Program Channel Access Unit (PCAU)

Broadcast Quality Audio from Any D4, DLC or NGDLC System

Featuring apt-X™ Broadband Audio Technology

...Delivering Quality Time After Time
Broadband Audio Transport: Limitations of Existing Technology

Market demand for broadband media—including Internet radio, event broadcasts, studio to antenna links, teleconferencing, etc.—continues to grow at an unprecedented pace. While advances in access equipment have allowed operating companies to tap into this rich revenue pool by offering an array of Broadband Data solutions, persistent technological hurdles in broadcast quality audio transport have prevented effective selling of Broadband Audio along side Broadband Data. Today’s costly and inefficient solutions rely on complicated and time-consuming “manual workarounds” and “special assemblies” which, by liberal standards, deliver less than optimum audio quality.

Specific limitations adversely affecting traditional network audio transport are numerous. First, existing Program Channel circuit packs can only be deployed in D4 channel banks—no service is available from DLC or NG DLC systems, which severely limits access to customers in the last mile. In addition, multiple unique circuit packs are required to support each service. Separate Transmit and Receive units may be required for each service speed—7.5 kHz and 15 kHz, for example—resulting in a need for as many as 8 separate plug-in units. And, because alignment is often difficult, with repetitive adjustments required to “tweak-in” adequate performance, turn-up is time consuming and cumbersome.

Perhaps more seriously, current network audio transport requires significant bandwidth—as much as half a T1 line for stereo transmission. Yet even allowed this voracious bandwidth requirement, audio performance, which continues to be based on noisy and antiquated 1980s technology, remains marginal. More contemporary potential alternatives such as MPEG Layer II, III or IV have proven unsuitable. Based on “lossy compression” algorithms, they introduce substantial encoding/decoding delays which make real-time interactive conversations impractical if not impossible. Worse, these conventional encoding schemes lose as much as 95% of their audio content after just 4 tandem or “back-to-back” connections.

The results:

• **Existing Network Audio Transport Solutions are Poor and Inefficient**

• **Broadcast Quality Audio Transport is Largely Unacheived**

• **Potential High-revenue Broadband Audio Market is Untapped**
The Solution:
Pulsecom/APT Program Channel Access Unit (PCAU)

Pulsecom, in partnership with Audio Processing Technology, Ltd. — the Belfast, Ireland based leader in audio compression technology with a global customer base encompassing the world of professional broadcasters, radio stations, post-production and music studios — has introduced the Pulsecom/APT Program Channel Access Unit (PCAU). Capitalizing on APT’s acclaimed apt-X™ 16-bit audio compression technology currently used throughout the broadcast industry and in all DTS professional cinema sound systems, the groundbreaking Pulsecom/APT PCAU sets a new standard for high quality Program Channel audio performance.

Featuring universal service support, the Pulsecom/APT PCAU utilizes standard U-Interface 2B1Q transport to deliver an unprecedented 20Hz to 15 kHz audio from D4, DLC or NG DLC systems. In addition, a single PCAU can act as both a Transmit or Receive unit and supports 5, 7.5, 8 or 15 kHz transport. The Pulsecom/APT PCAU offers instant alignment and 3 times greater bandwidth efficiency than convention units, with just 2 DS0s required for a 20 Hz to 15 kHz link (conventional program channel units require a six DS0s to support 15 kHz circuits).

Most significantly, the apt-X™ algorithm used by the Pulsecom/APT PCAU results in near-instantaneous encoding/decoding and supports multiple tandem connections without degradation, making it ideal for virtually all web-based and traditional applications. In addition to providing superior audio transport, the apt-X™ compression technology also results in secure, encoded audio communication links which protect against Internet hacking and public switched network access. Based on proven ISDN transport, and with full NEBS Level 3 compliance, “plug-and-play” Type 400 mechanics and network standard loopbacks, the PCAU is designed to support high volume deployment. The result:

- True Broadcast Quality Audio Transport is a Reality

Features Overview:

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
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<tbody>
<tr>
<td>Standard 2B1Q U-Interface Access</td>
<td>Universal Service Deployment</td>
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<td>(Point-to-Point)</td>
<td></td>
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<tr>
<td>Standard Type 400 Mechanics</td>
<td>A Full range of inexpensive mountings and installation options.</td>
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<tr>
<td>Universal TX/RX and 5, 7.5, 8 and 15 kHz Operating Modes</td>
<td>A Single Circuit Pack supports ALL Program Channel Services to Cut Inventory Costs and Simplify Turn-up</td>
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<tr>
<td>Simple LED Performance Status</td>
<td>Instant Indication of Circuit Status. Eliminates Frustrating and Time-consuming Program Channel Alignment</td>
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<tr>
<td>Open Architecture Standard Compliance</td>
<td>Assures Long-term Performance and Simple Maintenance</td>
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<td>(Maintenance, NEBS)</td>
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Typical Applications:

Network Audio Transport — Today’s Traditional Method

- Expensive and Time Consuming Turn-up
- Multiple Circuit Packs Required, Increasing Inventory Costs or Resulting in Turn-up Delays

