

VISU-P Panels

General Description

The VISU-P panels are human machine interfaces designed for front mounting and especially developed for using the EASY PLC's or PLC-Core-Modules of frenzel + berg electronic with the CoDeSys target visualization.

Already the standard versions of the VISU-P panels are equipped with a 5,7" color TFT display and touch panel. An additional keyboard depends on panel model.

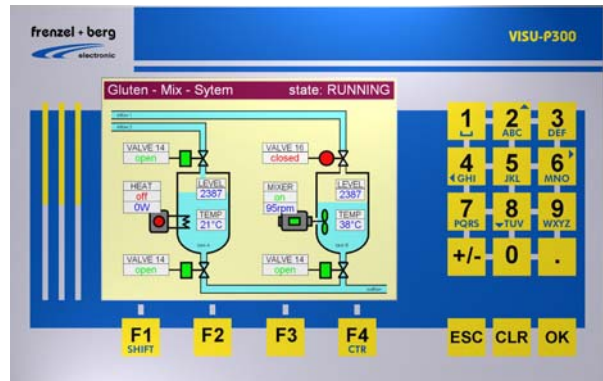
All panels have a plug and play serial graphic interface that allows coupling or decoupling panel's from and to a running PLC System. So there is also no programming required by panel replacement.

All this enables possibility for using such a panel as a portable HMI, also as a mounted device to a fix place. At least the interface is construed for long wire distance.

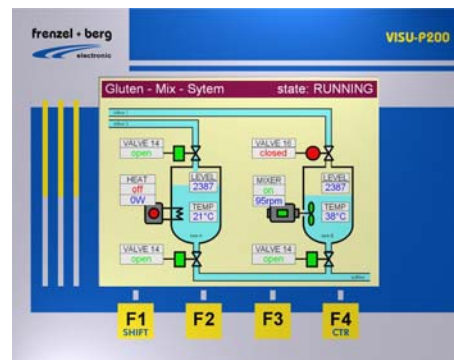
Features

- 5,7" color TFT display
- Analog Touch-Screen
- Keyboard
- LED Backlight
- Buzzer (key-Beep)
- Serial graphic interface (Rs232, RS485)
- 24V single supply
- Stand alone screen setup
- Front mounting
- Installation depth < 35 mm
- Protection class IP65 (front side)
- Temperature range -10 to 60 °C

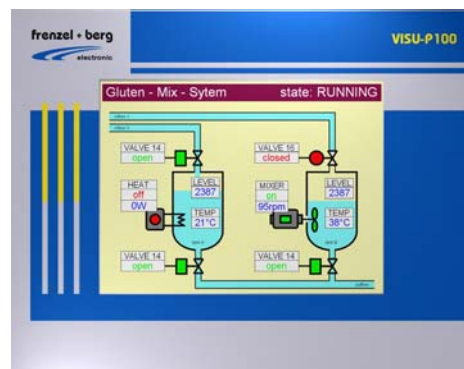
VISU-P300



VISU-P200



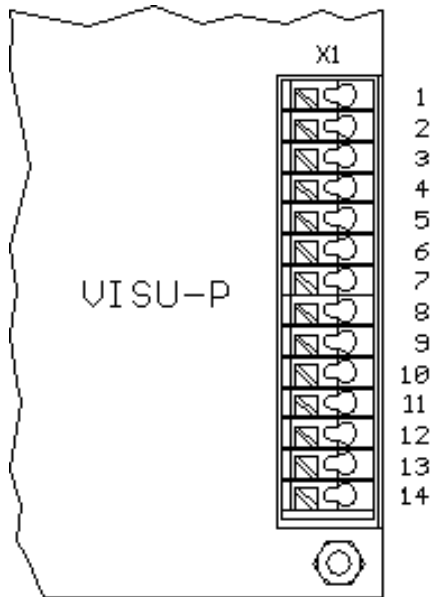
VISU-P100



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Connection

All connections to the panel will be done to the clamps on the backside of the panel

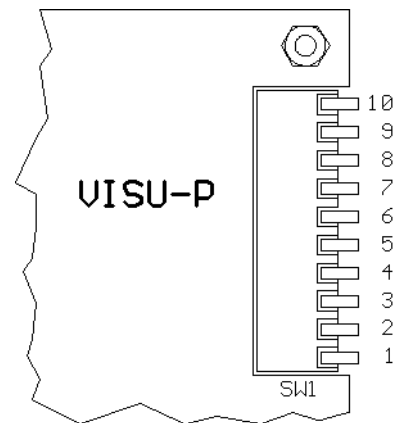


X1 Clamp

Pin No.	Pin Name	Funktion
1	CANH	CAN-Bus Signal H
2	CANL	CAN-Bus Signal L
3	GND	Common Ground
4	CANH	CAN-Bus Signal H
5	CANL	CAN-Bus Signal L
6	GND	Common Ground
7	A	RS422/485 input
8	B	RS422/485 inverted input
9	Z	RS422/485 inverted output
10	Y	RS422/485 output
11	TXD	RS232 Signal TXD
12	RXD	RS232 Signal RXD
13	U24	Power supply +24V
14	GND	Common Ground

Note: CAN-Bus and RS422/485 interface are not available in standard model.

