

crystal

Welcome to digital broadcasting.



English



crystal: Ready to perform.

There is just one short sentence that perfectly describes the crystal: the ideal mixing console for broadcasters who want to be on air – now. Simple, clear and unambiguous. With the crystal, we offer a tool that combines the highest quality with well-conceived ease of operation. The technology is all there, but it's your programmes that must be centre stage. Unnecessary gimmicks shouldn't overwhelm you; better that clear operating concepts assist you, so you can concentrate on your objective – to produce great broadcasts. Using an attractive console, at an attractive price, and made by one of the most distinguished audio technology manufacturers in the world.



Highest usability for radio hosts: crystal in everyday broadcasting.

A quick glance at the news, run through the guest list and the playlist, and then it kicks off – the Monday morning show with thousands of listeners. It's just as well that radio presenters can now fully rely on their mixing consoles, because they know exactly what is where. The ergonomic design simplifies operation, even in a hectic situation. Well laid-out displays provide the right information, all of the time. And it's actually enjoyable to handle a broadcast with the new crystal – even on a Monday morning, just after 4.30 am.

Advantages of the crystal in everyday broadcasting:

- Well laid-out control surface for the best possible overview
- Short user training time, thanks to a universal operating concept
- Ingenious n-1 conference logic for convenience and security during transmission
- VisTool touchscreen software for visual feedback and extended ease of operation
- Easy connection to radio automation systems



Flexible operation for editors: crystal at the editor's workstation.

Your editors have everything they need: a selection of original sounds, fundamental expertise and pointed comments. They also have a deadline, because the lunch-time show starts in 40 minutes. That's why they want to concentrate on the content of the feature and not on the technology. Fortunately, they have the ideal tool with the crystal, because this new mixing console can be operated easily, even when the job becomes complicated. All the required functions are right there and directly accessible. Standardised templates guarantee logical workflows. And there are also system-wide functions that increase efficient operation. Thus the next few hectic minutes are no problem, at least, not as far as the technology is concerned.

Advantages of the crystal in everyday editing:

- Compact desktop console for flexible operation
- Ergonomically designed control surface for intuitive operation
- Direct access to the most needed functions (eg. listen selection or GPIO control)
- Ready-for-operation – standard configurations get you going
- Integration in video environments and larger systems via MADI and SDI (embedded audio)





crystal networking

A shining single workstation solution and a brilliant team player: the crystal offers many features when it comes to networking – from the option of being able to connect audio via MADi through to its functional integration into comprehensive broadcasting systems. The advantage: you benefit from more efficiency at work, while saving unnecessary costs.

- Cost efficient MADi interfaces for high-performance audio networking
- System-wide availability of signals (listen selections, live feeds etc.)
- Network control via TCP/IP for resource sharing or multi-studio operation
- Support of system-wide functions (broadcast button, talkback, control data etc.)
- Integration in video environments and larger systems via MADi and SDi (embedded audio)





More than more:
crystal highlights.



Compact system core

Just 1 RU high, 19 inches wide – with the crystal, highest quality now comes in a compact package. The system core does not only stand out with its neat dimensions, but also with a speed that is ready for immediate action; this PC-free unit guarantees a short boot time. A further advantage of the crystal is the comprehensive feature set available in even the basic version, that enables you to make a quick start on your everyday work. What if you want to expand the boundaries? Additional options are available to meet the widest range of requirements – even glass fibre links to the main control room.



Ergonomic control surface

Its compact construction and high-value design make the crystal an ideal desktop unit. Apart from its modern looks, the crystal is particularly attractive because of its outstanding ergonomics. It doesn't matter whether you choose the 4, 8, 12 or 16 fader model, multi-coloured status displays and two high-visibility OLED displays per channel guarantee optimum workflow, even in critical situations. As far as components are concerned, particular importance is attached to quality and durability. After all, the crystal reflects two important maxims: ‚Made in Germany’ and ‚Made by Lawo’.



