ruby

RADIO
MIXING
CONSOLE

LAWO

IMAGINE
CONTROL
CREATE

ruby

RADIO MIXING CONSOLE

ruby

THE MIXING CONSOLE, EVOLVED.

Ask any broadcast professional, and they'll agree: Radio today is completely different than 30 years ago. We're creating and delivering more exciting, engaging content than ever before, using technology that seems to be evolving – getting smarter – every day.

At Lawo, we think it's time the console evolved too. Our designers spent countless hours analyzing the way talent works, and they came to a conclusion so obvious it's startling: the mixing console is no longer the center of the studio. The computer screen is.

Meet ruby, the mixing console that truly meets the demands of modern radio, by blending the hands-on immediacy of physical faders with the context-sensitive efficiency of multi-touch controls. Ruby frees your talent to create easily, naturally, effortlessly — in the way that suits them best.

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RADIO MIXING CONSOLE

UNCLUTTERED. INTUITIVE. POWERFUL.

When our engineers set out to design a new radio mixer, their goal was to completely re-think the modern broadcast console. They talked at length to operators about their work, observed how they interacted with studio tools, and studied the way today's studios are designed.

What did they learn? That there's been a fundamental shift in the way programming is produced. Studio tasks are more computer-oriented than ever before — screens are everywhere. Operators are also busier than ever. Whether producing a talk show or morning program with multiple phones and a half-dozen mics, or voice-tracking while running a live show, there's no margin for error.

To fit this new environment, we built a whole new kind of console — one that meets and exceeds the demands of today's radio workplace, with physical and virtual controls that complement each other. Multi-touch enabled information displays that let operators adjust settings quickly and easily. On-screen controls and meters that can quickly dock to free screen space for other production tools. Motorized faders that silently assume preset positions instantly. And advanced automated functions, like AutoMix hands-free mixing, that leave talent free to create (instead of baby-sitting levels). And that's only the beginning.

We call it ruby. You'll call it amazing.

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RADIO MIXING CONSOLE

HIGHLIGHTS

FORM PLUS FUNCTION

The ruby mixing surface has a sleek, modern look that's both functional and beautiful, designed for fast, accurate operation. From the high-resolution OLEDs that display sources and settings to the programmable function buttons and big, tactile ON/OFF and PFL keys with LED backlighting, ruby looks and feels great. Built in Germany to exacting Lawo standards, ruby features all-metal construction, premium 100 mm faders with built-in dust shield, ergonomic wrist-rest and ultra-reliable switches and rotary controls. There are smart tools like AutoMix, an intelligent algorithm that automatically maintains the balance of multi-mic productions so that creative staff an focus on what they do best — create!

VISUAL CONTROL

With ruby, the physical controls are only part of the story. Today, board operators interact as much (or more) with screens and displays as they do with the mixing console. So we've integrated mixing tools and other console controls into ruby's multi-touch enabled display (powered by VisTool, our amazingly powerful

GUI-building software). Now, talent can make fast adjustments to audio levels with "virtual faders", tweak EQ and dynamics processing, load snapshots, change routes and more using intuitive onscreen controls. VisTool even enables you to design context-sensitive screens customized to your station's unique operating style.

SOFTWARE INTEGRATION

Delivery systems, voice track recorders, audio editors and Web browsers play an important role in today's live radio operations. Unfortunately, they often promote screen clutter, blocking studio sight-lines. ruby helps solve this problem. Unlike consoles that demand an entire display, ruby reduces screen clutter with the ability to instantly "dock" console informatics. Talent can then use the screen for other tasks, while meters, clocks and timers stay visible at screen's edge. Another click, and the ruby display returns.

SPEEDY SETUP, UNPARALLELED FLEXIBILITY

When you unpack your new console, you want to start making radio — not spending days programming it. Some consoles require learning complicated software to configure every little detail; others give you quick setup, but sacrifice flexibility. ruby doesn't force you into doing things one way or the other. Want to get up and running fast? Use Lawo Console Designer software to evaluate and select the most common configuration options. Or, choose Expert mode and tweak to your heart's content.

FINALLY — A TRUE AES67 CONSOLE

Lawo believes in standards. So much so that we were an integral part of developing and ratifying the AES67 standard. So it should be no surprise to learn that ruby was designed from the ground up with AES67 in mind, from its built-in high-capacity AES67 I/O to its routing capabilities. And, because ruby is a Lawo radio console, it's equally at home in traditional environments where MADI plays a big part. ruby is even ST2110-30 and ST2022-7 compliant, which makes it the perfect radio console for bridging legacy baseband audio formats with radio's standards-based digital future.

KEY FEATURES

- 4-fader to 16-fader frame sizes may be combined to design consoles of up to 60 faders
- Single-frame or split-frame, flush or counter-top mountings
- Standards-based AES67 / RAVENNA IP-Audio networking with ST2110-30/-31 and ST2022-7 compliance
- Console Designer software helps speed installation
- One-touch SmartSnap snapshots make it easy to switch quickly between on-air and production work
- Fader Maps allow grouping of faders with similar sources for easy one-button recall and adjustment
- Stereo, mono and 5.1 mix outputs

- Smooth 100 mm motorized faders, standard. Switch to manual fader control if desired
- AutoMix hands-free mixing rides gain on multiple channels automatically, so talent doesn't have to
- One-button AutoGain optimizes microphone levels while talent talks
- Windows™-based VisTool GUI builder lets you design custom multi-touch capable screens and controls
- AES67 and MADI I/O standard, expandable with multiple analog, digital, and Dante® I/O options

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RADIO MIXING CONSOLE

HIGHLIGHTS

TWICE AS PRODUCTIVE

Today's radio operations require multitasking, so ruby helps talent become more productive with unique SmartSnaps console snapshots. Each SmartSnap contains both On-Air and Production modes; a button-touch toggles between them for instant switching between live broadcasting duties and off-air production of voice tracks, interviews, or other elements. When finished, another button-tap returns the console to On-Air Mode, with motorized faders instantly assuming their previous positions.

