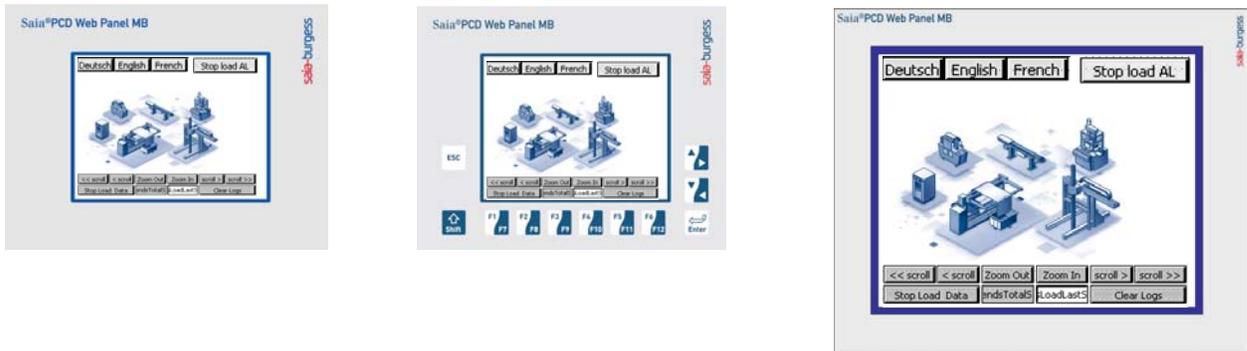


Saia®PCD Web panel with MicroBrowser

5.7" VGA / TFT: PCD7. D457VTCF / VMCF & VTCFH
 10.4" VGA / TFT: PCD7.D410VTCF

Manual /user's guide



Revision	Description	date
Rev 0	Release Edition – Manual/User's guide for 5.7 MB panels VGA version 26/858 PE1 – valid from FW 1.00.00	05.12.08
Rev 1	Manual/User's guide for 5.7 and 10.4 MB panels VGA – version 26/858 PE2 – valid from FW 1.01.00. Add section: 12.3	19.01.09
Rev2	Section 6.4: add comment * / Section 6.4.5 : Default s-bus timeout = 500ms / Section:6.7 adaptation / Section 8: Full updated !!New section 16 : known bugs	09.04.09
Rev 3 a	Based on FW 1.11.35: new log.txt, Portrait landscape (rotation), QVGA / VGA (resolution), Save changes. New rules for missing fonts. New numbering of the sections. Additional sections: 16 = List of message-box messages + example of calculation of size memory requirement of online Trends. 18 = error message advanced. Index a → Add "Some rules regarding gif image" section 17	07.08.09 & 18.08.09
Rev 3 b	- Same as Rev 3a with FW 1.12.01 + Add "power request" on section 4.	30.9.09
Rev 3 c	Revision of the section 17: "recommendation". Please read this section in first	12.10.09
Rev 4	Add section 11.2: multi languages: examples Section 16: List of message box message: Out of memory in heap 2 can appears in case of "offline" trends too. Section 18: Error messages advanced: additional information	20.11.09
Rev 5	- New FW version 1.12.11 supporting new features of the Web Editor 5.14.27 as: Web-editor scalable function (up scaling), Moving painter object, Polygon rotation, tachometer Macro, New macro dialogs (new teq format) - Alarming/trending works with a different port other than 80. - Alarming/trending works through S-Bus Section 7.5: Adaptation: Add build.in keyboard layout (MB comfort line) Add new section 9.1: uBT_Backlight container diagram	12.02.10
Rev 6	Section 9: uB_Terminal containers → updated descriptions (+ new uBT_BackLightOn, uBT_DisplayRotation and uBT_ScaleMode) + info regarding the "Not active containers". Section 12.1: using equally Standard or "crossed" Ethernet cable when using X2 port in http direct or EtherSbus	01.04.10
Rev 7	Additional info regarding Font size → see the SECTION 10	10.05.10
Rev 8	In progress :16 list of message-box	
Rev 9	Main: Add the user's guide part regarding the haptic MB Panel	12.01.11
Rev 10	Not released	
Rev 11	Not released	
Rev 12	For next release: Multi connection / Support macro save logs to files / DHCP DNS / info video cache calculation / Gif files decompression into video cache at starting. This revision is corresponding to the firmware version 1.18.xx	

→ This document is regularly updated.

Saia®PCD VGA Web panel with MicroBrowser

Types:

5.7” TFT VGA PCD7. D457VTCF / VMCF and VTCFH
 10.4” TFT VGA PCD7.D410VTCF

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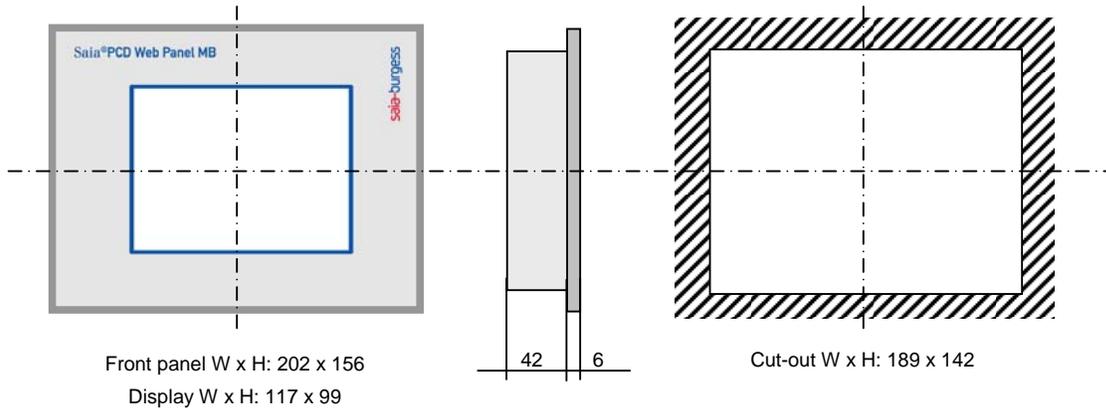
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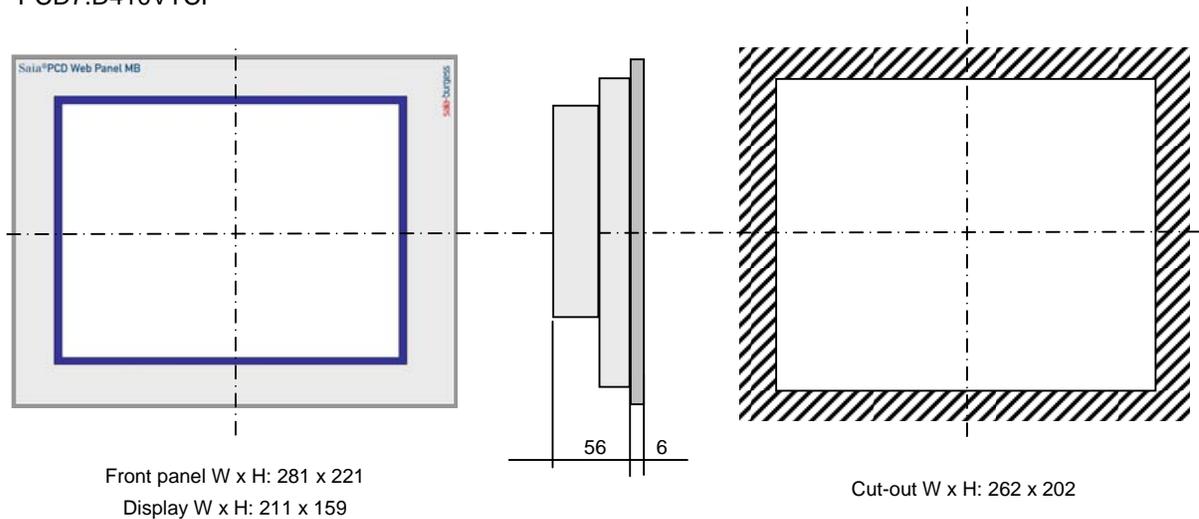
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1. Dimensions and cut-out (all in mm)

PCD7.D457VTCF / VMCF and VTCFH

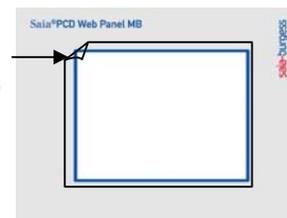


PCD7.D410VTCF



2. Mounting

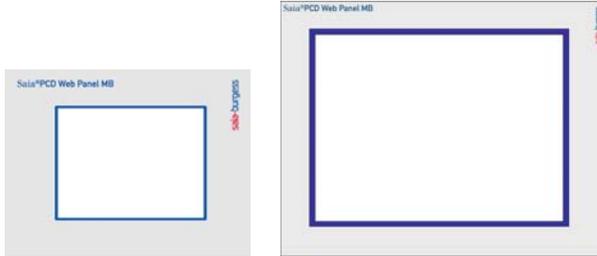
- REMOVE the protective transparent film (if need) - - - - - →
- Flush mounting by 4 (x6 for the 10,4") brackets with grub screw M5x30
- Mounting position is horizontal or vertical position (see section 7.4.1)
- Ensure that the ventilation slits are positioned above and below in mounting position.
- Operation temperature: 0...50 °C (portrait or landscape positions)
- Extended operation temperature → contact the PCD support.



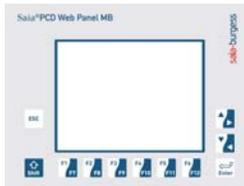
3. Operation and handling

3.1. Base Line 5.7” MB panels and 10.4”

Touch-screen operated by finger or pen (stylus). Do not operate with sharp tools (e.g. screw drivers)



3.2. Comfort Line MB panels (combined touch and keypad)



Functions F1 to F6 → directly with F key depression.
Functions F7 to F12 → with key combination: shift + F key
(programming with the web-editor: see section 14)



Up/down navigation. Combine with shift key for right/left navigation.



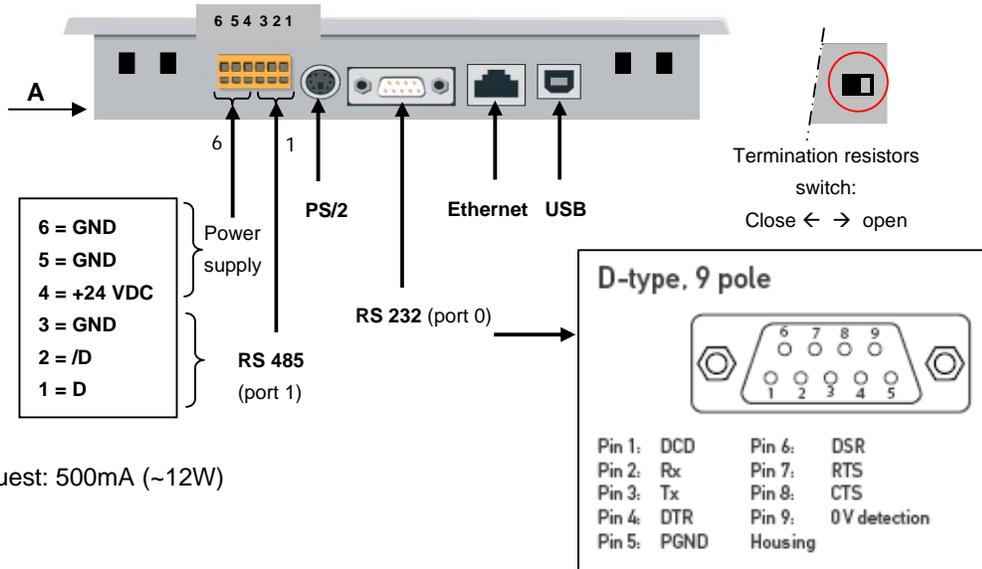
Enter key: “Enter” function



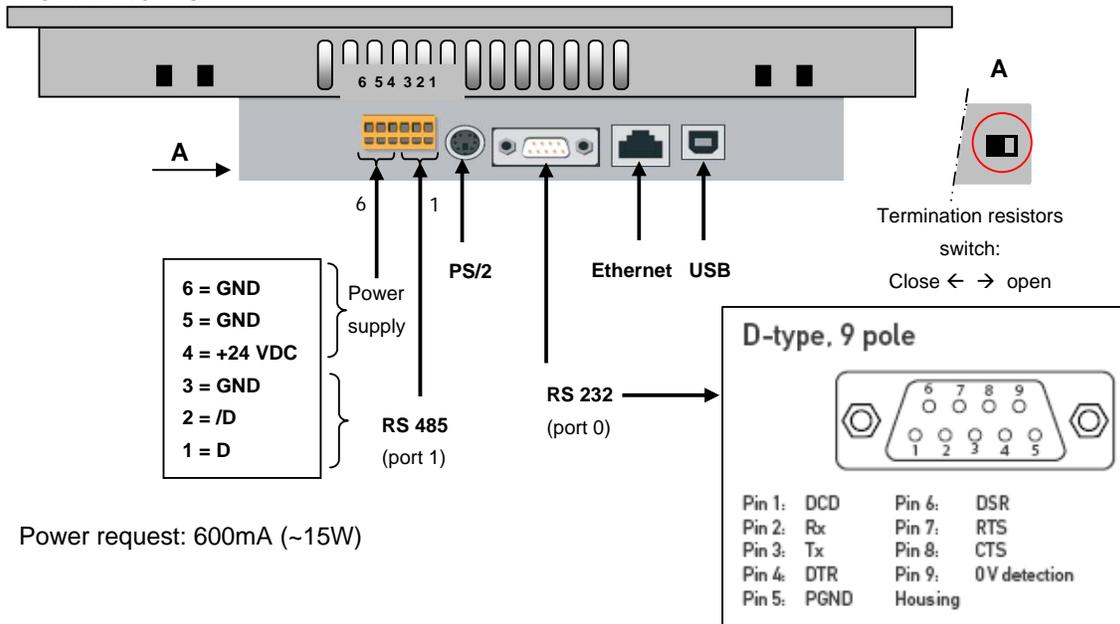
Escape key

4. Connections and power request

PCD7.D457VTCF / VMCF and VTCFH



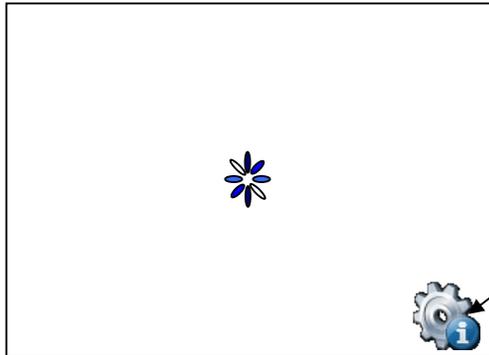
PCD7.D410VTCF



Title		Description	PCD7.D	457VTCF	457VMCF	410VTCF	457VTCFH
Power Supply	Gnd (-) / 24V (+)	Spring connector, 6-pole, in combination with RS-485 communication		x	x	x	x
Communication	PS/2	Standard Mini DIN 6 (external keyboard /barcode reader)			x	x	
	RS232 (port 0)	D-type 9		x	x	x	
	Ethernet	RJ 45 with LED control		x	x	x	x
	USB	Standard USB slave		x	x	x	x
	RS485 (port 1)	Spring connector, 6-pole, in combination with power supply		x	x	x	x

5. TITLE

The title screen is displayed for a few seconds. It is the first screen that appears after a power ON. The Welcome text and the splash image are defined in → system / intro screen (section xx)



For a few seconds and by pressing on this icon, you enter immediately on the setup menu.
 Or see section 6: setup menu

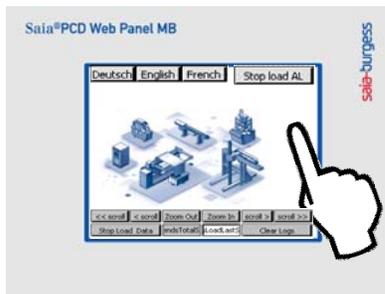
 = Animated Icon for “please wait, activity in progress, loading”

Custom your start page: See section 7.3.2.3

6. Enter & Quit the Setup Menu

Enter in the setup menu:

- By pressing **at any time** and anywhere (except on the buttons areas) during 4 seconds
- By pressing on an Icon at start (see section 5.TITLE)
- SETUP menu contains an ON-LINE Help (press help icons)



6.1. Password

MB panels from the PCD7.D4 xxxx series are delivered without a Setup password. However, if a password has subsequently been defined for access to the Setup menu, you will have to enter the correct password and confirm it with OK.

Setting password see section 7.6

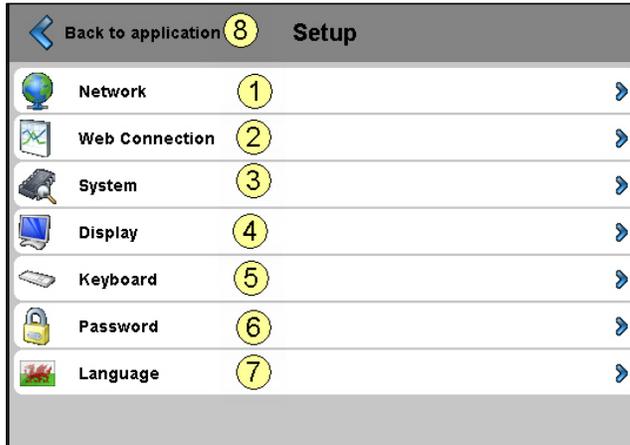
6.2. Save and quit



By changing one or several parameters, you must confirm that you want to save, save & reboot or not save the new parameters.

7. SETUP screen

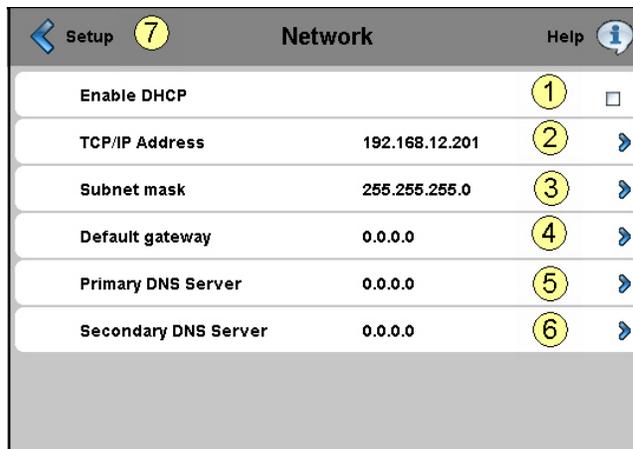
Setup screen is the first screen that appears by entering in the setup menu.



