

Content

Objective.....	2
System tables.....	2
@@SYSTAB_GUI_SIMPLEMENU.....	3
@@SYSTAB_GUI_FKEYS.....	5
@@SYSTAB_GUI_LABELS.....	7
BuildIn Macros.....	8
__Harp_Gui_ChangeLabel.....	8
__Harp_Gui_SetStatusLine.....	9
__Harp_Gui_SetFkeyDef.....	9
__Harp_Gui_SelectItems.....	10
__Harp_SystemCall.....	10
System signals for HARP.....	11
@@SYS_GUI_REFRESH.....	11
@@SYS_GUI_LABEL_FK1.....	11
@@SYS_GUI_LABEL_FK2.....	11
@@SYS_GUI_LABEL_FK3.....	11
Document Revision History.....	12

Objective

Starting with Firmware version 6.23.5 for HARP device, two new mechanisms were introduced in SDF-V3.

1. System tables for HARP
2. BuildIn Macros for HARP
3. System signals for HARP

System tables

System tables are SDF tables with a reserved name and a fixed structure,

Currently such system tables must still be defined by the user, but in future firmware versions a system table with correct column definitions can be created by just giving the name of the requested system table.

The first system tables introduced, were created in HARP firmware, to allow dynamically configuration of display content in SDF menu and to dynamically assign macros and labels to the function keys F1...F3.

Three system tables had been defined for this reason.

- @@SYSTAB_GUI_SIMPLEMENU
- @@SYSTAB_GUI_FKEYS
- @@SYSTAB_GUI_LABELS

Remark:

In very early firmware versions supporting HARP System tables the @@SYSTAB_GUI_LABELS was named @@SYSTAB_GUI_FKEY_LABELS.

Later this system table was renamed to @@SYSTAB_GUI_LABELS as additional labels text were integrated into this system table.

In general, we propose to update your HARP firmware to latest version available on our webpage <https://lipowsky.com/downloads/> .

This will make sure that you can use all features described in this document.

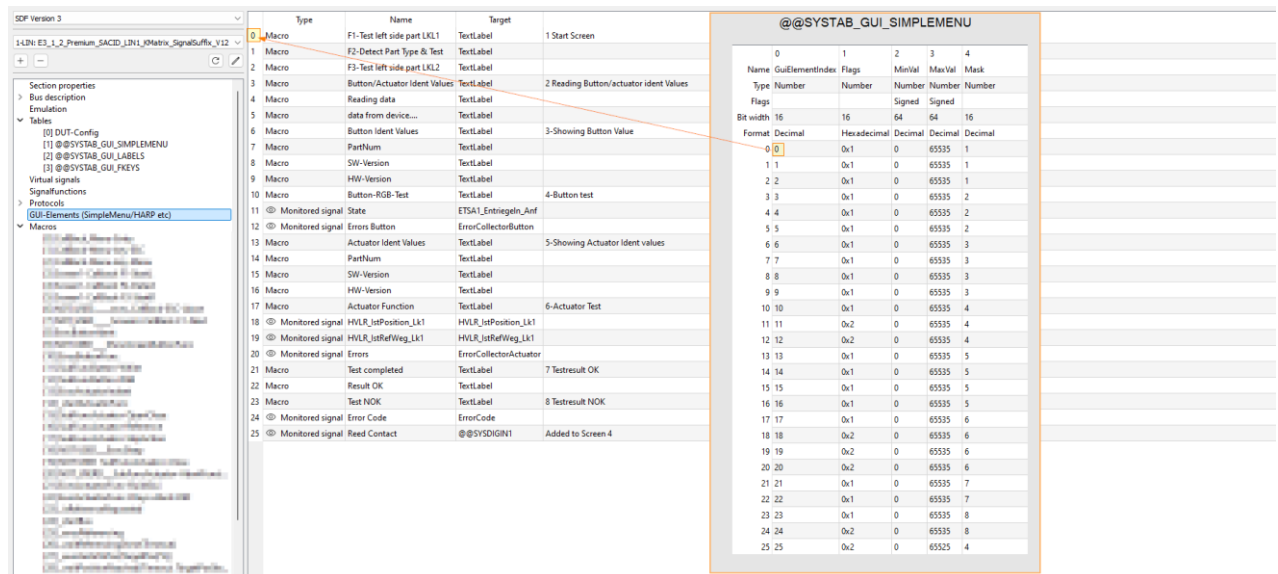
As there had been some firmware version after 6.23.5 with bugs related to the features described here, please make sure your device uses firmware 6.25.0 or later.