Setting up for a live band or guest round-table discussion? Use SmartSnaps to extend your mixing capabilities. Simply assign additional mics or other inputs to faders in Production Mode, then add their outputs to your On-Air mix — instantly doubling your console's fader count. Some broadcasters use this feature to manage complex shows with smaller consoles.

THE PERFECT MIX, AUTOMAGICALLY

Keeping mic levels levelled can be a real chore — especially when half a dozen people are talking at the same time.

AutoMix takes the sting out of producing multi-mic talk shows. It's simple to use: just place talent mics in AutoMix mode, and weight each one – more or less important – within the mix. Once done, a sophisticated gain-riding algorithm, with adjustable source priority, automatically maintains the balance and reduces ambient noise from open mics — leaving talent free to concentrate on content.

The uses are virtually limitless. For instance, your morning show host's mic gets a higher AutoMix priority than those of his sidekicks, so that their mics are ducked when he talks. For news and interview round-tables, assign mics equal priority to ensure a smooth, evenly balanced mix.

Since AutoMix works with mono, stereo and even 5.1 sources, it's perfect for production. Assign the talent mic and the playout computer to AutoMix, give talent a high priority, and music beds get ducked to create perfect voiceovers.

MORE MAGIC

In addition to AutoMix, ruby makes short work of setting mic gain levels. With one-touch AutoGain, operators can calibrate any or all microphone signals easily, without having to learn about dB values and overloads. With just a button press, AutoGain levels microphone gains automatically within seconds — while talent just talks into the mic.

POWER TO SPARE

ruby's Power Core is perhaps the most powerful mixing engine ever designed for a radio console. Massive amounts of DSP enable perfect audio shaping via 96 channels of parametric EQ, expansion, compressing, limiting, de-essing and delay synchronization, mixed to as many as 80 buses. There's plenty of standard I/O: 2 redundant Ethernet ports for control; 2 redundant Ethernet ports each carry up to 128 AES67 inputs and outputs (depending upon license package); 4 MADI ports handle 256 total I/O signals (128 with redundant MADI connections), and 8 expansion slots provide space for even more I/O — both digital and analog.

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VISTOOL

INTUITIVE, NATURAL CONTROL

In today's radio stations, the computer monitor is the studio's centerpiece. Playout system controls, phone queues, news and weather, social media platforms, and even live copy are onscreen — and the number of those screens has increased dramatically. Yet, while today's talent expects interactive displays, consoles still force them to use physical controls, diverting attention from displayed information. And when focus is lost, shows suffer.

ruby solves this problem by melding physical and virtual controls. Faders, source assignments, monitor selection and other familiar controls are all available on ruby's beautifully crafted work surface — while at the same time, on-screen console controls are squarely within the operator's field of focus, enabling intuitive touchscreen operation. It's this beautiful blend of physical and virtual that makes ruby one of the most powerful, easy-to-operate consoles ever designed.

YOUR CONSOLE, YOUR INFORMATION, YOUR WAY

ruby's control screens do more than just display meters — they're optimized for use with today's multi-touch displays. Powered by Lawo VisTool, a sophisticated GUI builder with a vector-graphics engine that renders clear, beautiful displays at any size or resolution, ruby combines multi-touch controls with information in an infocenter designed for today's fast-paced studio environment — optimized with all the tools talent needs to produce seamless,

error-free shows. Meters, timers, clocks, EQ, dynamics, routing displays, input parameters, channel assignments and more are part of ruby's interactive toolkit. Touch the screen to adjust voice processing, take phone calls, recall console snapshots, load audio sources and more. Use on-screen virtual faders to quickly adjust source and monitor gain. Build custom displays that combine Web browsers, playlists — even video feeds.

Best of all, ruby never insists on having a whole screen to itself. To help combat display proliferation, ruby's display instantly "docks", freeing screen space for playout systems, audio editors and other crucial tasks. When docked, console controls are stored out of sight, while important real-time meters and clocks remain visible within a compact sidebar.