1	Network	MB panel settings	See section	7.1
2	Web connection	Configuration of the Web connection	See section	7.2
3	System	Info/settings/special/FW download and reboot	See section	7.3
4	Display	Display settings	See section	7.4
5	Keyboard	Virtual Keyboard and PS2 settings	See section	7.5
6	Password	Enter a password	See section	7.6
7	Language	Selection of the language (E, G, F, I and Dutch)		
7	Back to application	Back to application		

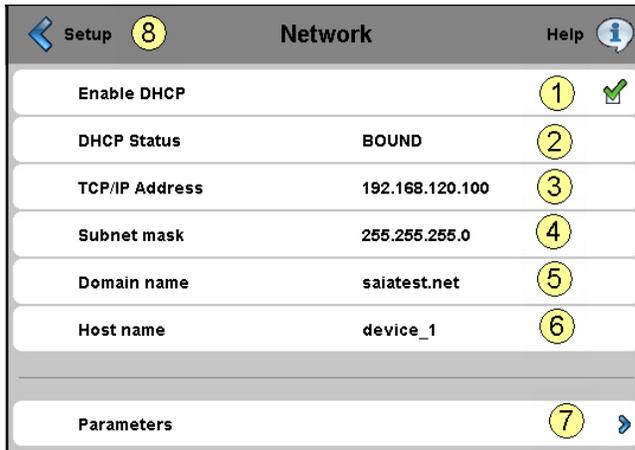
7.1. Network

7.1.1. No DHCP server is used (Standard configuration)



1	Enabled DHCP	<input type="checkbox"/>	Default is disabled	<input type="checkbox"/> no selected: The user must supply IP address,...
2	TCP/IP Address	192.168.12.201	Read/write	IP address of the MB panel
3	Subnet Mask	255.255.255.0	Read/write	Subnet Mask IP address
4	Default gateway	0.0.0.0	Read/write	Default gateway IP address
5	Primary DNS server	0.0.0.0	Read/write	IP address of the primary DNS server
6	Secondary DNS server	0.0.0.0	Read/write	IP address of the secondary DNS server
7	Setup			Return the main setup menu

7.1.2. DHCP server is used

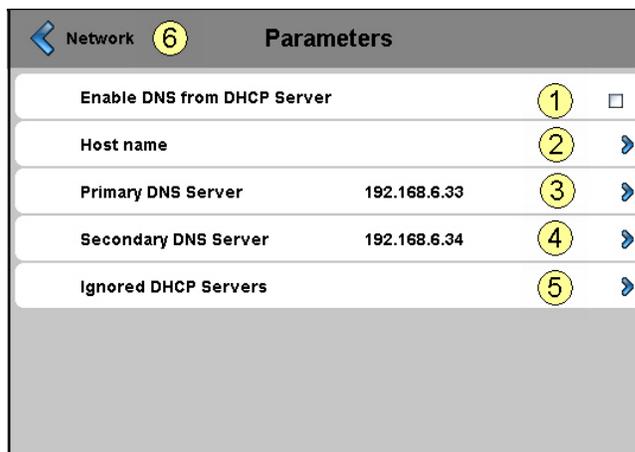


1	Enabled DHCP <input checked="" type="checkbox"/>	Default is disabled	<input checked="" type="checkbox"/> selected: Enabled . the configuration is supplied by the DHCP server.
2	DHCP status	Read only	INIT , INIT-REBOOT, REBOOTING, BOUND = gets an address from the server
3	TCP/IP Address	Read only	IP address of the MB panel provides by the DHCP server.
4	Subnet mask	Read only	Subnet Mask IP address provides by the DHCP server.
5	Domain name	Read only	Provides by the DHCP server.
6	Host name	Read only	
7	Parameters >	Write	See the section 7.1.3
8	Setup		Return the main setup menu

→ See also the Document 26-867 section 4 (TCP/IP Enhancements DHCP and DNS)

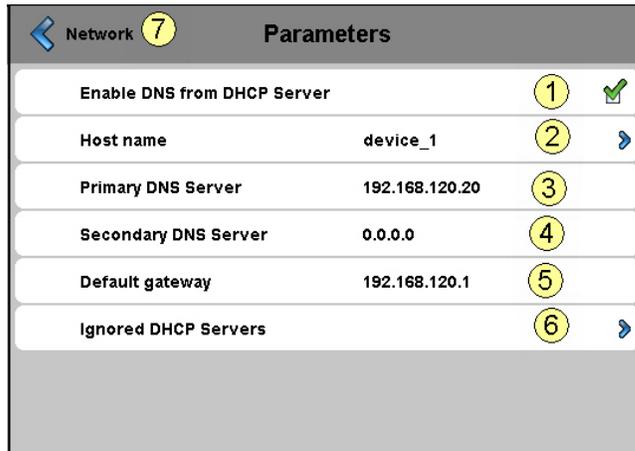
7.1.3. Parameters (Disable or Enable DNS from DHCP server)

Is DISABLED



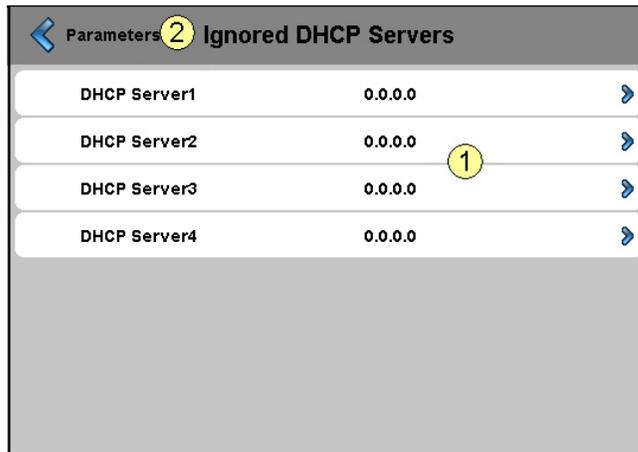
1	Enable DNS from DHCP server <input type="checkbox"/>	Default is disabled	<input type="checkbox"/> not selected: DNS from DHCP server is disabled (Don't get DNS from DHCP server)
2	Host name	Read/write	Free Host name
3	Primary DNS server	Read/write	IP address of the primary DNS server
4	Secondary DNS server	Read/write	IP address of the secondary DNS server
5	Ignored DHCP servers		See the section 7.1.4
6	Network		Return to Network menu

Is ENABLED



1	Enable DNS from DHCP server <input checked="" type="checkbox"/>	Default is disabled	<input checked="" type="checkbox"/> selected: DNS from DHCP server is Enabled (Get DNS from DHCP server)
2	Host name	Read/write	Free Host name (example: device_1)
3	Primary DNS server	Read only	IP address of the primary DNS server
4	Secondary DNS server	Read only	IP address of the secondary DNS server
5	Default gateway	Read only	IP address of the default gateway
6	Ignored DHCP servers		See the section XXXXXXXX
7	Network		Return to Network menu

7.1.4. Ignored DHCP server



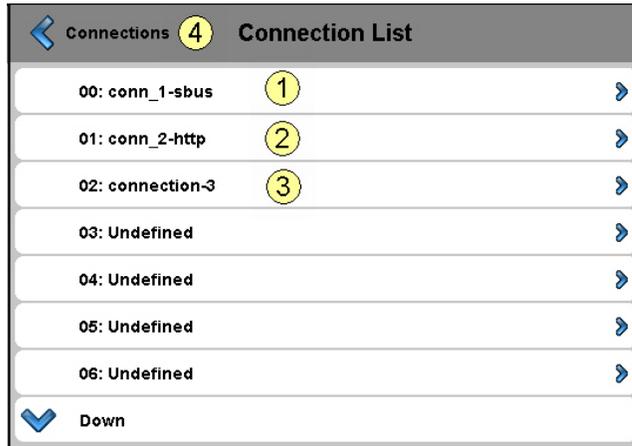
1	DHCP Server1 DHCP Server2 DHCP Server3 DHCP Server4	Read/Write Default is 0.0.0.0	IP addresses of Ignored DHCP servers 1,2,3 4
2	Parameters		Return to Parameters menu

7.2. Web connection

We advise you to create one connection or more (till x16) in **using the “Connection List” in first.** Edit the connection or connections, and chose the connection witch must be used in your project. Each connection may be edited in anytime.

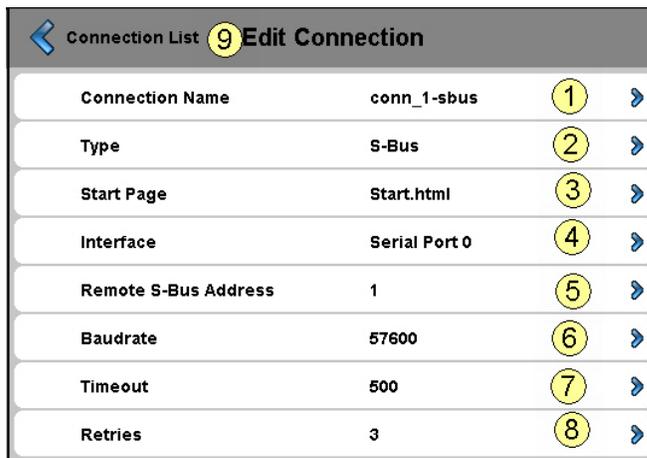
The names of connections are necessary for the URL jump (see section 7.2.5)

7.2.1. Connection List (NEW)



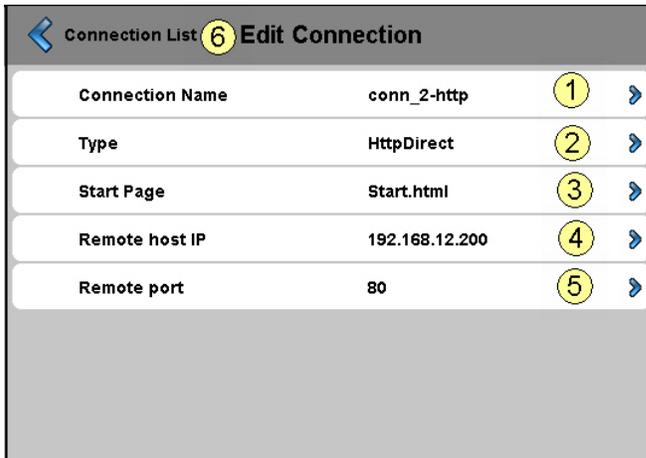
1	conn_1-sbus >	Undefined (default)	Name of the first connection: example conn_1-sbus
2	conn_2-http >	Undefined (default)	Name of the second connection: example conn_2 -http
3	connection-3 >	Undefined (default)	Name of a third connection: example connection-3
4	Connections		Return to the Connections menu

7.2.2. Edit an S-Bus Connection



1	Connection name	Conn_1-sbus	Name of the connection	
2	Type	S-bus	Type of connection	See 7.2.5
3	Start Page	Start.html	Name of the start-page of this connection	
4	Interface	Serial Port 0	Serial interface number	See 7.2.6
5	Remote S-bus Address	1	S-bus address of the connected PCD	See 7.2.7 7.2.8
6	Baudrate	57600	Baudrate of the serial com. Kbytes/sec	
7	Timeout	500	Timeout of S-bus protocol msec	
8	Retries	3	Number of retries	
9	Connection list		Return to the connection list	

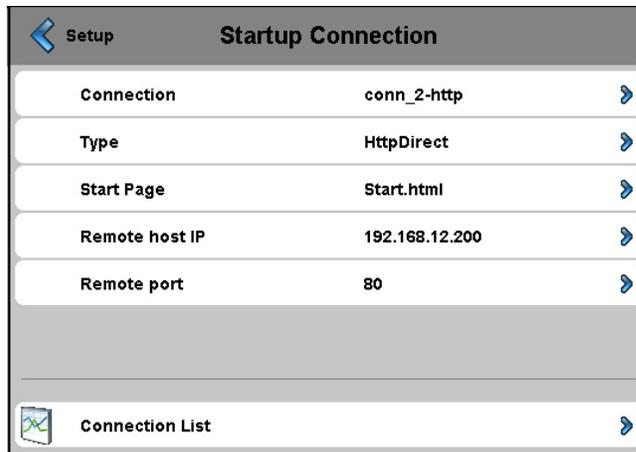
7.2.3. Edit an http direct Connection



1	Connection name	conn_2 -http	Name of the connection	
2	Type	HttpDirect	Type of connection	See 7.2.5
3	Start Page	Start.html	Name of the start-page of this connection	
4	Remote host IP	192.168.12.200	IP address of the connected PCD	
5	Remote port	80 (default)	Remote port	
6	Connection list		Return to the connection List	

7.2.4. Choose the Startup Connection

→ In Fine, choose the Startup connection



7.2.5. URL Jump on web-Editor

The string contains: the name of the connection list / the name of the html start page

<input checked="" type="checkbox"/>	URL Jump	URL	<input type="text" value="conn2_http/Start.html"/>	<input type="button" value="Browse"/>
		Frame	<input type="text" value="_self"/>	<input type="button" value="v"/>

7.2.6. Further info regarding types & parameters of connections

7.2.6.1. TYPE of connection

Local	No connection with any PCD The connection is to the local IP address 127.0.0.1
Httpdirect	http direct connection (Ethernet only)
S-Bus	S-bus connection (Serial or Ethernet)

7.2.6.2. Type of S-bus Interface connection

Ethernet	Ether-Sbus connection
Serial port 0	Serial S-bus connection Port 0 RS 232 (D-Sub 9)
Serial port 1	Serial S-bus connection Port 1 RS 485 (orange spring connector no.1,2,3)

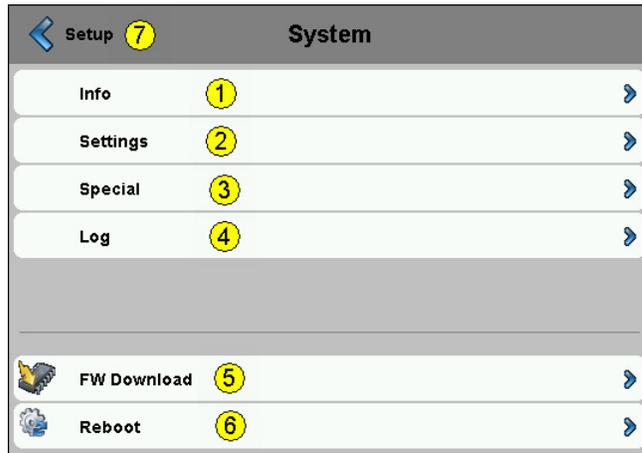
7.2.6.3. Parameters of Ether-S-bus connection

Remote S-Bus Address	1 (default) Up to 253	S-bus address of the PCD
Remote IP Address	xx.xx.xx.xx	IP address of the PCD
Timeout (ms)	Default 500 (100 to 2000)	Ether S-bus timeout: 600 ms is recommended in most case.
Retries	Default 3 (1 to 20)	Number of attempts: try + retries

7.2.6.4. Parameters of Serial S-bus connection

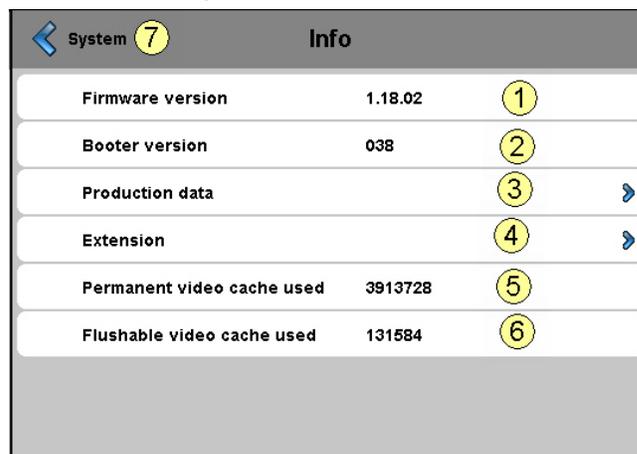
Type	S-Bus	Read only
Interface	Serial Port 0 (or 1)	Serial S-bus connection
Remote S-Bus Address	1 (default) Up to 253	S-bus address of the PCD
Baudrate	9600 KBits/s (default) 1200-2400-4800-9600-19200- 38400-57600-115200	Selection of the communication Baudrate
Timeout (ms)	Default 500 (100 to 2000)	S-bus timeout : 500 ms is recommended in most case.
Retries	Default 3 (1 to 20)	Number of attempts: try + retries

7.3. System



1	Info	System info (FW , booter versions...)	See section	7.3.1
2	Settings	Concern: buzzer, order of file search, startup timeout, infoscreeen, file cache, Autorepeat.	See section	7.3.2
3	Special	Reset parameters, Format M1_flash and Intflash.	See section	7.3.3
4	Log	Overview log.txt	See section	7.3.4
5	FW Download	Select mode of downloading	See section	7.7
6	Reboot	Reboot MB panels (with confirmation)	Like a power OFF and ON, but without any HW switching	7.8
7	Setup	Return the main setup menu		

7.3.1. Sytem info



1	Firmware version	V xxxx	Firmware version of the MB panel (Read only)
2	Booter version	V xxxx	Booter version of the MB panel (Read only)
3	Production data		See Section
4	Extension		See Section
5	Permanent video cache used	xxxxxx	Info: Permanent video cache used / read only ~ 4 MByte
6	Flushable video cache used	xxxxx Byte	Flushable video cache used / read only. Memory used in cache of the pictures. It is depending of the size and nber of gif files in caching. (see section 21)
7	System		Return to system page

7.3.1.1. Production data

Info 8 Production data		
ASN	D7.D457VTCF00	1
Serial number	018A3B45	2
MAC Address	00:50:C2:93:35:78	3
HW version	c	4
Fabrication date	2008/1b	5
Display type	16	6
HW LCD rotation	0	7

