

# **aFLAT-Series**

## **CRTtoLCD-1-TC/LC**

<b>Technical Manual</b>	
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<b>1.0</b>	<b>User Information</b>
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1.0	Warranty
	<p>Each board is carefully and thoroughly tested before being shipped. If, however, problems should occur during the operation, please check your user specific settings of all boards included in your system. This is often the source of the fault. If a board is defective, it can be sent to your supplier for repair. Please take care of the following steps:</p> <ul style="list-style-type: none"> <li>- The board returned should correspond to the factory default settings since a test is only possible under this settings.</li> <li>- In order to repair your board as fast as possible , we require some additional information from you. Please fill out the attached Repair Form and include it with the defective board.</li> <li>- If possible, the board will be upgraded to the latest version without additional cost.</li> <li>- Upon receipt of the board, please be aware that your user specific settings were changes during the test.</li> </ul> <p>Within the guarantee, the repair is free as long as the guarantee conditions were kept. If no fault has been found, you will be charged with the test cost due to the high test expenditure. Repairs outside of the guarantee will be charged.</p> <p>This Kontron Hamburg product is warranted against defects in material and workmanship for our guaranteed warranty period from the date of shipment. During the warranty period, Kontron Hamburg will, at its option, either repair or replace products which prove to be defective.</p> <p>For warranty service or repair, the product must be returned to a service facility designated by Kontron Hamburg.</p> <p>The foregoing warranty shall not apply to defects resulting from improper or inadequate maintenance or handling by buyer, unauthorized modification or misuse, operation outside of the environmental specifications for the product, or improper installation or maintenance.</p> <p>Kontron Hamburg will not be responsible for any defects or damages due to a faulty Kontron Hamburg product other than the products supplied by Kontron Hamburg.</p>

<b>1.1</b>	<b>Introduction</b>
	<p>The CRTtoLCD-1-TC is a highly integrated TFT panel interface controller, which allows an easy adaptation of standard analog video sources to a digital TFT panel. The CRTtoLCD-1-TC needs only one single 12V power supply and incorporates all needed functionality, including optional 4 or 8 wire touch controller for USB or PS/2 interfaces, to build up a full featured TFT monitor. The card generates the necessary power sequencing for the flat screen. The highly flexible architecture of the CRTtoLCD-1-TC panel interface allows adapting nearly any available TFT panel. Therefore a variety of panel adapters and programming are available on request.</p>
<b>1.2</b>	<b>Technical Information Summary</b>
	<p><b>Analog-Input Features :</b></p> <ul style="list-style-type: none"> <li>- Fully integrated 135MHz 8-bit triple-ADC, PLL and pre-amplifier</li> <li>- On-chip programmable OSD engine</li> <li>- Integrated PLLs</li> <li>- 10-bit programmable gamma correction</li> </ul> <p><b>Integrated Analog Front End</b></p> <ul style="list-style-type: none"> <li>- Integrated 8-bit triple ADC</li> <li>- Up to 135MHz sampling rates</li> <li>- No additional components needed</li> <li>- All color depths up to 24-bits/pixel are supported</li> </ul> <p><b>High-Quality Advanced Scaling</b></p> <ul style="list-style-type: none"> <li>- Fully programmable zoom</li> <li>- Independent horizontal / vertical zoom</li> <li>- Enhanced and adaptive scaling algorithm for optimal image quality</li> <li>- Recovery Mode / Native Mode</li> </ul> <p><b>Input Format</b></p> <ul style="list-style-type: none"> <li>- Analog RGB VGA up to <a href="#">SXGA@70Hz</a></li> <li>- 15 Pin standard VGA connector</li> </ul> <p><b>Operating Modes</b></p> <ul style="list-style-type: none"> <li>- Bypass mode with no filtering</li> <li>- Multiple zoom modes: - with filtering, - with adaptive (ACE) filtering</li> </ul> <p><b>Integrated On-Screen Display</b></p> <ul style="list-style-type: none"> <li>- On-chip character RAM and ROM for better customization</li> <li>- Optional external OSD supported for greater flexibility</li> <li>- Supports both landscape and portrait fonts</li> <li>- Many other font capabilities including: blinking, overlay and transparency</li> </ul>

<b>1.2</b>	<b>Technical Information Summary</b>
	<p><b>Output Format</b></p> <ul style="list-style-type: none"><li>- Support for 8 or 6-bit panels (with high quality dithering)</li><li>- One or two pixel output format</li></ul> <p><b>Built In High-Speed Clock Generator</b></p> <ul style="list-style-type: none"><li>- Fully programmable timing parameters</li><li>- On-chip PLLs generate clocks for the on-chip</li><li>- ADC and pixel clock from a single reference oscillator</li></ul> <p><b>Auto-Configuration / Auto-Detection</b></p> <ul style="list-style-type: none"><li>- Phase and image positioning</li><li>- Input format detection</li></ul> <p><b>Display Interface Features :</b></p> <ul style="list-style-type: none"><li>- Control signal generation for backlight inverter</li><li>- backlight dimming support</li><li>- voltage generation and power sequence control for panel</li><li>- Flat screens can be used with either 3.3V or 5V.</li><li>- FLEX32 and FLEX50 ( Digital RGB ) panel interface up to 36-Bit</li><li>- JILI40 ( LVDS ) panel interface ( one and double port up to 24 Bit )</li></ul> <p><b>Operating Features :</b></p> <ul style="list-style-type: none"><li>- 4 button user interface</li><li>- On Screen Display ( OSD ) control for all features</li><li>- Full multi sync capable</li><li>- VESA DPMS and DDC2B support</li><li>- Single voltage supply ( +12V DC )</li><li>- Dynamic Power Management for minimal power consumption via DPMS</li><li>- No software drivers needed!</li></ul>

1.3.0 Configuration							
		OFF	ON	Description		Delivery Default	
OFF	=>	ON	1	Normal operation	Firmware update	Update firmware via serial port X3	SW1-1 <b>OFF</b>
		2	DE	/DE	inverts DE-signal		SW1-2 <b>OFF</b>
		3	SINGLECLK	DUALCLK	for doublepixel (ODD/EVEN)		SW1-3 <b>OFF</b>
		4	R_FB	/R_FB	Reserved		SW1-4 <b>OFF</b>
		5	Reserved	Reserved	Reserved		SW1-5 <b>OFF</b>
		6	Reserved	Reserved	Reserved		SW1-6 <b>OFF</b>
		7	Reserved	Reserved	Reserved		SW1-7 <b>OFF</b>
		8	Reserved	Reserved	Reserved		SW1-8 <b>OFF</b>
<b>SW1</b>							

<b>1.3.0</b>	<b>Configuring the FLEX-32/50-Interface</b>
The FLEX32/50-Interface must be configured for the flatpanel specific timings, updating the board with specific panel files is done via the serial OSD feature. The panel files are distributed via the internet database <a href="http://www.kontron-hh.com">www.kontron-hh.com</a> .	

