System T – Breaking down barriers

Decentralised and distributed remote audio production

Solid State Logic

OXFORD · ENGLAND

System T: Remote and at home

Providing audio production services for outside broadcast events and sports has slowly been moving away from the traditional OB truck scenario as the industry battles with reduced budgets and – more recently – with the need to reduce engineers physically being in attendance. This has resulted in new solutions to manage audio productions: 'remote' and 'at home' production.

Decentralised production

The audio requirements of remote and at-home production are similar, but often have different scales at each location. For audio, 'remote production' implies sending I/O and potentially processing equipment to a venue, while also maintaining the advantages of an audio control room with a control surface, acoustic treatment, and monitoring.

'At-home production' generally covers taking the control position somewhere outside of the broadcast centre, such as the audio engineer's home or kitchen table.
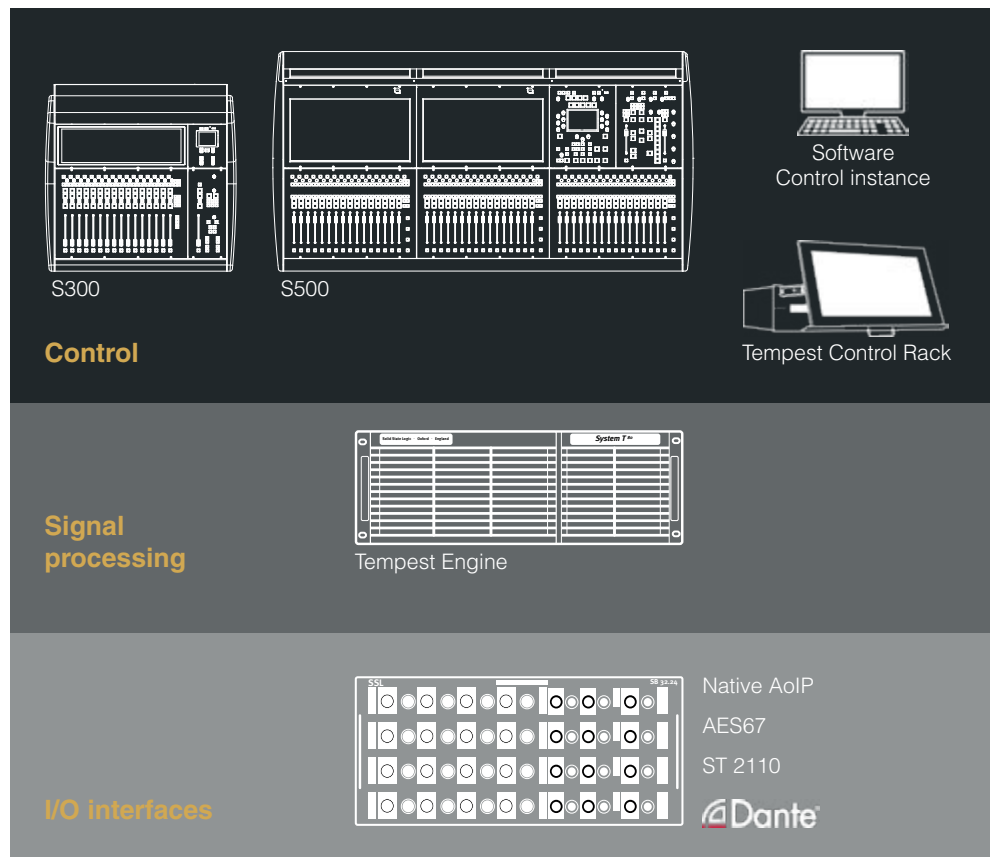
A more general term is 'decentralised production', meaning not all in a single central location. When broken down into I/O, processing and control, with each element as a movable networked entity, scaling the deployment at each location to fit the production requirements becomes much simpler and more efficient. The technology and products required for decentralised production of any form can result in the front-end operational experience becoming universal.

