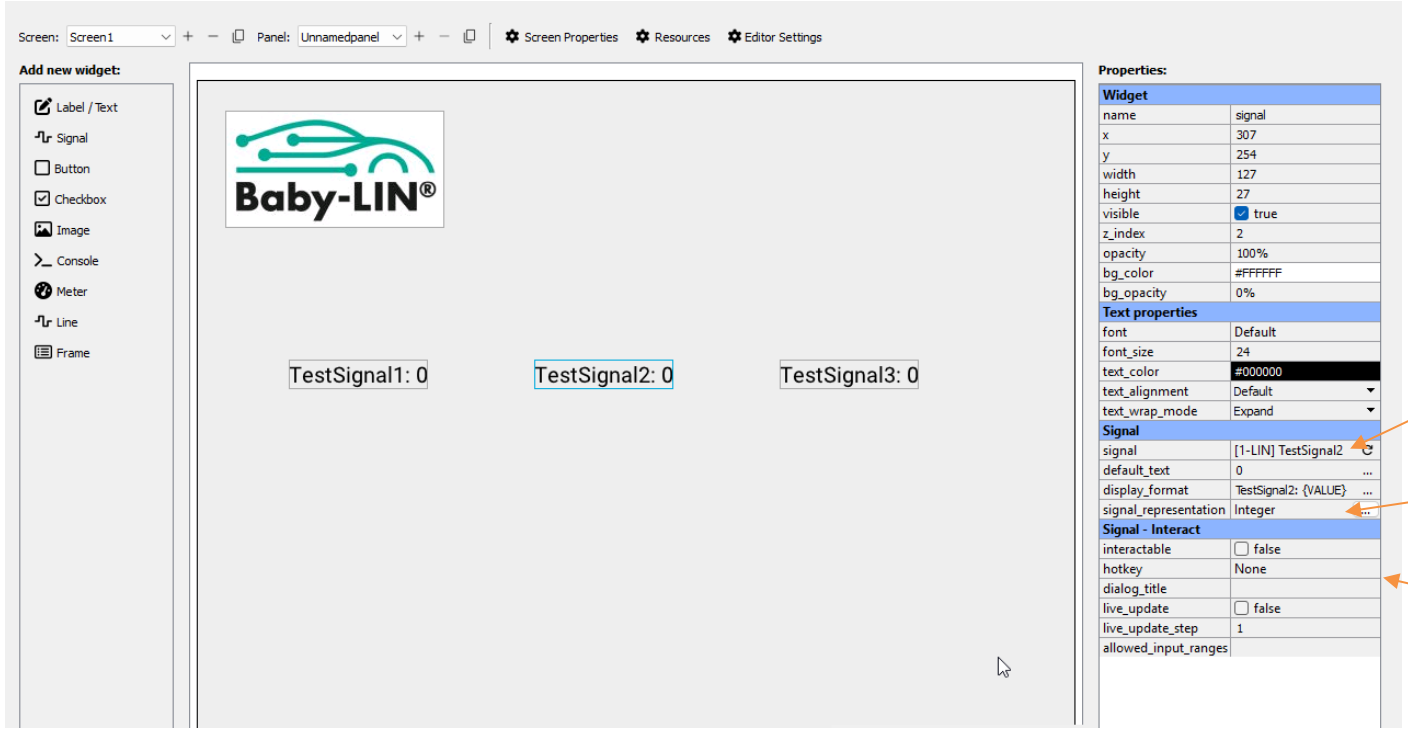
If recoloring is enabled, same syntax can be used in setprop … “text”= commands from within SDF.


Back
This text used predefined symbols
press F1 to restart
Edit Text
Enter text:
This text used predefined symbols
press F1 to restart
Predefined symbols
OK
Cancel
Properties:
Widget
name label
x 42
y 92
width 436
height 383
visible true
z_index 0
opacity 100%
bg_color #FFFFFF
bg_opacity 0%
Text properties
font Default
font_size 32
text_color #000000
text_alignment Default
text_wrap_mode Clip
Label
text
text_recolor true
Extended label text editor
with predefined symbols

Property change on multiple elements

Change the properties of several elements at the same time by selecting them and setting the property to the new common value they all should have.
Here the width of all selected text labels will be changed to 100.

Signal widget



Signal linkage into SDF

Signal representation

Interactive section

Note: In contrast to the previous GUI elements, the new GUI is global for all bus sections contained in the SDF, allowing signals from different bus sections to be displayed in same panel.

Signal widget display formats

Signal values can be displayed as an

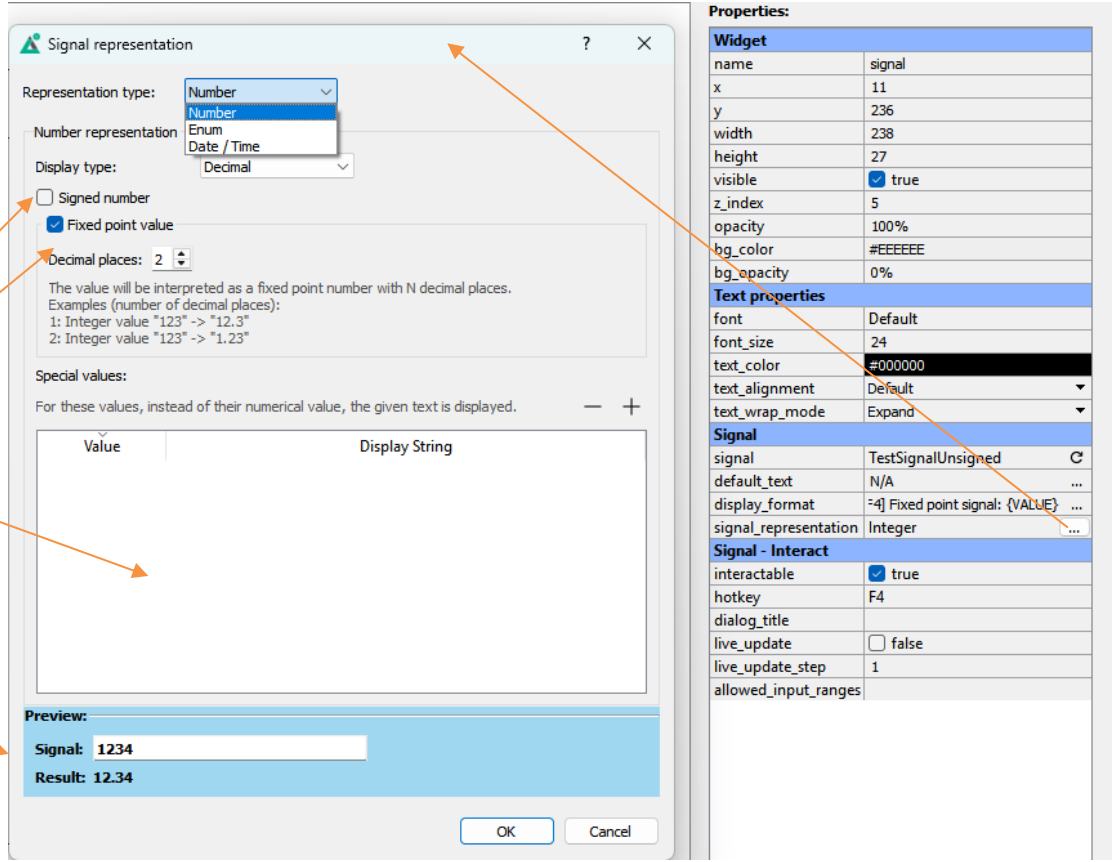
- number
- enum or
- converted time.

