SKYLARK TECHNOLOGY INC.
PRODUCT CATALOG
October 2022

SL NEO Media Platform Software
SL NEO Media Servers and Processors

Multiformat Capture, Ingest & Playout
On Air Graphics & Channel Branding
Open and Closed Captioning
Live Production: News, Studio, Sports
Live Censorship
Media Asset Management
File & Signal Processing
Multichannel Monitoring
IP and ASI Encoding
MPEG TS Processing
Web Streaming

10/2022

SL NEO
MEDIA PLATFORM

workflow designer

SL NEO Software Media Platform

The SkyLark concept is based on the interaction of software modules with different functionality, working together in realtime on one or more hardware platforms and performing certain sequences of operations with streaming and file content according to schedules and rules.

To organize the workflow for media production or playout, you need to select the number and types of software modules by functionality and define the interconnections between them.

A wide range of types of software modules supporting all modern technologies, standards and protocols, with flexible and detailed settings, together with client applications and Web-clients, constitute a single universal system for organizing and supporting media workflows: The SL NEO Software Media Platform, developed by SkyLark Technology Inc.

For the media industry, ensuring the reliability and resilience of technological systems is a priority. SL NEO platform modules support various "hot" redundancy schemes with alarm functions and auto-synchronization of content and running schedules.

SL NEO Server Software Modules: Roles and Main Features

SL NEO Base Module is the Center for communication and data exchange between all modules of the Platform.

Uncompressed audio-video realtime streams with embedded additional data (SCTE tags, Closed Captions, Timecode, etc.) are used for the internal exchange format between Software Modules.

SL NEO Base Module contains a virtual router for internal uncompressed streams, codecs for media files and I/O compressed streams, a Web Server for local or remote Platform configuration via web browser, and other software components that ensure system operation.

Stream Capture Module decodes a single ASI/IP stream or receives a SDI/HDMI data from a single port of capture card. The module extracts ANC data from the input signal or stream. Contains a built-in MPTS demultiplexer, extracting a single stream from input multiplex.

The result of decoding is one uncompressed audio/video/data stream for transmission to connected modules (for example, to file recorder) and one proxy stream for visual monitoring over the network.

The number of active Stream Capture modules determines the number of Capture Ports of the system.

Functional Diagram
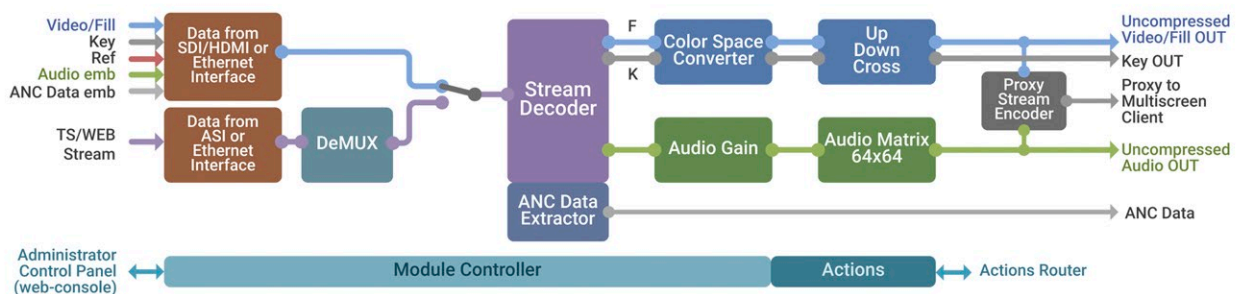
File Recorder Module receives one uncompressed audio/video/data from the connected module, performs encoding according to the selected rec profile (resolution, fps, AV codecs, file container) and writes to files according to the loaded schedule or according to the defined rules.

File Recorder works together with the SL NEO Media Database and the original metadata is transferred from the recording sheet lines.

SL NEO Software Media Platform

File Recorder makes 2 parallel recordings: full res and proxy, records ANC Data and supports LTC/VITC.

According to the schedule, the recorder can send commands through the Device Server module to the SDI router to switch signal source and control VTR via Device Server in batch capture mode.

Functional Diagram
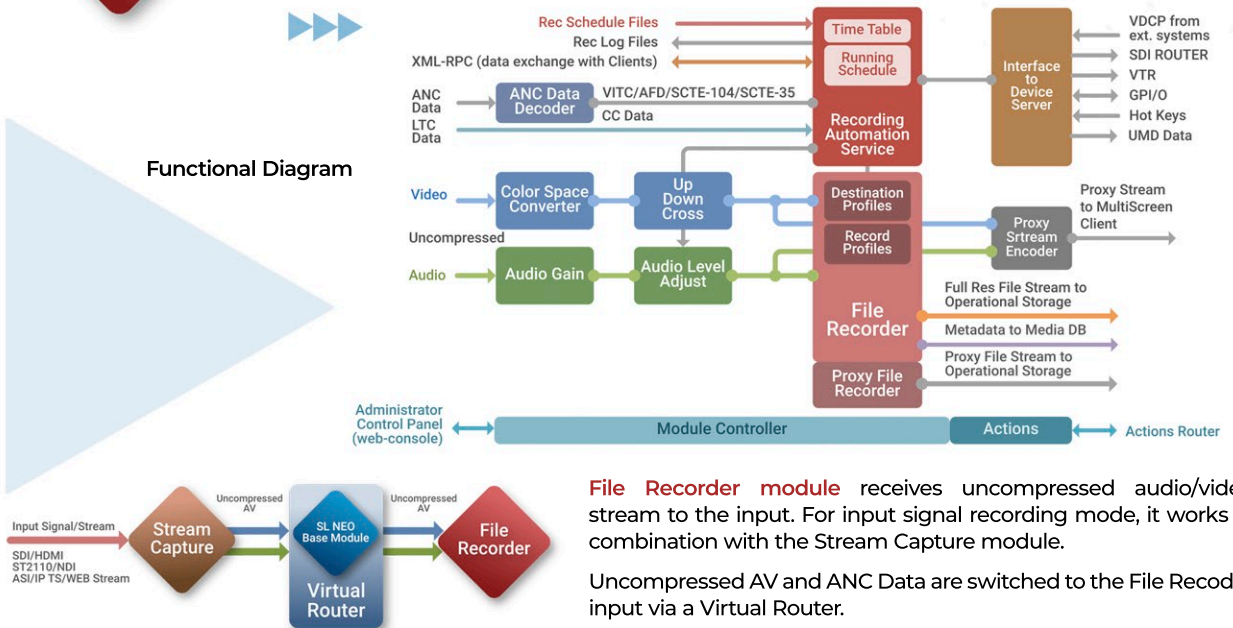
File Recorder module receives uncompressed audio/video stream to the input. For input signal recording mode, it works in combination with the Stream Capture module.

Uncompressed AV and ANC Data are switched to the File Recoder input via a Virtual Router.

Transfer Manager automatically copies and moves media files between archives, NAS, NLE and ingest/playout servers based on rules. In priority download mode for playout, the executable playlists are analyzed.

File processing during copying (in the Pro version): transcoding (changing resolution, FPS, codec and container), sound level or volume normalization and proxy generation.

Transfer Manager provides online synchronization of content playout servers SL NEO, the main and backup half sets.

The module supports multithreaded copying with adjustable speed, which allows creating transcoding farms on multiple hardware platforms based on Transfer Manager, working by one or more rules.

Transfer Manager supports copying CLF playlists files for guarantee delivery from traffic to watch folders on Playout Servers.

The module can be used for automatic encoding of subtitles from supported text formats into MXF with S436M tracks (SEA607/708/OP47).

Media Database significantly expands the functional scope of the operating system when working with media: the user does not work with files but with clips, text metadata enables material search by basic attributes: time, place, event, person, while additional technical profiles, such as proxy, enable collective editing without a significant load on the network.

The functionality of the module depends on the settings and license type.

Extended functionality is designed for media archives of different levels: from the production archive of a news department to the archive of a television company based on tapes (LTO).

The functionality of the Media Database module allows you to automatically scan and index network file storages, thereby adding new materials to the archive. The metadata schema can be customized by users with appropriate access rights. The module provides the functions of individual levels of access to content.

Each SL NEO 1000-3000, 5000-7000 series server comes with an included Media Database module that operates 10 text metadata fields in the initial configuration.


Program Player works as a playout automation system for a single PGM Channel with layered graphics and external device control. The module runs a schedule containing "main" and "secondary" events.

The final PGM video is a composition containing several layers (from bottom to top):

- full-screen BG Layer (e.g. external Live Feed),
- full-screen Main Layer (File Playout Layer overlapping BG),
- 8 independent Graphic Layers. Each layer contains a graphic player with a title generator. Player can be set to play a selected graphics clip or use a its own playlist,
- logo layer (one or more graphics files or clips).

The final PGM video/audio is rendered directly during playback.
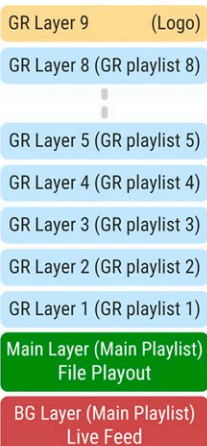
Program Player

Graphics players can work autonomously and be controlled manually (e.g. in a production studio). Module can control external devices - SDI routers via Device Server, as well as external graphics systems (Chyron, Vizrt).

Program Player generates service data for the Multiscreen module and external multiviewers using TSL/UMD protocols, allows you to display interactive information about the current state of events.

### Data Processing During Playout

Program Player receives and processes DTMF and SCTE-104/SCTE-35 data in the signal from the central station. SCTE data in the input signal is received and transmitted by Stream Capture module. Program Player starts and stops events with identifiers specified in SCTE metadata.

The DTMF and SCTE-104/SCTE-35 generation mode is used to control of regional insertions. Tag positions and SCTE metadata are generated by Program Player according to the information specified in the playlist fields. Embedding SCTE data into the output signal is performed by the Stream Encoder module.

Program Player supports generation of CEA-608/708, OP-42/47 Closed Captions in Live or File modes. Integration with FAB, Polistream devices allows you to implement Automated Live Captioning for News, Sports and other live programming.

In File Mode Program Player use text files with markup as sources for Closed Captions. Module also supports Closed Captions and Teletext retransmission mode.

Functional Diagram
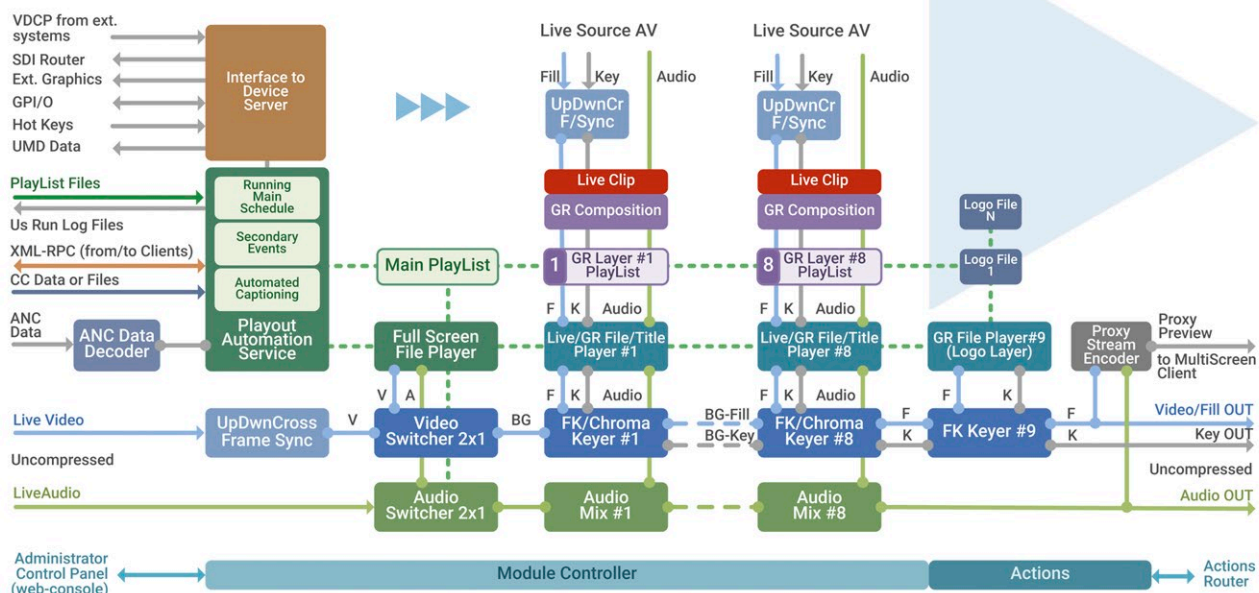
In live production, a Short Delay of a few seconds is often used to quickly "block out" clauses and other undesirable moments.

Typically, a delay time of 7 seconds is a common value in broadcast practice (a feature called Seven Second Delay or Profanity Delay).

Profanity Delay module uses server memory as a buffer to store data.

The second type of time delay is a delay with a shift of output signal relative to input signal from 3 minutes to several hours.

The function is implemented by the Time Shift module. The disk system acts as a buffer for data storage. This technology is popular in the U.S. for pouring tape from the east coast to the west coast, in different time zones.

Profanity Delay

Time Shift

IR & LSM Player module performs Intant Replays and Slow Motion Playback of recorded fragments, works together with file recorders.

IR & LSM Player is a basic element of 7000 series servers. By operator's commands, the module instantly switches to the slow motion playback mode, selects the input (camera) for slow motion playback, and the repeat can be programmed.

Smooth speed control: from -200% to +200%, the change of speed up to the playback of a single frame. Quick markup and creation of clip bases, fast editing, editing and playback of selected scenes.

The module has 2 outputs - Program and Preview with display of service information.

IR & LSM Player

MultiScreen

One **MultiScreen module** can accept up to 24 input signals and streams of all possible formats and arrange their video sequences in 24 windows of multiscreen composition, with an indication of audio or loudness levels.

Alarms for freeze frame, black field and audio level deviation from specified values are available.

A separate window can display the clock and current date. Integration with File Recorder and Program Player modules: this allows you to visualize information about playback and recording schedules.

The uncompressed virtual video/audio stream from the output of the Multiscreen module connected to the input of the Stream Player module via Virtual Router. In such a way the additional SDI/HDMI or AS/IP MS output is implemented in SL NEO servers, the same principle is used in Multiscreen Processors SL NEO 8000 series.

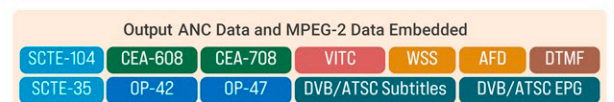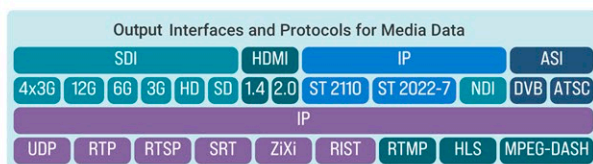**Functional Diagram**
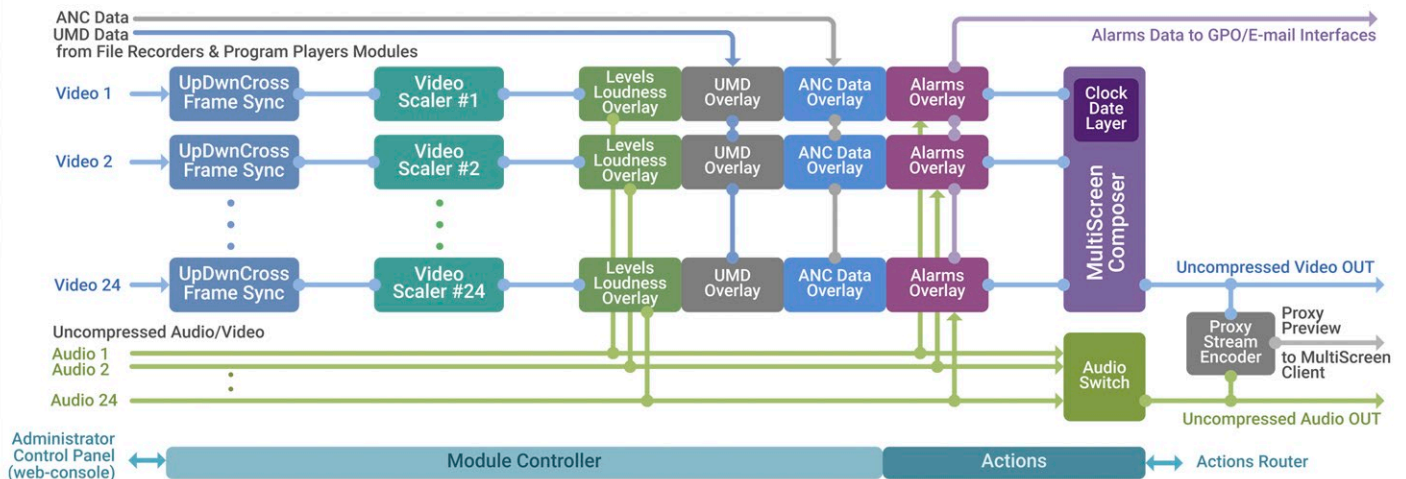
Stream Player

One **Stream Player module** encodes and generates one stream of MPEG2/H.264/H.265 via ASI or Ethernet interface. In SDI/HDMI mode Stream Player provides an interface to the output board, in SDI/NDI modes it can generate FILL and KEY.

The module accepts uncompressed audio/video/data as input (internal data exchange format between all SL NEO modules).

Stream Player performs signal and data processing operations:

- up/down/cross conversion with changing video frame rate;

- loudness normalization for audio streams in accordance with EBU-R128, audio levels normalization and dynamic range compression;

- DTMF generation, multiplexing into the output stream data of Closed Captions, SCTE-104 or SCTE-35 markers, as well as as EPG, AFD and VITC.

To generate several streams with different protocols, resolution and FPS parameters several Stream Player modules will be required, according to the number of streams. Uncompressed signals to their inputs may come from the same source via Virtual Router.

Output Interfaces and Protocols for Media Data			
SDI	HDMI	IP	ASI
4x3G 12G 6G 3G HD SD	1.4 2.0	ST 2110 ST 2022-7 NDI	DVB ATSC
		IP	
UDP RTP RTSP SRT ZiXi RIST	RTMP HLS MPEG-DASH		

Output ANC Data and MPEG-2 Data Embedded					
SCTE-104	CEA-608	CEA-708	VITC	WSS	AFD	DTMF
SCTE-35	OP-42	OP-47	DVB/ATSC Subtitles	DVB/ATSC EPG	

Functional Diagram

SL NEO Software Media Platform
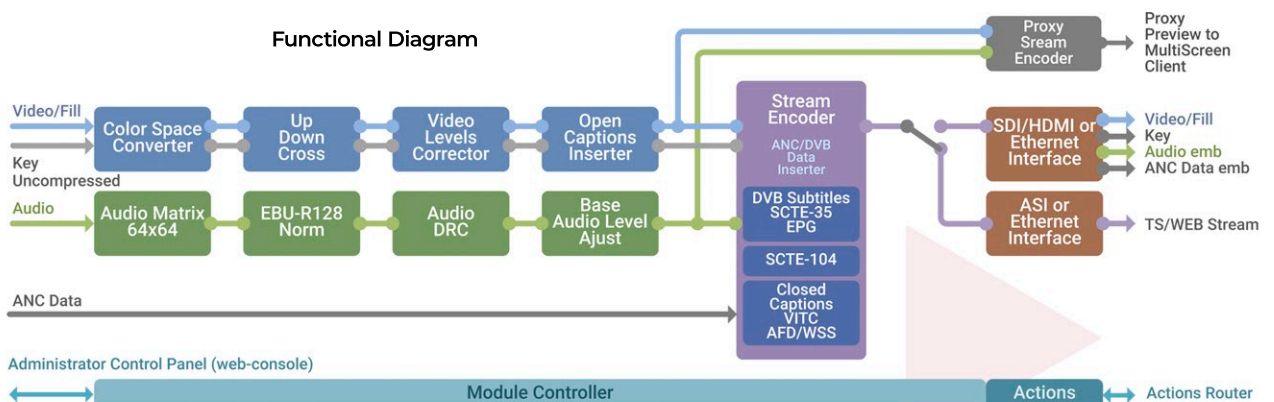
Media streams exchange between SL NEO Server modules.
Maximum possible number of modules of each type on one hardware platform.
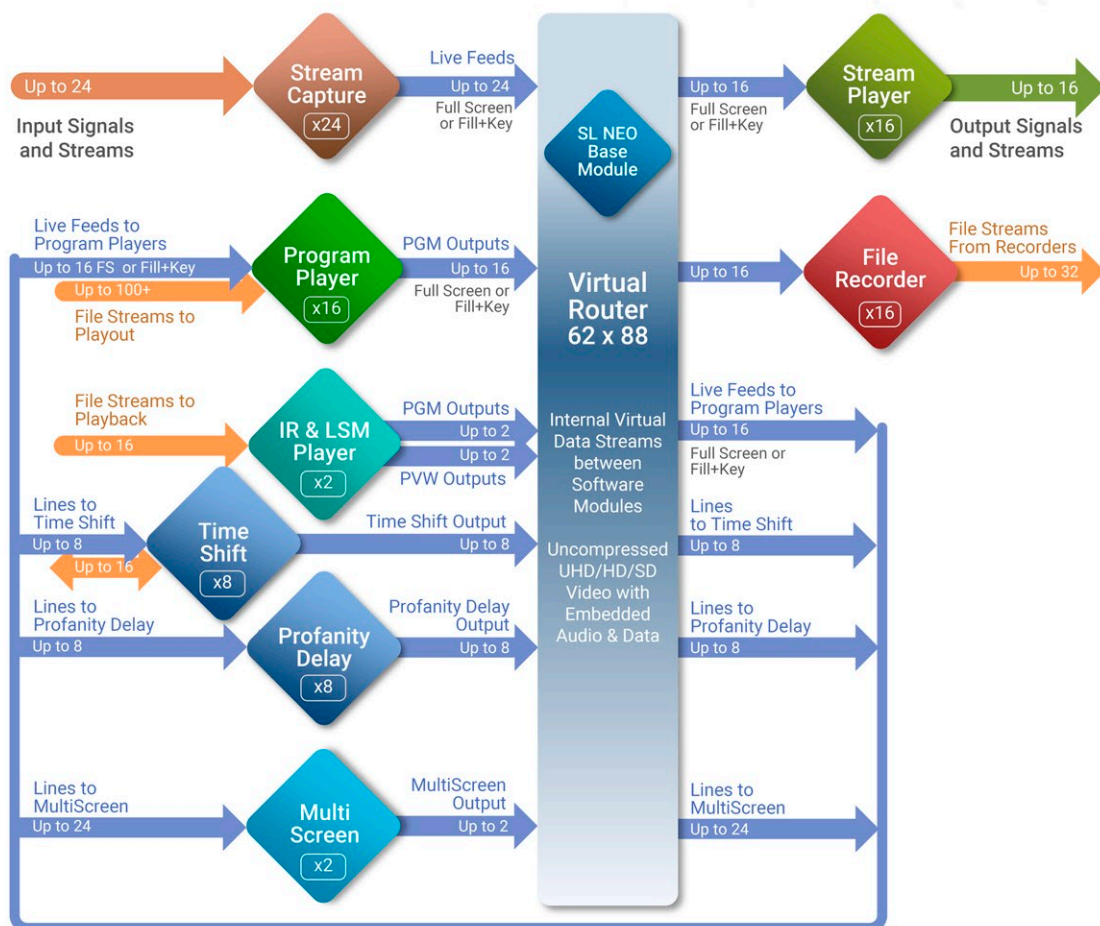

Software Interface to External Sysems & Devices

During rec/playout, Device Server Module receives commands from the File Recorder or Program Player and retransmits them to external devices through software and hardware interfaces.

External Devices controlled from the SkyLark SL NEO Recording/Playout System:
- SDI Routers via Serial/Ethernet (Evertz/Leitch/BMD/Snell/Nevion/Grass Valley/Ross and others),
- VTRs with RS-422 (Sony 9-pin Remote Protocol) or IEEE1394,
- GPI/O Devices via USB modules Ontrak,
- Vizrt (direct integration) or Chyron Graphics Stations (CII, Chyron Intelligent Interface),
- Audio Devices (Ember+),
- Multiviewers with TSL5 UMD Protocol.

SkyLark SL NEO Recording/Playout System in slave mode:

The File Recorder and Program Player modules can receive control commands from external Systems via VDCP over IP in slave mode, as well as from external control panels and devices via GPI/O and Hot Keys.

Action Router

The SL NEO software modules can exchange control commands to perform certain actions.

The main part of this technology is the Action Router module, it is responsible for control level communication.

The SL NEO Command Exchange System is used to automate several parallel processes during the execution of recording and playback schedules:
- controlling the start/stop of secondary graphic events from markers in the main playlist lines,
- controls the start/stop of recording and playback events from external commands or from markers,
- to generate control commands and DTMF/SCTE-104/SCTE-35 messages according to the markers in the main playlist.

Interaction of software modules with Action Router is performed via XML-RPC protocol.

Client Software & Web - Clients

The SL NEO Client Software is designed to workflow management from workstations via the local network. The user interface and connections to the server components are configured for each workstation, according to its role.

If the server components are located in the data center and remote management carried out through a global network, the SL NEO Web Applications Server allows remote clients to monitor and manage all processes via a web browser.

Client applications connect to the server modules, display the current status of operations, and provide full control and management of the execution progress of recording and playback schedules.

The SL NEO Client Software includes tools for collective non-linear editing by proxy copies, network editors for creating and editing multi-layered compositions of graphics and design templates, tools for file import, transcoding, cataloging, search, browsing, and markup of materials.

Directly from workstations you can manually control SDI switches and redirect IP streams, control the passage of signals between software modules, at all points of the virtual path.

Air Manager

Air Manager is a multifunctional application that combines tools for managing multiple recording and playback channels, record- and playlist editors, networked graphics editor, tools for searching, viewing, importing and marking up file content.

