Instruction Manual
PE Video Line Converter

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Installation:

The converter has a wide-range power supply is for 110V-240V AC

The monitor is connected to the 15 pin D-Sub plug. The video source is connected via 3 BNC plugs. If your system delivers a separate sync signal, connect it to the external sync input, please. For the first installation, you need to adjust the converter via the mouse.

On the rear there is an 8-pin CAT5 connector for the PE video lightpen adapter (you can order it as an option). Please, don't connect any other device to this plug, the converter and the system can be damaged. You will find details the chapter „lightpen adjustments".

You can disable the build in 75 ohm termination on the BNC red, green and blue connectors by the setup menu, if you need the signal chained to another monitor or a video printer, which has his own termination. You find this option in the „INSTALLATION MENU".

Immediately after power on, the converter is ready for conversion. The LED on the front is lighted.

You can see a typical connection (with lightpen) in drawing1 at the end of this documentation

The video converter has to be adjusted before the first operation.
You will find several presets in the default menu, e.g.
SIEMENS Teleperm M, SIEMENS Braumat, SIEMENS R30, Hartmann & Braun Contronic P, Foxboro, MAN Pecom, Landis & Gyr, ABB VT30, AEG Atlas, etc.

Attention: if the menu is locked, you will find the solution in the chapter: „what shall I do if..."

Hardcopy Option activation:

You can activate the option by entering the purchased activation code in the printer menu. The activation will remain permanent.

Adjustment:

It is important to know the principle of operation.
There are 2 important adjustments:
Adjustments for the source and adjustments for displaying on the monitor.
The converter can multiply the number of lines for a very clear display of video information without gaps between the lines.

Control:

After clicking the right mouse button, the main menu is displayed in a part of the picture. So it is possible to view the result of changing your settings.

You navigate through the menus by clicking the left mouse button. At any time it is possible to restore the last saved settings by pressing the right mouse button.

It doesn't matter on which horizontal position the menu line is clicked, just the line is important. On some menu items, a value is displayed on the left side of the menu. Adjusting this value, a ruler is displayed on the bottom line. You can adjust the value coarse by keeping the left button pressed and drag the value by movement of the mouse. A movement to the right increases the value and vice versa. Additionally, you can make fine adjustments by clicking the – and + sign at the ends of the ruler line.

You can easy play with the values. If something goes wrong, the old stored value is just a click with the right button away. After finishing the setting ore just after doing some adjustments, you can store all settings in NVRAM by the SAVE-LOAD menu.

Saving your adjustments:

Click in the main menu on 'SAVE-LOAD'. Then click in the SAVE Menu on the line: SAVE MODE 0 AND CLEAR 1-2, that's all. Now your values are stored, even, if the power is switched off.

It is possible to save up to 3 different settings. Just click on the line
SAVE MULTI MODE 0 – 2. You should remember which location you use for what source. You can see the actual mode also in the main menu on the topside right. After exiting the main menu, the converter

switches automatically between different settings, if your system uses different timings by a video switch.
If you do not need multiple settings, use only the command SAVE MODE 0 AND CLEAR 1-2. That insures to have only one setting for your timing.

On Screen Help:

You can see a question mark in the left upper corner of the menus. As long as you hold the left mouse button pressed above this position, you will see a helptext. Each line in the helptext corresponds to the same menu line.

Procedure for adjustment:

First do all adjustments at the converter. After doing all adjustments and the picture is fine, you may do some small corrections at the monitor.

First select from the LOAD DEFAULT TIMINGS Menu the appropriate default timing. If you cannot find your system in the presets, just pick the one where the picture looks somewhat similar to the original one. But remember the setting, this is your defined starting point for the adjustment.

One adjustment is very important for capturing the video data: The number of pixels in one horizontal line including the retrace period of the monitor beam, this is the horizontal total value. The converter works with a phase locked loop, which regenerates the pixel-clock of the source. This is a very accurate circuit. Each pixel from the source has to „fall" into a correct „memory slot". This HTOTAL value is adjusted in the SOURCE TIMING MENU.
If the value is correct, the whole image should be displayed clear from left to right. If the value is not correct adjusted, you can see a disturbed or unstable point for each deviation, e.g. if the source value is 656 and you have adjusted HTOTAL to 654, you will see 2 disturbed places on the horizontal line.