Network Audio Transport Featuring the Pulsecom/APT Program Channel Access Unit (PCAU)

- Universal Access

- D4
- DLC
- NGDLC
- Secure Link Applications
In its unique “Stand Alone” Mode, the Pulsecom/APT PCAU can provide Broadband Audio over 3 miles of twisted pair without a carrier system (D4, DLC or NGDLC)

Ideal for Secure Link Applications

Outstanding Broadband Audio Quality

Aclaimed Audio Performance over Twisted Pair

- 20 Hz to 15 kHz
- Virtually Instantaneous Encoding and Decoding
Pulsecom/APT PCAU Features:

- **apt-X™** 16-bit audio compression technology, using 24-bit architecture, sets a new standard for high quality program channel audio performance.

- By utilizing industry-standard Basic Rate U-Interface 2-wire twisted pair transport, the Pulsecom/APT PCAU can interface to standard U-Interface line cards for connections up to 18 kFt away from D4, DLC or NG DLC carrier systems.

- Secure, encoded audio communication links protected against internet hacking and public switched network access.

- Exclusive ability to operate in a “point-to-point” stand-alone mode without using a carrier system for campus applications.

- Fully automatic alignment eliminates time-consuming adjustment and tweaking of multiple network elements.

- Unlike conventional program channel units that require a full six (6) DS0s to support 15 kHz circuits, the PCAU requires only two (2) DS0s to provide 20 Hz to 15 kHz audio transport.

- Unlike common “Lossy Compression” algorithms such as ISO MPEG Layer II, III and IV that introduce substantial encoding/decoding delays and make real-time interactive conversations impractical, the Pulsecom/APT PCAU delivers near-instantaneous encoding and decoding suitable for virtually all web-based and traditional applications.

- Optimized for broadcast applications, the apt-X™ algorithm permits multiple tandem connections without degradation. Conventional encoding schemes lose as much as 95% of their content after just 4 tandem (or “back-to-back”) connections.

- With network standard maintenance capabilities, the PCAU responds to standard U-Interface eoc NT1 loopback command protocols so that ISDN repeaters may be used to extend loop range beyond 18 kFt. V.54 inband loopback codes are also recognized for DS0 loopback support.

- Standard Type 400 mechanics keep mounting costs low.

- Network synchronization, audio, far end and loopback LEDs provide an immediate and comprehensive indication of circuit performance and status.

- Audio LED is green if an audio signal is present and flickers red if the input signal is over modulated.

- Easy to use switches select 5, 7.5, 8 or 15 kHz operation as well as Transmit or Receive mode to permit the PCAU to be used universally for Program Channel applications.

- A front panel 310 audio jack is available that automatically provides isolation from the edge connector audio pins.

### Ordering Information:

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>PCAU</td>
<td>Universal 15, 8, 7.5 and 5 kHz Program Channel Access Unit</td>
<td>PGCPFC0D</td>
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<tr>
<td>O3D3-RT</td>
<td>Wall or Rack Mounting Shelf</td>
<td>SOM1200G</td>
</tr>
<tr>
<td>2100-0300</td>
<td>120 vac to -48 Vdc Wall Transformer</td>
<td>SOM2SP8C</td>
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Pulsecom: A Secure Investment

Before investing infrastructure dollars in a vendor that may not be around tomorrow, consider Pulsecom for all of your telecommunications access equipment needs. As part of Hubbell Incorporated (HUBB), a $1.4 Billion company established in 1888, Pulsecom is secure enough to protect your investments and future infrastructure dollars. We understand that our customer’s time is better spent concentrating on business strategy and tactics than worrying about the compatibility, flexibility and viability of their telecommunications supplier. At Pulsecom, our financial stability, proven real-world performance, simple evolution, and commitment to quality are the foundations of our business.

From the Central Office to the desktop, Pulsecom supplies Network Access Providers with a full range of communications solutions including Optical Access Systems, Power Systems, Integrated Access Devices, DSL tool kits that enable seamless DSL deployment in existing carrier equipment, D4 Central Office systems, and high performance and cost-effective Digital Loop Carrier Systems. An ISO-9001 registered firm with over 30 years of experience and an installed base of over 9,000,000 voice and data circuits, Pulsecom maintains a network approach to design, development, manufacturing and customer service. Combined with single-point ordering and support, Pulsecom offers economies that extend well beyond initial cost savings. Our mission: “Delivering Quality Time After Time,” is at the heart of everything we do.

Audio Processing Technology, Ltd. (www.apt.com) is at the forefront of audio compression technology with a global customer base encompassing the world of professional audio through international broadcasters, telecommunications companies, local and national radio stations and post-production and music studios. APT headquarters are in Belfast, Northern Ireland, with satellite offices in the United States and Japan.

For more information on the Pulsecom/APT Program Channel Access Unit, or for information on other Pulsecom products and solutions, please visit our website (www.pulse.com), or call our Customer Service Department at 1-800-381-1997 (or 703-471-2950).

Thank you for your interest in Pulsecom.

Visit our website: www.pulse.com