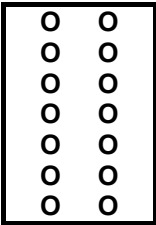
**Notice : If using X2 or X4 please check carefully panel voltage supply and adjust JP1 equal to flat panel requirements.**

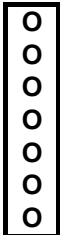
<b>1.3.0</b>	<b>Configuring the JILI40-Interface</b>
The JILI40-Interface must be configured for the flatpanel specific timings, updating the board with specific panel files is done via the serial OSD feature. The panel files are distributed via the internet database <a href="http://www.kontron-hh.com">www.kontron-hh.com</a> .	

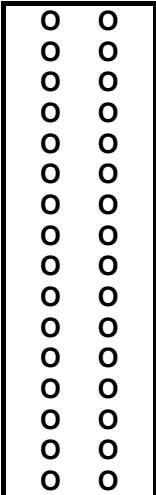
**Notice : If using X1 please check carefully panel voltage supply and adjust JP1 equal to flat panel requirements.**

<b>1.4</b>		<b>Connectors</b>	
1.4.1	RGB analog input	X9	
1.4.2	OSD keypad connector	X5	
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1.4.4	FLEX32-Interface	X4	
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1.4.6	JILI40-Interface	X1	
1.4.7	DC Power supply	CN1	
1.4.8	Backlight/Flatpanel power supply configuration	JP1	
1.4.9	Backlight control configuration	JP2	
1.4.10	4/8 wire touch screen connector	X10	
1.4.11	USB Interface connector	X11B	
1.4.12	PS/2 Interface connector	X11A	
1.4.13	RS232 Serial Port	X3	

<b>1.4.1</b>		<b>RGB analog input X9</b>		
High Density Sub-D-Connector 15 Contacts, Receptacle Case/Size : Right Angle, Through Hole				
	<b>Name</b>	<b>Pin</b>	<b>Description</b>	
	RED	1	○	analog input red
	GREEN	2	○	analog input green
	BLUE	3	○	analog input blue
	ID2	4	○	Not connected
	GND	5	○	Analog Ground
	GND	6	○	Analog Ground red
	GND	7	○	Analog Ground green
	GND	8	○	Analog Ground blue
	DDC_5V	9	○	Not connected
	GND	10	○	Analog Ground
	ID0	11	○	Not connected
	DDC_SDA	12	○	DDC serial data
	HSYNC	13	○	Horizontal sync input
	VSYNC	14	○	Vertical sync input
	DDC_SCL	15	○	DDC serial clock




















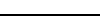
1.4.2		<b>OSD keypad connector X5</b>			
14 Contacts IDC Connector, Gold plated, double row, vertical mount, through hole					
Description	Name	Pin	Pin	Name	Description
+5V DC Power	VCC	1		2	L_ENA LED Enable ( Operating )
Confirm Key (TTL)	MFB3	3		4	MFB1 OSD Menu key (TTL)
Down Key (TTL)	MFB4	5		6	MFB0 Up Key (TTL)
Serial Transmit (TTL)	TXD	7		8	RXD Serial Receive (TTL)
Switch LED (TTL)	MFB11	9		10	MFB2 ON/OFF Key (TTL)
Low active Reset (TTL)	/RESET	11		12	+12V +12 V DC Power
Power Ground	GND	13		14	GND Power Ground

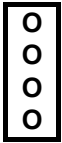
1.4.3		<b>Backlight Connector X6</b>		
Apply operating voltage for backlight inverter using connector X6				
Connector Single Row, 7 Contacts, Case/Size : Right Angle, 1,25mm Pitch				
Pin	Name	Description		
X6 	1	NC	Not connected	
	2	Backlight dimming control	( analog signal 0V to 4.9V)	
	3	GND	Power Ground	
	4	Backlight power supply	5 / 12 V DC (switched) see JP1	
	5	Backlight power supply	5 / 12 V DC (switched) see JP1	
	6	GND	Power Ground	
	7	BLON	Backlight control signal ( TTL ) Polarity settings see JP2	

1.4.4		<b>FLEX32-Interface X4</b>			
This connector directly matches through an interface cable for 31/41 pin VGA/SVGA TFT interface. All flat screen signals are LVTTTL compatible (3.3V )					
Flatfoil Connector 32 Contacts, Right Angle, Bottom Contact Case/Size : 0,5mm Pitch, Series : 6210 / ZIF					
Description	Name	Pin	Pin	Name	Description
Power Ground	GND	1		2	SCLK Data clock
Latch pulse	LP	3		4	FLM First Line Marker
Power Ground	GND	5		6	P0 Panel Data R0
Panel Data R1	P1	7		8	P2 Panel Data R2
Panel Data R3	P3	9		10	P4 Panel Data R4
Panel Data R5	P5	11		12	GND Power Ground
Panel Data G0	P6	13		14	P7 Panel Data G1
Panel Data G2	P8	15		16	P9 Panel Data G3
Panel Data G4	P10	17		18	P11 Panel Data G5
Power Ground	GND	19		20	P12 Panel Data B0
Panel Data B1	P13	21		22	P14 Panel Data B2
Panel Data B3	P15	23		24	P16 Panel Data B4
Panel Data B5	P17	25		26	GND Power Ground
Data Enable	MOD ( DE )	27		28	PANEL_VCC Panel Power
Panel Power	PANEL_VCC	29		30	R/L Right/Left
Up/Down rotate	U/D	31		32	NC Not connected