Record Control

Record windows with executable record sheets (by the number of recording channels) display the list of recording tasks and their current statuses.

Each Record window connects to the File Recorder server module and displays its status. For each event, the source is specified, which may be an external line, or a VTR.

Rec-lists are loaded either from the media scheduling system or prepared in the rec-list editor.

The functions of creating, editing, inserting new lines or a rec-sheet file in the executable recording schedule, setting the «life» time of the material are implemented.

Each Record window contains an indicator of the input audio level and level control.

The number of record control windows is not limited and is set in the process of software configuration.
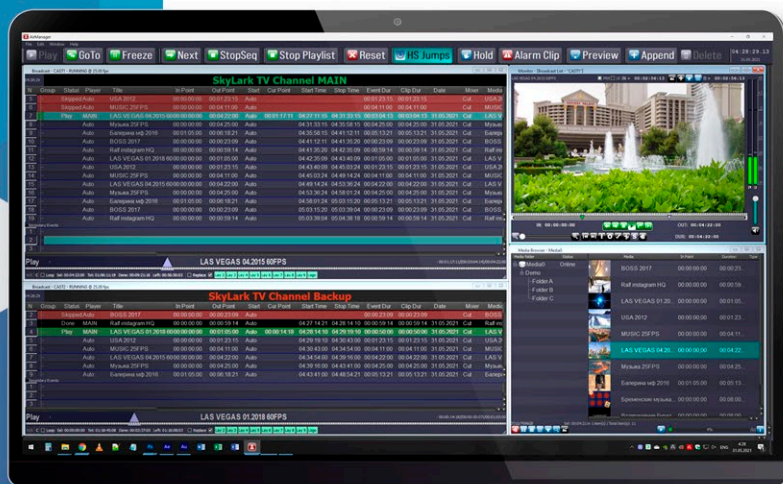
Playout Control

The Air Manager user interface may consist of multiple windows named "Broadcast".

Each window is connected to a specific active Program Player module and displays the current schedule into the module and the status of events. "Broadcast" windows allow you to control the playout of many channels from one workstation.

The playlists are loaded from scheduling systems, Excel files, or compiled in Air Manager's built-in playlist editor.

"Broadcast" windows let you edit the playlist and the events in the list, including emergency jump to any event, hold functions, alarm clip insertion, and much more.

Each main event in the playlist can be linked to Slave or Secondary events. A secondary event can be, for example, a graphic composition whose start of playback is linked to the start of the main event.

Media Browser

The Media Browser window displays the storage contents of each of the servers to which you have a network connection.

The Media Browser features manual import of files into the server storage, adding a brief description, searching, filtering, setting «lifetime», and exporting materials and their fragments.

Media Data Management also includes services for managing import task lists, transcoding capabilities during import-export, and proxy copy creation.

SL NEO Software Media Platform
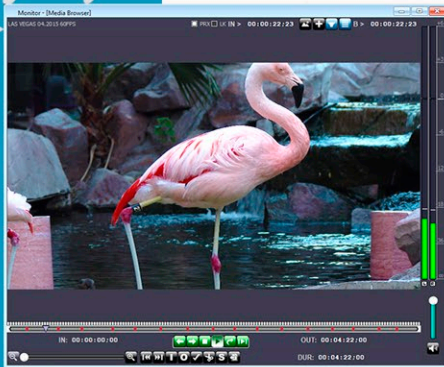
▶ **The File Monitor window** is used to view clips selected in the Media Browser or in the Play/Record list lines. Easily change the IN and OUT points, including the OUT point for the playing event.

▶ Using a proxy for browsing does not load arrays and makes it possible to connect many client workstations to servers on the network at the same time.

▶ Quick navigation through keyframes, choosing audio tracks for listening and level monitoring.

▶ File Monitor video and audio can be redirected from the video card of the client station to the SDI/HDMI Output Board to view content in Full Res on an external video monitor, with an overlay of audio levels and timecode.

▶ Support for Hot Keys allows the use of standard USB Jog-Shuttle mounting controllers and keyboards to work with video.

Network Graphics Editor

▶ Allows you to create and edit titles and graphic compositions. It is a module within the application's Air Manager, News Cut, connect and interacts with Media Database.

▶ All source materials for and results of the work are stored on server storage. Rendering is performed by the server directly during playback.

▶ Graphics Editor allows you to work with static graphics, 32-bit video files, Live video.

▶ Editor has a comprehensive set of tools for creating graphics with 2D DVE, titles including reels, crawls, TV clock, and RSS feeds.

News Cut
Network Video Editor

▶ Network client application for collective editing of news reports using proxies.

Source material is stored in a database of one or more SL NEO servers, all News CUT users have network access to the database and proxy.

▶ The results of editing are stored in the server database in the form of text XML descriptions of the editing solutions, and the stories are available for playback immediately after editing is completed.

There is no need to use rendering, because the source material is played back by editing points. Titles and graphics are overlaid during playback.

▶ Thanks to the «growing file» technology, it is possible to edit materials that are in the process of recording.

A set of effects for video and graphics layers includes 2D DVE, Chroma Key, adjusting audio levels and playback speed.

▶ News CUT is very similar to the standard NLE editors in its feature set, allowing you to assemble multi-track compositions on TimeLine, add simple Mix/Wipe transitions and layer graphics such as texts, placeholders, backgrounds, warped video, animation and Voice-over.
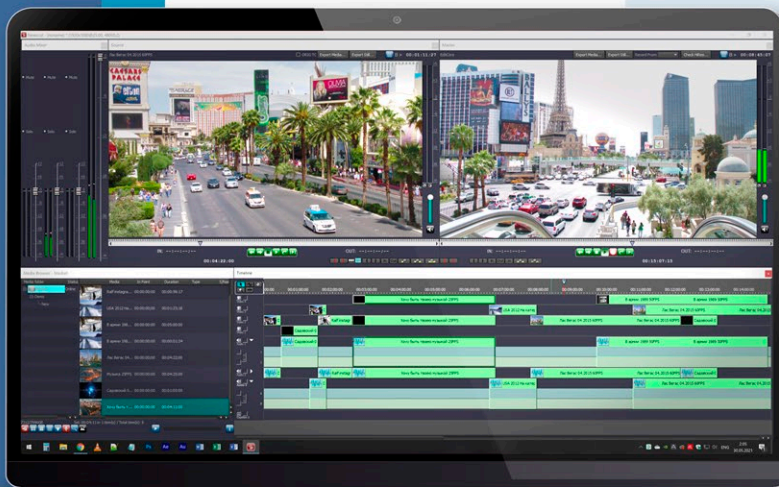
Web - Clients

▶ When creating a «cloud» systems, the installation of client applications is not always possible and appropriate.

▶ For cases where the server components are located in one or more data centers, and ingest & playout is carried out via the Internet, SL NEO Web Applications Server allows remote clients to monitor and manage the system functionality through a web browser.

▶ For web-clients can manage all the basic functions of the SL NEO platform: Ingest & Playout Remote Control, File Ingest, Content Searching, Browsing and Management, I/O Streams Preview, Compliance Recording preview via the web.

SL NEO Software Media Platform

Media File Transfer

Automatic operations provided by **Transfer Manager Software**, a part of the SL NEO Media Platform.

Transfer Manager is intended for automatic multithreaded operations with arrays of media files and metadata between nodes of production and broadcast systems: Tape Archives, Workstations, NLEs, File Servers with SMB support.

Transfer Mansger contains a server part and a client part. The server part can be run on any PCs in the common network.

Client connections are possible via LAN or WAN using a web browser.

▶ Transfer Manager Lite and PRO

The Lite version only copies and moves files without processing: no file changes are made, proxy generation is included.

TM Lite comes in a basic package with the SL NEO 1000–3000 and 5000–7000 Series Servers.

TM Lite is also available as a «standalone» version.

TM Lite used In Redundancy Schemes for continuous on-line content synchronization between the Main and Backup Playout Servers (files + metadata).

The PRO version performs File Transcoding and Processing during transfer:
- File decodig to Uncompressed AV Data level,
- Up/Down/Cross Convertion (with FPS, Color Spaces Conversion),
- Output Loudness Normalization (LUFS Scale, according to EBU R-128),
- Audio Levels Normalization (dBFS Scale),
- Audio Dynamic Range Conversion,
- Audio Tracks Mapping,
- Closed Caption Processing (readind text file, generating CC stream and inserting it into File and vice versa),
- File Encoding with same or other types of AV Codecs and File Container.
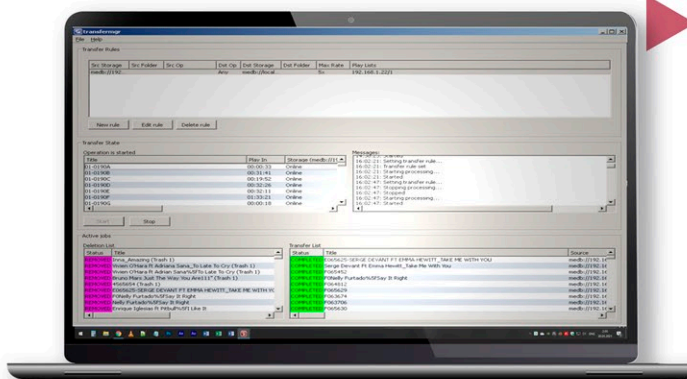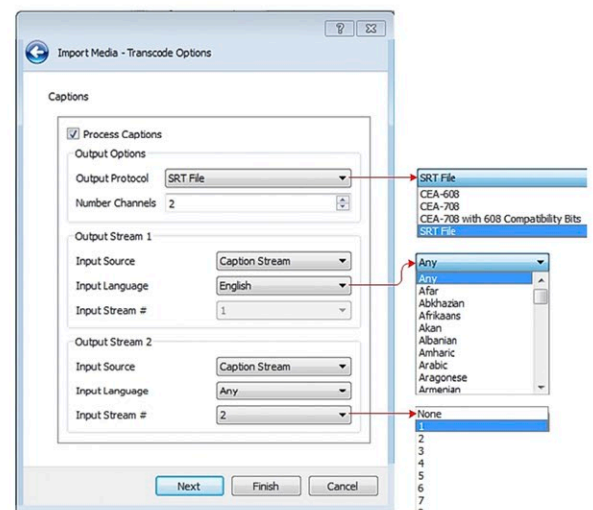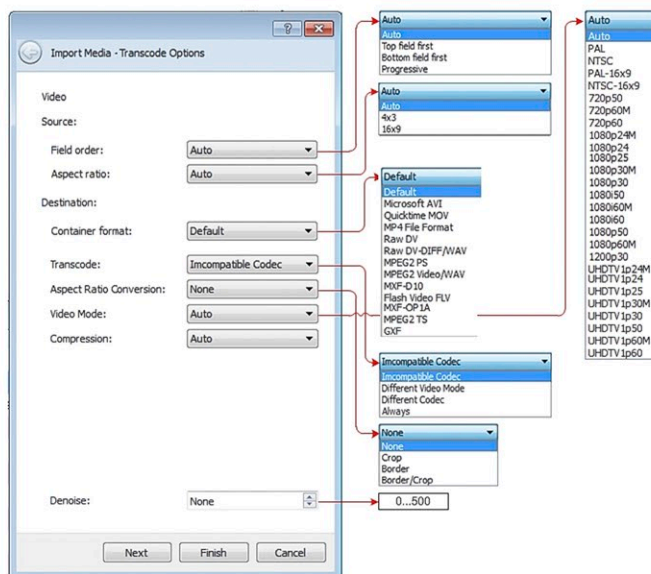
File Copying in parallel with Recording

Media Database uses «growing file» technology when writing to local server storage.

Integration of Transfer Manager with Media Database allows to start the file copying process simultaneously with the start of recording. Copying in parallel with recording allows to significantly optimize workflow operations.

Use cases for Transfer Manager in the «server-client» version

In a Cloud environment, in cases where there is no dedicated network channel to access the servers, Internet connections are used for work. Unstable speeds and high latency do not allow the use of client applications. For such cases, Transfer Manager is controlled via a web browser.

In Local Systems with multiple servers, engineers need to centrally control and manage processes from one or two workstations. In this case, the «server-client» implementation solves the management tasks.

Rules for File Operations

Copy - copying files from source storage to destination storage. New files that appeared on the source storage are copied, as well as files that were deleted from the destination storage are copied again from the source storage.

Copy and Rotate - permanent automatic unidirectional synchronization of the target storage from the source storage. This rule is used, for example, to synchronize arrays and DBs of broadcast servers — main and backup.

Move - moving files from source storage to destination storage, with replacement of files on the destination storage, regardless of the times of last modification of files.

Move and Rotate - moving files from source storage to destination storage with replacing only new versions of files at destination storage.

Copy Once - one-time copying from the source repository to the destination one.

Copy Once and Rotate - copying from the original location to the target location with tracking the new versions and replacing the obsolete files on the target location.

Copy for Playlist - priority copying from source repository to destination repository only for files whose names are specified in the executable playlists. Transfer Manager interacts with Program Player modules, the tracked identifiers in the playlists are Media and Title.

File Import & Redundancy Functional Diagram

The diagram shows two ways of implementing the process of importing files into the operational storage of the SL NEO playback servers: automatic and manual. For each option is available work in the local network and via WAN.

The redundancy schemes use continuous online synchronization of content between the primary and backup servers, performed automatically using TM.
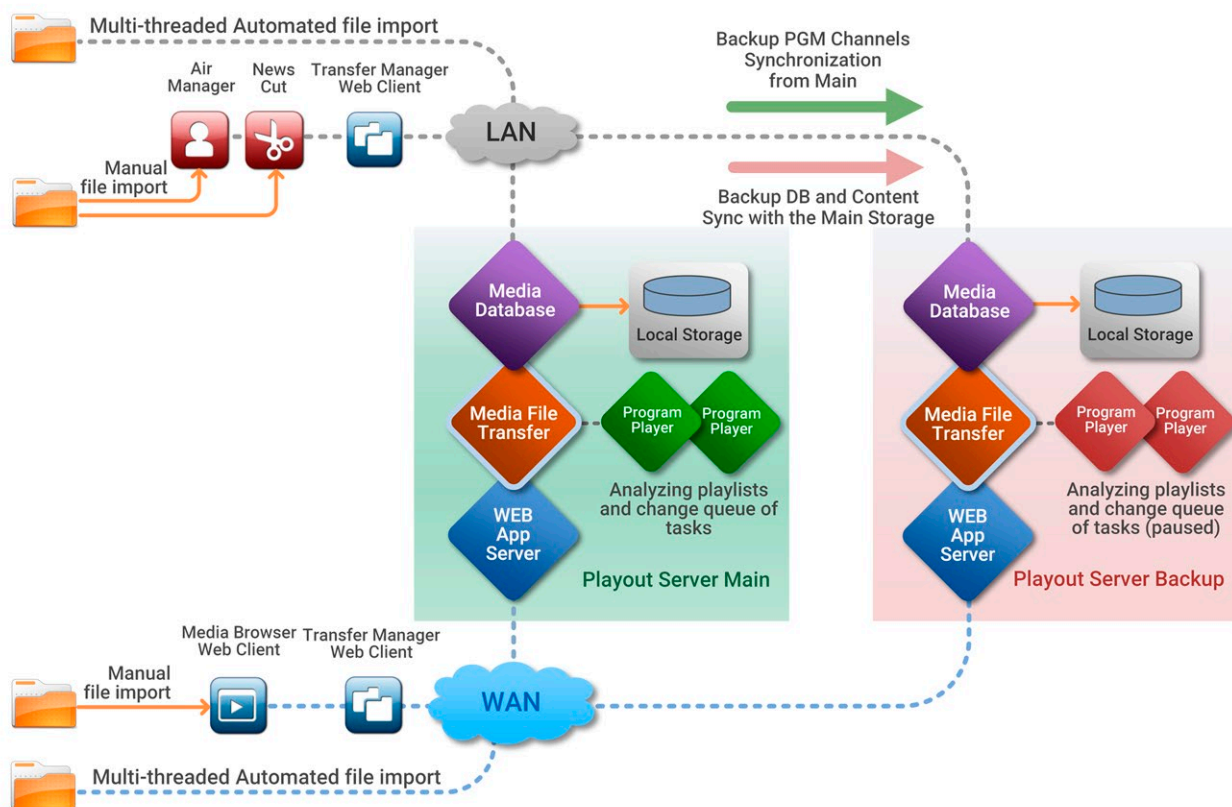
SL NEO Software Media Platform

iMAM: Asset Management System

Performs recording, importing, cataloging, searching, browsing, transcoding, and automatic content transfer operations. Works with file servers, NAS, tape streamers and libraries. The system is integrated with all servers of the SkyLark SL NEO product line and with external traffic systems: Broadview, Provis.

i-MAM is a complete content management system that allows you to catalog, store, search and manage media and metadata. The server and client software is integrated into the main processes: Ingest (multi-channel recording, file import), Cataloging, Search, Browsing, Production (NLE), Automated Playout.

At the heart of i-MAM is SL NEO Media Database, which contains descriptions (metadata) of material objects, a set of standard and user-created attributes. The use of the database solves the problem of assigning objects to categories with the possibility of belonging an object to many categories at once.

▶ SL NEO i-MAM Tasks

- Quickly find material based on text metadata;
- Find one or more fragments of material, export the files to NLE station for further editing;-
- Edit story by proxy copy in the built-in NLE editor, export full-res copy;
- Find and select materials for playback, preview them;
- Manage the process of automatic copying of on-air material from the archive to playout servers.

SL NEO i-MAM Features for archiving, cataloging, storing and searching

- Multi-channel recording (ingest) from external lines and VTRs, creation of new archive materials;
- Import of production-completed and "source" file materials into the archive from NLE and other sources;
- Proxy generation in parallel with file recording and importing;
- Cataloging (entering text descriptions) for different categories: time and place, authors, participants, roles, legal, technical and other information;
- Possibility for users to change and add new categories for descriptions of materials independently;
- Generation of a collection of key frames for each material and their text descriptions;
- Convenient and quick search and viewing of materials;
- Differentiation of access rights to the system's resources;
- Backup and reserve copying of descriptive information stored in the database;
- Integration with NLE at file level, support for common containers (avi, mov, mxf, mp4, ...) and codecs;
- Integration with SL NEO platform playout servers (automatic copying of materials from the archive "under the playlist").

SL NEO i-MAM Software Components

Media Database Module provides network clients with access to Full Res or Prox files and the metadata describing the material.

Media Database stores the metadata schema and the text descriptions themselves, keeps track of the contents of disk arrays, performs indexing of newly added files, and allows differentiation of user rights.

iMAM uses the Adobe XMP metadata schema. Descriptions can be stored both in the archive system database and in the media files themselves.

File Recorder Module writes to files according to the loaded schedule or according to the defined rules. File formats and compression algorithms provide full compatibility with non-linear editing systems. TC is received in LTC or VITC formats.

File Recorder controls SDI Router and VTR through Device Server. Access to the material for viewing and editing is provided in 1 second after the start of recording.

Media File Transfer Module performs automated operations:

importing, exporting, moving files between file servers, archives, production systems and storage of SL NEO servers, with the ability to configure moving rules, proxy and media conversion parameters, including re-encoding files when copying/moving - changing codec, file container, HD/SD UP/DOWN/CROSS conversion, changing frame rate, changing aspect ratio, color spaces, audio volume levels and loudness normalization.

SL NEO Software Media Platform

Device Server

Tape library driver provides a command interface between the SL NEO Media Database platform and the tape library management software.

Commands and functions are supported for archiving, unpacking data, getting information about tape library status and job progress.

Integration with tape libraries is performed at the file system level, which is emulated by the library management software (Xendata, IBM Tivoli etc.) Working with the standard Windows network protocol (CIFS) for file exchange does not bind the user to any particular tape library.

Client software: Media Connect, Air Manager, News Cut dissplays the contents of the i-MAM server repositories to which you are connected, directly interacting with the Media Database server modules.

Displays metadata fields and keyframe collections for each material. The search window provides a wide range of functions for searching materials and their fragments by metadata fields, date, time, location, persons, etc.

You can import media files into the repositories, add descriptions, set their «lifetime,» export the content and its fragments: graphics, animations, audio and video materials, graphics compositions made in the Graphics Client, XML clips, as the results of editing in News CUT. Media data management also includes services to manage the list of import tasks, the ability to transcode materials, creating proxy.

Data management in the SL NEO environment is implemented as a virtual file system, which combined with a friendly interface allows you to quickly find the necessary material, view it in a separate window in proxy or full resolution, mark up the desired fragments, save them, export, edit descriptions.

SL NEO iMAM Software Modules interconnections
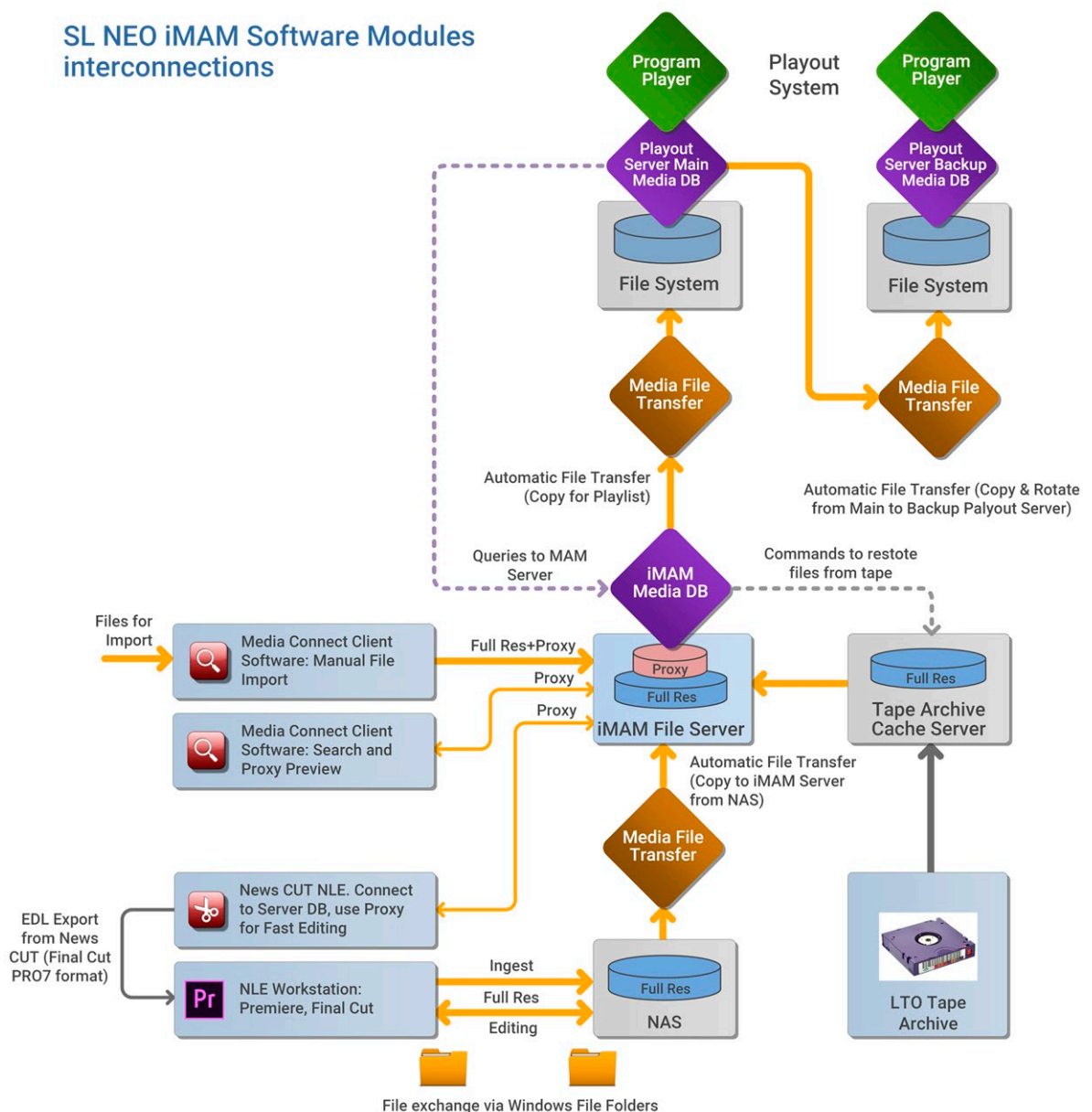
SL NEO Media Platform Technical Specifications

Video Formats and Color Spaces
625i, 525i, 720p, 1080i, 1080p, 2K cinema 2048x1080p, 2160p
25/29,97/50/59.94/60 fps
Color Spacing: BT.601/709/2020, SMPTE ST2084, ARIB STD-B67

I/O Streams Interfaces, Protocols, Codecs
SDI: SD/HD/3/6/12G SDI, 4x 3G SDI/Audio Embedded
IP: SMPTE ST2110, 2022-7
IP: NDI
IP: HLS, RTMP, UDP, RTP, SRT, Zixi, RIST, MPEG-DASH
DVB/ATSC IP: UDP/RTP Unicast/Multicast SPTS/MPTS
DVB/ATSC ASI: SPTS/MPTS
Video Codecs: MPEG2/H.264/H.265
Audio: 48kHz, 16/24 bit PCM, ADPCM, MPEG-1 L-II/III, AAC, AC3

I/O Streams Data Embedded
OP-42/OP-47 WST Teletext and Closed Captions
CEA-608/CEA-708 Closed Captions
EPG/Subtitles in MPEG2 TS
SCTE-104/SCTE-35 markers with metadata
VBI/VANC Data: VITC, AFD, WSS
DTMF Cue Tones

Device Servers
VDCP over IP (Slave mode for Single REC or PGM Channel)
VizRT (Master mode for Single PGM Channel)
Chyron CII (Master or Slave mode for Single PGM Channel)
SDI Router for Playout Automation (for Single Device)
SDI Router for REC Automation (for Single Device)
VTR for REC Automation (for Single Device, Sony Remote Protocol)
TSL5 UMD (Master mode for Single Device)
Ember+ (for Junger Audio Devices. Master mode for Single Device)

