

# Nexperia Home 8550 Software Development Kit

This complete, assembled reference platform gives ISVs and other Nexperia Home Partners everything they need to create software applications and libraries for TVs, set-top boxes, digital entertainment hubs, and home media server products based on the Nexperia PNX8550 home entertainment engine.



## Key features

- Complete, assembled kit for developing and testing software applications and libraries for the Nexperia PNX8550 home entertainment engine
- Ideal for mid- to high-end analog/digital and digital TVs, set-top boxes, digital entertainment hubs, and home media server products with advanced TV, multimedia, and connectivity features
- Includes reference hardware, system software, A/V streaming software layer, operating systems, demo and sample applications, test streams, diagnostic software, software tools, and documentation
- Includes software to handle basic analog signal path functions for multiple audio and video streams
- Host-based application development and standalone demo modes
- Streaming media application development simplified through the Nexperia Home API
- Available to ISVs and other third parties through the Nexperia Home Partner Program

Reference hardware, system software, and application development tools for the PNX8550 home entertainment engine

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The Nexperia™ Home 8550 software development kit (NH-8550 SDK) is a flexible platform for creating software applications for the Nexperia PNX8550 home entertainment engine. This complete, assembled kit gives ISVs and other third-party software companies everything they need to develop, port, test, and demonstrate applications and libraries for TV, set-top, digital entertainment hub, and home media server products. It is available through the Nexperia Home Partner Program.

## PNX8550 home entertainment engine

The PNX8550 is a highly integrated media processor capable of supporting advanced analog and digital TV, multimedia, control, and connectivity features. On a single chip, it handles conditional access, MPEG-2 transport stream demux, video decoding, high-quality video enhancements, audio decoding and mixing, graphics generation, image composition, and display. Powerful MIPS32 and TriMedia processor cores work together with on-chip units to efficiently handle control, communications and media processing functions in hardware and software. The MIPS32 PR4450 CPU controls and balances all on-chip functions; two TriMedia TM3260 CPUs handle real-time media tasks, many advanced video enhancements, and all audio operations.

## Streamlined application development

In the NH-8550 SDK's development workflow, software is written on a host system (such as a PC) then downloaded to SDK reference hardware through an EJTAG connection. Peripheral interfaces and devices are also accessible for programming and debugging through the EJTAG interface. Control and user interface applications for the MIPS core are developed using OS and connectivity APIs.

Development of streaming media applications for the PNX8550 is simplified through the Nexperia Home API (NHAPI). The NHAPI is implemented through a high-performance streaming A/V software layer that abstracts the

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programming interface to the task level through 'use cases.' Use cases automatically handle both the streaming media processing tasks and all associated setup steps such as task prioritization, memory allocation, buffer management, A/V synchronization, etc. The NH-8550 SDK supports the single-window video and dual-window video use cases.

## Standalone (no host) demo mode

The NH-8550 SDK also supports a demo mode that does not require connection to a host system. In this mode, a preloaded demo executes on power up, allowing user interaction through the remote control. It outputs video through DVI or CVBS connections for display. In demo mode, all peripherals can be controlled and simple control commands can be given for programming and debugging purposes.

## SDK content

The complete NH-8550-SDK includes reference hardware, development tools, system software, operating systems, A/V streaming software, a demo/sample application, development tools, and documentation. As delivered, the it includes software to handle basic analog signal path functions for multiple audio and video streams.

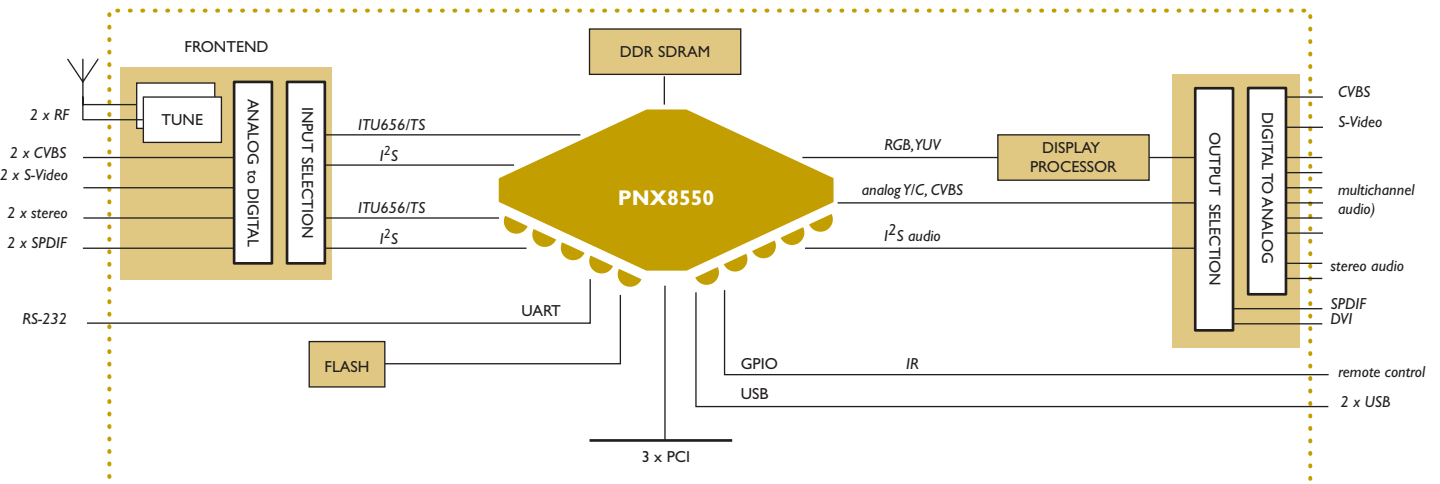
## Reference hardware

Housed in a closed chassis with a power supply, the reference hardware is preconfigured for system development. The cover can be easily removed for debugging or configuration. Six push buttons on the front panel can be programmed through application software to perform simple control functions. A programmable Philips iPronto® remote control and cables (power, audio, video, and data) are included.