You should have an image on your system with as much as possible pixels on the screen for this adjustment, something like text or patterns.

Only one particular value is possible for a particular system, it depends on completely the clock divider in the system.

After adjusting the number of pixels, you can do the pixel fine-tuning.
Here you can control, if each pixel is captured in the center. So you can reach the best picture quality.

You can do these adjustments automatically in most cases; see the description later in this chapter.

Now you should do the vertical and horizontal phase adjustment.
Adjust the hphase so that just the begin of the line is visible at the left side of the screen, and the vphase so that the start of the image on top is correct.

You can use the table at the end of this manual for writing down your settings. This is important if you change your converter to reproduce the same setting on another converter. Adjustment of a converter with known settings takes only some minutes.

Display adjustment

Go to the DISPLAY MENU and adjust the HOR FREQUENCY kHz to a value, which leads to a refresh rate of more than 70 Hz. This ensures a flicker-free display. You can go as high as your monitor is capable, but keep in mind if you change to another monitor, this monitor could be out of the frequency range. About 78kHz is a good example, all new monitors can handle this frequency. You can readout the resulting refresh value in the field REFRESH=xxx HZ.

In some cases, there might be an interfering between the input frequency of the source and the display frequency. In this case a slight modification of the line frequency can help.

Brightness adjustment: adjust the monitor to a medium brightness. Then adjust the converter brightness just to this point, where the brightness on white display parts reaches the point of saturation that means no further increase of intensity on the monitor is visible. Then reduce it slightly under this value. This

ensures to use the full range of the analogue – digital converters. All other brightness and contrast adjustments are done at the monitor.

Auto adjustment

If you have an unsupported source, which is not covered by default presets, the converter is able to find out the critical value of HTOTAL and pixel fine-tuning automatically in the most cases.
Go to the SOURCE MENU --> AUTO MENU and click AUTO HTOT - PIXEL FINE. The Converter will scan the whole HTOTAL range and tries to find the correct settings. Select a picture on the system with a lot of video information, e.g. text and graphic patterns, which covers most part of the screen.

The automatic search goes from HTOTAL 512 and stops at 1060, if no setting is found. The search is done with a reference video level on the green input. If nothing is found, it is possible to modify the reference level, default is 15, and maybe you can try 10 or 20.

The search can be aborted by pressing both mouse buttons simultaneously.

Shortform Adjustments:

Factory settings: both mouse buttons simultaneously

SAVE-LOAD MENU:
Load default setting

SOURCE TIMING MENU:
HTOTAL, HPHASE, PIXEL FINETUNING

SAVE-LOAD MENU:
Save your settings

Menus short description:

MAIN MENU:

< OSD OFF - EXIT	**Leave menu, normal operation**
> SOURCE MENU	**Adjustment video source**
> DISPLAY MENU	**Adjustment display**
> LPEN MENU	**Lightpen menu**
> SAVE - LOAD	**Save, load previous settings**
> PRINT MENU	**Hardcopy**
> Installation	**Language, Brightness, Termination**
Conv SN xxxxx Ver 4.xx	**Serial number, software version**

SOURCE TIMING MENU

> INPUT MODE MENU	**PLL Mode setting**
> AUTO MENU	**Auto-adjustment**
HTOTAL PIXELS PER LINE	**No. of source pixels**
PIXEL FINETUNING 0-63	**PIXEL fine tuning**
HPHASE 0-255	**Horizontal phase**
VPHASE 0-31	**Vertical phase**

INPUT MODE MENU

> Special Trabant MENU	**special Menu for trabant disabling**
SYNCSEP 0-31	**Sync pulse separator adjustment**
INTERLACE MODE	**Line interleave procedure on or off**

SPECIAL TRABANT MENU

< INPUT MODE MENU	**Back to INPUT MODE MENU**
Trabant Kill Pre 0-31	**trabant disabling before sync pulse**
Trabant Kill Post 0-63	**trabant disabling after sync pulse**
Noise Reduction Enable	**Noise reduction filter switch**
Noise Reduction Level	**Noise reduction level adjustment**
Freeze Picture	**stop actualizing the image**