SDI Routers Remote Protocols
Grass Valley Triton BDS
Grass Valley Nvision/Native Protocol/Vega/M-2100
Nevion Vikinx v128/Thor
Leitch, Kramer
BMD Videohub Ethernet/RS-232
Snell Switcher/Remote Protocol
Evertz Quartz/QMC-2
Sierra XXvse
Utah SC-4/RCP-1
Pro Bel SW-P-02/SW-P-08
Venux VM/SI/3000 ASCII
Ross Video Presmaster/NK-SCP/A
ELPRO SDZHD Series
AJA KUMO
Imagine LRC
LES, Profitt

I/O Interfaces, Boards, Devices
Dektec DTA-2172/2174B/2175/2178/2179/2195 SDI/ASI Boards
Dektec DTA-2160/2162 ASI/IP with FEC Boards
Nvidia/Mellanox ConnectX NIC
Matrox DSX LE3/LE4 Boards
DataPath Vision RGB Boards
Blackmagic DeckLink SDI/HDMI Boards
Standard Ethernet Interfaces
i-Link/IEEE 1394 Interfaces
DirectShow Devices

GPIO, LTC Readers
USB GPIO: Ontrak ADU200, ADU2X8
LTC Readers: Adrienne AEC-41, Plura PLC,
Miranda Little Red, Horita TCI-50

Other Protocols
SNMP (SL NEO Server Software Monitoring)
NTP/PTP Client
SMB/CIFS, FTP

Video Codecs (Recording to Files & Playback)
SD/HD
DV25, DVCPRO25, DVCPRO50, DVCPROHD100, HDV
IMX 30/40/50
XDCAM EX SP/HQ
XDCAM HD LP/SP/HQ.422
DNxHD 120/145/180/220
AVCHD
XAVC 50/100/200
XAVC Long GOP
AVC-Ultra 50/100/200
AVC-Ultra Long G (12/25/50)
PRORES HQ/SD/LT
MPEG-2 I-Frames/Long GOP
H.264 L I-Frames/Long GOP

Ultra HD
H.264 8/10 bit
XAVC 300/480
XAVC Long GOP
AVC-Ultra 300/480
AVC-Ultra Long G
PRORES SQ/HQ
DNxHR SQ/HQ
HEVC 8/10 bit

Audio Codecs
RAW 16/24 Bit PCM, ADPCM, MPEG-1 L-II/III, AAC, AC3,
AC3 passthrough

File Containers
MXF-OP1A, MXF-D10
Avid MXF (OP-Atom)
Sony XDCAM HD/422 (MXF-OP1A)
Sony XAVC 50/100/200/300/480/LongGOP (MXF-OP1A)
P2 AVC-Ultra 50/100/200/300/480/LongG (MXF-OP1B)
Microsoft AVI, MPEG PS/TS
QuickTime MOV, DV DIFF
MP4, MPG, GXF

Graphics File Formats
PNG with alpha, PSD, BMP, JPG
Microsoft AVI, QuickTime MOV uncompressed with alpha
Microsoft AVI JPGA with alpha
Audio Supported

Recording Environments
OS File System: work with files only, normal or fragment file
recording mode (array of files with configured fixed duration)

SL NEO Media DataBase: work with Virtual Clips
(full res+proxy+metadata), growing file recording mode

Avid Unity/Interplay

SL NEO Software Compoments & Options
Media DataBase
Stream Capture, Stream Player
File Recorder, Program Player
Profanity Delay, Time Shift
MultiScreen
Device Server
Transfer Manager Lite/Pro
TS MUX
SCTE-104/SCTE-35 Generation (for Single PGM Channel)
EBU R128 Loudness Normalization (for Single Output Port)
Closed Captions Generation (ANC Data, for Single PGM Channel,
Live/File modes)
DVB/ATSC Subtitles Generation (for Single PGM Channel)
Main - Backup PGM Channel Sync (for Single PGM Channel)
NVENC for Output Stream Encoding
NVENC for REC Channels
Avid Unity/Interplay Support (for REC Channels)
Web Application Server
Broadcast Media Player

SL NEO Client Applications
Air Manager, Rec Manager,
News Cut, Media Connect,
RT Client, VTR Client,
MultiScreen Client, Live Panel

SL NEO Software Media Platform

Information for order

Server Software Components

Ingest/Capture
Live ingest (includes 1x Stream Capture + 1x File Recorder) - one channel ingest module HD/SD or UHD/HD.

Extra Stream Capture (SDI or IP) - one channel capture module HD/SD or UHD/HD. Live Events for Playout, one input for Multiscreen, input for stream encoding or transcoding.

Playout/Output
Playout automation, no graphics (includes 1x Program Player with Live/File full screen Player + 1x Stream Player + MediaDatabase - 1x per server) - one PGM module HD/SD or UHD/HD with one output.

Playout automation with Lite graphics (includes 1x Program Player with Live/File full screen Player, 2x GR Layers + 1x Stream Player + MediaDatabase - 1x per server) - one PGM module HD/SD or UHD/HD with one output.

Playout automation with Pro graphics (includes 1x Program Player with Live/File full screen Player, 9x GR Layers + 1x Stream Player + MediaDatabase - 1x per server) - one PGM module HD/SD or UHD/HD with one output.

Standalone graphics (includes 1x Program Player with 9x GR Layers + 1x Stream Player + MediaDatabase - 1x per server) - one PGM module HD/SD or UHD/HD with one output.

Extra output connector (SDI or IP) - one channel Stream Player module HD/SD or UHD/HD with one output.

SCTE-104/SCTE-35 generation - for one PGM module.

Main and Backup Playlist Sync Option - for one PGM.

Playout EBU-R128 loudness module - one channel module for one output.

Processing
Profanity delay (includes 1x Stream Capture + 1x Profanity Delay, + 1x Stream Player) - one channel delay module.
Multi-viewer (includes 1x Multiscreen + 1x Stream Player).
Instant Replay & LSM (includes 1x IR & LSM + 2x Stream Player).

Device Control
SDI Router control module.
GPI/O control module (up to 8 ports).
Vizrt control module - for one PGM.
Cyron CII control module - for one PGM.
Audio Device Control (Ember+).
TSL UMD Data - for one ext. device.
VDCP for SL NEO Player/Recorder control from ext systems.

File Processing
Transfer Manager Lite (no transcoding, only container rewrapping).
Transfer Manager Pro (transcoding, caption encoding).

Storage/Asset Management
MediaDatabase (10 connections).
Extra connections for basic MediaDatabase (x5 connection, x10 connections).
MediaDatabase MAM/Workflow features (x5 connection, x10 connections).
MediaDatabase TAPE/Archive support.

Client Software

Client Software
Air Manager client license.
Ma Connect client license.
News Cut client license.
News Cut EBU-R128 loudness module.

Web-clients
Web Applications Server (x2 client connections).

Software Packages

Packages
Channel-in-a-box (includes 1x Stream Capture + 1x File Recorder + 1x Program Player with graphics + 1x Stream Player. (AirMgr, TransferMgr Lite, MediaDatabase) - 1x per server) HD/SD or UHD/HD.

Channel-in-a-box Pro (includes 1x Stream Capture + 1x File Recorder + 1x Program Player with graphics + 1x Device Server for SDI Router control + 1x Stream Player. TransferMgr Pro, MediaDatabase, full Client Software Kit) - 1x per server HD/SD or UHD/HD.

SkyLark

SL NEO MEDIA SERVERS AND PROCESSORS

UHD/HD/SD Configurations in 9 Base Series

SL NEO 1000	Multichannel Ingest Servers
SL NEO 2000	Multformat File Players
SL NEO 3000	Integrated Playout - Channel in a Box
SL NEO 4000	Time Shift & Delay Servers
SL NEO 5000	On Air Graphics Servers
SL NEO 6000	Compliance Recorders
SL NEO 7000	Instant Replay & LSM Servers
SL NEO 8000	MultiScreen Processors
SL NEO 9000	Stream Processors
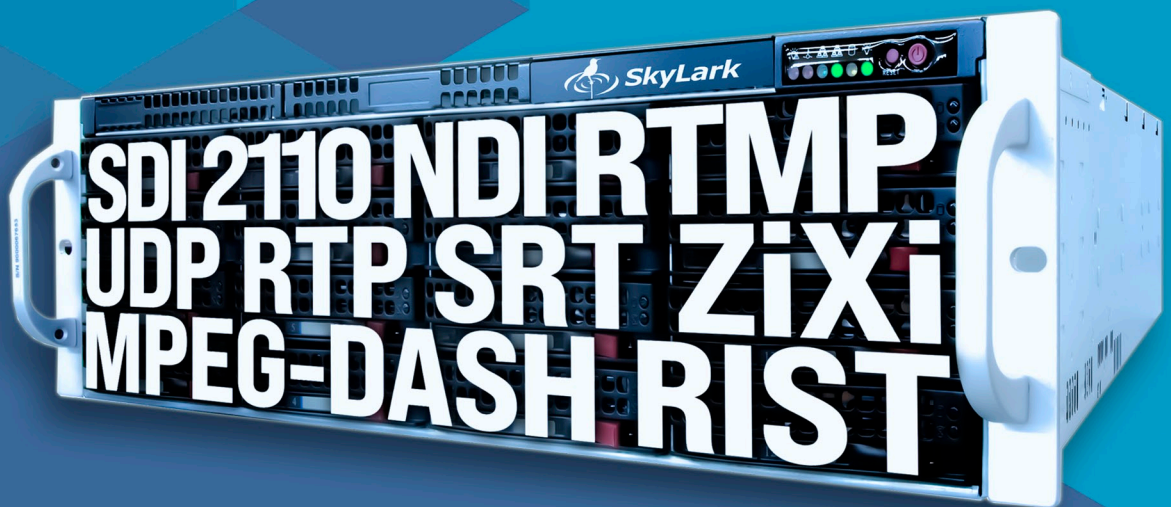
Media Servers are basic elements of the technological infrastructure of a broadcasting company.

They are responsible for workflow implementation and perform many parallel operations: multi-channel recording, uploading, processing and storage of content, provide multiuser data access to prepare materials for playout, generate multibitrate program streams of linear broadcasting channels according to schedules.

SkyLark Technology Inc. presents the SL NEO line of Media Servers & Processors with superior functionality and technical characteristics that have successfully established themselves with flawless performance in many broadcasters around the world.

SkyLark

SL NEO 1000 Servers
Multichannel Recorders

▶ Universal Ingest Solution for Production, Playout and Archives

▶ Up to 16x HD or 4x UHD Capture Ports & Recorders in one System Unit

▶ Mix of Ports Types: SDI, HDMI, ASI, IP (depending on the model & options)

▶ In Basic Configuration: SMPTE ST2110, NDI, HLS, RTMP, RTP, UDP, SRT, RIST, Zixi

SDI 2110 NDI RTMP UDP RTP SRT ZiXi MPEG-DASH RIST

Main Features

Rec Schedules, Start Types, SDI Router & VTR Control

Recording according to schedules, configurable rules based on time tables. Cyclic recording mode with lifetime.

Creating, editing rec-schedules, import from traffic systems. Full control over all recording processes from the Air Manager client application or web clients.

Types of events start: Manually, at Hard Time, by external XML-RPC, VDCP, GPI Commands, by data from incoming SCTE-104, SCTE-35, DTMF markers, synchronous start of several recorders.

SDI Router Control for automatic or manual source switching before event starts, automated VTR Control via RS-422, IEEE1394 in batch capture mode.

Recording Profiles, Editing during Ingest

Multiple recording profiles can be configured for each recording channel: resolution, fps, audio/video codec types and file container. You can select the desired recording profile for each event in the rec-schedule.

Audio track switching and quick audio level adjustment from client workplaces during recording.

Several recorders can be connected to one capture port for parallel recording with different resolution, codecs and container.

Seconds after recording starts, incoming clips can be used for immediate editing in the News Cut client application.

SL NEO Media Database

Functionality of the built-in Media Database of SL NEO 1000 Server:
- initial content cataloging by transferring metadata from the record schedule lines,
- network multiuser access to recorded material, metadata, and proxies,
- content search in Server storage by txt metadata (10 text attribute fields in the standard SL NEO Server license),
- browsing, clip trimming, quick collective proxy editing in News Cut NLE application, content lifetime settings,
- content marking (adding and storing keyframes and other attributes).

SL NEO 1000 Servers supports manual and automatic marking of materials during recoding by external commands, markers and signs in the input streams:
- Hotkeys from client applications, XML-RPC, GPI commands from external devices,
- SCTE-104, SCTE-35 data, and DTMF tags, detection of video freezes and black frames in input streams,
- searching for matches of video fragments in the input signal with the stored reference video.

Closed Captions Recording

Servers supports recording and storage of CEA-608, CEA-708, OP-42, OP-47 Closed Captions Data, DVB/ATSC Subtitles Data in SL NEO Media Database.

Hot Redundancy

SL NEO 1000 Servers supports parallel recording to the Main and Backup Servers, controlled from a single rec-schedule.

SL NEO 1000 Servers
Multichannel Recorders

SkyLark

▶ Automated File Export

Transfer Manager Lite is a server/client software tool for automatic migration of recorded files from local server storage to NLE-stations, on-air zone and to archive.

Transfer Manager supports multistream file copying based on rules.

SL NEO Media Database uses "growing file" technology when writing to local storage. Integration of Transfer Manager with Media Database allows to start the file copying process simultaneously with the start of recording. Copying in parallel with recording allows to significantly optimize workflow operations.

The full version - Transfer Manager Pro supports transcoding files (change codecs, container) with up/down/cross conversion.

▶ Input Streams Monitoring

SL NEO platform offers two different technologies to monitor all AV inputs, outputs and internal system streams:

1. **Built-in MultiScreen Client application** allows workstations to perform on-line monitoring of AV signals coming from all active capture, recording and other Server Software modules in Network (in proxy mode).

2. **Optional SDI/HDMI and/or IP/ASI Multiscreen Monitor Output** is needed to view all input signals in multiview mode with an overlay of audio levels. Built-in up/down/fps conversion allows signals with different resolution and frame rates to be displayed together on the same display (in full HD or UHD mode).

Alarms will alert the operator to abnormal situations such as freeze frame or "black" field, when audio levels are exceeded or undershot. Integration with File Recorder modules allows you to visualize TC/Text information about current recording event.

For the SL NEO 1000 Servers, the Optional Multiscreen Monitor Output and built-in MultiScreen Client application allow you to monitor all signals/streams of the server Capture and Recording modules inputs.

▶ Software Modules Connection Diagram for SL NEO 1000 Servers Series
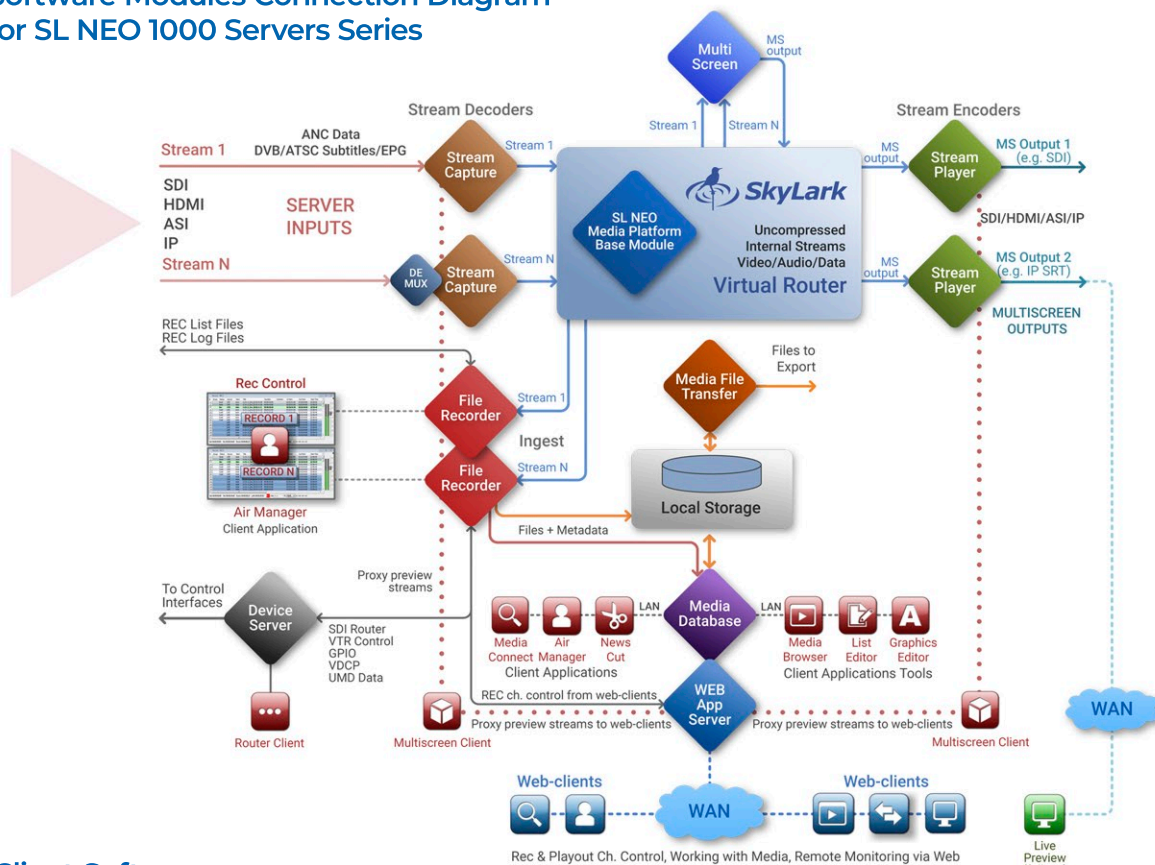
▶ Client Software

Air Manager is the main client application with integrated tools for control multiple recording channels, editing schedules, searching, browsing, importing/exporting content. GUI has "Record" windows with executable recording schedules (depending on the number of recording channels), displaying a list of tasks and their current statuses.

Each "Record" window connects to the File Recorder server module.

The **Media Browser** window displays the contents of the media database of each of the SL NEO servers on the network. This tool is used to search for content, edit text metadata, manually migrate and transcode files.

The **File Monitor** window is used to preview clips selected in the Media Browser, or in the rec schedule lines.

▶ SL NEO 1000 Server Software Licensing

Only the number of Capture Ports, the number of Recording Channels and the overall format (SD/HD/UHD) are licensed. Any switching of settings between Capture Pport types (SDI/HDMI/IP/ASI) and supported IP protocols does not require additional licenses.

The Name of the Base Model of the SL NEO Server is made up of the values of the 5 variables located after the name of the product line:

SL NEO S F.C.P H A

S First Digit of the SL NEO Series Number	**F** Maximum Video Operating Mode	**C** Number of Capture Ports or REC CH	**P** Number of PGM CH or Output Ports	**H** Type of Hardware I/O Board (Brand)	**A** Useful capacity of the Array in Tb
SERIES	**FORMAT**	**CAPTURE**	**PLAYOUT**	**HARDWARE**	**ARRAY**
S = 1 - 1000 Series Multichannel Recorders	F = 2 - HD 1080i 50/60	for F = 2, C = 4...16	P = 0	H = D – Dektec DTA	SDI + Audio Embedded
	F = 3 - 3G 1080p 50/60	for F = 3, C = 4...12	P = 0	H = A – Dektec DTA	DVB/ATSC ASI (SPTS)
	F = 4 - UHD 2160p 50/60	for F = 4, C = 2...4	P = 0	H = M – Matrox DSX LE3/4	SDI + Audio Embedded
				H = N – Nvidia NIC	IP: SMPTE ST 2110/2022-7
				H = E – Onboard 1GbE Port	IP: NDI, HLS, RTMP
					SPTS IP: RTP, UDP, SRT, Zixi
				H = B – BlackMagic SDI I/O	SDI + Audio Embedded
				H = H – BlackMagic HDMI	HDMI + Audio Embedded

For Base Models 1000 Series:
C = No. of Capture Ports = No. of REC CH
P = 0 (no PGM CH, no Output Ports)

Technical Specifications for SL NEO 1000 Servers

Hardware configuration, including CPU/HDD models, number and types of I/O Boards depends on the selected SL NEO Server Model and set of Options.

Server Hardware
Supermicro 2...4U chassis, two power supply modules in hot backup.
One or two Intel Xeon Gold CPU, 48/96Gb DDR4 RAM,
SSD for OS, two onboard 1GbE ports.
Built-in hardware RAID-10, 8x or 16x SE SAS 3.5" RE 8 or 16Tb array useful capacity.
OS Windows Server 2022 x64

Capture Ports & REC Channels
Capture Ports HD/SD: 4...16, Capture Ports UltraHD: 2...4
REC Channels HD/SD: 4...16, REC Channels Ultra HD: 2...4

Video Formats and Color Spaces
625i/525i, 720p, 1080i/1080p, 2K cinema 2048x1080p, 2160p
25/29,97/50/59.94/60 fps
Color Spacing: BT.601/709/2020, SMPTE ST2084, ARIB STD-B67

Input Streams: Interfaces, Protocols, Codecs
SDI: SD/HD/3...12G SDI, 4x 3G SDI/Embedded Audio
IP: SMPTE ST 2110, SMPTE ST 2022-7
IP: NDI, HLS, RTMP, UDP, RTP, SRT, Zixi, RIST, MPEG-DASH
DVB/ATSC IP UDP/RTP Unicast/Multicast SPTS/MPTS
DVB/ATSC ASI: SPTS/MPTS
Video Codecs: MPEG2/H.264/HEVC
Audio: 48kHz, 16 or 24 bit PCM, ADPCM, MPEG-1 L-II/III, AAC, AC3

Input Ancillary/MPEG2 TS Data
OP-42/47 WST Teletext, Closed Captions
CEA-608/708 Closed Captions
DVB/ATSC Subtitles, EPG
SCTE-104/SCTE-35 markers with metadata
VBI/VANC Data: VITC, AFD, WSS

Protocols, Device Support
XKEYS XK-24/60/80 Support
SNMP (SL NEO Software)

Ordering Information

To order the SL NEO 1000 Series Server, send us the following information:

- Base Model Name,
- Capture Ports formats (SD/HD/3G/UHD, FPS), types (SDI/HDMI/ASI/IP), protocols for IP and number,
- REC Channels formats (SD/HD/3G/UHD, FPS) and number,
- Codecs and Containers for Media Files,
- Information about redundancy scheme,
- Type (internal, external) and useful capacity of RAID-array,
- Required Hardware and Software Options,
- Required Client Licenses.

The Client Applications are pre-installed on the server platform, and one set of Client Software for installation on a workstation is included with each SL NEO Server.

