

# A104 QUAD T1/E1 AFT card

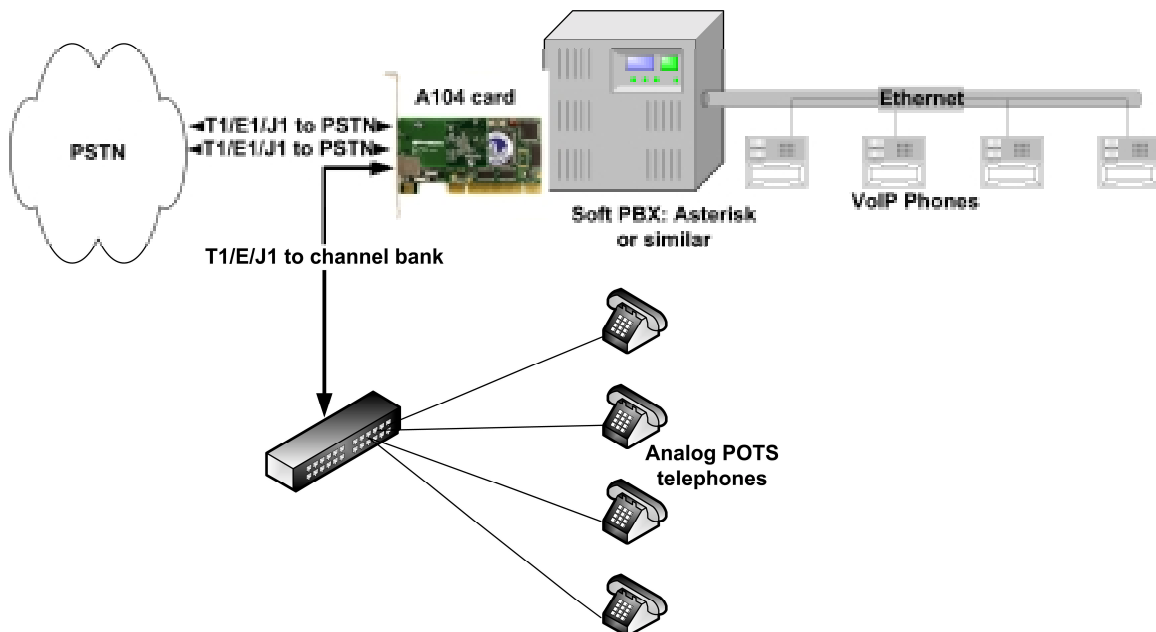
The A104 is an updated, quad port version of Sangoma's range of Advanced, Flexible Telecommunications (AFT) hardware designed for optimum support of voice and data over T1, E1 and J1.



Based on bus mastering PCI technology supported by a ring-buffer DMA architecture, the A104 provides full speed 132 Mbps PCI bus transfer with minimal real-time processor load and fully supported interrupt sharing. This provides optimal performance in demanding environments such as soft PBX/IVR voice applications.

## Operational modes

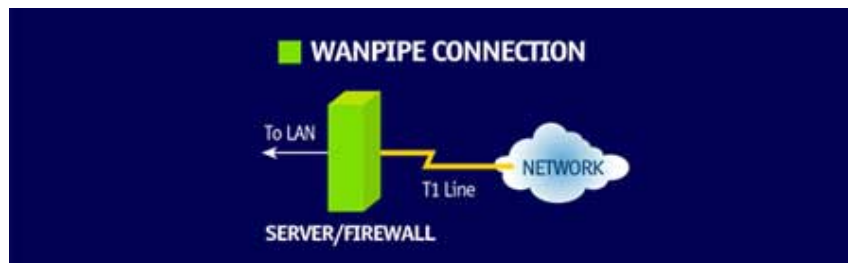
### Voice modes:



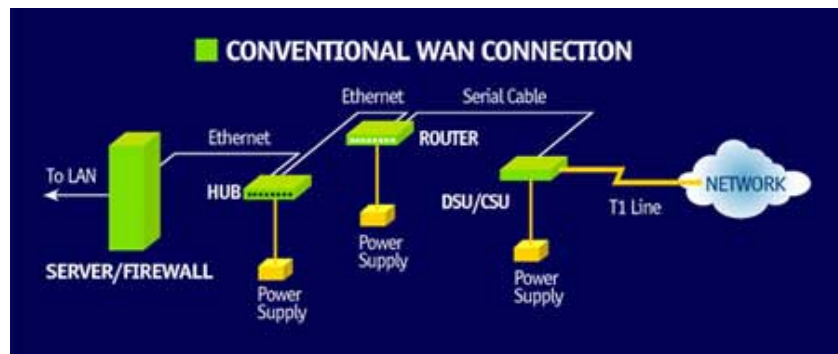
- The A104 and drivers fully support TDM voice gateways for the **Asterisk™** PBX project, as well as other Open Source and proprietary PBX/Switch/IVR applications.

