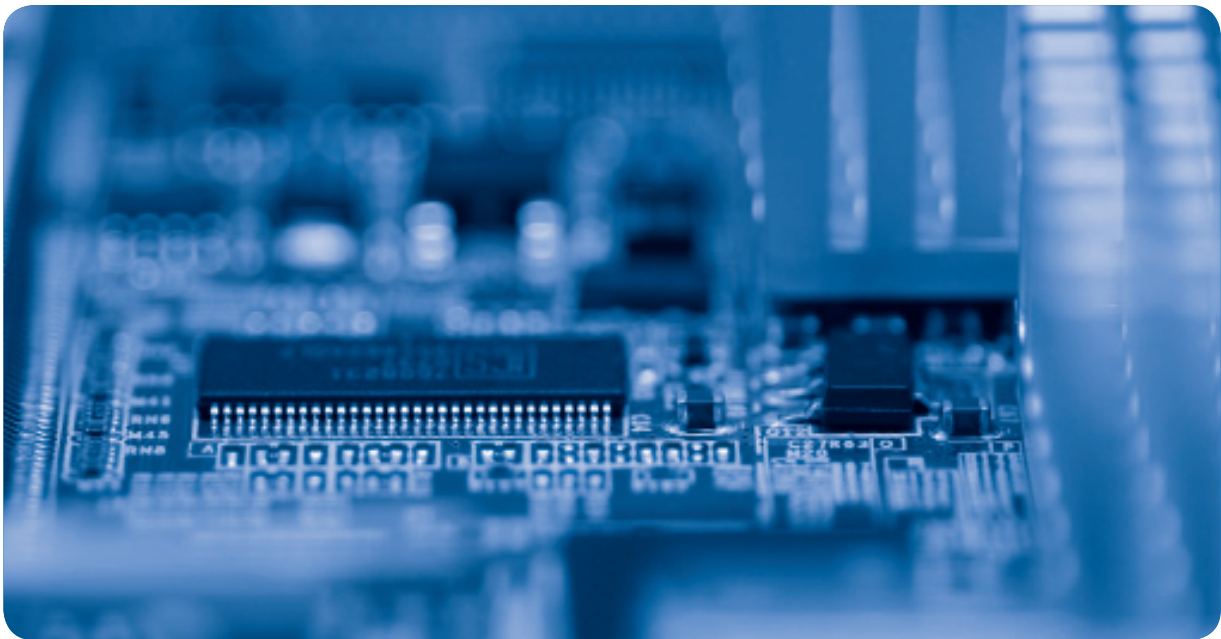


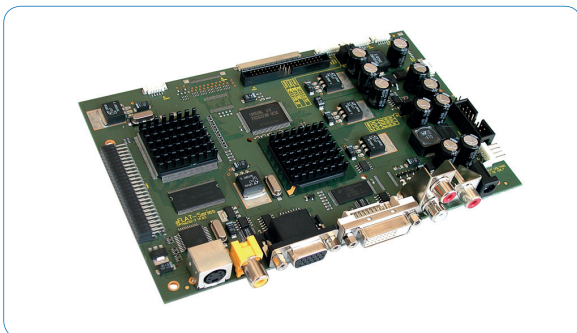
» Application Story «

CRTtoLCD in Infotainment



Pure Uninterrupted Graphics Action

Sophisticated Display Technology for Digital Pinball With CRTtoLCD



Kontron's CRTtoLCD flat-panel controller provides display control in the world's first digital pinball machine, TAB-Austria's "Virtual Pinball." The complete 42" monitor unit with its sophisticated thermal design was developed and supplied by ABLE Design. The Intel® Pentium® 4 motherboard and high-end ATI graphics card was specifically designed for TAB-Austria.