1.4.5		<b>FLEX50-Interface X2</b>			
This connector directly matches through an interface cable for XGA TFT flatpanels. All flat screen signals are LVTTTL compatible (3.3V )					
Flatfoil Connector 50 Contacts, Right Angle, Bottom Contact Case/Size : 0,5mm Pitch, Series : 6210 / ZIF					
Description	Name	Pin	Pin	Name	Description
Power Ground	GND	1	0 0	2	PD30 Panel Data OB0
Panel Data OB1	PD31	3	0 0	4	PD32 Panel Data OB2
Panel Data OB3	PD33	5	0 0	6	PD34 Panel Data OB4
Panel Data OB5	PD35	7	0 0	8	PD18 Panel Data OR0
Panel Data OR1	PD19	9	0 0	10	PD20 Panel Data OR2
Panel Data OR3	PD21	11	0 0	12	PD22 Panel Data OR4
Panel Data OR5	PD23	13	0 0	14	PD6 Panel Data EG0
Panel Data EG1	PD7	15	0 0	16	PD8 Panel Data EG2
Panel Data EG3	PD9	17	0 0	18	PD10 Panel Data EG4
Panel Data EG5	PD11	19	0 0	20	GND Power Ground
Panel Data OG0	PD24	21	0 0	22	PD25 Panel Data OG1
Panel Data OG2	PD26	23	0 0	24	PD27 Panel Data OG3
Panel Data OG4	PD28	25	0 0	26	PD29 Panel Data OG5
Panel Data EB0	PD12	27	0 0	28	PD13 Panel Data EB1
Panel Data EB2	PD14	29	0 0	30	PD15 Panel Data EB3
Panel Data EB4	PD16	31	0 0	32	PD17 Panel Data EB5
Panel Data ER0	PD0	33	0 0	34	PD1 Panel Data ER1
Panel Data ER2	PD2	35	0 0	36	PD3 Panel Data ER3
Panel Data ER4	PD4	37	0 0	38	PD5 Panel Data ER5
Power Ground	GND	39	0 0	40	LP Latch pulse
First Line Marker	FLM	41	0 0	42	Data Enable MOD ( DE )
Power Ground	GND	43	0 0	44	SCLK Data clock
Not connected	NC	45	0 0	46	NC Not connected
Not connected	NC	47	0 0	48	PANEL_VCC Panel Power
Panel Power	PANEL_VCC	49	0 0	50	PANEL_VCC Panel Power


1.4.6		JIL140-Interface X1			
All flat screen signals are LVDS compatible					
Connector Double Row 2mm, 40 Contacts, Gold plated Case/Size : Vertical, Through Hole					
Description	Name	Pin	Pin	Name	Description
Enables Backlight (see X6)	BLON#	1		2	BLON# Enables Backlight (see X6)
Backlight Adjust (see X6)	BLADJ	3		4	STX3+ Even Receiver Signal(+) (R2IN 3+)
Even Receiver Signal(-) (R2IN 3-)	STX3-	5		6	+12V_F +12V (behind Fuse)
Even Clock Signal(+) (CK2IN +)	STXC+	7		8	STXC- Even Clock Signal(-) (CK2IN -)
+12V (behind Fuse)	+12V_F	9		10	STX2+ Even Receiver Signal(+) (R2IN 2+)
Even Receiver Signal(-) (R2IN 2-)	STX2-	11		12	+12V_F +12V (behind Fuse)
Even Receiver Signal(+) (R2IN 1+)	STX1+	13		14	STX1- Even Receiver Signal(-) (R2IN 1-)
+12V (behind Fuse)	+12V_F	15		16	STX0+ Even Receiver Signal(+) (R2IN 0+)
Even Receiver Signal(-) (R2IN 0-)	STX0-	17		18	+12V_F +12V (behind Fuse)
Odd Receiver Signal(+) (R1IN 3+)	FTX3+	19		20	FTX3- Odd Receiver Signal(-) (R1IN 3-)
Power Ground	GND	21		22	GND Power Ground
I <sup>2</sup> C clock	DDCSCL	23		24	DDCSDA I <sup>2</sup> C Data
Power Ground	GND	25		26	FTXC+ Odd Clock Signal(+) (CK1IN +)
Odd Clock Signal(-) (CK1IN -)	FTXC-	27		28	GND Power Ground
Odd Receiver Signal(+) (R1IN 2+)	FTX2+	29		30	FTX2- Odd Receiver Signal(-) (R1IN 2-)
Power Ground	GND	31		32	FTX1+ Odd Receiver Signal(+) (R1IN 1+)
Odd Receiver Signal(-) (R1IN 1-)	FTX1-	33		34	GND Power Ground
Odd Receiver Signal(+) (R1IN 0+)	FTX0+	35		36	FTX0- Odd Receiver Signal(-) (R1IN 0-)
Power Ground	GND	37		38	GND Power Ground
Panel VCC ( switched ) see JP1	Vcc_P	39		40	Vcc_P Panel VCC ( switched ) see JP1









1.4.7		DC power supply CN1		
Apply operating voltage using connector CN1.				
4 Contact Connector, Single Row, Right Angle, Polarization, through hole				
		Pin	Name	Description
CN1	 *1)	1	+5V Out	+5 V DC Power Out
		2	GND	Power Ground
		3	GND	Power Ground
		4	+12V In	+12 V DC Power In


**\*1)NOTE:**


Don't connect any floppy-connectors from AT/ATX power supplies here! You **MUST** cut off the 5V power cord, before you plug in! Otherwise the CRTtoLCD-1-LC/TC will be destroyed!

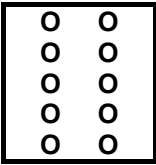
1.4.8		<b>Backlight and flatpanel power configuration JP1</b>				
This configuration is only valid for X1, X4, X2 and X6. Short pins 1-2 or 3-4 or 5-6 or 7-8 or 9-10 to choose required voltage supply. <b>Caution !</b> Only one configuration for backlight and flatpanel is allowed, otherwise the board is permanently damaged.						
Connector Double Row 2,54 mm, 10 Contacts, Gold plated Case/Size : Vertical, Through Hole						
Pin	Pin	Name	Description	Delivery Default		
JP1	1		2	+3.3V	+ 3.3V DC Power for flatpanel power	<b>1-2 closed</b> <b>Open</b> <b>Open</b> <b>Open</b> <b>9-10 closed</b>
	3		4	+12V	+ 12V DC Power for flatpanel power	
	5		6	VCC	+ 5V DC Power for flatpanel power	
	7		8	VCC	+ 5V DC Power for backlight power	
	9		10	+12V	+ 12V DC Power for backlight power	