ruby comes with a pre-configured collection of control screens ready to run as a multi-touch, docking display. Timer and NTP-synchronized clock, Loudness Metering, monitoring and metering of main outputs, output routing and Snapshot tools are provided; an interactive settings screen is shown when a channel's Options mode is activated.
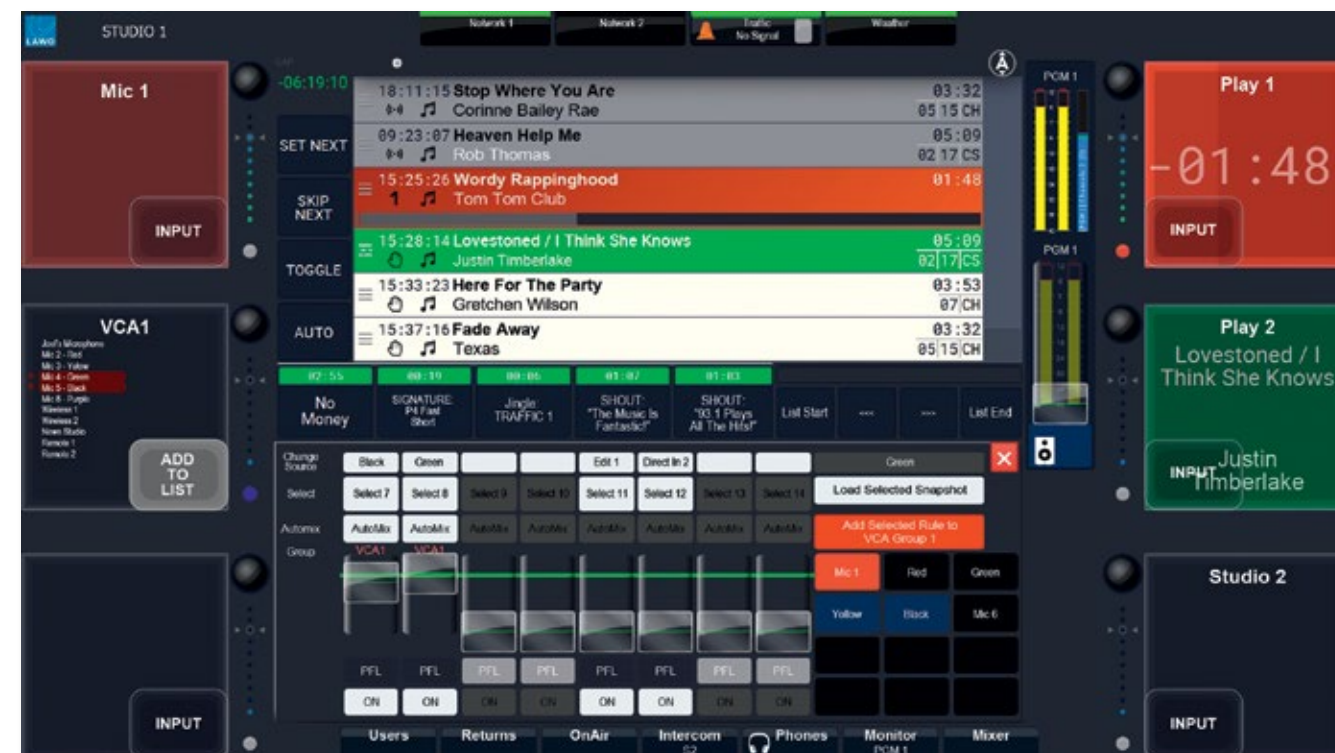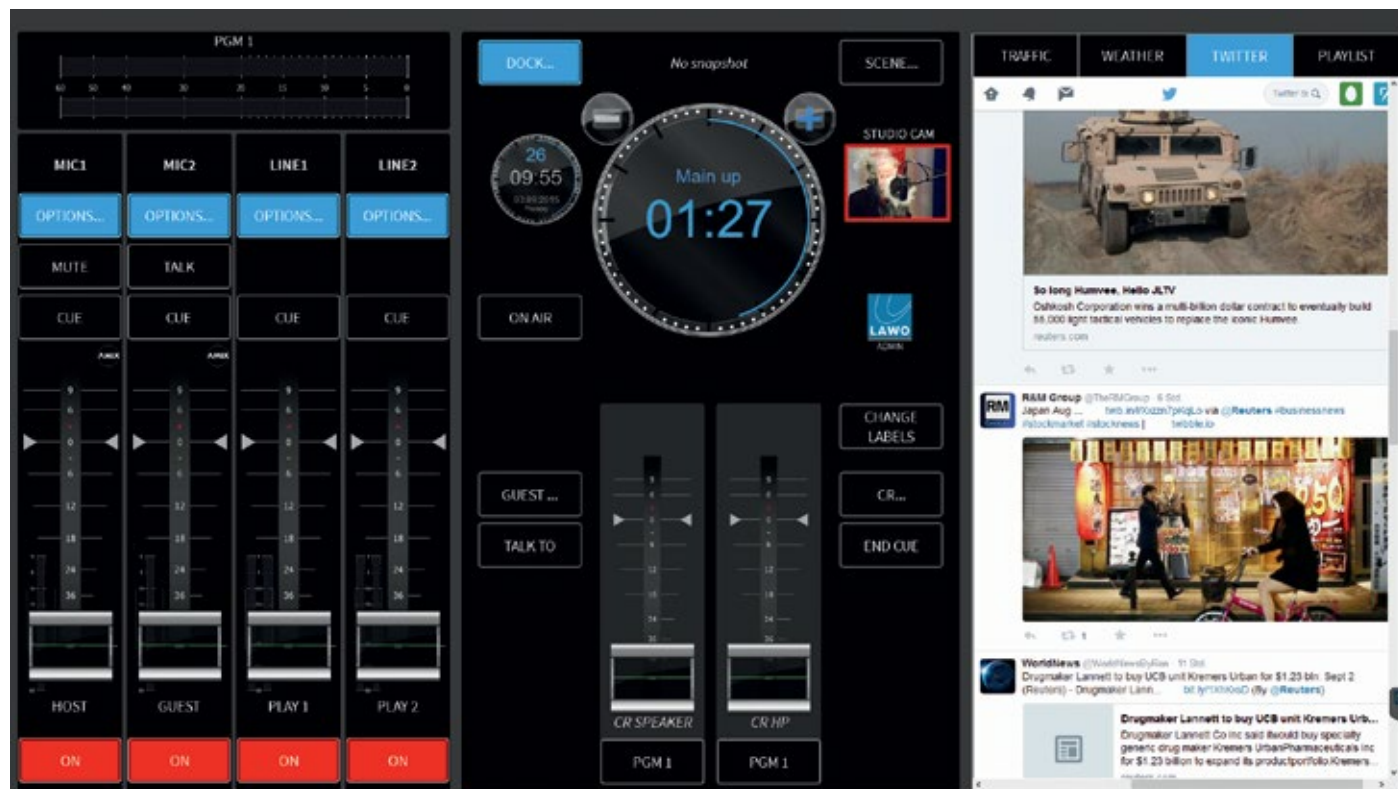
ON-SCREEN CONTROLS

