

# AXN10-N Pseudo-Wire Access Device™

## Key Benefits and Features

- IETF PWE3-based Pseudo-Wire capabilities including Circuit Emulation Services (CES), ATM, Frame Relay and HDLC
- Industry-leading CES including enhanced jitter management
- The industry's most robust clock recovery (HPCR®)
- Extensive Ethernet capabilities such as port-based VLAN tagging and switching
- Advanced QoS mechanisms, including rate limiting on a per-port basis, DiffServ and Ethernet VLAN 802.1Q/P
- Field-replaceable, redundant power supply
- Seamless interoperability with all generations of mobile wireless base stations
- Remote management capabilities through Axerra's CLI and AXNVision™ NMS



AXN10-N



AXN10-NR

## Pseudo-Wire Emulation

A mechanism that emulates the essential attributes of a specific service such as T1/E1 leased line or ATM over a Packet-Switched Network

## For Mobile Backhaul and Voice/Data Integration over Carrier Ethernet or IP Access Networks

Axerra Networks' AXN10-N is a flexible, compact, customer-located Pseudo-Wire access device designed to enable cost-effective cell site voice and data traffic backhaul as well as voice and data integration over Carrier Ethernet or IP access networks.

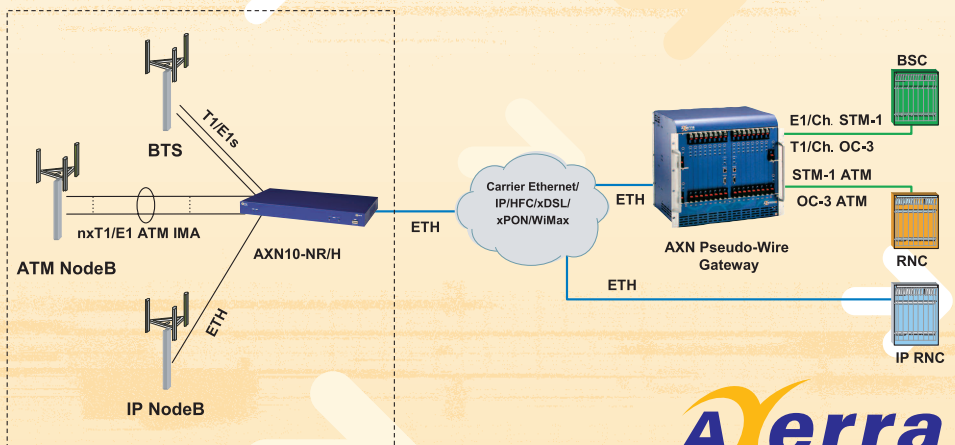
With the AXN10-N service providers can convert any packet access network (Carrier Ethernet, broadband wireless including WiMAX, cable HFC, xDSL, PON, etc.) into a full-service alternative to TDM access and Layer 2 services, such as ATM and HDLC. Mobile service providers can significantly reduce their operational expenses by providing an alternative to costly leased line access and avoiding multiple overlay networks. Wireline service providers are able to preserve customers' revenues from traditional services while migrating to next generation networks. Carrier Ethernet service providers are able to open up new and immediate revenue opportunities by offering profitable traditional services, such as T1/E1 private line and PBX voice backhaul, as well as advanced Ethernet services.

By offering the full range of voice and data services over a single, unified, packet-based infrastructure, providers can cut costs, increase revenues, and expand their market, while preserving business customers' investments in existing equipment, thereby ensuring a non-disruptive migration path to packet-based networks.

The AXN10-N Pseudo-Wire access device is available with 4 or 8 T1/E1 ports as well as three 10/100 BaseT LAN Ethernet interfaces and two 100 BaseFx interfaces (SFP). It is based on Axerra's field-proven Multiservice over Packet (MSoP) technology and is fully interoperable with the other members of the AXN family: AXN1, AXN100, AXN800, and AXN1600, delivering the industry's most scalable family of Pseudo-Wire gateways and access devices.

## Key Applications

- CDMA/CDMA2000 backhaul over packet-based RAN
- GSM/UMTS backhaul over packet-based RAN
- T1/E1 circuit emulation for TDM leased-line replacement
- PBX-to-PSTN backhaul and PBX-to-PBX (tie-line) connectivity
- ATM Services including ATM IMA
- HDLC virtual leased lines for X.25/SNA/IPX transport



**Axerra**  
networks

The Pseudo-Wire Company®

# AXN10-N PRODUCT SPECIFICATIONS

## HARDWARE SPECIFICATIONS

### Physical Interfaces

#### E1:

- Number of Ports: 4 or 8
- Bit Rate: 2.048 Mbps  $\pm$  50 ppm
- Standards Compliance:  
ITU G.703, G.704, G.706, G.732
- Framing  
Unframed, FAS, FAS with CRC4,  
MFAS with CAS, MFAS with  
CAS and CRC4
- Line Code: AMI
- Zero Suppression: HDB3
- Signal Level  
Receive:  
LTU 0 to -43 dB  
w/o LTU 0 to -12 dB
- Transmit:  
3.00V ( $\pm$ 10%) for 120  $\Omega$   
2.37V ( $\pm$ 10%) for 75  $\Omega$
- Jitter and Wander Performance  
ITU G.823, G.8261
- Connectors:  
Balanced RJ-45, 120  $\Omega$   
Unbalanced BNC 75  $\Omega$  connectors via  
an optional adapter cable