The reference backplane allows connection of a variety of input sources such as composite video, S-Video, component video, and direct digital data streams. It outputs to display devices such as a CRT TV, plasma screen, LCD display, or projector through analog (CVBS) or digital (DVI) connections. The SDK also includes standard connectivity and control interfaces such as RS-232 (UART), USB, infrared (remote control), and GPIO and can be extended with additional modules and PCI cards.

## Software, development tools, operating systems

The NH-8550 SDK includes system software, software development tools, the streaming A/V software layer (NHAPI), operating systems, and related software documentation. For the MIPS processor, the SDK



includes the WindRiver® Platform for Consumer Devices (VxWorks RTOS, Flash File System, USB stacks, 2D graphics and media library, and many networking protocols and stacks for the MIPS processor) and an evaluation license of the WindRiver Tornado tool suite. Users can license extensions as needed from WindRiver. The Kit also includes support for the WindRiver WindPower ICE EJTAG debugger board. For the TriMedia processor, the pSOS RTOS is included. A streaming A/V software layer provides the programmer interface for the NHAPI.

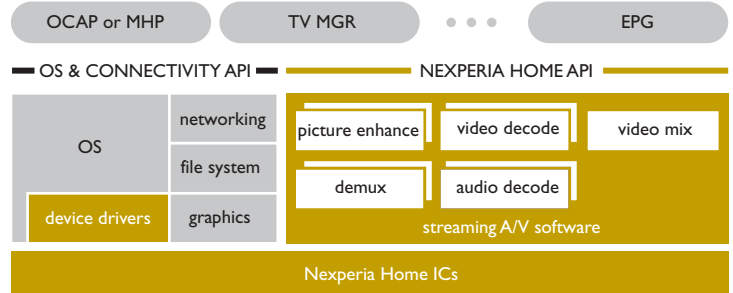
The board support package includes source for board support libraries such as boot, kernel and peripheral support. It also includes drivers for emulators and host drivers for communication between the board and a host development platform.

#### Sample software, demo, test streams, and diagnostic software

A set of example/reference applications demonstrate SDK hardware and streaming A/V software features. Provided as source code, they can be used as a basis for developing more complex applications. A demo application highlights the SDK's major features such as dual-stream processing, accepting and processing IR input, and handling various tuner signals. Test streams can be used for debugging and to demo basic capabilities of the SDK and codec libraries. Diagnostic software facilitates testing of SDK hardware and interfaces.

#### Maintenance and support

The SDK includes support services such as e-mail and technical phone support and access to Nexperia Home Partner web-based development resources such as problem tracking and a support database. Training can be provided on request.



*The NH-8550 SDK's Nexperia Home-compliant software architecture leverages the NH-API to simplify development of streaming tasks.*

#### Technical specifications

##### Kit content

**Reference hardware** Encased chassis, reference board

**Operating systems** *MIPS* WindRiver Platform for Consumer Devices (VxWorks RTOS, Flash File System, USB stacks, 2D graphics and media library, networking protocols and stacks for MIPS)  
*TriMedia* pSOS RTOS

**Development tools** *MIPS* WindRiver Tornado tool suite for MIPS (evaluation license.); extensions can be licensed as needed directly with WindRiver  
WindRiver WindPower ICE EJTAG debugger board support

**NHAPI** streaming A/V software layer for application development on PN8550's TriMedia cores

**NHAPI use cases** single window video, dual window video

**Other software** *drivers* for remote control, front panel buttons  
*demo* executable object  
*diagnostics* executable object

**Cables** Power cord, 4 CVBS cables, 3 S-Video cables, one set of stereo audio cables, 1 DVI cable

**Documentation** NHAPI Technical Description  
VxWorks OS for MIPS  
pSOS OS for TriMedia and tuner modules  
WindRiver Tornado Tool Chain User Guide  
Getting Started manual  
Board level documentation, circuit diagrams

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## Technical specifications (continued)

### Media interfaces

**A/V input** 2 RF connections (for TV signals), 2 CVBS connectors, 2 S-Video connectors, 2 pairs stereo audio connectors, 2 SPDIF connectors

**A/V output** 1 CVBS connector, 1 S-Video connector, 1 DVI connector, 3 pairs audio connectors (for multi-channel audio), 2 25-watt stereo audio outputs (for speakers), 1 SPDIF connector, 2 stereo audio outputs (for headphones)

### Control and connectivity interfaces

**Infrared** 1 port on front panel

**Front panel** 6 programmable push buttons

**USB** 2 external USB v1.1 (host) connectors

**RS-232** 1 external connector via UART

**EJTAG** internal EJTAG connector

**PCI** 3 internal PCI slots

### Data services

**Channels** Via two VBI capture units; 652-line WST teletext, 525-WST teletext, NABTS, Closed Captioning, WSS, and VPS data

### Video output

**incoming digital** 1280x768@50P and 1280x768@60P

**incoming 50 Hz** 720x576@50I or 720x288@50P

**incoming 60 Hz** 720x480@60I or 720x240@60P

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