INCREDIBLY CUSTOMIZABLE

Standard ruby screens are built with VisTool Standard GUI-builder software. But you can have even more power by upgrading to VisTool Unlimited to design and build custom touch-sensitive screens to match your station's unique operating style.
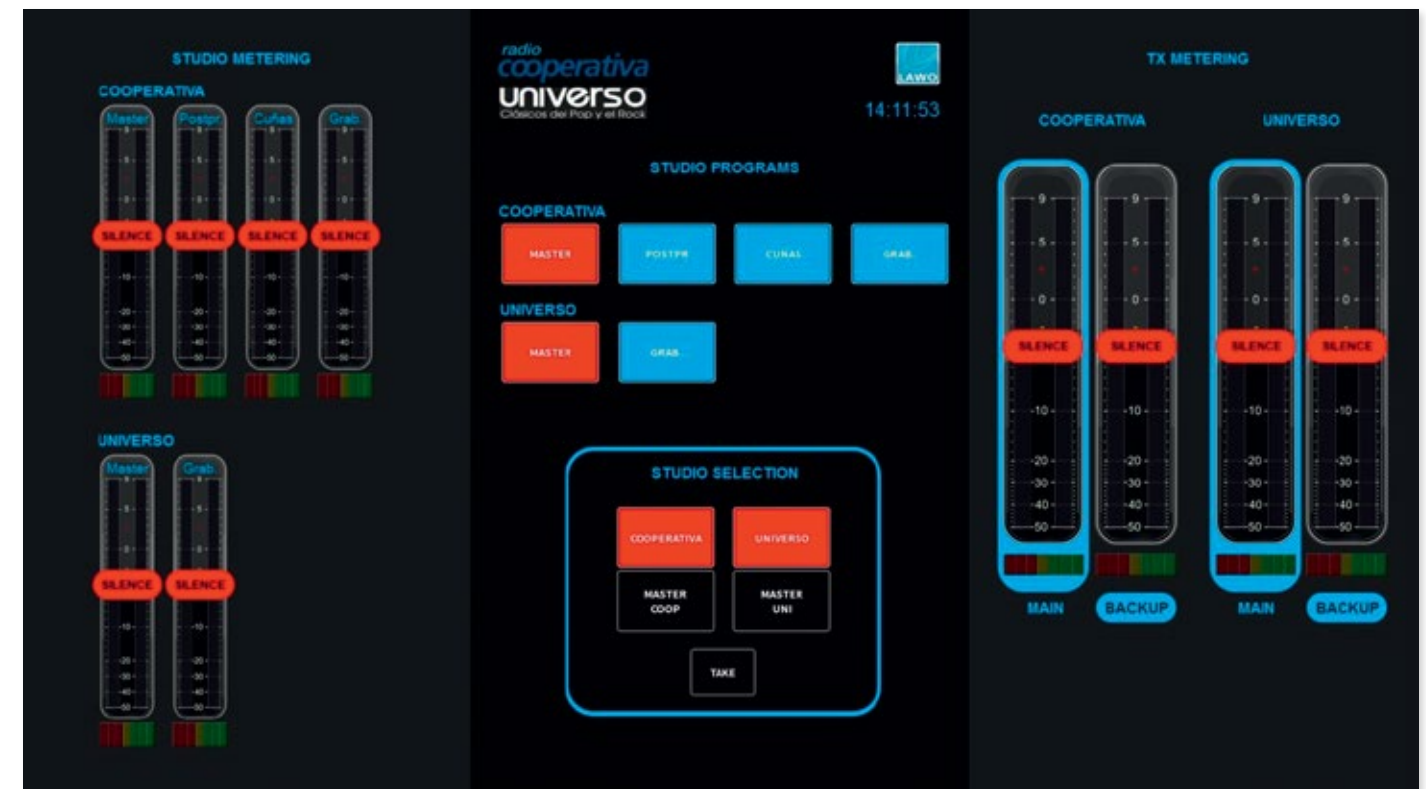
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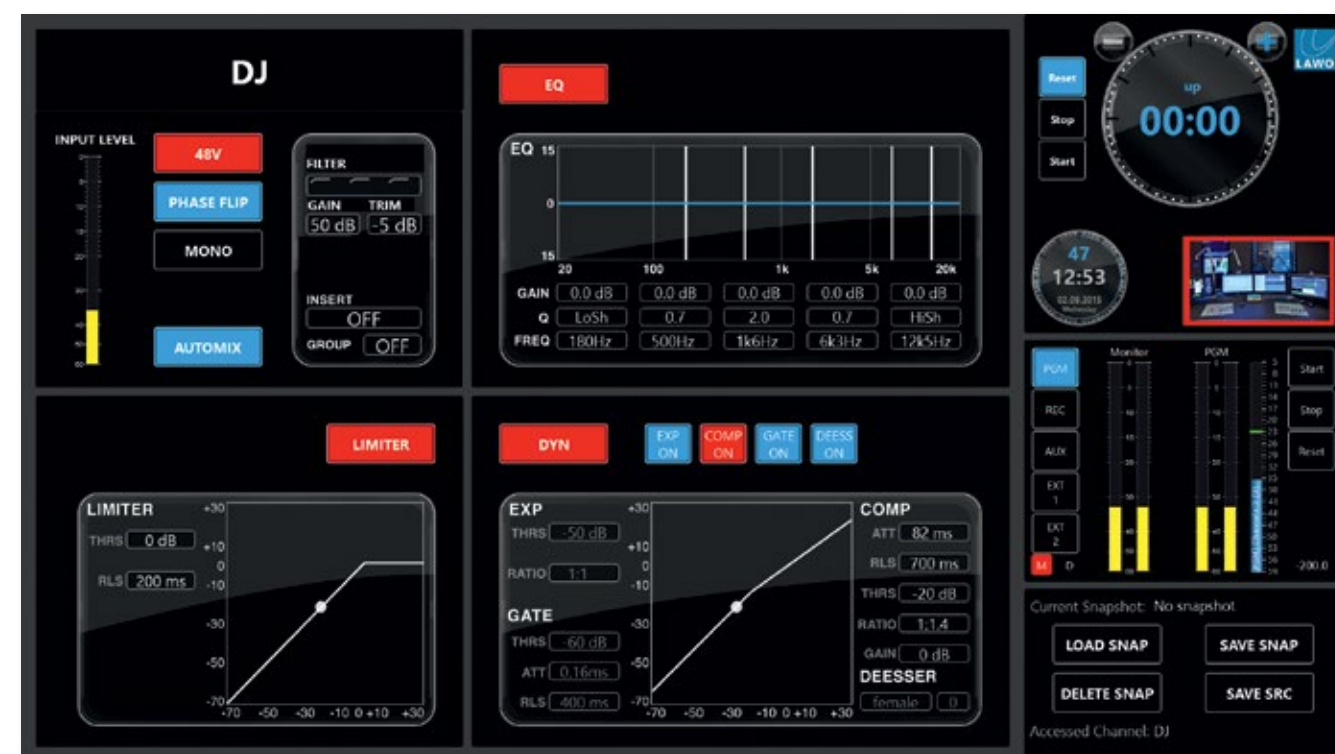
Just drag-and-drop elements to build custom control screens or meter walls, and integrate studio software tools using the open-source Ember+ control protocol. Make multiple pages of layouts, display them on multiple screens and switch between them at will. You can even save groups of screen objects as "snippets", which can quickly be re-used as you build more custom screens. A comprehensive library of vector objects is included, but you can create and import your own custom graphics too.