AUTO MENU

< SOURCE TIMING MENU	**Back to SOURCE MENU**
HTOTAL PIXELS PER LINE	**No. of source pixels**
REF VALUE 0-63	**Reference value for auto setting**
AUTO HTOT - PIXEL FINE	**Autom. recognition and pixel fine**
AUTO PHASE	**Autom. setting of H and VPHASE**
AUTO HOR DISP PIXEL	**Autom. setting of HDISP value**
AUTO VERT DISP LINES	**Autom. setting of VDISP value**

DISPLAY MENU

LCD Adj Pattern	**Pattern for LCD Monitor auto adjust**
Hor Scale	**Hor. Image scaling**
Vert Scale	**Vert. Image scaling**
Hor Smooth 1-3	**Hor. smoothing**
Vert Smooth 1-3	**Vert. smoothing**

DISPLAY TIMING MENU

> VERTICAL MENU LCD Menu / Display image repetition rate

HOR DISP	**No. of pixels shown**
HOR FRONTPORCH 0-255	**Distance of video to Hsync pulse**
HOR POS - BACKPORCH 0-255	**Hor. position / distance Hsync - video**
HOR FREQUENCY KHZ 13-120	**Horizontal frequency display**

VERTICAL MENU:

< MAIN MENU	**Back to MAIN MENU**
VERT DISPLAY LINES	**Vert. no. of lines**
VERT FRONTPORCH 0-255	**Distance video to Vsync**
VERT POS - BACKPORCH32-255	**Vert. Position**
HOR SYNC POLARITY	**Hsync pulse polarity**
VERT SYNC POLARITY	**Vsync pulse polarity**

LPEN-MOUSE MENU

< MAIN MENU	**Back to MAIN MENU**
> MOUSE LPEN EMULATION MENU	**Sub-menu mouse settings**
MOUSE OR LPEN ENABLE	**Activate lightpen**
SIEMENS TELEPERM MODE	**Setting for SIEMENS TELEPERM**
SIEMENS TELEPERM 8AA (8EA) TYPE	**TELEPERM M lightpen type**
Mouse X OFFSET	**Hor. mouse delay**
Lightpen X OFFSET	**Hor. lightpen delay**

MOUSE LPEN EMULATION MENU

< LPEN MENU	**Back to LPEN MENU**
MOUSE SIMULATE LPEN	**Replace lightpen with mouse**
MOUSE HIGH SPEED	**Mouse speed fast/slow**
MOUSE CURSOR TIMEOUT	**“Time out” for mouse cursor**
MENU LOCK AFTER SECONDS	**Block menu during lightpen operation**
LPEN HIGH INTENSITY	**Lighter setting for lightpen operation**
LPEN CURSOR SHAPE	**Mouse cursor type acc. to table**

SAVE LOAD MENU

SAVE MODE 0 AND CLEAR 1-2	**Saves mode 0, delete multimode**
SAVE MULTI MODE 0	**Saves the settings to mode 0**
SAVE MULTI MODE 1<	**Saves the settings to mode 1**
SAVE MULTI MODE 2	**Saves the settings to mode 2**
RESTORE MENU	**Restore mode 0-2**
LOAD DEFAULT MENU	**Default pre-settings**

RESTORE MENU

RESTORE MODE 0	**Restore MODE 0**
RESTORE MODE 1	**Restore MODE 1**
RESTORE MODE 2	**Restore MODE 2**

PRINT MENU

> PRINT COLOUR MENU	**Sub-menu for colour settings**
<< MAKE HARDCOPY AND EXIT	**Hardcopy trigger, exit menu**
HARDCOPY BRIGHTNESS	**Own brightness setting for hardcopy**
ECONOMY MODE	**Less ink use, faster**
HOR SCALE	**Horizontal size**
VERT SCALE	**Vertical size**

PRINT COLOUR MENU

EXCHANGE WHITE-BLACK	**Setting for black background**
WHITE TO GREY	**Changes white to grey (instead of black)**
YELLOW TO ORANGE	**Changes yellow to orange (easy to read)**