For number presentation the interpretation as signed integer and an optional fixed point representation can be chosen.

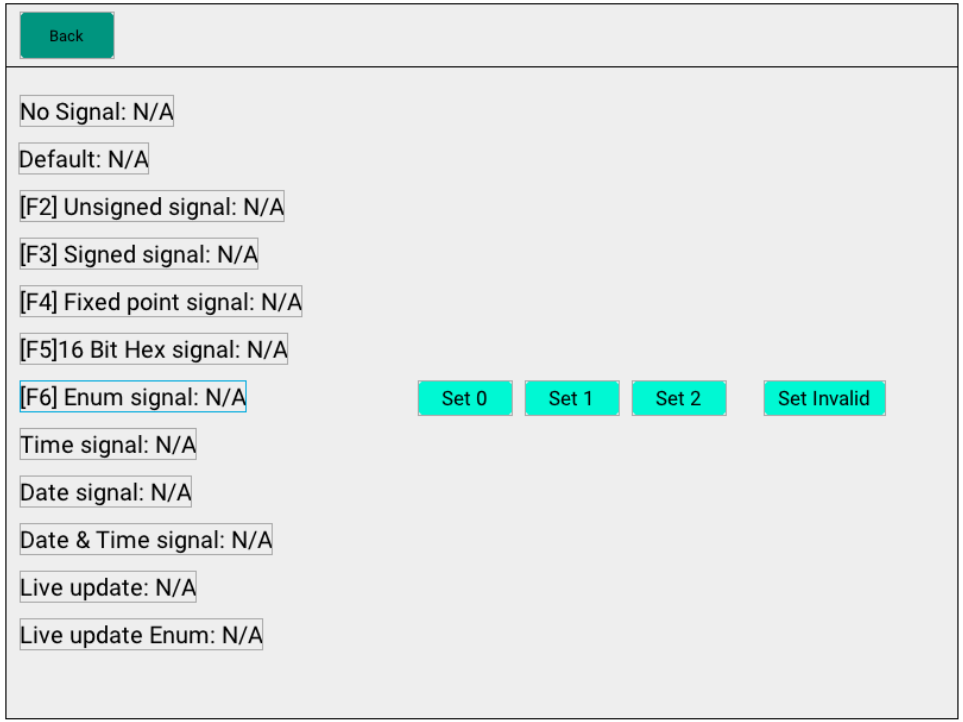
Now representation type number you can also define special value, which will then be shown instead of value.

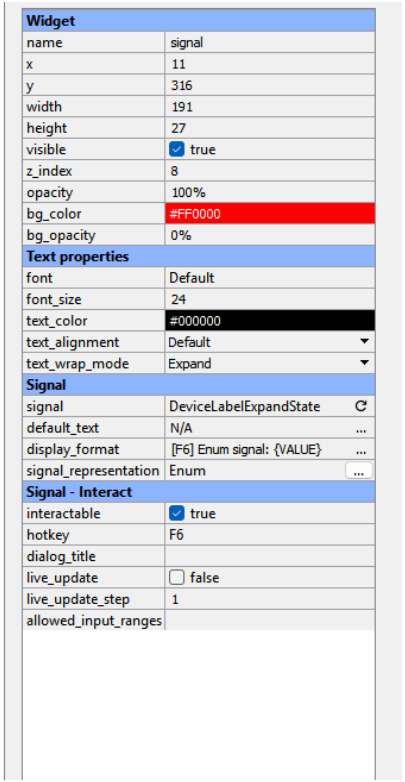
Eg. 0 for OFF etc

The preview shows the displayed value for the given signal value.



Signal widget interact properties





Widget	
name	signal
x	11
y	316
width	191
height	27
visible	true
z_index	8
opacity	100%
bg_color	#FF0000
bg_opacity	0%
Text properties	
font	Default
font_size	24
text_color	#000000
text_alignment	Default
text_wrap_mode	Expand
Signal	
signal	DeviceLabelExpandState
default_text	N/A
display_format	[F6] Enum signal: {VALUE}
signal_representation	Enum
Signal - Interact	
interactable	true
hotkey	F6
dialog_title	
live_update	false
live_update_step	1
allowed_input_ranges	

Property section Interact

Enables value editor in GUI.

Value Editor can either be opened by

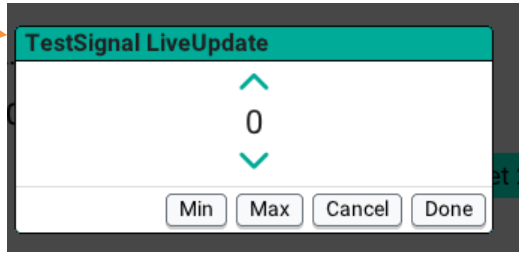
- Mouse click in SimpleMenu or WebGui
- Hotkey press
- By focus & select method on device

Signal widget interact property Live Update

Per default value editors pass the editded value to the SDF only on closing the editor.
So changed signal value gets active only after closing the editor, e.g. sent on the LIN bus.
Sometimes it is better to have a kind of immediately signal change update.
This is enabled by live_update feature.