@@SYSTAB_GUI_SIMPLEMENU

This system table is related to the GUI Elements defined in the GUI-Elements tree node of the section. It allows us to add new functionality to each of the GUI-Elements.

Typically, this system table will have as many rows as you have Gui Elements defined. Each row in the table is related to a specific Gui-Element entry.

The reference is given by the number in Column[0] GuiElementIndex.



The screenshot shows a software interface with a table of GUI elements on the left and a detailed view of the @@SYSTAB_GUI_SIMPLEMENU table on the right. The table has columns for Name, GuiElementIndex, Flags, MinVal, MaxVal, and Mask. The flags column is highlighted, showing values like 0, 1, 2, 3, 4, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25. The flags are interpreted as bit positions 0 through 5.

Meaning of Flags value (Col[1]) in @@SYSTAB_GUI_SIMPLEMENU

Bitposition	Meaning	Mask
Bit 0..3	0: not visible	0x00
	1: Show static value	0x01
	2 Show and refresh on changes	0x02
	3 Editable value	0x03
Bit 4	Longedit supports left/right arrow key to select digit to change	0x10
Bit 5	Update on change (update Signal value with every change, without OK button)	0x20

The value in column Mask defines, which of the entries will be shown on execution of buildin macro ___Harp_Gui_SelectItems (selection index, Refreshmode).

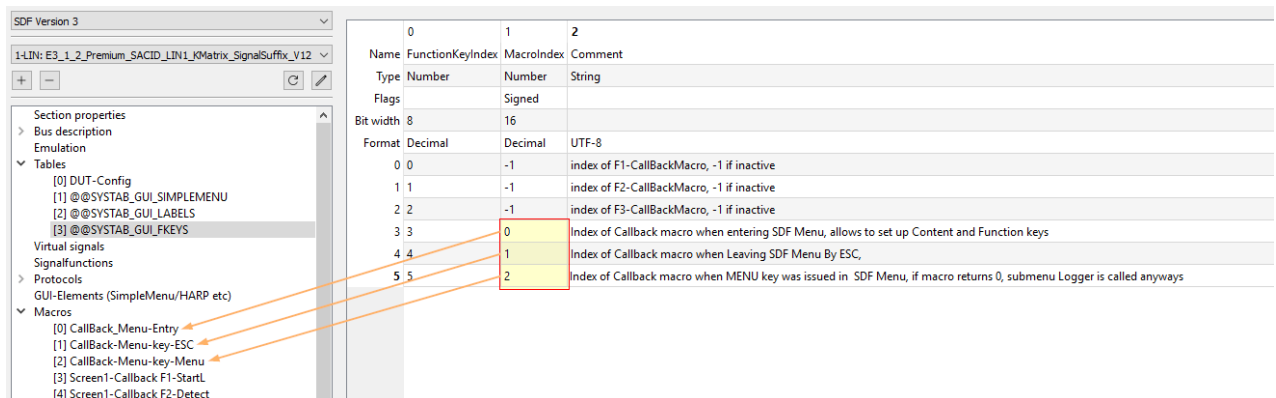
A mask value of 65535(0xffff) defines that this entry will be will shown for any selection index passed to the BuildIn macro (new in firmware V.6.25.0).

@@SYSTAB_GUI_FKEYS

This tables allows to assign any SDF macro as callback macro for any of these events referenced by FunctionKeyIndex. Means, if any of these events occur, the corresponding macro will be called for execution.