System T – Decentralised and distributed remote audio production

Agile and scalable

SSL's System T and Network I/O break down into I/O, signal processing and control software, all distributed across networked devices and computers. Instances of the System T software can run on control surfaces, SSL rackmount controllers, COTS computer hardware or virtual machines. System T control software is a set of applications, rather than a single app; inter-app communication is also performed using standard network data.
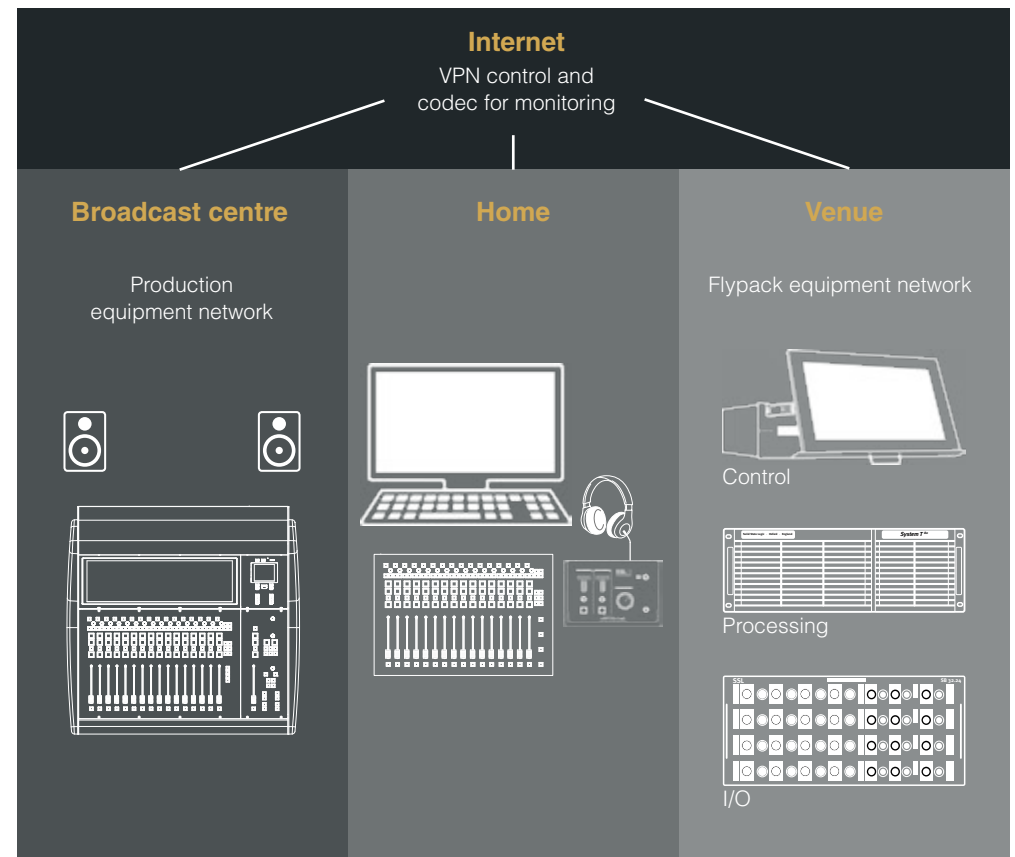
System T technology can facilitate working from home using off-the-shelf components over the internet. Physical console surfaces, or software instances running on your own computing hardware can remotely control the console at your facility via a VPN. All control positions utilise the same GUI design, for a unified user experience.

