



# Intel<sup>®</sup> IXP400 Digital Signal Processing (DSP) Software Version 2.6.2

Software Product Specification

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*April 2005*



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## Revision History

Date	Revision	Description
April 2005	001	Initial release.

## 1.0 Product Context

Intel<sup>®</sup> IXP400 Digital Signal Processing (DSP) Software v2.6.2 provides basic voice-processing functionality for voice-over-IP (VoIP) applications using the Intel<sup>®</sup> IXP421, IXP423, and IXP425 network processors.

## 2.0 Product Specifications

Intel<sup>®</sup> IXP400 Digital Signal Processing Software v2.6.2 offers the following general product features:

- ITU T.38 Fax Relay
  - V.17 at 14400, 12000, 9600, and 7200 bps fax modulation and demodulation
  - V.21 at 300 bps fax modulation and demodulation
  - V.27ter at 4800 and 2400 bps fax modulation and demodulation
  - V.29 at 9600 and 7200 bps fax modulation and demodulation
- 128-ms echo cancellation
- Selectable (either HSS or External PCM Interface) front-end Pulse Code Modulation (PCM) interface
- Maximum eight voice channels when using G.711 for 533 MHz processor
- ITU-T compatible voice coders:
  - G.729ab with VAD and CNG support
  - G.711  $\mu$ -law and A-law CODEC with 10-ms frame size
  - G.711 Annex 2. Support for VAD and CNG
  - G.723.1 with 5.3 and 6.3 Kbps rates and VAD and CNG support
  - G.722
  - G.726 with 16, 24, 32 and 40 Kbps rates and FRC3551 and I.366 Annex E packing formats
- Multiple frames per packet. Maximum numbers of frames per packet are:
  - 6 for G.711 and G.722
  - 8 for G.723.1
  - 9 for G.726 40 Kbps
  - 12 for G.726 32 Kbps
  - 16 for G.726 24 Kbps
  - 24 for G.729
- PSTN failover via Low Latency HSS bypass
- Packet loss concealment (PLC) for G.711, G.726, and G.722
- Configurable PCM interface in the wideband or narrowband mode

- Runtime dynamic switching of coder types
- Runtime dynamic changing of the number of frames per packet
- Automatic switching of decoder types according to the received RTP packets
- Automatic Gain Control (AGC) support for encoder, with provision for manual setting with mute compliant to ITU G.169
- Automatic Level Control (ALC) support for decoder, with provision for manual setting with mute compliant to ITU G.169
- Echo cancellation for narrowband and wideband interface compliant to ITU G.168
- DTMF generation and detection
- Dynamic DTMF tone clamping
- RFC-2833 tone-event support for DTMF with variable frame rate
- Modulated-tone generation capability
- Fax-tone detection (CNG, CED, and V.21 Preamble)
- Generation and receipt of FSK modem signals for caller ID
- Call-progress-tone generation for the United States, Japan, and China
- Dynamic/Adaptive jitter buffer algorithm
- Audio mixer for three-way calls and small conferences (up to five parties)
- User-customizable control API
- Audio player for G.711 and G.729 recorded data
- Digital gain control in the TDM front end
- TDM switch (normal mode with echo cancellation or low latency mode)
- User-defined tones for tone generation and detection

Software Development Environments that are compatible with the Intel® IXP400 Digital Signal Processing Software v2.6.2 are:

- Wind River\* VxWorks\* Developer Tool Kit 2.2.1 (Tornado\* 2.2.1 / VxWorks 5.5.1) with GCC compiler + Intel® IXP400 SW v1.3
- Wind River VxWorks Developer Tool Kit 2.2.1 (Tornado 2.2.1 / VxWorks 5.5.1) with GCC compiler + Intel® IXP400 SW v1.4
- MontaVista\* Linux\* Professional Edition 3.0 with GCC compiler + Intel® IXP400 SW v1.3
- MontaVista Linux Professional Edition 3.0 with GCC compiler + Intel® IXP400 SW v1.4
- MontaVista Linux Professional Edition 3.1 with GCC compiler + Intel® IXP400 SW v1.4

Hardware Development Platforms that are compatible with the Intel® IXP400 Digital Signal Processing Software v2.6.2 are:

- Intel® IXDP425 / IXCDP1100 Development Platform
- ADI\* Engineering Coyote\* Reference Design