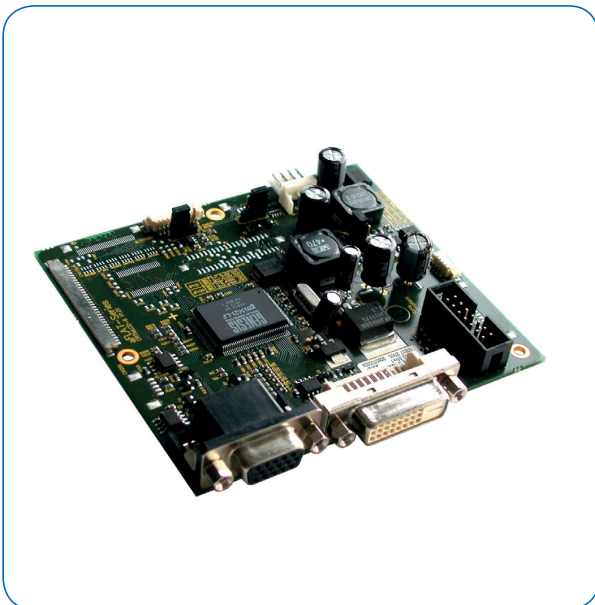
TAB-Austria's digital "Virtual Pinball" machines provide perfect mechatronics for 3D pinball action. This includes manual ball path manipulation including tilt via motion sensors and "mechanics" you can feel with vibration feedback. They also provide much more than just classic pinball functions: astonishing 3D and sound effects, playing area extension via submenus and playing scenarios that can be continuously updated. Virtual Pinball currently supports six games, including pinball, as well as action and strategy games. For professional gaming operators, it is a particularly attractive investment since it can provide features and effects that are always up-to-date and respond to trends in gaming. The terminals can be networked with TAB-Austria's Online Terminal Management (OTM). Every terminal with OTM can always offer the latest version and games, as well as ChampionsNet and software updates. With ChampionsNet, players can enter their scores in national and international high score lists – or in the Hall of Fame for the world's best scores. With OTM, customer not only receive software updates but all of their terminals can participate in international tournaments, which brings in more income. All of this makes Virtual Pinball an excellent investment, with an amortization period of 10 months or less for many installations, especially if the online tournaments organized by TAB-Austria are utilized. The long term cost of digital pinball machines is even lower than that of classic pinball machines, thanks to falling flat display and hardware prices. The machines do not need to be changed every three months to accommodate customers' changing game preferences – a software update with new games is all that is needed – and they are not as failure-prone as mechanical pinball machines: an electronic pinball machine has a lifetime comparable to that of an integrated industrial computer. The fan is the most failure-prone component but even that has an MTBF of 50,000 or more hours. For 24-hour-a-day operation in Las Vegas, that would correspond to c. 5.7 years. By this age, conventional pinball machines would long be worn out and outdated. With the appropriate software updates, digital pinball machines can be operated for much longer than five years and still provide the latest games. This longevity depends on the hardware, which must be designed as a closed, arcade and restaurant-proof system that can withstand cigarette smoke and fatty cooking fumes. Development of such a system with a 42" display and Pentium® 4 performance with a total power consumption of some 300 W is no simple matter. It places heavy demands on the development specialists because horizontal pinball displays are even harder to ventilate than vertical systems. These tasks were outsourced by TAB-Austria, whose core competences are in the development and marketing of gaming machines. To accomplish them, the company looked to Munich-based ABLE Design, a leading specialist industrial flat-panel monitor system provider that emphasizes individual development. Not being linked to a particular manufacturer, ABLE Design always places the application and its environment at the heart of its development work to provide optimally customized display technology, filter glasses, interfaces, controllers, and housing technology. Only nonstandard components are developed from scratch. Customers such as TAB-Austria value this philosophy, and after the requirement specifications were formulated ABLE



Design quickly supplied a suitable solution. A completely closed, front-side IP54-protected display unit, which can cool the 42" display at a 15% tilt from horizontal with a two-chamber system via heat exchangers, is being used. In addition, the monitor is protected from mechanical and liquid damage by a chemically hardened safety glass sheet that is more stable than a car windshield; this places even higher demands on the thermal design. The built-in display provides a resolution of 852 x 480 pixels and a peak brightness of 1000 cd/m². Signals from the ATI graphics card, connected to the 2.4GHz Pentium® 4 motherboard via the AGP slot, are converted for the plasma panel by a CRTtoLCD-2 flat display converter from Kontron's Hamburg-based flat panel specialists. This converter from the aFLAT series was chosen over other competitive Asian solutions because of its ability to provide high-quality clean images without jagged edges, flexible software adaptation, and long-term availability. Kontron's aFLAT series boards offer high quality signal processing and the latest generation of aFLAT boards are now coming out with features customized for specific application focuses and technological use. The CRTtoLCD product portfolio is also being supplemented by cable sets for all current displays. Adaptation for other flat panel models is usually possible with little effort. The latest CRTtoLCD boards are CRTtoLCD-5, CRTtoLCD-6, and CRTtoLCD-7.

