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d*FLAT*-AGP-1

Technical Manual

... We Drive Your Display!

Preliminary

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	Technical Manual
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1.0 Warranty

Each board is carefully and thoroughly tested before being shipped. If, however, problems should occur during operation, please first check the user settings of all boards present in your system, as this is quite often the source of the fault. If a board is defective, it can be sent to your supplier for repair. Please make sure of the following:

- The board should be returned with all parameters set to their factory default, since a test is only possible with these settings.
- We require certain additional information so that we may repair your board as quickly as possible. Please fill out the repair form provided and include it with the defective board.
- It is possible that the board will be upgraded to the latest version at no extra cost.

When you receive the board, please be aware that any user settings you may have set will have been changed during the test.

Repair is free of charge within the guarantee period as long as the conditions for guarantee are met. If no fault is found, you will be charged the cost of the test, due to the high expense to perform the test. Repairs outside the guarantee period will be charged.

Warranty is provided for this Kontron Hamburg product against material and workmanship defects for the warranty period, starting from the shipping date. During the warranty period, Kontron Hamburg will, at its discretion, either repair or replace products that prove to be defective.

The product must be returned to a service facility designated by Kontron Hamburg for warranty service or repair.

The foregoing warranty shall not apply to defects resulting from improper use or handling, inadequate maintenance, unauthorized modification or misuse, operation in environmental conditions other than those specified for the product, or improper installation or maintenance.

Kontron Hamburg will not be responsible for any defects or damages due to a faulty Kontron Hamburg product if it has not been directly supplied by Kontron Hamburg.

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1.1	d*FLAT*-AGP-1 Features
	ATI Mobility Radeon M6 (16 MB DDRAM), M7 (32 MB DDRAM) or M9 (64 MB DDRAM) graphics controller Full AGP support, including 2x and 4x modes, sideband addressing and AGP texturing 2D / 3D graphics accelerator Up to 1600x1200 resolution at True Color (16.7 M) Integrated dual-channel LVDS interface at up to 85 MHz per channel. Integrated TMDS transmitter running up to 165 MHz supporting up to 1600x1200 at 60 Hz. Fully compliant with DVI and DFP connection standards Dual view in extended mode allows simultaneous, independent LCD / CRT or DVI / CRT output Powerful drivers for WIN 95, WIN 98, WIN ME, WIN NT4.0, WIN 2K, WIN XP and LINUX Board size: 134x90 mm ***Guaranteed long-term availability – up to 5 years!***

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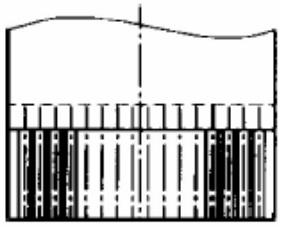
1.2	Introduction
1.2.1	**The JILI interface** The JILI interface is based on FFC (Flat Foil Cable). JILI is standard for many available cable kits and LVDS receivers.

JILI adapter signals:

- LVDS signals (1 or 2 pixel/clk)
- Display power available (3.3V, 5V or 12V)
- Enable LCDVCC control signal
- Backlight on / off control signal
- Backlight power (5V or 12V)
- DDC signals (not free useable)
- Display detect signal

(40-pole 0.5 mm pitch)

JILI connector

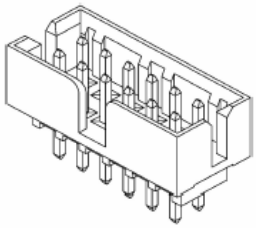


JILI cable (FFC)

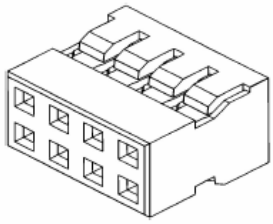
1.2.2	**The JILI40 interface** The JILI40 interface is based on a 2x20-pin 2.0 mm pitch connector. Several cable kits are available.