All are READ ONLY

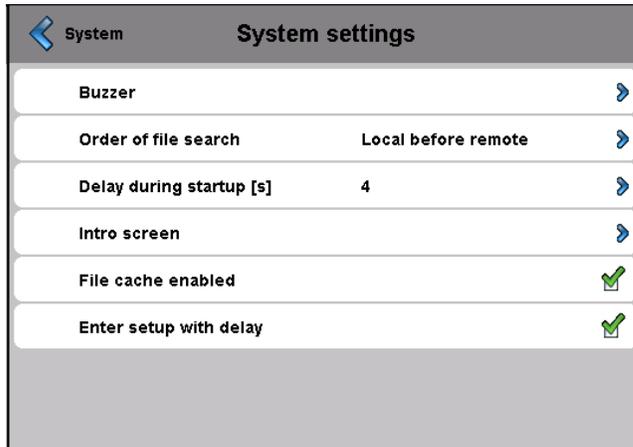
1	ASN	PCD7.	Code of Product
2	Serial Number	xxxxxx	Serial number of the panel. This number is unique and it can be used for product traceability.
3	Mac address	12 Charact.	Unique Mac address
4	HW version	XX	Hardware version
5	Fabrication date	xxxxxx	Fabrication date
6	Display type	xx	Type of display on board
7	HW LCD rotation	x	Code of rotation of the display
8	System		Return to info page

7.3.1.2. Extension info (only for special configuration)

Info 3 Extension info		
Extension 1 ASN	no extension	1
Extension 1 version	No FW version	
Extension 2 ASN	no extension	2
Extension 2 version	No FW version	

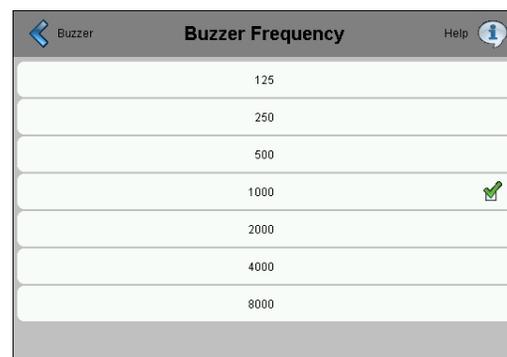
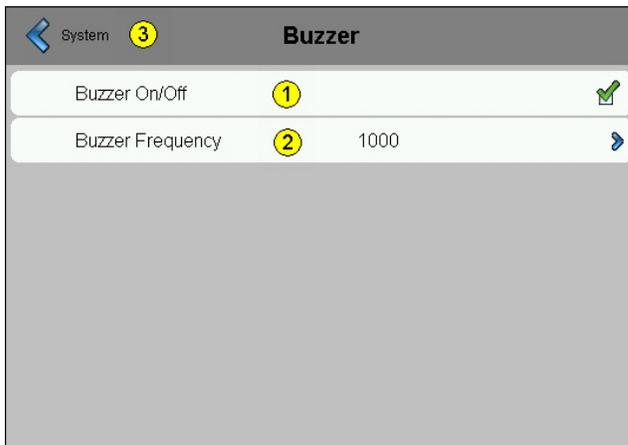
1	Extension 1 ASN Extension 1 version		Special code and FW for special configuration 1
2	Extension 2 ASN Extension 2 version		Special code and FW for special configuration 2
3	Info		Return to info page

7.3.2. Settings



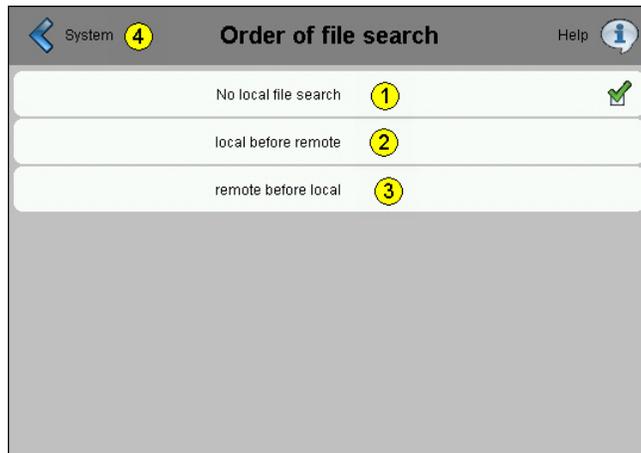
1	Buzzer	On / Off / frequency	See section	7.3.2.1
2	Order of file search	Local / remote files	See section	7.3.2.2
3	Delay during Startup (s)	4 (default)	Min: 0 & Max:15	
4	Intro screen	Entry welcome text and splash image	See section	7.3.2.3
5	File Cache enabled	Default: Enabled In normal operation, the file cache should always be enabled.	The file cache can be enabled/ disabled. Disabling is particularly useful for projects in development in order to see the visible change in files cached.	
6	Enter setup with delay	Default: Enabled	Delay is enabled or disabled	
7	System		Return to system page	

7.3.2.1. Buzzer



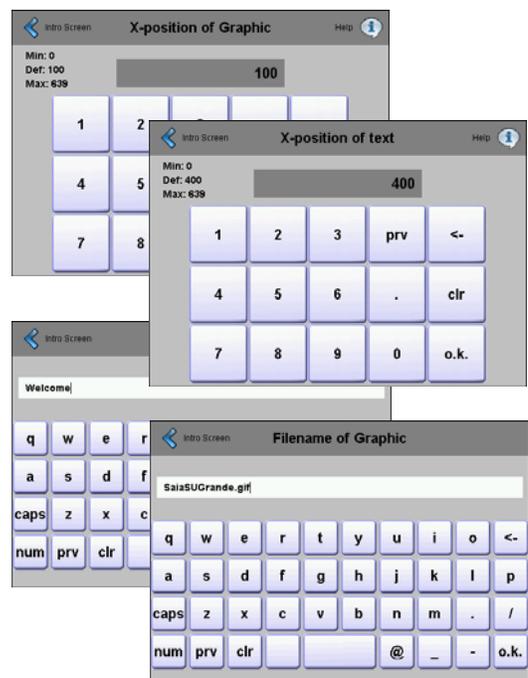
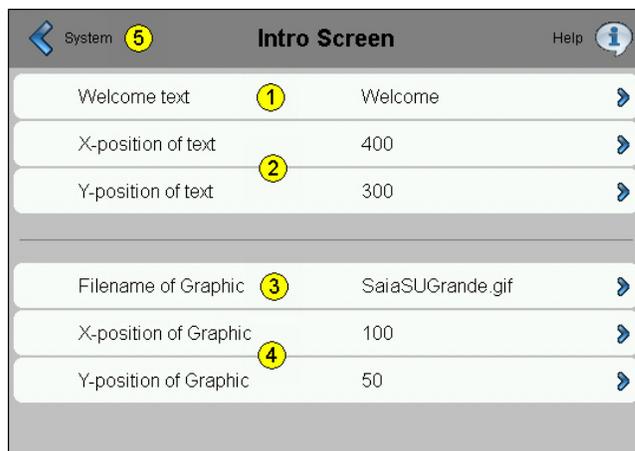
1	Buzzer on/off	Default is on	Change by pressing once
2	Buzzer Frequency	Default is 1000	Select between 125 and 8000 Hz
3	System		Return to system page

7.3.2.2. Order of file search



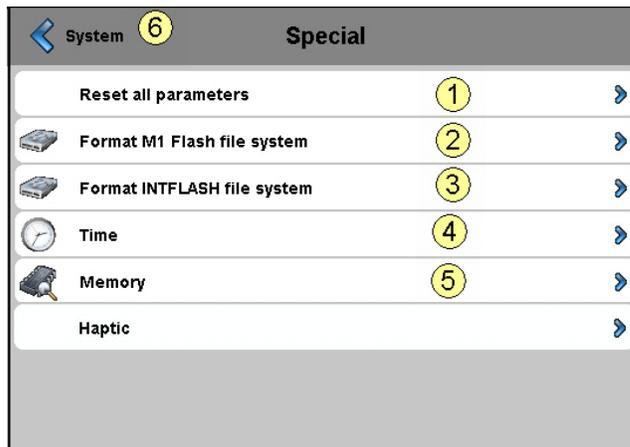
1	No local file search	Default	"No local file search" means that no files (.teq or .gif) will be searched in the local server (= uBrowser server).
2	Local before remote		"Local file search before remote" means that files (.teq or .gif) will be searched in the local server before searching in the PLC server. With additional SD-card, files will be searched first in M1_FLASH (embedded 4MB flash), then in SLOFLASH (SD-card flash).
3	Remote before local		"Local file search after remote" means that files (.teq or .gif) will be searched in the remote server before searching in the local server (MB panel)
4	System		Return to system page

7.3.2.3. Intro screen



1	Welcome text	Default: Welcome	Free welcome text
2	X position of text	Default X= 400 pixel	Value between 0 and 639
2	Y position of text	Default Y= 300 pixel	Value between 0 and 479
3	Filename of Graphic	SaiaSUGrande.gif	Gif file
4	X position of Graphic	Default X= 100 pixel	Value between 0 and 639
4	Y position of Graphic	Default Y= 50 pixel	Value between 0 and 479
5	System		Return to system page

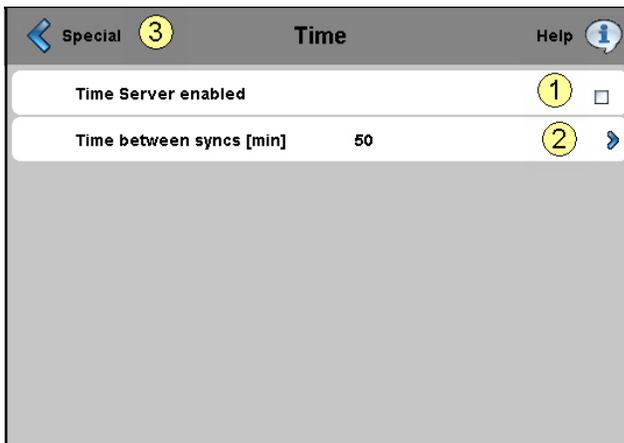
7.3.3. System Special



Appear only for Haptic MB panel VTCFH
Warning "!" S-Bus on Port 0 is not working if haptic is enabled!" → on See the section 7.3.3.1

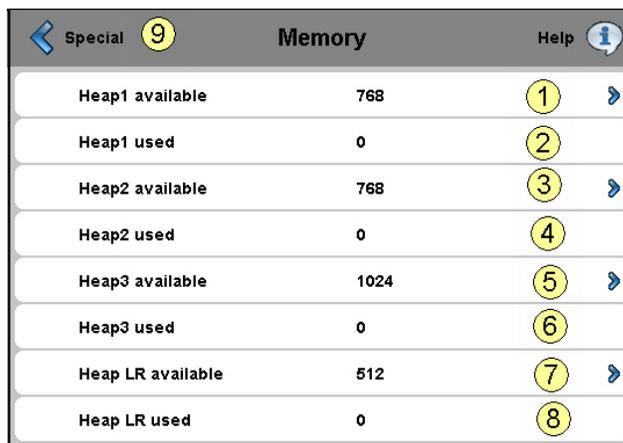
1	Reset all parameters	This command allows to reset all parameters to the default values	
2	Format M1_FLASH file system	Advanced function with this message of confirmation: "Do you really want to format the M1 flash?" This command erases flash and creates files system. When format is Ok. Return to the system menu (see 4)	
3	Format INTFLASH file system	Advanced function with this message of confirmation: "Do you really want to format Intflash?" Be careful you lose all the parameters of configuration, s-bus and MBterminal, Including the calibration. The panel reboots automatically.	
4	Time	Default is Disabled !!!	See section
5	Memory	Only in case of problems: out of range of memories → Heap 1, 2, 3 and LR.	See section
6	System	Return to the system menu	

7.3.3.1. Time



1	Time server enabled	Default is disabled <input type="checkbox"/>	Is enabled by selecting <input checked="" type="checkbox"/>
2	Time between syncs (min)	Default is 50 minutes	The time is synchronized on startup and re-synchronized periodically after this value.
3	Special		Return to Special menu

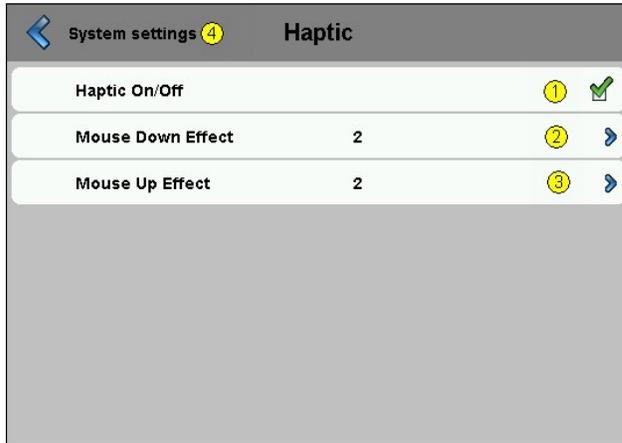
7.3.3.2. Memory



1	Heap1 available	Read/Write Default: 768 kbytes	max: 2048 kbytes
2	Heap1 used	Read only	See list of Message-Box messages - section 20
3	Heap2 available	Read/Write Default: 768 kbytes	max: 4096 kbytes
4	Heap2 used	Read only	See list of Message-Box messages - section 20
5	Heap3 available	Read/Write Default: 1024 kbytes	max: 4096 kbytes
6	Heap3 used	Read only	See list of Message-Box messages - section 20
7	Heap LR available	Read/Write Default: 512 kbytes	Min 512 max: 1024 kbytes
8	Heap LR used	Read only	See list of Message-Box messages - section 20
9	Special		Return to the Special menu

7.3.3.3. Haptic version (PCD7.D457VTCFH)

Setup menu of the MB haptic panel with “Global effects “



1	Haptic On/off	Default: On	Change by pressing once
2	Mouse Down Effect	Default: 8	Mouse down effect → number 1 to 27, which are configured globally and apply to the buttons only
3	Mouse Up Effect	Default: 2	Mouse Up effect → number 1 to 27, which are configured globally and apply to the buttons only
4	System settings		Return to system settings page

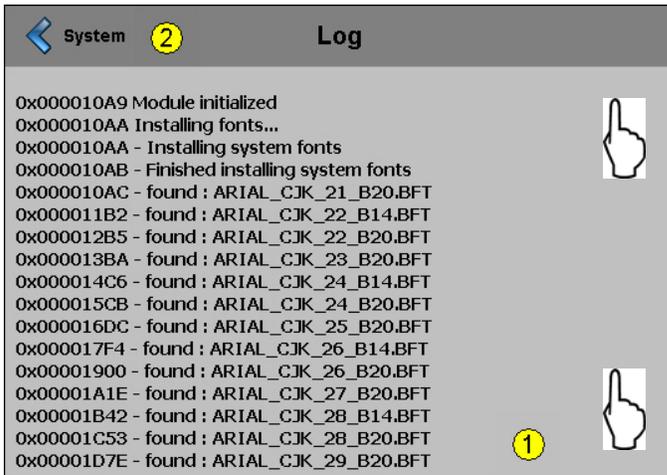
The haptic-enabled HMI device will come with a library of haptic effects. Which effect is denoted by a numeric value, starting from 1. The total number of effects available has not been defined and will vary for different hardware. The effects index described here will be exposed by the firmware to the Microbrowser/Web Editor. The firmware will be responsible for managing the effects library, such that the haptic effect for each number remains consistent over different hardware versions.

- *Effect 0 – no effect*
- Effect 1 – 6: Various clicks to simulate button presses
- Effect 7 – 9: Various buzzes to simulate alarms
- Effect 10 – 15: Effects gradually increasing in amplitude and duration
- Effect 16: Spring effect
- Effect 17: Thud effect
- Effect 18 – 19: double click
- Effect 20 – 27: Various special effects
- Effect 28 or greater: Don't use it (no effect)

- Mouse down effect is the very most sensitive effect. Mouse up effect can be omitted in most case
- Effect numbers 6 to 9, 20, 22, 24 and 27 are the stronger effect numbers.