Example: SL NEO 12.10.0 D16

Example:	SL NEO 12.10.0 D16
Max mode:	HD 1080i 50/60
Number of Capture Ports and REC Channels	10
Number of PGM Channels and Output Ports	0
Hardware: Dektec DTA	I/O: SDI + Audio Embedded
Internal Array:	Useful capacity 16 Tb

Video Codecs (Recording to Files)

SD/HD
DV25, DVCPRO25, DVCPRO50, DVCPROHD100, HDV
IMX 30/40/50
XDCAM EX SP/HQ, XDCAM HD LP/SP/HQ.422
DNxHD 120/145/180/220
AVCHD
XAVC 50/100/200, XAVC Long GOP
AVC-Ultra 50/100/200
AVC-Ultra Long G (12/25/50)
PRORES HQ/SD/LT
MPEG-2 I-Frames/Long GOP
H.264 L I-Frames/Long GOP

Ultra HD
H.264 8/10 bit
XAVC 300/480, XAVC Long GOP
AVC-Ultra 300/480, AVC-Ultra Long G
PRORES SQ/HQ
DNxHR SQ/HQ
HEVC 8/10 bit

Audio Codecs (Recording to Files)
RAW 16/24 Bit PCM, ADPCM, MPEG-1 L-II/III, AAC, AC3

File Containers
MXF-OP1A, MXF-D10
Avid MXF (OP-Atom)

Sony XDCAM HD/422 (MXF-OP1A)
Sony XAVC 50/100/200/300/480/LongGOP (MXF-OP1A)
P2 AVC-Ultra 50/100/200/300/480/LongG (MXF-OP1B)

Microsoft AVI, MPEG PS/TS
QuickTime MOV, DV DIFF
MP4, MPG, GXF

Environments for Recording
The number of file streams per recorder is two (Full Res + Proxy)

OS File System: work with files only, normal or fragment file recording mode (array of files with configured fixed duration)

SL NEO Media DataBase: work with virtual clips (files+metadata), growing file recording mode

Avid Unity/Interplay

Hardware & Software Options

Hardware Options

LTC Input (Including one of supported LTC Readers and Software License: Adrienne AEC-41, Plura PLC, Miranda Little Red, Horita TCI-50)

GPIO (Including one of supported USB GPIO and Software License, up to 8 IO Ports: Ontrak ADU200, ADU2X8)

GPU Board

Increase Internal RAID Array Capacity

2x SSD in RAID-1 for System

Additional Hardware Ports

SD/HD/3/6/12G, 4x3G SDI, HDMI, ASI I/O Ports

NVIDIA ConnectX 10/25/40/50/100/200G Ports for SMPTE ST2110/2022-7

1G Ethernet Ports for UDP/RTP IP with SMPTE 2022-1 FEC

Standard 1/10G Ethernet Ports for IP Streams, Control, File Transfer

RS-232/422/485, i-Link/IEEE1394 Hardware Ports

AES I/O for Matrox DSX Boards

Software Options

Transfer Manager PRO

NVENC Assistance (for File Encoding or Output Stream Encoding)

Avid Unity/Interplay Support (for REC Channels)

Web Application Server

Client Applications

Air Manager, Rec Manager, News Cut

Additional I/O Ports & Channels (SD/HD or UHD Software Licenses)

Capture Port (SDI/HDMI, ASI/IP with DeMux and Stream Decoding, all supported Protocols)

Output Port (SDI/HDMI, ASI/IP with Stream Encoding, all supported Protocols)

MultiScreen Processor (4, 8, 16 or 24 Inputs Software License)

REC Channel (Full Res + Proxy)

Device Server Software Licenses

VDCP for REC Automation (Slave mode for Single REC Channel)

SDI Router for REC Automation (for Single Device)

VTR for REC Automation (for Single Device)

TSL5 UMD (Master mode for Single Device)

SDI Routers Control Protocols

Grass Valley Triton BDS

Grass Valley Nvision/Native Protocol/Vega/M-2100

Nevion Vikinx v128/Thor

Leitch

Imagine LRC

Kramer

BMD Videohub Ethernet/RS-232

Snell Switcher/Remote Protocol

Evertz Quartz/QMC-2

Sierra XXvse

Utah SC-4/RCP-1
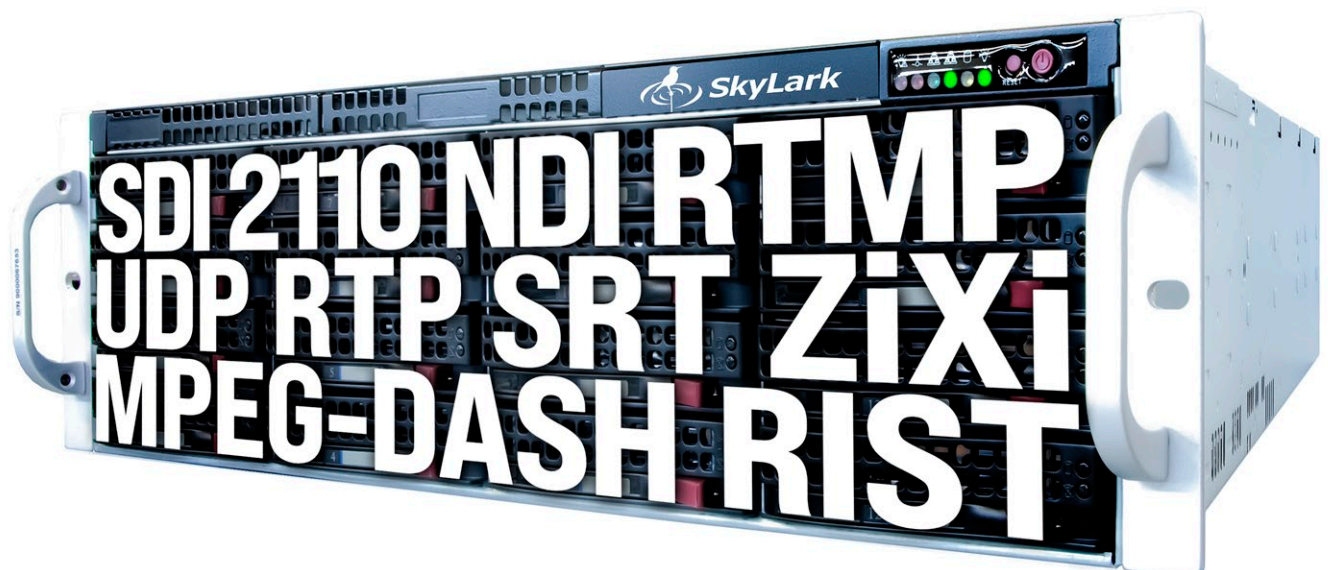
Pro Bel SW-P-02/SW-P-08

Venux VM/SI/3000 ASCII

Ross Video Presmaster/NK-SCP/A

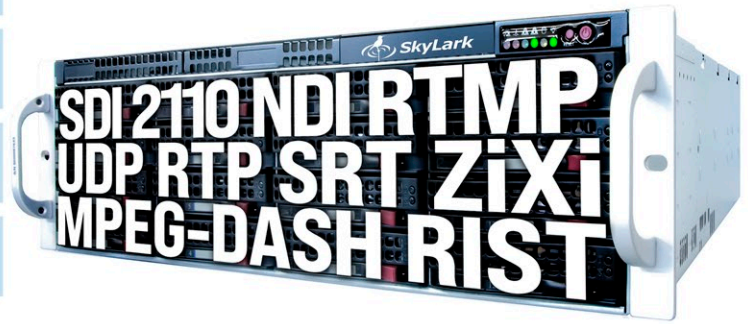ELPRO SDZHD Series

AJA KUMO

LES

Profitt

SL NEO 2000 Servers
Multipurpose Playout

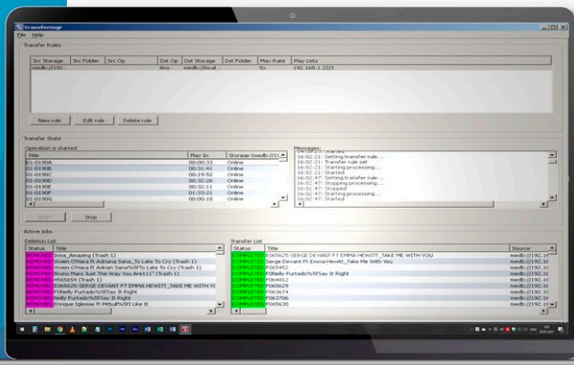- **Multichannel Playout with Graphics for Live Production and Broadcasting**
- **Up to 8x HD or 2x UHD PGM Channels with Multiformat Output Channels**
- **SDI/HDMI, ASI/IP I/O, Open/Closed Captioning, AV & ANC Data Processing**
- **IP I/O: SMPTE ST2110, NDI, HLS, RTMP, RTP, UDP, SRT, Zixi, MPEG-DASH, RIST**

Main Features

Automated File Ingest

Transfer Manager Lite - Server/Client tool for automatic copying and moving file content between production units. File operations are automated, according to configurable rules.

Transfer Manager used for moving files from Ingest to Playout zone, NLE and to archive. Integration with SL NEO Media Database allows to start the file copying process simultaneously with the start of recording.

The second scenario - priority copying from NLE and archive to Playout Servers arrays with analysis of executable playlists. Files first in the play queue are copied first.

The module supports multithreaded copying with adjustable speed.

Transfer Manager supports copying CLF playlists files for guarantee delivery from traffic to watch folders on Playout Servers.

The full version - **Transfer Manager Pro** is available as an option. It allows transcoding files: changing codec and container, performing up/down/cross conversions and Loudness Level normalization during file copying.

Media Database for working with Media

SL NEO Media Database significantly expands the functional scope of the operating system when working with media:

Users does not work with files but with clips, text metadata enables material search by basic attributes: time, place, event, person,

While additional technical profiles, such as proxy, enable collective editing without a significant load on the network.

Each SL NEO 2000 series server comes with an included Media Database module that operates 10 text metadata fields in the initial configuration.
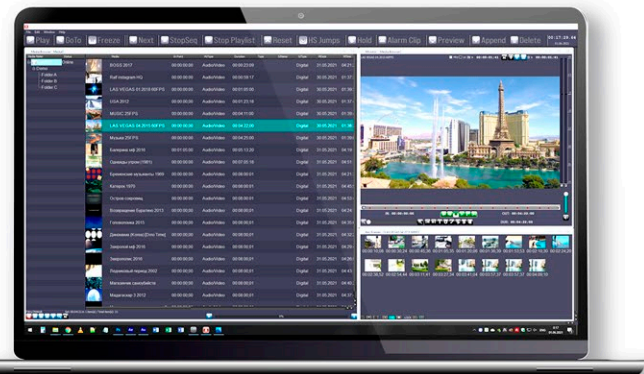
Manual and Scheduled Playback

Air Manager - multifunctional client application containing tools for managing multiple recording and playback channels.

The Air Manager GUI can contain several windows named **Broadcast**.

Each such window is connected to a specific active Program Player module and displays the current schedule loaded into the module and the status of events.

Window "Broadcast" let you edit the playlist and the events in the list, including emergency jump to any event, hold functions, alarm clip insertion, and much more. Different types of event starts are available: manually, by time, sequential playback or start by external commands.

The SL NEO 2000 server is a convenient and reliable tool for playing short news stories: quick start, instant jump to any clip in the playlist, play files that are still being copied, edit the output point of the clip during playback.

Servers supports multi-channel playback by playlists with synchronous startup.

Redundancy schemes from N+1 to N+N provide for on-line synchronization of backup playlists from the main server, automatic copying of content from the main server to the backup with tracking of changes in file versions.

GR Layer 9   (Logo)
GR Layer 8 (GR playlist 8)
⋮
GR Layer 5 (GR playlist 5)
GR Layer 4 (GR playlist 4)
GR Layer 3 (GR playlist 3)
GR Layer 2 (GR playlist 2)
GR Layer 1 (GR playlist 1)
Main Layer (Main Playlist) File Playout
BG Layer (Main Playlist) Live Feed
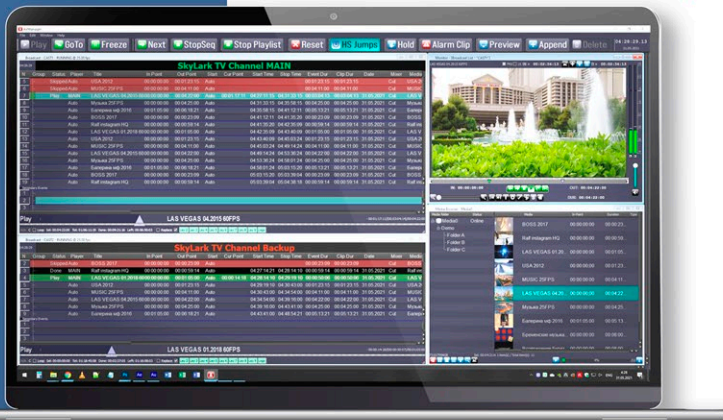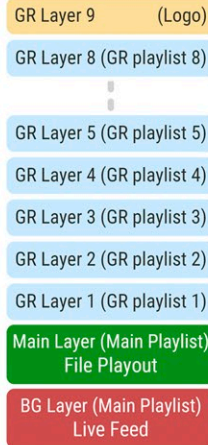
On Air Graphics

8 Graphics Players plus 1 Logo Player for each SL NEO 2000 Server Program Channel.

Playback of the prepared layered compositions is done manually or automatically.

Text data are not tied to the design templates and can be downloaded from external sources (Excel, RSS, HTML, Weather Stations).

Graphic Composition - the main element of the design of programs of any format: TV news, weather forecasts, etc.

In addition to text and pre-rendered animations, compositions can contain 2D DVE, PIP, video from LIVE sources from server inputs, mixes of audio tracks.

Compositions are created and edited with the built-in network graphics editor (Air Manager and News CUT applications).

Playback of compositions does not require a pre-rendering.

Software Modules Connection Diagram for SL NEO 2000 Servers Series
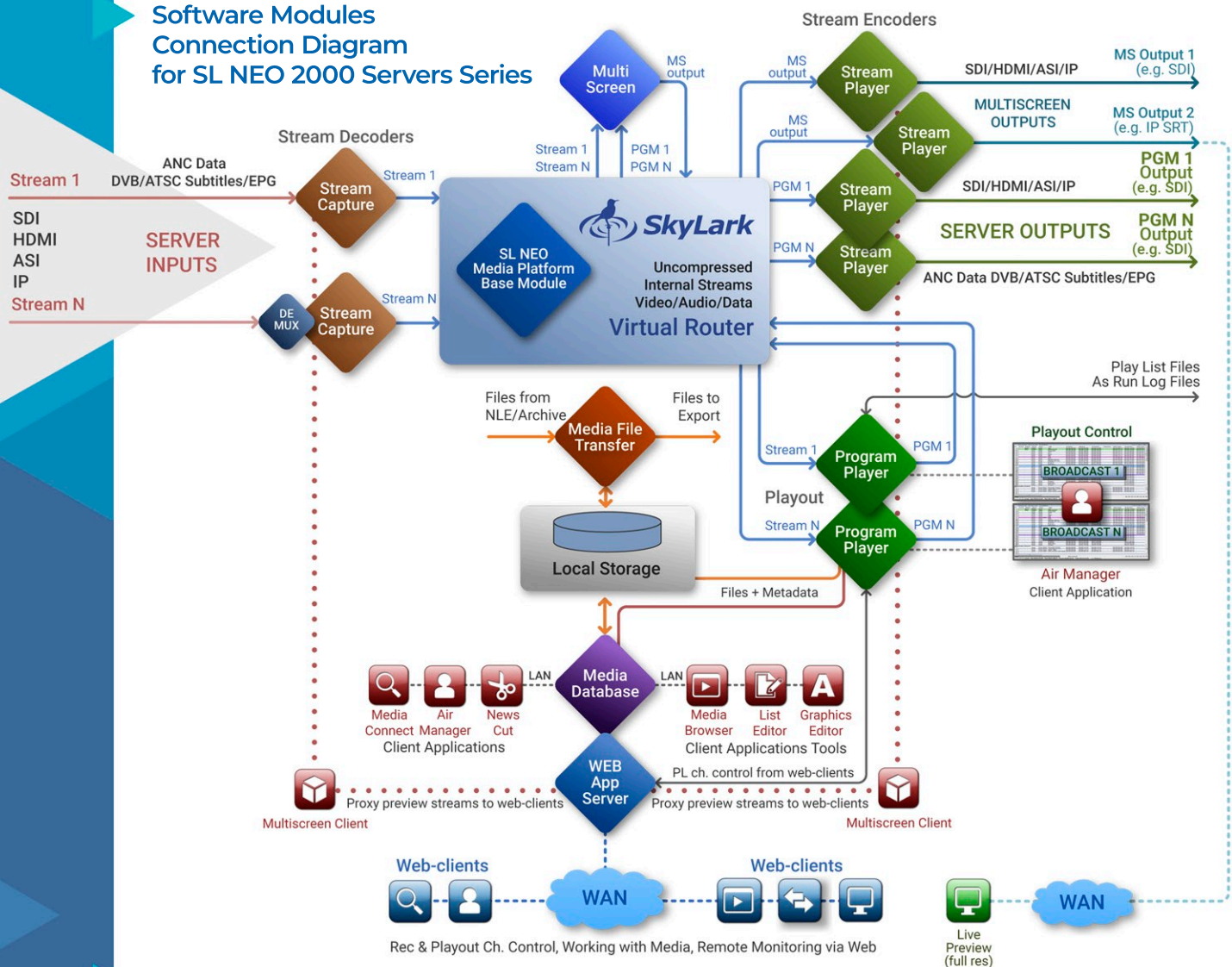
Output Streams Monitoring

SL NEO platform offers two different technologies to monitor all AV inputs, outputs and internal system streams:

1. **Built-in MultiScreen Client application** allows workstations to perform on-line monitoring of AV signals coming from all active Program Players, Stream Encoders and other Server software modules in Network.

2. Optional **Multiscreen Monitor Output** is needed to view all output signals in multiview mode with an overlay of audio levels. Built-in up/down/fps conversion allows signals with different resolution and frame rates to be displayed together on the same display.

Alarms will alert the operator to abnormal situations such as freeze frame or "black" field, when audio levels are exceeded or undershot.

For the SL NEO 2000 Servers, the Optional Multiscreen Monitor Output and built-in MultiScreen Client application allow you to monitor all signals/streams of the server outputs.

The Name of the Base Model of the SL NEO Server is made up of the values of the 5 variables located after the name of the product line:

SL NEO S F.C.P H A

S First Digit of the SL NEO Series Number	**F** Maximum Video Operating Mode	**C** Number of Capture Ports	**P** Number of PGM CH or Output Ports	**H** Type of Hardware I/O Board (Brand)	**A** Useful capacity of the Array in Tb
SERIES	**FORMAT**	**CAPTURE**	**PLAYOUT**	**HARDWARE**	**ARRAY**

SERIES	FORMAT	CAPTURE	PLAYOUT	HARDWARE	ARRAY
S = 2 - 2000 Series Playout Servers	F = 2 - HD 1080i 50/60	FULL GRAPHICS KIT — for F = 2, C = 0...8	for F = 2 or 5, P = 1...8	H = D – Dektec DTA	SDI + Audio Embedded
	F = 3 - 3G 1080p 50/60	for F = 3, C = 0...8	for F = 3 or 6, P = 1...8	H = A – Dektec DTA	DVB/ATSC ASI (SPTS)
	F = 4 - UHD 2160p 50/60	for F = 4, C = 0...2	for F = 4 or 7, P = 1...2	H = M – Matrox DSX LE3/4	SDI + Audio Embedded
	F = 5 - HD 1080i 50/60			H = N – Nvidia NIC	IP: SMPTE ST 2110/2022-7
	F = 6 - 3G 1080p 50/60	LOGO ONLY		H = E – Onboard 1GbE Port	IP: NDI, HLS, RTMP
	F = 7 - UHD 2160p 50/60				SPTS IP: RTP, UDP, SRT, Zixi
				H = B – BlackMagic SDI I/O	SDI + Audio Embedded
				H = H – BlackMagic HDMI	HDMI + Audio Embedded

For Base Models 2000 Series:
C = Number of Capture Ports (no REC CH in 2000 Series Servers)
P = No. of PGM CH = No. of Output Ports

For cases where layered graphics functions are unnecessary, you can use Models without Graphics Package: only Logo Layer will be active in ALL PGM CH.

In **variable F** these models are marked with numbers 5, 6 and 7 for HD, 3G and UHD formats respectively. **You can activate the full graphics package for each PGM Channel at any time.**

Example:	**SL NEO 23.4.6 D8**
Max mode:	3G 1080p 50/60
Number of Capture Ports and REC Channels	4
Number of PGM Channels and Output Ports	6
Hardware: Dektec DTA	I/O: SDI + Audio Embedded
Internal Array:	Useful capacity 8 Tb

Technical Specifications for SL NEO 2000 Servers

Hardware configuration, including CPU/HDD models, number and types of I/O Boards depends on the selected SL NEO Server Model and set of Options.

Server Hardware
Supermicro 2...4U chassis, two power supply modules in hot backup.
One or two Intel Xeon Gold CPU, 48/96Gb DDR4 RAM,
SSD for OS, two onboard 1GbE ports.
Built-in hardware RAID-10, 8x or 16x SE SAS 3.5" RE 8 or 16Tb array useful capacity.
OS Windows Server 2022 x64

I/O Ports & PGM Channels
Capture Ports HD/SD: 0...8, Capture Ports UltraHD: 1...2
PGM Channels HD/SD: 1...8, PGM Channels Ultra HD: 1...2
Output Ports HD/SD: 1...8, Output Ports UltraHD: 1...2

Video Formats and Color Spaces
625i/525i, 720p, 1080i/1080p, 2K cinema 2048x1080p, 2160p
25/29,97/50/59.94/60 fps
Color Spacing: BT.601/709/2020, SMPTE ST2084, ARIB STD-B67

I/O Streams: Interfaces, Protocols, Codecs
SDI: SD/HD/3...12G SDI, 4x 3G SDI/Embedded Audio
IP: SMPTE ST 2110, SMPTE ST 2022-7
IP: NDI, HLS, RTMP, UDP, RTP, SRT, Zixi, RIST, MPEG-DASH
DVB/ATSC IP UDP/RTP Unicast/Multicast SPTS/MPTS
DVB/ATSC ASI: SPTS/MPTS
Video Codecs: MPEG2/H.264/HEVC
Audio: 48kHz/16/24 bit PCM, ADPCM, MPEG-1 L-II/III, AAC, AC3

I/O Ancillary/MPEG2 TS Data
OP-42/47 Teletext, Closed Captions
CEA-608/708 Closed Captions
DVB/ATSC Subtitles, EPG
SCTE-104/SCTE-35 markers with metadata
VBI/VANC Data: VITC, AFD, WSS

Protocols, Device Support
XKEYS XK-24/60/80 Support
SNMP (SL NEO Software)

Video Codecs (Files Playout)
SD/HD
DV25, DVCPRO25, DVCPRO50, DVCPROHD100, HDV
IMX 30/40/50
XDCAM EX SP/HQ, XDCAM HD LP/SP/HQ.422
DNxHD 120/145/180/220
AVCHD
XAVC 50/100/200, XAVC Long GOP
AVC-Ultra 50/100/200
AVC-Ultra Long G (12/25/50)
PRORES HQ/SD/LT
MPEG-2 I-Frames/Long GOP
H.264 L I-Frames/Long GOP

Ultra HD
H.264 8/10 bit
XAVC 300/480, XAVC Long GOP
AVC-Ultra 300/480, AVC-Ultra Long G
PRORES SQ/HQ
DNxHR SQ/HQ
HEVC 8/10 bit

Audio Codecs (Files Playout)
RAW 16/24 Bit PCM, ADPCM, MPEG-1 L-II/III, AAC, AC3

File Containers
MXF-OP1A, MXF-D10
Avid MXF (OP-Atom)

Sony XDCAM HD/422 (MXF-OP1A)
Sony XAVC 50/100/200/300/480/LongGOP (MXF-OP1A)
P2 AVC-Ultra 50/100/200/300/480/LongG (MXF-OP1B)

Microsoft AVI, MPEG PS/TS
QuickTime MOV, DV DIFF
MP4, MPG, GXF

Still Graphics (single files and sequences)
JPG, BMP
With Alpha: PNG, TGA, TIFF, PSD

Video Codecs with Alpha
Uncompressed
TGA, QTRLE
Speed HQ, Lagarith
Key from a separate file
JPGA codec for AVI

File Containers for Video with Appha
Microsoft AVI, QuickTime MOV (audio supported)

SL NEO 2000 Servers
Multipurpose Playout

Hardware & Software Options

Hardware Options
LTC Input (Including one of supported LTC Readers and Software License: Adrienne AEC-41, Plura PLC, Miranda Little Red, Horita TCI-50)
GPIO (Including one of supported USB GPIO and Software License, up to 8 IO Ports: Ontrak ADU200, ADU2X8)
GPU Board
Increase Internal RAID Array Capacity
2x SSD in RAID-1 for System

Additional Hardware Ports
SD/HD/3/6/12G, 4x3G SDI, HDMI, ASI I/O Ports
NVIDIA ConnectX 10/25/40/50/100/200G Ports for SMPTE ST2110/2022-7
1G Ethernet Ports for UDP/RTP IP with SMPTE 2022-1 FEC
Standard 1/10G Ethernet Ports for IP Streams, Control, File Transfer
RS-232/422/485, i-Link/IEEE1394 Hardware Ports
AES I/O for Matrox DSX Boards

Software Options
Transfer Manager PRO
Profanity Delay
Time Shift
SCTE-104/SCTE-35 Generation (for Single PGM Channel)
EBU R128 Loudness Normalization (for Single Output Port)
CEA-608/708, OP-42/47 Live Closed Captions (generation from Live Data Source or from Files, for Single PGM Channel)
DVB/ATSC Subtitles (generation from Live Data Source or from Files, for Single PGM Channel)
Main - Backup PGM Channel Sync (for Single PGM Channel)
NVENC Assistance (for File Encoding or Output Stream Encoding)
Avid Unity/Interplay Support (for REC Channels)
Web Application Server
TS Mux (up to 16x SPTS in 2x Groups)

Client Applications
Air Manager, Rec Manager, News Cut

Additional I/O Ports & Channels (SD/HD or UHD Software Licenses)
Capture Port (SDI/HDMI, ASI/IP with DeMux and Stream Decoding, all supported Protocols including SDI/NDI Fill+Key)
Output Port (SDI/HDMI, ASI/IP with Stream Encoding, all supported Protocols including SDI/NDI Fill+Key)
MultiScreen Processor (4, 8, 16 or 24 Inputs Software License)
REC Channel (Full Res + Proxy)
PGM Channel with Full Graphics (8 GR Layers + Logo Layer)
PGM Channel with Lite Graphics (1 GR Layers + Logo Layer)
Graphics for PGM Channel (additional GR Layers)

Device Server Software Licenses
VDCP for REC Automation (Slave mode for Single REC Channel)
VDCP for Playout Automation (Slave mode for Single PGM Channel)
VizRT (Master mode for Single PGM Channel)
Chyron CII (Master or Slave mode for Single PGM Channel)
SDI Router for Playout Automation (for Single Device)
SDI Router for REC Automation (for Single Device)
VTR for REC Automation (for Single Device)
TSL5 UMD (Master mode for Single Device)
Ember+ (for Junger Audio Devices. Master mode for Single Device)

Ordering Information

To order the SL NEO 2000 Series Server, send us the following information:

- Base Model Name,
- Capture and Output Ports formats (SD/HD/3G/UHD, FPS), types (SDI/HDMI/ASI/IP), protocols for IP and number,
- PGM Channels formats (SD/HD/3G/UHD, FPS) and number,
- Codecs and Containers for Media Files,
- External Data Sources for Graphics and Closed Captions,
- Information about redundancy scheme,
- Type (internal, external) and useful capacity of RAID-array,
- Required Hardware and Software Options,
- Required Client Licenses.

The Client Applications are pre-installed on the server platform, and one set of Client Software for installation on a workstation is included with each SL NEO Server.