#### T1:

- Number of Ports: 4 or 8
- Bit Rate: 1.544 Mbps  $\pm$  32 ppm
- Standards Compliance:  
ANSI T1.403, Telcordia TR-62411
- Framing: Unframed, D4, ESF
- Line Code: AMI
- Zero Suppression: B8ZS
- Signal Level  
Receive:  
CSU 0 to -36 dB  
DSU 0 to -15 dB
- Transmit:  
CSU 0 to -22.5 dB  
DSU software adjustable at 0 to 655 ft.
- Jitter and Wander Performance  
Telcordia TR-62411, ITU G.824, G.8261
- Connectors: Balanced RJ-45, 100  $\Omega$

#### Ethernet:

- Number of Ports: 5  
3x 10/100BaseTx (User or Network)  
2x 100BaseFx (User or Network)
- Standards Compliance:  
802.3 (Fixed settings, autonegotiation)  
802.1Q/P
- Connectors:  
10/100BaseTx – RJ-45  
100BaseFx – LC duplex (SFP)  
SFP transceivers should be  
ordered separately
- Range:  
Multimode – 2 km for 62.5 $\mu$   
Single mode – 15 km for 9 $\mu$

### Indicators

- Power: Green – Active
- PS-1 / PS-2 (AXN10-NR/H)  
Green – On  
Red – Failure  
Off – Not powered / not connected
- Alarm  
Off – No alarms  
Orange – Minor alarm  
Red – Major alarm

- Ethernet  
Link: Green – On  
Activity: Amber – On
- T1/E1  
LOS (Red)  
RAI (Orange)

### Power Options

- DC Power (AXN10-N/H):  $\pm$ 18 to  $\pm$ 72 VDC  
Nominal:  $\pm$ 24,  $\pm$ 48,  $\pm$ 60 VDC
- DC Power (AXN10-NR/H):  $\pm$ 18 to  $\pm$ 60 VDC  
Nominal:  $\pm$ 24,  $\pm$ 48 VDC
- AC Power: 90 to 264 VAC Nominal:  
100 - 240 VAC
- Field replaceable power supply  
(AXN10-NR/H)
- Redundant power supply (AXN10-NR/H)

### Power Consumption

- AXN10-N/H
  - DC: 9W to 13W
  - AC: 10W to 15W
- AXN10-NR/H
  - DC: 11W to 16W
  - AC: 12W to 18W

### Physical Dimensions

- AXN10-N/H
  - Inches: 1 RU (h) x 9.1" (d) x 8.2"  
(1/2 19") (w)
  - Cm: 4.45 (h) x 23.0 (d) x 20.8 (w)
- AXN10-NR/H
  - Inches: 1 RU (h) x 9.1" (d) x 19" (w)
  - Cm: 4.45 (h) x 23.0 (d) x 43.8 (w)

## SOFTWARE SPECIFICATIONS

### Pseudo-Wire Services

#### TDM-CES:

- Framed (CESoPSN)  
n x DS0 (1  $\leq$  n  $\leq$  31)
- Unframed (SAToP)

#### ATM:

- Cell-based (AAL0)  
VPC, VCC, and VCC Bundle modes
- Frame-based (AAL5)
- ATM cell concatenation: single or multiple cells  
encapsulated per Pseudo-Wire frame
- DS1/E1 UNI
- ATM IMA UNI  
Up to 8 ports per group  
Up to 2 groups

#### HDLC/PPP:

- Port mode

#### Frame Relay:

- One-to-One mode
- Port mode

### IP Service Interworking

- HDLC IP Service Interworking
- Frame Relay IP Service Interworking

### Ethernet Services

- Bridging/Forwarding between  
Ethernet interfaces
- Port-based VLAN tagging
- Rate limiting (per port):  
Up to 1 Mbps – 512 kbps steps  
1 Mbps up to 100 Mbps – 1 Mbps steps

### OAM

#### Diagnostics:

- Terminal (Local) loopback
- Facility (Remote) loopback

- FDL
- In band loopback

### Performance Monitoring:

- T1 / E1 (G.826)  
5 x 24 hour interval  
96 x 15 minute interval  
ES, SES, UAS

### Alarms:

- T1  
Alarm Indications Signal (AIS)  
Remote Alarm Indication (RAI)  
Loss of Signal (LOS)  
Loss of Framing (LOF)
- E1  
Alarm Indications Signal (AIS)  
Remote Alarm Indication (RAI)  
Loss of Signal (LOS)  
Loss of Framing (LOF)  
Loss of Multiframing (LOM)  
Remote Loss of Frame Indication (RAIM)

## GENERAL SPECIFICATIONS

### Timing:

- Adaptive Clock Recovery (ACR)
- High Precision Clock Recovery  
(HPCR<sup>®</sup>; optional) Complying with: Telcordia  
TR-62411, ITU G.823, G.824, G.8261
- Internal:  $\pm$ 25 ppm (non-HPCR)
- Loopback timing

### QoS Management

- Dynamic bandwidth allocation between voice  
and data
- Layer 3 Marking – DiffServ
- Layer 2 Marking – VLAN 802.1Q/P
- Jitter buffer – programmable up to  
256 msec

### Management Specifications

- In-band or out-of-band
- SNMP
- Syslog
- Command Line Interface  
(RS-232 / Telnet / SSH)
- AXNVision NMS
- Remote Software Upgrade

### Environmental Specifications

- Operating temp: -20°C – 60°C / -4°F – 140°F
- Humidity: 5%–90% non-condensing

### Regulatory Specifications<sup>1</sup>

- Safety: UL60950-1 CAN/CSA-C22.2,  
EN60950-1
- EMC: FCC part 15-class B, ETSI 300-386-2  
Class B, VCCI Class B



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<sup>1</sup>Please contact Axerra Networks for current approval list