**XipLink Optimization Software (XipOS)**

- **SCPS-TP Protocol Acceleration**
  - Fills the wireless link to capacity
  - SCPS-TP based TCP acceleration
  - Interoperable PEP (I-PEP) Compliant
  - XipLink Transport Controls (XTC)
    - Fixed Rate Control Mode
    - Dynamic Rate Control Mode
    - Programmable Rate Control
    - Basic Rate Control Mode
  - Integrated advanced traffic shaping up to 100 QoS classes
    - Configurable committed, maximum rates

- **Streaming Data Compression**
  - Exceeds the wireless link bandwidth
  - Delivers 2x to 10x in bandwidth gain
  - Reduces the number of packets

- **Internet Optimizations**
  - HTTP Acceleration
  - Dynamic Web Cache hardware option

- **Security - Optimize Encrypted Data**
  - Install with any type of encryption
  - Integrated IPsec VPN encryption option

- **Voice Optimization**
  - ROHC Header Compression
  - Packet Coalescing

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**Maximum Wireless Capacity**

*Increased throughput and reduced cost*

XA-Appliances deliver the most advanced satellite and wireless optimization in easy to install appliances, right-sized for the bandwidth and number of users at each location. For small and medium sized sites, set-top-box appliances are easily installed without the need for trained IT staff. For very high speed links or central aggregation sites, fully redundant appliances can optimize links up to 155 Mbps and support thousands of simultaneous sessions, typically increasing bandwidth from 2x to 10x for all TCP applications.

![Picture of XipLink Appliances](image)

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**XipLink XA-Appliances Overview**

- **Maximum Wireless Capacity**
  - Increased throughput and reduced cost
  - XA-Appliances deliver the most advanced satellite and wireless optimization in easy to install appliances, right-sized for the bandwidth and number of users at each location.
  - For small and medium sized sites, set-top-box appliances are easily installed without the need for trained IT staff.
  - For very high speed links or central aggregation sites, fully redundant appliances can optimize links up to 155 Mbps and support thousands of simultaneous sessions, typically increasing bandwidth from 2x to 10x for all TCP applications.

![Picture of XipLink Appliances](image)

**XipOS works between users of any two devices of any type.** A central XA-Appliance can support remote users of devices with XE-Embedded XipOS, the XS-104 single board computer or users with a XipStick portable optimizer. Based on the SCPS specification, XipOS optimization simultaneously works with secure and un-secure users over any wireless network.

- **Works over any Wireless Network**
- **Works with all Data Encryption**

![Diagram of XipLink Optimization](image)

**VSAT - TDMA / SCPC / Mesh / MSS**

**3G / 4G Cellular - Interconnect and Backhaul**

**Terrestrial Point-to-Point and Point-to-Multipoint**

**LTE / WiMax / WiFi - CPE to Base Station links**
XipLink Optimization Software (XipOS)

XipLink Optimization Software (XipOS) delivers maximum bandwidth across wireless communication links using extensions of the Space Communication Protocol Specification (SCPS).

Protocol acceleration, streaming data compression and Internet web browsing enhancements are combined in very efficient, easy-to-install appliances, single board computers and portable devices with options for integrated IPSec VPN and Dynamic Web Caching.

Easy to Deploy and Manage
- Completely transparent to users
- Layer 2 - Bridge installation (typical remote)
- Layer 3 IP Router installation (typical hub site)
- RIP / OSPF / BGP routing protocols
- Redundant appliances use CARP
- Centralized configuration option

Optimize any Wireless Network Topology
- VSAT - Star Topologies
- Mesh networks of any size
- Dedicated SCPC links
- Terrestrial Point to Point links
- Terrestrial Point to Multi-Point links

SCPS-TP Protocol Acceleration
- Fast-Start algorithms
- Acknowledgment Frequency Reduction
- Selective Negative Acknowledgements

Streaming (across packets) Data Compression
- Proprietary streaming data compression
- X1 and X2 modes for efficiency
- Dynamic Active Resource Management

