

## A116

### 16 Span T1/E1/J1

**Sixteen spans of T1, E1 or J1 available with carrier-grade hardware echo cancellation — the ultimate high-density solution.**

The A116 is part of Sangoma's family of Advanced Flexible Telecommunications hardware product line – using high-performance PCI Express interface, providing superior performance in critical systems all over the world.

The A116 supports up to 32.8 Mbps of full duplex data throughout 480 voice calls using 16 T1/E1/J1 spans.

With Sangoma boards, you can take advantage of hardware and software improvements, as soon as they become available. The A116, like all boards in Sangoma's AFT family, is field-upgradable with crash-proof firmware.

Choose the Sangoma A116E and A116DE, equipped with world class DSP hardware to achieve carrier-grade echo cancellation and voice quality enhancement functions for telecommunication systems.



A116DE PCIe Board



1U Rack-Mountable Panel

#### Typical A116 Applications:

- Call Centers
- Value-Added Services
- Large IVR Systems
- Gateways and Soft Switches



## Technical Specifications

- Sixteen T1/E1 ports with optimum PCI Express interface for high performance voice and data applications
- Mix T1 channel banks and E1 networks with full channel synchronization. TDM clocking mode lets network timing to be passed from a network-connected DS0 to any or all of the other ports, so both T1/E1 are supported simultaneously
- Support for Asterisk® and FreeSWITCH®
- Fully compatible with all commercially available motherboards – proper PCI-standard interrupt sharing without manual tuning
- Dimensions: Full height by half length (107mm x 176mm)
- Connector: Dense 68 pin SCSI type interface
- Intelligent hardware: Downloadable FPGA programming with multiple operating modes; add new features related to voice and/or data when they become available
- Line decoding: HDB3, AMI, B8ZS
- Framing: CRC-4, Non CRC4, ESF, SF, D4, J1 (Japan)
- PCI Express Bus Version: 1.1
- Power Consumption: 2A @ 3.3V, 0.1A @ 12V
- Temperature range: 0–50°C
- Ring buffer DMA handling for minimum host intervention and guaranteed data integrity on high volume systems
- Supports Robbed Bit Channel Associated Signaling (CAS) and ISDN PRI
- T1/E1 and fractional T1/E1, multiple channel HDLC per line for mixed data/TDM voice applications
- Optimized per channel DMA streams and hardware-level HDLC handling unload the host CPU
- Uses raw bit-stream interfaces to support arbitrary non-standard line protocols, such as non-byte aligned monosynch or bisynch
- WANPIPE® routing stack is completely independent of TDM voice application for total system reliability
- WANPIPE® supports certified, field-tested, and reliable Frame Relay, PPP, HDLC, and X.25
- Impedance: Configurable to 75ohms or 120ohms

## Optional DSP Hardware Echo Canceller Daughter Board

- G.168–2002 echo cancellation in hardware
- 1024 taps/128ms tail per channel on all channel densities
- DTMF decoding and tone recognition
- Voice quality enhancement: music protection, acoustic echo control, and adaptive noise reduction
- Does not increase the physical size of the card, and no additional slot is required

## Operating Systems

- Windows® 2003, Windows® XP, Windows® Server 2008, Windows® Vista, Windows® 7
- Linux (all versions, releases and distributions from 1.0 up)

## T1/E1 Status Alarms

- RED: Telco Red Alarm Condition
- OOF: Out of Frame
- LOS: Receive Loss of Signal
- AIS: Alarm Indication Signal
- RAI: Remote Alarm Indication (Yellow Alarm)

## Line Protocols

Voice CAS, MFC/R2, PRI, ATM, Frame Relay, X.25, HDLC, PPP, SS7, Transparent bit-stream, BSC

## Higher Level Protocols

IP/IPX over Frame Relay/  
PPP/HDLC/X.25, X.25 over  
Frame Relay (Annex G),  
BSC over X.25, SNA over  
X.25, PPPoE, PPPoA, IP  
over ATM



Punch Down Cable

## Certification (Pending)

FCC Part 15 Class A, FCC Part 68, CISPR 22, EN 55022,  
Class A, CISPR 24, AFIC-2016, IEC 60950, JATE

## Diagnostic Tools

WANPIPEMON, System logs

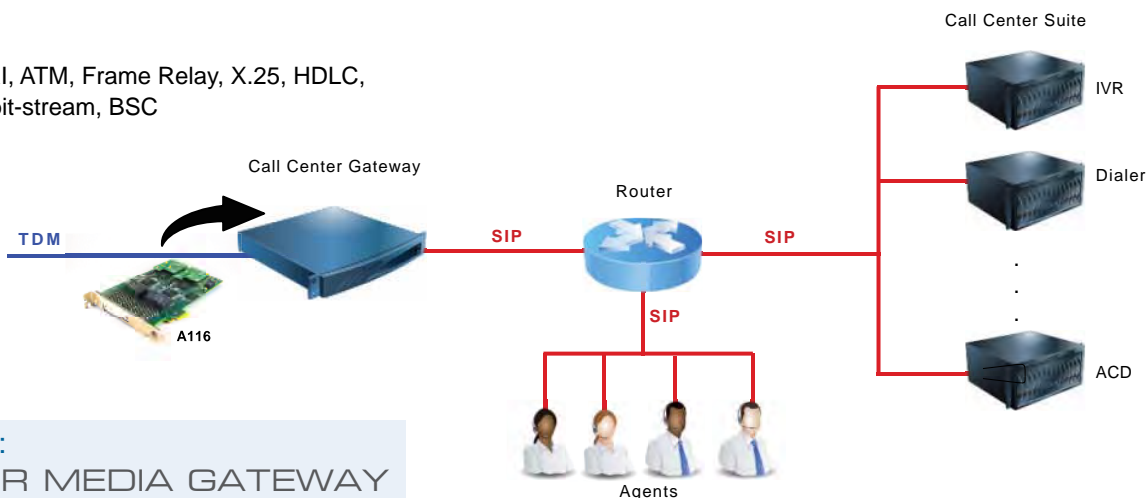
## Warranty

Lifetime warranty on parts and labour. Plus a 30-day no questions asked return policy.

## Production Quality

ISO 9002

## Sample Application: CALL CENTER MEDIA GATEWAY



## Ordering Information

SKU	Description
A116E	PCIe, 16 spans, no H/W Echo Cancellation (not recommended for voice applications)
A116DE	PCIe, 16 spans, with H/W Echo Cancellation
SPEC-A116+PNLKIT	1U Rackmountable Breakout panel with 16 RJ45 ports: Contains a cable with a 68-pin connector at one end and 16 RJ45 female connectors on a rackmountable faceplate at the other end
CBL-649	6-Foot punch down cable with a 68-pin connector at one end and loose 68 color coded wires at the other end. Can be punched down or wire wrapped with the end-users connector block of choice