In this case the signal editor looks like this.

Signal - Interact	
interactable	☑ true
hotkey	None
dialog_title	TestSignal LiveUpdate
live_update	☑ true
live_update_step	10
allowed_input_ranges	0,20-100

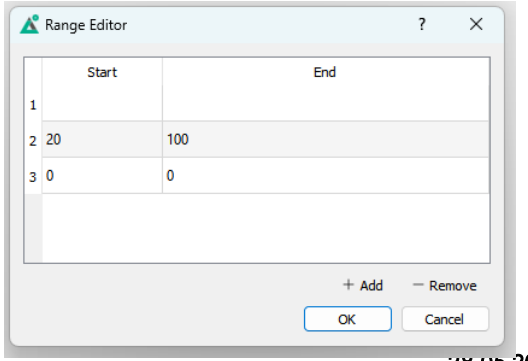


For every left-click on the up/down arrows (SimpleMenu or Web Gui) or
every press on up/down buttons on the device keypad,
the value will be incremented or decremented by the given step size.

Values are limited by pproperty allowed range.
If no range is defined the signal size defines the minimal and maximal values.

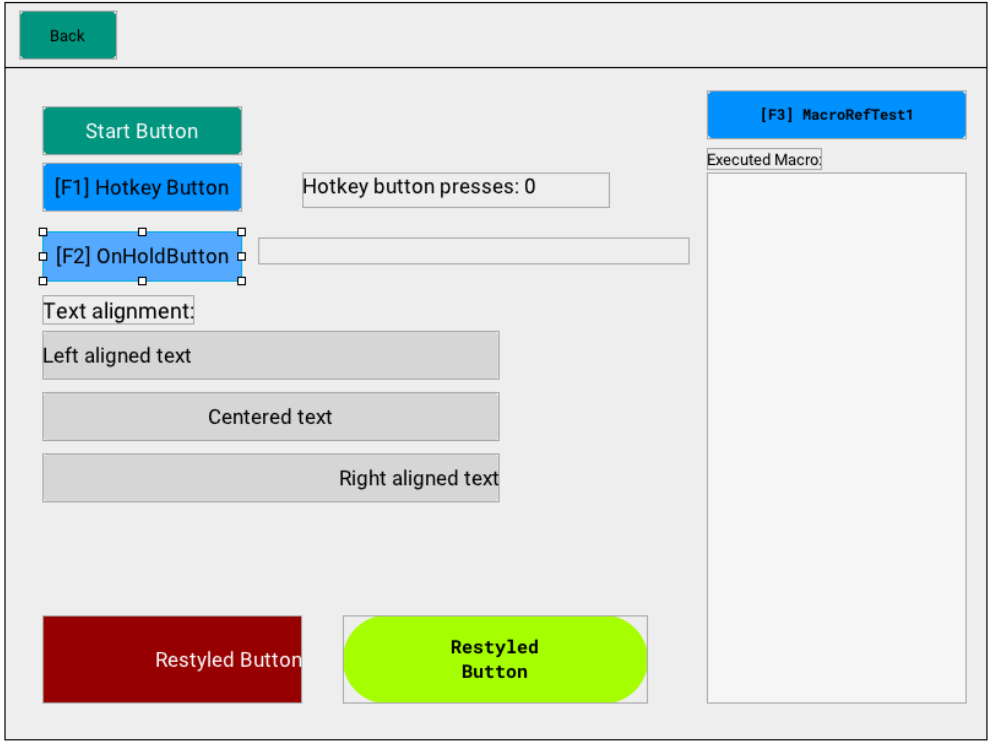
The Min and Max buttons allow for quick setup of minimal and maximal value of allowed range.

Allowed range can be configured by combining several ranges.
Here an example for a combined range allowig values for {0, 20, 21, 22,…100}



For fine tuning a signal value, live_udate offers a more convenient user experience.

Button Widget



Properties:

Widget	
name	button
x	30
y	186
width	163
height	41
visible	true
z_index	5
opacity	100%
Text properties	
font	Default
font_size	20
text_color	#000000
text_alignment	Center
text_wrap_mode	Clip
Button	
background	#55AAFF
text	[F2] OnHoldButton
corner_radius	7
border_width	0
border_color	#000000
Button - Interact	
interactable	true
panel_id	[None]
hotkey	F2
on_press_macro	[1-LIN] OnHoldButtonPressed
on_release_macro	[1-LIN] OnHoldButtonReleased

Position and size

Text font, size, color and alignment

Interact Section

With 2 linkages with macros for button press and release

Focus & Select Mode

To allow simulation of mouse clicks on device display the Focus & Select mode was introduced.

If a panel with at last one interactable widget with Hotkey assignment is displayed, Focus & Select mode can be activated by either

- Long press on Menu Button or
- Short press on Menu button and selection of first entry Focus & Select by Enter (F3) key.

In Focus & Select mode the F1 …F6 keys are switched to their secondary functions (green labeling)

F2/F4,F5 and F6 are used to focus the next interactable element on screen.

