

# Adax SX – Signaling Extender



## Simple and Reliable Backhaul and Concentration of SS7 TDM Transport over IP



### Overview

The telecom market predicted the total demise of circuit switching and the complete replacement of TDM by IP some time ago but in fact today the situation has changed and SS7 is back in fashion:

Service providers need to maximize the return on investment in their networks and are keeping TDM equipment in service, especially the end-node voice switches. In remote communities, such as Africa, India and rural Americas, the solution is much the same - keep the TDM equipment at the edge, modernize the core with IP and backhaul the SS7 links over the core.

Other service providers are turning to virtualization to deploy network elements for multi-protocol, divergent, networks quickly and cost-effectively. They can make new services available more rapidly and at a lower cost but in many cases, they still need to support legacy TDM SS7 connections.

The Adax Signaling Extender (SX) can be configured as an SS7 backhaul device, or as an SS7 link concentrator and front-end interface, to maximize the core network performance:

### Backhaul of SS7 LSL links with M2UA

The Adax Signaling Extender (SX) routes SS7 traffic over an IP network to an IP-enabled device, or routes IP traffic over an IP network to an SS7 device. M2UA is the SIGTRAN User Adaptation layer for MTP2 and the Nodal Interworking Function (NIF) provides transparent connectivity between traditional, circuit-switched SS7 signaling end points and any IP-enabled signaling point such as an SCP, STP, HLR etc. By leveraging MTP2 to M2UA interworking, the Adax SX provides this functionality with no additional point codes and requires no modifications to the MTP3 layer, addresses or routes on either side of the network.

For backhaul, the TDM lines in the local communities remain but are turned into VoIP and SIGTRAN before they go long distances so that those long-haul SS7 links are replaced by IP. Replacing these long-distance, dedicated, TDM circuits with IP over shared-use networks provides substantial savings for the service providers by reducing their core network transport costs whilst preserving their investment in remote TDM endpoints switching systems. The IP transport can also improve the core network performance.

### Front-End Interface and Concentrator for SS7 TDM links

With virtualization the signaling gateway functions are implemented in datacentre servers and service providers can scale and deploy network elements as needed, according to the real-time traffic conditions. But many of them still need to support legacy TDM SS7 connections too. The Adax SX provides a convenient front-end to the Adax vGW for SS7 TDM T1/E1 links (DS0 and HSL) and supports the interface of those legacy TDM SS7 connections to any SIGTRAN protocol over the IP transport.

The Adax SX provides a method of communication for the physical SS7 TDM links to transparently operate over an underlying transport service of SCTP with M2UA. This efficiently carries the data and control elements of MTP2 to the Adax vGW, whilst leaving the high overhead of the TDM elements behind, to improve performance. This interface provides transparent connectivity between the traditional circuit-switched SS7 signaling points and the central SS7 application server. Many SS7 LSLs can be consolidated through the IP connection to the Adax vGW from the SX by being multiplexed over a single SCTP association or distributed over multiple associations.

### Adax SX Features and Benefits

- Maintain SS7 TDM connectivity in IP networks
- Replace long-distance, dedicated, TDM circuits with IP over shared-use networks
- Backhaul SS7 LSLs over IP with M2UA
- Concentrate SS7 TDM links in to the Adax Virtualized Signaling Gateway
- Transparent to the network, no additional point-codes required
- Protect investment in Legacy TDM equipment
- Reduce network transport costs and improve performance with SS7 over IP
- Many SS7 LSLs can be consolidated over single or multiple SCTP links to SCP, STP, HLR etc
- Substantial cost savings with typical 18-24 month return of investment
- Signaling transport reliability guaranteed by Adax SCTP
- Adax SCTP error correction protects against message loss
- Simple management interface with CLI and GUI options
- Pre-integrated, low-cost, small footprint, front-end or backhaul solution in 1U HP DL20 server

## Reliability - Guaranteed

Signaling transport reliability is guaranteed by Adax SCTP's error correction features that deliver a robust, reliable, high performance transport layer to prevent message loss. The multi-homing provisioning options implement link monitoring and fail-over robustness and redundancy for quick recovery.

Security in the network is more important today than ever before as they become subject to attacks with greater frequency and potential damage. Today's interconnected networks are vulnerable to hijacking via insecure links or rogue network nodes. Application vendors can unknowingly allow the network to be compromised when presumably 'secure VPNs' invisibly transport threats within packets, much of which was unimaginable even 5 years ago. RFC 4895 authentication for SCTP addresses this concern without compromising performance or network monitoring visibility.

Adax SCTP/T is the most robust, scalable, authenticated SCTP implementation available and as the transport protocol for the Adax SX and vGW will secure and optimize the network as it grows.

## Virtual HDC-M2UA Software Solution

The complementary Adax virtual HDC-M2UA software product specifically leverages, preserves and enhances the current investment in SS7 stacks and allows an MTP3 application server, SCP, STP, HLR etc to communicate with remote SS7 nodes using M2UA over an IP based core network. By installing the Adax HDC-M2UA software in application servers running SS7 stacks such as Aricent or Trillium and others, the existing MTP3-MTP2 convergence layer will not have to be modified.

The M2UA operates like a virtual SS7 board and the existing SS7 ioctls are automatically converted to the appropriate M2UA control message. This means that the virtual SS7 board is then connected to the remote node with all the SS7-IP conversion simply happening at the application server within the HDC-M2UA software module. This solution offers the following advantages:

- Easy migration of existing SS7 TDM links to IP
- Many signaling connections can be consolidated into the virtual application server
- No modifications required to existing MTP3-MTP2 convergence layer
- M2UA can operate like a virtual SS7 board
- Existing SS7 ioctls are automatically converted to M2UA control messages
- No new point code required, preserving current SS7 pointcode map

## Technical Specifications

### Protocol and Standards Compliance

- SS7 MTP2: ITU-T Q.703, ETSI 300 008, 300 008-1, ANSI T1.111, TTC JT-Q.703, ITU Q.703 Annex A 1996, China SS7 YD/T 1125 – 2001
- A, B, C, D, E, F Links

### SIGTRAN

- SCTP: RFC 4960 (see Adax SCTP/T datasheet for further details)
- M2UA: RFC 3331

### Interfaces Available

- T1/E1/J1 ports
- Drop & Insert on all channels
- GbE ports

### Management

- AdaxGWManager GUI Interface (Web/Java)
- SNMP v2 for Traps and Statistics
- Telnet/Command Line Interface, password protection
- TFTP for software upgrade

### Designed to Meet

- "NEBS Ready" system option designed to meet CE, UL, TUV and FCC
- For Electrical & Safety standards compliance see separate datasheets for the Adax boards

### Environmental Conditions

- Operating -5°C to 55°C
- Relative Humidity 5% to 90%
- Storage -40°C to 70°C

All specifications are subject to change without notice.

## Adax Signaling Gateway Solutions

The Adax Signaling Gateway can be deployed in multiple configuration and platform scenarios as required. See also datasheets for the Adax GW and Adax vGW to get a full overview of our legacy interworking solutions.

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