DIP-Switch (SW1)



SW1 DIP-Switch

Baudrate (bit/sec)	switch		
	3	4	5
460800	ON	ON	ON
230400	ON	ON	OFF
115200	ON	OFF	ON
(reserved)	ON	OFF	OFF
57600	OFF	ON	ON
38400	OFF	ON	OFF
19200	OFF	OFF	ON
9600	OFF	OFF	OFF

Serial Interface	7
RS232 is enabled	OFF
RS422/485 is enabled	ON

Don't connect RS232 if RS422/485 is enabled !

Screen Orientation	9	8
Normal orientation 0°	OFF	OFF
Orientation rotated 90°	OFF	ON
Orientation rotated 180°	ON	OFF
Orientation rotated 270°	ON	ON

Do touch calibration after orientation was changed !

Manual Setup	10
Startup setup menu disabled	OFF
Startup setup menu enabled	ON

Note: Other switches are reserved for future use.

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RS232 Settings

When RS232-Interface is used, the following Parameters are fix.

Startbits	Databits	Stopbits
1	8	1

The Baudrate can be set via DIP-Switch between 9600 and 460800 Baud. (see SW1)

Normal Operation

After power up the VISU-P shows the information "READY" and "Vx.xx". This info is shown until communication to the host PLC is running or a communication error was detected. In case of error the display shows an error message as long as the error persist. Otherwise the visualization is displayed.

Panel Setup Menus

The VISU-P-Panel has setup menus for setting hardware parameter as brightness, contrast, ... do the touch calibration and get additional information to the panel.

There are two possibilities to enter setup menus:

- 1.) Use library function "SysVisuTool_SetupMenu" in your PLC program.
- 2.) Press any key or hold on touch-screen pressed during power up.

(Note: Feature 2 is disabled if DIP10 is in OFF position)

Setup Main Menu



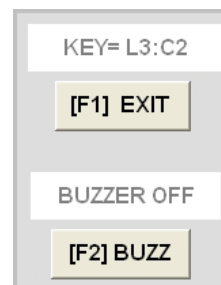
Select next by using function key or press button on touch screen.

Setup Menu Display



Select next by using function key or press button on touch screen.

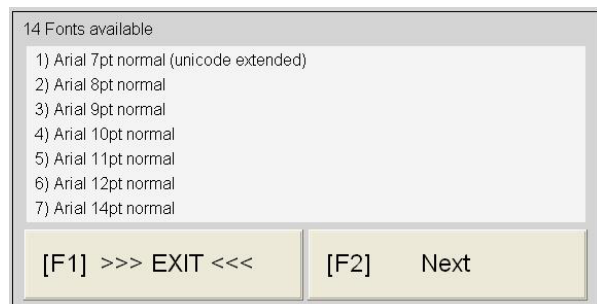
Setup Menu Keyboard



Shows key matrix line and column of last pressed key.

<[F2] BUZZ> toggles the buzzer and an icon (⊖) on the start screen. If the buzzer is off, the icon is displayed.

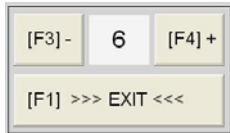
Setup Menu Font-Info



Shows a list of available fonts for this panel. Fonts named "Unicode extended" includes lot of special characters from other countries. (e.g. parts of Cyrillic font, Chinese font, ...) For using Unicode Characters the "dynamic text function" of CoDeSys may be used.

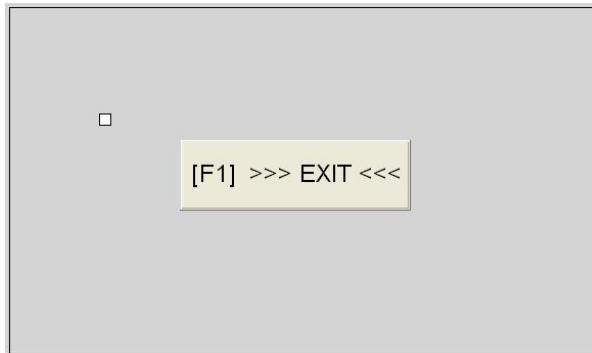
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Setup Menu Brightness



Allows changing brightness in 10 steps between 0 and 9. Setting will be stored after Exit. So next power up is with same brightness.