INSTALLATION MENU

< MAIN MENU	**Back to MAIN MENU**
Language 0-2	**0=english, 1=german, 2=french**
INPUT TERMINATION OFF	**Switch off 75 Ohm input termination**
BRIGHTNESS 0-100	**Set brightness**
Fix LCD 1280*1024 60Hz VESA	**Display timing fixed to VESA Mode**
Flash Menu	**Feature to upgrade software via PC**

Lightpen adjustments:

On sets with lightpen option, please consider the following warning:
It's important to use only the proper lightpen adapter, otherwise a damage of the adapter and lightpen or even of the interface part of the system is possible! The following adapters are available:

1.) Hartmann & Braun Contronic P
2.) SIEMENS Teleperm M for Lichtgriffel Typen 8EA
3.) SIEMENS Teleperm M for Lichtgriffel Typen 8AA (older versions)

You can find the Teleperm M lightpen type on the bottom of the lightpen holder. There will be a type plate, e.g. 6DS 3317 - 8EA

Load the setting from the LOAD DEFAULT menu
SIEMENS TELEPERM M or HARTMANN+BRAUN CONTRONIC,
dependent on your system.

The lightpen relevant settings are in the LPEN MENU.
The choice „ SIEMENS TELEPERM MODE " must be checked for Teleperm types, if you have lightpen type 8AA, check additional the switch „SIEMENS TELEPERM 8AA TYPE„

Adjust the converter for good picture quality, as described in the manual, by the PIXEL FINE adjustment.

Now connect the lightpen adapter to the converter and between the system and the lightpen holder box.

First, activate the lightpen simulation mode
MOUSE SIMULATE LPEN in the LIGHTPEN EMULATION MENU. Leave the menu.
A mouse cursor will be shown. Click with the left button and your system should react. You can optionally adjust the horizontal delay of the lightpen emulation by the SYSTEM OUT X OFFSET.

With this option, it is possible to use even a LCD monitor.

Cursor colors:

You have a choice out of 16 shapes ("LPEN CURSOR SHAPE"):
Crosshair color: 0=red, 1=green, 2=yellow, 3=blue, 5=pink, 6= turquoise, 7=white
Arrow: add 8 to the value
Large arrow: add 16 to the value
eg. white arrow = 15 (factory setting)

Activation of the light-pen:

Now switch the MOUSE SIMULATE LPEN to „0". You can use the light-pen and adjust the horizontal delay with the value „LPEN IN OFFSET".

Please note that after changing the horizontal frequency of the display or after changing the SYSTEM OUT OFFSET, it is necessary to re – adjust the LPEN IN OFFSET.

Menu lock:

To avoid accidentally activation of the menu, it can be locked.

The menu is locked a definable amount of seconds after power up of the converter. A value of

0 disables the locking. You find this value in the

LPEN MENU -> MOUSE EMULATION MENU.

Considerations for LCD Monitors

Most points are applicable to LCD monitors also. But there is one restriction:
A LCD monitor has a physically predefined number of pixels. The converter must be configured to fill exact one pixel with one dot of the video information.
We recommend doing all adjustments first with an analog monitor.
Do all adjustments till you have a clear, sharp picture with all information on it.

The converter has an interpolation function. In this mode, the LCD works always in the physical resolution, e.g. 1280x1024 in standard VESA mode.

In the instal menu activate „FIX LCD 1280*1024 60Hz VESA“. The display timing is now fixed to VESA mode and cannot be changed.

Go to the display menu and click to „LCD ADJ PATTERN“. An ajdustment pattern for the LCD will be displayed. On the LCD Monitor do the automatic adjustment. If necessary, correct the timing by hand, so that you can see the pattern without disturbance.

The system picture will be too small and in the left upper corner. Now correct the hor. and vert. size with the x and y scale factors to have a full screen display.
You can adjust the smoothing like you prefer.