CRTtoLCD-5 – Flat-Panel Controller With RGB and DVI Inputs

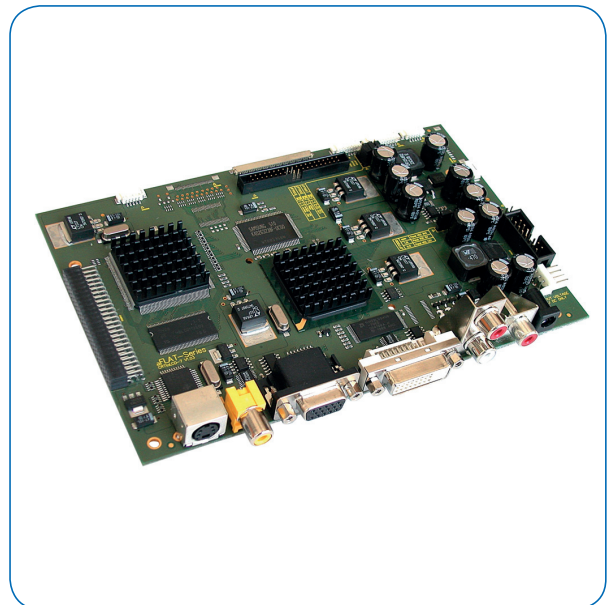
The CRTtoLCD-5 multimedia flat-panel controller converts analog RGB or DVI input signals into digital TTL or LVDS signals for TFT panels. The board has an integrated Genesis chip and provides resolutions up to SXGA. Input resolutions up to UXGA can be processed. Display is downscaled for the appropriate panel size. In comparison to its predecessors, the new CRTtoLCD-5 board has improved improved scaling



algorithms, distribution of the voltage supply for the panel and controller to two power supply units integrated into the board, and a new 10-pole "high-power connector" for backlight support (up to 4 A), found on the variant for LVDS panels. Even the usually outstanding price/performance ratio of CRTtoLCD boards was surpassed. In terms of its dimensions, the board is mechanically compatible with its predecessors CRTtoLCD-1, CRTtoLCD-2, and CRTtoLCD-3, which facilitates upgrading to the current product series.

CRTtoLCD-7: With Additional Composite and S-Video Inputs

The CRTtoLCD-7 multimedia and TV flat-panel controller has not only the RGB and DVI inputs found on the CRTtoLCD-5 board but also features composite and S-Video inputs for PAL/NTSC signals as well as comprehensive video source support (e.g. analog YPbPr signals can optionally be processed).



This makes it ideally equipped for video sources such as recorders, DVD players and cable, satellite, and digital television, which are becoming increasingly important in the B2B field. Besides typical applications such as POS/POI terminals, gaming machines, medical devices, etc., multimedia applications with information terminals or public televisions in subway stations, airports, businesses, and gas stations are rapidly growing in number. Reception of television signals is supported by an optional TV tuner with a teletext decoder, which is implemented via an expansion board. Faroudja's leading Adaptive Motion Deinterlacing technology, a product of many years of experience in high-end flat-panel consumer televisions, is used to provide optimum display, especially for rapidly moving images. The CRTtoLCD-7 thereby enables input and display with resolutions up to WUXGA, limited by the high-end Genesis chips used. Hence, it also supports HDTV resolutions (e.g., 1080i = 1920 x 1080 pixels or 720p = 1280 x 720 pixels), high-resolution television standards that are expected to become phenomenally important by the time the 2006 World Cup soccer championship rolls around. The Picture-In-Picture (PIP) function implemented here enables simultaneous viewing of two image sources. The multimedia functionality of the controller is underscored by the additional component- and YUV signal-processing option provided via the 15-pole analog RGB input. An integrated audio amplifier and a remote control connection option (corresponding to the Philips RC5 standard) round out the feature set. An extension connector enables connection of additional modules, e.g., a TV tuner module with a teletext decoder and an integrated audio amplifier.

For TTL or LVDS

Each of the flat-panel controllers is available with TTL or LVDS output to the TFT panel. The JILII30 interface enables control of single and dual-port LVDS TFT panels with up to 2 x 24-bit data width; FLEX32 enables control of 18-bit TTL flat panels. A single 12V power supply is sufficient. Panel and backlight



power sequencing is accomplished on the controller.

Easy-to-Use Keypad for On-Screen Display

An On-Screen Display (OSD) keypad is available for both CRTtoLCD boards for changing settings and controlling specific board properties. The OSD can easily be configured via the keypad or under Windows on a PC via the serial interface. An adapter cable converting RS232 commands into TTL signals is available as an accessory. This enables optimized settings to be saved in a file and called up at any time – even for other panels. The serial OSD control is ideal for use in high-volume production because it eliminates the need to set each controller individually. The various flat panels are adjusted individually in a Kontron-typical way: via special “panel files” guaranteeing optimum display. Individual firmware adaptations can also be made easily and quickly via the newly developed software tool KCWB (Kontron Configuration Workbench). From now on this will have the same look and feel for all new aFLAT series controllers. Control software (Windows OSD) and panel files can also be downloaded from www.kontron-emea.com/flatpanel.