If the macro index is -1, no macro is called.

As table cells can be written during runtime, the macro assigned to an event can be activated mor deactivated or assigned to another macro, by macro command table



Name	FunctionKeyIndex	MacroIndex	Comment
Type	Number	Number	String
Flags	Signed		
Bit width	8	16	
Format	Decimal	Decimal	UTF-8
0	0	-1	index of F1-CallbackMacro, -1 if inactive
1	1	-1	index of F2-CallbackMacro, -1 if inactive
2	2	-1	index of F3-CallbackMacro, -1 if inactive
3	3	0	Index of Callback macro when entering SDF Menu, allows to set up Content and Function keys
4	4	1	Index of Callback macro when Leaving SDF Menu By ESC,
5	5	2	Index of Callback macro when MENU key was issued in SDF Menu, if macro returns 0, submenu Logger is called anyways

FunctionkeyIndex	Event
0	F1 is pressed in SDF Menu
1	F2 is pressed in SDF Menu
2	F3 is pressed in SDF Menu
3	SDF menu is entered after SDF loading or on return from Keyboard Menu
4	SDF Menu is entered by ESC key
5	Menu Key was pressed in SDF Menu

The function key indices 0...2 existed from the very beginning, the events with index 3...5 were implemented later, so make sure to run the latest HARP firmware to use them.

Functionkeyindex = 3 Call macro on SDF Menu opening

The function key index 3 can be used to do the initial setup of display content in SDF menu, assignment of the Function Keys F1...F3 labels and callback functions.

So, in above screenshot table row[3] defines the macro with Index [0] (CallBack_Menu-Entry) to be executed every time the SDF Menu in Harp is entered.

Functionkeyindex = 4 Call macro on ESC-Key

With ESC key the SDF menu can be left.

The function key index 4 can be used to execute some specific actions by assigning an appropriate callback macro, in above screen shot the macro CallBack-Menu-key-ESC is assigned to this event.

Functionkeyindex = 5 Call macro on Menu-Key

With Menu key pressing with SDF menu, normally the logger menu will open.

The function key index 5 can be used to execute some specific actions when the Menu key is pressed, by assigning an appropriate callback macro,

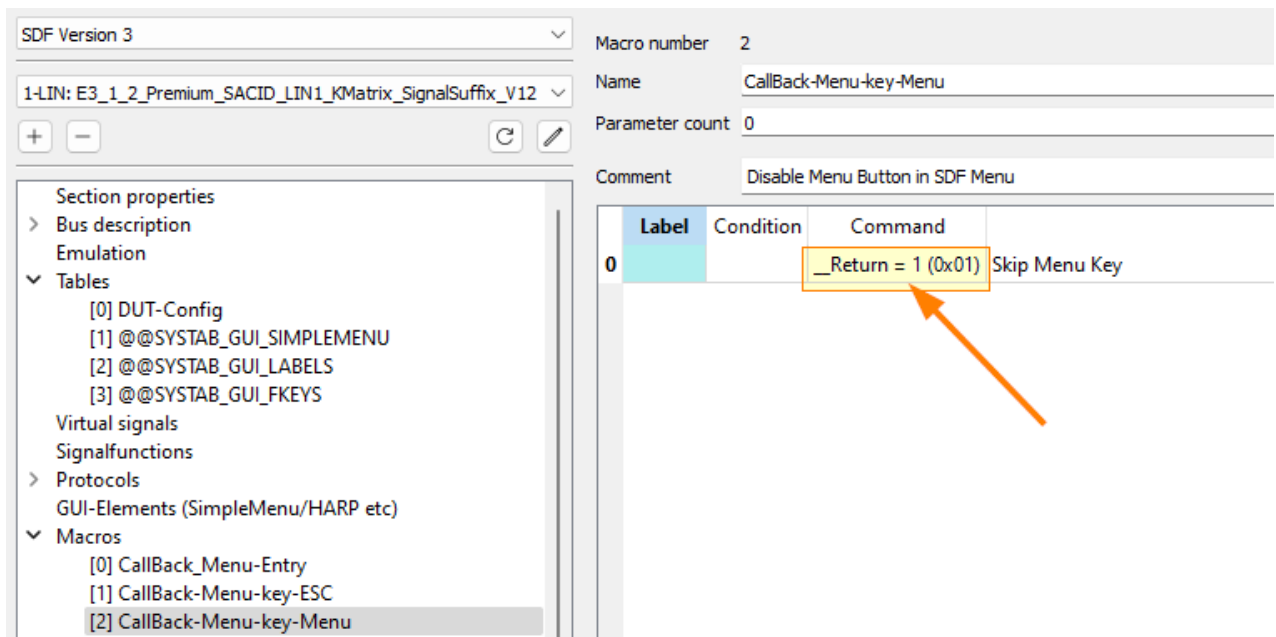
Depending of the return value of the assigned macro, the logger menu will open or not.