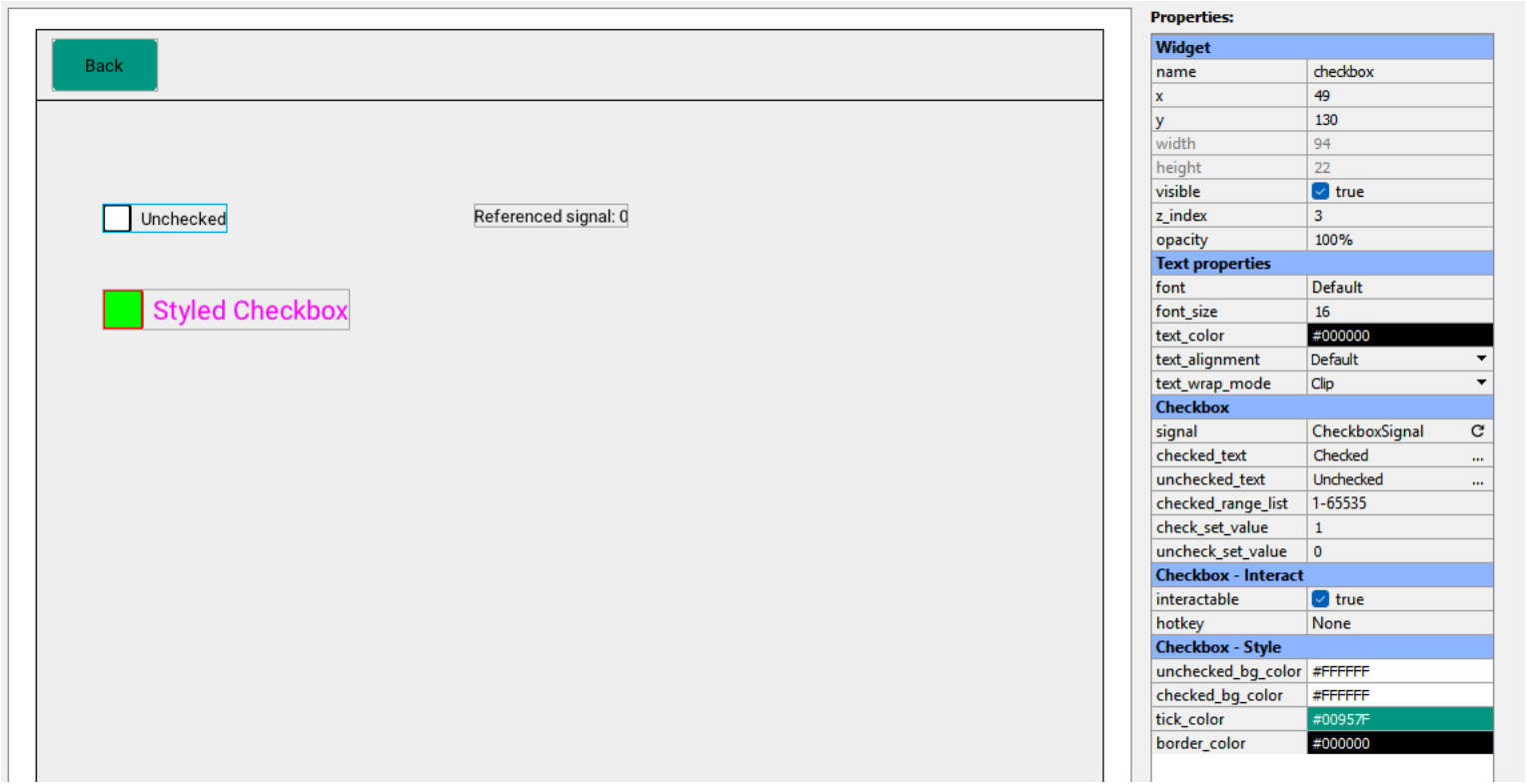
F3 key will trigger the element like open a value editor or execute a macro.

Focus & Select mode is finished by ESC(F1) key.

While Focus&Select mode is activated, the key actions are not forwarded to SDF for processing (system signals SYSDIGIN1—6, digital input events etc.)

Checkbox widget

Checkbox value is mainly intended to display or input binary values.

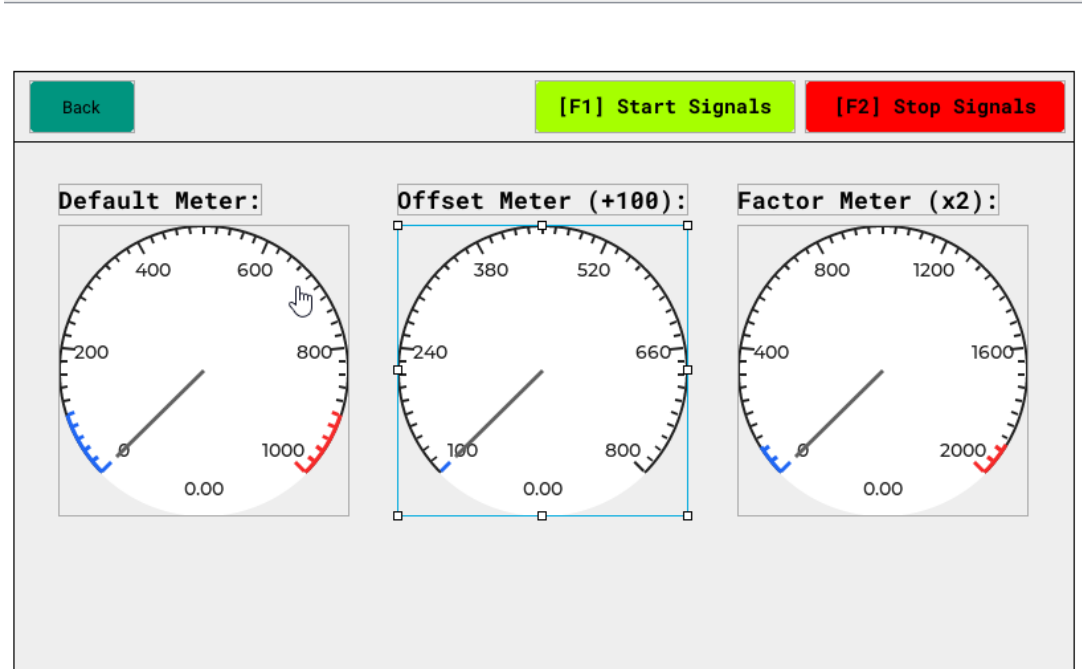


Properties:

Widget	
name	checkbox
x	49
y	130
width	94
height	22
visible	true
z_index	3
opacity	100%
Text properties	
font	Default
font_size	16
text_color	#000000
text_alignment	Default
text_wrap_mode	Clip
Checkbox	
signal	CheckboxSignal
checked_text	Checked
unchecked_text	Unchecked
checked_range_list	1-65535
check_set_value	1
uncheck_set_value	0
Checkbox - Interact	
interactable	true
hotkey	None
Checkbox - Style	
unchecked_bg_color	#FFFFFF
checked_bg_color	#FFFFFF
tick_color	#00957F
border_color	#000000