SDI Routers Control Protocols

Grass Valley Triton BDS
Grass Valley Nvision/Native Protocol/Vega/M-2100
Nevion Vikinx v128/Thor
Leitch
Imagine LRC
Kramer
BMD Videohub Ethernet/RS-232
Snell Switcher/Remote Protocol
Evertz Quartz/QMC-2
Sierra XXvse
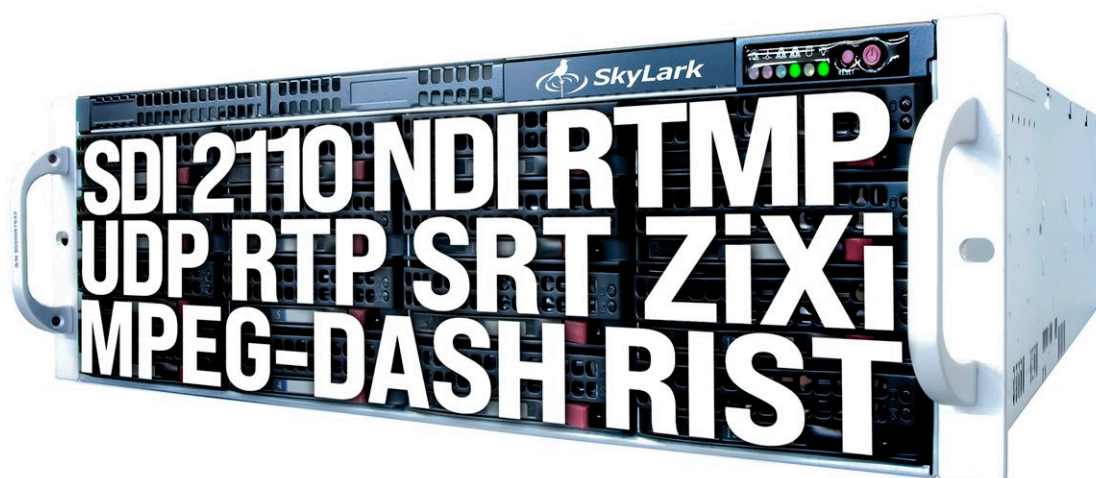Utah SC-4/RCP-1
Pro Bel SW-P-02/SW-P-08
Venux VM/SI/3000 ASCII
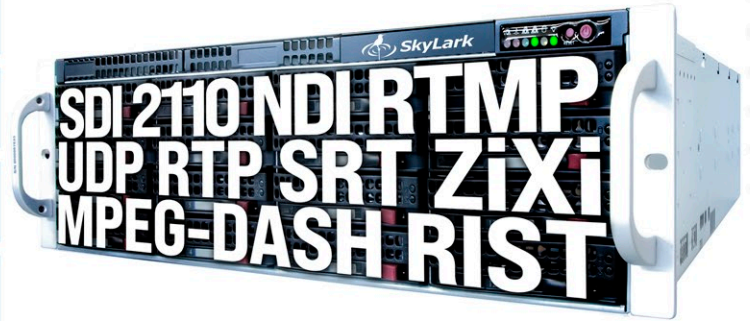Ross Video Presmaster/NK-SCP/A
ELPRO SDZHD Series
AJA KUMO
LES
Profitt

SL NEO 3000 Servers
Channel In A Box

- ▶ **Automated Ingest, Playout, Branding with Multiformat Streaming**
- ▶ **Up to 16x HD or 4x UHD I/O Ports Up to 8x REC and 8x PGM HD Channels**
- ▶ **SDI/HDMI, ASI/IP Reassignable I/O Ports and PGM & REC Channels**
- ▶ **Base Configurations Supports: NDI, HLS, RTMP, RTP, UDP, SRT, Zixi, RIST**

SL NEO 3000 Servers are designed to automate workflows on any type of TV Channel - satellite, cable, terrestrial, corporate, cloud. They successfully operate on both regional and federal TV Stations.

Based on SL NEO Software Media Platform, Servers has a powerful system of processing files, signals and streams. Buffering, frame synchronization together with up/down/cross-conversion provides the ability to frame accurate switch, mix and playback live sources and files at various resolutions and FPS.

Main Features

Capture & Live Ingest

Server SL NEO 3000 inputs are intended to receive external SDI and ASI/IP streams that are used in workflow for:

- Live events in output program;
- Playout with a delay (input stream for delay);
- Insertions of regional ads and local programs (stream from central station);
- Live events recording to files according to Shedules.

Recording is automatically performed according to schedules and configurable rules. Full control over all recording processes is available from the Air Manager client application or through web clients.

● A built-in **Schedule Editor** is provided for creating and editing recording schedules, and import from traffic systems is supported. Each recorder can work according to an internal schedule on specified days and hours of the week.

● A variety of **Start Types**, including Manual, Hard Time, external XML-RPC, VDCP, GPI commands, incoming SCTE-104, SCTE-35, DTMF markers, and synchronous start for several recorders.

● **SDI Switch Control** function is used for automatic or manual source switching before the event, automatic VTR control via RS-422, IEEE1394 in batch recording mode is possible.

● The built-in **Rec Manager Scheduler** analyzes list of events and generates tasks for recorders, minimizing their downtime.

● **Seconds after recording starts**, incoming clips can be used for immediate editing in the News Cut application or playback by the SL NEO Server.

File Ingest

Transfer Manager Lite - Server/Client tool for automatic copying and moving file content between production units.

File operations are performed in multi-threaded mode, automatically, according to configurable rules.

TM Lite used for moving files from Ingest to Playout zone, NLE and to archive. Integration with SL NEO Media Database allows to start the file copying process simultaneously with the start of recording.

The second scenario - priority copying from NLE and archive to Playout Servers arrays with analysis of executable playlists. Files first in the play queue are copied first.

TM Lite supports copying CLF playlists files for guarantee delivery from traffic to watch folders on Playout Servers.

The full version - **Transfer Manager Pro** is available as an option. It allows transcoding files: changing codec and container, performing up/down/cross conversions and Loudness Level normalization.

Preparing on-Air Graphics

Graphics Editor allows you to create and edit titles and graphic compositions. It is a module within the application's Air Manager, News Cut, connect and interacts with SL NEO Media Database.

All source materials for and results of the work are stored on an array Server, allowing for network collaboration between multiple users and instant playback of created compositions.

Rendering is performed by the SL NEO 3000 Server directly during playback.

Graphics Editor allows you to work with static graphics files, fragments of 32-bit animation and video, with access to the database and proxy copies.

Editor has a comprehensive set of tools for quickly creating graphics with 2D effects and titles including reels, crawls, TV clock, PIP and RSS feeds.
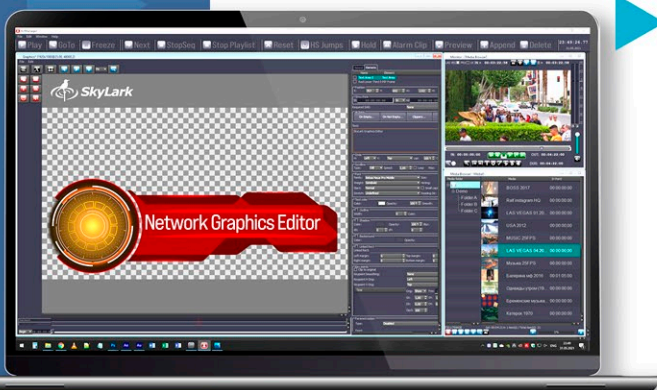
File & Live Events with Graphics

The SL NEO 3000 Server plays files and switches Live sources to the Program Outputs according to the events in the playlists. The start type is set for each event: manually, by hard time, by external command, or sequentially.

Servers supports mixed content playback: UHD/HD/SD and SDR/HDR. Up/down/cross conversions are performed in real time during playback.

8x Graphics & Title Players plus 1 Logo Player for each SL NEO 3000 Server Program Output.

The start and stop of graphic events are linked either to events in the main playlist, or to a hard time, or done manually. Linking a "secondary" graphic event to a "primary" event means starting/stopping a "secondary" event synchronously or from time shift from the start/stop of the "primary" event.
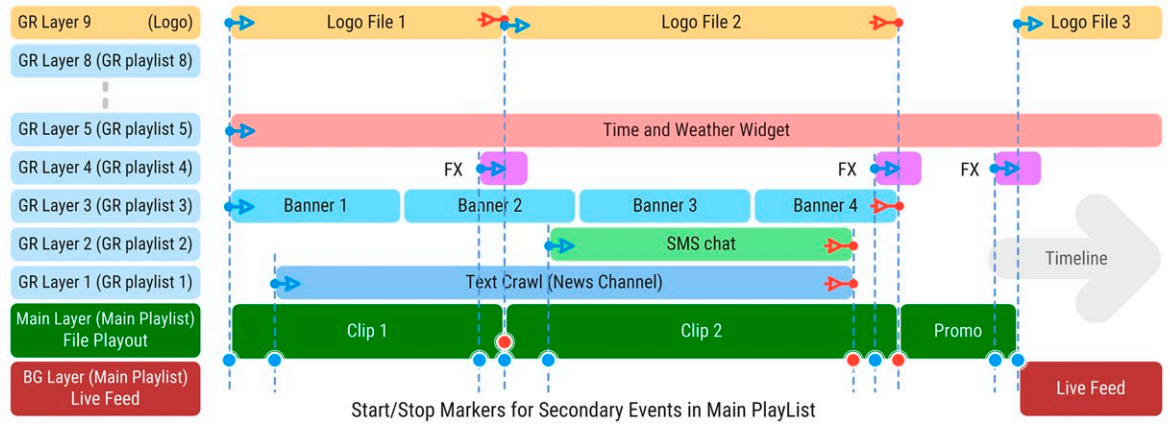
Device Control

Automatic control of external SDI router or GPI devices is performed during recording and playout. SDI router controlled via the Device Server software module.

According to the events in the record- and play- shcedules, the server modules **File Recorder** and **Program Player** send commands for switching to the **Device Server**, which translate commands to the SDI Router. Thus, before starting a record or playback event, a certain signal source at the server input is automatically switched.

Integration with External Systems

SL NEO 3000 Server Software directly integrated with **Chyron** and **Vizrt** Graphics Stations. External graphics are controlled from the main playout schedule of the SL NEO System. The current statuses of external systems are displayed in a main ingest & playout control interface - **Air Manager** client application.

Integration with **FAB**, **Polistream** systems allows you to implement **Automated Live Captioning** for News, Sports and other live programming.

SL NEO 3000 Servers are integrated with the **U.S. Emergency Alert System (EAS)**, the National Public Notification System during a national emergency.

Encoding & Processing

To distribute output programs in various environments, SDI/ASI/IP Streams with the necessary resolution/fps parameters, IP-protocols, and bitrates are generated at Server Output Ports. The procedure for creating a single output signal/stream is performed by the **Stream Player software module**.

In Playout configurations, it receives uncompressed AV and ANC data from the **Program Player** module and then:

- encodes one compressed stream, sends it to the NIC/ASI port, or
- encodes one uncompressed data stream in SDI/HDMI format, sends it to the Output Board, or
- encodes one uncompressed SMTE ST2110 stream, sends it to the NVIDIA NIC Output Port.

Within the system, several Stream Player modules works simultaneously, and their number is equal to the number of output streams.

Video Processing
Up/Down/Fame Rate Conversion
HDR/SDR Color Spaces Conversion
Video Levels Adjustment
Deinterlace Mode
Genlock Mode

Audio Processing
Audio Level Adjustment
Audio Matrix 64x64
Dynamic Range Conversion
EBU R128 Loudness Normalization

ANC Data Processing
Generation or Retranslate:
CC data OP-42/47, CEA-608/708
SCTE-104/35 markers
AFD/WSS

Output Streams
SDI: SD/HD/3..12G, 24...60 FPS
IP: SMPTE ST-2110/20/30/40
IP: SMPTE ST-2022-7
IP: NDI
ASI/IP TS: UDP/RTP
IP WEB STREAMS: SRT/HLS/RTMP/Zixi

Each Stream Player module performs AV & data processing operations:

- up/down/cross conversion with changing video frame rate;
- loudness normalization for audio streams in accordance with EBU-R128, audio levels normalization and dynamic range compression;
- DTMF generation, multiplexing into the output stream data of Closed Captions, SCTE-104 or SCTE-35 markers, as well as EPG, AFD and VITC.

SL NEO 3000 Servers
Channel In A Box

SkyLark
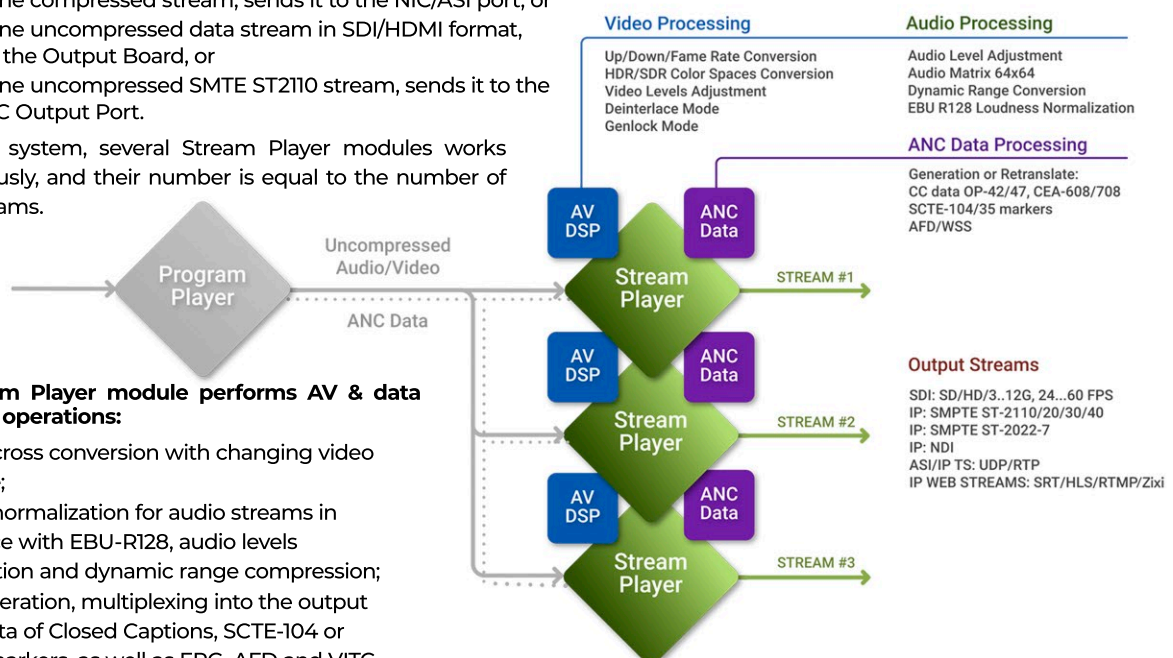
Software Modules Connection Diagram for SL NEO 3000 Servers Series

Stream Encoders

Multi Screen — MS output

Stream Player — SDI/HDMI/ASI/IP — MS Output 1 (e.g. SDI)

MULTISCREEN OUTPUTS — MS Output 2 (e.g. IP SRT)

Stream Decoders

Stream 1 — ANC Data DVB/ATSC Subtitles/EPG — Stream Capture — Stream 1

SDI / HDMI / ASI / IP — **SERVER INPUTS**

Stream N — DEMUX — Stream Capture — Stream N

SL NEO Media Platform Base Module

Uncompressed Internal Streams Video/Audio/Data

Virtual Router

Stream 1 / Stream N — PGM 1 / PGM N

Stream Player — PGM 1 Output (e.g. SDI)

Stream Player — SDI/HDMI/ASI/IP — **SERVER OUTPUTS** — PGM N Output (e.g. SDI)

ANC Data DVB/ATSC Subtitles/EPG

REC List Files / REC Log Files

Play List Files / As Run Log Files

Files from NLE/Archive — **Media File Transfer** — Files to Export

Rec Control — RECORD 1 / RECORD N

File Recorder — Stream 1

Ingest

File Recorder — Stream N

Local Storage

Playout

Program Player — Stream 1 — PGM 1

Program Player — Stream N — PGM N

Playout Control — BROADCAST 1 / BROADCAST N

Air Manager Client Application

Files + Metadata — Files + Metadata

Air Manager Client Application

Proxy preview streams

Device Server — To Control Interfaces

SDI Router / VTR Control / GPIO / VDCP / UMD Data

Router Client — Multiscreen Client

Media Database — LAN — LAN

Media Connect / Air Manager / News Cut — **Client Applications**

Media Browser / List Editor / Graphics Editor — **Client Applications Tools**

WEB App Server

REC ch. control from web-clients / Proxy preview streams to web-clients

PL ch. control from web-clients / Proxy preview streams to web-clients

Device Server — To Control Interfaces

SDI Router / GS Control / GPIO / VDCP / UMD Data

Multiscreen Client — Router Client

Web-clients — WAN — **Web-clients** — WAN

Rec & Playout Ch. Control, Working with Media, Remote Monitoring via Web

Live Preview (full res)

SL NEO 3000: I/O Data Types

The SL NEO 3000 Series Servers offer the widest range of functionality in the line. The diagram shows the main categories and types of data used by the Server Platform to interact with external infrastructure components.

I/O Interfaces and Protocols for Media Data

SDI					HDMI		IP				ASI
4x3G	12G	6G	3G	HD	SD	1.4	2.0	ST 2110	ST 2022-7	NDI	DVB	ATSC

IP

| UDP | RTP | RTSP | SRT | ZiXi | RIST | RTMP | HLS | MPEG-DASH |

Log Files, Data for Controlling External Systems, SNMP Monitoring

REC Log Files	As Run Log Files	Tech Log Files	EDL Files
SL NEO Control Protocol via XML-RPC or REST		SDI Router	VTR
Vizrt	Chyron CII	GPO	EMBER+ Data	TSL5 UMD Data
SNMP Data (from Hardware & SL NEO Software)				

I/O ANC Data and MPEG-2 Data Embedded

SCTE-104	CEA-608	CEA-708	VITC	WSS	AFD	DTMF
SCTE-35	OP-42	OP-47	DVB/ATSC Subtitles		DVB/ATSC EPG	

I/O Media and Metadata Files

Full Screen I/O, Import files with Alpha channel (see full list in Tech Spec)

Audio/Video/Metadata					Still Graphics and Sequences			
MXF		MPEG	AVI	MOV	MPG	BMP	JPG	PSD	PNG
OP	OP1A	OP1B	D10	PS	TS	DV	DIFF	MP4	SLG (XML-based GR templates)

Input Data and Files for Closed Captions & Subtitles

| Live CC Data | Recorded Clips in DB | MXF | SRT | SMI | TTML | STL |

Pass through or transcoding CC from one format to another

Input Data for Synchronization, Data from External Systems, Schedule files

NTP	PTP	Bi-Level Sync	Tri-Level Sync
VDCP	CII	GPI	SL NEO Control Protocol via XML-RPC or REST
REC Schedules Files	PLAY Schedules Files	EDL Files

Client Software: Air Manager, News Cut, Routing Client

Air Manager is the main client application of the SL NEO Media Platform, a comfortable tool for managing multiple playout and recording channels with functions for editing schedules, searching, browsing, importing/exporting & transcodimg file content.

The Air Manager GUI consists of the following types of windows: **"Recording"**, **"Broadcast"**, with executable schedules that display lists of events and their current statuses.

The number of windows of each type in the work interface and access rights are configured individually, depending on the role of the workstation in the workflow.

Workstations with Air Manager in Control Room

Record- and Playlists are loaded from traffic systems, from Excel files or compiled in the built-in lists editors of the Air Manager application.

The Media Browser window displays the contents of the Media Database of each of the SL NEO servers to which there is a network connection. In the SL NEO virtual file system, you can search for clips by text attributes, markup and view proxy.

The File Monitor window is used to view and edit the clips selected in the Media Browser or in the playlist and record rows.

The tools of the File Monitor window allow you to carefully and quickly edit executable playlists directly in the "Broadcast" windows: change IN and OUT markers, cut and trim the clip currently playing.

The Network Graphics Editor lets you create and edit titles and graphic compositions. It works as part of the Air Manager and News Cut applications and interacts with Media Database.

All source materials for and results of the work are stored on server storage. Rendering is performed by the SL NEO server directly during playback.

News Cut Application

News Cut is network client application for collective editing of news reports using proxies. Source material is stored in a database of one or more SL NEO servers, all News CUT users have network access to the database and proxy.

The results of editing are stored in the server database in the form of text XML descriptions of the editing solutions, and the stories are available for playback immediately after editing is completed.

Routing Client is a client application designed for manual remote control of SDI-switches, IP-stream redirection, as well as for switching control interfaces.

Routing Client Application

The application has a classic interface for this kind of tasks and allows several users at the same time to quickly perform switching at their workplaces.
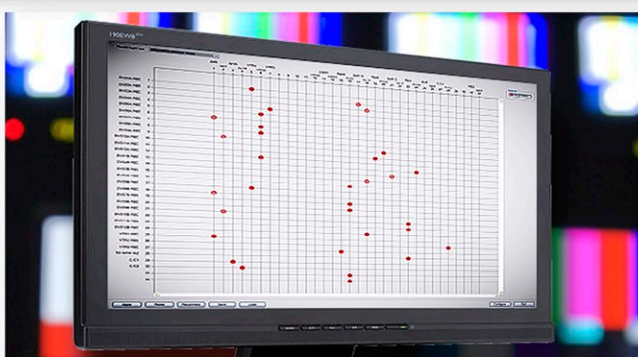
SL NEO 3000 Use Cases

Operational production: 1). Live recording, fast editing, delayed playback. 2). Short Delay (profanity delay). 3). News Production.

Central playout station: Broadcasting to multiple Time Zones (SCTE/DTMF control markers generation for auto-replacement of ad/program blocks in regions.

Regional playout station: decoding control commands in the signal from the central station, inserting of ad/program blocks. Commands to Start/Stop by results of matching a pre-selected fragment with fragments of the received video (in the absence of control signals).

Cloud playout system: remote access and monitoring from WAN area. Management of recording channels, playback SL NEO 3000 server, access to the content through a web-browser (via Web Application Server).

Playout Systems Based on CIAB. SDI and Compressed IP Streams Mix

In the example, you can see 2 SL NEO servers 3000 series (main and backup). Each generates 4 output programs. The sources for these 4 programs are files and external feeds: 4 SDI lines and 4 IP streams.

Fault tolerance is provided by 100% "hot" redundancy of servers. Redundant playlists and playout channels operate in parallel and synchronously with the main channels. This allows you to instantly switch to a redundant half-set if necessary.
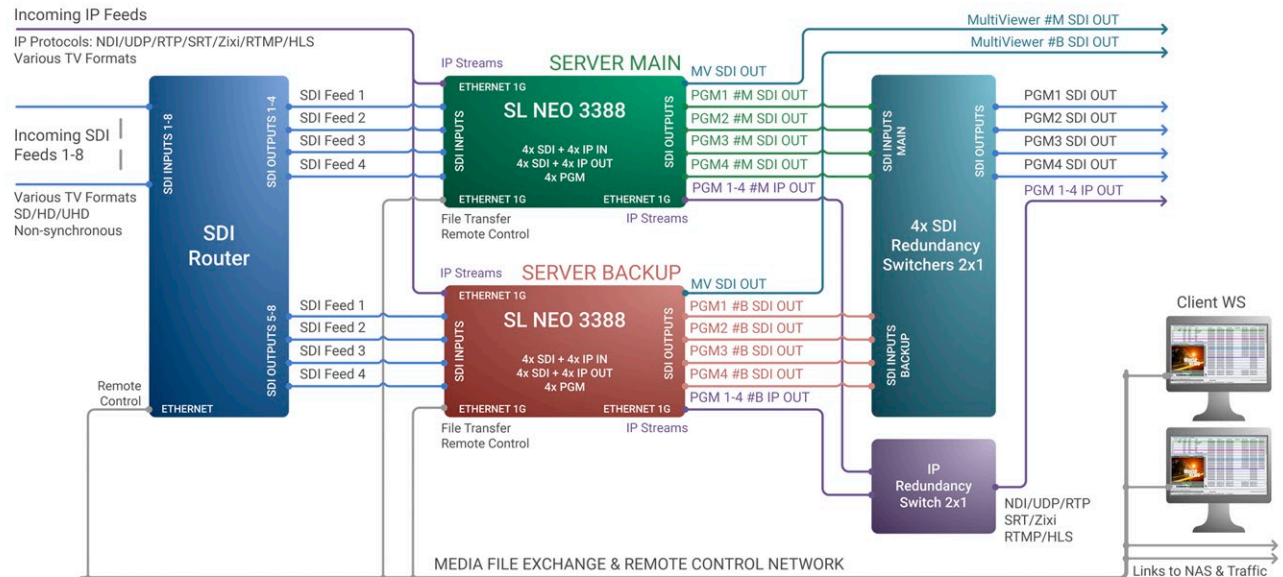
It's possible to combine the input SD/HD/UHD SDI signals and IP/ASI streams with different resolutions and frame rates. All ports/inputs use buffering and frame synchronization together with up/down/cross conversions. This ensures parallel processing of signals of any standards and frame rates.

Therefore, Skylark's solution provides possibilities of switching, mixing, and playing files and live sources with different resolution and FPS on-air. The same can be said about multiscreen displaying on a single monitor for signals of various formats: NTSC/PAL/720p/1080i/1080p/2160p with FPS values varying from 25 to 60.

The external SDI router receives the commands from servers and switches signals to server inputs for recording or for using in output programs as Live sources. 8 streams: SDI and IP for each program on the outputs of the main and backup server.