Callback Macro terminates with

`_Return = 0` Logger menu opens

`_Return != 0` Logger menu is not opened.

So, this CallBack-Menu-key-Menu macro will omit the logger menu to open.

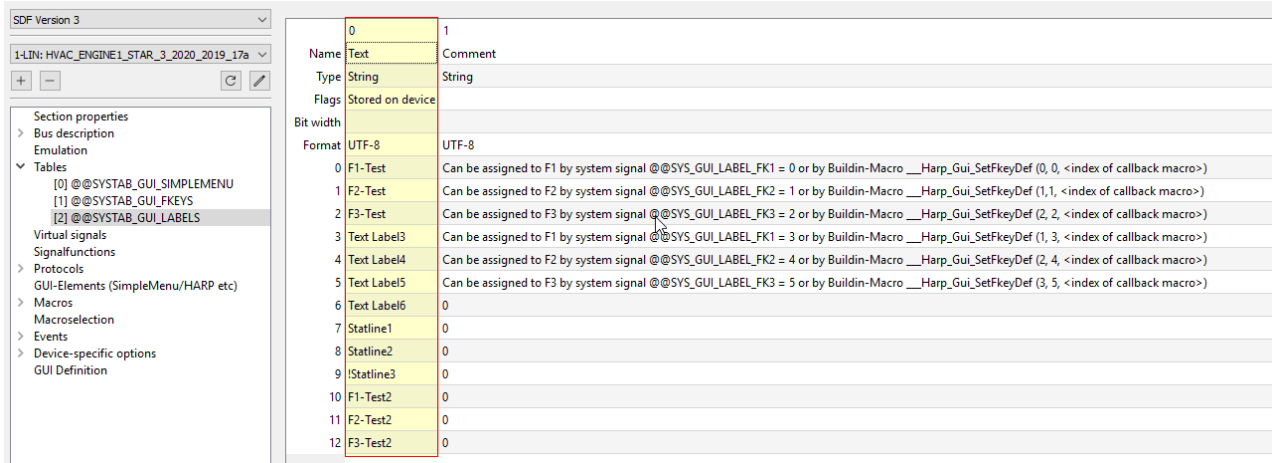


The screenshot shows the SDF software interface. On the left, a tree view shows the 'Macros' section expanded, with '[2] CallBack-Menu-key-Menu' selected. The main area displays the macro configuration for 'CallBack-Menu-key-Menu' (Macro number 2). The 'Comment' field contains 'Disable Menu Button in SDF Menu'. Below this is a table with columns 'Label', 'Condition', 'Command', and an unlabeled column. The table contains one row with Label '0', an empty Condition field, Command '___Return = 1 (0x01)', and the unlabeled column containing 'Skip Menu Key'. An orange arrow points to the '___Return = 1 (0x01)' command.