REMOTE CONTROL AND USER MANAGEMENT
Today's networked studio infrastructure makes it easier than ever to control devices remotely, and share information between studios. VisTool is designed to take maximum advantage of studio networking, giving you the ability to operate your ruby console remotely with complete access to every function, using only a PC and network connection.

VisTool also enables you to share console settings between studios. An unlimited number of Snapshots and DSP profiles can be stored and recalled from any networked console, allowing individual talent settings, or customized Show settings, to be available everywhere in the station. You can even make console configurations portable — profiles can be customized to individual operator preferences, and loaded automatically when each user logs in at the console.

There's also a sophisticated rights-management system that gives studio engineers the power to tailor access to console features based on multiple user groups, or even a user-by-user basis. Set up different access levels for technical personnel, experienced DJs, and trainees. Decide which console features are accessible, and which ones are locked. Make individual snapshots available for recall by specific users — even restore voice processing settings automatically for each user login. The sky's the limit!

KEY RUBY DISPLAY FEATURES
- Create and use multiple pages per console
- Connects to console via TCP/IP
- Multi-touch operation enables onscreen control of a wide range of console parameters
- Outstanding user management with custom snapshots available locally or across the network
- Create and save "snippets" to easily recall and re-use functions while building new screen sets
- Docked, windowed or full screen – VisTool shares screen space beautifully with other apps
- VisTool Editor enables creation of custom page layouts
- Large included library of scalable vector objects includes buttons, meters, text displays, faders and rotary controls, loudness indicators, confidence meters, processing curves and more.

ABOUT DISPLAY DOCK (VISTOOL STANDARD)
- Included with every ruby console
- Preconfigured to get you up and running quickly
- Overview screen includes docking bar with timer and clock view, monitoring and metering of main outputs, and access to Snapshot database
- Built-in X-Y matrix for output routing
- Full screen view of channel parameters

ABOUT VISTOOL UNLIMITED*
- Unlimited possibilities for configuring customized layouts using the graphics library in VisTool Editor — even import your own custom graphic elements
- Create multiple pages of different layouts, display them on multiple screens and switch them during operation
- Open existing configurations and adapt them to your needs
- Save and re-use groups of items as snippets.
- Download more snippets from our website

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RADIO MIXING CONSOLE

SURFACE CONTROLS

Build your ruby by combining fader modules (containing 4 motorized faders each) with one master control module. Each fader strip is laid out for intuitive, error free operation, with context-sensitive controls that give fast access to the functions needed for each source. The control module has controls for all signal parameters, bus assignments, console snapshots, monitor source selections, and has a number of user keys that can be customized to perform specific actions.