- Supports Robbed Bit Channel Associated Signaling (CAS) and ISDN PRI.
- Block mode raw bit-stream interface for integration with the Asterisk Open Source PBX/IVR platform.
- Channelized mode supporting individual DMA into voice timeslots plus on-board HDLC support of PRI channel for soft PBX implementations that can use these features.
- Field upgradeable hardware allows for new TDM-related functions to be added as they become available.

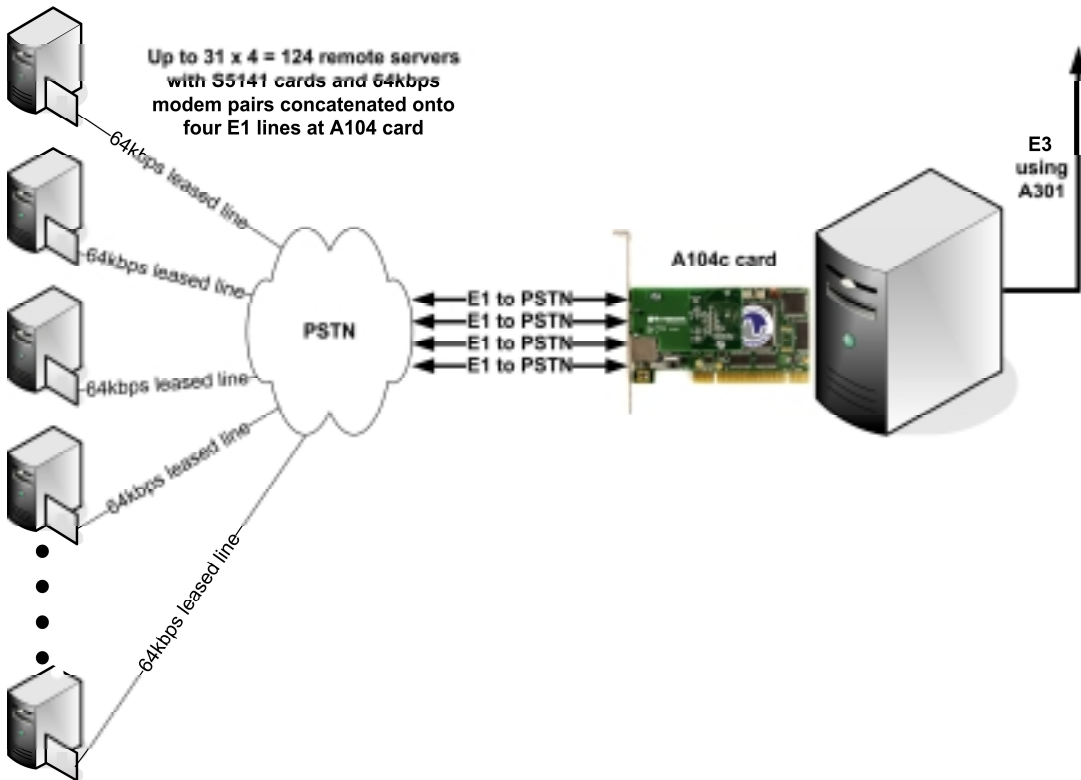
**Data only:**



To Replace

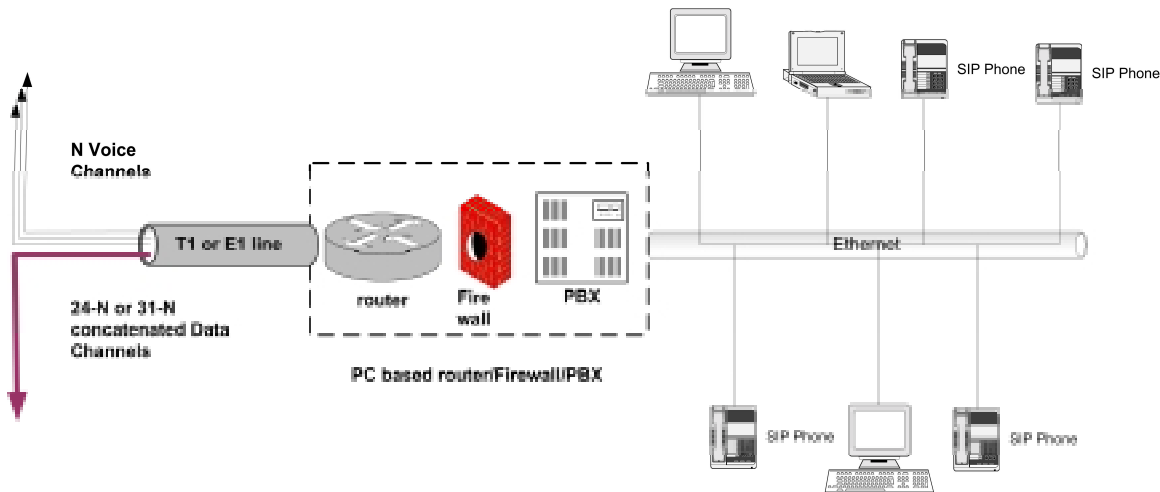


- T1/E1 and fractional T1/E1, single channel HDLC per line.
- Full channelized mode to act as major network hub for sub-DS1 remotes. The A104c can support any configuration of up to 124 remote 64kbps connections carrying Frame Relay, PPP or HDLC data. Timeslots can be concatenated to support remote fractional T1/E1/J1 sites in any combination.



- Raw bitstream interfaces can be used to support arbitrary non-standard line protocols such as non-byte aligned monosynch or bisynch.

### Mixed Voice/Data mode:



- Robust combination of router/PBX functions in one server.
- WAN data connection is supported by Sangoma's standard **WANPIPE**<sup>®</sup> routing stack , completely independently of TDM voice application for total system reliability.
- **WANPIPE**<sup>®</sup> supports certified, field tested and reliable Frame Relay, PPP, HDLC and X.25.

### **Technical Specifications**

- Quad port T1/E1/J1 card.
- Dimensions: 2U Form factor: 120mm x 55 mm for use in restricted chassis.
- 32 bit bus master DMA data exchanges across PCI interface at 132Mbytes/sec for minimum host processor intervention.
- Ring buffer DMA handling for minimum host intervention and guaranteed data integrity on high volume systems.