Label	Condition	Command	
0		___Return = 1 (0x01)	Skip Menu Key

@@SYSTAB_GUI_LABELS

The text strings given in column [0] of this system table can be assigned to function keys by using the system signals @@SYS_GUI_LABEL_FK1, @@SYS_GUI_LABEL_FK2 and @@SYS_GUI_LABEL_FK3.



Name	Type	Comment
0	String	
1	String	
F1-Test	String	Can be assigned to F1 by system signal @@SYS_GUI_LABEL_FK1 = 0 or by Buildin-Macro __Harp_Gui_SetFkeyDef (0, 0, <index of callback macro>)
F2-Test	String	Can be assigned to F2 by system signal @@SYS_GUI_LABEL_FK2 = 1 or by Buildin-Macro __Harp_Gui_SetFkeyDef (1, 1, <index of callback macro>)
F3-Test	String	Can be assigned to F3 by system signal @@SYS_GUI_LABEL_FK3 = 2 or by Buildin-Macro __Harp_Gui_SetFkeyDef (2, 2, <index of callback macro>)
Text Label3	String	Can be assigned to F1 by system signal @@SYS_GUI_LABEL_FK1 = 3 or by Buildin-Macro __Harp_Gui_SetFkeyDef (1, 3, <index of callback macro>)
Text Label4	String	Can be assigned to F2 by system signal @@SYS_GUI_LABEL_FK2 = 4 or by Buildin-Macro __Harp_Gui_SetFkeyDef (2, 4, <index of callback macro>)
Text Label5	String	Can be assigned to F3 by system signal @@SYS_GUI_LABEL_FK3 = 5 or by Buildin-Macro __Harp_Gui_SetFkeyDef (3, 5, <index of callback macro>)
Text Label6	String	
Statline1	String	
Statline2	String	
Statline3	String	
F1-Test2	String	
F2-Test2	String	
F3-Test2	String	

The value assigned to the system signals @@SYS_GUI_LABEL_FK1...3 must match the row index of the requested text.

If a value of 0xffff or 0xffffffff is assigned to any of the @@SYS_GUI_LABEL_FK* signals the corresponding function key is deactivated and not shown.

Note, that this system signal method with @@SYS_GUI_LABEL_FKx is legacy.

Alternatively, you now can use **buildin macro __Harp_Gui_SetFkeyDef** to assign texts defined in this system table to a function key.

With the new **buildin macro __Harp_Gui_ChangeLabel** it's now also possible to replace label names in SDF menu by strings given in @@SYSTAB_GUI_LABELS.

Additionally, the **buildin macro __Harp_Gui_SetStatusLine** can be used to assign text content for the display status line from this system table

As the buildin macros are the more powerful methods, **the system signals @@SYS_GUI_LABEL_FK1/2/3** should not be used for new projects.

But they are still supported for compatibility reasons.

BuildIn Macros

___Harp_Gui_ChangeLabel

Parameter GuiltemIndex

Index of Gui-Element = number in first column of Gui-Element Tab

	Type	Name	Target	
0	Macro	F1-Test left side part LKL1	TextLabel	1 Start Screen
1	Macro	F2-Detect Part Type & Test	TextLabel	
2	Macro	F3-Test left side part LKL2	TextLabel	
3	Macro	Button/Actuator Ident Values	TextLabel	2 Reading Button/actuator ident Values
4	Macro	Reading data	TextLabel	
5	Macro	data from device....	TextLabel	
6	Macro	Button Ident Values	TextLabel	3-Showing Button Value
7	Macro	PartNum	TextLabel	
8	Macro	SW-Version	TextLabel	
9	Macro	HW-Version	TextLabel	
10	Macro	Button-RGB-Test	TextLabel	4-Button test
11	⊗ Monitored signal	State	ETS_A1_Entriegeln_Anf	
12	⊗ Monitored signal	Errors Button	ErrorCollectorButton	