JILI40 connector signals:

- LVDS signals (1 or 2 pixel/clk)
- Display power available (3.3V, 5V or 12V)
- Enable LCDVCC control signal
- Backlight on / off control signal
- DDC signals (not supported)
- Display detect signal (not supported)



(2x20 pin 2.0 mm pitch)
JILI40 connector



JILI40 mating connector

Please visit our website for more information about our products: www.kontron-hh.com

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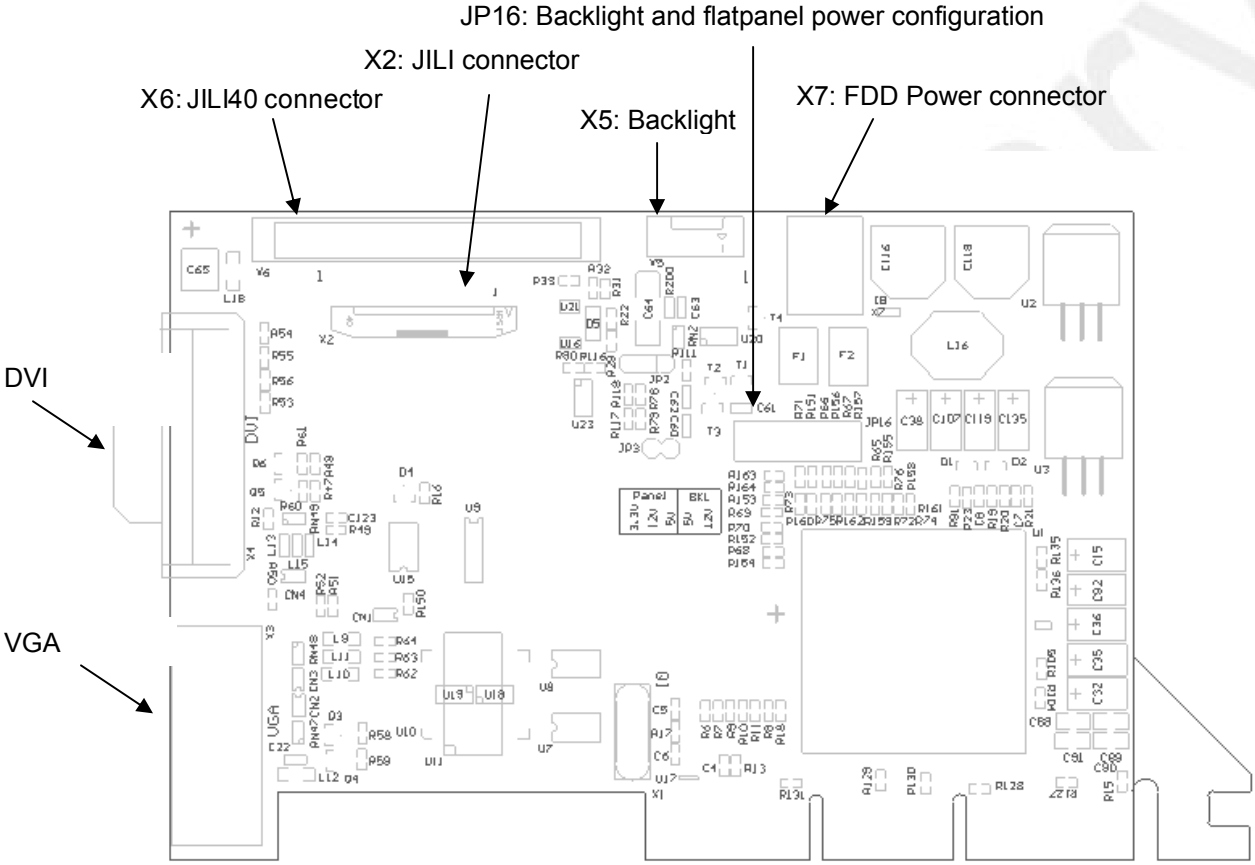
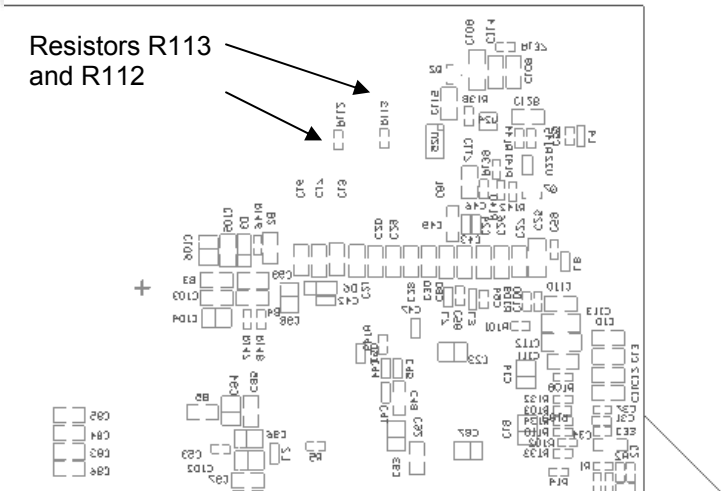
d*FLAT*-AGP-1 Mechanical Layout