Meter widget

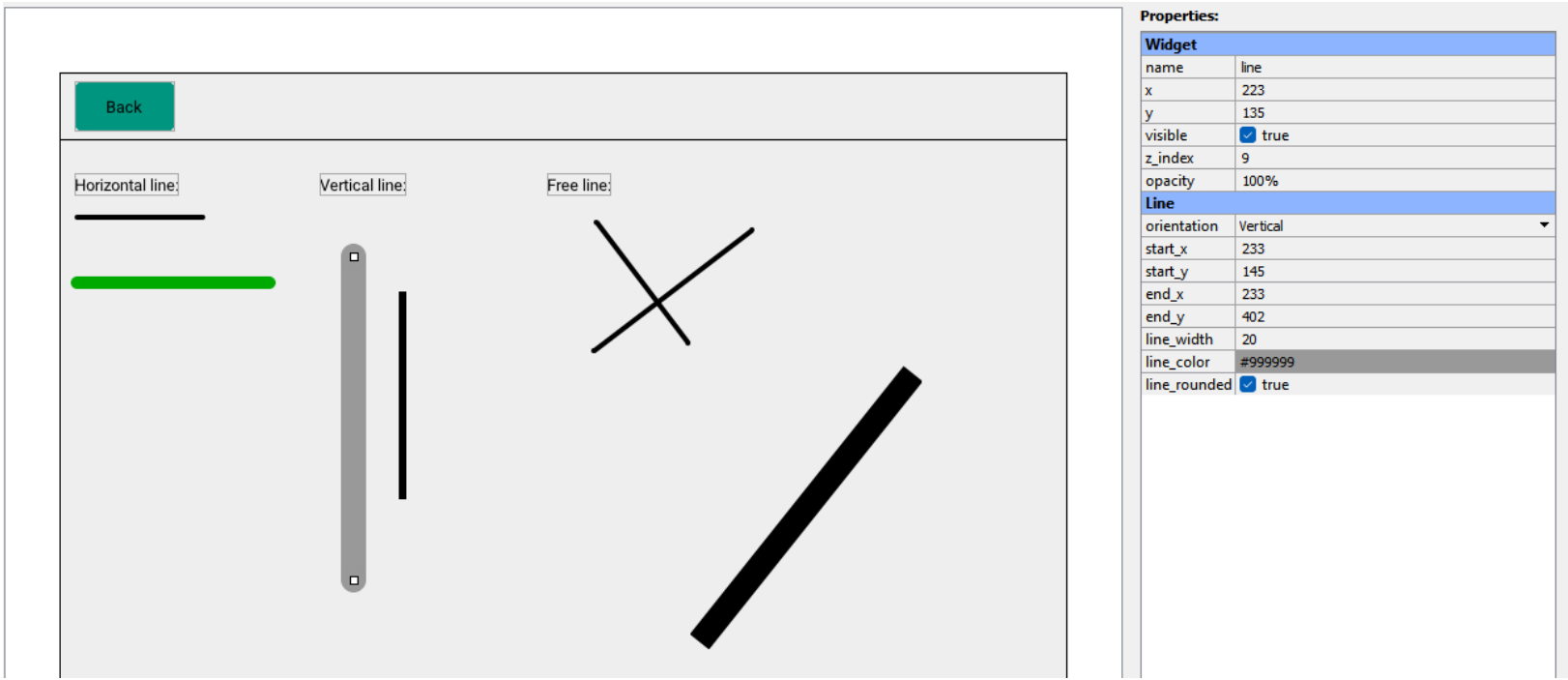
Meter widget allows to show a signal value in a meter representation.
Some new properties had been added to this widget.



Properties:

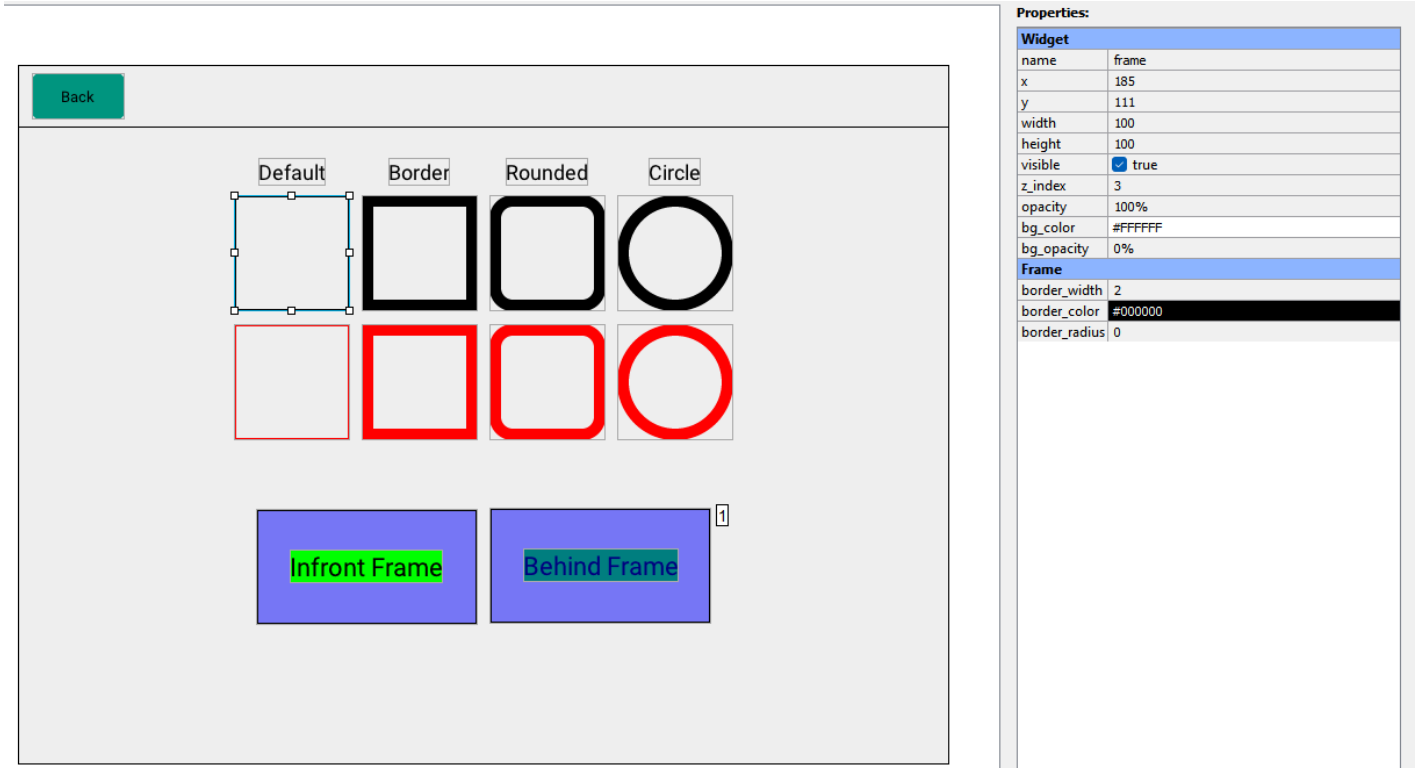
Widget	
name	signal_meter
x	289
y	115
width	220
height	220
visible	true
z_index	7
opacity	100%
SignalMeter	
signal	MeterTestSignal
signal_representation	Integer
unit	
scale_start	100
scale_end	800
lower_limit	100
upper_limit	900
factor	1.000000
offset	100.000000
SignalMeter - Interact	
interactable	false
hotkey	None
dialog_title	
live_update	false
live_update_step	1
allowed_input_ranges	