1.4.9		<b>Backlight control configuration JP2</b>					
Use JP2 to control polarity of backlight control signal of X1 and X6.							
Connector Double Row 2,54 mm, 3 Contacts, Gold plated Case/Size : Vertical, Through Hole							
	1	2	3	Pin	2-3	1-2	Delivery Default
JP2					/BLON Never unplug/replug this while in use!	BLON	1-2 closed

1.4.10		<b>4/8 wire touch screen connector X10</b>		
Use X10 to connect a 4 or 8 wire resistive touch screen.				
Connector Single Row, 8 Contacts, Case/Size : Right Angle, 2,54mm Pitch				
	Pin	Name	Description	
X10		1	Y-	Touch screen Y- coordinate
		2	Y- REF	Y- coordinate reference
		3	Y+ REF	Y+ coordinate reference
		4	Y+	Touch screen Y+ coordinate
		5	X+	Touch screen X+ coordinate
		6	X+ REF	X+ coordinate reference
		7	X- REF	X- coordinate reference
		8	X-	Touch screen X- coordinate

<b>1.4.11</b>	<b>USB Interface connector X11B</b>		
	The controller converts the decoded X/Y data of the attached touch screen in a USB serial stream. Drivers and calibration tools are available at our website <a href="http://www.kontron-hh.com">www.kontron-hh.com</a> .		
4 Contact Connector, Single Row, Right Angle, Polarization, through hole			
		<b>Pin</b>	<b>Name</b>
<b>X11B</b>		<b>1</b> <b>2</b> <b>3</b> <b>4</b>	+5V DATA - DATA+ GND
			<b>Description</b>
			+5 V DC Power Differential USB Data - Differential USB Data + Power Ground

<b>1.4.12</b>	<b>PS/2 Interface connector X11A</b>		
	The controller converts the decoded X/Y data of the attached touch screen in a PS/2 compatible serial stream. Drivers and calibration tools are available at our website <a href="http://www.kontron-hh.com">www.kontron-hh.com</a> .		
4 Contact Connector, Single Row, Right Angle, Polarization, through hole			
		<b>Pin</b>	<b>Name</b>
<b>X11A</b>		<b>1</b> <b>2</b> <b>3</b> <b>4</b> <b>5</b> <b>6</b>	MDATA NC GND +5V MCLK NC
			<b>Description</b>
			PS/2 Data Not connected Power Ground +5V DC Power PS/2 Clock Not connected

<b>1.4.13</b>	<b>Serial OSD connector X3</b>				
	The OSD ( On Screen Display ) can be controlled either trough the keypad or the serial connector X3 for configuration purposes or mass production. See also chapter 1.6 detailed description. <b>Caution !</b> The transmit and receive signals have RS232C level and are crossed!				
10 Contacts IDC Connector, Gold plated, double row, vertical mount, through hole					
<b>Description</b>	<b>Name</b>	<b>Pin</b>	<b>Pin</b>	<b>Name</b>	<b>Description</b>
Not connected	NC	<b>1</b>		<b>2</b>	NC
Transmit signal	COM_TXD	<b>3</b>		<b>4</b>	NC
Receive signal	COM_RXD	<b>5</b>		<b>6</b>	NC
Not connected	NC	<b>7</b>		<b>8</b>	NC
Power Ground	GND	<b>9</b>		<b>10</b>	+5V

<b>1.5</b>	<b>On Screen Display</b>
	<p>With the OSD ( On Screen Display ) you can modify the settings and control the special features of the CRTtoLCD-1-TC. The OSD uses a number of menus for making changes and turning the special features on or off. The configuration can be done via the OSD-keypad ( OSD-Panel-Kit ).</p> <p>To start the OSD press the “OSD” button on the keypad, after switching the power supply on. If a valid flat panel configuration is installed the OSD Main Menu will be displayed.</p> <p><b>To select an item</b>, simply use “OSD” to move the cursor to the field you want. Then use “Confirm” to select the field. Use “Up” or “Down” to select a value for that field. The “Save” command in the OSD Main Menu save the values currently displayed in all the menus.</p> <p><b>To display a sub menu</b>, simply use “OSD” to move the cursor to the field you want. Then use “Confirm” to select the field</p> <p><b>The Main Menu</b>  You can make the following selections on the Main Menu itself. Use the sub menus for other selections.</p>

### OSD Main Menu

Feature	Button	Description
RGBMenu	Enter Submenu with “Confirm”.	Adjust color level submenu
GeometryMenu	Enter Submenu with “Confirm”.	Adjust image submenu
ContrastMenu	Enter Submenu with “Confirm”.	Adjust color contrast level
SpecialMenu	Enter Submenu with “Confirm”.	Special features submenu
Save	Press “Confirm”	Save all adjustments in NV-RAM.
Revert	Press “Confirm”	Invalidates all adjustments.
PowerDown	Press “Confirm”	Switch off panel and backlight. Wake up with “Power On/Off” key.
Exit	Press “Confirm”	Turn off the OSD menu.

### RGBMenu

Feature	Button	Description
Brightness	Use “Up” and “Down”	Adjust red / green / blue color level, Range : 0 to 255
BrightRed	Use “Up” and “Down”	Adjust red color level, Range : 0 to 255
BrightGreen	Use “Up” and “Down”	Adjust green color level, Range : 0 to 255
BrightBlue	Use “Up” and “Down”	Adjust blue color level, Range : 0 to 255
ColorTemp	Use “Up” and “Down”	Range : 0 to 255
Sharpness	Use “Up” and “Down”	Adjust sharpness, Range : 0 to 1
MainMenu	Press “Confirm”	Go back to OSD-Main Menu

### GeometryMenu

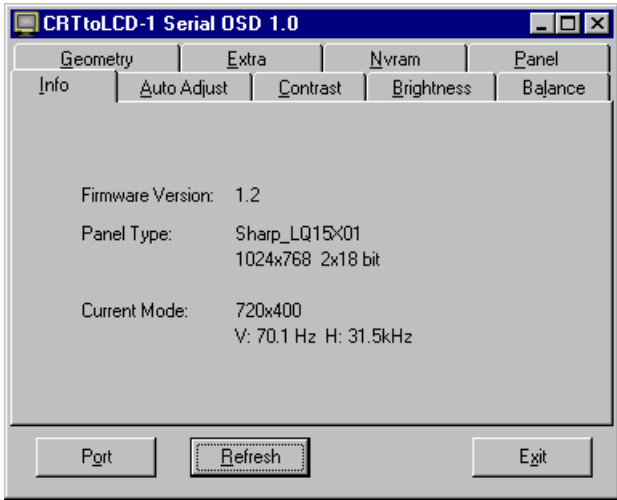
Feature	Button	Description
AutoAdjust	Press “Confirm”	Adjust image automatically
Hposition	Use “Up” and “Down”	Move the image position horizontally, Range : 0 to 255
Vposition	Use “Up” and “Down”	Move the image position vertically, Range : 0 to 255
Htotal	Use “Up” and “Down”	Range : 0 to 255
AutoPhase	Press “Confirm”	Range : 0 to 255
Delay	Use “Up” and “Down”	Range : 0 to 255
MainMenu	Press “Confirm”	Go back to OSD-Main Menu