Setup Menu Touch Test



Shows a small rectangle at the last touched position. If the rectangle is not displayed at the touched position, touch calibration should be done.

Setup Menu Touch Calibration



Click into the small rectangle. Repeat this handling as often as the small rectangle is displayed next position. If this menu closes, calibration is finished.

Screen Orientation

Screen orientation can be changed with the Dip-Switches 8 and 9. (see Dip-Switch SW1)
The default setting (normal orientation) is 0°.
After changing the screen orientation (0°, 90°, 180°, 270°) via Dip-Switch, the Touch positions may not longer match to the displayed objects. So after orientation was changed, the touch calibration must be done urgent.

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Start Using VISU-P Panel

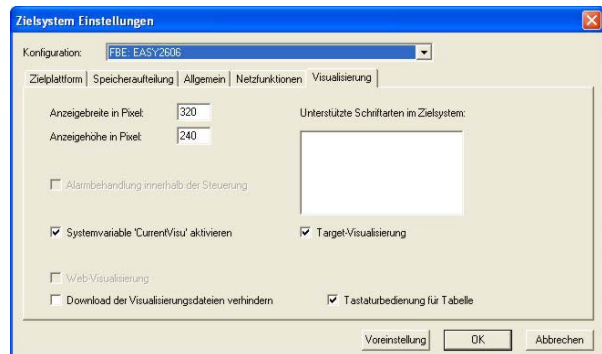
Using the VISU-P Panel in a CoDeSys project is very easy.

If you have a CoDeSys project and you want to add a target visualization, you only have to select a RS232 COM-Port for visualisation in the PLC configuration of CoDeSys and connecting the panel to this COM-Port.

Then a check must be at the "Target Visualisation" in menu "Target System" in card "Visualisation".

If "parameter configuration (Baudrate,...)" is identically set as at the panel, the system is ready for run.

The following description shows an example for getting started a visualisation with the VISU-P panel and an EASY2606 step by step.



When display dimension is set 320x240 pixel and 'Current Visu', Target-Visu, keyboard for table are selected as shown in figure → click OK.

Select program as structured text and click OK. Then write the following small program into the code area window.

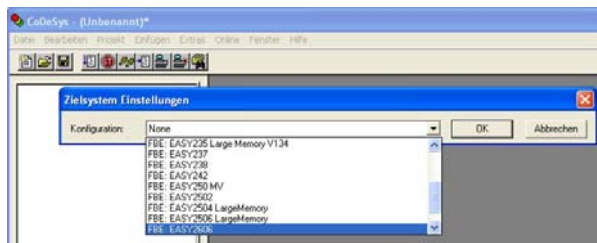
Project Example

Precondition

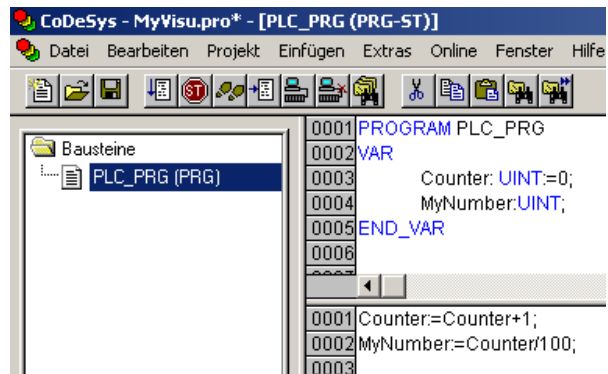
- CoDeSys development tool (V2.3.xx) must be installed on PC
- FBE-Targets must be installed via CoDeSys tool program "Install Target".

Step 1: Creating A New Project

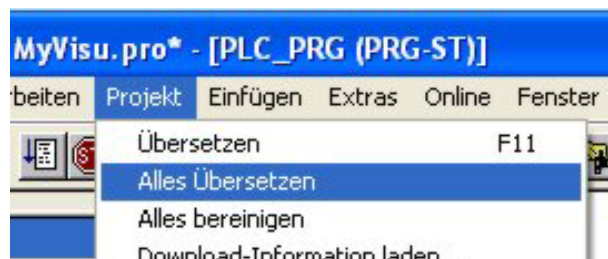
Start the CoDeSys development tool on your PC. Select NEW into the FILE menu and select target system "FBE: EASY2606 ...".