Hardcopy Option:

If you purchased this option, you can make a hardcopy on an inkjet printer via parallel centronics cable. The following HP printers are compatible: Deskjet 970cxi, Deskjet 6122, Deskjet 6127, Business Inkjet 2230

You can make a screenshot of the actual video information on normal A4 paper. It takes about 1 minute for a hardcopy.
After triggering the hardcopy the image is stored in a separate memory, so you can continue your work without interruption. You can initiate the hardcopy from the menu and also from a button on the converter or via electrical line from a contact or logic signal. It isn't required to set up the printer (no jumper's etc).

You can adjust the printout size by the two hor and vert scale factors. A greater value means a bigger size of the printout.

There is an extra brightness control in the print menu. Adjustment should be done to ensure the best hardcopy quality, because the printer has only 4 color intensities per color. A somewhat higher value than the main brightness is a good experience.
To reduce color consumption with black background, you can exchange white/black. If white to gray is selected simultaneously, white is mapped to gray, so you have good visibility on white characters on a bright background.
Yellow to orange enhances the visibility of yellow.

Hardcopy triggering via signal line:

You can use a switch contact or button and connect it to the 2,5 mm earphone jack. If the contact is closed longer than 10ms, the hardcopy will start. The ground and inner contact is used.

You can use also a logic signal with TTL level. If it is held more than 10ms to LOW, the printing is triggered.
Logic signal definition:
< 0,8V = LOW
> 2,4V = HIGH
The signal is pulled high via 4,7k-Ohm towards internal +5V.

Hardcopy at systems with multiple monitors:

A very economic version is the use of an automatic centronics printer switch. Please, use a professional one with separate power supply. The converter doesn't use a bi-directional interface. Only data, busy and strobe is used.

What to do if...

...the menu is locked:

To avoid accidentally activation of the menu, it can be locked.

The menu is locked 30 seconds after power up of the converter. You find this switch in the LPEN MENU -> MOUSE EMULATION MENU.
If locked, it is only possible to enter the menu a predefined time. To unlock, switch the converter off and on again. Now you have 30 seconds to press the right mouse button and enter the menu.

...the display is too narrow:
Decrease the values for HOR FRONTPORCH and HOR POS-BACKPORCH in the display menu. Also reduce HOR DISP to a value, where you can view the whole information.

...you miss some part of the image on the display or there is some additional „garbage" visible:
the left and top margin is adjusted in the source menu, the right and bottom margin in the display menu according to the following table:

1.) left HPHASE (*SOURCE MENU*)
2.) top VPHASE (*SOURCE MENU*)
3.) right HOR DISP (*DISPLAY MENU*)
4.) bottom VERT DISPLAY LINES (*VERTICAL MENU*)
You should adjust the values in this order, because some values have influence to others.

...there is no correct synchronization of the image:
Check if there is sync on green available. If the old monitor had only 3 lines, it used sync on green.
Connect all previous used lines to the converter.
There could be another problem: Check, if the video signal is proper terminated with 75 Ohm, not double terminated nor unterminated.
If you are in doubt, remove any T – connectors and route the signal directly to the converter with the termination switched on. If this works properly, you can go to the desired configuration step by step.

Tech. data

Supply voltage:	**110 - 240V AC, 50-60Hz**
Power consumption	**5VA**
Video input:	**0,7-1 Vss, sync on green or BNC**
Output to the Monitor:	**15 pin D-Sub Std. VGA pinning**
Mouse:	**PS/2, 2 buttons, Microsoft Format**
Max operating temperature:	**0 - 45 degrees centigrade**

Distribution:

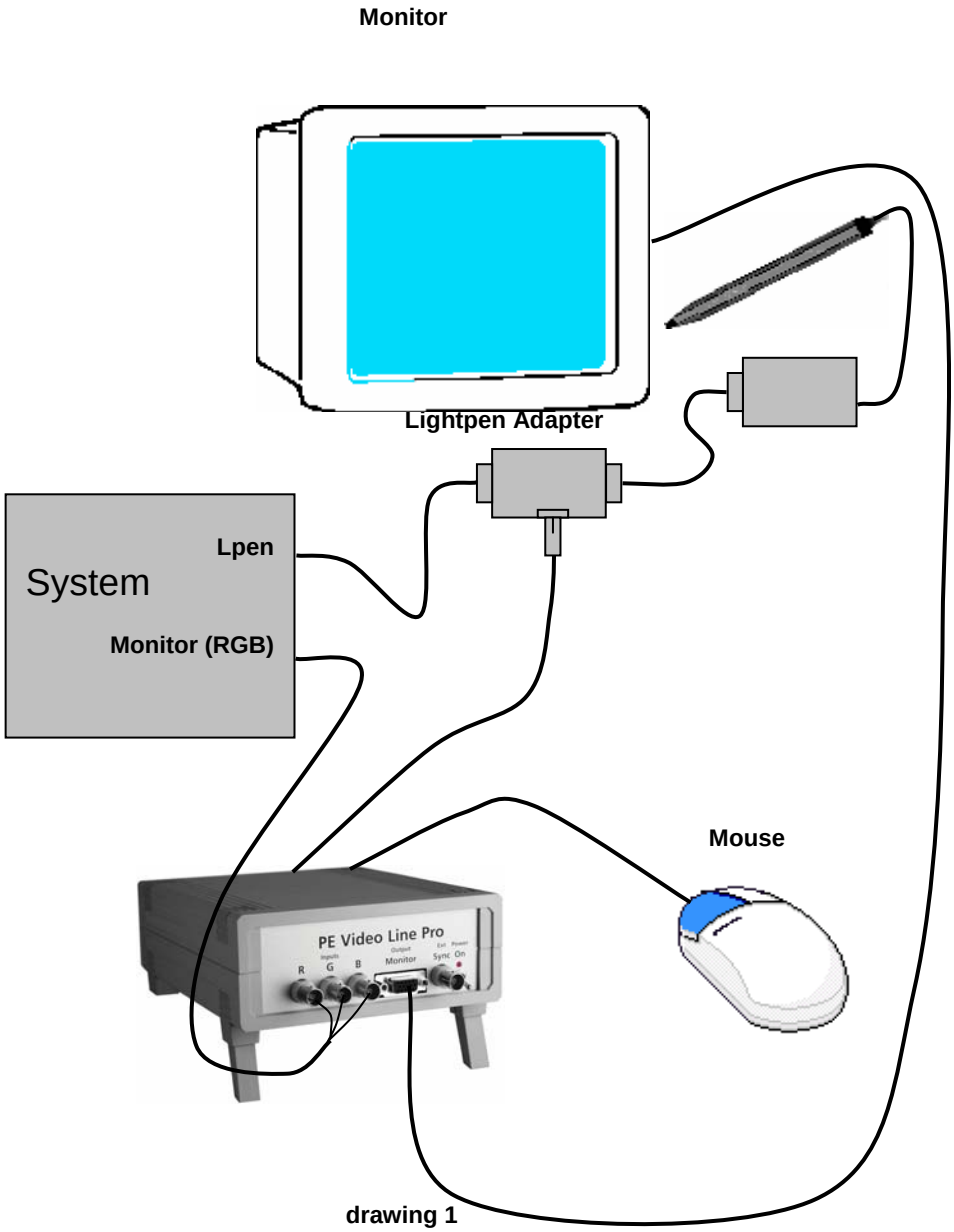
ProVis-Lahr GmbH
Rainer-Haungs-Str. B 33