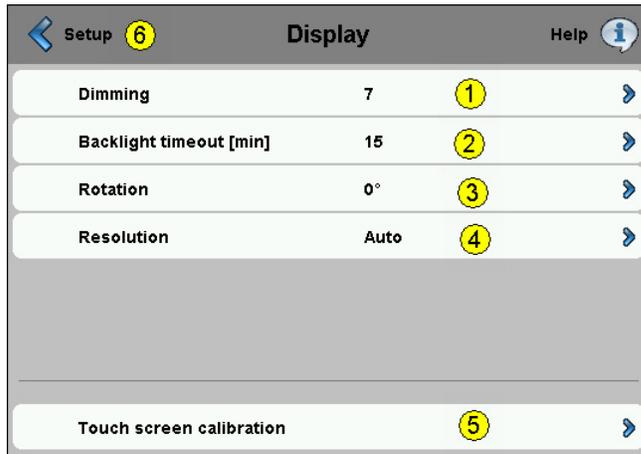
Please see the appendix A Section 21 for detailed wave form and duration of each effect

7.3.4. Log

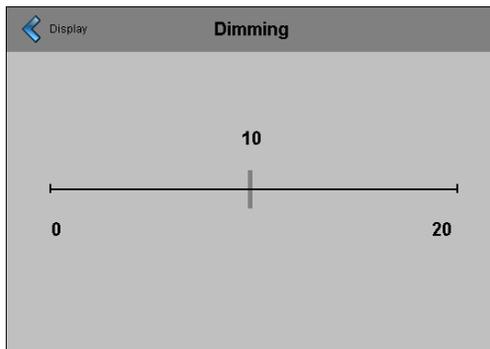


1	LOG.TXT/ Read only	Glance over the list by pressing on the touch. That allows controlling, for example, if the fonts are found. At the back page: Info regarding the errors. Access to log.txt via FTP: uBT_FS/LOG.TXT	
2	System	Return to the system menu	

7.4. Display



Dimming

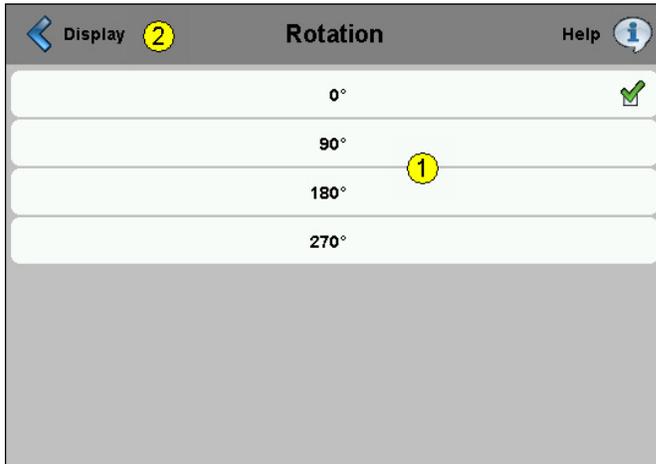


RE-calibration



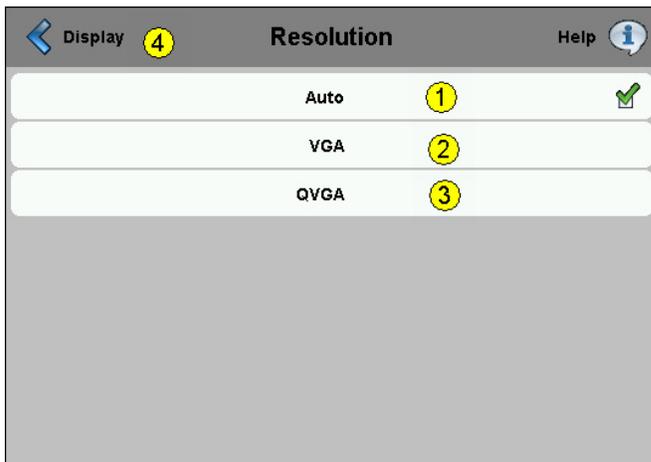
1	Dimming	Default:10	Adjustable between 0 and 20	
2	Backlight timeout (min)	Default:15 minutes	The backlight turns off if neither the touch-screen nor any keys are pressed during this time. The backlight reactivates as soon as the blank screen or keys are pressed. Adjustable between 0 and 5000.	
3	Rotation	Def. 0°	Landscape portrait	See section 7.4.1
4	Resolution	Def. Auto	Auto,VGA or QVGA resolution	See section 7.4.2
5	Touch screen calibration	Re-calibration	Use carefully a stylus or a fine pen	
6	Setup		Return the main setup menu	

7.4.1. Rotation



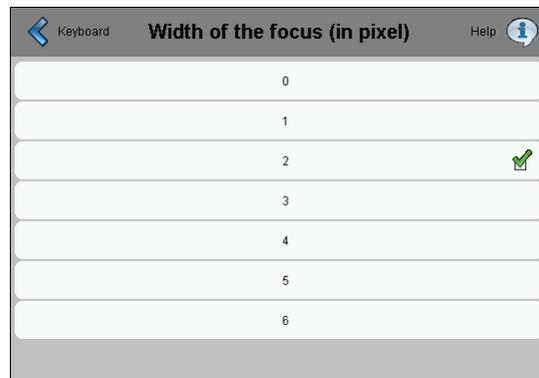
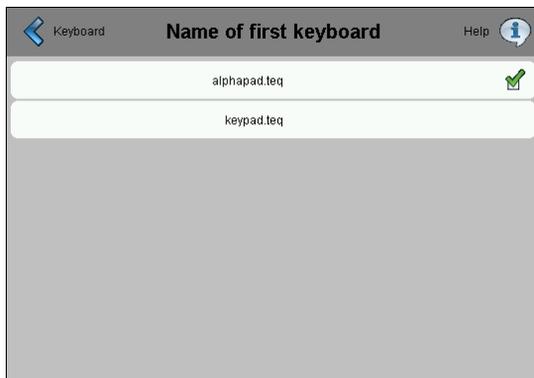
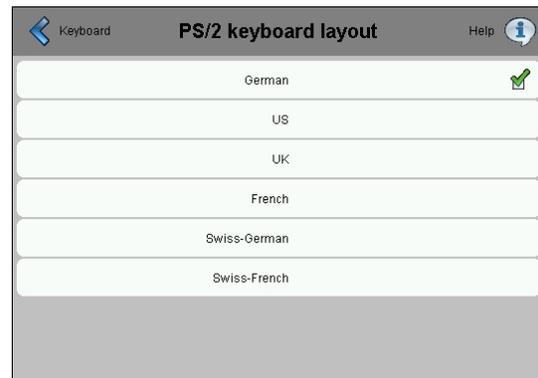
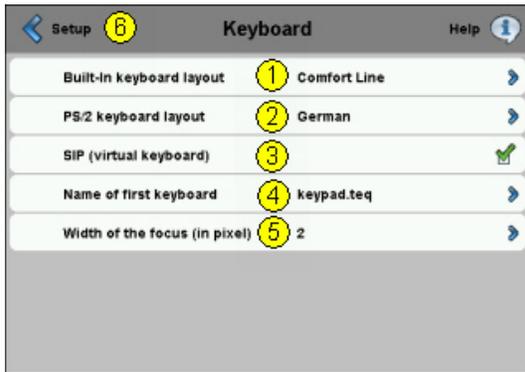
1	0°, 90°, 180°, 270°	Default: 0°	Change the orientation landscape to portrait + inverted
2	Display		Return to display menu

7.4.2. Resolution



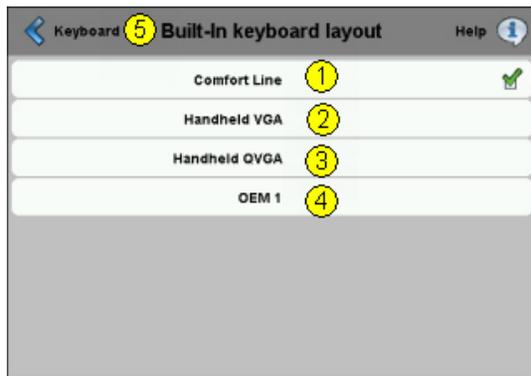
1	Auto	Default	The panel tries to determine the resolution of each teq.
2	VGA		All teq's are displayed with VGA resolution
3	QVGA		All teq's are displayed with QVGA resolution
4	Display		Return to display menu

7.5. Keyboard



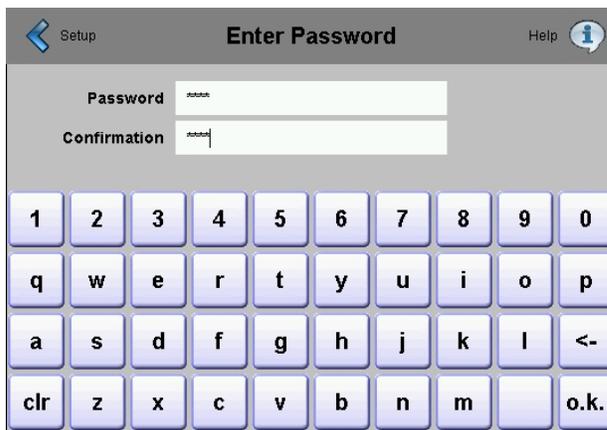
1	Build-in keyboard layout	Default panel with keys: Comfort line panel	See the section 7.5.1
2	PS/2 keyboard layout	Default: GE (German)	PS/2 External Keyboard languages GE (German) or US (English US) or UK (English UK) or FR (French) CH-GE (Swiss German) or CH-FR (Swiss French)
3	SIP (virtual keyboard)	Default: Enabled	Enable/Disable SIP (S oft I nput P anel). Virtual keyboards
4	Name of the first keyboard	Default: Alphapad.teq, alphanumeric keyboard is opened in first	You can choose: Alphapad.teq or keypad.teq in first. (respectively alphanumeric or Numeric keyboard)
5	Width of the focus (in pixel)	Default is 2 pixel	Selection between 0 to 6 pixel. A border is drawn around the currently active button or edit field. The width of this border is controlled by the property and is measured in pixel. If a width of 0 is selected no border is drawn. This is useful if only touch screen operation is used.
6	Setup		Return the main setup menu

7.5.1. Build-in keyboard layout



1	Comfort line	Keyboard layout VGA MB panel with keys/Fkeys
2	Handheld VGA	Keyboard layout VGA Handheld.
3	Handheld QVGA	keyboard layout QVGA Handheld. (old version)
4	OEM 1	Customer specific
5	Keyboard	Return to the keyboard menu

7.6. Enter Password



Setting a password

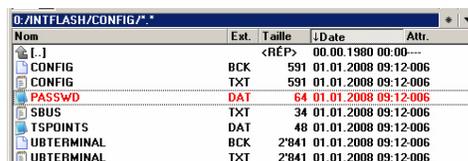
Alpha, numeric or alphanumeric password is possible (maximum characters = 32 , spaces included)

If setting a password, a confirmation is required.

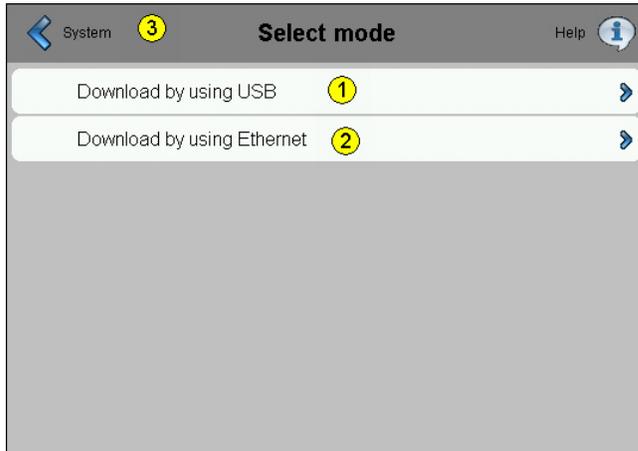
If setting a new password, a confirmation is required and if the entered phrases do not match, the old password is retained.

If you want to remove password protection, just enter and confirm no characters

☹️ Forgot your password → [delete the passwd.dat file \(FTP connexion\)](#) it's all

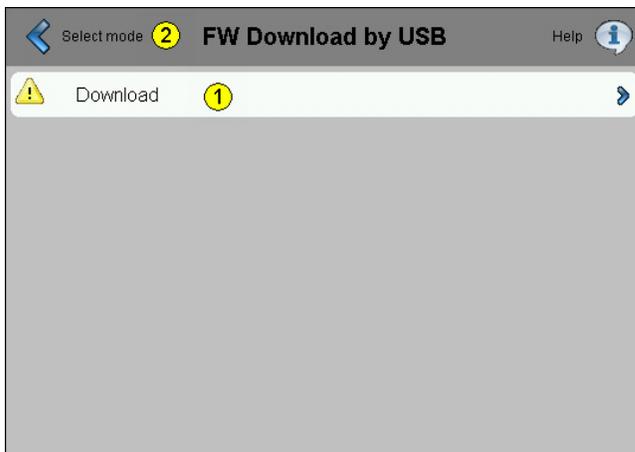


7.7. Firmware Download (MB panel side)



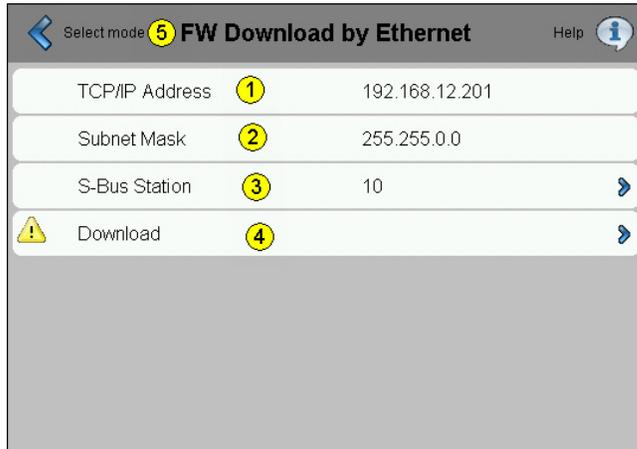
1	Download by using USB		See section	7.7.1
2	Download by using Ethernet		See section	7.7.2
3	System	Return to system page		

7.7.1. FW Download by USB



1	Download		Hit the download button to put the MB panel into download mode. After a successful update of the FW, the MB panel will restart automatically after ~ 15 sec.	
2	Select mode		Return to the Firmware select mode page	

7.7.2. FW Download by Ethernet



1	TCP/IP address	Read only	
2	Subnet Mask	Read only	
3	S-Bus station	Read/write	You may change the S-Bus station number before hitting the download to put the MB panel into download mode.
4	Download		Hit the download button to put the MB panel into download mode. After a successful update of the FW, the MB panel will restart automatically after ~ 15 sec.
5	Select mode		Return to the Firmware select mode page

7.7.3. Firmware Download (Saia's firmware download utility)

Firmware can be updated in using the firmware download utility.

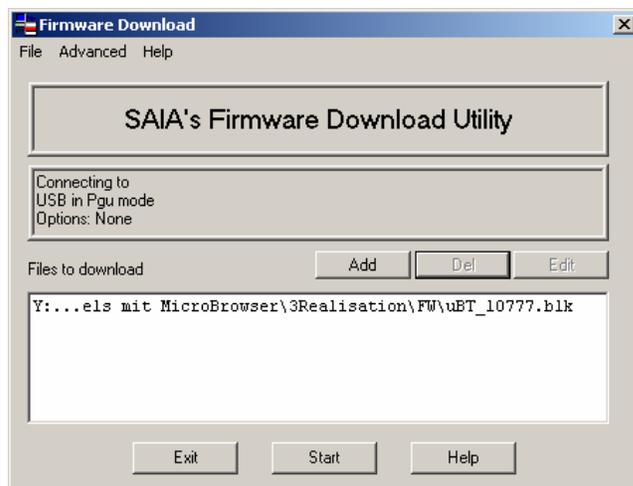
The microBrowser panels must be connected to the PC via its USB or via Ethernet

Then select "Firmware Download" from the terminal settings menu.

Start the firmware download utility of the PG5 programming tool (PG5 1.4, PG5 2.0)

Only one .blk file to download is necessary

After downloading, the display is freeze for about 15 seconds.



7.8. Reboot MB panel

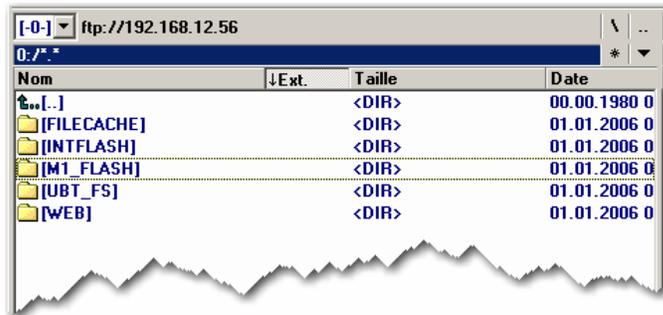
Like a power OFF and ON, but without any HW switching



8. Local files / local server

FTP is the only way of accessing its internal structure: Saia files system (ftp access: user name and password).

ftp:// IP address



- FILECACHE : contains the cache memory ⇒ 1 MB RAM
- INTFLASH : ⇒ 4 MB flash (→ 512 KB File system) contains:
- INTFLASH/CONFIG**
- KEYMAP.DAT → keymap configuration (only for MB with keys(Fkeys))
 - PASSWD.DAT → password (forgot your password → delete it)
 - TSPOINTS.DAT → for internal usage !
 - FTPCONFIG.TXT → FTP configuration
 - CONTAINER.DAT → for internal usage !
 - DHCPCCONFIG.TXT → DHCP configuration
 - DNSCONFIG.TXT → DNS configuration
 - CONFIG.TXT → Description of modules (examples: .Filename of SNTIP /PPP config files or direct config of M1_FLASH)
 - SBUS.TXT → IP proxy / station number
 - UBTERMINAL.TXT** → MB panel configuration file (contains also all uBT containers)

As well as all BACKUP files of the DHCPCCONFIG, DNSCONFIG, CONFIG and UBTERMINAL .TXT files

INTFLASH/WEBPAGES

- xxx.GIF files → reserved for Setup Menu
- SBUS → directory

SLOFLASH : Automatically created by plugging SD-card interface with SDflash

M1_FLASH : ⇒ 4 MB flash (File system)

M1_FLASH/CONFIG

M1_FLASH/WEBPAGES

→ Directory reserved for all the project files that you want to "LOCAL"

M1_FLASH/TRENDLOGS

→ TRENDLOGS directory is created automatically by saving logs to files. The .CSV files containing the logs will be saved automatically in this place.(by using web-editor MB macro S2F)

M1_FLASH/FONT

→ FONT directory must create by the user. It will contain all special or additional .bft font files.

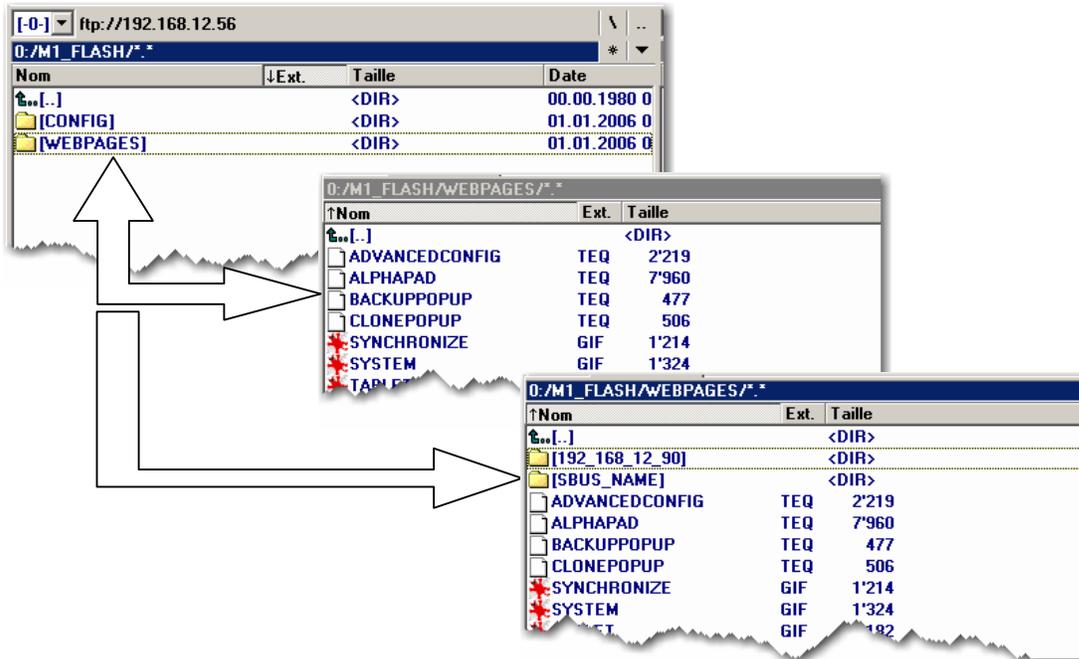
UBT_FS : UBT_FS/LOG.TXT

Listing of the Startup Process + info errors (read only)

WEB : for internal usage

8.1. M1_FLASH/WEBPAGES

ftp:// IP address / M1_FLASH/WEBPAGES



8.2. Copy to M1_FLASH (local FTP server)

1) Recommended and the easier: Copy all common files (.teq, .gif) to M1_FLASH/WEBPAGES.