Then click to the card "Visualisation".



Compile this program. PROJECT/COMPILE ALL.

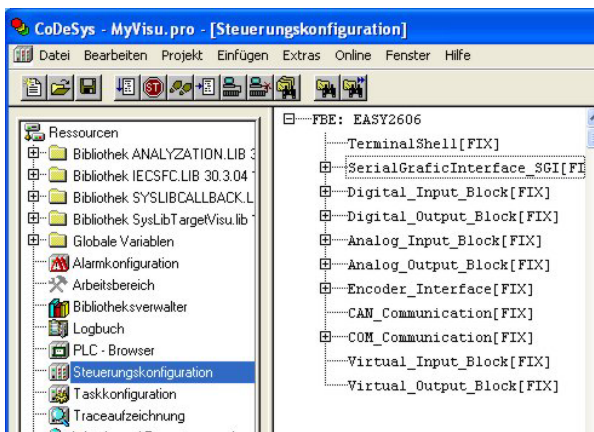


If result has 0 errors and 0 warnings, save project (FILE/SAVE) as "MyVisu.prj".

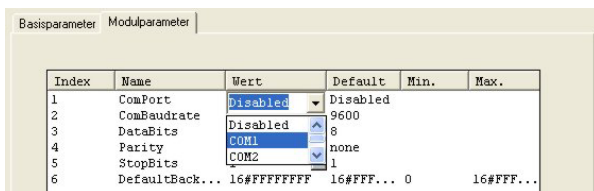
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Step 2: PLC Configuration For Visualisation

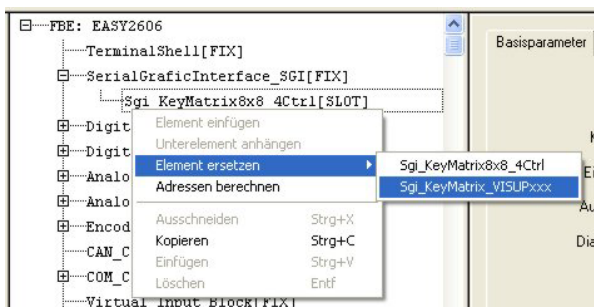
Then switch to card "Resources" and select menu "PLC Configuration" click right mouse button into this card and insert a new object. After this open the tree FBE:EASY2606 in the right window by click to the plus. Then select "SerialGraficInterface".



Switch to the card "Modulparameter" and click to value disabled in line ComPort. Select "COM1". All other parameters should have default value.



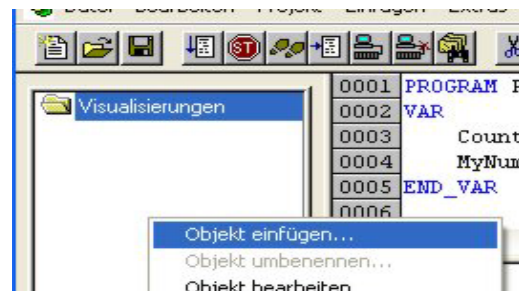
Then open tree "SerialGraficInteface_SGI" by click to plus. A right mouse click "Sgi_KeyMatrix8x8_4Ctrl" opens a menu. Click to "Element Exchange" and select "Sgi_KeyMatrix_VisuPxxx".



After this configuration is ready. A Communication between EASY2506 and VISU-P panel is generally possible now.

Step 3: Create A Small Program

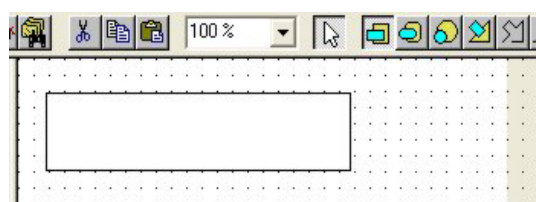
Switch to card "Visualisation", click right mouse button into this card and insert a new object.



The main visu object always must have the name "PLC_VISU". So type this for the new object's name.

Then you get a white area on grey background in the graphic editor. This white area equals display dimension of the VISU-P panel. All objects drawn inside the white area will be displayed when program is running. (If possible do not place object outside. They are invisible but they needs processing power on panel)

In our first project we draw only one rectangle into the white area. (approximately as shown in figure below)



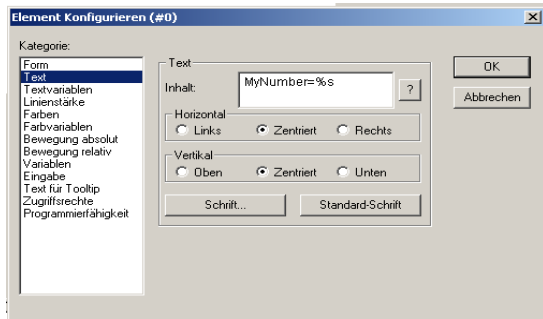
Then click right mouse button onto the rectangle and select configuration.