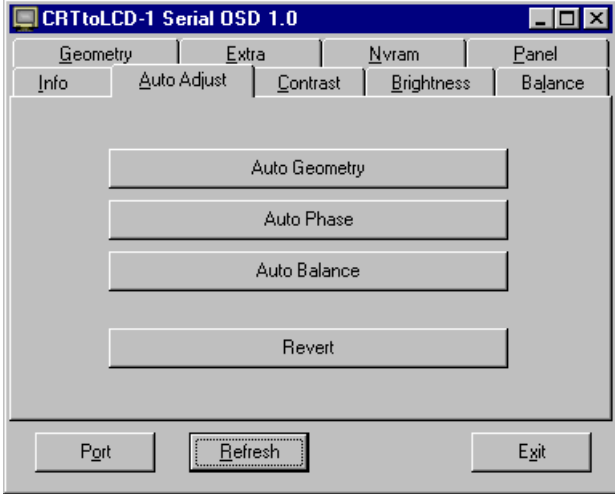
### ContrastMenu

Feature	Button	Description
AutoBalance	Press "Confirm"	Adjust balance and contrast automatically
Contrast	Press "Confirm"	Adjust red/green/blue contrast automatically
ContRed	Use "Up" and "Down"	Adjust red contrast, Range : 0 to 255
ContGreen	Use "Up" and "Down"	Adjust green contrast, Range : 0 to 255
ContBlue	Use "Up" and "Down"	Adjust blue contrast, Range : 0 to 255
Balance	Press "Confirm"	Adjust red/green/blue balance automatically
BalanRed	Use "Up" and "Down"	Adjust red balance, Range : 0 to 255
BalanGreen	Use "Up" and "Down"	Adjust green balance, Range : 0 to 255
BalanBlue	Use "Up" and "Down"	Adjust blue balance, Range : 0 to 255
Backlight	Use "Up" and "Down"	Adjust backlight dimming voltage, Range : 0 to 100
MainMenu	Press "Confirm"	Go back to OSD-Main Menu

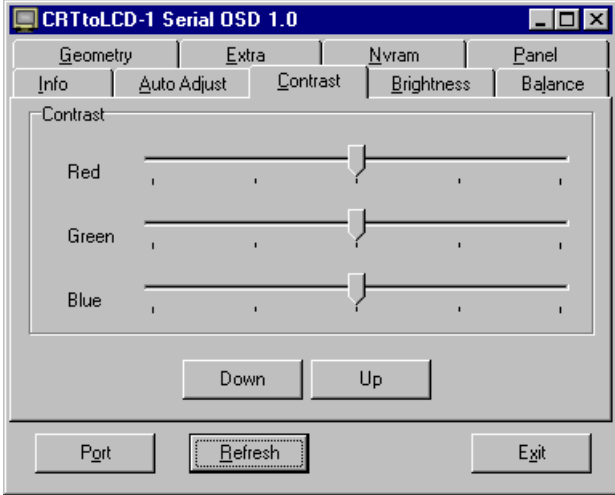
### SpecialMenu

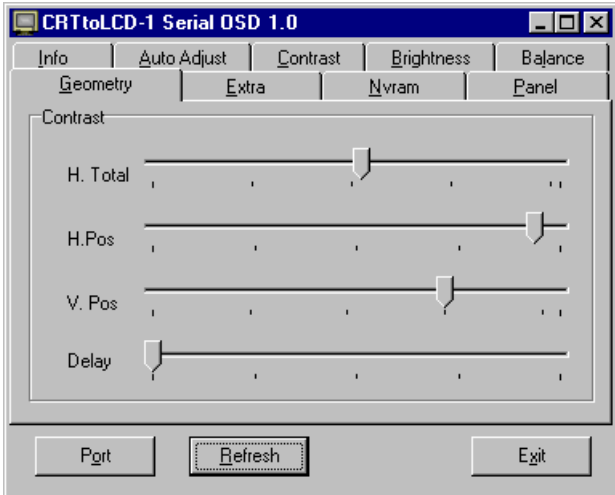
Feature	Button	Description
DosGfxOnOff	Press "Confirm"	DOS Emulation, Range : ON or OFF
NvramInit	Press "Confirm"	Initialize NV-RAM to factory defaults
MainMenu	Press "Confirm"	Go back to OSD-Main Menu

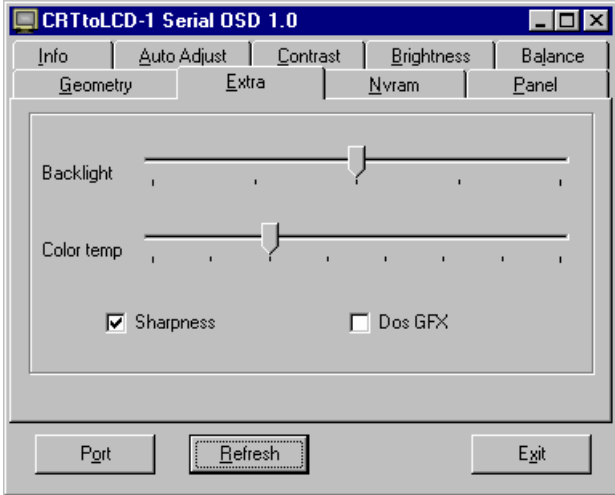
<b>1.6</b>	<b>Serial OSD</b>
	<p>The Serial OSD feature, program starts with serosd.exe /P, allows the user to configure the CRTtoLCD-1-LC/TC via the serial port. The program offers 9 Setup pages, as shown in the following sections:</p> <p style="text-align: center;">Information menu for video mode, panel type and firmware revision.</p> <div style="text-align: center;">  </div> <p><b>Firmware Version</b> – Displays the Firmware version of the attached board.  <b>Panel Type</b> – Displays the panel type.  <b>Current Mode</b> – Displays the current video mode.  <b>Port</b> – Selects the serial port ( COM1 to COM4 ).  <b>Refresh</b> – Builds up a new picture or menu.</p>