VisTool touchscreen software

Additional functionality and an even better console overview: VisTool touchscreen software is a perfect complement to the crystal's control surface. Not only signal processing but also various other functions can be graphically displayed. Additional features such as access to snapshot databases, routing matrix control or timers, all add to the ease-of-use and confidence in everyday operation.



Modular panels

Do you need additional buttons, want to modify your workspace layout, or require more control facilities for additional devices? Then the KSC series panels are the perfect solution for you. Whether it is playback, pre-listen or red light control – the wide selection of panels will suit all requirements. Depending on your needs, up to fifteen of these button control panels can be fully integrated into your system.



Everyday work can be a breeze:
crystal operating philosophy.

When anyone sees the crystal for the first time, they are always enthusiastic. Partly because this new mixing console from Lawo is simply a visually attractive device, but also because the operating elements are arranged in just the way that discerning users always wanted. For example, the high resolution OLEDs guarantee an optimum overview of console status in every situation, and from every angle. Or the user templates, that mean long setup times are a thing of the past – thanks to standard configurations – and make instant start ups possible. And buttons with an elegant RGB look that colour code themselves according to their function: yet another convincing reason for the professional user.



Point by point:

Advantages of the crystal operating surface at a glance.

- 1 **Rotary controls** For setting DSP parameters, and the adjustment of microphone preamps or aux send levels.
- 2 **Multi-function buttons** For the control of DSP parameters and bus assignment, and also for assignments to individual functions (eg. PFL, conference, talkback). Button labelling is provided by the adjacent OLED display, while visual feedback is provided by multi-coloured LEDs.
- 3 **OLED display** For the labelling of multi-function buttons and to display DSP parameters. Bus assignments are also shown on this display.
- 4 **Access button** Channel selection to change DSP parameters or source assignment.
- 5 **Faders** Long-life 100 mm faders with built-in dust shield.
- 6 **Multifunctional status display** This oval display indicates the source group or audio presence using multi-colour LEDs.
- 7 **OLED display** Indicates the source name (label). Permanent display, large characters and central positioning provide for maximum security during operation.
- 8 **Multi-function buttons** Large buttons for the most important or regularly used functions such as ON/OFF, PFL, mute or the start control for source feeds – optimally and neatly placed in the lower area of the control surface.
- 9 **Peak meter with integral correlation meter** For the level and correlation display of summed or monitor signals.
- 10 **Function buttons** These buttons are used to operate DSP parameters, select summing and aux buses, and for snapshot control.
- 11 **Rotary control with label button** This is for setting the level and balance of, for example, the monitor or headphone signals. Using the assignment button, the control can be labelled. The button can also be used to mute the corresponding output.
- 12 **Multi-function buttons** Normally used to select monitor sources. The buttons can be individually assigned and labelled.
- 13 **Multi-function buttons** Further buttons for MUTE, DIM or talkback.

Simply suitable:

crystal control surface variations.

crystal
4-fader model



crystal
8-fader model



crystal
12-fader model



crystal
12-fader split model



crystal
16-fader model





For an even better overview:
VisTool touchscreen software.

Extend your mixing console with the optional VisTool software* and you'll benefit from a better overview and even more functionality. Thus you can, for example, extend the capacity of the crystal with additional functions such as timers or snapshot databases. Additionally, this innovative tool allows you to view channel parameters, or provide an overview by arranging level and status displays on several layers. You have the choice of a number of versions, from the standard operation version to one that provides freely user-configurable control surfaces.

VisTool plus points:

- Better overview and intuitive operation via the touchscreen
- Up to 6 logic-controlled timers for comprehensive event control
- Work with snapshots in a central database
- DSP parameter display (eg. dynamics and EQ characteristics) simplifies signal processor control
- Additional level display for input channels or summing buses
- Interfaces for logic, routing matrix and DSP control can be freely arranged and supplemented with display elements

(* VisTool operation requires a PC with Windows® 2000/XP, including an Ethernet connection and suitable monitor/touchscreen.)

For even more functionality:
Extend your crystal with panels.