Line widget can be used to decorate the GUI and to separate areas on the panel.
There is no runtime function or SDF action related to this widget.



Frame widget

Frame widget can be used to decorate the GUI and to separate areas on the panel.
There is no runtime function or SDF action related to this widget.



Properties:

Widget	
name	frame
x	185
y	111
width	100
height	100
visible	true
z_index	3
opacity	100%
bg_color	#FFFFFF
bg_opacity	0%
Frame	
border_width	2
border_color	#000000
border_radius	0

Control GUI elements at runtime

There are several ways to change the GUI in the context of SDF execution:

Signal, Meter and checkbox widgets
These widgets typically have a dynamic link to the SDF, and display the current signal value

Signal and Button Widget
with interactable = true will allow sigmal change or macro execution at runtime

Console Widget
shows the the macroprint output on the debug report channel in a scrollable list window.

Widget Properties changes
All properties of a widget can be changed at runtime: text, text colour, visibility, etc.

MessageBox
This mechanism allows a message to be transferred from the SDF to the GUI.
Furthermore a user feedback is optionally available.

Widget Property changes

There is a special syntax for the Macro Print command to change the widget properties

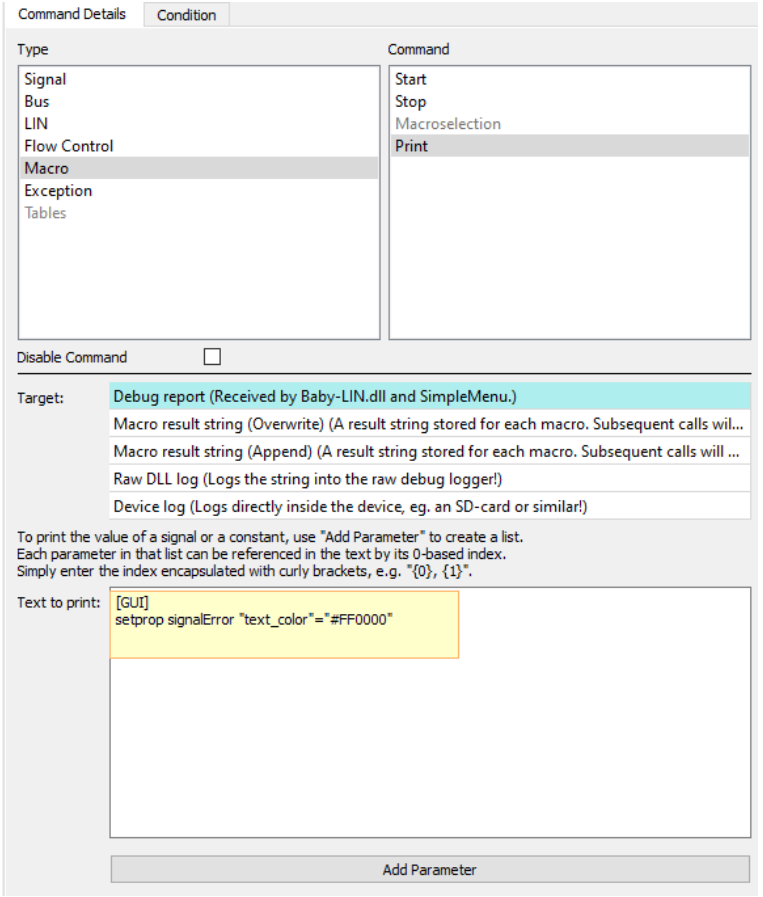
```
[GUI]
setprop signalError "text_color"="#FF0000"
```

[GUI] and setprop are reserved keywords.