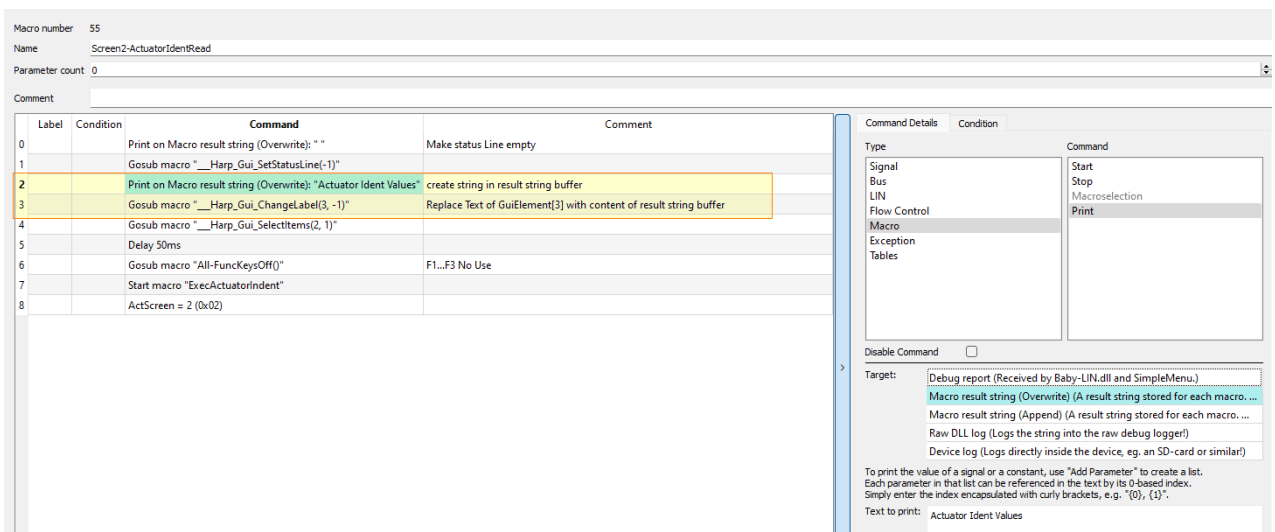
Textindex

index of text to use

0....n text is taken from row[n] in table @@SYSTAB_GUI_LABELS

-1 text is taken from result string buffer, which typically has been filled by appropriate macro print command with target

Example of result string usage



__Harp_Gui_SetStatusLine

Puts referenced text to HARP display status line

Param1 Textindex
 Index of text to use
 0....n text is taken from row[n] in table @@SYSTAB_GUI_LABELS
 -1 text is taken from result string buffer, which typically has been filled
 by appropriate macro print command

Param2 Optional, was never implemented, can be omitted.

__Harp_Gui_SetFkeyDef

Redefines FKey [0..2] label text and callback macro

Param1 Fkey Index {0...2}
Param2 Text index
 Index of text to use
 0....n text is taken from row[n] in table @@SYSTAB_GUI_LABELS
 -1 text is taken from result string buffer, which typically has been filled
 by appropriate macro print command
 -2 Hide function key, macro still might de assigned

Param3 Index of assigned callback macro for the referenced function Key F1...F3 .
 A macro index of -1 will deactivate any callback macro for the function key referenced in
 Param1

Macro number	51		
Name	Screen1-Start		
Parameter count	0		
Comment			
Label	Condition	Command	C
0		Gosub macro "__Harp_Gui_SelectItems(1, 1)"	
1		Gosub macro "__Harp_Gui_SetFkeyDef(0, 0, 3)"	START-L
2		Gosub macro "__Harp_Gui_SetFkeyDef(1, 1, 4)"	DETECT
3		Gosub macro "__Harp_Gui_SetFkeyDef(2, 2, 5)"	START-R
4		Print on Macro result string (Overwrite): " "	Make status Line empty
5		Gosub macro "__Harp_Gui_SetStatusLine(-1)"	
6		ActScreen = 1 (0x01)	

In macro line[1] FK1 is assigned with Text in row[0] of table @@SYSTAB_GUI_LABELS and the macro [0] is assigned as callback macro, when function key is pressed.

