

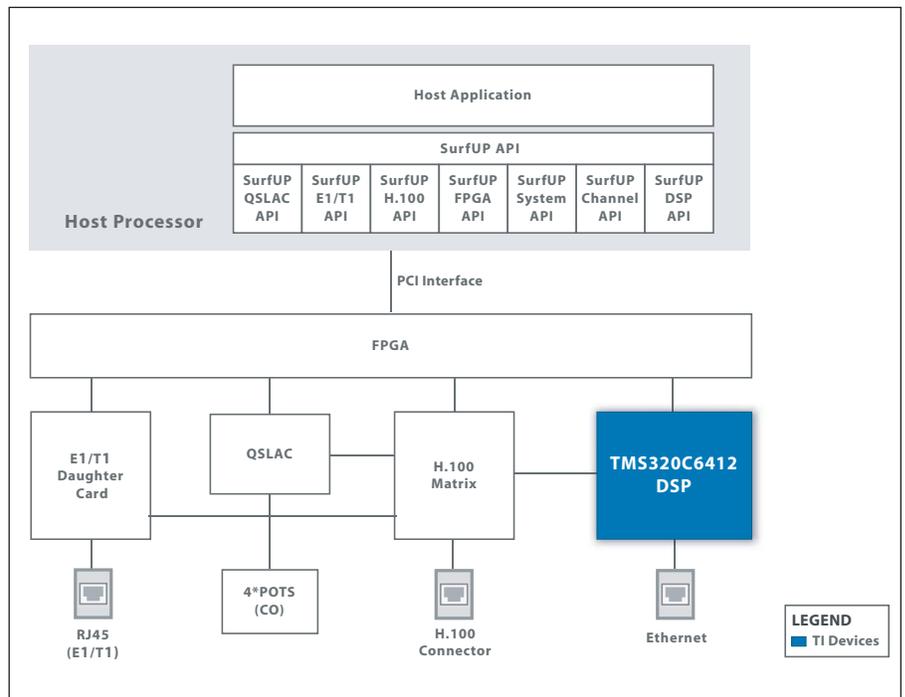
# Triple-Play Infrastructure Solution

## Benefits

- Enhanced media processing PCI card for simultaneous processing of voice/video/data (fax/modem) on a single DSP
- Offers the most cost-effective per-channel prices
- Available in three different configurations for optimized price/performance
- Supports all standard interfaces

The SurfAce-112™ is a fully integrated 3/4-size PCI card providing simultaneous Triple-Play processing capabilities for developers of media gateways, CTI applications, Remote Access Servers (RAS), and a multitude of other voice, video and data (fax/modem) applications. Featuring cost-effective high port density and Surf's patent-pending Open Framework design, the SurfAce-112 utilizes Texas Instruments' state-of-the-art TMS320C6412 DSP to facilitate integration of customers' host applications and shorten time-to-market.

## System Example: Triple-Play Infrastructure Solution



## Target Applications

- Triple-Play applications
- CTI Applications
- Voice and video gateways
- Media servers
- Packet-to-packet applications
- Session border controllers
- Remote Access Servers (RAS)
- Lawful interception
- Quality monitoring
- Test equipment