SMPTE ST 2110 IP Streams

SkyLark's Channel-in-a-Box allows you to create a multichannel playout system that uses the SMPTE ST2110 IP-protocol. For receiving/transmitting SMPTE ST 2110–20/30/40 streams, NVIDIA Rivermax network adapters are used. The ST2022–7 redundancy and 'seamless' switching standard is supported. Device detection and connection is implemented in NMOS browser (IS-04, IS-05). The diagram shows an example of creating a fault-tolerant 8-channel system that uses the ST2110 transport.
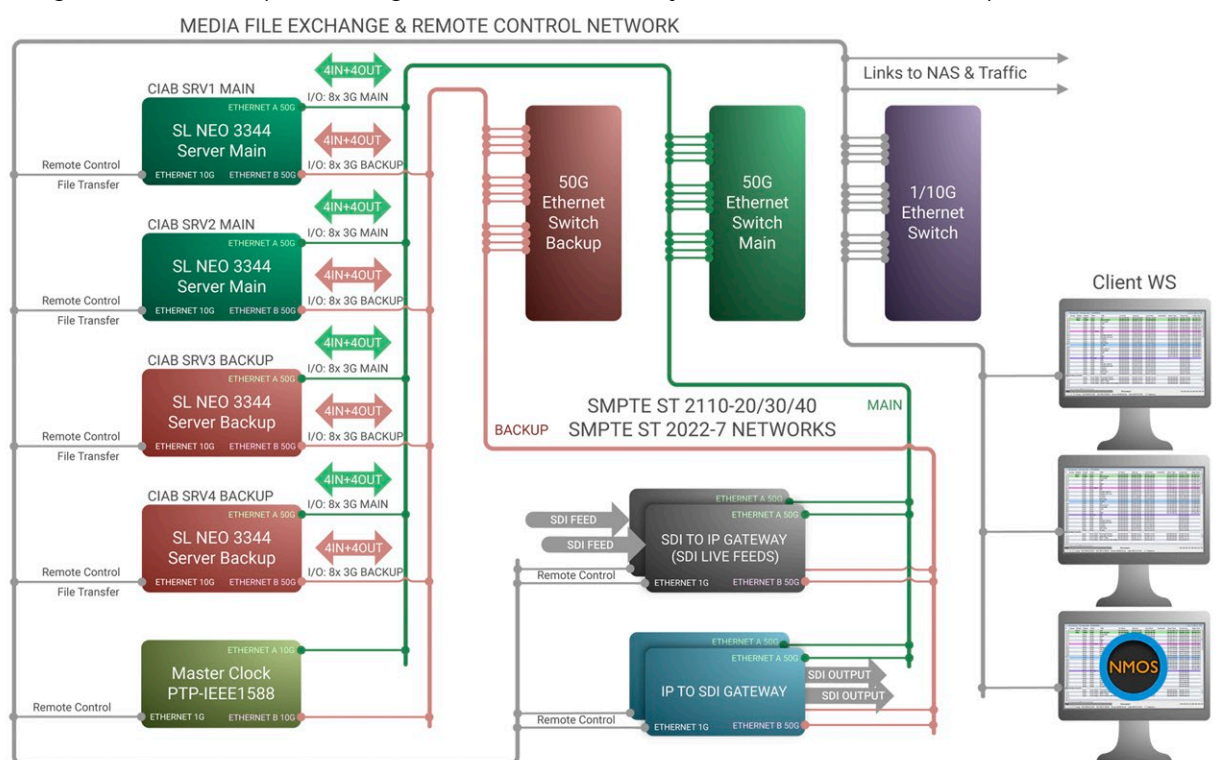
SkyLark

SL NEO 3000 Servers
Channel In A Box

The Name of the Base Model of the SL NEO Server is made up of the values of the 5 variables located after the name of the product line:

SL NEO S F.C.P H A

S First Digit of the SL NEO Series Number	**F** Maximum Video Operating Mode	**C** Number of Capture Ports or REC CH	**P** Number of PGM CH or Output Ports	**H** Type of Hardware I/O Board (Brand)	**A** Useful capacity of the Array in Tb
SERIES	**FORMAT**	**CAPTURE**	**PLAYOUT**	**HARDWARE**	**ARRAY**

SERIES	FORMAT		CAPTURE	PLAYOUT	HARDWARE	ARRAY
S = 3 - 3000 Series Channel in a Box	F = 2 - HD 1080i 50/60	FULL GRAPHICS KIT	for F = 2, C = 1...8	for F = 2 or 5, P = 1...8	H = D – Dektec DTA	SDI + Audio Embedded
	F = 3 - 3G 1080p 50/60		for F = 3, C = 1...8	for F = 3 or 6, P = 1...8	H = A – Dektec DTA	DVB/ATSC ASI (SPTS)
	F = 4 - UHD 2160p 50/60		for F = 4, C = 1...2	for F = 4 or 7, P = 1...2	H = M – Matrox DSX LE3/4	SDI + Audio Embedded
	F = 5 - HD 1080i 50/60	LOGO ONLY			H = N – Nvidia NIC	IP: SMPTE ST 2110/2022-7
	F = 6 - 3G 1080p 50/60				H = E – Onboard 1GbE Port	IP: NDI, HLS, RTMP
	F = 7 - UHD 2160p 50/60					SPTS IP: RTP, UDP, SRT, Zixi
					H = B – BlackMagic SDI I/O	SDI + Audio Embedded
					H = H – BlackMagic HDMI	HDMI + Audio Embedded

For Base Models 3000 Series:
C = No. of Capture Ports = No. of REC CH
P = No. of PGM CH = No. of Output Ports

For cases where layered graphics functions are unnecessary, you can use Models without Graphics Package: only Logo Layer will be active in ALL PGM CH.

In **variable F** these models are marked with numbers 5, 6 and 7 for HD, 3G and UHD formats respectively. **You can activate the full graphics package for each PGM Channel at any time.**

Example:	SL NEO 32.4.6 D8
Max mode:	HD 1080i 50/60
Number of Capture Ports and REC Channels	4
Number of PGM Channels and Output Ports	6
Hardware: Dektec DTA	I/O: SDI + Audio Embedded
Internal Array:	Useful capacity 8 Tb

Series 3000 Base Models with reassignable I/O ports and REC/PGM Channels: total number of REC/PGM Channels in Model Name - after letter X

SL NEO S F X P H A

S First Digit of the SL NEO Series Number	**F** Maximum Video Operating Mode	**X**	**P** Total Number of I/O Ports (REC/PGM Channels) for self-configuration	**H** Type of Hardware I/O Board (Brand)	**A** Useful capacity of the Array in Tb
SERIES	**FORMAT**		**PORTS/CHANNELS**	**HARDWARE**	**ARRAY**

SERIES	FORMAT		PORTS/CHANNELS
S = 3 - 3000 Series Channel in a Box	F = 2 - HD 1080i 50/60	FULL GRAPHICS KIT	for F = 2 or 5, P = 2...8
	F = 3 - 3G 1080p 50/60		for F = 3 or 6, P = 2...8
	F = 4 - UHD 2160p 50/60		for F = 4 or 7, P = 2...4

Example:	SL NEO 32X8 D16
Max mode:	HD 1080i 50/60
Total Number of I/O Ports, REC/PGM Channels	8
Hardware: Dektec DTA	I/O: SDI + Audio Embedded
Internal Array:	Useful capacity 16 Tb

Technical Specifications for SL NEO 3000 Servers

Hardware configuration, including CPU/HDD models, number and types of I/O Boards depends on the selected SL NEO Server Model and set of Options.

Server Hardware
Supermicro 2...4U chassis, two power supply modules in hot backup.
One or two Intel Xeon Gold CPU, 48/96Gb DDR4 RAM,
SSD for OS, two onboard 1GbE ports.
Built-in hardware RAID-10, 8x or 16x SE SAS 3.5" RE 8 or 16Tb array useful capacity.
OS Windows Server 2022 x64

I/O Ports & PGM Channels
Capture Ports HD/SD: 1...8, Capture Ports UltraHD: 1...2
REC Channels HD/SD: 1...8, REC Channels Ultra HD: 1...2
PGM Channels HD/SD: 1...8, PGM Channels Ultra HD: 1...2
Output Ports HD/SD: 1...8, Output Ports UltraHD: 1...2

Video Formats and Color Spaces
625i/525i, 720p, 1080i/1080p, 2K cinema 2048x1080p, 2160p
25/29,97/50/59.94/60 fps
Color Spacing: BT.601/709/2020, SMPTE ST2084, ARIB STD-B67

I/O Streams: Interfaces, Protocols, Codecs
SDI: SD/HD/3...12G SDI, 4x 3G SDI/Embedded Audio
IP: SMPTE ST 2110, SMPTE ST 2022-7
IP: NDI, HLS, RTMP, UDP, RTP, SRT, Zixi, RIST, MPEG-DASH
DVB/ATSC IP UDP/RTP Unicast/Multicast SPTS/MPTS
DVB/ATSC ASI: SPTS/MPTS
Video Codecs: MPEG2/H.264/HEVC
Audio: 48kHz/16/24 bit PCM, ADPCM, MPEG-1 L-II/III, AAC, AC3

I/O Ancillary/MPEG2 TS Data
OP-42/47 Teletext, CEA-608/708 Closed Captions
DVB/ATSC Subtitles, EPG
SCTE-104/SCTE-35 markers with metadata
VBI/VANC Data: VITC, AFD, WSS

Video Codecs (File Rec & Playout)

SD/HD
DV25, DVCPRO25, DVCPRO50, DVCPROHD100, HDV
IMX 30/40/50
XDCAM EX SP/HQ, XDCAM HD LP/SP/HQ.422
DNxHD 120/145/180/220
AVCHD
XAVC 50/100/200, XAVC Long GOP
AVC-Ultra 50/100/200
AVC-Ultra Long G (12/25/50)
PRORES HQ/SD/LT
MPEG-2 I-Frames/Long GOP
H.264 L I-Frames/Long GOP

Ultra HD
H.264 8/10 bit
XAVC 300/480, XAVC Long GOP
AVC-Ultra 300/480, AVC-Ultra Long G
PRORES SQ/HQ
DNxHR SQ/HQ
HEVC 8/10 bit

Audio Codecs (Files Playout)
RAW 16/24 Bit PCM, ADPCM, MPEG-1 L-II/III, AAC, AC3

File Containers
MXF-OP1A, MXF-D10
Avid MXF (OP-Atom)

Sony XDCAM HD/422 (MXF-OP1A)
Sony XAVC 50/100/200/300/480/LongGOP (MXF-OP1A)
P2 AVC-Ultra 50/100/200/300/480/LongG (MXF-OP1B)

Microsoft AVI, MPEG PS/TS
QuickTime MOV, DV DIFF
MP4, MPG, GXF

Still Graphics (single files and sequences)
JPG, BMP
With Alpha: PNG, TGA, TIFF, PSD

Video Codecs with Alpha
Uncompressed
TGA, QTRLE
Speed HQ, Lagarith
Key from a separate file
JPGA codec for AVI

File Containers for Video with Appha
Microsoft AVI
QuickTime MOV
Audio supported

Hardware & Software Options

Hardware Options
LTC Input (Including one of supported LTC Readers and Software License: Adrienne AEC-41, Plura PLC, Miranda Little Red, Horita TCI-50)
GPIO (Including one of supported USB GPIO and Software License, up to 8 IO Ports: Ontrak ADU200, ADU2X8)
GPU Board
Increase Internal RAID Array Capacity
2x SSD in RAID-1 for System

Additional Hardware Ports
SD/HD/3/6/12G, 4x3G SDI, HDMI, ASI I/O Ports
NVIDIA ConnectX 10/25/40/50/100/200G Ports for SMPTE ST2110/2022-7
1G Ethernet Ports for UDP/RTP IP with SMPTE 2022-1 FEC
Standard 1/10G Ethernet Ports for IP Streams, Control, File Transfer
RS-232/422/485, i-Link/IEEE1394 Hardware Ports
AES I/O for Matrox DSX Boards

Software Options
Transfer Manager PRO
Profanity Delay
Time Shift
SCTE-104/SCTE-35 Generation (for Single PGM Channel)
EBU R128 Loudness Normalization (for Single Output Port)
CEA-608/708, OP-42/47 Live Closed Captions (generation from Live Data Source or from Files, for Single PGM Channel)
DVB/ATSC Subtitles (generation from Live Data Source or from Files, for Single PGM Channel)
Main - Backup PGM Channel Sync (for Single PGM Channel)
NVENC Assistance (for File Encoding or Output Stream Encoding)
Avid Unity/Interplay Support (for REC Channels)
Web Application Server
TS Mux (up to 16x SPTS in 2x Groups)

Client Applications
Air Manager, Rec Manager, News Cut

Additional I/O Ports & Channels (SD/HD or UHD Software Licenses)
Capture Port (SDI/HDMI, ASI/IP with DeMux and Stream Decoding, all supported Protocols including SDI/NDI Fill+Key)
Output Port (SDI/HDMI, ASI/IP with Stream Encoding, all supported Protocols including SDI/NDI Fill+Key)
MultiScreen Processor (4, 8, 16 or 24 Inputs Software License)
REC Channel (Full Res + Proxy)
PGM Channel with Full Graphics (8 GR Layers + Logo Layer)
PGM Channel with Lite Graphics (1 GR Layers + Logo Layer)
Graphics for PGM Channel (additional GR Layers)

Device Server Software Licenses
VDCP for REC Automation (Slave mode for Single REC Channel)
VDCP for Playout Automation (Slave mode for Single PGM Channel)
VizRT (Master mode for Single PGM Channel)
Chyron CII (Master or Slave mode for Single PGM Channel)
SDI Router for Playout Automation (for Single Device)
SDI Router for REC Automation (for Single Device)
VTR for REC Automation (for Single Device)
TSL5 UMD (Master mode for Single Device)
Ember+ (for Junger Audio Devices. Master mode for Single Device)

Ordering Information

To order the SL NEO 3000 Series Server, send us the following information:

- Base Model Name,
- Capture/Output Ports formats (HD/3G/UHD, fps), types (SDI/HDMI/ASI/Ethernet) and number,
- Types and protocols for I/O IP Streams,
- REC Channels formats (HD/3G/UHD, fps) and number,
- PGM Channels formats (HD/3G/UHD, fps) and number,
- Codecs and Containers for Media Files,
- External Data Sources for Graphics and Closed Captions,
- Information about redundancy scheme,
- Type (internal, external) and useful capacity of RAID-array,
- Required Hardware and Software Options,
- Required Client Licenses.

The Client Applications are pre-installed on the server platform, and one set of Client Software for installation on a workstation is included with each SL NEO Server.

**SDI Router Control Protocols supported by the SL NEO Software**

Grass Valley Triton BDS
Grass Valley Nvision/Native Protocol/Vega/M-2100
Nevion Vikinx v128/Thor
Leitch, Imagine LRC
Kramer
BMD Videohub Ethernet/RS-232
Snell Switcher/Remote Protocol
Evertz Quartz/QMC-2
Sierra XXvse
Utah SC-4/RCP-1
Pro Bel SW-P-02/SW-P-08
Venux VM/SI/3000 ASCII
Ross Video Presmaster/NK-SCP/A
ELPRO SDZHD Series
AJA KUMO
LES, Profitt

SL NEO 5000 Servers
On Air Graphics

▶ **Universal On Air Graphics & Channel Branding Solution**

▶ **Up to 8x HD PGM, up to 2x UHD PGM Channels. Live Inputs, Fill+Key I/O**

▶ **8x Graphics & Title Players + Logo Layer for each PGM Channel**

▶ **Internal Keying (overlay Graphics on the input video) or External Keying (Fill+Key)**
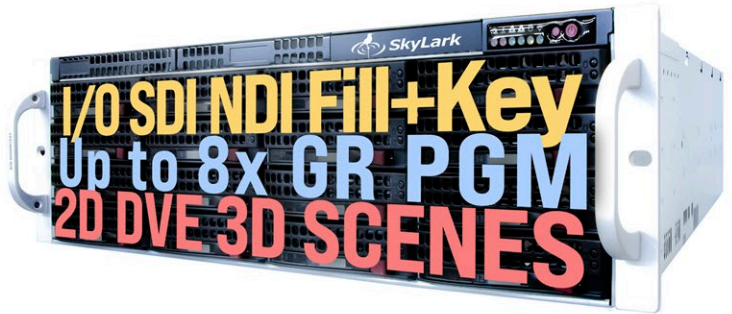
The SL NEO 5000 is a fully automated interactive Character Generators for Live Production and Channel Branding. Maximum number of output HD Programs - 8 (up to 8x Capture and 8x Output Ports). For UHD: up to 2x Capture and 2x Output Ports for 2x UHD Programs.

At the basis of on-air graphics technology is the playback of multilayer dynamic compositions with text/file/live elements and parametrization of objects with data from external sources.

Main Features

Basic design elements

#### Titles, roll or crawl lines on dynamic backgrounds

The number of such objects is not limited. They can be randomly combined with any other objects. The content of the text can be dynamically changed by reading the information from external sources.

SMS chats, weather, currency exchange rates

Data from external sources - text information that is read from txt- or xml-files, or comes from providers of information services in the form of RSS-resources and is displayed by the graphic "engine" of SL NEO server as crawl lines, scrolling lists or alternating text lines.

Typical examples are info-bars, SMS chats, news crawls, weather information and currency rates.

SL NEO platform has its own **RSS server** that generates a local RSS resource, which in turn uses one or more folders with txt- or xml-files as a source of text data. The RSS data is transferred to the appropriate graphical compositions and parameterizes the text layers.
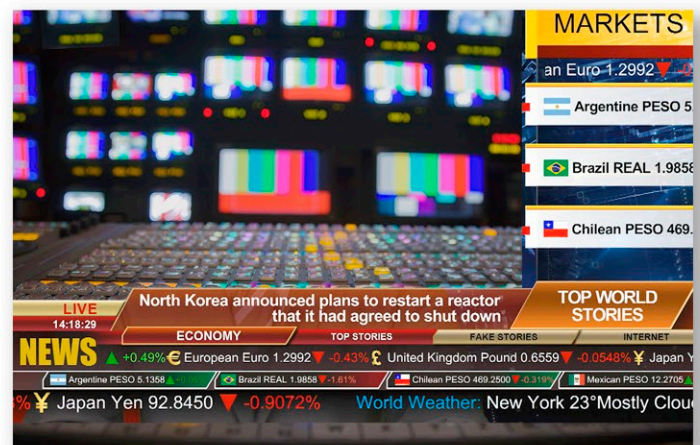
Clocks, Animations, Live Video and 2D DVE

● Visualization of the current time is implemented in the form of "digital" and "analog" clocks of arbitrary design with animation and audio. It is possible to create collages for several time zones, direct and reverse counters, displaying weather readings and other information.

● Animations can be played from sequences of TGA/PNG/PSD files, or from avi/mov files with an alpha-channel.

Compositions can contain transitions and 2D effects, PIP elements, video from server inputs, mixes of audio tracks.

● A composition can contain several layers of text, "picture-in-picture" objects, backgrounds and frames, layers of text strings with data (TXT, RSS).

● All objects can be set as the key-point motion paths, each composition can contain audio. Audio is mixed in the program signal and output in SDI/NDI FILL or in a separate AES line.

Preparing on-Air Graphics

Networked Graphics Editor allows you to create and edit titles and graphic compositions. It is a module within the application's Air Manager, News Cut, connect and interacts with SL NEO Media Database.

Graphics Editor includes tools for creating mulrilayered Graphics use 32-bit animation with begin, loop, end fragments, 2D DVE: pip, zoom, mix and wipe transitions with keypoints.

For text rendering, text objects can be parameterized with the data contained in the main playlist lines.

All source materials for and results of the work are stored on SL NEO 5000 Server array, allowing for network collaboration between multiple users and instant playback of created compositions. Rendering is performed by the SL NEO Server directly during playback.

Squeeze Back

Squeeze Back is a method for displaying additional information (such as ads and promotions) that reduces the image size of the current playlist event in order to display ads on a free area of the screen.

The SL NEO 5000 Series Servers allow you to implement this feature in 2 modes:

1). With saving the duration and soundtrack of the main event (only reducing the size is used),

2). With increasing the video playback speed of the main event (the original sound is played, the duration is reduced). This mode is most useful for the final titles of movies.

Squeeze Back effects are playing using templates created in the built-in Graphics Editor.

Graphics Playback

The SL NEO 5000 Server allows you to playback graphical compositions in several modes.

In the production studio can be used lists from pre-prepared templates and compositions with manual start. Playback is possible according to the schedules, the type of starting is set for each event: manually, by time, by external command or sequentially.
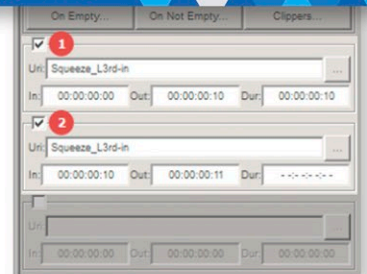
When working as part of a playout system, the SL NEO 5000 Server is controlled from the external automation system. SL NEO 2000 and 3000 series servers can control the 5000 server via XML-RPC using the SL NEO platform's common control protocol. From third-party automation systems, SL NEO 5000 controlled using Chyron CII or SL NEO control protocol.

The Final Program is a composition containing 2 layers:
  - Full Screen Clear Program from external Playout System,
  - Graphics Program from SL NEO 5000: final video/audio mix of all graphics layers.
   Graphics Program can be issued as NDI/SDI Fill + Key, or use SL NEO 5000 server's internal overlay mode on the incoming Clear Program signal).

Graphics Program from SL NEO 5000 consists of 8 independent Graphics Layers and one logo Layer. Each Layer is a virtual player with a title generator. Each player can be set to play a a selected graphics composition or use its own playlist. Logo player has a minimum of functions and play a selected graphics file or composition.

Virtual players are components of the Program Player server module, which acts as an automated playout system for a single program. The final video/audio module renders directly during playback.

Graphic events are linked to events in the main playlist. Linking a "secondary" graphic event to a "primary" event means starting/stopping a "secondary" event synchronously or from time shift from the start/stop of the "primary" event.
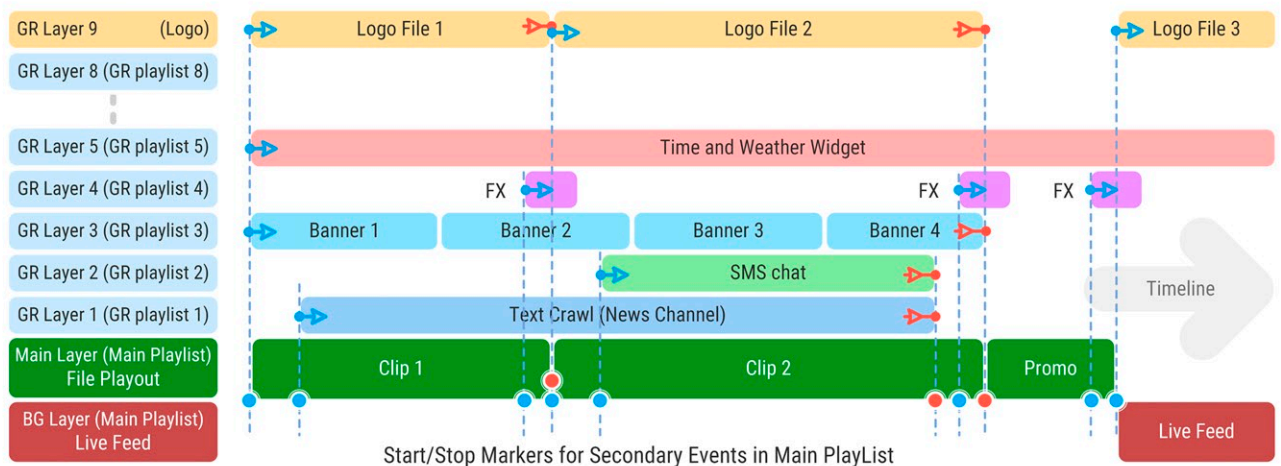
Software Modules Connection Diagram for SL NEO 5000 Servers Series

The diagram shows three possible uses for the SL NEO 5000 server.

A. In a Live production studio, the Server 5000 series plays compositions with graphic files and titles, generates Fill + Key, controlled by the operator through the **Air Manager** client application.

B. Server overlays the graphic on the incoming signal in internal keying mode. The **Program Player "B"** module can be controlled from an external automation system or controlled by the operator.

C. In an automated playout system server receives a pair of Fill and Key signals from an external system (e.g. from a sports broadcast graphics).
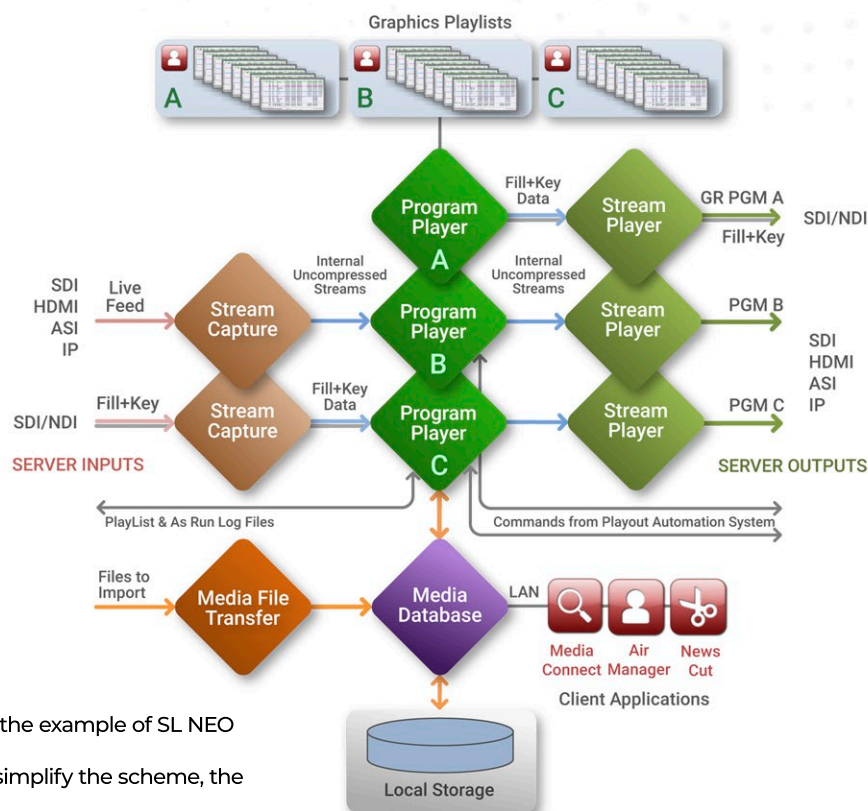
The **Program Player "C"** module is controlled from an external automation system, but operator can control a separate Graphics Layer and inserting of external graphics.

Types and interconnections of Software Modules on the example of SL NEO Server 5000 series configuration:
2 Capture Ports, 3 Program Channels, 3 Outputs. To simplify the scheme, the base module is not shown.

