

Enabling next-generation on-board navigation systems

“The combination of Altera’s programmable solutions for the automotive industry and excellent development support shortened our design time by six months and made it possible for us to meet the demanding schedule we set for the TravelPilot Rome.”

*Georg Sandhaus
Director of System Engineering
Blaupunkt*



Consumers are increasingly demanding on-board electronic systems that support sophisticated navigation capabilities. At the high end, you’re integrating next-generation navigation systems with other dashboard capabilities so they become the primary display and audio hubs for sound systems, cellular phones, and climate control.

But you also have to consider the cost constraints involved in designing low-end systems targeted at consumers on a budget. Our FPGAs deliver the flexibility and scalability you need to quickly and cost-effectively deliver a broad range of navigational functionality to your customers, regardless of the capabilities and price points they demand.

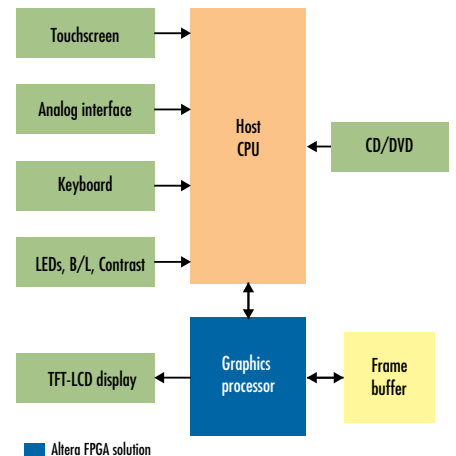
Programmable and scalable

Whether building simple turn-by-turn (TBT) or more sophisticated 3D automotive navigation systems, you require powerful graphics processing capabilities. Altera’s Cyclone® FPGA series and suite of complementary products and solutions provide you with unequalled functionality as well as pricing that is highly competitive with ASICs.

Our programmable solutions:

- Provide you with the ability to create scalable and innovative designs that can be used in a broad range of navigation products, from low- to high-end systems.
- Enable you to design flexible navigation systems that eliminate the need to build separate connections between the system’s microprocessor and each of the many different consumer interface standards.
- Deliver unequalled performance through extremely efficient high-speed data routing that processes data in parallel within the FPGA’s digital domain rather than moving it to an external microprocessor for serial operation.
- Cut costs and development time by offering interfacing IP cores such as media-oriented system transport (MOST) and controller area network (CAN) as well as digital signal processing (DSP) functions such as filtering and digital transmission control protocol (DTCP).

Typical graphics processing navigation system



Unparalleled performance

On-board navigation systems need considerable graphics processing power. Unlike digital signal processors or ASSPs, Altera FPGAs can manage multiple instructions in a single clock cycle, and are thus better suited to perform the necessary computationally intensive algorithms.

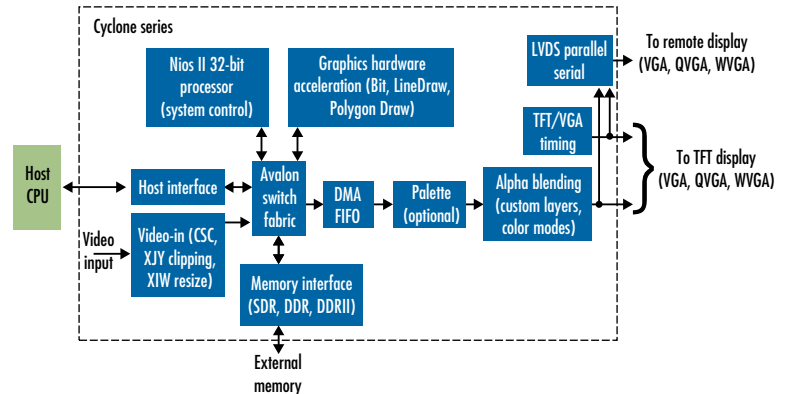
In addition to easily handling processing-heavy operations such as scaling, filtering, and alpha blending, our Cyclone FPGA series:

- Accommodates high-graphics computations due to its memory interface with the Avalon® switch fabric.
- Supports the Altera Nios® II 32-bit embedded processor that can be used for graphics processing and for additional control functions.
- Enables graphics hardware acceleration that can include functions such as BitBlt (copy object into frame buffer, 2D-DMA transfer, possibly with blending).
- Supports single data rate (SDR), double data rate (DDR), and DDRII memory types.
- Allows for multiple channels of alpha blending.
- Supports LVDS graphics output for remote display applications.

Unmatched scalability

With its highly efficient device architecture, the Cyclone series of FPGAs meets the stringent performance demands of your automotive navigation system designs. Additionally, no soft processor comes close to matching the performance, utility, and cost-efficiency of the Nios II processor implemented in a Cyclone device. Our programmable technologies enable you to efficiently deliver both high-end and low-cost navigation solutions to your customers.

Low-cost graphics implementation



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