Extend your crystal with a number of button control panels and you are ideally equipped for a variety of tasks – for example, conference use, talkback circuits, or prelisten and playback of audio sources from other work areas. Up to fifteen panels can be integrated cost-effectively into the system using the CAN interface, or may be connected, depending on type, via Ethernet (TCP/IP).

TB-12

19"/1RU panel with 12 backlit buttons, talkback microphone and loudspeaker



KSC.T20

19"/1RU panel with 20 backlit buttons



KSC.LCD16

19"/1RU panel with 16 LCD buttons



KSC.LCD15P1

19"/1RU panel with 15 LCD buttons, and 1 rotary control (eg. for level control)



KSC.LCD14P2

19"/1RU panel with 14 LCD buttons, and 2 rotary controls (eg. for level control)



KSC.GPIO32

19"/1RU panel with 32 GPIO contacts and 8 VCA inputs



High performance and simply handled: crystal system core.

Equipped to the hilt, the crystal system core can be started up instantly. In its basic configuration, this crystal base unit comes with all the required audio interfaces, and provides complete routing, control and central signal processing (DSP) facilities. Everything is handled within the system core: communication between the control surface and panels, network connections for VisTool and for diagnostics and service, interfaces for external equipment such as radio automation systems and, naturally,

audio peripherals. Should your requirements still not be covered, the crystal can be extended with up to two audio interface cards, fitted to the integral expansion slots. The cards come in various types: analogue line, AES3 or HD/SD SDI (embedded audio). In addition, the high-performance MADI option, with up to 256 additional channels, facilitates connection from the core to other mixing consoles or audio networks, via glass fibre links.

Innovative and uncomplicated: crystal service features.

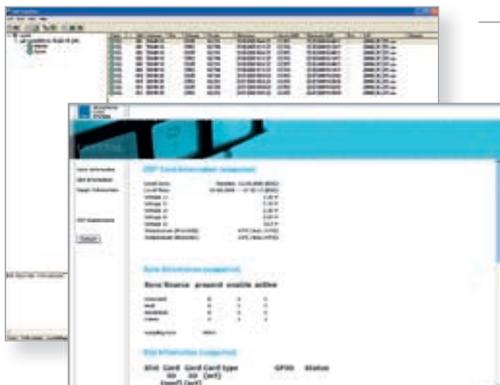
Uncomplicated maintenance of the crystal mixing console can be carried out via a network. You simply enter the IP address of your crystal into a web browser and – with a network connection in place – you are immediately provided with a complete overview

of the current status of your console. Special tools are provided to perform configuration changes and software updates just as elegantly.



crystal service advantages:

- Stability and shortest boot time thanks to a PC-free control system
- Integral OLED display shows the most important system core parameters, directly on the device
- Simple status monitoring via a web browser and the integral web server
- Simple maintenance: software and configuration updates can be carried out from a central point, via the network interface
- Project-specific solutions provide additional status displays on the control surface and VisTool interface, as well as the central logging of reports and alerts from one or more systems