- Fully supported interrupt sharing through deferred procedure interrupt handling.
- Intelligent hardware: Downloadable Field Programmable Gate Array programming with multiple operating modes. Allows new features related to voice and/or data to be added when they become available.
- Power: 800mA peak, operational 300mA max at +3.3v or 5v.
- MTBF: > 1 Million hours.
- Autosense compatibility with 5v and 3.3v PCI busses.
- Temperature range: 0 – 50C.
- Line decoding: HDB3, AMI, B8ZS.
- Framing: CRC4, non-CRC4, ESF, D4T1/E1.
- Clocking mode: Normal, Master.

### **RJ 45 Pin-out**

RJ45 E1/T1 pinouts	
Pin	Signal
1	RTIP
2	RRING
4	TTIP
5	TRING

### **Operating systems**

Linux (all versions, releases and distributions from 1.0 up). Windows, FreeBSD, Open BSD, NetBSD to follow shortly.

### ***T1/E1 Status alarms***

- ALOSV: Loss of Signal alarm
- LOS: Receive Loss of Signal
- ALTLOS: Alternate loss of Signal Status
- OOF: Out of Frame
- RED: Telco Red Alarm condition
- AIS: Alarm Indication Signal

### ***Line protocols***

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

### ***Higher level protocols***

Asterisk Open PBX/IVR, IP/IPX over Frame Relay/ PPP/ HDLC/ X.25, X.25 over Frame Relay (Annex G), BSC over X.25 (DMT and TCOP), SNA over X.25, PPPoE, PPPoA, IP over ATM.

### ***Warranty***

Three years parts and labour.

- OOSMFV: Loss of Signaling Multiframe
- OOCMFV: Loss of CRC Multiframe
- OOFV: Out of Off-Line Frame
- RAIV: Receive Loss of Signal
- YEL: Receive Telco Yellow Alarm

### ***Certification***

FCC Part 15 Class A, FCC Part 68, CE.

### ***Diagnostic Tools***

WANPIPEMON, SNMP, System logs.

### ***Production quality***

ISO 9002

### ***Contact information***

Tel: 905-474-1990 xt 114

FAX: 905-474-9223

[sales@sangoma.com](mailto:sales@sangoma.com)

<http://www.sangoma.com>