Front side:



Back side:



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1.4 Connecting a Flatpanel

There are basically two possibilities for connecting a flatpanel to the d*FLAT*-AGP-1 card: using the JILI interface (40 pin flat foil cable on connector X2) or using the JILI40 interface (40 pin IDC connector X6). The first option requires an additional adapter cable by which the panel voltage and the backlight voltage can be set. The JILI40 interface, on the other hand, is available for passively connecting a panel, i.e. the flatpanel and backlight voltages must be set on the d*FLAT*-AGP card (JP16). Only in this case the backlight connector X5 have any significance.

The 40-pin JILI cable (flat foil) is mostly used for connecting small panels (up to XGA resolution) while, as a rule, high-resolution displays (greater than XGA) require the passive connection. You can find out more about suitable adapters on the website www.kontron-hh.com.

The d*FLAT*-AGP card has its own internal database of maximum 31 panel records. It is based on KONTRON's JILI3 software interface. The principle behind this is basically the allocation of identification numbers (IDs) by which the desired record can be called up. The IDs and panels currently supported are listed on the KONTRON website. If your panel is not listed, please consult your distributor. If using an external JILI adapter with flat foil cable, it is possible that this does not yet contain any JILI3 record, which would result in the panel not responding. In this case, the data memory on the adapter must be reprogrammed with a correct JILI3 record (using the DOS tool ATIMx.EXE as described later in this manual).

EXAMPLE: What must I consider when using, for example, an SXGA panel (passive connection with the IDC connector X6):

1. Check whether your panel already has a JILI3 ID
2. Make or order a suitable cable for the connector X6
3. Make or order a backlight cable for the connector X5
4. Select the correct panel and backlight voltages with jumper JP16
5. Switch on the assembly **without** the display attached
6. Run the program ATIMx.EXE and transmit the JILI3 file (see below)
7. Restart the assembly, this time **with** the display attached

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1.5	Multiple Display Devices
	The display output can be sent to three separate devices simultaneously: an analogue CRT (or comparable device), a digital DVI monitor and a panel with fixed parameters. There are two distinct applications to be considered: The boot phase (DOS mode) and the activation of a special driver for other operating systems (e.g. Windows or Linux). In the above mentioned configuration, the panel determines the resolution and frequencies in DOS mode. The DVI monitor must also be able to handle different input frequencies (example: the panel supports SVGA and the DVI device SXGA). The parameters for the DVI monitor are read over the DDC connection. Should the panel resolution be greater than that of the DVI monitor, no data will be output. There are various parameters for working with in extended mode, offered by the special drivers (Windows and Linux). Each screen can be driven at its own specific resolution.