Internet Optimizations
- HTTP Acceleration
- DNS Caching
- Dynamic Web Cache hardware option
- XiPix (XA-30K Product Only)

XipOS Transport Controls (XTC)
- Fixed Rate Control
- Dynamic Rate Control
- Programmable Rate Control
- Basic Rate Control

Flexible Deployment Options
- XA-Appliances
- XS-Specialty Products
  - XipStick Portable Optimizer
  - XS-104 Single Board Computer
- XE-Embedded XipOS
  - BSD, Linux, Windows devices
## XA-Appliances for Maximum Bandwidth

![Product Image](image1)

<table>
<thead>
<tr>
<th>Sessions</th>
<th>Bandwidth</th>
<th>Sessions</th>
<th>Typical Use</th>
<th>XipLink Products</th>
</tr>
</thead>
<tbody>
<tr>
<td>XA-50</td>
<td>2 Mbps</td>
<td>50</td>
<td>Small Office / Vehicles</td>
<td>![Image]</td>
</tr>
<tr>
<td>XA-500</td>
<td>4 Mbps</td>
<td>500</td>
<td>Medium Office / Vehicles</td>
<td>![Image]</td>
</tr>
<tr>
<td>XA-500C</td>
<td>4 Mbps</td>
<td>500</td>
<td>Web Cache Hardware Option</td>
<td>![Image]</td>
</tr>
<tr>
<td>XA-2000</td>
<td>8 Mbps</td>
<td>2,000</td>
<td>Medium to Large Offices</td>
<td>![Image]</td>
</tr>
<tr>
<td>XA-4000</td>
<td>16 Mbps</td>
<td>4,000</td>
<td>Data Center Applications</td>
<td>![Image]</td>
</tr>
<tr>
<td>XA-4000C</td>
<td>16 Mbps</td>
<td>4,000</td>
<td>Web Cache Hardware Option</td>
<td>![Image]</td>
</tr>
<tr>
<td>XA-10K</td>
<td>45 Mbps</td>
<td>10,000</td>
<td>Large Office / Teleport</td>
<td>![Image]</td>
</tr>
<tr>
<td>XA-30K</td>
<td>155 Mbps</td>
<td>30,000</td>
<td>Very High Data Rates</td>
<td>![Image]</td>
</tr>
<tr>
<td>VPN-xxxx</td>
<td>All</td>
<td>Variable</td>
<td>IPSec Software Option</td>
<td>![Image]</td>
</tr>
</tbody>
</table>

## XA-Appliances with XipLink Optimization Software

### SCPS-TP Protocol Acceleration
- Kernel based using XipLink Dynamic Socket Buffers
- Transparent operation as SCPS-TP proxy gateway
- Satlabs I-PEP compliance for interoperability
- XipOS Transport Control modes for full bandwidth utilization on dedicated and dynamic links
- Selective acceleration

### Quality of Service
- Hierarchical Class Based Queuing
- DSCP classification and re-marking
- UDP / VOIP or other data prioritization
- Integrated with XipOS Transport Control modes
- Committed and maximum rate options

### Data Compression Algorithms
- Multiple, simultaneous algorithms (X1 and X2)
- Active Resource Manager for dynamic control

### Internet Optimizations
- Dynamic Web Cache hardware option (disk)
- HTTP Acceleration
- TTCP Fast Start
- HTTP Compression and XiPix (XA-30K only)

### XipLink Real-Time: Voice Header Compression
- RDHC Header Compression
- Packet Coalescing

### Management
- Web based graphical user interface uses HTTPS
- Standard and Proprietary SNMP MIB's for monitoring
- NetConf based central configuration model
- Real time reporting and graphing on each appliance
- Remote upgrades
- Configuration Profiles

### Network and Redundancy Capabilities
- Installs as Layer 2 Bridge or Layer 3 IP Router
- Dynamic routing protocols - BGP, RIP, OSPF
- Redundant appliances use CARP protocol - Hot Standby
- Remote devices can use simple on-board Fail-to-Wire
- IP Version 6 Routing
- Advanced Anti denial of service capabilities
- Lightweight Tunnels
- NAT
- DHCP Server and Client