The Name of the Base Model of the SL NEO Server is made up of the values of the 5 variables located after the name of the product line:

SL NEO S F.C.P H A

S First Digit of the SL NEO Series Number	F Maximum Video Operating Mode	C Number of Capture Ports	P Number of PGM CH and Output Ports	H Type of Hardware I/O Board (Brand)	A Useful capacity of the Array in Tb
SERIES	**FORMAT**	**CAPTURE**	**PLAYOUT**	**HARDWARE**	**ARRAY**
S = 5 - 5000 Series On Air Graphics Servers	F = 2 – HD 1080i 50/60	for F = 2, C = 0...8	for F = 2, P = 1...8	H = D – Dektec DTA	SDI + Audio Embedded
	F = 3 – 3G 1080p 50/60	for F = 3, C = 0...6	for F = 3, P = 1...6	H = A – Dektec DTA	DVB/ATSC ASI (SPTS)
	F = 4 – UHD 2160p 50/60	for F = 4, C = 0...2	for F = 4, P = 1...2	H = M – Matrox DSX LE3/4	SDI + Audio Embedded
				H = N – Nvidia NIC	IP: SMPTE ST 2110/2022-7
				H = E – Onboard 1GbE Port	IP: NDI, HLS, RTMP
					SPTS IP: RTP, UDP, SRT, Zixi
				H = B – BlackMagic SDI I/O	SDI + Audio Embedded
				H = H – BlackMagic HDMI	HDMI + Audio Embedded

The 5000 series models do not have REC channels.
Capture Ports are used for Live Events in PGM Channels.
Some models also have no Capture Ports (C=0): In these cases, Models work like a Graphics File Playout Servers.

Each PGM Channel is paired with a Output Port: in Basic configurations their number is identical.

The 5000 Series Servers work with SDI and NDI over IP either in full-screen mode with internal keying or in Fill and Key Input/Output mode.

The suffix "FK" is added to the Capture/Playout variables in the name of models with Fill and Key support.

Example:	SL NEO 53.2.4FK D4
Max mode:	3G 1080p 50/60
Number of Capture Ports:	2
Number of PGM and Output Ports	4x (Fill+Key)
Hardware: Dektec DTA	I/O: SDI + Audio Embedded
Internal Array:	Useful capacity 4 Tb

Ordering Information

To order the SL NEO 5000 Series Server, send us the following information:

- Base Model Name,
- Capture/Output Ports formats (HD/3G/UHD, fps), types (SDI/HDMI/ASI/Ethernet) and number,
- Types and protocols for I/O IP Streams,
- PGM Channels formats (HD/3G/UHD, fps) and number,

- External Data Sources for Graphics and Closed Captions,
- Information about redundancy scheme,
- Type (internal, external) and useful capacity of RAID-array,
- Required Hardware and Software Options,
- Required Client Licenses.

The Client Applications are pre-installed on the server platform, and one set of Client Software for installation on a workstation is included with each SL NEO Server.

Technical Specifications for SL NEO 5000 Servers

Hardware configuration, including CPU/HDD models, number and types of I/O Boards depends on the selected SL NEO Server Model and set of Options.

Server Hardware

Supermicro 2...4U chassis, two power supply modules in hot backup.
One or two Intel Xeon Gold CPU, 48/96Gb DDR4 RAM,
SSD for OS, two onboard 1GbE ports.
Built-in hardware RAID-10, 4x or 8x SE SAS 3.5" RE 4 or 8Tb array useful capacity.
OS Windows Server 2022 x64

I/O Ports & PGM Channels

Capture Ports HD/SD: 1...4, Capture Ports UltraHD: 1...2
PGM Channels HD/SD: 1...4, PGM Channels Ultra HD: 1...2
Output Ports HD/SD: 1...4, Output Ports UltraHD: 1...2

Video Formats and Color Spaces

625i/525i, 720p, 1080i/1080p, 2K cinema 2048x1080p, 2160p
25/29,97/50/59.94/60 fps
Color Spacing: BT.601/709/2020, SMPTE ST2084, ARIB STD-B67

I/O Streams: Interfaces, Protocols, Codecs

SDI: SD/HD/3...12G SDI, 4x 3G SDI/Embedded Audio
IP: SMPTE ST 2110, SMPTE ST 2022-7
IP: NDI, HLS, RTMP, UDP, RTP, SRT, Zixi, RIST, MPEG-DASH
SDI/NDI: Fill+Key I/O modes
DVB/ATSC IP UDP/RTP Unicast/Multicast SPTS/MPTS
DVB/ATSC ASI: SPTS/MPTS
Video Codecs: MPEG2/H.264/HEVC
Audio: 48kHz/16/24 bit PCM, ADPCM, MPEG-1 L-II/III, AAC, AC3

I/O Ancillary/MPEG2 TS Data

OP-42/47 Teletext, CEA-608/708 Closed Captions
DVB/ATSC Subtitles, EPG
SCTE-104/SCTE-35 markers with metadata
VBI/VANC Data: VITC, AFD, WSS

I/O Interfaces & Boards

Dektec DTA-2172/2174B/2175/2178/2179/2195 SDI/ASI Boards
Dektec DTA-2160/2162 ASI/IP Boards with FEC
Mellanox ConnectX Network Adapters
Matrox DSX LE3/LE4 Boards
DataPath Vision RGB Boards
Blackmagic DeckLink Boards
Standard Ethernet Interfaces
IEEE1394 Interfaces
DirectShow Devices

Other Protocols

SNMP (Hardware/SL NEO Software Monitoring)
NTP/PTP Client, SMB/CIFS, FTP

Video Codecs (File Playout)

SD/HD

DV25, DVCPRO25, DVCPRO50, DVCPROHD100, HDV
IMX 30/40/50
XDCAM EX SP/HQ, XDCAM HD LP/SP/HQ.422
DNxHD 120/145/180/220
AVCHD
XAVC 50/100/200, XAVC Long GOP
AVC-Ultra 50/100/200
AVC-Ultra Long G (12/25/50)
PRORES HQ/SD/LT
MPEG-2 I-Frames/Long GOP
H.264 L I-Frames/Long GOP

Ultra HD

H.264 8/10 bit
XAVC 300/480, XAVC Long GOP
AVC-Ultra 300/480, AVC-Ultra Long G
PRORES SQ/HQ
DNxHR SQ/HQ
HEVC 8/10 bit

Audio Codecs (File Playout)

RAW 16/24 Bit PCM, ADPCM, MPEG-1 L-II/III, AAC, AC3

File Containers

MXF-OP1A, MXF-D10
Avid MXF (OP-Atom)

Sony XDCAM HD/422 (MXF-OP1A)
Sony XAVC 50/100/200/300/480/LongGOP (MXF-OP1A)
P2 AVC-Ultra 50/100/200/300/480/LongG (MXF-OP1B)

Microsoft AVI, MPEG PS/TS
QuickTime MOV, DV DIFF
MP4, MPG, GXF

Still Graphics (single files and sequences)

JPG, BMP
With Alpha: PNG, TGA, TIFF, PSD

Video Codecs with Alpha

Uncompressed
TGA, QTRLE
Speed HQ, Lagarith
Key from a separate file
JPGA codec for AVI

File Containers for Video with Appha

Microsoft AVI
QuickTime MOV
Audio supported

Hardware & Software Options

Hardware Options

GPIO (Including one of supported USB GPIO and Software License, up to 8 IO Ports: Ontrak ADU200, ADU2X8)
GPU Board
Increase Internal RAID Array Capacity
2x SSD in RAID-1 for System

Additional Hardware Ports

SD/HD/3/6/12G, 4x3G SDI, HDMI, ASI I/O Ports
NVIDIA ConnectX 10/25/40/50/100/200G Ports for SMPTE ST2110/2022-7
1G Ethernet Ports for UDP/RTP IP with SMPTE 2022-1 FEC
Standard 1/10G Ethernet Ports for IP Streams, Control, File Transfer
RS-232/422/485, i-Link/IEEE1394 Hardware Ports
AES I/O for Matrox DSX Boards

Software Options

Transfer Manager PRO
SCTE-104/SCTE-35 Generation (for Single PGM Channel)
EBU R128 Loudness Normalization (for Single Output Port)
CEA-608/708, OP-42/47 Live Closed Captions (generation from Live Data Source or from Files, for Single PGM Channel)
DVB/ATSC Subtitles (generation from Live Data Source or from Files, for Single PGM Channel)
Main - Backup PGM Channel Sync (for Single PGM Channel)
NVENC Assistance (for File Encoding or Output Stream Encoding)
Avid Unity/Interplay Support (for REC Channels)
Web Application Server
TS Mux (up to 16x SPTS in 2x Groups)

Client Applications

Air Manager, Rec Manager, News Cut

Additional I/O Ports & Channels (SD/HD or UHD Software Licenses)

Capture Port (SDI/HDMI, ASI/IP with DeMux and Stream Decoding, all supported Protocols including SDI/NDI Fill+Key)
Output Port (SDI/HDMI, ASI/IP with Stream Encoding, all supported Protocols including SDI/NDI Fill+Key)
MultiScreen Processor (4, 8, 16 or 24 Inputs Software License)
REC Channel (Full Res + Proxy)
PGM Channel with Full Graphics (8 GR Layers + Logo Layer)
PGM Channel with Lite Graphics (1 GR Layers + Logo Layer)
Graphics for PGM Channel (additional GR Layers)

Device Server Software Licenses

Chyron CII (Slave mode for Single PGM Channel)
TSL5 UMD (Master mode for Single Device)
Ember+ (for Junger Audio Devices. Master mode for Single Device)

Ordering Information

To order the SL NEO 5000 Series Server, send us the following information:

- Base Model Name,
- Capture/Output Ports formats (HD/3G/UHD, fps), types (SDI/HDMI/ASI/Ethernet) and number,
- Types and protocols for I/O IP Streams,
- PGM Channels formats (HD/3G/UHD, fps) and number,
- Codecs and Containers for Media Files,
- External Data Sources for Graphics and Closed Captions,
- Information about redundancy scheme,
- Type (internal, external) and useful capacity of RAID-array,
- Required Hardware and Software Options,
- Required Client Licenses.

The Client Applications are pre-installed on the server platform, and one set of Client Software for installation on a workstation is included with each SL NEO Server.

I/O Interfaces and Protocols for Media Data
Internal Keying Mode: Input Stream Decoging, overlays Graphics, mix Audio, Encoding

SDI						HDMI		IP				ASI	
4x3G	12G	6G	3G	HD	SD	1.4	2.0	ST 2110	ST 2022-7	NDI		DVB	ATSC

IP
UDP · RTP · RTSP · SRT · ZiXi · RIST · RTMP · HLS · MPEG-DASH

I/O Interfaces and Protocols for Fill+Key

SDI						IP
4x3G	12G	6G	3G	HD	SD	NDI

I/O Media and Metadata Files

Full Screen I/O, Import files with Alpha channel (see full list in Tech Spec)

Audio/Video/Metadata				Still Graphics and Sequences			
MXF	MPEG	AVI	MOV	MPG	BMP	JPG	PSD	PNG
OP · OP1A · OP1B · D10	PS · TS	DV · DIFF · MP4	SLG (XML-based GR templates)

Input Data for Synchronization, Data from External Systems, Schedule files

NTP	PTP	Bi-Level Sync	Tri-Level Sync
CII	GPI	SL NEO Control Protocol via XML-RPC or REST	

PLAY Schedules Files	EDL Files

Log Files, Data for Controlling External Systems, SNMP Monitoring

As Run Log Files	Tech Log Files	EDL Files
SL NEO Control Protocol via XML-RPC or REST	TSL5 UMD Data	GPO

SNMP Data (from Hardware & SL NEO Software)

I/O SDI NDI Fill+Key Up to 8x GR PGM 2D DVE 3D SCENES

SL NEO 6000 Servers
Loggers & Compliance Recorders

SkyLark
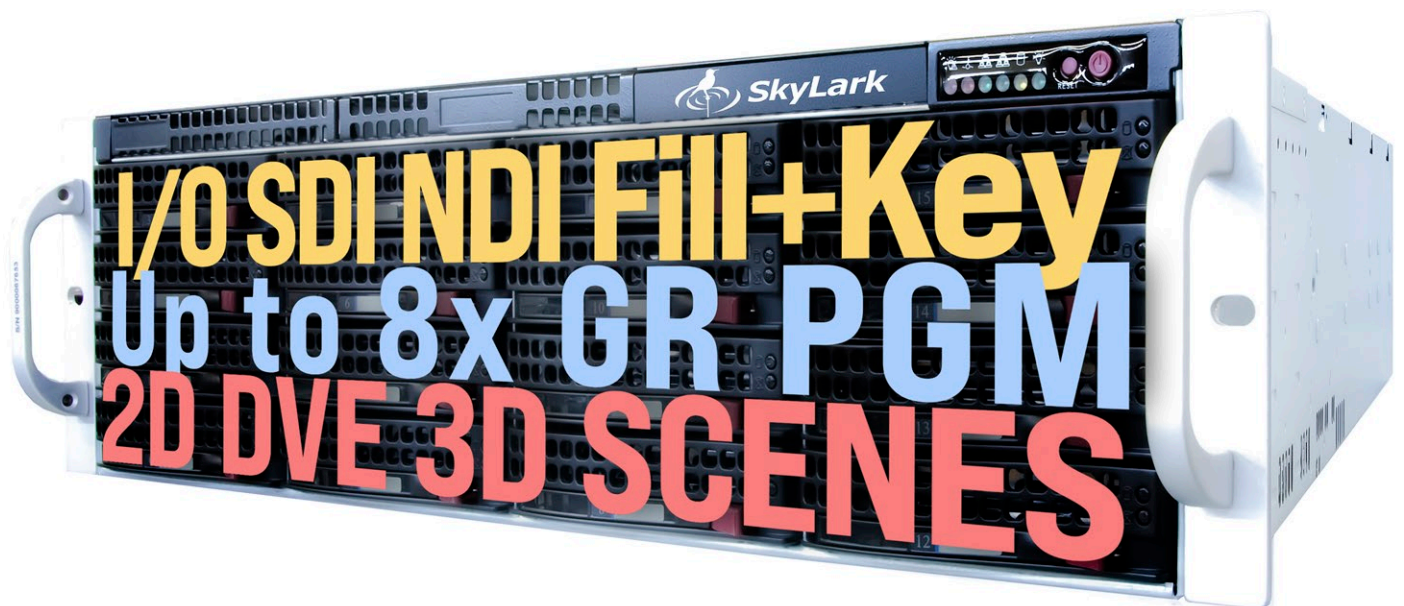
▶ **Multiformat Solution for Compliance Recordind & Air Logging**

▶ **Up to 16x HD or 4x UHD Capture Ports and Recorders in the System Unit**

▶ **Mix of Capture Ports: SDI, HDMI, ASI, IP (depending on model & options)**

▶ **In Basic Configuration: SMPTE ST2110, NDI, HLS, RTMP, RTP, UDP, SRT, Zixi, RIST**
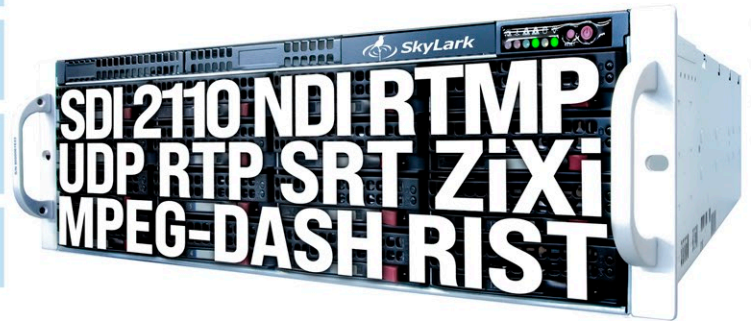
Main Features

Time Tables, Recording Modes

Recording is provided automatically according to configurable rules based on time tables.

For each recorder you can select the cyclic recording mode with the content storage time in days and set up to 5 rules with the initial data: day of the week, start time and duration of the recording fragment.

The schedule recording mode for each channel is implemented and similar in functionality to the 1000 and 3000 series servers, including creating, editing and importing schedules files.

Full control over the recording processes is performed from the Air Manager client application or via web clients.

Event start types: Manually, by Hard Time, by external XML-RPC, VDCP or GPI commands, by data from incoming SCTE-104 or SCTE-35, DTMF tags, by matching of input video with pre-defined video fragment.

For each recording channel you can adjust the down-conversion of resolution and FPS, color space conversion, select the types of audio/video codecs and bitrates for optimal use of disk space.

The 6000 series servers allow you to overlay the actual date and time of recording on the video during recording.

For radio broadcast logging, audio-only recording mode is available.

Closed Captions Recording

Servers SL NEO 6000 supports recording and storage of CEA-608, CEA-708, OP-42, OP-47 Closed Captions, MPEG2 EPG/Subtitles data in Media Database. Decoding and visualization of closed captions is available in the File Monitor window of the Air Manager client application.

Functionality of the built-in SL NEO Media Database

- initial content cataloging: while recording, metadata is automatically generated: folder with date, recording time,

- quick multiuser access for browsing, preview, and for editing in News Cut: a few seconds after recording starts,

- content search in Server storage by txt metadata (10 text attribute fields in the standard SL NEO Server license).

Automatic Content Marking

Content marking (adding and storing keyframes and other attributes in Media DB) during recoding by external commands, markers and signs in the input streams:

- GPI, Hot Keys commands, SCTE-104, SCTE-35, DTMF data, detection of video freezes and black frames in input streams,

- searching for matches of video in the input signal with the stored reference video fragments.

Input Streams Monitoring

SL NEO Media Platform offers two different technologies to monitor all I/O signals and internal system streams:

1. Built-in MultiScreen Client application allows PC-workstations to perform on-line monitoring of AV streams coming from all active capture, recording, encoding and other SL NEO Server Software Modules in Network (in proxy mode).

2. Optional SDI/HDMI and/or IP/ASI Multiscreen HD Monitor Output is needed to view all input/output/internal AV streams from all active SL NEO Server Software Modules in multiview mode with an overlay of audio levels. Built-in up/down/fps conversion allows signals with different resolution and frame rates to be displayed together on the same display (in full HD or UHD mode).

Alarms will alert the operator to abnormal situations such as freeze frame or "black" field, when audio levels are exceeded or undershot.

Integration with File Recorder modules allows you to visualize TC/Text information about current recording event.

For the SL NEO 6000 Servers, the Optional Multiscreen Monitor Output and built-in MultiScreen Client application allow you to monitor all signals/streams of the server Capture and Recording modules inputs.

SL NEO 6000 Servers
Loggers & Compliance Recorders

SkyLark
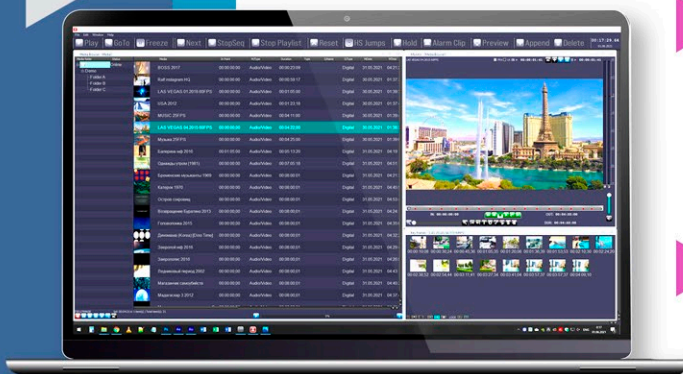
► **Software Modules Connection Diagram for SL NEO 6000 Servers Series**
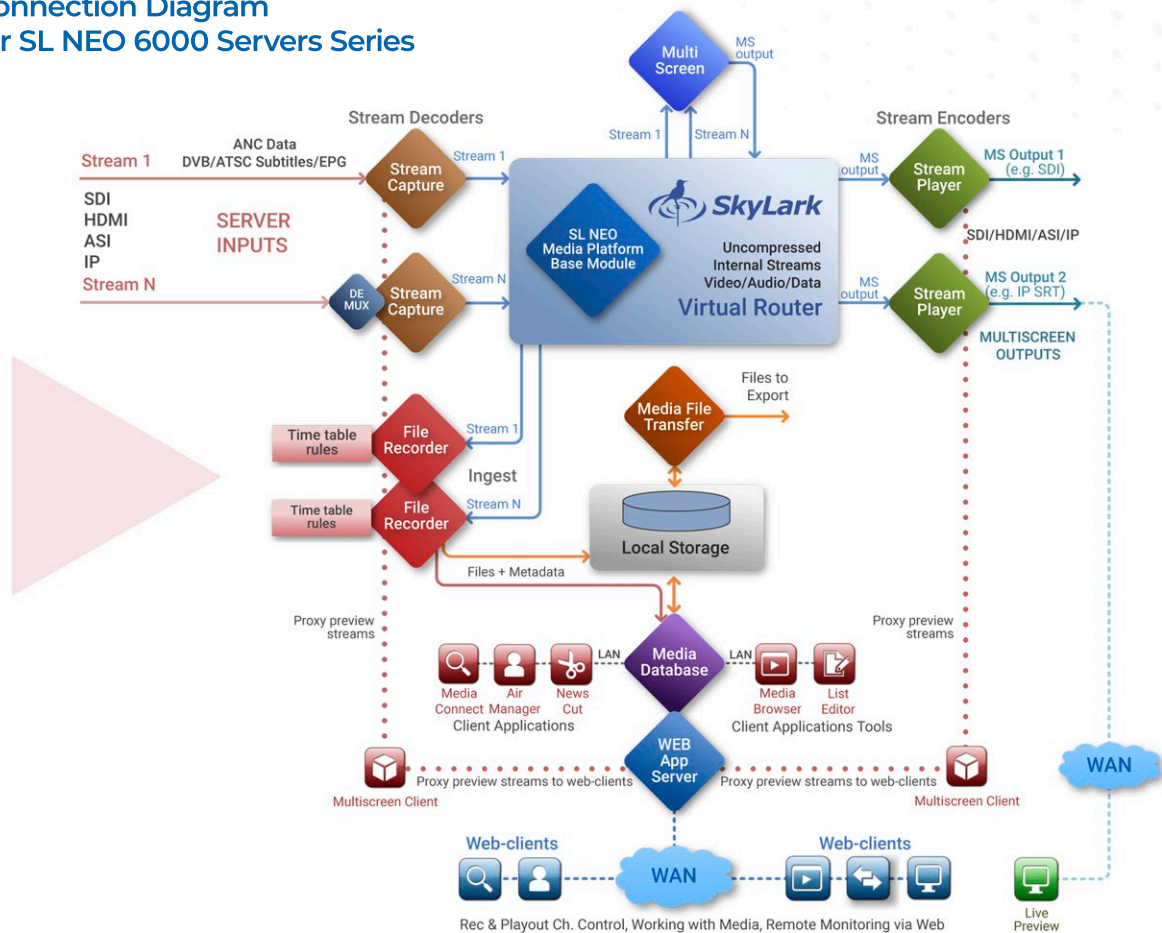
► ## Client Applications and web-Clients

Air Manager is the main client application with integrated tools for control multiple recording channels, editing schedules, searching, browsing, importing/exporting content.

The **Media Browser** window displays the Media Database contents of each of the SL NEO servers to which you have a network connection, allow to quick search, preview, trimming and manual exporting of fragments.

The **File Monitor** window is used to view the clips selected in the Media Browser. File Monitor video and audio can be redirected from the video card of the client station to the SDI/HDMI Output Board to view content in Full Res on an external video monitor, with an overlay of audio levels and timecode.


News CUT - is a Network client application for collective editing.

Source materials are stored in a database of one or more SL NEO servers, all News CUT users have network access to the database and full res or proxy.

Thanks to the growing file technology, it is possible to edit materials that are in the process of recording.

News CUT is very similar to the standard NLE editors in its feature set, allowing you to assemble multi-track compositions on TimeLine, add simple Mix/Wipe transitions and layer graphics such as texts, placeholders, backgrounds, warped video, animation and Voice-over.

Editing results are stored in the server Media Database as XML text descriptions and can be rendered and exported to separate mediafiles.

When building cloud-based systems, installing client applications is not always possible or feasible.

For cases where the server components of the compliance recording system are located in one or more data centers and the records are viewed via the Internet, **SL NEO Web Applications Server** has been developed. It allows remote clients to work via a web browser.

All basic functions are available for web clients: record management, content search, browsing, trimming and manual file export.

SL NEO 6000 Servers
Loggers & Compliance Recorders

SkyLark

The Name of the Base Model of the SL NEO Server is made up of the values of the 5 variables located after the name of the product line:

SL NEO S F.C.P H A

S First Digit of the SL NEO Series Number	F Maximum Video Operating Mode	C Number of Capture Ports or REC CH	P Number of PGM CH or Output Ports	H Type of Hardware I/O Board (Brand)	A Useful capacity of the Array in Tb
SERIES	**FORMAT**	**CAPTURE**	**PLAYOUT**	**HARDWARE**	**ARRAY**
S = 6 - 6000 Series Compliance Recorders	F = 2 - HD 1080i 50/60	for F = 2, C = 4…16	P = 0	H = D – Dektec DTA	SDI + Audio Embedded
	F = 3 - 3G 1080p 50/60	for F = 3, C = 4…16	P = 0	H = A – Dektec DTA	DVB/ATSC ASI (SPTS)
	F = 4 - UHD 2160p 50/60	for F = 4, C = 2…4	P = 0	H = M – Matrox DSX LE3/4	SDI + Audio Embedded
				H = N – Nvidia NIC	IP: SMPTE ST 2110/2022-7
				H = E – Onboard 1GbE Port	IP: NDI, HLS, RTMP
					SPTS IP: RTP, UDP, SRT, Zixi
				H = B – BlackMagic SDI I/O	SDI + Audio Embedded
				H = H – BlackMagic HDMI	HDMI + Audio Embedded

For Base Models 6000 Series:
C = No. of Capture Ports = No. of REC CH
P = 0 (no PGM CH, no Output Ports)

Technical Specifications for SL NEO 6000 Servers

Hardware configuration, including CPU/HDD models, number and types of I/O Boards depends on the selected SL NEO Server Model and set of Options.