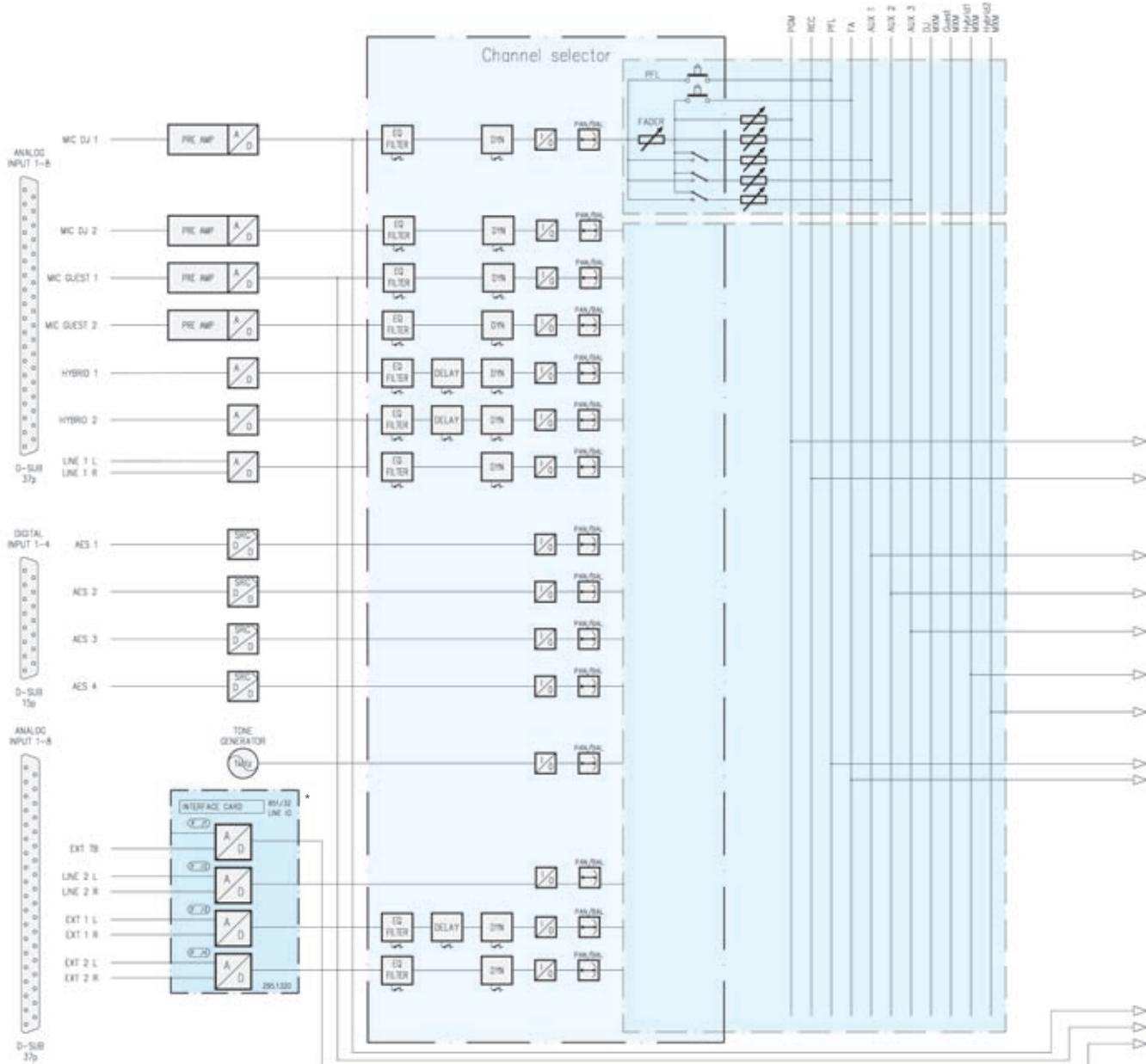


Standard configuration 'Radio On-Air':

The smart solution for radio hosts.

Whether for a local station or public broadcaster, in a self operated or a traditional radio studio – the crystal template 'Radio On-Air' has everything you need for everyday broadcasting. It starts with the microphone connection, which, with the crystal, comprises two inputs for the DJ and two inputs for guest microphones. How about going live to a sports arena or a phone-in competition? With two hybrid lines, plus conference buses and a control output, you can start immediately. Further features: feeds can easily be connected to your mixing console via one of the four AES or analogue line inputs.