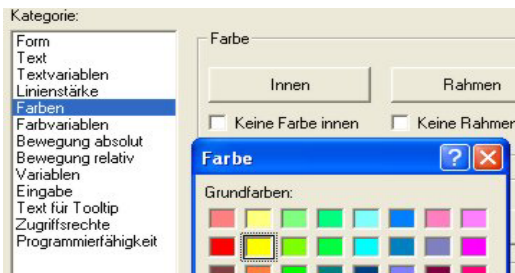
Now change to the category "Text" at first. Then set horizontal and vertical centric, and as font select

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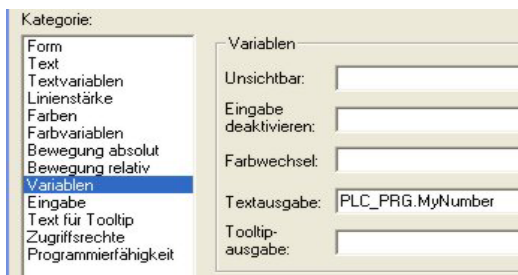
Arial 10 pt. In field text write the string "MyNumber=%S".



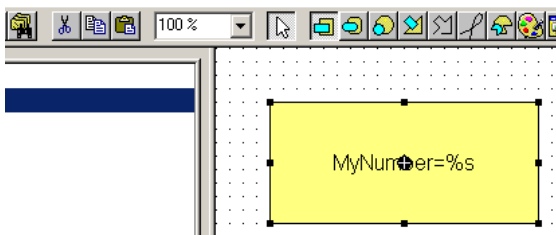
As next change to category "Colours" and then click Color "Inner". Then click into the yellow field and confirm this selection with "OK".



Now change to category "Variable" and write 'PLC_PRG.MyNumber' into the "Textoutput" field.



Then confirm configuration window with OK. Now your rectangle should look like in the figure below.



The small program is ready now.


Step 4: Connecting EASY2606 to PC


Use the EASY-Programming-Cable for this connection. Plug the 6-Pin DIN connector to the EASY and SUB-D-9 connector to an RS232-Interface of the PC. Then switch on power to EASY2606.

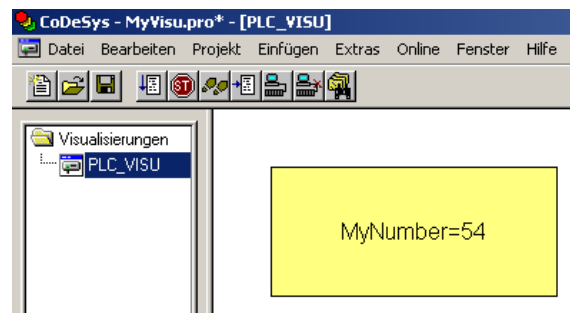
Click to menu "Online" and select "Communication Parameters". In this menu change select the COM-Port you will use with the EASY. Other Parameter should be as in the table below.

Baudrate	Startbits	Databits	Stopbits
57600	1	8	1



Then click button Online . If compilation was without errors and without warnings, load the program into the EASY2606.

After loading click button Run . When program runs the Visualisation Window should look like the figure below.

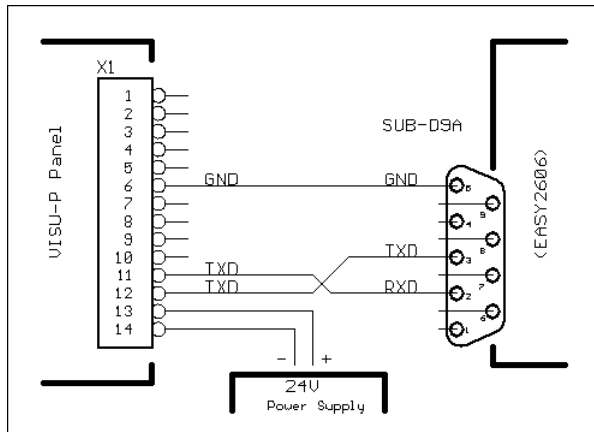


As next connect the VISU-P panel to the EASY2506.