D-77933 Lahr/Schw.
Germany

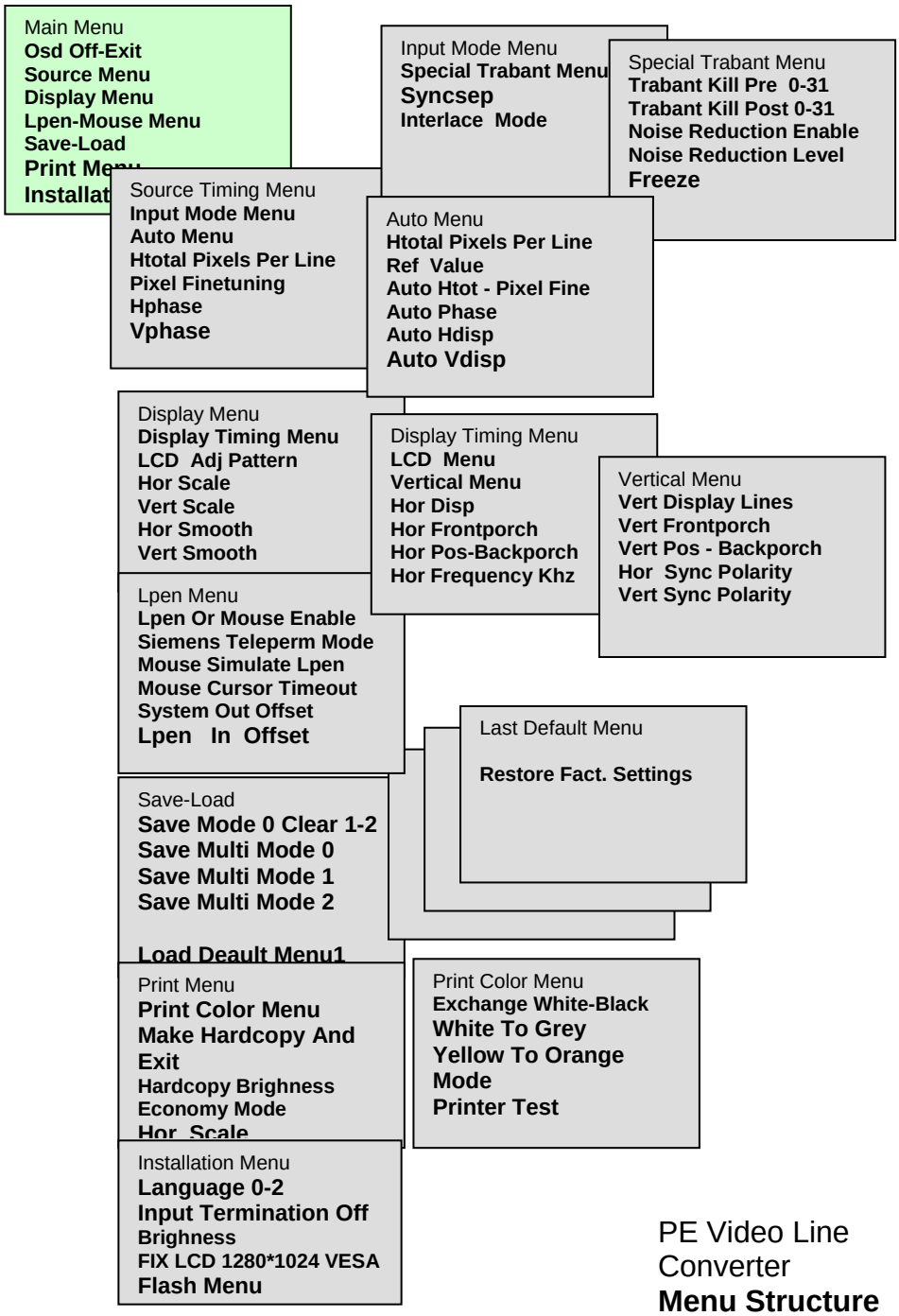
Tel.: +49-7821-909978-0
Fax: +49-7821-909978-1

Email: info@provis-lahr.de
Internet: www.provis-lahr.de

Videoconverter configuration			
		Datum / date	Monitor
		Ser. Nr.	
		System Type	Adjustments
		Kunde / customer	Clock
			Resolution
			Smoothing
		SW Version	Contrast
		Main	Brightness
		Source Hfrq kHz	Screensize
		Source Vfrq Hz	Phase
		Lines	
		Brightness	
		Source	
		Htotal	
		Pixel Fine	
		Hphase	
		Vphase	
		Input Mode	
		Scale	
		Syncsep	
		Interlace Mode	
		Video Output Level	
		Display	
		HOR Disp	
		HOR Frontporch	
		HOR POS Backporch	
		HOR Frequ kHz	
		Vertical	
		VERT Display Lines	
		Vert. Frontporch	
		Vert. Pos. Backporch	
		Extended Hsync	
		Hsync Polarity	
		Vsync Polarity	
Bemerkung / comment			


Monitor
Lightpen Adapter
Lpen
System
Monitor (RGB)
Mouse
PE Video Line Pro

drawing 1



PE Video Line Converter
Menu Structure