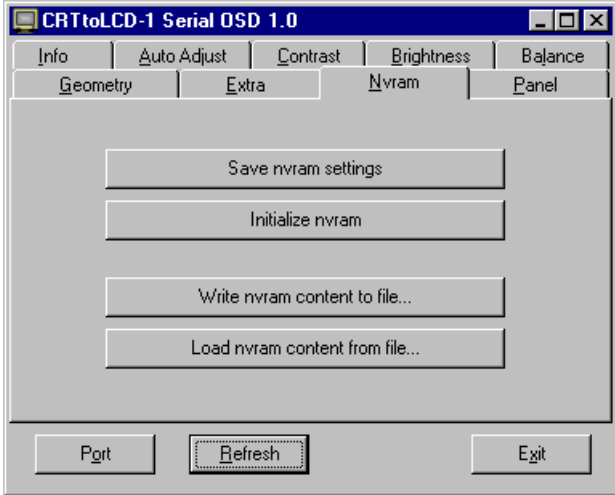
<b>1.6</b>	<h3 style="text-align: center;">Auto Adjust Menu</h3> <p style="text-align: center;">Configuration menu for adjustments.</p>
	 <p><b>Auto Geometry</b> – Adjust image automatically.</p>
	<p><b>Auto Phase</b> – Adjust phase automatically.</p> <p><b>Auto Balance</b> – Adjust balance and contrast automatically.</p> <p><b>Revert</b> – Invalidates all adjustments made in this session.</p>

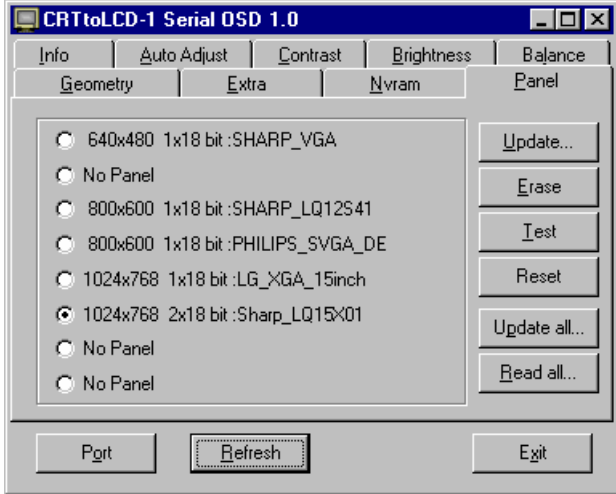


<b>1.6</b>	<p align="center"><b>Contrast / Brightness / Balance Menu</b></p> <p align="center">Configuration menu for contrast, brightness and balance. Values can be modified with “Up” and “Down” or with the mouse cursor.</p>
	
	<p><b>Red</b> - Adjust red color contrast, red color level and red color balance.</p> <p><b>Green</b> - Adjust green color contrast, green color level and green color balance.</p> <p><b>Blue</b> - Adjust blue color contrast, blue color level and blue color balance.</p>

<b>1.6</b>	<b>Geometry Menu</b>
	<p style="text-align: center;">Configuration menu for horizontal and vertical position of the image.</p> <div style="text-align: center;">  </div> <p><b>H.Total</b> – Adjust of the total horizontal position.  <b>H.Pos.</b> – Move the image position horizontally.  <b>V.Pos.</b> – Move the image position vertically.  <b>Delay</b> – Adjust the delay of incoming to outgoing picture data.</p>

<b>1.6</b>	<b>Extra Menu</b>
	<p style="text-align: center;">Configuration menu for backlight and color values.</p> 
	<p><b>Backlight</b> – Adjust backlight voltage. Range ( 0V to 4.3V )</p> <p><b>Color temp</b> – Adjust Color temperature.</p> <p><b>Sharpness</b> – Select pixel sharpness.</p> <p><b>DOS GFX</b> – Select DOS Font emulation.</p>

<b>1.6</b>	<h2>Nvram Menu</h2>
	<p style="text-align: center;">Configuration menu for NVRAM settings.</p> 
	<p><b>Save nvram settings</b> – Save all settings of the OSD in the onboard EEPROM.</p> <p><b>Initialize nvram</b> – Initialize the OSD settings to values stored in onboard EEPROM.</p> <p><b>Write nvram content to file...</b> – Save all values of the EEPROM in a file.</p> <p><b>Load nvram content from file...</b> – Load values from file to the EEPROM and initialize the OSD with these values.</p>

1.6	<h2>Panel Menu</h2>
	<p style="text-align: center;">Configuration menu for panel types.</p> 
	<p><b>Update...</b> – Select a panel file from the database. The database is distributed via the internet : <a href="http://www.kontron-hh.com">www.kontron-hh.com</a></p> <p><b>Erase</b> – Erase the selected panel</p> <p><b>Test</b> – Test the selected panel until next reset of the board.</p> <p><b>Reset</b> – Reset to default state.</p> <p><b>Update all...</b> – Write binary panel file, created by “Read all... option”, in the flash eeprom.</p> <p><b>Read all...</b> – Read out all panel files out of the board and write it to a binary file.</p>

