PTP 650S Hotsheet: Small Form Factor Sub-6 GHz NLOS Backhaul

Initial Pitch (Hook)

- Up to 450 Mbps aggregate throughput offers high performance
- 4.9 to 6.05 GHz wide-band operation covers the most popular sub-6 GHz bands
- Small Cell Backhaul supporting 2G/3G/4G/LTE networks specifically for short up to 1.25miles / 2.0 km range (ranged extendable with software key)
- Small Form Factor - volume less than 3L or 180cu inches qualifies as 'de minimis' for mounting in public areas
- Support with 1588v2.....timing and SyncE phase synchronization
- User-configurable channel widths – 5 to 45 MHz allows flexible options in congested RF spectrum
- Industry leading spectral efficiency – 10 bps/Hz allows for deployments in congested RF environments
- Low latency to support voice, video and data communication
- Line-rate packet processing (more than 900K PPS) for high speed transmission
- Flexible I/O options – out of band management, fiber, PoE port and TDM support
- Hitless adaptive coding and modulation for high availability
- Dynamic Spectrum Optimization (DSO) allows for continuous spectrum analysis and automatic selection of the best channel
- Secure management and 128/256-bit AES encryption ensures the integrity of critical data

Market Segments

- Wireless and Wireline Service Providers
- Industries (Oil, Gas, Transportation, Mining)
- Government PublicSafety Sector
- Utilities (Electricity, Water)
- Enterprise Private Networks (Healthcare, Education, Hospitality)

Questions (Probing)

Wireless Service Providers

- Are you looking to support Small Cell backhaul?
- How are you addressing the unique timing requirements of 4G/LTE backhaul (1588 / SyncE / GPS)?
- Do you deploy wireless links in your network for backhaul or access?
- What frequencies do you use?
- What is your mix of business and residential customers?
- Do you deploy any temporary projects where licensed backhaul is not an option?

Wireline Service Providers

- How do you serve high- revenue enterprise customers currently unreachable by fiber?
- How long does it take from order to revenue for a new enterprise customer not currently served by fiber or reachable via line of sight?

Industries (Oil, Gas, Transportation, Mining)

- What are your video surveillance requirements for asset protection?
- Is there a plan to expand the use of video beyond high production sites?
- Do you have personnel safety initiatives requiring video or real- time broadband at well-heads, compression stations and field sites?
- Do you prefer to have a privately owned network vs. carrier network?
- Do you have a disaster preparedness plan?

Government Public Safety Sector

- How much are you spending on leased lines (T1/E1, analog, frame relay, etc...)?
- What is your timeline for migrating from traditional TDM to an IP network?
- Did you consider information assurance when migrating from TDM to IP?
- Do you see an increase in demand for high quality video used for evidentiary purposes?
- Do you currently use 4.9 GHz in your network? What is the primary use for this frequency?
- Do you have a disaster preparedness plan? Does it cover outages in the public network or failures in wireline infrastructure?

Utilities (Electricity and Water)

- Do you have plans to create an AMI Backbone?
- What are your video surveillance requirements for asset protection?
- Do you have personnel safety initiatives that require video or real- time broadband?
- Do you prefer to have a privately owned network vs. carrier network?
- Is there a need to monitor the entire physical infrastructure of your Industrial Control System?
- Do you need to have rapid deployments during special circumstances?

Enterprise Private Networks (Healthcare, Education, Hospitality)

- How much are you spending on leased lines (T1/E1, analog, frame relay, etc.)?
- What is your plan when these circuits are no longer offered or when the costs continue to go up?
- Do you have a disaster preparedness plan? Does it cover outages in the public network or failures in wireline infrastructure?
- Do you have adequate broadband cover age throughout your physical premises?
- What is your video surveillance (asset protection and personnel safety) plan for remote areas of operation?

Key Selling Points: The PTP 650S offers the best

Performance

- 4.9 to 6.05GHz coverage in a single SKU
- Up to 450Mbps aggregate throughput in 45MHz channels
- Up to 1.2 miles / 2 km
- Increased link budget at 64/256QAM
- 5 to 45 MHz channel bandwidth flexibility
- Fast Adaptive Modulation

Reliability

Fast Adaptive Modulation

- Near and Non Line of sight performance
- IP66/67 Mechanics
- -40C to +60C operating temperature
- 40 Years Mean Time Between Failures (MTBF)

Versatility

- Small form factor
- 1588v2 and Synchronous Ethernet
- Easy to integrate layer 2 bridge implementation
- Symmetric and Asymmetric TDD operation
- Connectorized/Integrated versions
- 4.9 to 6.05GHz coverage in a single SKU
- TDD Synchronization
- Standard PoE output port (802.3at)
- TDM module (8 T1/E1 ports)
- Two Gigabit Ethernet Ports and optional SFP port for Fiber
- Split Frequency configurations for the most difficult links

Security

- 128/256-Bit AES Encryption (FIPS 197)
- HTTPS/TLS and SNMPv3 management interfaces
- Identity-Based User Accounts
- Configurable Password Rules
- RADIUS authentication
- Event Logging and Management (syslog and on-board)

Management

- Secure remote management – https and SNMPv3
- RADIUS authentication for management users
- Multiple user role-based logins
- IPv4/IPv6 dual stack management
- Support security audits with syslog
- Support for Cambium Wireless Manager v4.0SP4

Benefit

Wireless & Wireline Service Providers	**Government Public Safety Sector**	**Industries** (Oil, Gas, Transportation, Mining)	**Utilities** (Electricity, Water)	**Enterprise Private Networks** (Healthcare, Education, Hospitality
• Reliable Small Cell and Macro Cell Backhaul • Respond quickly to market changes • Generate new revenue opportunities by providing backhaul and access to customers	• Reduce operating budgets by elimnating leased lines	• Increase personnel safety with real-time video and voice communications to remote areas	• Reduce operating budgets by elimnating leased lines	• Avoid fiber installation for campus connections (FCS alternative) • Reduce operating budgets by eliminating leased lines
• Cost-effectively capitalize on new opportunities	• Increase intra-and inter-agency collaboration	• Reduce operating budgets by eliminating leased lines and satellite communications	• Provide better insight into power usage and improve energy efficiency	• Improve business continuity and disaster preparation
• Offer more profitable services	• Enhance emergency response and situational awareness	• Supply uninterrupted communications for mission-critical operations, even in hostile environments	• Enhance access to transmission, distribution, and consumption data	• Increase intra- and inter-department collaboration
• Generate new revenue sources by extending services to underserved and remote customers	• Provide anytime access to vital information	• Save on equipment and tower costs by reducing the number of hops	• Increase personnel safety with real-time video and voice communications to remote areas	• Cost-effective delivery of on-demand and HD videos
• Make needed infrastructure enhancements cost-effectively	• Better utilize resources and increase productivity		• Reduce truck-rolls by extending expertise and information to the field	• Enhance physical security of personnel

Connectorized - Front

Integrated - Back