# Triple-Play Infrastructure Solution

## Functional Description

<b>Voice Compression</b> <ul style="list-style-type: none"> <li>G.711, G.726, G.723.1A, G.729AB, G.729E, G.728, G.722.2 (WB AMR), GSM-NB-AMR, GSM-FR, GSM-HR, GSM-EFR, EVRC, SMV, Q-CELP13</li> <li>G.711-compliant VAD/CNG/PLC</li> <li>Transcoding</li> <li>Linear-to-compressed, compressed-to-linear</li> </ul>	<b>Modem Termination Support</b> <ul style="list-style-type: none"> <li>Data pumps: V.92, V.90, V.34, V.32bis, V.32, V.22bis, V.22, V.23, V.21, Bell103</li> <li>Error correction: V.42, MNP2-4</li> <li>Data compression: V.44, V.42bis, MNP5</li> <li>HDLC for PPP (RFC 1662)</li> <li>PPP over Ethernet</li> <li>Synchronous V.34 for H.324</li> </ul>
<b>Video Compression</b> <ul style="list-style-type: none"> <li>H.263 Baseline</li> <li>MPEG4 Simple Profile</li> <li>Resolution: any up to full D1</li> <li>Frame rate: any up to 30 FPS</li> <li>Transcoding</li> <li>YUV-to-compressed, compressed-to-YUV</li> </ul>	<b>IWF Support</b> <p>Mobile Side:</p> <ul style="list-style-type: none"> <li>Modified ITU V.110, A-TRAU with HSCSD support for bearer and Fax services</li> <li>A-TRAU'</li> <li>Non-transparent mode (RLP versions 0, 1, 2)</li> </ul> <p>PSTN Side:</p> <ul style="list-style-type: none"> <li>GSM 03.45 for Fax G3 support</li> <li>PSTN Fax, Modem and ISDN</li> </ul>
<b>Tones and Telephony Features</b> <ul style="list-style-type: none"> <li>DTMF detection/generation/suppression</li> <li>DTMF and other telephony relays using RFC2833</li> <li>CID types 1 &amp; 2 generation and detection</li> <li>MF-R1 &amp; MF-R2 tone generation and detection</li> <li>Call progress tone detection</li> <li>User-defined tone/event detection and generation</li> <li>Tone generation and detection on the IP side</li> </ul>	<b>Voice Conferencing Support</b> <ul style="list-style-type: none"> <li>N-way with configurable dominant speaker algorithm</li> <li>Simultaneous mixing of IP and PSTN participants</li> </ul>
<b>Echo Canceller</b> <ul style="list-style-type: none"> <li>G.168-2000-compliant with tail length of 32, 64, 128ms</li> <li>Automatic turn-off upon detection of Fax and Modem; port switches to transparent pass-through mode</li> </ul>	<b>H.324/3G-324M Interface (future)</b> <ul style="list-style-type: none"> <li>3G-324M-to-packetized Video-over-IP format converter</li> <li>H.324 (V.34)-to-packetized Video-over-IP converter</li> <li>H.324-to-3G-324M converter</li> </ul>
<b>Network Support for Voice</b> <ul style="list-style-type: none"> <li>RTP, RTCP: RFC 3550/3551</li> <li>Adaptive and programmable jitter buffer</li> <li>Variable frame size (5ms to 30ms)</li> </ul>	<b>Voice/Fax Record/Play/Announce</b> <ul style="list-style-type: none"> <li>Record and play Voice files</li> <li>Convert Fax into TIFF files and TIFF files to G3 Fax</li> <li>Voice and Fax can originate from PSTN or IP interfaces</li> <li>Internal play/record storage: minimum 24MB per DSP</li> </ul>
<b>Fax-Relay Support</b> <ul style="list-style-type: none"> <li>T.38 (2.4-14.4Kbps) and Fax over G.711</li> <li>Data pumps: V.17, V.29, V.27ter, V.21, V.34HD</li> <li>FEC/Redundancy</li> <li>Maximum jitter: 1 sec.</li> <li>Maximum delay: 6 sec. roundtrip</li> </ul>	<b>System Interface</b> <ul style="list-style-type: none"> <li>UDP/IP packetization from DSP</li> <li>VLAN support</li> <li>CALEA/ETSI: distribution of traffic to multiple IP destinations</li> <li>C-callable function host API</li> <li>Host API available on Linux, VxWorks, and Windows® operating systems</li> <li>Remote real-time diagnostics integrated into DSP</li> <li>DSP control through HPI/Ethernet interface</li> <li>Variable I/O and processing block size</li> <li>Online monitoring of DSP resources</li> </ul>
<b>Fax Termination</b> <ul style="list-style-type: none"> <li>T.30/T.32 (2.4-14.4Kbps)</li> <li>Data pumps: V.34 Fax, V.17, V.29, V.27ter, V.21, V.34HD</li> <li>Protocol: T.30</li> <li>Interface: T.32</li> </ul>	<b>Signaling Support</b> <p>Integration-ready for third-party signaling stacks for:</p> <ul style="list-style-type: none"> <li>SIP</li> <li>3G-324M/H.324</li> <li>H.323</li> <li>MGCP</li> <li>H.248/MEGACO</li> </ul>
<b>Modem Relay Support</b> <ul style="list-style-type: none"> <li>V.150.1 termination up to V.92 (V.8 gateway, MR1)</li> <li>Voice-band data (Modem over G.711)</li> </ul>	

Technology for Innovators, the black/red banner and Code Composer Studio are trademarks of Texas Instruments. Windows is a registered trademark of Microsoft Corporation.

All other trademarks are the property of their respective owners.

## Component Selection

TI DSP: TMS320C6412

- E1/T1 daughter card (optional)
- AFE 4 POTS and DFE single E1
- H.100 interface in some applications
- Ethernet interface for the DSP or the PTMC board
- PTMC Connector
- SurfUP API – High level interface to all board components

## Hardware

- Power requirements: Total 11.5 Watts
- DSP: C6412@500 / 600 / 720 MHz
- SDRAM
  - 32-64MB organized as 2x4M x 32 bits
  - Two SDRAMs per DSP
- Supported Interfaces
  - PCI
  - Single E1/T1 RJ-45 supporting PRI signaling
  - 100Base-T Ethernet (RJ-45)
  - 4 SLIC POTS on board (FXS)
  - H.100
  - PTMC connectors carry the SurfRider-812
  - Power connector
  - RS-232 connector
- JTAG
  - DSP JTAG connector for DSP emulation
  - FPGA JTAG connector for FPGA booting and programming
  - Boundary-Scan JTAG
- Operating Temperature: 0°C-55°C (32°F-131°F)
- Storage Temperature: -25°C-85°C (-13°F-185°F)
- Relative Humidity: 20% to 80% (non-condensing)
- Dimensions
  - Length: 255mm (PCI form factor)
  - Width: 110mm

## Getting Started

### Tools

- TI Code Composer Studio™ Integrated Development Environment
- For development within the application layer: SurfUP developer's package
- For development inside the DSP: SurfUP developer's package as well as the SurfUP Open Framework developer's package

### Documentation

- All relevant technical documentation available from Surf

## Contact Information for Questions/Support

To purchase this solution or for more information:  
[www.surf-com.com](http://www.surf-com.com); [support@surf-com.com](mailto:support@surf-com.com)