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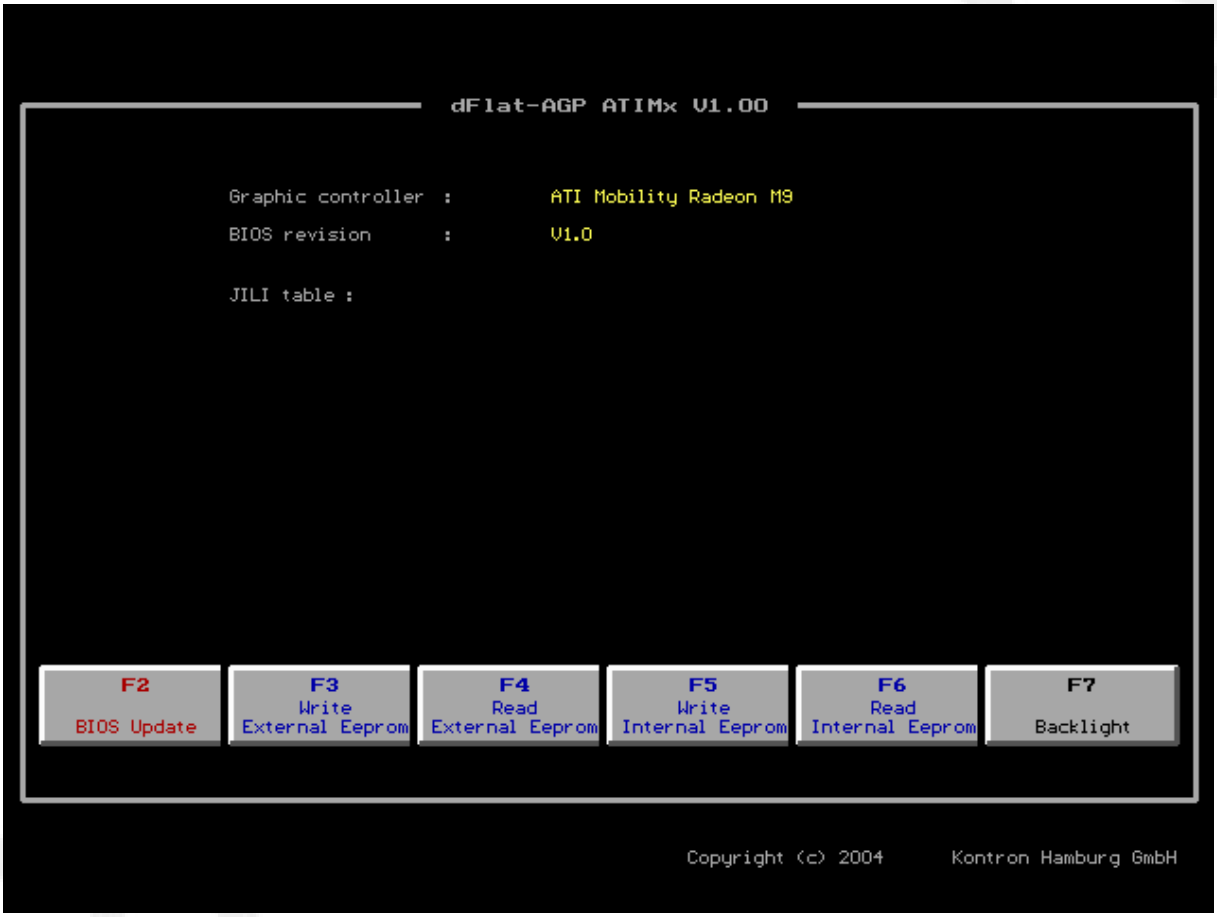
1.6	The DOS Tool ATIMx.EXE
	This tool lets you update the BIOS, read and write JILI3 files and test the backlight dimming voltage. The accompanying program ATIFLASH.EXE is only a helper utility (please do not run it separately). A German-language version can be run by specifying option 'ger' at the command prompt.



	The line "Graphic controller" states the controller type (M6 / M7 / M9) while the line "BIOS revision" states the current BIOS version. More lines follow under these, listing the JILI3 IDs currently implemented to let you check whether the desired flatpanel is already in the table.

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F2 BIOS Update

The VGA BIOS reprogramming begins immediately after entering the file name. This process must NOT be interrupted on any account (e.g. by warm starting) until a message displays that programming is successful. A manual restart is required to activate the new VGA BIOS.

F3 Write External Eeprom

This option is only available for the external adapter with 40 pin (flat foil) JILI cable (connector X2). It allows you to program a JILI3 file. Only a valid JILI3 file guarantees trouble-free functioning of the panel. The corresponding data can be downloaded from www.kontron-hh.com

F4 Read External Eeprom

This function lets you read back a JILI3 file from an external adapter.

F5 Write Internal Eeprom

This is the function for writing a JILI3 file when connecting a panel using a JILI40 connector (IDC connector X6). Only a valid JILI3 file guarantees trouble-free functioning of the panel. Activation requires a manual restart. **The BIOS file is required to run this function.**

F6 Read Internal Eeprom

This lets you read back the JILI3 file programmed with F5.