N.B.: When local server use involves copying .teq or .gif files to it (or even .itq, .csv and .html files), you must build (web builder) .tcr at the minimum, because it contains all the PPO data.

Remember to change the setup option from "No local file search" to "Local file search before remote".

2) Copy all dedicated files (.teq + .gif) to M1_FLASH/WEBPAGES, into the respective sub-directories. Each dedicated station has its own sub-directory.

→ Name of files: maximum 24 ASCII characters without spaces, format name included.

Sub-directory names reflect communication type:

- SBus communication → SBus name of station (e.g.: Station_trans1)
- http direct communication → IP address of station, but with "underlines" instead of "dots" (e.g.: IP address 192.168.12.90 becomes 192_168_12_90)

N.B.: When local server use involves copying .teq or .gif files to it (or even .itq, .csv and .html files), you must build (web builder) .tcr at the minimum, because it contains all the PPO data.

Remember to change the setup option from "No local file search" to "Local file search before remote".

9. uBTerminal containers (VGA)

Container variables, available to the user, are included in the firmware of these terminals.

Containers let the application program exchange information with the firmware. All container variables have the prefix "uBT_". Caution: case sensitive !!!

A limited number of containers is also visible / accessible over the configuration file entries in directory INTFLASH/CONFIG.

These settings can be read over a file read of these files over FTP.

Overwriting the files over FTP causes the terminal to take all changes that are given within the files.

To use FTP an Ethernet connection is required.

Do not use write access on the container from the application and over FTP at the same time.

This may lead to undefined results.

Config file entry	Container (Source HN 10.03.10)	Type	Default	Min Value Min Length	Max Value Max Length	Description
R/W	uBT_AlarmFrequency	Decimal value string	1000	125	8000	Frequency setting of the acoustic alarm (Hz) (Rounded down to 125,250,500,1000,2000,4000,8000) Use this before starting the alarm. Renewed setting during running alarm will be first used at the next start of the alarm.
No	uBT_AlarmStart	Decimal value string	0	0	30000=30 Sec	Write a value to start or stop the pulsed acoustic alarm. The acoustic alarm can be started with a setting of the interval time (0 ..30000 mSec) of the pulsed signal. A 50% duty cycle is used with pulse time equal to pause time. If already running a renewed setting is ignored. Setting it to 0 however switches it off immediately. The alarm also stops by any touch on the screen.
R/W	uBT_AlarmVolume	Decimal value string	10	0	20: 100%	Acoustic alarm volume setting (0 ... 20). As pulse width modulation is used to control the volume this setting has an influence on the sensed pitch of the alarm. Use this before starting the alarm. Renewed setting during running alarm will be first used at the next start of the alarm.
R/W	uBT_AutoRepeat	Boolean value string	0	0	1	At Soft Input Panel SIP (keyboard on the screen) use: SIP Key board: Autorepeat on(1), off (0)
No	uBT_BackLight	Boolean value string	1	0	1	Read/write 1, 0 → Remote backlight control OFF The backlight is switched OFF if the control is '1' before. Any touch on the screen switches the backlight on again. Read/write 0,1 → Remote backlight control ON The backlight is switched ON if the control is '0' before. The backlight may switch off afterwards again after a time out. For remote control over PPO <-> container coupling only. <i>The use in the Button and Edit painters is not supported.</i>

Config file entry	Container (Source HN 10.03.10)	Type	Default	Min Value Min Length	Max Value Max Length	Description
No	uBT_BackLightOn (added at FW version 1.12.11 upwards)	Boolean value string	1	0	1	Direct control of the back light at a write to this container (1: On, 0 : off). It returns the status of the back light at read back. The container is set with the activation of the backlight at the touch of the screen, and reset with the switch of of the backlight after a switch off of the backlight over uBT_BackLightTimeout. It can be used for remote monitoring and remote control over PPO <-> container coupling, local user control on the terminal over the Button painter (Mouse down, Mouse up), and locally used over the Edit box painter in the Web project.
R/W	uBT_BackLightTimeout	Decimal value string	15	0	5000	Time (min) after which the backlight switches off. At any touch of the screen, or at a switch on over container, the back light switches on and the count down restarts. If the value is 0 the backlight time out supervisory is inactive. A switched on back light is kept switched on forever in that case.
Read only	uBT_BooterVersion	ANSI text string	Current version string	0	8	Firmware booter version Read only string
R/W	uBT_BuzzFreq	ANSI text string	1000	125	8000	Frequency setting of the acoustic beep at touch (125,250,500,1000,2000,4000,8000) This sets the pitch of the acoustic signal at the use of the touch function of the touch panel.
R/W	uBT_BuzzOnOff	Boolean value string	1 (On)	0	1	Acoustic beep at touch on (1)/off (0)
R/W	uBT_BuzzVol	Decimal enum. value string	1	0	20 : 100%	Read/write buzzer volume setting (0 ... 20). This sets the volume of the acoustic signal at the use of the touch function of the touch panel. As pulse width modulation is used to control the volume this setting has an influence on the sensed pitch of the alarm. Volume 0 setting switches it off.
Read only	uBT_ConfigType	ANSI text string	Current Config Type	0	24	Configuration Type Read only string
Read only	uBT_ConfigVersion	ANSI text string	Current Config Version	0	4	<i>The container is not available for the users yet.</i>
R/W	uBT_DefaultGateway	IP address string	0x00 00 00 00	*	*	Read/write IP address of the gateway within the used subnet (forced setting, default override). * 0 setting deactivates this forced setting. With 0 setting, depending on the used router, external addresses that are outside the subnet can not be reached. Modifications force a restart. FTP connections are lost with that.
No	uBT_DispResolution	ANSI text string	<Screen width> <Screen height> <Color depth>	0	16	Resolution information Read only string

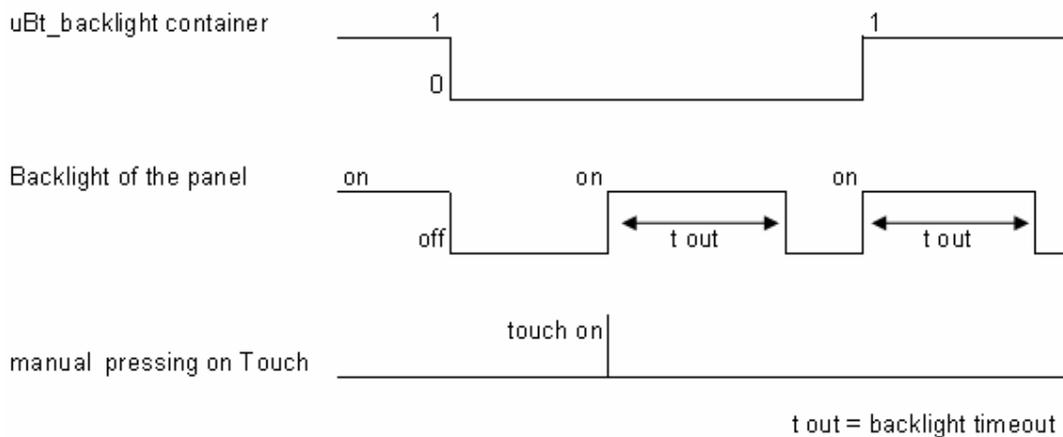
Config file entry	Container (Source HN 10.03.10)	Type	Default	Min Value Min Length	Max Value Max Length	Description
Yes	uBT_DisplayRotation	UTF8 1) !!!! text string	0° (0x30 C2 B0)	0°	270°	Rotation 0°,90°,180°,270° Modifications force a restart. FTP connections are lost with that. !!!! 1) FTP client may not support direct display of UTF8. The display is rotated 'as such' with part of the screen possibly not displayed – also in the auto scale mode. If up scaling is active the scaling from the non rotated display is kept at rotation. Rotated screens take the calibration on non rotated screens. To calibrate the screen please return to non-rotated use.
R/W	uBT_EnableCache	Boolean value string	1 (Enabled)	0	1	File cache use (1), 0 no file cache for all non-image visualization files. Files first are cached the moment they are used. The cache is the place where files are searched first, independent of local file use settings. The cache is cleared at start-up and at URL jumps. Image files are decompressed and cached in a separate video cache that is always active. This video cache is cleared at start-up and URL jumps and at too much data loaded, in which case all required files are reloaded and decompressed again.
R/W	uBT_EnableSIP	Boolean value string	1 (Enabled)	0	1	Read/write SIP → Select Soft Input Panel (keyboard on the screen) Write 0 → SIP is disabled. Virtual keyboards are disabled. Write 1 → SIP is enabled. Virtual keyboards (alphapad.teq and keypad.teq) are enabled.
R/W	uBT_FirstPadName	Decimal enum. value string	alphapad. Teq	1	24	File name entry for an alternative virtual keyboard file as replacement for alphapad.teq at local file use. At local file use alphapad.teq from the setup menu (from INTFLASH/WEB) is used by default. The alternative file – that must be named otherwise than alphapad.teq - can be placed in M1 or SD flash over FTP, or included in the stored web project in the remote server. The maximum number of characters (file extension with dot included) is 24.
No	uBT_FlashStatus	Decimal value string	0	0	255	M1 Flash status20: Device present,no file system 21: Device present,file system OK 22: Device present, error at file system creation 23: Device present, busy creating file system 24: Device present, busy with flash sector based compression -1: Unknown error
R/W	uBT_FocusBorderWidth	Decimal value string	2	0	5	On the Edit and Button Painter visualization a rectangle focus frame is drawn to indicate it's activation. This setting is used for the object focus frame line width (pixel): 1-5 0 switches the focus off.
R/W	uBT_InactivityPollTime	ANSI text string	0	0	5	Touch / Keyboard inactivity supervisory selection (1), at 0 off. Used for a switch to a less frequent touch / keyboard entry polling mode.

Config file entry	Container (Source HN 10.03.10)	Type	Default	Min Value Min Length	Max Value Max Length	Description
No	uBT_IntFlashStatus	Decimal value string	0	0	255	Internal Flash status 20: Device present,no file system 21: Device present,file system OK 22: Device present, error at file system creation 23: Device present, busy creating file system 24: Device present, busy with flash sector based compression -1: Unknown error
R/W	uBT_IntroGraphicName	ANSI text string	SaiaSU Grande.gif	0	20	Intro Graphic
R/W	uBT_IntroGraphicXPos	Decimal value string	100	0	639	Intro Graphic position (Horizontal position from the left)
R/W	uBT_IntroGraphicYPos	Decimal value string	50	0	479	Intro Graphic position (Vertical position, downwards from the top)
R/W	uBT_IntroText	ANSI text string	Welcome	0	32	Intro text
R/W	uBT_IntroTextXPos	Decimal value string	350	0	639	Intro text position (Horizontal position from the left)
R/W	uBT_IntroTextYPos	Decimal value string	300	0	479	Intro text position (Vertical position, downwards from the top)
R/W	uBT_TCPIPAddr	IP address string	0xC0 A8 0C 5A: 192.168. 12.90	*	*	Read/write TCP/IP address of terminal (own address) within the used subnet.* Modification forces a restart. FTP connections are lost.
No	uBT_IsTSPresent	Decimal value string	Current value	0	255	Touch screen detected (1). If 0 the calibration at start-up has / will be skipped.
No	uBT_LastKeyEvent	ANSI text string		0	32	<i>The container is not available for the users yet. Last key event code</i>
No	uBT_LastKeyEventUp	ANSI text string		0	32	<i>The container is not available for the users yet. Last key up event code</i>
R/W	uBT_LcdContrast	Decimal value string	10	0	20: 100%	Contrast dimming / Backlight brightness setting (0:20). A higher value puts the brightness up.
R/W	uBT_LocalFileSearch	Decimal enum. value string	Local before remote (1)	0	2	Select local filesearch mode 0: no local file use 1: use local files before remote 2: use remote files before local The local search order is fixed, in order of use: - Video cache (image only) - File cache (if enabled) - Internal Flash - M1_Flash - SD Card Flash if used
No	uBT_MACAddr	ANSI text string		0	20	Own MAC address (read only)
No	uBT_MultiKeyValue	ANSI text string	0	0	1	<i>The container is not available for the users yet. External SIP Keyboard multi key indication (1). At 0 no actual multi key active</i>
R/W	uBT_SbusAddr	Decimal value string	10	0	253	Own Sbus address

Config file entry	Container (Source HN 10.03.10)	Type	Default	Min Value Min Length	Max Value Max Length	Description
R/W	uBT_ScaleMode	Decimal enum. value string	Auto (0)	0	2	Upscale mode setting Auto (0): Smaller views are automatically adjusted to the terminal screen size on a view by view base. QVGA views are expanded to full screen use on VGA terminals (horizontal and vertical two fold expansion with pixel doubling). VGA (1): Forced setting to VGA without up-scaling of smaller views. This switches the up-scaling off on VGA terminals. QVGA (2): Forced up-scaling with pixel doubling on VGA terminals. The setting gets effective at the next view jump or URL jump, or after restart.
Read only	uBT_SerialNumber	ANSI text string		0	12	Serial Number (read only)
No	uBT_Setup	Boolean value string	0	0	1	The container is not available for the users yet. A setting to 1 cause the terminal to pop up and jump in the setup menu.
R/W	uBT_SubNetMask	IP address string	0xFF FF FF 00	*	*	Read/write subnet mask of the subnet that is used by the terminal. * Modification forces a restart. FTP connections are lost.
Read only	uBT_Version	ANSI text string	Current version string	0	32	Firmware version Read only string

*:Generally IPv4 private addresses are used. Standard settings are:
 - 1 x A class, with subnet addresses 10.x.x.x, and mask 255.0.0.0 - parts may be used also
 - 16 x B class, with subnet addresses 172.16.x.x up to 172.31.x.x and mask 255,255,0,0 – parts or combinations may be used also
 - or 256 x C class, with subnet addresses 192.168.0.x up to 192.168.255.x and mask 255,255,255,0 -combinations may be used also

10. Using uBT BackLight container



11. Additional uBTerminal containers for “Save logs to File” function

Container Name	Default	Meaning	Access
uBT_TrendPath		Dynamically concatenated file path.	ronly
uBT_TrendDevice	M1_FLASH:	Current saving device.	ronly
uBT_TrendDir	WEBPAGES/ TRENDLOGS	Sub Directory to store all trends.	rd
uBT_TrendSDFlash	0	0: M1_FLASH (VGA) INTFLASH (SVGA) 1: SLOFLASH*	rw
uBT_TrendPrefix	TR	Filename prefix, max 5 characters	rw
uBT_TrendSave		Latest saved file.	ronly
uBT_TrendLoad		Current loaded file.	rw
uBT_TrendSelect	Latest file in the directory.	Current selected file. When saving a trend this value gets set with the saved file name.	rw
uBT_TrendOldest	Modifies the uBT_TrendSelect container. Use with actions on buttons.	Select the oldest file.	wonly
uBT_TrendNewest		Select the newest file.	wonly
uBT_TrendPrev		Select a previous file.	wonly
uBT_TrendNext		Select a next file.	wonly
uBT_TrendDelAll	Use with actions on buttons.	Delete all files in directory.	wonly
uBT_TrendDelSel		Delete the current selected file.	wonly
uBT_TrendDelLast		Deleted the last saved file.	wonly
uBT_TrendDelOld		Deleted all files older than the selected file.	wonly

→ Example with the online minimal S2F macro for MB panel “**MB_OnlineTrendMinimal_5_13_01_S2F.esm**”
 See the section 18.

12. Additional uBTerminal containers for “Haptic” panels

Container variables, available to the user, are included in the firmware of these terminals.

Containers let the application program exchange information with the firmware. All container variables have the prefix "uBT_". Caution: case sensitive !!!

Container names	FTP access	Range	Default	Description
<u>uBT_HapticOn</u>	yes	-	1	Be careful!!!! : NEVER change (in all case) the default value (1) of this container!!!
uBT_HapticEnable	no	0 or 1	1	If set to 1, haptic effects are enabled. If set to 0, haptic effects are disabled. can be changed dynamically from the Web Project.
uBT_HapticMouseDownEffect	yes	0 to 27	1	Defines the effect that is played when the user presses a BUTTON object.
uBT_HapticMouseUpEffect	yes	0 to 27	1	Defines the effect that is played when the user releases a BUTTON object.
uBT_HapticRepeatEffect	no	0 to 27	1	Defines the effect that is played when the user presses and holds a BUTTON object. The effect is repeated according to the "uBT_HapticRepeatPeriod". Stops when the user releases the BUTTON object.
uBT_HapticRepeatPeriod	no	10 to 3000ms	300ms	Defines the time between each "uBT_HapticRepeatEffect". All values are in millisecond.

Important points:

When programming the haptic effects, there are two important points which you should be aware of:

1. The above Container variables above apply to ALL BUTTON objects,
2. The Container variables are evaluated at the time the haptic effect plays.

These two points means that the Web Project programmer has to take care of the state of the variables. In order to simplify the programming, we suggest the following programming method.