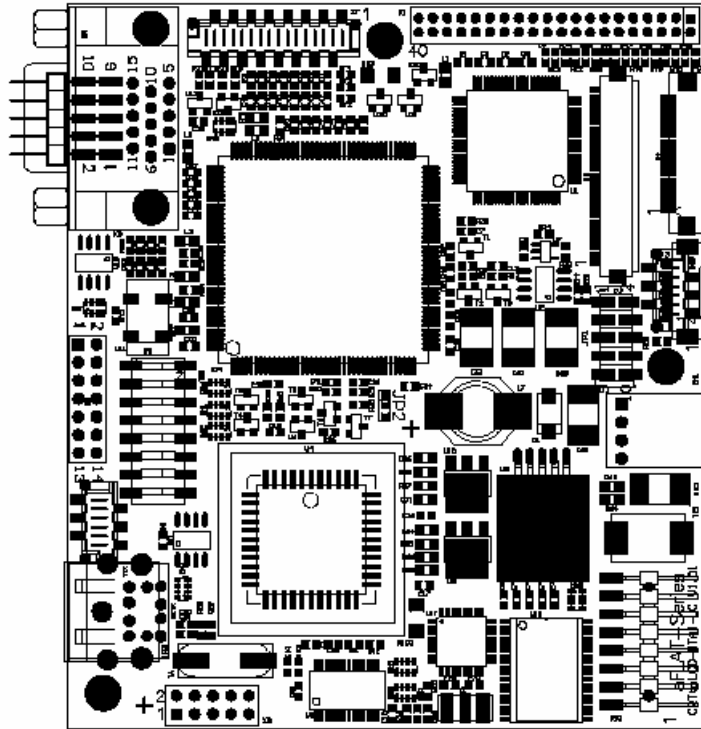
1.7	Technical Specification
	<p>These values were measured with OSD-Panel attached and without flatpanel and backlight inverter.</p> <p><b>- Supply voltage at 25°C :</b></p> <p>Minimum supply voltage : + 7,0 V DC  Typical supply voltage : + 12,0 V DC  Maximum supply voltage : + 14.4 V DC</p> <p><b>- Typical Input current at 25°C :</b></p> <p>CRTtoLCD-1-TC with input signal (XGA) : 250 mA  CRTtoLCD-1-TC with powerdown : 84 mA  CRTtoLCD-1-TC without input signal : 268 mA</p> <p><b>- Supply voltage ripple :</b> 100 mV peak to peak 0 – 20 MHz</p> <p><b>- Current Rating of the output circuits :</b></p> <p>VCC ( 5V or 3.3V ) : 2A  BACKLIGHT (5V or 12V) : 2A  Digital Outputs for Flatpanel-Interface : 2 up to 20mA ( default 6 mA )</p> <p>VGA connector signals :</p> <p>Sync input voltage low : 0.8 V  Sync input voltage high : 2.4 V  RGB input voltage : 0 – 0.7 V with 75 Ohm external termination  RGB input current : 0 – 5 mA</p> <p><b>- Temperature :</b> operating : 0° C – 60° C (*1)  Non operating : - 10° C – 85° C  (*1) The maximum operating temperature is the maximum measurable temperature on any spot on the module surface. It is the user responsibility to keep this temperature within the above specification.</p> <p><b>- Thermal gradient :</b> operating : 25° C per hour  non-operating : 40° C per hour</p> <p><b>- Relative Humidity :</b> operating : 10% - 90 % RH non-condensing  non operating : 5% - 95% RH non-condensing</p> <p><b>- Mechanical :</b> Shock : 50G/20ms square wave maximum  Vibration : 1G/0-600Hz, dwell not to exceed</p> <p><b>- Altitude :</b> operating : 0 – 3000 m  non-operating : 0 – 5000 m</p> <p><b>- Dimensions of the printed circuit board :</b></p> <p>Width : 88.9 mm  Length : 101.6 mm  Thickness : 1.50 mm</p> <p><b>- Dimensions of the module :</b></p> <p>Width : 95.00 mm  Length : 118,60 mm  Height : 13.00 mm</p>

1.8		Supported Video Modes	
Video Mode Input	Maximum vertical refresh rate	Mode No.	Mode standard
720 x 400	70 Hz	1	DOS
640 x 350	70 Hz	2	EGA
640 x 400	70 Hz	3*	DOS
640 x 400	85 Hz	4*	DOS
640 x 480	60 Hz	5	VGA
640 x 480	72 Hz	6	VGA
640 x 480	75 Hz	7	VGA
640 x 480	85 Hz	8*	VGA
800 x 600	56 Hz	9	SVGA
800 x 600	60 Hz	10	SVGA
800 x 600	72 Hz	11	SVGA
800 x 600	75 Hz	12	SVGA
800 x 600	85 Hz	13*	SVGA
1024 x 768	60 Hz	14	XGA
1024 x 768	70 Hz	15	XGA
1024 x 768	74 Hz	16*	XGA
1024 x 768	75 Hz	17	XGA
1024 x 768	85 Hz	18*	XGA
1024 x 384	85 Hz	19*	
1152 x 864	59 Hz	20*	
1152 x 864	70 Hz	21*	
1152 x 864	75 Hz	22*	
1280 x 1024	60 Hz	23	SXGA
1280 x 1024	75 Hz	24*	SXGA
640 x 480	66 Hz	25*	VGA
832 x 624	76 Hz	26*	
720 x 240	60 Hz	27*	NTSC
720 x 286	50 Hz	28*	PAL

\* **Note** : These mode can be detected but no image is available on the flat panel.