FADER MODULE

1. ROTARY CONTROL allows configuration of DSP parameters and manual adjustment of mic, line and aux send levels.
2. CONTEXT-SENSITIVE MULTIFUNCTION KEYS control bus assignments, DSP settings and PFL, Conference and Talkback assignments. The adjacent OLED display indicates the function of each key.
3. TOP OLED DISPLAY shows the action assigned to each adjacent multifunction key.
4. ACCESS BUTTONS change source assignments, and display the state of SmartSnaps On-Air / Production Mode. All buttons have multi-color LED backlights that you can customize to help operators instantly identify functions by color.
5. MOTORIZED 100 MM FADERS are of the highest quality and have integral dust shields for long life.
6. CONFIGURABLE STATUS DISPLAY indicates fader group assignment, or input signal using multi-color LED backlights with VU/dB reference level
7. BOTTOM OLED DISPLAY indicates assigned audio source.
8. RECESSED START / PFL KEYS perform channel On / Off, Mute and PFL (Cue) functions, plus manual start of audio devices. Recessed keys with finger guards protect against accidental activation; film-legendable keys can be easily customized in the field.
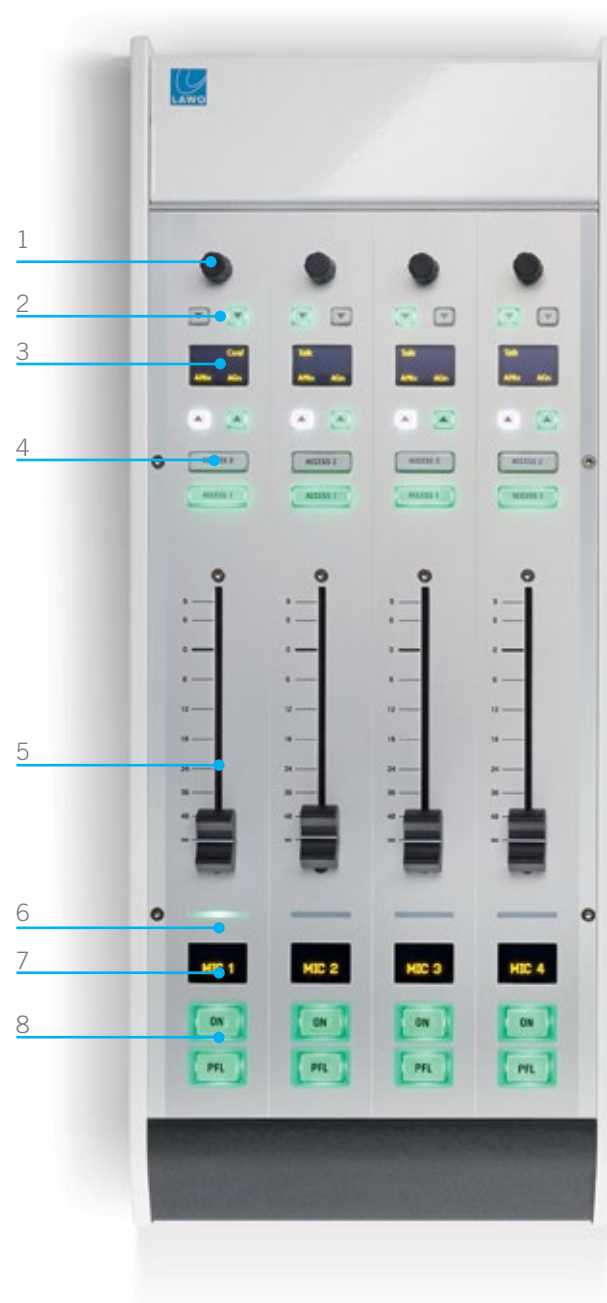
MASTER CONTROL MODULE

1. ROTARY CONTROLS adjust Guests and Studio monitor controls, as well as DSP functions.
2. MULTIFUNCTION KEYS mirror those found on Fader Modules; can be used to adjust DSP parameters or assigned to custom functions.
3. OLED DISPLAY shows the action assigned to each adjacent multifunction key.
4. SmartSnaps SNAPSHOT KEYS let the operator quickly switch between the On-Air and Production work spaces
5. SYSTEM KEYS for access to DSP parameters bus routing, Snapshot save and recall, and other console settings.
6. ASSIGNABLE USER KEYS can be assigned for quick access to frequently-used functions, such as Monitor sources switching, Talkback activation, etc. These keys are assigned using an intuitive drag-and-drop system and can be individually labelled.
7. OLED MONITOR SOURCE DISPLAYS show the sources feeding the monitor speakers and headphones; adjacent rotary controls adjust their volume.
8. MONITOR DIM / MUTE KEYS let the board operator quickly attenuate and restore monitor levels without adjusting rotary volume controls.
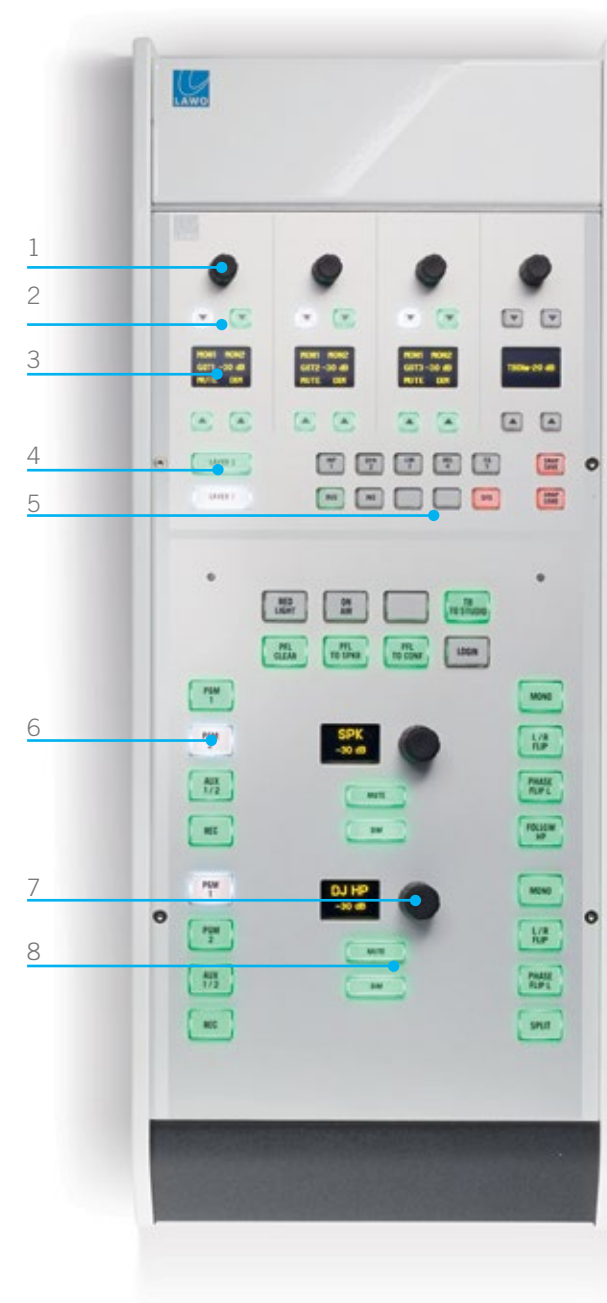
Power Core

AOIP MIXING ENGINE + I/O NODE

Power Core

THE SUPER AUDIO ENGINE

SMALL BUT MIGHTY
Never judge a book by its cover — or a mixing engine by its rack size. At just 1RU, Power Core's compact form belies the immense capabilities inside.