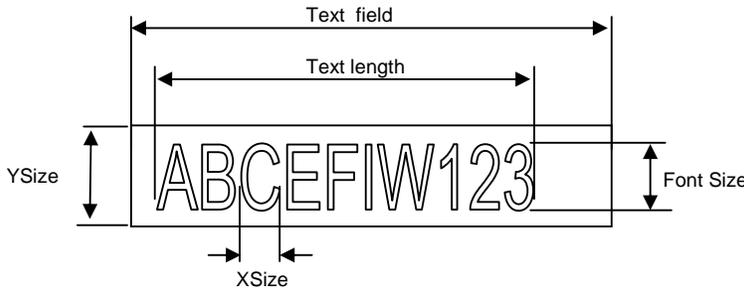
13. Default fonts

Default fonts available for VGA MB panel

Fonts and font style	FONT SIZES						
	10	12	14	16	20	24	36
Arial	x	x		x	x	x	x
Arial Bold			x		x	x	x
Courier New		x		x	x		
Courier New Bold			x		x		
Tahoma		x		x	x	x	
Tahoma Bold			x		x	x	

Calculation of reserved margins regarding:

Simple text box, multiline text box, edits box text field and button with text.



Definitions :

- Font size: size of the character (font size in pixel)
- YSize: size of the painter (in pixel)
- XSize: width of one character
- Text length: length of an one line text.
- Text field: length of the painter

General recommendation regarding the Text field (info already in the online-help of the first Web-editor Version)

It is recommended to use text fields that are up to 20% larger than the size that is displayed in the editor. For very precise text field length, you can also use the table below min xSize and max xSize.

General recommendation regarding the Ysize in comparison with the font size and style

The rule is generally that text is written WITHIN the outline that is INWARD drawn - so the outline subtracts twice from the available height & width.

At Button and editor box use a 2 pixel shading is added (on the *inside* of the outline at buttons, on the *outside* at edit box functions).

The text field on the edit box is currently still written *on the whole area* and will be overwritten with the outline and 3D shading at outline use if chosen too big. The button text field is written on the inside is correctly written within, as with the simple text box and (new for the firmware) multiline text box use.

The added margins to be reckoned with are:

- simple and multiline text boxes: 2 x outline width + 1
- buttons: 2 x outline width + 5
- edit fields : 2 x outline width + 5

	Fontsize	ySize	min xSize	max xSize
Arial	36	41	7	36
Arial	24	28	7	24
Arial	20	23	6	20
Arial	16	19	3	16
Arial	12	15	3	12
Arial	10	12	3	10
Arial Bold	36	41	9	35
Arial Bold	24	28	7	23
Arial Bold	20	23	6	20
Arial Bold	14	16	4	15
CourierNew	20	23	12	12
CourierNew	16	19	10	10
CourierNew	12	14	7	7
CourierNew	10	12	6	6
CourierNew Bold	20	23	12	12
CourierNew Bold	14	17	8	8
Tahoma	24	29	5	24
Tahoma	20	25	4	20
Tahoma	16	20	4	16
Tahoma	12	15	4	12
Tahoma	10	13	3	10
Tahoma Bold	24	29	7	29
Tahoma Bold	20	25	6	24
Tahoma Bold	14	17	4	17

14. Special Fonts and Unicode Fonts

14.1. Generality

The user is able to provide additional fonts to satisfy his requirements regarding the languages he is using or regarding special fonts/style/size which are not standard in the MB panel .

Examples of languages: Russian, Greek, Chinese, Japanese, Korean

Examples of fonts: Comic sans MS, Charleworth, Book Antica, Century, Trebuchet, Verdana

All the fonts can be combined with different sizes: 10,12,14 ... or styles: plain (or regular), bold ...

Fonts and Unicode fonts: <http://www.sbc-support.ch> → them Product info → HMI → Web-Panel PCD7.D4xxx → Additional information for Sales Companies (restricted Area)

It is possible to install other font files on an MB Panel in order to satisfy the requirement for special languages and fonts/styles/sizes which are not present in the list. In this case, contact the sbc-support.

Arial font could be recommended to be sure to cover all the characters. This is especially for languages using a lot of characters as the Chinese.

This is done through the use of Unicode font files (.bft) , which are being generated and provided by Saia-Burgess. The firmware searches at the following locations for the font files:

M1_FLASH/FONT

SL0FLASH/FONT (in the case of SD card is installed)

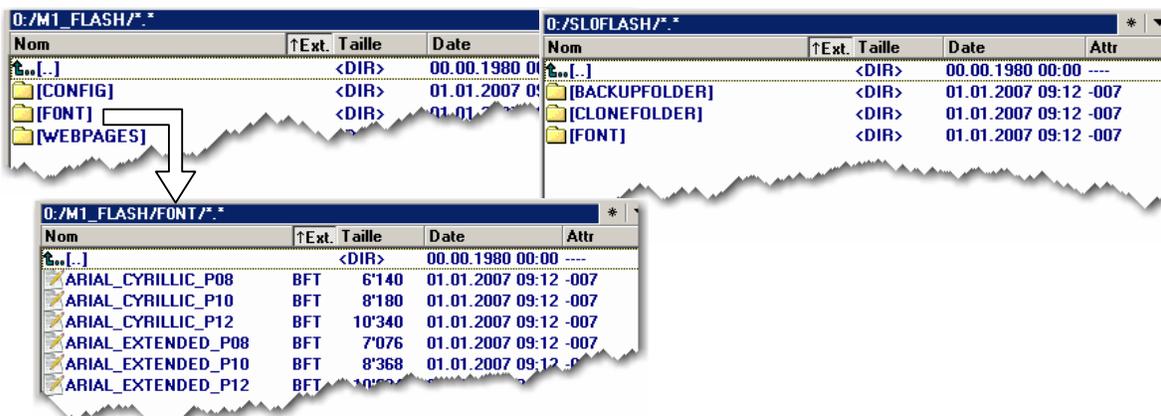
INTFLASH/FONT (*not recommended, is for internal usage*)

A font file contains the data for one continuous range of characters. In case one needs for example Greek and Cyrillic two files should be loaded, one containing the Greek alphabet, the other one containing the Cyrillic characters.

The size of a font file must not exceed 128 KBytes.

(There are several files to cover the Chinese language)

If a font file is found it is registered. It is possible to register a maximum of 65 different files. As soon as a character is needed, the font file will be opened and the data of the character retrieved. These data will be cached for later reuse.



→ Font file name: 24 ASCII characters max without spaces (extension file included)

→ Font files installation: By copying the files via a FTP connection to the FTP server of the MB panel.

→ Chinese fonts: size 12 is the minimum size readable.

14.2. Multi languages: example

→ Change a language by pressing on a button (set variable on mouse down)

Basic example is a translation of Happy Birthday in “Czech” in using “HTML TAG” type.

The “Czech” language needs extended European characters which are downloadable from sbc-support site in restricted area.

What's the drill?

1) The Unicode Font(s).bft file(s) with extended European characters must be copied under ... /FONT (see the above section 11.1)

2) Web-editor: Edit a static text with the text “Happy Birthday” and chose the “HTML TAG” type.

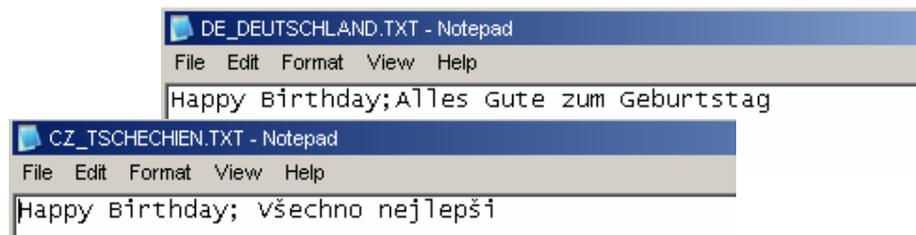


Remark regarding “Text positions Advanced Tab”: When using exotic characters (like Katakana, Chinese ..) it is recommended to keep the default text positions (not centered, not justified)

3) Some fonts can not display all of the Unicode characters. It is recommended to use the fonts “Arial Unicode MS” or ‘MS Sans Serif’ which are a good choices for Unicode characters.

Don't edit your CSV file directly in the S-Web Editor, because the text window of the S-Web Editor saves the CSV file in ASCII mode. You can use Notepad for example to edit your CSV files (or any other text editor which allows you to save files in Unicode format). In the 'Save As' dialogue in Notepad you can choose 'Unicode' in the DropDown 'Encoding'. Use the format 'Unicode Text' in MS Excel.

If you saved your CSV file in Unicode format and you have chosen a font in your HMI which is able to display Unicode characters, the Unicode strings should be displayed correctly. You needn't make additional settings in the S-Web Editor, if you want to use Unicode.



4) Web-editor: create a button with the following "Actions Set variables" parameters:
type is "container", name is "@LANGUAGE" then the Unicode .csv file.



We advise you to copy the .csv files in the local server of the MicroBrowser Panel under INTFLASH/
Webpages/...

→ Read also the topic: "Multilingual HMIs" in the online help of the Web-editor.

14.3. Interpretation of wrong fonts (types, sizes or styles)

1. Arial, same style, **keep** size
2. Arial, plain, **keep** size

If this size does not exist for Arial :

3. Same font name, same style, **reduce size to the next best**
4. Same font name, plain, **reduce size to the next best**

If a smaller font does not exist for this font name:

5. Arial, same style, **reduce size to the next best**
6. Arial, plain, **reduce size to the next best**

If a smaller font also does not exist for Arial:

7. Arial, same style or plain , **use the smallest available size**

The substitution of a font with a other font is reported in the log file (see the section 6.7.3)

14.4. Web-editor

The Unicode characters set are available:

- by using the source type "HTML tag" in the web editor and via a .CSV file.
- by entering directly the text as a "string" in the web editor , in this case "Not necessary to use .CSV files. In this case doesn't import Web-Editor project which was compiled with a Microsoft Windows using Unicode characters set A to another Microsoft Windows using Unicode characters set B.

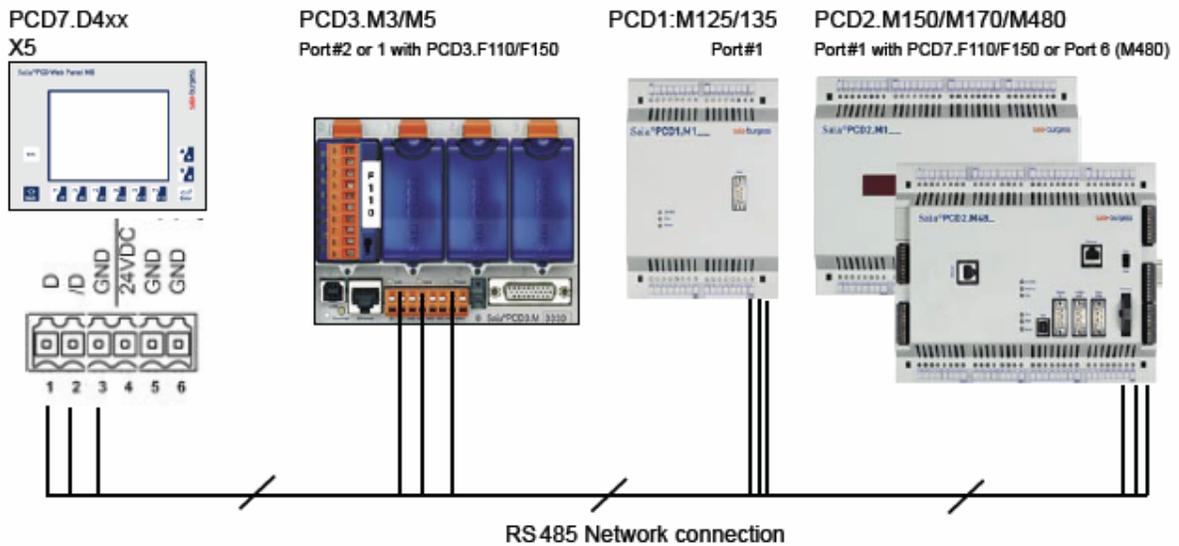
15. Interface connection

15.1. Ethernet port RJ45, X2



Connection between terminal PCD7.D4xx and Saia® PLCs PCD1.M135, PCD2.M150/M170 and PCD2.M480 can be made. You can use Standard or CAT5 “crossed” Ethernet cable equally when using the X2 Port in http direct or Ether-S-Bus. To multiple the network connections, please use Fast Ethernet Switch 10/100 Mbps resp. through a Router.

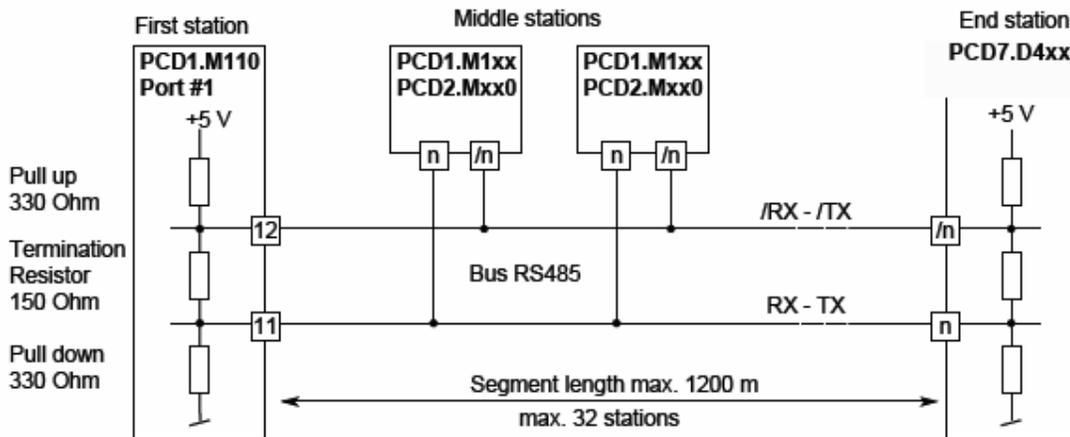
15.2. S-Bus on RS 485 :



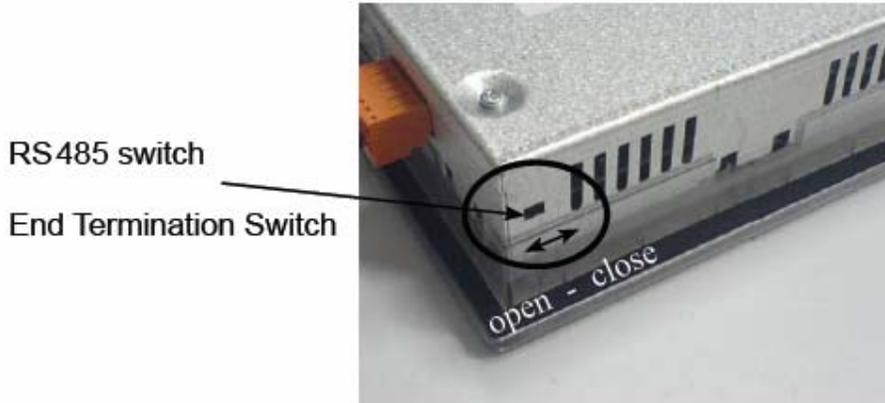
Pining nr of each PLC connected is defined in their dedicated manual. (will be integrated here in next manual release)

Termination resistors for proper End of line

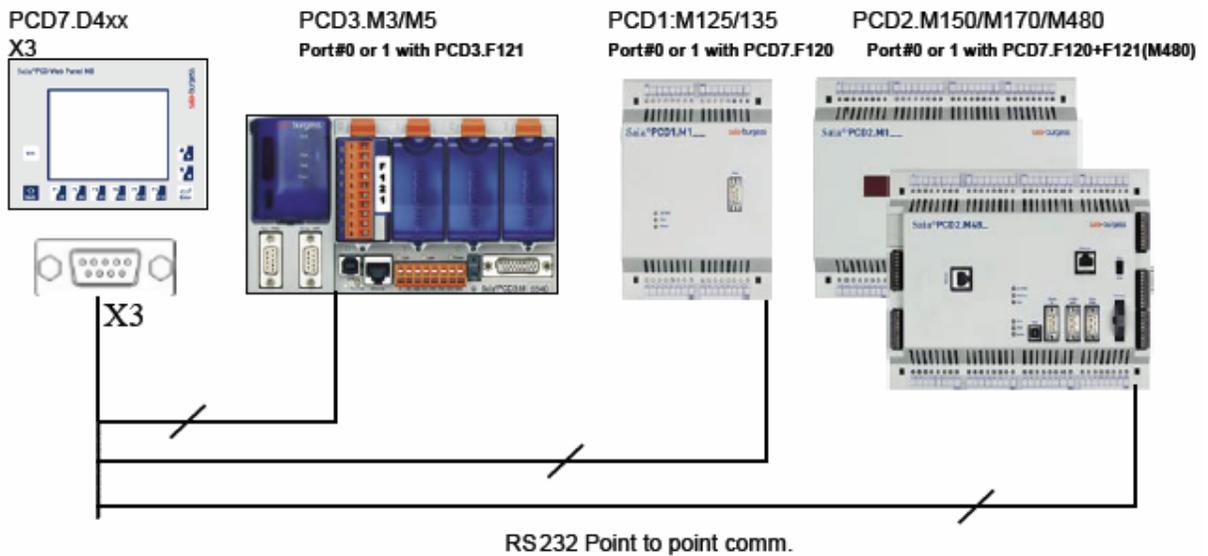
In the example below, you see a possible interconnection between terminals and PLCs. In order to avoid reflexions on the communication line please terminate the network with termination resistors. On the PCD7.D4xx, a switch is available:



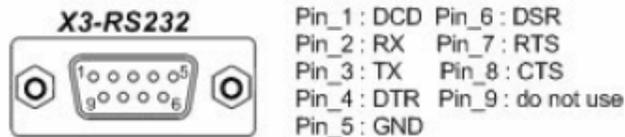
The next image shows you where it is located.--> When the switch is placed on the **top position**, the network is **closed**.--> When the switch is placed on the **bottom position**, the network is **open**.



15.3. S-Bus on RS 232 :

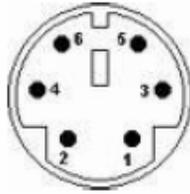


Interface pining:



15.4. PS/2 Interface

This interface uses a standard MiniDIN connector 6-pin as follow :



Pin 1: PS2/Data
Pin 2,6: n.c.
Pin 3: GND
Pin 4: +5 V
Pin 5: PS2/Clock

What can we connect to?