F7 Backlight

This generates the dimming voltage for both the backlight connection on the d*FLAT*-AGP (X5) card and the external adapter driven via connector X2 (provided this adapter has a Type MAX536x DAC component). The value 0 corresponds to approx. 0 V and 255 corresponds to approx. 5 V.

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1.7 Connectors

1.7.1 *Backlight connector X5*

Apply operating voltage for backlight inverter using connector X5

Single row connector, 7 pin, case / size: right angle, 1.25mm pitch

		Pin	Name	Description
X5	O	1	NC	Not connected
	O	2	Backlight dimming control	(analog signal 0V to 4.9V)
	O	3	GND	Power Ground
	O	4	Backlight power supply	5 / 12 V DC (Switched) see JP16
	O	5	Backlight power supply	5 / 12 V DC (Switched) see JP16
	O	6	GND	Power Ground
	O	7	BLON	Backlight control signal (TTL)

1.7.2 *JILI- Interface X2*

All JILI (JUMP*tec* Intelligent LVDS Interface) signals are LVDS compatible.

Flat foil connector 40 pin, right angle, bottom contact
case / size: 0.5mm Pitch, series: 6210 / ZIF

Description	Name	Pin		Pin	Name	Description
Not connected	LTGIO0	1	O O	2	FTX0-	Odd Receiver Signal(-) (R1IN 0-)
Odd Receiver Signal(+) (R1IN 0+)	FTX0+	3	O O	4	DIGON	Controls Panel Digital Power
Odd Receiver Signal(-) (R1IN 1-)	FTX1-	5	O O	6	FTX1+	Odd Receiver Signal(+) (R1IN 1+)
Not connected	BIASON	7	O O	8	FTX2-	Odd Receiver Signal(-) (R1IN 2-)
Odd Receiver Signal(+) (R1IN 2+)	FTX2+	9	O O	10	GND	Power Ground
Odd Clock Signal(-) (CK1IN -)	FTXC-	11	O O	12	FTXC+	Odd Clock Signal(+) (CK1IN +)
Power Ground	GND	13	O O	14	FTX3-	Odd Receiver Signal(-) (R1IN 3-)
Odd Receiver Signal(+) (R1IN 3+)	FTX3+	15	O O	16	DDCSDA	DDC (I²C) Data
Even Receiver Signal(-) (R2IN 0-)	STX0-	17	O O	18	STX0+	Even Receiver Signal(+) (R2IN 0+)
DDC (I²C) Clock	DDCSDA	19	O O	20	STX1-	Even Receiver Signal(-) (R2IN 1-)
Even Receiver Signal(+) (R2IN 1+)	STX1+	21	O O	22	GND	Power Ground
Even Receiver Signal(-) (R2IN 2-)	STX2-	23	O O	24	STX2+	Even Receiver Signal(+) (R2IN 2+)
Power Ground	GND	25	O O	26	STXC-	Even Clock Signal(-) (CK2IN -)
Even Clock Signal(+) (CK2IN +)	STXC+	27	O O	28	GND	Power Ground
Even Receiver Signal(-) (R2IN 3-)	STX3-	29	O O	30	STX3+	Even Receiver Signal(+) (R2IN 3+)
+5.0V DC Power	Vcc_F	31	O O	32	Vcc_F	+5.0V DC Power
+5.0V DC Power	Vcc_F	33	O O	34	Vcc_F	+5.0V DC Power
Enables Backlight	BLON#	35	O O	36	GND	Power Ground
Power Ground	GND	37	O O	38	+12V_F	+12V DC Power
+12V DC Power	+12V_F	39	O O	40	+12V_F	+12V DC Power

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1.7.3 JILI40-Interface X6

All flat screen signals are LVDS compatible

Double-row connector 2mm, 40 pin, gold plated
case / size: vertical, through hole