Why do you need dedicated panel adapters for embedded systems?

A number of CPU boards and panels cannot be linked together using a prefabricated, generic cable type, since there is no real industry standard in this case. To date, PSWG has only been available for a few panels. Thus, even once a panel and a CPU board have been selected, functioning communications between the two are still a long way off. Based on the image signal output by the computer (e.g., TTL or LVDS) and the selected panel, suitable cable sets (display interfaces) have to be purchased or developed. Kontron's core tasks in the area of panel linking are therefore:

- » Continuous development of standard interfaces for embedded systems for proprietary display connections, which vary according to manufacturers, formats, and display performance levels and
- » Provision of converters that convert graphics data according to the intelligence of the embedded system or panel-board combination.

These two task complexes can be accomplished via intelligent panel adapters corresponding to the JIPA and JILI standards (plug & display!) and especially low-cost, simple cable sets. All of these variants are available from Kontron as off-the-shelf solutions, easing system developers' and integrators' tasks in making embedded computer boards and other video sources fit diverse display types and vice versa. From simple cable sets to complex graphics controls, everything the system developer or integrator needs is offered.

Daniel Piper

Distribution & Marketing
Manager at Kontron's Flat
Panel Division in Hamburg,
Germany

Gert H. von Steinäcker

CEO of ABLE Design, a
manufacturer of industrial
flat-panel monitor systems
based in Munich, Germany.

Wolfgang Krenn

Deputy Development
Manager at TABAustria,
based in Ansfelden, Austria.

About ABLE Design

ABLE Design is a leading company specializing in industrial flat-panel monitor systems. The DIN EN ISO 9001-certified company has a product range that includes both standard products and individual developments, into which a significant portion of development know-how flows, for customers. Electronics development is in-house; production is done within the company or, for high-volumes series, cost-effectively by contract manufacturers. ABLE Design was founded in 1994 by three private shareholders to serve the growing market for electronic flat-panel monitors. In 1995 ABLE Design was the first company to offer a purely digitally controlled plasma flat screen. A little while later the first European "Long-Distance LVDS Interface" for digital displays followed. Today the company offers a wide range of board and system-level products. Not being linked to a particular manufacturer, ABLE Design always places the application and its environment in the forefront to provide optimally customized display technology, filter glasses, interfaces, controllers, and housing technology. Only nonstandard components are newly developed. Customers such as TAB-Austria value this philosophy because only in this way can ABLE Design offer standard or OEM products of outstanding performance and quality at attractive prices.

About TAB-Austria

For TAB-Austria, a leading provider of entertainment devices, “innovation” is not just a buzzword – it’s the company’s mission. Research and development are the most important pillars of the company. Thus, TAB-Austria will also stand for groundbreaking product development in the future. The declared goal of TAB-Austria is the creation of coin-operated terminals of the highest quality. The company wants to win customers with diversity, innovation, and creativity and hence will not only design but also continuously improve its devices. Focus is always on innovative design and terminal ergonomics. All products are perfectly customized according to the needs and requirements of the Digital Age and manufactured according to individual customers’ wishes and needs – just in time.

About Kontron

Kontron is a global leader in embedded computing technology. With more than 40% of its employees in research and development, Kontron creates many of the standards that drive the world’s embedded computing platforms. Kontron’s product longevity, local engineering and support, and value-added services, helps create a sustainable and viable embedded solution for OEMs and system integrators.

Kontron works closely with its customers on their embedded application-ready platforms and custom solutions, enabling them to focus on their core competencies. The result is an accelerated time-to-market, reduced total-cost-of-ownership and an improved overall application with leading-edge, highly-reliable embedded technology.

Kontron is listed on the German TecDAX stock exchanges under the symbol “KBC”. For more information, please visit: www.kontron.com

CORPORATE OFFICES

Europe, Middle East & Africa

Lise-Meitner-Str. 3-5
86156 Augsburg
Germany
Tel.: +49 (0) 821 4086-0
Fax: +49 (0) 821 4086 111
sales@kontron.com

North America

14118 Stowe Drive
Poway, CA 92064-7147
USA
Tel.: +1 888 294 4558
Fax: +1 858 677 0898
info@us.kontron.com

Asia Pacific

17 Building,Block #1, ABP.
188 Southern West 4th Ring Road
Beijing 100070, P.R.China
Tel.: +86 10 63751188
Fax: +86 10 83682438
info@kontron.cn