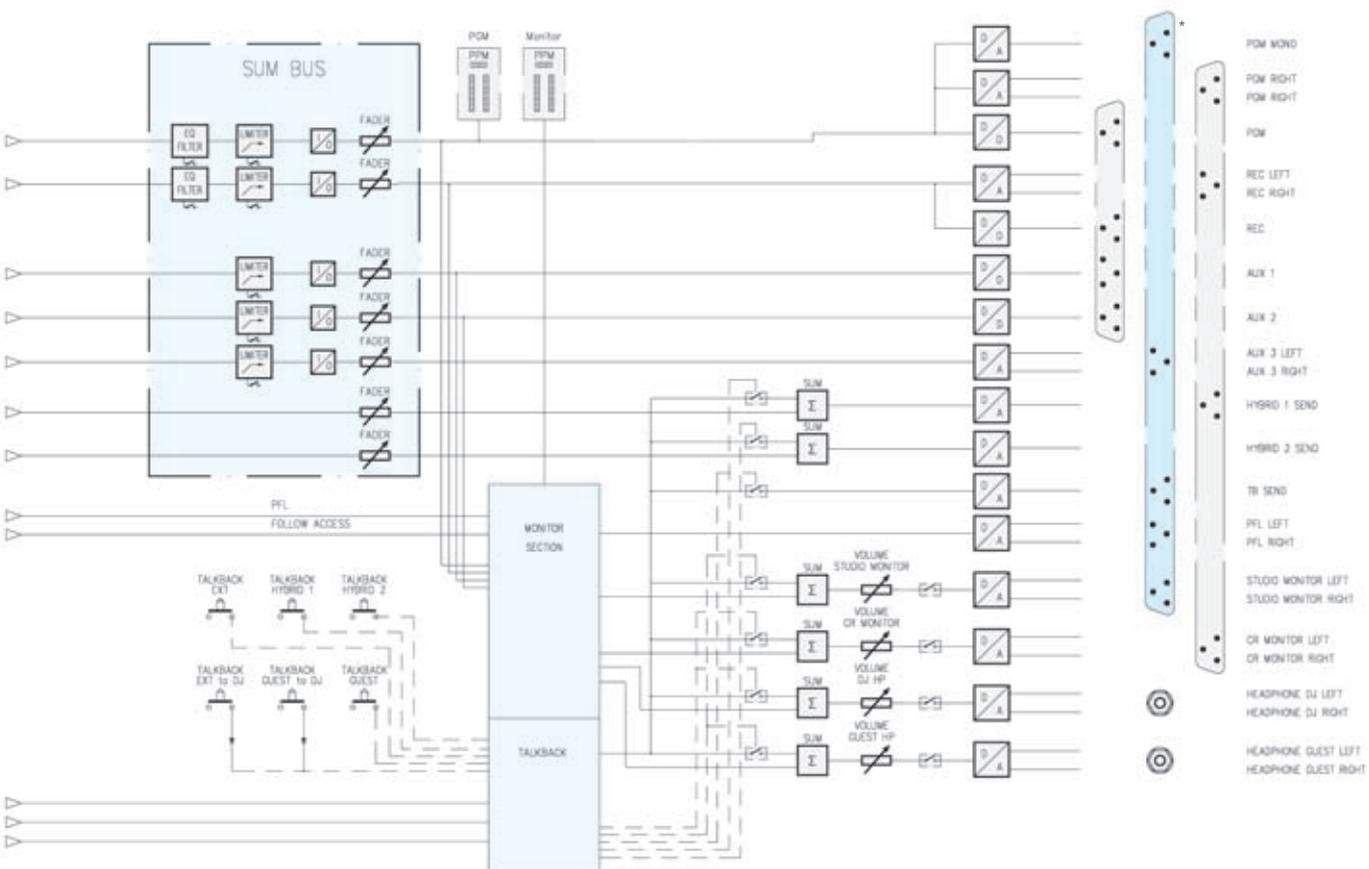
For communication between DJ, guests and technicians, the internal talkback is ready to go, while the external talkback system guarantees undisturbed contact with the outside world. In addition, you will be reassured by the crystal's control facilities – for example, red light signalling and monitor muting, and the entire programme can be transmitted in analogue or digital formats. As you can see, with the radio template you can get into the programme straight away – without complicated configuration or lengthy and tiring setup times.



Ready, Steady, Go:

User templates ensure a rapid start.

A computer for which you first have to write the programs? Not everyone's idea of fun! This is why we have developed a range of intelligent standard configurations, based on many years of experience and the user feedback we have received. The result: the crystal user templates that are particularly convincing where it is important – in practical and everyday operation. The proof is in the templates themselves: your console is ready for use after just a few adjustments; long preparation times are not required, and you can concentrate right from the start on what is most important – your programme. Benefit from these new standards in user guidance, and select the configuration that suits your application!