Instead of using the virtual Keyboard from the MB-Panel, you can use this interface to branch a PS/2 Keyboard or a Barcode reader or simply BOTH together connected on a Y cable special.

If you only want to use this external keyboard/barcode, it is better to disable a function called SIP (Virtual Keyboard) in the Setup Menu/Configuration/Special/. Normally, on MB-Panel where a Touchscreen is taking place, this SIP function is always enabled.

When using a Y connection with both keyboard and barcode reader, you must be careful to use each device separately not simultaneously.

See also the point 1.5.7 in the QuickStart Section for more information.

15.5. USB Service Interface

Standard cable from the market, type Master to Slave can be used.

This interface is only use for service purpose (like a FW update), but not for any other communication.

16. Web-editor project

16.1. Wed-editor Version

For VGA MB panel, we recommend using, of course, the up-to-date version

16.2. QVGA → VGA and VGA (Win panel) → VGA (MB panel)

A - From QVGA project to VGA project

First solution (simpler) → adapt the resolution:

This option is selectable in the setup menu (see section 7.4.2) All teq's are displayed with QVGA resolution (pixel doubling).

Other solution:

Texts, edit boxes, button and bargraph as well as drawings, gif images should be resized (enlarged).

QVGA macro-functions (trending, alarming) are available. You can resize (enlarge) them and keep therefore only one macro by screen or you can place several macros on the same teq views, thus you reduce the number of page.

You can also exchange them by standard macro-functions which are already designed for VGA resolution n

B - From VGA project for Win panel to VGA project for MB panel

The project is, in most case, compatible.

- The standard VGA macros, trending and alarming macro are supported. Only "Online trends macro with time scale" and "Save / load to file functions" of some macros are not supported.
- The number of default fonts of the new VGA panels has increased (x22 default fonts: see the list of the user's guide), but they are, nevertheless, limited.
- The animated gif are not supported by the MB panels. Only the first picture of the animated gif will be displayed on the VGA MB panel.

We ask you therefore:

- to control the texts and the length of texts (can be cut at end) and to adapt eventually the fonts
- to replace eventually animated gif by the macro " animatedGif x_xx_xx."

16.3. Adapting virtual Keyboard (SIP)

→ The virtual keyboard appears only if SIP option is enabled (See the section 7.5)

Best way to use customized virtual keyboards

You can customized the standard virtual (alpha and keypad) keyboard.

Don't change the original Alpha and keypads in the /INTFLASH/WEBPAGES/

but

Via FTP, select in the /INTFLASH/WEBPAGES/ the ALPHAPAD.TEQ ; KEYPAD.TEQ ; ALPHAPAD90.TEQ ; KEYPAD90.TEQ files and copy them in a web-editor project.

Modify the teq views and save them without changing the file names.

Then copy the new files in M1_FLASH/WEBPAGES/

Thanks of the option: "Local file search before remote", the new (modified) ALPHAPAD.TEQ ; KEYPAD.TEQ ; ALPHAPAD90.TEQ KEYPAD90.TEQ will be displayed.

Be careful.

- Don't modify deeply these TEQ views (keep the inside macros...)
- Customized the standard virtual keyboard is not "harmless"
- We recommend changing only the "décor" (background colours, ...)

17. Advanced

17.1. Advanced Information concerning FW download

Recommendations if you met with difficulties in downloading via USB.

Power on the MB-Panel, with the USB cable REMOVED. Hit the download button to put the MB panel into download mode then you are able to connect the USB Cable on the MB-Panel and to press Start on the FW Download utility.

Recommendations if you met with difficulties in downloading via USB or Ethernet

If you stop or loose the communication during the downloading procedure, the system won't show you again any display. It is then normal because the FW Flash Memory is erased at the beginning of the procedure.

17.2. The safety procedure to download a firmware

17.2.1. The safety procedure to download a firmware is always via USB.

A. Power off the MB-Panel

B. On the Top of the Back Cover there is a hole of 3mm diameter. Inside you'll find a button. Take a fine pen or a little screwdriver (the best is a cylinder with Dia 3mm) and press continuously (hold it) on that button. Here below the position of that **reset button**:



C. Then at the same time Power ON the MB-Panel. Wait about 3-4 sec. until the LED is flashing. Then Download the FW with the Saia firmware download utility.

ATTENTION: the named *.blk file corresponds to a full FW file. Use only files provided by SAIA-Burgess Controls SA and for a Panel PCD7.D4xx.

17.2.2. Reset / Device Back to default parameters

The reset button can also be used in some special cases to make a full reset of the MB-Panel and to restore the default parameters set from the manufacturer.

When can this function be useful?

When doing a FTP connection to the local server, it can be that you did copy in wrong directory the local file desired. Or may be you did erase inadvertently some files needed for the Setup Menu display.

The most known Error is when the display is writing: **“uBTerminal not found”** and the screen stays for a while without changing the page displayed. In that case do the following steps:

1. Power off the MB-Panel
2. On the Top of the Back Cover, activate the reset button (see previous 14.2.1) by holding it
3. At the same time, power on the MB-Panel. After about 5 seconds, the buzzer is switched on and its frequency is increasing.
4. Once the sound (resp. frequency) of the buzzer is stabilized, after about 10 seconds, you can release the reset button and wait.

The waiting time can last between 1 or 2 minutes. In that time the FW does rebuild the whole memory organization and recover every necessary default files. At the end the MB-Panel will do an automatic reboot and ask you for a new Touch screen calibration. Calibrate it and your system will be fully restored.

18. Special Trend macros for MB panels with save logs to files

-The web-editor Macro-library contains trend macros which are specific for Microbrowser panels.

-These trend macros are 100% based on the Standard Trend macros (Minimal and Complete) with some additional edit fields and buttons (container variables) which allow to display and manage the csv files and erase them if need.

-The names of the Macros are the same as the standard macros with the prefix "MB_"

-The online and offline trend logs can be saved as "CSV format file" in the MB panel itself and can be replayed on it. These .CSV files are readable as text via an FTP access. These files are saved in the MB panels under a sub-directories of the M1_FLASH/ WEBPAGES/ "TRENDLOGS" (or SD flash in option).

-The name of the CSV file is create automatically except a free prefix of max 5 characters. The name contains the full date of the creation of the file: the year, the month, the day and the hour/minute/second.

example: TR_20110713081305.CSV (TR_is the prefix)

Web-Editor

After downloading the macros, create two sub-directories and copy them.

MacroLib/SaiaTrendMacro/MB_ trend macros with S2F

MacroLib/ SaiaHDLLogTrendMacro/MB_ HDlog macros with S2F

→ MacroLib /SaiaTrendMacro / **MB_ trend macros with S2F**

This concerns the "online trends", "offline trends" (DBs) and "offline saved trends", which allow all saved files to be replayed.

 MB_OnlineTrendComplete_S2F_5_13_01	esm
 MB_OfflineTrendMinimal_S2F_5_13_01	esm
 MB_OfflineTrendComplete_S2F_5_13_01	esm
 MB_OfflineSavedTrendMinimal_S2F_5_13_01	esm
 MB_OfflineSavedTrendComplete_S2F_5_13_01	esm

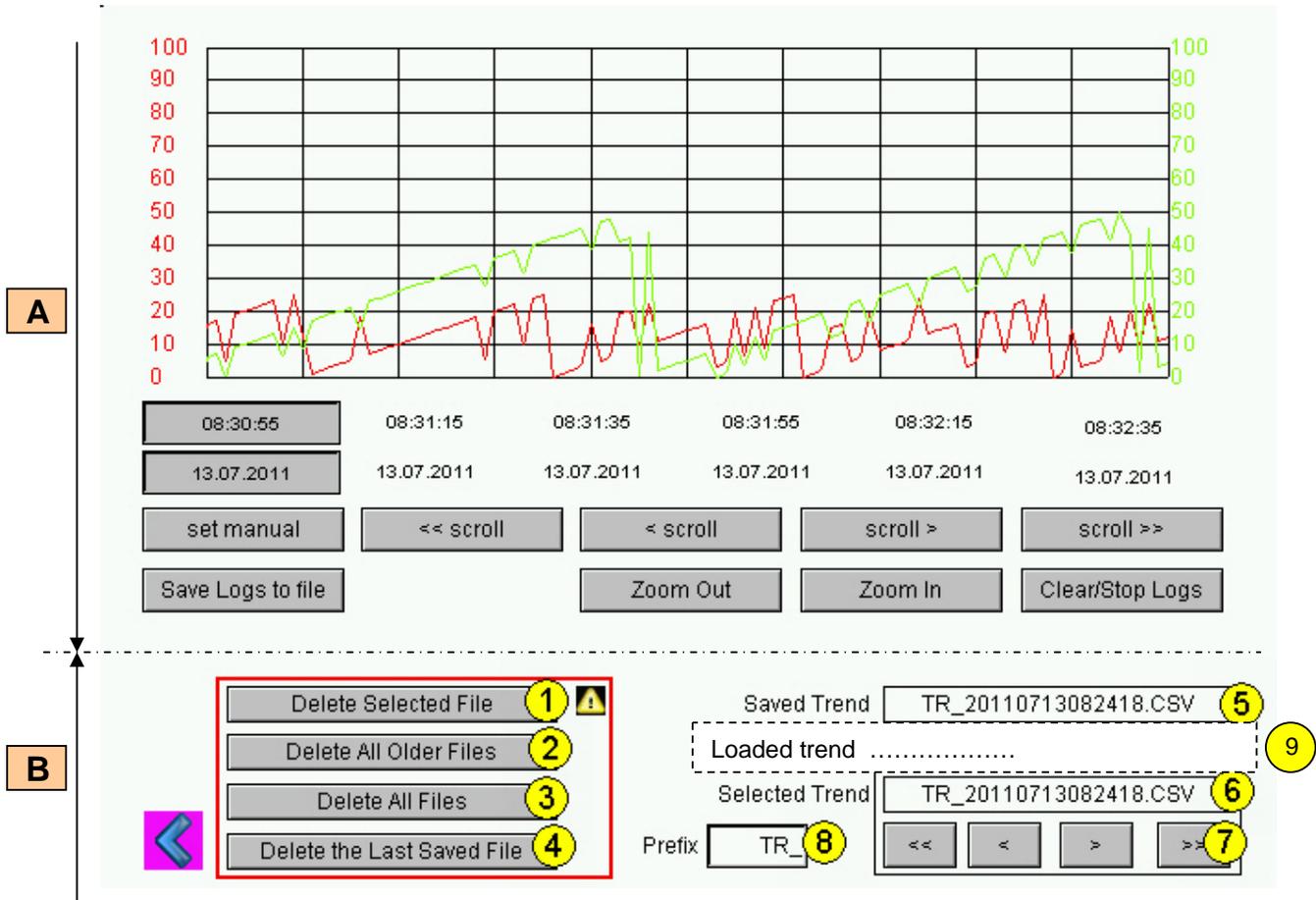
→ MacroLib/SaiaHDLLogTrendMacro / **MB_ HDlog macros with S2F**

This concerns the "remote offline saved trends" (HDlog macros)

 MB_RemoteOffSavedTrdMini_S2F_5_14_25	esm
 MB_RemoteOffSavedTrdComplete_S2F_5_14_25	esm

Section 11 shows the list of containers required by the special MB_ trend macros.

MB panels → Example of Trend teq view with the macro “MB_OnlineTrendMinimal_5_13_01_S2F.esm”



A Standard online Trend minimal macro

B Additional buttons and edit fields which allow: displaying the saved file names, the list of saved files as well as navigating in the list of .CSV files .

Nr.	Designation	Action	
1	Delete Selected File	By pressing	Delete the Selected Trend file (6)
2	Delete All Older files	By pressing	Delete all files older than the selected file.
3	Delete All files	By pressing	Delete all saved files
4	Delete the last Saved File	By pressing	Delete the last saved file
5	Saved Trend	Read only	Full name of the last saved file
6	Selected Trend	Read only	Latest file in the directory. By pressing on the navigating buttons you can show the list of saved files and select one of them.
7	<< < > >>	By pressing	Allows to navigate in the file list with the same prefix
8	Prefix name	Read/write	Free characters using as prefix (5 characters max)
9	Loaded trend	Read only	Not in the online trend but only with the MB_OfflineSavedTrend macros. Name of the loaded file which is selected

Important: According to the application, some buttons or edit fields are not necessary.
What's the drill? Ungroup the macro and delete buttons edit fields that you do not use. Re-group it.

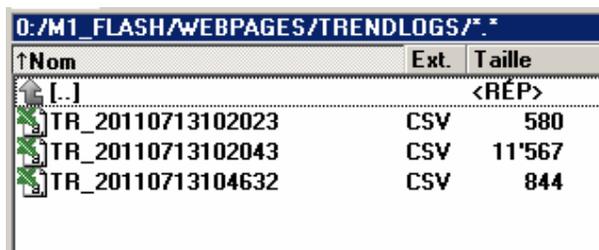
Example: the Edit Box with the Prefix name can be remove without changing the trend function

You may also to redesign the macro: enlarge the buttons... but the position of the dates and times (X axis) must be not changed.(reversed..)

FTP access

By FTP access, you can display the list of .CSV files and read them.

In M1_FLASH/TRENDLOGS/



↑Nom	Ext.	Taille
[.]		<REP>
TR_20110713102023	CSV	580
TR_20110713102043	CSV	11'567
TR_20110713104632	CSV	844

In SLOFLASH/TRENDLOGS/

If you have an SD_card on board, you can save the files on it.
The uBT_TrendSDFlash container variable (default value is 0) must be forced to 1.



↓Nom	Ext.	Taille
[.]		<REP>
SD_20110713104632	CSV	55'112

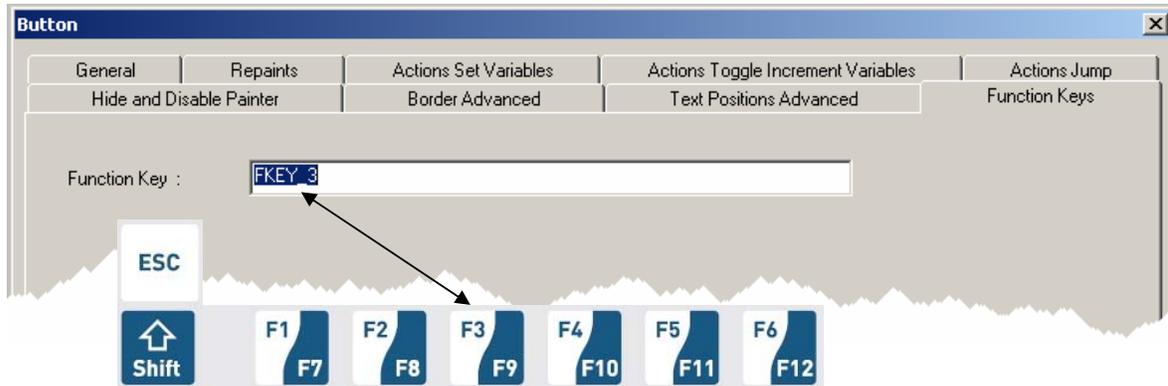
Choose to save the files in the M1_fFash or in the SD card.
!!!! Saving files alternatively in the M1_Flash then in the SD-card can cause problems.

19. Programming function keys for web panels with Fkeypads

Place a button on the view and open the function keys tab.
 Use the syntax: **FKEY_1, FKEY_2 ... FKEY_12, ...and ESC**
 The number of buttons depends on how many Fkeys you want to use.
 N.B.: case sensitive.



Example: With the comfort line MB panel, 12 function keys are available.



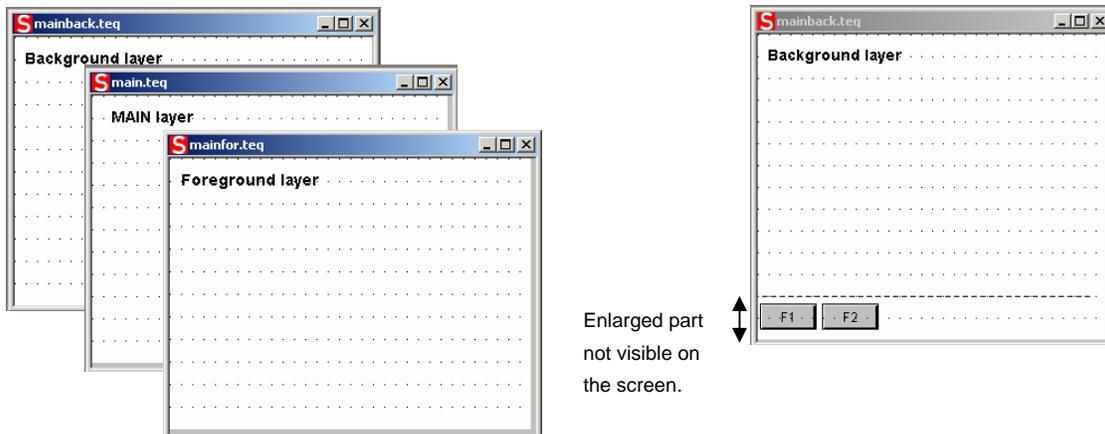
Do not use the "Hide Painter" command to hide the button.

A button hidden in this way will, in fact, be briefly visible on-screen when the page is changing.
 We advise you to place the buttons on an enlarged part of the background layer.

Further detail:

Use the advanced features of TEQ views.

One TEQ view can be made with three different layers. Each layer can be edited separately by the user. At runtime, the three layers will merge into one view.



What's the drill?

Create a background TEQ and enlarge it. Buttons corresponding to the Fkeys can be placed in the enlarged area. In this way, they will be invisible on the screen panel.

(Example with MB VGA panels: size is 640 x 480, enlarged size is 640 x 520).