___Harp_Gui_SelectItems

Param1	Selection value
Param2	Refresh mode
	0: do nothing
	1: Rebuild Menu, redraw it, restart on top line
	2: Rebuild Menu, redraw it, restart on current line
	3: Reassign Function keys (Directkeys) and redraw FunktionKeys

Deselects all Gui-Elements defined in @@SYSTAB_GUI_SIMPLEMENU and then activates only those items which have matching entry in column Mask with given selection value or if those items which have a value of 65535(0xffff) defined in column Mask. (Second features was introduced with firmware V.6.25.0)

___Harp_SystemCall

This is a building macro to access some HARP specific system calls with 2 parameters

___Harp_SystemCall (0,0)

___Harp_SystemCall (1,1)

Param1	Operation selector, defines specific operation
0:	shut off HARP device
	Param2 don't care
1:	define usage of local error message window
	Param2 = 0 : Use local error msg window
	Param2 = 1 : Suppress local error msg window

System signals for HARP

@@SYS_GUI_REFRESH

Writing a value to this system signal triggers on of these actions

- 0: do nothing
- 1: Rebuild Menu, redraw it, restart on top line
- 2: Rebuild Menu, redraw it, restart on current line
- 3: Reassign Function keys (Directkeys) and redraw FunktionKeys

@@SYS_GUI_LABEL_FK1

Defines the Function key F1 text label index as defined in @@SYSTAB_GUI_LABELS row[index].

e.g. value 0 will assign the text in row[0] to be shown for F1 key.

	0	1
Name	0	Comment
Type	String	String
Flags	Stored on device	
Bit width		
Format	UTF-8	UTF-8
0	F1-Test	Can be assigned to F1 by system signal @@SYS_GUI_LABEL_FK1 = 0 or by Buildin-Macro __Harp_Gui_SetFkeyDef (0, 0, <index of callback macro>)
1	F2-Test	Can be assigned to F2 by system signal @@SYS_GUI_LABEL_FK2 = 1 or by Buildin-Macro __Harp_Gui_SetFkeyDef (1, 1, <index of callback macro>)
2	F3-Test	Can be assigned to F3 by system signal @@SYS_GUI_LABEL_FK3 = 2 or by Buildin-Macro __Harp_Gui_SetFkeyDef (2, 2, <index of callback macro>)
3	Text Label3	Can be assigned to F1 by system signal @@SYS_GUI_LABEL_FK1 = 3 or by Buildin-Macro __Harp_Gui_SetFkeyDef (1, 3, <index of callback macro>)
4	Text Label4	Can be assigned to F2 by system signal @@SYS_GUI_LABEL_FK2 = 4 or by Buildin-Macro __Harp_Gui_SetFkeyDef (2, 4, <index of callback macro>)
5	Text Label5	Can be assigned to F3 by system signal @@SYS_GUI_LABEL_FK3 = 5 or by Buildin-Macro __Harp_Gui_SetFkeyDef (3, 5, <index of callback macro>)
6	Text Label6	0
7	Statline1	0
8	Statline2	0
9	!Statline3	0
10	F1-Test2	0
11	F2-Test2	0
12	F3-Test2	0

If a value of **0xffffffff (4294967295 decimal)** is assigned for @@SYS_GUI_LABEL_FK1, the F1 key will be deactivated on key is **not shown in display**.

This is more a legacy method, as buildin macro __Harp_Gui_SetFkeyDef is more versatile.
See description in chapter buildin macros.

@@SYS_GUI_LABEL_FK2

Same as @@SYS_GUI_LABEL_FK1, but for F2 key.

@@SYS_GUI_LABEL_FK3

Same as @@SYS_GUI_LABEL_FK1, but for F3 key.

Document Revision History

Date	Revision	Author	Comment
10.01.2025	A	AL	Initial Version