Server Hardware
Supermicro 2…4U chassis, two power supply modules in hot backup.
One or two Intel Xeon Gold CPU, 48/96Gb DDR4 RAM,
SSD for OS, two onboard 1GbE ports.
Built-in hardware RAID-10, 8x or 16x SE SAS 3.5" RE 8 or 16Tb array useful capacity.
OS Windows Server 2022 x64

Capture Ports & REC Channels
Capture Ports HD/SD: 4…16, Capture Ports UltraHD: 2…4
REC Channels HD/SD: 4…16, REC Channels Ultra HD: 2..4

Down Conversion when Recording:
SD Recording: no down-conversion, or down to 360x288
HD Recording: down to 640x350 or down to 960x540
UHD recording: down to 960x540

Video Formats and Color Spaces
625i/525i, 720p, 1080i/1080p, 2K cinema 2048x1080p, 2160p
25/29,97/50/59.94/60 fps
Color Spacing: BT.601/709/2020, SMPTE ST2084, ARIB STD-B67

Input Streams: Interfaces, Protocols, Codecs
SDI: SD/HD/3…12G SDI, 4x 3G SDI/Embedded Audio
IP: SMPTE ST 2110, SMPTE ST 2022-7
IP: NDI, HLS, RTMP, UDP, RTP, SRT, Zixi, RIST, MPEG-DASH
DVB/ATSC IP UDP/RTP Unicast/Multicast SPTS/MPTS
DVB/ATSC ASI: SPTS/MPTS
Video Codecs: MPEG2/H.264/HEVC
Audio: 48kHz/16/24 bit PCM, ADPCM, MPEG-1 L-II/III, AAC, AC3

Input Ancillary/MPEG2 TS Data
OP-42/47 Teletext, Closed Captions
CEA-608/708 Closed Captions
DVB/ATSC Subtitles, EPG
SCTE-104/SCTE-35 markers with metadata
VBI/VANC Data: VITC, AFD, WSS

Other Protocols
SNMP (SL NEO Software)

Ordering Information

To order the SL NEO 1000 Series Server, send us the following information:

• Base Model Name,
• Recording Channels formats (HD/3G/UHD, fps) and number,
• Capture Ports types (SDI/HDMI/ASI/Ethernet) and number,
• Types and protocols for incoming IP Streams,
• Codecs and bitrates for Media Files,
• Information about the ANC Data in the input signals/streams,
• Type (internal, external) and useful capacity of RAID-array,
• Required Hardware and Software Options,
• Required Client Licenses.

The Client Applications are pre-installed on the server platform, and one set of Client Software for installation on a workstation is included with each SL NEO Server.

Example:	SL NEO 62.16.0 D8
Max mode:	HD 1080i 50/60
Number of Capture Ports and REC Channels	16
Number of PGM Channels and Output Ports	0
Hardware: Dektec DTA	I/O: SDI + Audio Embedded
Internal Array:	Useful capacity 8 Tb

Video Codecs (Recording to Files)

SD/HD
DV25, DVCPRO25, DVCPRO50, DVCPROHD100, HDV
IMX 30/40/50
XDCAM EX SP/HQ, XDCAM HD LP/SP/HQ.422
DNxHD 120/145/180/220
AVCHD
XAVC 50/100/200, XAVC Long GOP
AVC-Ultra 50/100/200
AVC-Ultra Long G (12/25/50)
PRORES HQ/SD/LT
MPEG-2 I-Frames/Long GOP
H.264 L I-Frames/Long GOP

Audio Codecs (Recording to Files)
RAW 16/24 Bit PCM, ADPCM, MPEG-1 L-II/III, AAC, AC3

File Containers
MXF-OP1A, MXF-D10
Avid MXF (OP-Atom)

Microsoft AVI, MPEG PS/TS
QuickTime MOV, DV DIFF
MP4, MPG, GXF

Hardware & Software Options

Hardware Options
GPIO (Including one of supported USB GPIO and Software License, up to 8 IO Ports: Ontrak ADU200, ADU2X8)
Increase Internal RAID Array Capacity
2x SSD in RAID-1 for System

Additional Hardware Ports
SD/HD/3/6/12G, 4x3G SDI, HDMI, ASI I/O Ports
NVIDIA ConnectX 10/25/40/50/100/200G Ports for SMPTE ST2110/2022-7
1G Ethernet Ports for UDP/RTP IP with SMPTE 2022-1 FEC
Standard 1/10G Ethernet Ports for IP Streams, Control, File Transfer
AES I/O for Matrox DSX Boards

Software Options
Transfer Manager PRO, Web Application Server

Client Applications
Air Manager, News Cut

Additional I/O Ports & Channels (SD/HD or UHD Software Licenses)
Capture Port (SDI/HDMI, ASI/IP with DeMux and Stream Decoding, all supported Protocols)
Output Port (SDI/HDMI, ASI/IP with Stream Encoding, all supported Protocols)
MultiScreen Processor (4, 8, 16 or 24 Inputs Software License)
REC Channel

SL NEO 7000 Servers
Instant Replay and Slow Motion

▶ **The best Instant Replay Solution for Live Sports Production !**

▶ **Up to 16x HD Capture Ports & Recorders Up to 2x Workplaces**

▶ **SDI/HDMI/IP I/O Ports, build-in MultiScreen Output with Preview**

▶ **Affordable, Reliable, Fast and Easy to use**

Multi-Channel Recording and Instant Replays with smooth speed adjustment, fast editing and playback of highlights, events, promos and commercials as part of the main process.

Designed especially for Live Sports Productions! The use of professional JL Cooper Controllers guarantees fast and comfortable work of operators.

Main Features

Capture & Ingest

Up to 16x HD Recorders in one SL NEO 7000 Server Platform (depend on model & options).

Program and MultiScreen Output with Preview for every Workplace. Up to 2x Workplaces for one SL NEO 7000 Server.

Uninterrupted Synchronous Recording in the Growing File Mode.

The Materials is available for Replay & Editing a second after the recording starts.

All operations from a Professional Controller

Start/Stop Recording, Switching from Live to Replay mode Instantly. Customizable Multiviewer puts all inputs, outputs and information on one screen.

Editing I/O Points and replay of the highlights with smooth speed adjustment.

The Slomo Elite Professional Controller from JL Cooper Electronics is included. Up to 2x Workplaces and up to 2x Conrollers for one SL NEO 7000 Server.

Features

Non-stop recording during the whole event, Immediate switching to Slow Motion playback Mode.

Easily control of Server functionality with one or two Jog/Shuttle Replay Controllers: select replay input, replay programming, smooth speed adjustment from -200% to +200%, up to frame-accurate playback.

Markup and real-time clip base creation, fast editing, preview and playback of highlights.

Operations are provided from the controller, with the possibility of using a workstation with client software.

SL NEO 7000 Servers can also be a convenient tool for the analysis of controversial moments by referee.

The Basic Software Package includes the Transfer Manager Lite for automatic File Transfer to/from NLE stations, broadcast zone and archives.

Basic Operating Modes

Live Mode allows the operator to work with the Record Tray to playback replays in real time and set markers for future use of materials.

Preview Mode allows to prepare new segments for repeats at the same time as the current replay.

Playlist Mode allows to create, edit and execute playlists. The mode is useful for creating a clip with highlights.

Program, Preview and MultiScreen Outputs

Program Output is the main output of the system, which enables playback of prepared replays.

Preview Output is used for live preview and replay preparation with display of additional information for the operator: the time code of the current preview position, the time difference between the current position and the actual time, the current playback speed in percent, the time remaining to the end of the clip or playlist, the camera number.
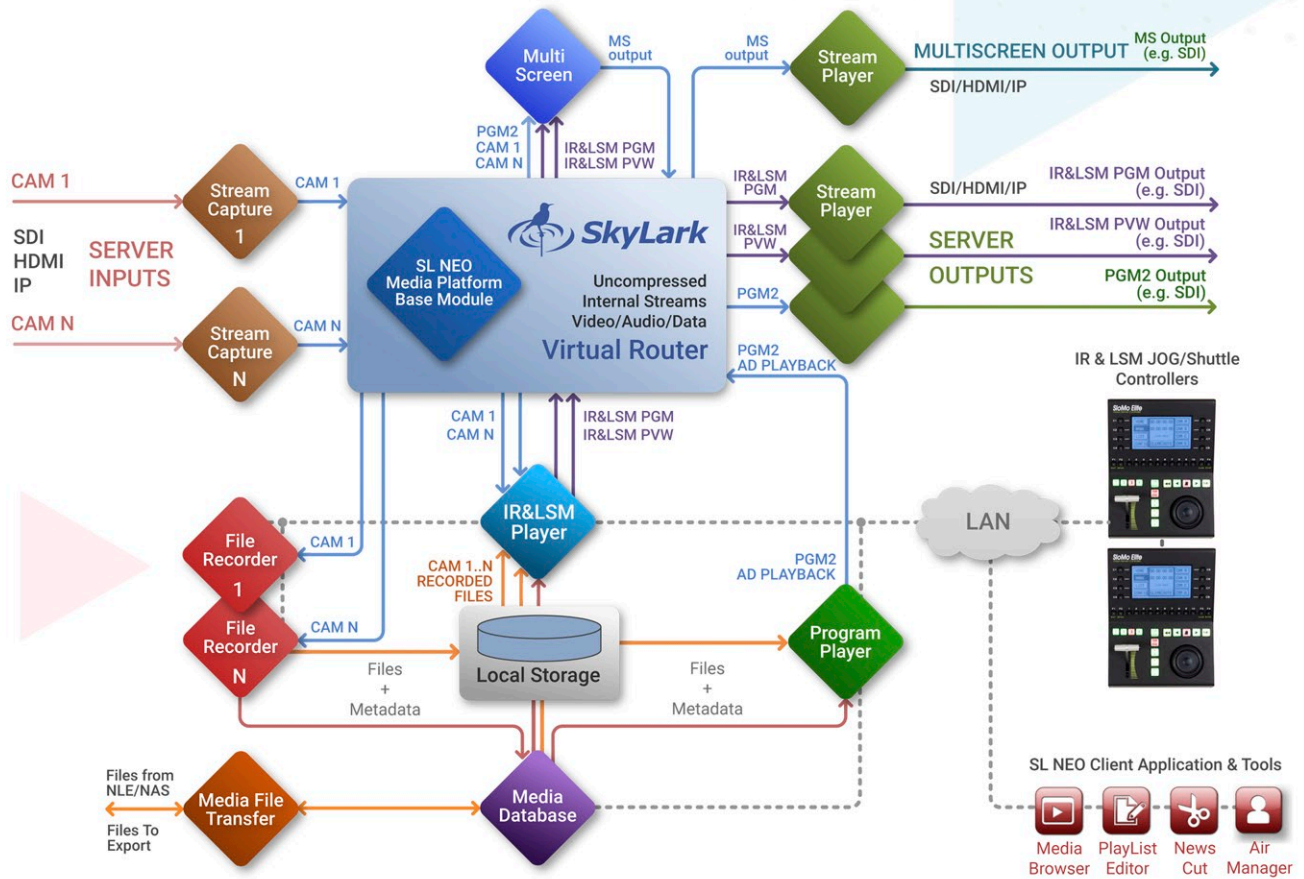
Multiscreen Output shows all the input signals and the program signal in multiscreen mode.

SkyLark

SL NEO 7000 Servers
Instant Replay and Slow Motion

**Software Modules Connection Diagram
for SL NEO 7000 Servers Series**

Software Modules Connection Diagram for SL NEO 7000 Servers Series. Diagram elements: SERVER INPUTS (CAM 1, CAM N — SDI HDMI IP) → Stream Capture 1 / Stream Capture N → SL NEO Media Platform Base Module — SkyLark — Uncompressed Internal Streams Video/Audio/Data — Virtual Router. Multi Screen → Stream Player → MULTISCREEN OUTPUT (MS Output e.g. SDI, SDI/HDMI/IP). Stream Player → SERVER OUTPUTS: IR&LSM PGM Output (e.g. SDI), IR&LSM PVW Output (e.g. SDI), PGM2 Output (e.g. SDI). IR&LSM Player, File Recorder 1 / File Recorder N, Local Storage, Program Player, Media Database, Media File Transfer (Files from NLE/NAS, Files To Export), Files + Metadata. IR & LSM JOG/Shuttle Controllers, LAN. SL NEO Client Application & Tools: Media Browser, PlayList Editor, News Cut, Air Manager.

The Name of the Base Model of the SL NEO Server is made up of the values of the 5 variables located after the name of the product line:

SL NEO S F.C.P H A

S First Digit of the SL NEO Series Number	**F** Maximum Video Operating Mode	**C** Number of Capture Ports (REC CH)	**P** Number of PGM/ PWV/MS CH (Output Ports)	**H** Type of Hardware I/O Board (Brand)	**A** Useful capacity of the Array in Tb
SERIES	**FORMAT**	**CAPTURE**	**PLAYOUT**	**HARDWARE**	**ARRAY**
S = 7 - 7000 Series. IR & LSM Servers	F = 2 – HD 1080i 50/60	for F = 2, C = 4…16	for F = 2, P = 3…6	H = D – Dektec DTA	SDI + Audio Embedded
	F = 3 – 3G 1080p 50/60	for F = 3, C = 4…16	for F = 3, P = 3…6	H = A – Dektec DTA	DVB/ATSC ASI (SPTS)
	F = 4 – UHD 2160p 50/60	for F = 4, C = 2…4	for F = 4, P = 3	H = M – Matrox DSX LE3/4	SDI + Audio Embedded
Standard Output Package:				H = N – Nvidia NIC	IP: SMPTE ST 2110/2022-7
1). **Program output** is the main output of the system, which enables playback of prepared replays.				H = B – BlackMagic SDI I/O	SDI + Audio Embedded
2). **Preview output** is used for live preview and replay preparation with display of additional information for the operator.				H = H – BlackMagic HDMI	HDMI + Audio Embedded
3). **Multiscreen output** shows all the input signals and the program signal in Multiscreen mode.					

Example:	**SL NEO 72.12.3 N16**
Max mode:	HD 1080i 50/60
Number of Capture Ports and REC Channels	12
Number of PGM/PVW/MS Channels and Output Ports	3
Hardware: Nvidia NIC	I/O: SMPTE ST 2110 over IP
Internal Array:	Useful capacity 16 Tb

SL NEO 7000 Servers
Instant Replay and Slow Motion

Technical Specifications for SL NEO 7000 Servers

Hardware configuration, including CPU/HDD models, number and types of I/O Boards depends on the selected SL NEO Server Model and set of Options.

Server Hardware

Supermicro 2...4U chassis, two power supply modules in hot backup.
One or two Intel Xeon Gold CPU, 48/96Gb DDR4 RAM,
SSD for OS, two onboard 1GbE ports.
Built-in hardware RAID-10, 8x or 16x SE SAS 3.5" RE 8 or 16Tb array useful capacity.
OS Windows Server 2022 x64

I/O Ports, REC/PGM/PVW/Multiscreen Channels

For One Operator Workplace (base configuration, one JL Cooper Slomo Elite Controller Included):

HD/SD
Capture Ports HD/SD: 4...16, REC Channels HD/SD: 4...16
LSM PGM Channels HD/SD: 1, LSM PVW Channels HD/SD: 1
LSM Multiscreen Channels HD/SD: 1
Output Ports HD/SD: 2 (LSM PGM Output, LSM Multiscreen Output)

Ultra HD
Capture Ports UHD: 2...4, REC Channels UHD: 2...4
LSM PGM Channels UHD: 1, LSM PVW Channels UHD: 1
Output Ports UHD: 2 (LSM PGM Output, LSM PVW Output)

Video Formats and Color Spaces
625i/525i, 720p, 1080i/1080p, 2K cinema 2048x1080p, 2160p
25/29,97/50/59.94/60 fps
Color Spacing: BT.601/709/2020, SMPTE ST2084, ARIB STD-B67

I/O Streams: Interfaces, Protocols, Codecs
SDI: SD/HD/3...12G SDI, 4x 3G SDI/Embedded Audio
IP: SMPTE ST 2110, SMPTE ST 2022-7
IP: NDI, HLS, RTMP, UDP, RTP, SRT, Zixi, RIST, MPEG-DASH
DVB/ATSC IP UDP/RTP Unicast/Multicast SPTS/MPTS
DVB/ATSC ASI: SPTS/MPTS
Video Codecs: MPEG2/H.264/HEVC
Audio: 48kHz/16/24 bit PCM, ADPCM, MPEG-1 L-II/III, AAC, AC3

I/O Ancillary/MPEG2 TS Data
SCTE-104/SCTE-35 markers with metadata
VBI/VANC Data: VITC, AFD, WSS

Video Codecs (IR & LSM Rec & Playback)

SD/HD
MPEG2 I-Frames, 422, 100Mbps
XAVC Class 100

Ultra HD
H264/AVC I-Frames, 420, 300Mbps
XAVC Class 300

Environment for IR & LSM Rec & Playback

SL NEO Media DataBase: work with virtual clips (files+metadata), growing file recording mode

Video Codecs (for General Purposes, File Rec & Playback)

SD/HD
DV25, DVCPRO25, DVCPRO50, DVCPROHD100, HDV
IMX 30/40/50
XDCAM EX SP/HQ, XDCAM HD LP/SP/HQ.422
DNxHD 120/145/180/220
AVCHD
XAVC 50/100/200, XAVC Long GOP
AVC-Ultra 50/100/200
AVC-Ultra Long G (12/25/50)
PRORES HQ/SD/LT
MPEG-2 I-Frames/Long GOP
H.264 L I-Frames/Long GOP

Ultra HD
H.264 8/10 bit
XAVC 300/480, XAVC Long GOP
AVC-Ultra 300/480, AVC-Ultra Long G
PRORES SQ/HQ
DNxHR SQ/HQ
HEVC 8/10 bit

Audio Codecs (Files Playout)
RAW 16/24 Bit PCM, ADPCM, MPEG-1 L-II/III, AAC, AC3

File Containers (for General Purposes, File Rec & Playout)
MXF-OP1A, MXF-D10
Avid MXF (OP-Atom)
Sony XDCAM HD/422 (MXF-OP1A)
Sony XAVC 50/100/200/300/480/LongGOP (MXF-OP1A)
P2 AVC-Ultra 50/100/200/300/480/LongG (MXF-OP1B)
Microsoft AVI, MPEG PS/TS
QuickTime MOV, DV DIFF
MP4, MPG, GXF

Environments for Recording

The number of file streams per recorder is two (Full Res + Proxy)

OS File System: work with files only, normal or fragment file recording mode (array of files with configured fixed duration)

SL NEO Media DataBase: work with virtual clips (files+metadata), growing file recording mode

Avid Unity/Interplay

Hardware & Software Options

Hardware Options
JL Cooper Slomo Elite Controller (for the second operator's workplace)
LTC Input (Including one of supported LTC Readers and Software License: Adrienne AEC-41, Plura PLC, Miranda Little Red, Horita TCI-50)
GPIO (Including one of supported USB GPIO and Software License, up to 8 IO Ports: Ontrak ADU200, ADU2X8)
GPU Board
Increase Internal RAID Array Capacity
2x SSD in RAID-1 for System

Additional Hardware Ports
SD/HD/3/6/12G, 4x3G SDI, HDMI, ASI I/O Ports
NVIDIA ConnectX 10/25/40/50/100/200G Ports for SMPTE ST2110/2022-7
1G Ethernet Ports for UDP/RTP IP with SMPTE 2022-1 FEC
Standard 1/10G Ethernet Ports for IP Streams, Control, File Transfer
RS-232/422/485, i-Link/IEEE1394 Hardware Ports
AES I/O for Matrox DSX Boards

Software Options
Transfer Manager PRO
Web Application Server

Client Applications
Air Manager, Rec Manager, News Cut

Additional I/O Ports & Channels (SD/HD or UHD Software Licenses)
LSM PGM/PVW/Multiscreen Channel + 2x Output Ports HD/SD
(for the second operator's workplace)
Capture Port (SDI/HDMI, ASI/IP with DeMux and Stream Decoding, all supported Protocols)
Output Port (SDI/HDMI, ASI/IP with Stream Encoding, all supported Protocols)
REC Channel (Full Res + Proxy)
PGM Channel with Full Graphics (8 GR Layers + Logo Layer)
PGM Channel with Lite Graphics (1 GR Layers + Logo Layer)
Graphics for PGM Channel (additional GR Layers)

Ordering Information

To order the SL NEO 7000 Series Server, send us the following information:

- Base Model Name,
- Capture/Output Ports formats (HD/3G/UHD, fps), types (SDI/HDMI/ASI/Ethernet) and number,
- Types and protocols for I/O IP Streams,
- REC Channels formats (HD/3G/UHD, fps) and number,
- Number of operator workplaces (1 or 2),
- LSM PGM Channels formats (HD/3G/UHD, fps),
- Type (internal, external) and useful capacity of RAID-array,
- Required Hardware and Software Options,
- Required Client Licenses.

The Client Applications are pre-installed on the server platform, and one set of Client Software for installation on a workstation is included with each SL NEO Server.

SL NEO Servers and Processors Features

Legend	Description
YES	Function available in Basic Configurations
OPT	Software/Hardware Option
Number	Maximum Number of Ports/Channels in the Basic Configurations
Blank Field	The function is not included in the Basic Configuration (call us)

SkyLark

DeMux / Capture / Recording / CC & Data / Device Control — DB / Transfer

SL NEO Servers Processors Series	TS De MUX	Capture Ports (up to)	I/O Redirect	Interface Type	IP Protocol	CC/SCTE DTMF Decoding	MPEG2 TS Subtitles Capture	Up/Down/Fps/Color Space Conversion	REC CH (up to)	GPU Assist	Codecs And Containers for REC	Proxy Gen	LTC In	VTR Control master	SDI SW GPIO master	SCTE DTMF slave	HOTKEY XMLRPC slave	VDCP GPIO slave	Media DB	File Transfer Lite	File Transfer Pro
1000. File Recorders	YES	16		YES	YES	YES	YES	YES	16	OPT	ALL SUPPORT	REC/FT	OPT	OPT	OPT	YES	YES	OPT	YES	YES	OPT
2000. Playout Servers	YES	16		YES	YES	YES	YES	YES	OPT			FT							YES	YES	OPT
3000. Channel in a Box	YES	16	YES	YES	YES	YES	YES	YES	16	OPT	ALL SUPPORT	REC/FT	OPT	OPT	OPT	YES	YES	OPT	YES	YES	OPT
4000. Time Delay Servers	YES	8		YES	YES	RELAY	RELAY	YES	8												
5000. On Air Graphics	YES	8		YES	YES	YES	YES	YES	OPT			FT							YES	YES	OPT
6000. Compliance Recorders	YES	16		YES	YES	YES	YES	YES	16		SELECTED	REC						OPT	YES	YES	OPT
7000. IR & LSM Servers		16		YES	YES			YES	16		SELECT/ALL	REC/FT	OPT				YES	OPT	YES	YES	OPT
8000. MultiScreen Processors	YES	24		YES	YES	YES	YES	YES	OPT										OPT		
9000. Stream Transcoders	YES	16		YES	YES	RELAY	RELAY	YES	OPT										OPT		

Playout / Graphics / Processing / Stream Encoding

SL NEO Servers Processors Series	PGM CH (up to)	MAIN FUNC CH	LIVE Events In PGM	GR Layers for 1PGM	Squeeze Back	Auto-mated Branding	SDI/NDI Fill+Key I/O	OPEN Captions Gen	SCTE DTMF slave	VDCP/CII GPIO slave	SDI SW EXT GS/GPIO master	A/Devices Ember+ master	EBU R128	Main Backup PGM Sync	Output Ports (up to)	Up/Down/Fps/Color Space Conversion	Interface Type	IP Protocol	TS MUX	SMPTE 2110 Out	Multi-screen OUT
1000. File Recorders															OPT						OPT
2000. Playout Servers	8		YES	9 or 2	YES	YES	SDI OPT	YES	YES	OPT	OPT	OPT	OPT	OPT	16	YES	SAME TYPE	YES	OPT	OPT	OPT
3000. Channel in a Box	8		YES	9 or 2	YES	YES	SDI OPT	YES	YES	OPT	OPT	OPT	OPT	OPT	16	YES	SAME TYPE	YES	OPT	OPT	OPT
4000. Time Delay Servers		8											OPT		16	YES	SAME TYPE	YES	OPT	OPT	
5000. On Air Graphics	8		YES	9	YES	YES	SDI OPT	YES	YES	CII OPT			OPT	OPT	16	YES	SAME TYPE	YES	OPT	OPT	OPT
6000. Compliance Recorders															OPT						OPT
7000. IR & LSM Servers		2													8	YES	SAME TYPE	YES		OPT	YES
8000. MultiScreen Processors		4													8	YES	SAME TYPE	YES		OPT	YES
9000. Stream Transcoders		16											OPT		16	YES	SAME TYPE	YES	YES	OPT	OPT

CC / Data Processing — Time Delay — Additional I/O Ports/Channels / GPU Encoding

SL NEO Servers Processors Series	CC/SCTE RELAY	Live CC Gen	File CC Gen	MPEG2 Subtitles Gen	SCTE 104/35 Gen	DTMF Gen	UMD TSL5 Gen	Short Delay	Time Shift	Additional Capture Ports	Additional REC Cannels	Additional PGM Channels	Additional Output Ports	GPU Assist for Stream Encoding
1000. File Recorders							OPT			OPT	OPT		OPT	
2000. Playout Servers	YES	OPT	YES	OPT	OPT	YES	OPT	OPT	OPT	OPT	OPT	OPT	OPT	OPT
3000. Channel in a Box	YES	OPT	YES	OPT	OPT	YES	OPT	OPT	OPT	OPT	OPT	OPT	OPT	OPT
4000. Time Delay Servers	YES							YES	YES	OPT			OPT	
5000. On Air Graphics	YES	OPT	YES	OPT	OPT	YES	OPT			OPT		OPT	OPT	OPT
6000. Compliance Recorders										OPT	OPT		OPT	
7000. IR & LSM Servers										OPT	OPT	OPT	OPT	
8000. MultiScreen Processors										OPT			OPT	
9000. Stream Transcoders	YES						OPT			OPT	OPT		OPT	OPT