Description	Name	Pin		Pin	Name	Description
Enables Backlight	BLON#	1	O O	2	BLON#	Enables Backlight
Backlight Adjust	BLADJ	3	O O	4	STX3+	Even Receiver Signal(+) (R2IN 3+)
Even Receiver Signal(-) (R2IN 3-)	STX3-	5	O O	6	+12V_F	+12V (behind Fuse)
Even Clock Signal(+) (CK2IN +)	STXC+	7	O O	8	STXC-	Even Clock Signal(-) (CK2IN -)
+12V (behind Fuse)	+12V_F	9	O O	10	STX2+	Even Receiver Signal(+) (R2IN 2+)
Even Receiver Signal(-) (R2IN 2-)	STX2-	11	O O	12	+12V_F	+12V (behind Fuse)
Even Receiver Signal(+) (R2IN 1+)	STX1+	13	O O	14	STX1-	Even Receiver Signal(-) (R2IN 1-)
+12V (behind Fuse)	+12V_F	15	O O	16	STX0+	Even Receiver Signal(+) (R2IN 0+)
Even Receiver Signal(-) (R2IN 0-)	STX0-	17	O O	18	+12V_F	+12V (behind Fuse)
Odd Receiver Signal(+) (R1IN 3+)	FTX3+	19	O O	20	FTX3-	Odd Receiver Signal(-) (R1IN 3-)
Power Ground	GND	21	O O	22	GND	Power Ground
DDC (I2C) clock	DDCSCL	23	O O	24	DDCSDA	DDC (I2C) Data
Power Ground	GND	25	O O	26	FTXC+	Odd Clock Signal(+) (CK1IN +)
Odd Clock Signal(-) (CK1IN -)	FTXC-	27	O O	28	GND	Power Ground
Odd Receiver Signal(+) (R1IN 2+)	FTX2+	29	O O	30	FTX2-	Odd Receiver Signal(-) (R1IN 2-)
Power Ground	GND	31	O O	32	FTX1+	Odd Receiver Signal(+) (R1IN 1+)
Odd Receiver Signal(-) (R1IN 1-)	FTX1-	33	O O	34	GND	Power Ground
Odd Receiver Signal(+) (R1IN 0+)	FTX0+	35	O O	36	FTX0-	Odd Receiver Signal(-) (R1IN 0-)
Power Ground	GND	37	O O	38	GND	Power Ground
Panel VCC (switched) see JP16	Vcc_P	39	O O	40	Vcc_P	Panel VCC (switched) see JP16

1.7.4 External DC power X7

Attention!!!: Additional current required for backlight and panel
can be supplied via external power connector X7.
Resistors R112 and R113 must be removed for this option.

4 contact connector, single row, right angle, polarization, through hole

	Pin	Name	Description
X7 O O O O	1	+5V	+5 V DC Power
	2	GND	Power Ground
	3	GND	Power Ground
	4	+12V	+12 V DC Power

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1.7.5 Backlight and flatpanel supply voltage configuration JP16

This configuration is only valid for X2, X5 and X7.
Use jumpers 1-2, 3-4, 5-6, 7-8 or 9-10 to configure the required supply voltage.

Caution! Only one configuration is allowed for backlight and flatpanel, otherwise the board will be damaged.

Double row connector 2.54 mm, 10 pin, gold plated
case / size: vertical, through hole

Pin			Pin	Name	Description	Delivery Default
JP16	1	O O	2	+3.3V	+ 3.3V DC for flat panel supply voltage	**Open**
	3	O O	4	+12V	+ 12V DC for flat panel supply voltage	**Open**
	5	O O	6	VCC	+ 5V DC for flat panel supply voltage	**5-6 closed**
	7	O O	8	VCC	+ 5V DC for backlight supply voltage	**Open**
	9	O O	10	+12V	+ 12V DC for backlight supply voltage	**9-10 closed**

1.7.6 DVI connector

This connector supports the connection of DVI or DVI-I (for VGA adapter)

Double row connector 2.54 mm, 10 pin, gold plated
case / size: vertical, through hole