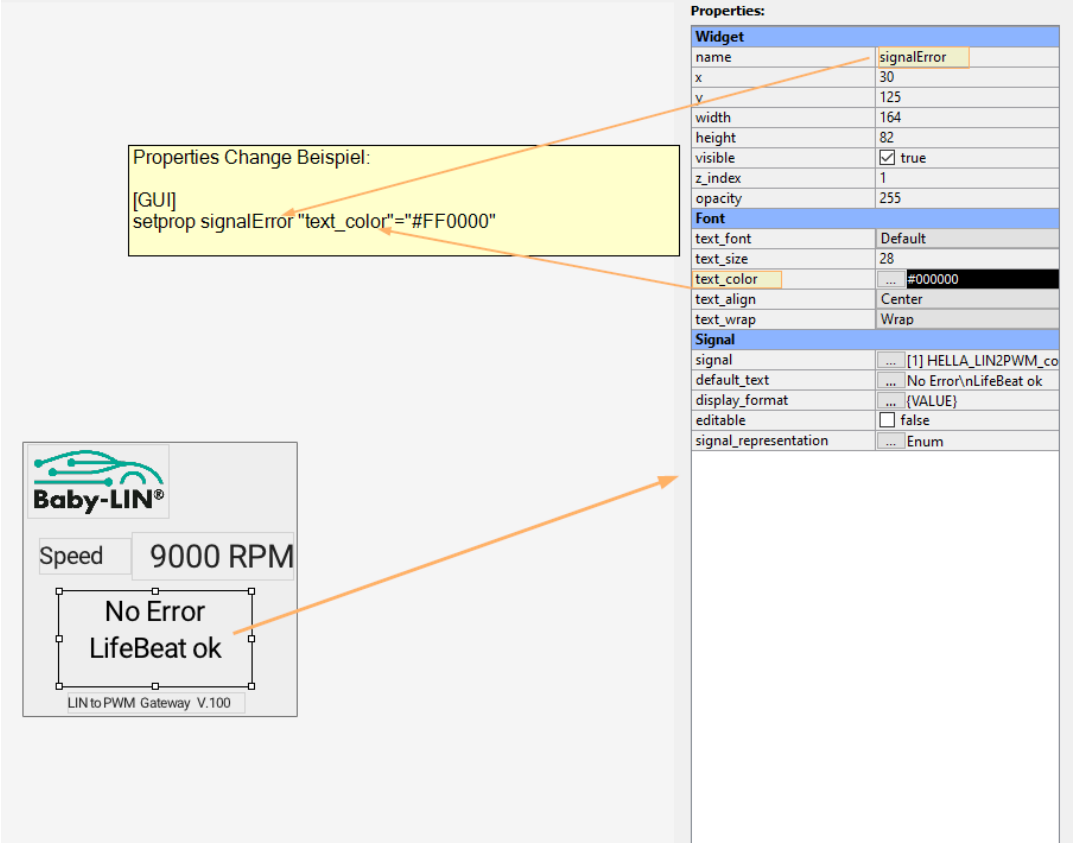
signalError is the widget name here. (Case sensitive!)

The widget name is followed by the name and new value of the property, both enclosed in quotation marks, and separated by an '=' character.

If the widget name contains blanks, it must also be enclosed in quotation marks.



Widget Property changes Signal



More examples

[GUI]
setprop signalError "visible" = "0"

Or
[GUI]
setprop signalError "visible" = "1"
setprop signalError "text_color" = "#00FF00"

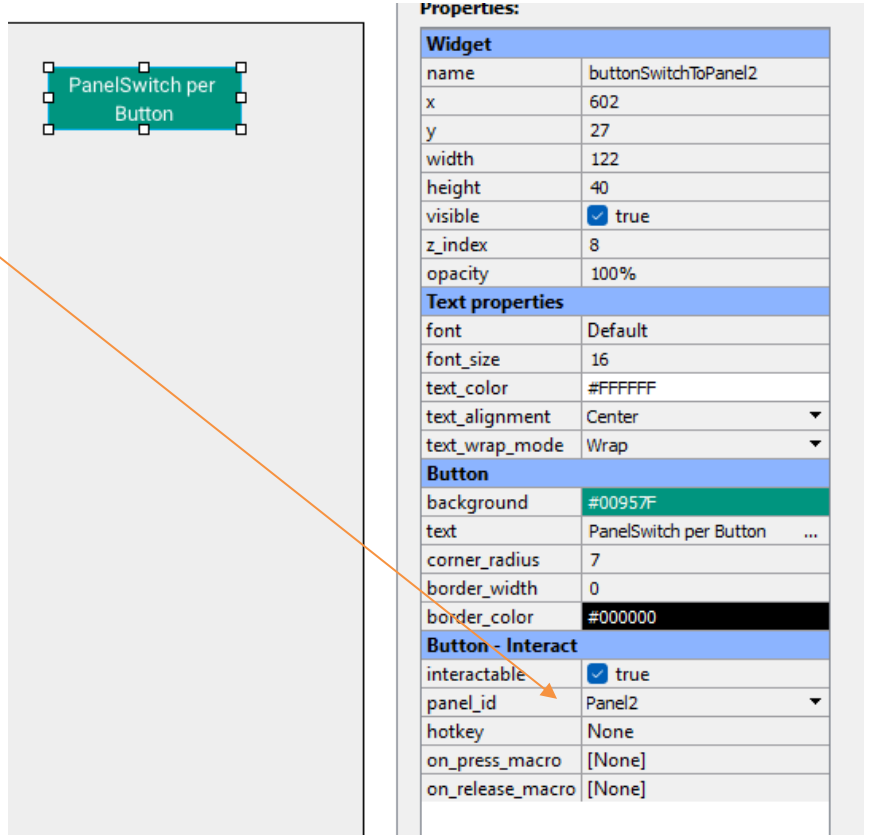
Multiple property changes can be in includes in the same Macro Print command .

For screens with multiple panels, there are 2 methods of switching between panels:

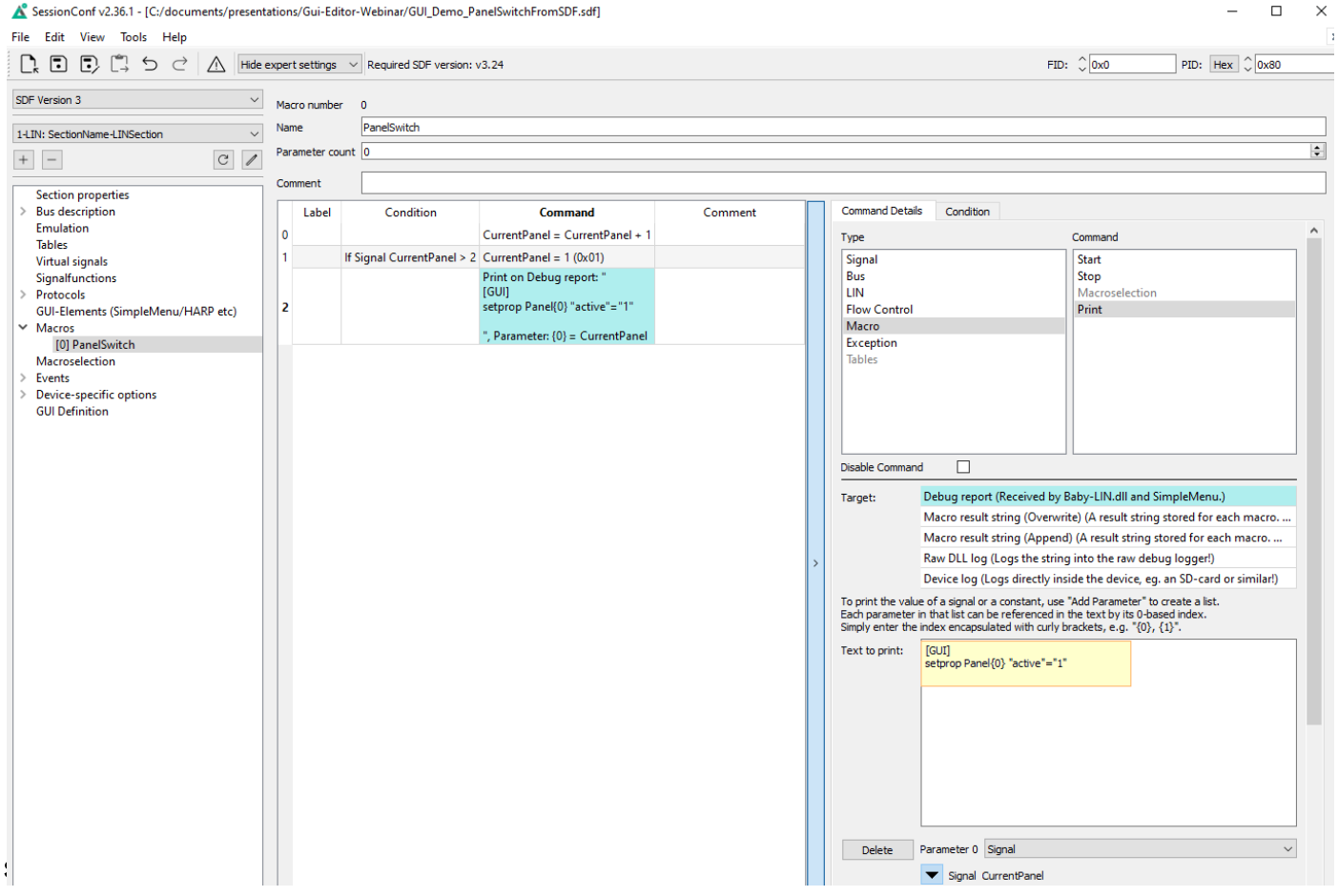
- Via button widget with assigned panel ID.
  On device you have to select Focus & Select modus first to trigger button in display. Alternatively, you can assign a hotkey on the Baby-LIN keyboard to the button.

- Via MacroPrint command from within the SDF
  [GUI]
  setprop Panel1 "active" = "1"
  or
  [GUI]
  setprop Panel2 "active" = "1"

  It is sufficient to set only the desired panel to active = 1, all others are automatically deactivated.



Switching panels



See also
GUI_Demo_panelSwitch.sdf

Messagebox Function

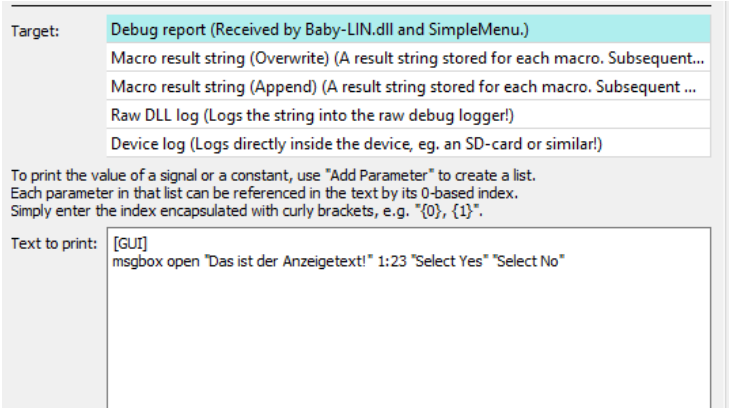
For displays from the SDF in the sense of a message box, there is another special syntax for the Macro Print command

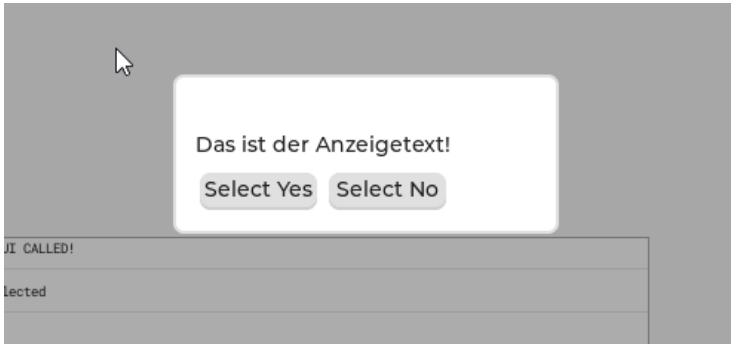
[GUI]
msgbox open "Das ist der Anzeigetext!" 1:23 "Select Yes" "Select No"

1:23 defines the section and signal index for a feedback signal, where the index (1..n) of the pressed selection is stored and can be evaluated in the SDF.

The two text strings "Select Yes" and "Select No" are the labels of the two buttons.

You can currently define up to 10 buttons.





Variants of Messagebox syntax

Open Message Box:

[GUI]
msgbox open "Message Box will disappear in 5s"

Update Message Box text:

[GUI]
msgbox update "Message Box will be closed after {0}s"

Close Message Box:

[GUI]
msgbox close

Macro number 2

Name Msgbox Update

Parameter count 0

Comment

	Label	Condition	Command
0			Print on Debug report: " [GUI] msgbox open "Message Box closes in 5s" "
1			popupcloseTimer = 5 (0x05)
2	loop		Delay 1000ms
3			popupcloseTimer = popupcloseTimer - 1
4			Print on Debug report: " [GUI] msgbox update " Message Box closes in {0}s" ", Parameter: {0} = popupcloseTimer
5		If Signal popupcloseTimer > 0	Jump to "loop"
6			Print on Debug report: " [GUI] msgbox close "

Roadmap 2025

- Allow picture resizing when positioning on panel
- Support for additional image formats
- Optimization of image storage
- Signal plotter
- Your ideas and requests