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Step 5: Connecting Panel To EASY2506

Connect the VISU-P panel to RS232-Interface COM1 of the EASY2506 as shown in figure below. Then switch on power to the panel.



After a short time the Panel should show the rectangle with a counting number.

Supported CoDeSys-VISU Features

The Panel supports a lot of CoDeSys-VISU features. Not all of the great many could be realised. See table for details.

Objects	Available feature / styles
Line	Selectable wide and color
Rectangle	(Frame / Filled / Text)
Rounded Rectangle	(Frame / Filled / Text)
Ellipse	(Frame / Filled / Text)
Polygone	10 points max. (Frame / Text)
Bitmap	(Frame / Fix / Mono / 24BitCo)

Frame	Object frame / line wide and color selectable
Filled	Object filled by selectable color
Text	Text written into object. Reference at frame or centre selectable. Font selectable. Note: Font depends on available Fonts at the Panel. If an other Font is used the Panel shows next related font.
Fix	No scaling for Bitmaps. Displayed in original size (pixels).
Mono / 24BitCo	Supported bitmap formats are 1BPP or 24BPP windows bitmaps (.BMP)

Key Table

After power up, when no key table was sent from the PLC to the panel, the key table values are the key position in matrix field. → 16#LC (Show setup menu keyboard)

The PLC transfers key table selected by the user. Selection is possible at the plc configuration at item "SerialGraficInterface". There are two table selectable. The "Sig_KeyMatrix8X8_4Ctrl" where the user can define key values itself, or the "Sig_KeyMatrix_VISUPxxx" where the key values of this panes are pre defined.

Key Values of Sig_KeyMatrix_VISUPxxx

Key	Key Value
1	16#0031
2	16#0032
3	16#0033
4	16#0034
5	16#0035
6	16#0036
7	16#0037
8	16#0038
9	16#0039
0	16#0030
+/-	16#002D
.	16#002E
ESC	16#001B
CLR	16#007F
OK	16#000D
F1 (SHIFT)	16#00F1
F2	16#00F2
F3	16#00F3
F4 (CTRL)	16#00F4

All key values are 16 bit values. The low byte is always the key value. The high byte signals state and special function keys.

Each key sends minimum two states. The key hit and the key release. This is coded in Bit 15 of the key value.

Bit15 = 0 → key hit or key roll over hits the key
Bit15 = 1 → key released

Bit 8..11 signals in addition pressed special function key.

Bit 8 = CTRL key is additionally pressed
Bit 9 = SHIFT key is additionally pressed
Bit 10 = reserved
Bit 11 = reserved

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Example

When "SHIFT 1" was pressed the following key values are generated:

16#00F1	[SHIFT] key hit
16#0231	[1] was pressed in addition
16#8231	[1] was released
16#80F1	[SHIFT] key released

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Absolute Maximum Ratings

Stresses greater than those listed parameters may cause permanent damage to the device. Functional operation should be restricted to recommended operation conditions. Exposure to absolute maximum rating conditions for extended times may affect reliability.

Parameter	Symbol	Rated Value		Units	Remarks
		Min.	Max.		
Power supply voltage	U24	- 0.3	36	V	
RS232 Receiver Input	V _I	- 25	25	V	
RS232 Transmitter Output	V _O	- 13,2	13,2	V	
RS232 ESD Protection	V _{ESD}	- 15	15	kV	
RS422/485 Receiver Input (A, B)	V _I	- 7,5	12,5	V	
RS422/485 Trans. Output (Y, Z)	V _O	- 7,5	12,5	V	
Operating temperature	T _A	-10	+60	°C	
Storing temperature	T _A	-20	+70	°C	