Description	Name	Pin		Pin	Name	Description
Receiver Signal(-) (RX2-)	RX2-	1	O O	2	RX2+	Receiver Signal(+) (RX2+)
Power Ground	GND	3	O O	4	NC	Not connected
Not connected	NC	5	O O	6	SCL_IN	DDC Clock
DDC Data	SDA_IN	7	O O	8	VSYNC	Vertical Sync
Receiver Signal(-) (RX1-)	RX1-	9	O O	10	RX1+	Receiver Signal(+) (RX1+)
Power Ground	GND	11	O O	12	NC	Not connected
Not connected	NC	13	O O	14	+5V	+5V DC from DVI video card
Power Ground	GND	15	O O	16	HP	Hot Plug
Receiver Signal(-) (RX0-)	RX0-	17	O O	18	RX0+	Receiver Signal(+) (RX0+)
Power Ground	GND	19	O O	20	NC	Not connected
Not connected	NC	21	O O	22	GND	Power Ground
Clock Signal(+) (RXC+)	RXC+	23	O O	24	RXC-	Clock Signal(-) (RXC-)
Analog red video data	RED	C1	O O	C2	GREEN	Analog green video data
Analog blue video data	BLUE	C3	O O	C4	HSYNC	Horizontal Sync
Analog Power Ground	AGND	C5	O O	C6	AGND	Analog Power Ground

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1.7.7 CRT Monitor Jack P1

15 pin high-density sub-D-jack

		Pins		
	RED	1	O	CRT analog output (red)
	GREEN	2	O	CRT analog output (green)
	BLUE	3	O	CRT analog output (blue)
	NC	4	O	Unused
	GND	5	O	Ground
	GND	6	O	Ground
	GND	7	O	Ground
	GND	8	O	Ground
	NC	9	O	Unused
	GND	10	O	Ground
	NC	11	O	Unused
	D_DATA	12	O	DDC Data
	HSYNC	13	O	Horizontal synchronization
	VSYNC	14	O	Vertical synchronization
	D_CLK	15	O	DDC Clock

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1.8 Electrical Specifications

Supply voltage: +3.3V DC +/- 5%
+5.0V DC +/- 5%
(+12V DC for Backlight if necessary)

Supply voltage ripple: 100 mV peak to peak 0 - 20 MHz

VGA connector signals:
RGB output voltage: 0 - 0.755 V with 75 Ohm external termination
RGB output current: 0 - 20.14 mA

The average power consumption of the video card is 8.6 watts without TFT-display (tested under Windows 2000). The distribution is as follows :

5V = 840 mA
12V = 10 mA
3.3V = 1300 mA

Absolute maximum ratings for panel- and backlight-power supply

Panel:	3.3V	1.7A
	5.0V	2.0A, see note (*2)
	12.0V	1.5A, see note (*2)
Backlight:	5.0V	1.0A
	12.0V	1.0A

1.9 Power Supply

The d*FLAT*-AGP-1 card requires +3.3V, +5V and +12V voltage supplied by the AGP bus. The 2.5V voltage is generated onboard. The AGP bus can also supply +12V for the backlight. The external power connector X7 can supply extra power for backlight and panel if required and, if so, resistors R112 and R113 must be removed.

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2.0 Environmental Specifications

Temperature

Ambient	0 °C to 50 °C, see note (*1)
Storage	-40 °C to 85 °C

Thermal gradient

Operating	25 °C per hour
Non-operating	40 °C per hour

Relative Humidity

Operating	5 % - 90 % RH non-condensing
Non-operating	0 % - 95 % RH non-condensing

Mechanical

Shock	50G/20ms square wave maximum
Vibration	1G/0-600Hz, dwell not to be exceeded

Altitude

Operating	0 - 3000 m
Non-operating	0 - 5000 m

(*1) The maximum temperature on the module surface can exceed above mentioned ambient temperature. It is the user responsibility to keep this temperature within the above specification.
(*2) Attention, for currents greater 1A (5V and 12V) an external power supply must be connected to X7 (resistors R112 and R113 must be removed).

Preliminary

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2.1 Technical Support

Please report any errors or problems to this email address: sales-graphic@kontron.com.

Normally, there is no telephone support. Please include the following information in your email message:

Company name
Your name
Address
Email
Telephone / fax
Exact description of the hardware, etc.
Exact description of the software in use (for example: Win 95 with driver XYZ)
Exact description of the fault.

2.2 Revision History

Date	Author	Version	Description
08/03/2004	S.Laudan, M. Hüttmann	1.0	Preliminary release

Preliminary