On the front panel, a high-resolution color TFT display gives status and setup information. I/O includes dual redundant AES67 Ethernet ports with SFP, capable of 128 bi-directional AoIP streams, and 4 ports for high-density MADI signals (up to 256 total channels of audio) — perfect for native MADI-to-AES67 AoIP conversion. It complies with the ST2110-30 standard too, ensuring seamless operation in combined radio / TV broadcast plants. ST2022-7 Seamless Protection Switching enables simultaneous dual-redundant network links, if you choose. Dual control ports, clock sync connections, and 8 GPI / GPO contact closures complete the scene.

Around back, auto-switching dual-redundant power is standard. Power Core's internal auto-ranging AC power supply is complemented by an inlet which accomodates an external 12VDC backup power supply. There are also 8 expansion slots, which accept a variety of optional IO expansion cards.

But where Power Core really shines is in raw audio processing horsepower. So much, in fact, that one Power Core can handle thousands of simultaneous signals. As many as 96 channels of DSP input processing can be unlocked to use for anything from EQ to de-essing, from dynamics to delay sync.

In fact, Power Core may be the most powerful audio signal processor ever made for broadcast.

FLEXIBLE BY DEFINITION
Because Power Core is so agile, we use software to configure it for different jobs. Used with the ruby control surface, it's a powerful mixing / routing engine. Used alone, it can become an "Über-Node" capable of ingesting massive amounts of audio to make available to your AES67 AoIP network. In its most advanced configuration, Power Core's massive DSP capabilities can be unlocked to apply audio correction to vast numbers of signals plant-wide. A variety of license packs are available to tailor Power Core to any performance or budget requirement. And the MAX package allows connection of as many as four independent ruby mixing surfaces to a single Power Core engine — a unique ability perfectly suited to today's multi-studio radio facilities. Whatever your workflow, Power Core is always optimized for the task at hand.

MAXIMUM DSP
Thanks to its enormous DSP capabilities, Power Core is ready for any processing job you throw at it. There's equalizers with five parameters: three fully-parametric bands and two semi-parametric bands that can be high- and low-shelf filters, a dynamics suite with gate, expansion, compression and limiting, realtime de-essing plus AutoGain for each mic input, and pan / balance adjustments for each input. As much as 5,300 ms of synchronization delay with switchable units (meters, milliseconds, or frames) is provided as well.

EASY, FLEXIBLE I/O OPTIONS
Power Core comes standard with a staggering amount of AES67 and MADI I/O already installed. But you can add lots more, quickly and easily. 8 rear-panel slots accommodate a variety of I/O modules, all equipped with high-density DB-25 connectors using the AES59 wiring standard to facilitate quick and easy hookup.

Simply pick the I/O you need and slide it into Power Core's waiting expansion slots — it couldn't be simpler.

AVAILABLE I/O CARDS

8x MIC / LINE IN
Maximum four per Power Core

8x ANALOG LINE IN
Eight mono / four stereo inputs per card

8x ANALOG LINE OUT
Eight mono / four stereo outputs per card

DANTE I/O inc. SRC
Dual-redundant ports; 64 total channels

STUDIO I/O
2 Mic / Line in, 2 Line outputs, 2 HP outputs

4x AES3 I/O
4 inputs and outputs on DB25 (bit-transparent; SRC on inputs)

4x AES3 I/O
4 HD-BNC inputs and outputs (bit-transparent; SRC on inputs)

2x MADI I/O
64 channels per SFP connection

1x MADI I/O incl. SRC
64 channels I/O with Sample Rate Conversion

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RUBY CONTROL SURFACE

- Desktop or flush-mount versions in 4, 8, 12 and 16 fader frame sizes, plus standalone 4 and 8 fader and Master Control extenders for localized control placement in multi-user studios
- Multiple frames may be combined for systems up to 60 faders
- Single-frame or split-frame configurations
- Motorized 100 mm faders, touch-sensitive to allow instant override of pre-programmed levels
- SmartSnaps dual-purpose snapshots with on-air + production modes and fader maps (supports up to 60 physical or virtual faders)
- 5 console snapshots for custom fader layouts that can be recalled with a single button press

CONTROL

- AES67 / RAVENNA discovery, connection management, and direct routing controls right on the control surface
- Supports popular RAS and Ember+ control protocols for playout control over IP or serial connections
- Programmable logic core (for "On-Air" tallies, Fader Start commands, Talkback integration, etc.)
- TCP/IP remote control for connected Lawo matrix
- Integrated mix-minus (clean feed) / conference logic (2 independent systems)
- Integration with radio automation systems via serial & TCP/IP

### CONFIGURATION AND MAINTENANCE

- Console Designer software for system and logic programming
- HTML interface for system setup and diagnostics
- Dedicated software tool for software updates
- Remote maintenance via VPN

DIMENSIONS

- Modules: 18.5 cm x 37.4 cm
- Frame: 49.2 cm front-to-back. End-plates: 0.8 cm each