20. List of Message-Box messages.

Messages	Remarks
Out of memory in Ramdisk	May appear if a file (most commonly a .gif) is too large. VGA MB panel: < 256 Kb (see also the section 22)
Language	
Failed to parse .csv	No memory is available to parse a .csv file.
LR: out of memory! or out of memory for language resource	No memory is available to parse a .csv file. or the total size memory used is > 512 kbytes (see also the section 22)
Failed to initialize LR heap!	The memory for the .csv file will be initialized every time a file is parsed. This message means it has failed.
Memory	
Failed to initialize heap 1	On the heap1 the painter objects and the list of current PPO's are allocated. This heap will be erased after each .teq jump
Out of memory in heap 1	the total size memory used by the painters is > 768 Kbytes (see also the section 22)
Failed to initialize heap 2	Container variables, Html tags, TCR table + source & Emit Objects of online trend are stored on heap 2. This heap will be initialized on every URL jump.
Out of memory in heap 2	The total size memory used by the html tags and containers variable > 768 Kbytes. Most probable cause for this message is that too many offline trends are active. → Can appears in case of offline trends and online trends too.
Out of memory in heap 3	→ Can appears mainly in case of too many data points. Offline trend, Alarms Events, HD log and online trend are stored on heap 3. - The total size memory used by the offline trend Data and HD log > 1024 kbytes also the section 13) The memory requirement must be calculated before using trends Example: In case of the Update period of process points (web-editor parameter) = 1000 milliseconds (store time in sec) x (total nber of trends) x (Size of one Data point → 28 Bytes) < ~ 750 Kbytes 1800 sec x 12 trends x 28 Bytes = `600 Kbytes
Object	
Maximum number of object reached!	The maximum amount of objects (like buttons, rectangles etc) in one .teq view has been exceeded. <u>Maximum object = 512</u> → See also the definition of an object in the section xx.
PPO	
OrderValues on remote host has failed !	Ordering of the list of current PPO's on the remote host has failed.
ReadFile on remote host has failed !	Periodic polling of PPO's has failed.
Communication	
buffer OVF in Spider_fileReadln(!)	During loading of a file more data has been received than the buffer will hold.
Range is null!	The calculation of the range of a bar graph has been faulty.
TCR	
value out of range !	The min/max limits of a TCR value have been exceeded.
value out of default range !	The value of a TCR is not valid, foe example "aa" for hour.
TEQ	
Reading UTF string failed;	Probably the end of the file was reached during reading of a string.
Painter	

21. Recommendations

21.1. In the “Project configurations”

- - Don't forget to select the default font that will be the most used in the project.

21.2. In the web-editor project (Global)

- It is recommended to use text fields that are up to 20% larger than the size that is displayed in the editor. Detail, see the SECTION 10.
- IMasterSaia5_xx_xx.jar is not necessary to display web page on a MB panel.
- At the minimum the .tcr file is the only one file which must be built in the web server project (.wsp), all the other file of the project can be copied in the flash (PLC or local M1_flash of the MB panel) under Mx_flash/webpages/
- gif file <250 Kbytes and max 638 x 478 pixel (one pixel free around)
- add Unicode fonts → check in the list: <http://www.sbc-support.ch> → them Product info → HMI → Web-Panel PCD7.D4xxx → Additional information for Sales Companies (restricted Area)
- Container offset name (containername) must not contain “underscore” or @ characters. (example: PDP-ADDRESS+@COFF_containername@,PDP-FORMAT)
- Don't forget !: Containers offset suffix is ,d for decimal and ,k for the format HH:MM
- You don't find the right font in the list → Contact the PCD support in Murten. We are willing to help you.
- MB VGA panels don't support yet “Online trends macros” (they are not correct time stamp).
- Calculation of the memory requirement see the section 16..
- Maximum of objects (painters) by page is 512 objects (VGA Panels) and 256 (QVGA panels)
- Number of PPOs per page: tested → 320 registers or 500 Flags.
- Project configuration → scalable html: Define HTMLs that resize the HMI during runtime according to a defined factor. Scale your HMI up to 200% for example without need to change your TEQ-Views. MicroBrowser will resize the TEQ-Views at runtime if you type in the URL of your new 'scalable' HTML file instead of your standard HTML.
Examples: Factor 2.000000 means 200% of 640x480 which is 1280x960
Factor < 1 (< 100%) is not recommended for application using MB panels.

21.3. Definition of an object in the web-editor

- An object is a static text, a multiline label, a line, a rectangle, an ellipse, a polygon, an edit box, a button, or a bargraph. The macros contain many objects (offline trend contains 44 objects).

21.4. Handling

- Touch screen: the basic material of the touch screen is the glass. Don't use screwdriver or hard tool to touch the touch. Touch only with the finger or a special “touch pen stylus”.
-
- Key-pads (for comfort line) : the tactile sensation being obtained by pressing a metal dome 12 mm. Don't use screwdriver or hard tool to press on it. Press the key-pads only with the finger.
- Advanced: use the right tool to process to a hardware reset (section 14.2). Don't use a paper clip or a needle. Use a drill ⌀3 and press softly on the microswitch.

21.5. Some rules regarding gif image

- The three time items on the image display of the MB panel are:
 - Repaint from video cache
 - Decompression into the video cache with URL jump and after startup (nearly linear with the number of pixels) . See section 7.3.1
 - File transfer time over the link, if not local
- 1 bigger picture (max 512 Kbytes) is better than 2 with the same total size of gif file . Recommended max size 798x 598 pixel (one pixel free around)
- It is better to use the same picture x times (in the same project) because it will transferred, decompressed and stored in video cache only once. For example: put it in the common background teq.

21.6. Gif files decompression into video cache at start.

21.6.1. Gif files: decompression into video cache at start using Gif List

This solution allows gif files to be decompressed into video cache **in the “background”**.

Advantage: You don't wait for the end of decompression before showing the first page.

The first page appears immediately (as with a project without gif list) and does not wait until all the gif files on the giflist have been decompressed. Decompression continues in the background until video memory is full in the case of multiple gif files in the giflist.

How to operate:

- Open Microsoft® Notepad” editor
- Write the following Head text for the file:

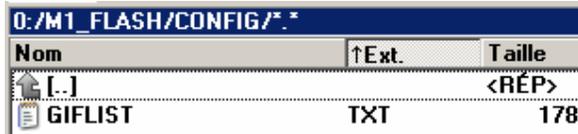
```
[PATH]  
M1_FLASH:/WebPages  
[FILE]
```

- Then enter the name of all the gif files (the same as under the local directory M1_FLASH/WebPages).
- Save the file under “GifList.txt” name.

Example of GifList.txt

```
[PATH]  
M1_FLASH:/WebPages  
[FILE]  
A_SETTINGS.GIF  
A_WATER_IA.GIF  
B_ALARM.GIF  
B_ALARM_A.GIF  
B_BACK.GIF  
B_CLIMATE_A.GIF  
B_CLIMATE_A_DE.GIF  
B_CLIMATE_A_EN.GIF  
B_CLIMATE_A_FR.GIF  
B_CLIMATE_A_IT.GIF  
B_CLIMATE_DE.GIF  
B_CLIMATE_EN.GIF  
B_CLIMATE_FR.GIF  
B_CLIMATE_IA.GIF  
B_CLIMATE_IA_DE.GIF  
B_CLIMATE_IA_EN.GIF  
B_CLIMATE_IA_FR.GIF  
B_CLIMATE_IA_IT.GIF  
B_CLIMATE_IT.GIF  
B_CLOCK.GIF  
B_ELECTRO_A.GIF
```

- Copy of GifList.txt under M1_FLASH/Config/
-



- In LOG.TXT (UBT_FS/LOG.TXT) for checking

Start Process Gif
{PATH}
M1_FLASH:/Webpages
{FILE}
Stop Process Gif

21.6.2. Gif file decompression into video cache at start using dummy first page

- Put all gifs into a dummy first page.
This solution allows decompression of gif files into video cache before showing the real first page of the project.

Advantage: Decompression is finished when you show the first page of the project
Disadvantage: You wait until the end of decompression before displaying the first page.

Tip: Display a dummy page containing:
- a text "Please wait while loading pictures"
- and ViewJump_onTimeout macro which jumps to the right first page of the project

21.6.3. Gif file decompression: evaluation/calculation

Available for solution of sections 21.6.1 and 21.6.2

How to evaluate the number of gifs in video cache based on number of pixels in the gif pictures?.
Total video cache (permanent and flushable) is 16 MBytes. Including 4.. 6 Mbytes for permanent.
Remaining ~ 10 -12 Mbyte are at disposal.

Examples of calculation of number of pictures using permanent video cache of 4 Mbytes

Example 1: Pixel number for pictures is 640 x 480 pixels (full screen).
 $12\ 000\ 000\ \text{Byte} / (640 \times 480) \times 2 = 19$ that means max 19 gif files can be in cache

Example 2: Pixel number for pictures is ~ 120 x 120 pixels
 $12\ 000\ 000\ \text{Byte} / (120 \times 120) \times 2 =$ that means max 400 gif files can be in cache

Remark: The ratio between the size of the gif file and the number of pixels is not a "constant"

22. Error messages advanced

Advanced: These following messages * can appear:
 If size memories used by the gif files, the painters, the html tags and containers var, the online trending and HD log, the language resources (.csv files) are too big.

Some uBT_parameters must be adapted by changing values in the file uBTeminall.txt under
 :/INTFLASH/CONFIG/ (and over a ftp connection) → Available only for **VGA** panels
 After modification the Panel has to be restart.

Recommendations:

We advise not to have the maximum value in first time and try with the medium value because if we increased all the memories to max. values it might create big problems and decrease significantly the performances.

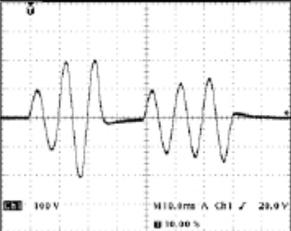
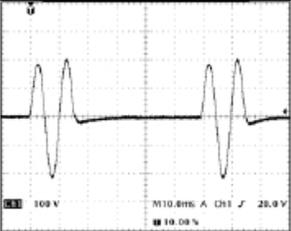
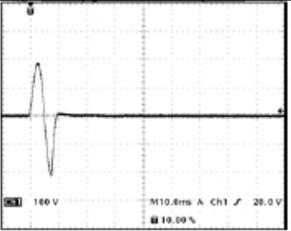
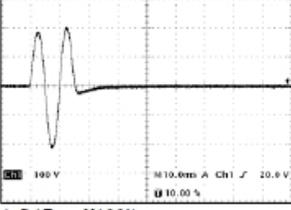
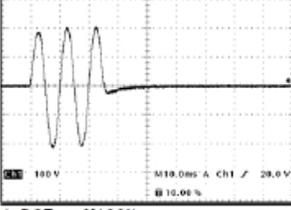
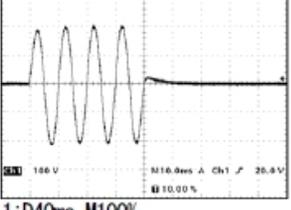
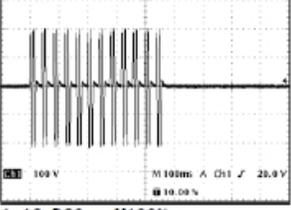
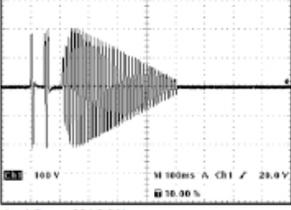
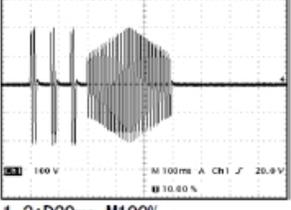
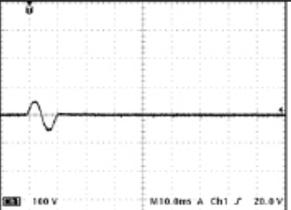
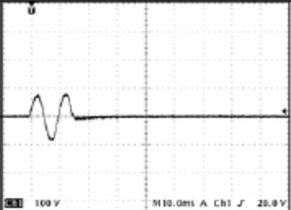
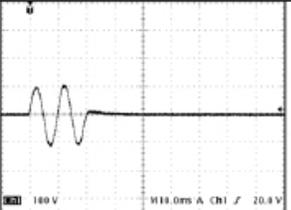
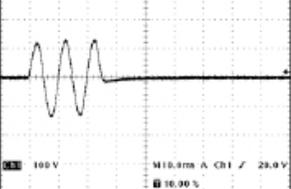
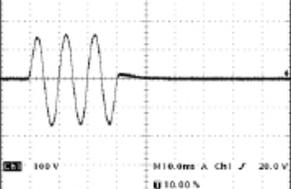
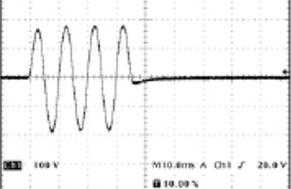
Error messages *	Defaults values	Mid values	Max values
- out of memory in ramdisk	256 kbytes	384 kbytes	512 kbytes
- out of memory in heap 1	768 kbytes	1024 kbytes	2048 kbytes
- out of memory in heap 2	768 kbytes	2048 kbytes	4096 kbytes
- out of memory in heap 3	1024 kbytes	2048 kbytes	4096 kbytes
- out of memory for language resource (or LR: out of memory)	512 kbytes	768 kbytes	1024 kbytes

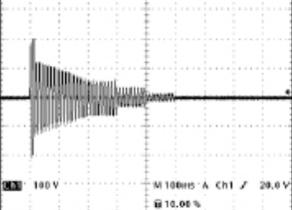
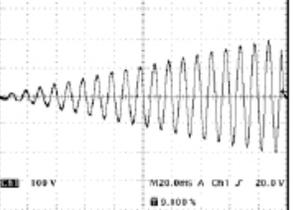
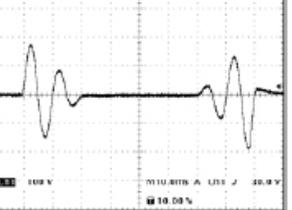
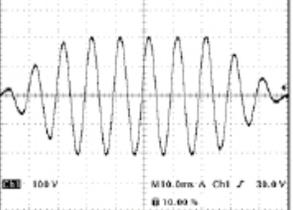
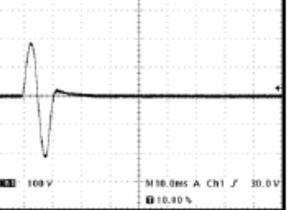
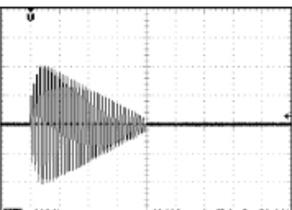
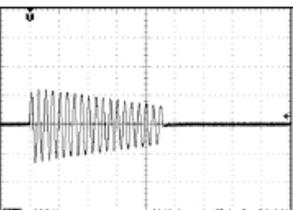
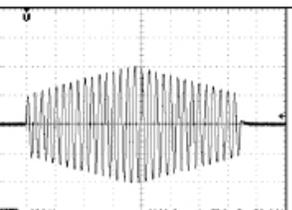
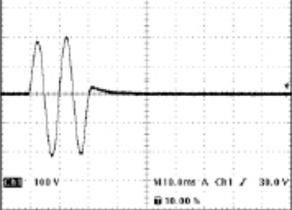
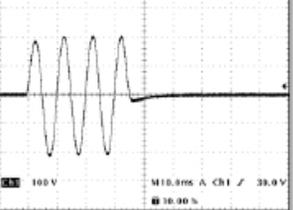
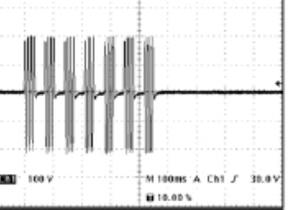
23. Appendix A – Haptic Effects

D = duration in milliseconds

M = magnitude

S = start time in milliseconds

<p>No. 1</p>  <p>1: D20ms, M50% 2: S10ms, D15ms, M100% 3: S40ms, D30ms, M40%–70%</p>	<p>No. 2</p>  <p>1: D15ms, M100% 2: S60ms, D15ms, M100%</p>	<p>No. 3</p>  <p>1: D8ms, M100%</p>
<p>No. 4</p>  <p>1: D15ms, M100%</p>	<p>No. 5</p>  <p>1: D25ms, M100%</p>	<p>No. 6</p>  <p>1: D40ms, M100%</p>
<p>No. 7</p>  <p>1~12: D20ms, M100% 2: S40ms, 3: 80ms ... 12: 440ms</p>	<p>No. 8</p>  <p>1: 10ms, M100% 2: S48ms, D14ms, M100% 3: S100ms same as No. 21</p>	<p>No. 9</p>  <p>1~3: D20ms, M100% S2: 70ms S3: 140ms 4: S200ms same as 23</p>
<p>No. 10</p>  <p>1: D10ms, M25%</p>	<p>No. 11</p>  <p>1: D15ms, M38%</p>	<p>No. 12</p>  <p>1: 20ms, M50%</p>
<p>No. 13</p>  <p>1: D25ms, M63%</p>	<p>No. 14</p>  <p>1: D30ms, M75%</p>	<p>No. 15</p>  <p>1: D35ms, M88%</p>

<p>16</p>  <p>1: D15ms, M100% 2: S15ms same as No. 22 3: S200ms, D100, M30% 4: S300ms, D100, M15% 5: S400ms, D100, M10%</p>	<p>17</p>  <p>1: D200ms, M: 0-100%</p>	<p>18</p>  <p>1: D20ms, M100->0% 2: S60ms, D20ms, M0->100%</p>
<p>19</p>  <p>1: D20ms, M100->0% 2: S30ms, D20ms, M0->100%</p>	<p>20</p>  <p>1: D100ms, M0%->100% (25ms) ->100% (75ms)->0% (100ms)</p>	<p>21</p>  <p>1: D10ms, M100%</p>
<p>No.</p> <p>22</p>  <p>1: D400ms, M50%->100% (25ms) ->100% (50ms)->0% (400ms)</p>	<p>No.</p> <p>23</p>  <p>1: D185ms, M60%->60% (10ms) ->30% (185ms)</p>	<p>No.</p> <p>24</p>  <p>1: D300ms, M50%->100% (150ms) ->50% (300ms)</p>
<p>25</p>  <p>1: D20ms, M100%</p>	<p>26</p>  <p>1: D35ms, M100%</p>	<p>27</p>  <p>1~7: D35ms, M100% 2: S70ms, 3: 140ms ·· 7: 420ms</p>