Software instances can be used with optional physical fader hardware, even at home. Two remote locations can simultaneously connect, with a third position within your facility. Each position has independent fader layouts and GUI displays for true collaborative operation when required.
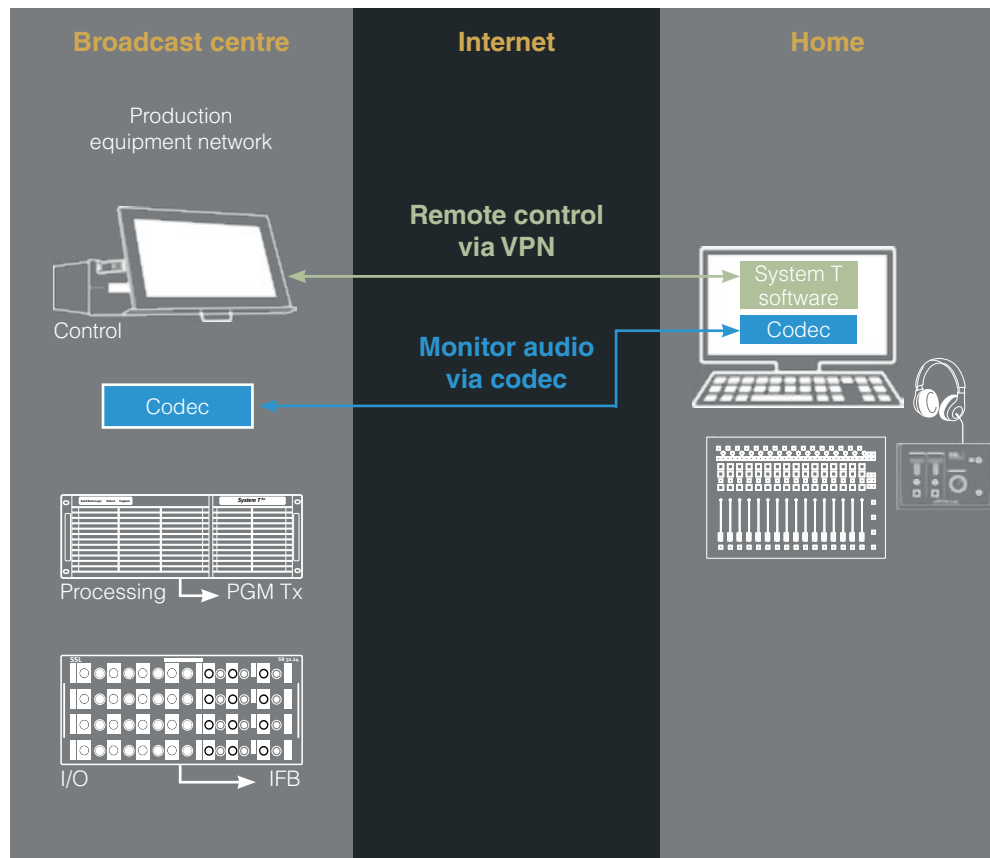
The same technology and concepts can be used for remote production. Utilising a rack of equipment shipped to an onsite venue, this can be remotely controlled from the surface in your broadcast centre, from home, or both. Technical access and mirrored screen capability are provided via an additional remote desktop application. This allows an engineer to take direct control of the back end of the target machine, providing technical configuration and support access independently from the audio engineer's operational remote control. Again, this is over the public Internet.

System T hardware

S300

S500

Software Control instance

Tempest Control Rack

Control

Tempest Engine

Signal processing

Native AoIP

AES67

ST 2110

Dante

I/O interfaces

Decentralised: remote and at-home production

Internet
VPN control and codec for monitoring

Broadcast centre

Production equipment network

Home

Venue

Flypack equipment network

Control

Processing

I/O

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Backhaul for monitoring

There are many technologies and codecs available for getting audio and video between two geographical locations. The type of event and connectivity available will likely be the primary factor when deciding whether to use an audio codec or piggyback on to the video transport. Processing placed at the venue or broadcast centre provides near-zero latency audio feeds for IFB and production mixes, these can be controlled remotely or from home. The audio monitor section requires transporting to the mix position: System T's virtual monitor output can be routed to any transport technology, the console simply sees this as I/O. The high-quality uncompressed production mix can separately be supplied directly from the console's processor.