Modules may be flush-mounted without frame, or desk-top-mounted with frame. Standard frame configurations shown above; extender modules shown at left.
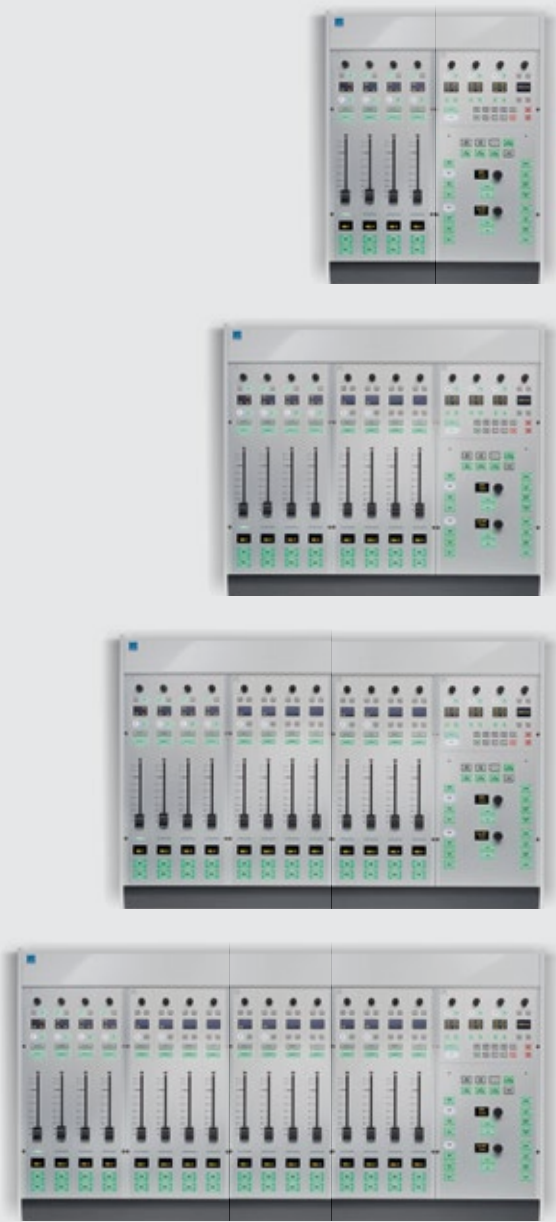
POWER CORE

SIGNAL PROCESSING

- 96 Input channels, each with Input gain, signal presence indicator, direct out, Insert, fader, Aux send with Pre / Post switching, pan / balance, AutoGain for each mic input
- Equalizer with 5 parameters: Three fully-parametric bands plus two semi-parametric bands that can also be shelf, high-pass, or low-pass filters
- Dynamics suite with gate, expander, compressor, limiter and De-Esser
- 4 individual AutoMix groups (up to 96 channels each) allow creation of multiple independent mixes
- All sources and all busses may be metered onscreen using EBU R128 Loudness Metering and/or PPM
- Sync delays of up to 5,300 ms with switchable units (meters, milliseconds, frames)
- 80 summing busses configurable as Program, Record, Aux, Group, Mix-Minus (clean feed) or General Purpose. A full DSP channel with EQ, Dynamics and Delay functions may be applied to any of these busses (up to 16 stereo or 32 mono busses)
- Channels and busses may be grouped into Stereo and 5.1 Surround bundles

STANDARD AUDIO INTERFACES

- 4 MADI (each 64 channels I/O) with SFP cages (MADI ports 1 / 2 and 3 / 4 can be grouped as dual-redundant interfaces)
- 2 AES67 / RAVENNA with SFP (in total up to 128 streams with up to 256 channels)
  (May be grouped as dual-redundant interfaces using SMPTE 2022-7 standard or LACP)

OPTIONAL EXTENSION PANELS

- 19"/1 RU panels with illuminated buttons, LCD-keys, pots & GPIO
- Control logic and levels for conferences, talkback and monitoring
- Connect up to 30 panels via CAN-Bus or TCP/IP

AVAILABLE I/O EXPANSION MODULES

- 8 Mic / Line inputs
- 8 Mono / 4 Stereo Line input
- 8 Mono / 4 Stereo Line output
- 4 Stereo AES input with SRC + 4 AES output
- 4 HD-BNC AES input with SRC + 4 HD-BNC AES output (bit-transparent)
- 2 Mic / Line in + 1 Stereo Line out + 2 Stereo Headphone out
- 2 MADI (64 I/O channels each) with SFP cages
- 1 MADI incl. SRC (64 I/O channels) with SFP cage
- 2 DANTE (Dual-redundant connections, 64 total channels)

CONTROL INTERFACES

- TCP/IP
- CAN
- RS422
- 8 GPIO (8 optocouplers, 8 silent CMOS relays with short circuit protection)

SYNCHRONISATION

- Wordclock input and internal generator with output
- Optional sync via MADI or PTP
- 48 kHz and 44.1 kHz

SOFTWARE DEFINED FUNCTIONS

- Some features described are extra-cost options. Power Core may be configured as an audio I/O device, mixing console engine, shared core for up to 4 independent mixing consoles (MAX version), or a router with extensive DSP capabilities. Ask your Lawo representative for detailed options and prices.

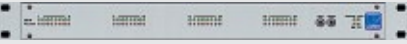| Panel	Code	Description
KSC.T20	(950/80)	19"/1RU panel with 20 backlit buttons
KSC.LCD16	(950/81)	19"/1RU panel with 16 LCD buttons
KSC.LCD15P1	(950/82)	19"/1RU panel with 15 LCD buttons, and 1 rotary control (e. g. for level control)
KSC.LCD14P2	(950/83)	19"/1RU panel with 14 LCD buttons, and 2 rotary controls (e. g. for level control)
KSC.GPIO32	(950/84)	19"/1RU panel with 32 GPIO contacts and 8 VCA inputs

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