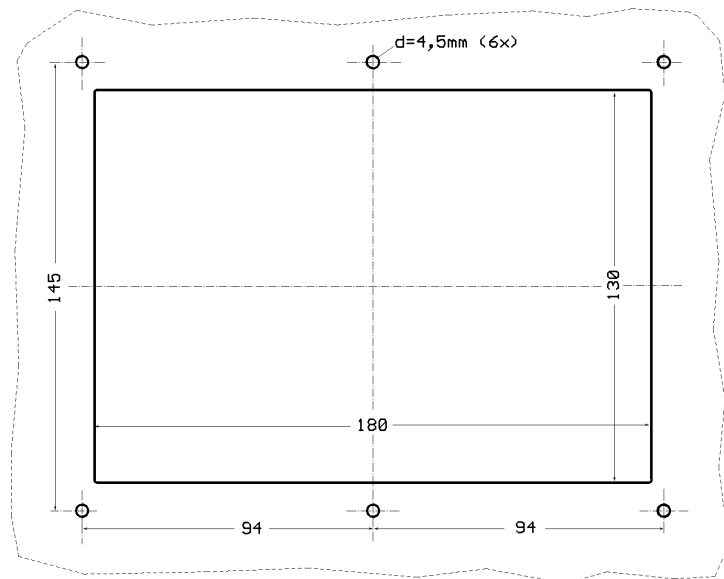
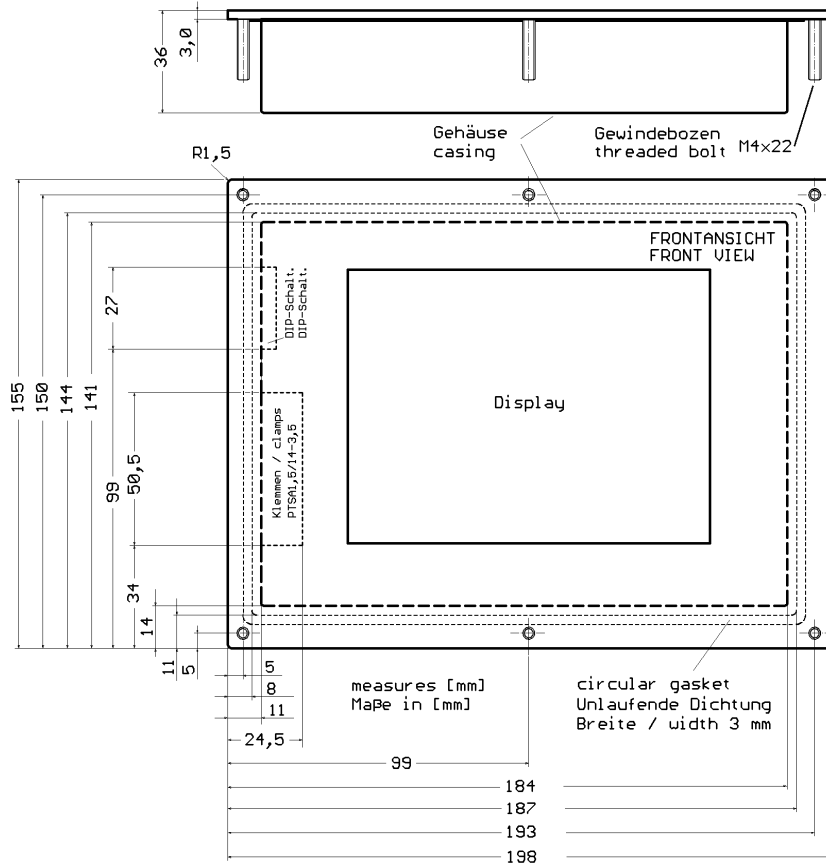
Recommended Operation Conditions and Characteristics

Functional operation should be restricted to recommended operation conditions.

Parameter	Symbol	Rated Value			Units	Remarks
		Min.	Typ.	Max.		
Power supply voltage	U24	10	24	32	V	
Power supply current	I _{CC}		130	200	mA	(24VDC)
RS232 Receiver Input	V _{IH}	- 3,0		- 15	V	
	V _{IL}	3,0		15	V	
RS232 Receiver Output	V _{OH}	- 5,0	- 5,4		V	R _L = 3kΩ to GND
	V _{OL}	5,0	5,4		V	R _L = 3kΩ to GND
RS422/485 Diff-Driver Output	V _{OD}	2,0			V	R _L = 100Ω
	V _{OD}	1,5			V	R _L = 60Ω
Operating temperature	T _A	-10		+60	°C	