Broadcast centre | **Internet** | **Home**

Production equipment network

Control

Remote control via VPN

System T software

Codec

Monitor audio via codec

Codec

Processing → PGM Tx

I/O → IFB

Audio monitoring

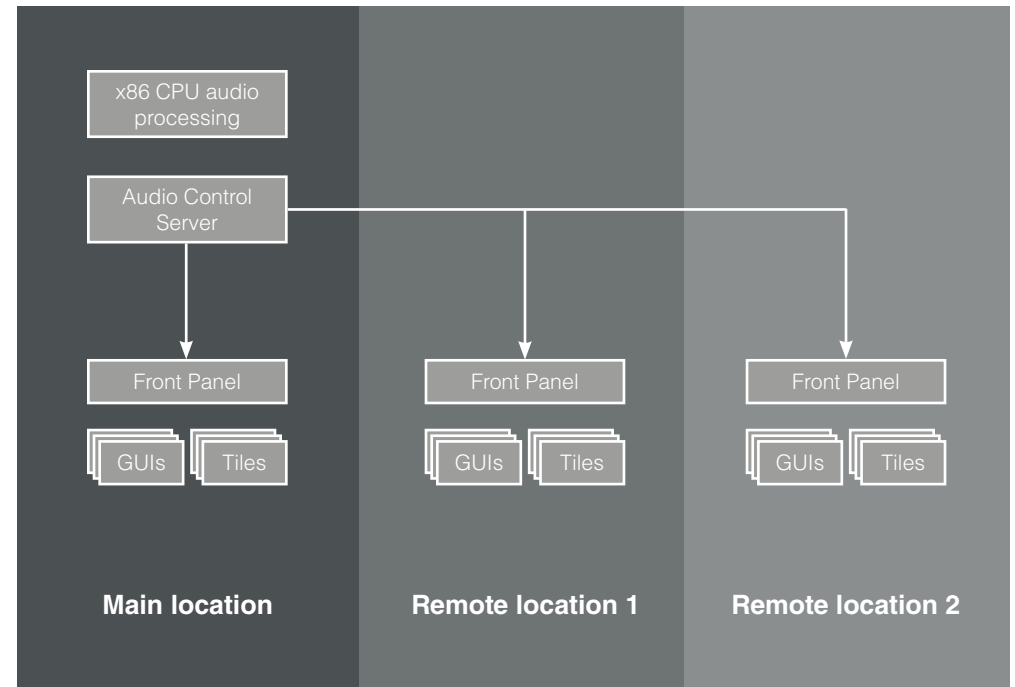System T – Decentralised and distributed remote audio production

Software architecture

Within System T, a core application is 'Audio Control Server' (ACS). This handles the parameter states for processing, integrating APIs and serving the other applications in the system. The control surface 'Front Panel' (FP) software is a client of ACS, and alongside GUIs and hardware tiles (e.g. faders) can be distributed and decentralised across a VPN.

Multiple surface or software client instances can simultaneously interact with the console, each providing their own local view and representation of the audio console, which is tailored – or restricted – for that user position. Breaking down the software into networked functional blocks, providing stateless GUIs, stateful control and signal processing further enhances the ability to decouple and decentralise components of the audio system.

With System T, each Front Panel instance provides its own independent view of the audio console. The selected path is a feature of Front Panel, allowing each operating position to be used simultaneously and independently, for fully distributed workflows. The main and remote positions can adjust processing and routing on different channels or buses, at the same time, without interfering with each other. The current layer/bank, and the layouts of layers and banks are unique to each front panel, each remote position can be configured to control the channel and buses they need from the surface, splitting functional usage between each location. Furthermore, additional layers may be configured to take over control if required for resilience purposes.

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Distributed capabilities

Networked surfaces, software, I/O interfaces and processing engines with transport, discovery, connection, control, and security layers are the building blocks of System T. Remote capabilities are as flexible as your ideas and connections. Remote across a facility, remote across a city, remote across a continent. Distributed and decentralised, providing true collaborative workflows, System T scales to your agile production requirements from home, the studio and the venue.

What next?

Find out more with a personalised demonstration on how SSL solutions can help transform your remote audio workflow.
Please contact our team via our regional offices or head to www.solidstatelogic.com for more information.

International HQ: Begbroke, Oxford, OX5 1RU, England
Tel +44 (0)1865 842300 · sales@solidstatelogic.com · www.solidstatelogic.com

Los Angeles: Tel +1 (818) 643 7040 · lasales@solidstatelogic.com
New York: Tel +1 (212) 315 1111 · nysales@solidstatelogic.com

Paris: Tel +33 (0)1 48 67 84 85 · frsales@solidstatelogic.com
Tokyo: Tel +81 (0)3 5474 1144 · jpsales@solid-state-logic.co.jp

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