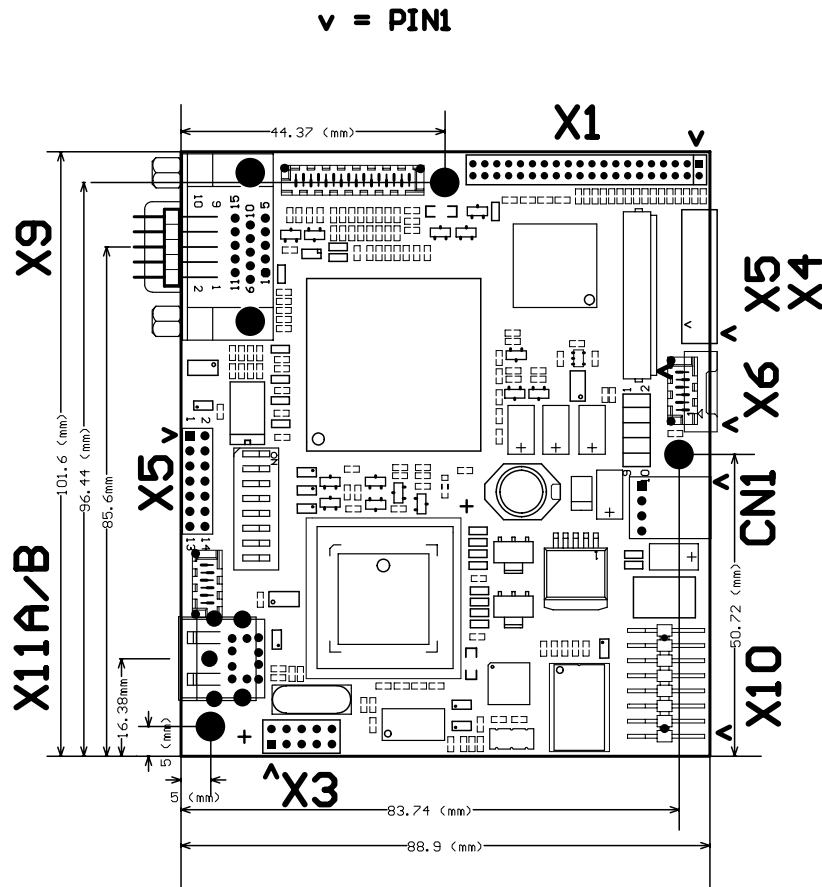
1.9

Layout/Schematics



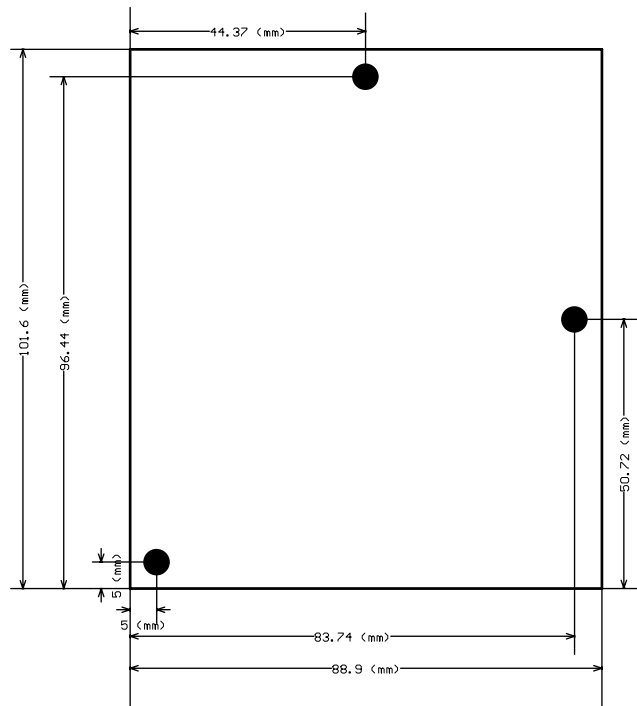


<b>1.9</b>	<b>Layout/Schematics</b>
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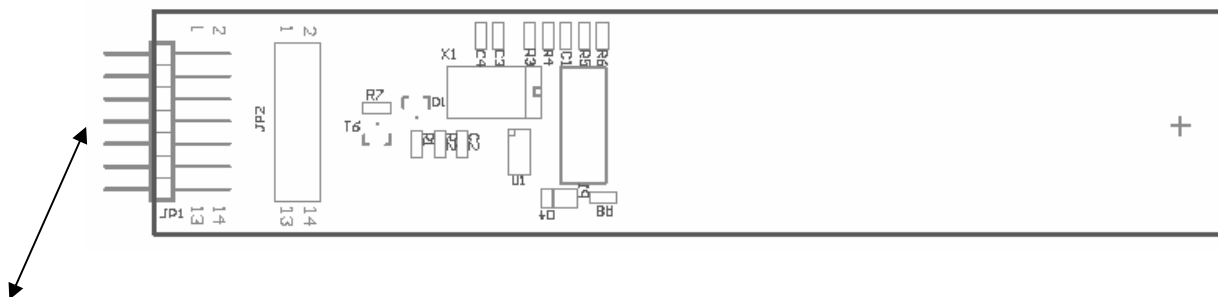
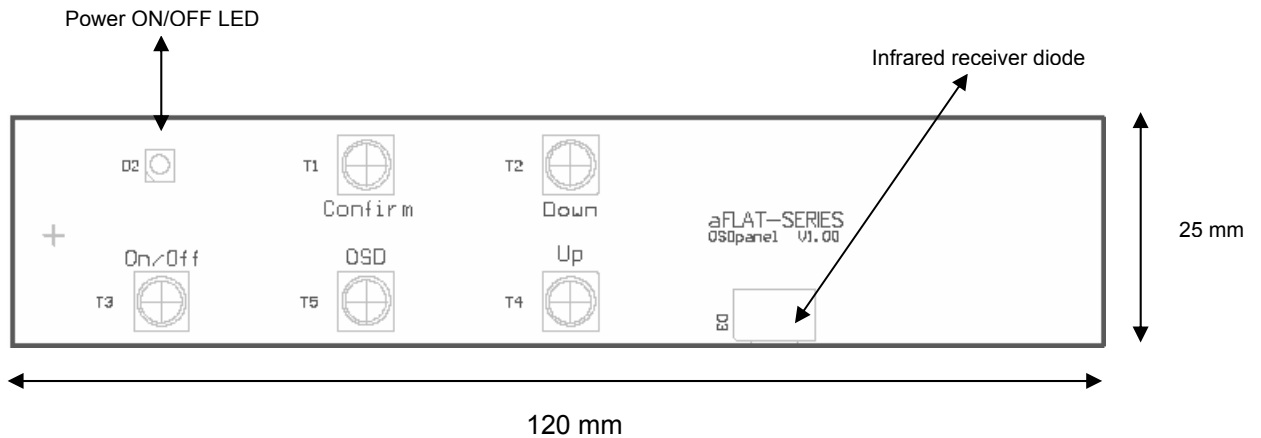
**1.9**

**Layout/Schematics**



**1.9** **Layout/Schematics**

OSD-Keypad "OSD-Panel"



Keypad JP1 connected to X5 of CRTtoLCD-1-TC/LC!

2.0	Technical Support
	<p>Please report any errors or problems to this email address: sales-graphic@kontron.com. Normally, there is no telephone support. In your email message, please include the following information :</p> <p style="padding-left: 40px;">Company Name Your Name Address Email Telephone/Fax Exact description of the hardware, etc. Exact description of the software in used (for example: Win 95 with driver XYZ ) Exact description of the error.</p>

2.1	Revision History		
Date	Author	Version	Description
23.02.2002	D.Finstel	1.0	Initial Release
25.04.2002	D.Finstel	1.1	Update Specs
30.05.2002	D.Finstel	1.2	Changed name to CRTtoLCD-1-TC
14.10.2002	D.Finstel	1.3	Update Specs
30.12.2002	D.Finstel	1.4	Update Specs
19.05.2003	D.Finstel	1.5	Added new assembly drawing
07.08.2003	D.Finstel	1.6	Updated specs
04.03.2004	M.Schulze	1.7	Updated specs