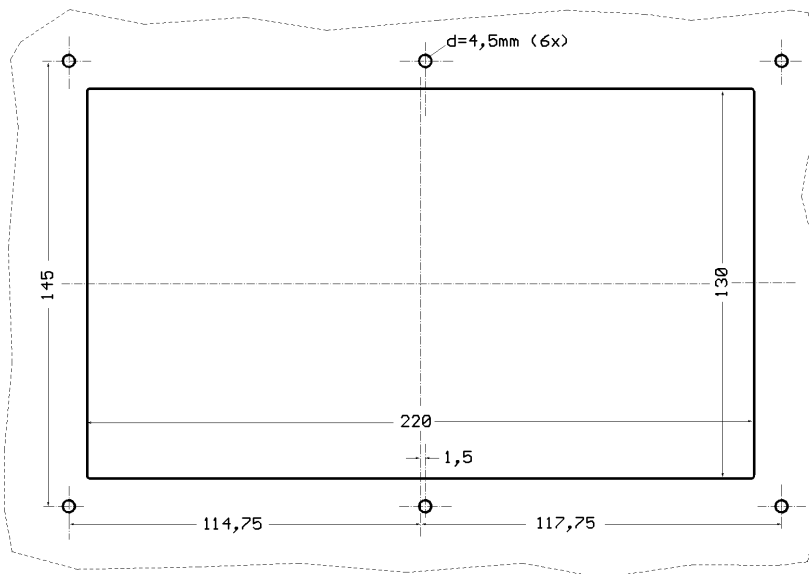
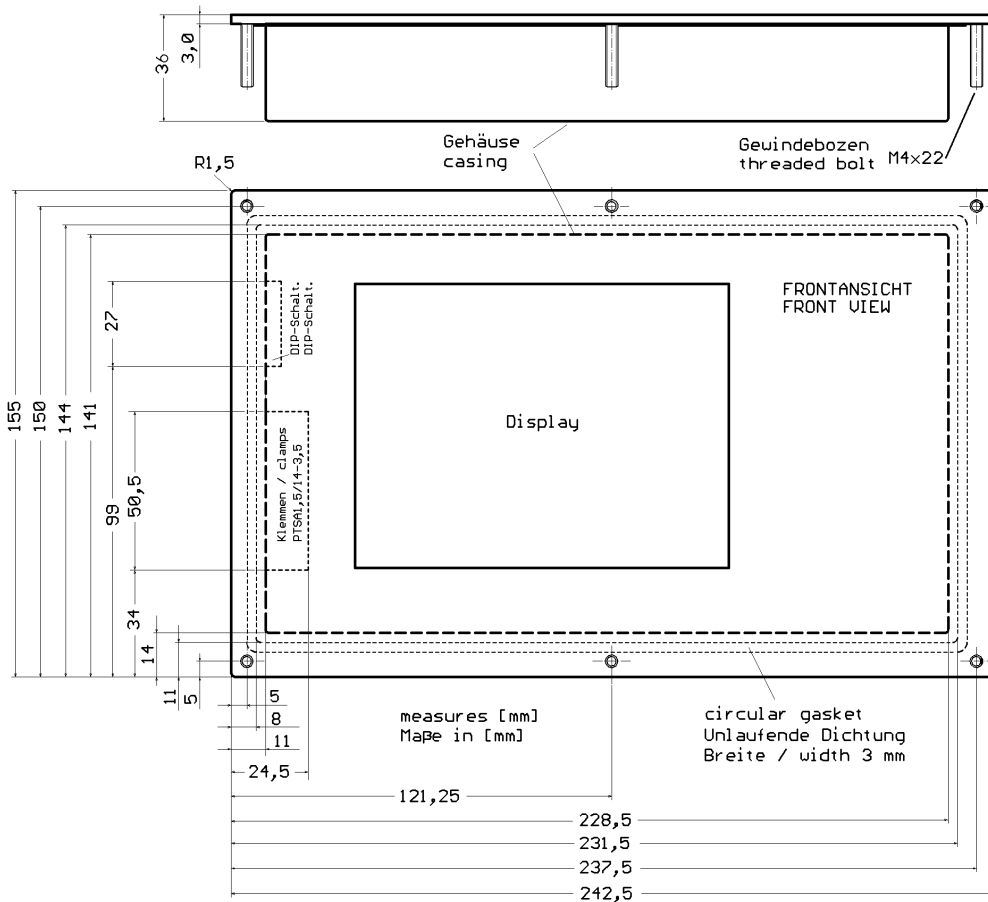
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Measurement VISUP-100



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Measurement VISUP-300



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Version History and Notes

Version	Date	Changes
1.03	29.04.08	X1 pinning changed (At V1.02 datasheet the pinning was wrong / mirrored)
1.04	09.05.08	X1 pinning changed (wrong numbers)
1.05	02.06.08	Key table of default key values added
1.07	24.02.10	Measurement VISUP-100 changed, last picture
1.34	24.09.10	Dip-switch description changed, DIP 6 is used to enable / disable RS422/485
1.35	13.10.2010	DIP 6 was wrong, DIP 7 is used to enable / disable RS422/485
1.38	18.10.2012	Setup menu new item <buzzer on/off>

The information herein is given to describe certain components and shall not be considered as warranted characteristics. Terms of delivery and all rights to technical changes are reserved.

We hereby disclaim any and all warranties, including but not limited to warranties of non-infringement, regarding circuits, descriptions and charts stated herein.

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