### Virtual Private Networking (VPN)
- XipOS optimization operates over any encrypted network
- Installed in-line to optimize the data before encryption
- IPSec-VPN software option for any XA-Appliance
- Enables on-board 128 / 256 bit AES encryption

### Hardware
- RS-232 serial console serial or out-of-band management
- Flash drive resilience for reliability (image backup)
## XA-Appliances

### Hardware Specifications

#### Model XA-50, Model XA-500, and Model XA-500C

<table>
<thead>
<tr>
<th>Height</th>
<th>Width</th>
<th>Depth</th>
<th>Weight</th>
<th>Temp. Range</th>
<th>Power</th>
<th>Certifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>30 mm</td>
<td>290 mm</td>
<td>170 mm</td>
<td>0.9 kg</td>
<td>0˚ to 40˚ C</td>
<td>14 W</td>
<td>CE / FCC</td>
</tr>
<tr>
<td>12 inches</td>
<td>11.4 inches</td>
<td>6.8 inches</td>
<td>2.0 lbs.</td>
<td>32˚ to 140˚ F</td>
<td>14 W</td>
<td>CE / FCC</td>
</tr>
</tbody>
</table>

#### Model XA-2000

<table>
<thead>
<tr>
<th>Height</th>
<th>Width</th>
<th>Depth</th>
<th>Weight</th>
<th>Temp. Range</th>
<th>Power</th>
<th>Certifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>35 mm</td>
<td>225 mm</td>
<td>155 mm</td>
<td>1.6 kg</td>
<td>0˚ to 50˚ C</td>
<td>60W</td>
<td>CE / FCC</td>
</tr>
<tr>
<td>1.4 inches</td>
<td>8.9 inches</td>
<td>6.1 inches</td>
<td>3.5 lbs.</td>
<td>32˚ to 140˚ F</td>
<td>60W</td>
<td>CE / FCC</td>
</tr>
</tbody>
</table>

#### Model XA-4000 and Model XA-10K

<table>
<thead>
<tr>
<th>Height</th>
<th>Width</th>
<th>Depth</th>
<th>Weight</th>
<th>Temp. Range</th>
<th>Power</th>
<th>Certifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>44 mm</td>
<td>430 mm</td>
<td>393 mm</td>
<td>6.0 kg</td>
<td>5˚ to 45˚ C</td>
<td>350W</td>
<td>CE / FCC</td>
</tr>
<tr>
<td>1.7 inches</td>
<td>16.9 inches</td>
<td>15.5 inches</td>
<td>13.2 lbs.</td>
<td>41˚ to 113˚ F</td>
<td>350W</td>
<td>CE / FCC</td>
</tr>
</tbody>
</table>

#### Model XA-30K with Redundant Power Supplies

<table>
<thead>
<tr>
<th>Height</th>
<th>Width</th>
<th>Depth</th>
<th>Weight</th>
<th>Temp. Range</th>
<th>Power</th>
<th>Certifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>88 mm</td>
<td>430 mm</td>
<td>500 mm</td>
<td>17.0 kg</td>
<td>0˚ to 40˚ C</td>
<td>500W</td>
<td>CE / FCC</td>
</tr>
<tr>
<td>3.5 inches</td>
<td>16.9 inches</td>
<td>19.6 inches</td>
<td>37.5 lbs.</td>
<td>32˚ to 104˚ F</td>
<td>500W</td>
<td>CE / FCC</td>
</tr>
</tbody>
</table>

### Specifications for Height, Width, Depth, Weight, Temp. Range, Power, and Certifications:

- **Height**: Measured in millimeters (mm) or inches.
- **Width**: Measured in millimeters (mm) or inches.
- **Depth**: Measured in millimeters (mm) or inches.
- **Weight**: Measured in kilograms (kg) or pounds (lbs).
- **Temp. Range**: Ranges from 32˚ to 140˚ F for Celsius (˚C) to Fahrenheit (˚F).
- **Power**: Measured in watts (W).
- **Certifications**: Includes CE and FCC certifications.