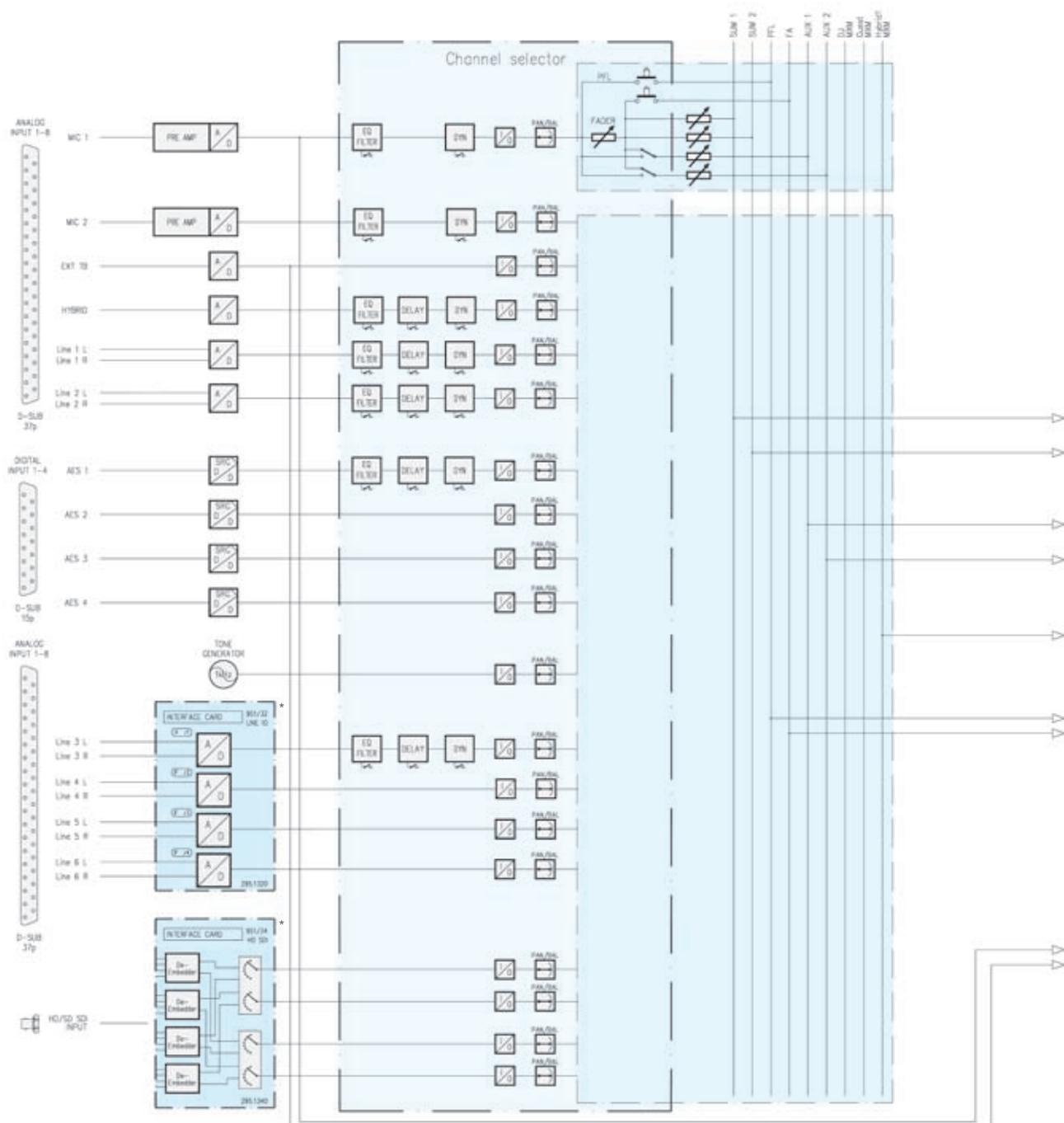
*optional

Standard configuration 'Edit Suite':

The smart solution for editors.

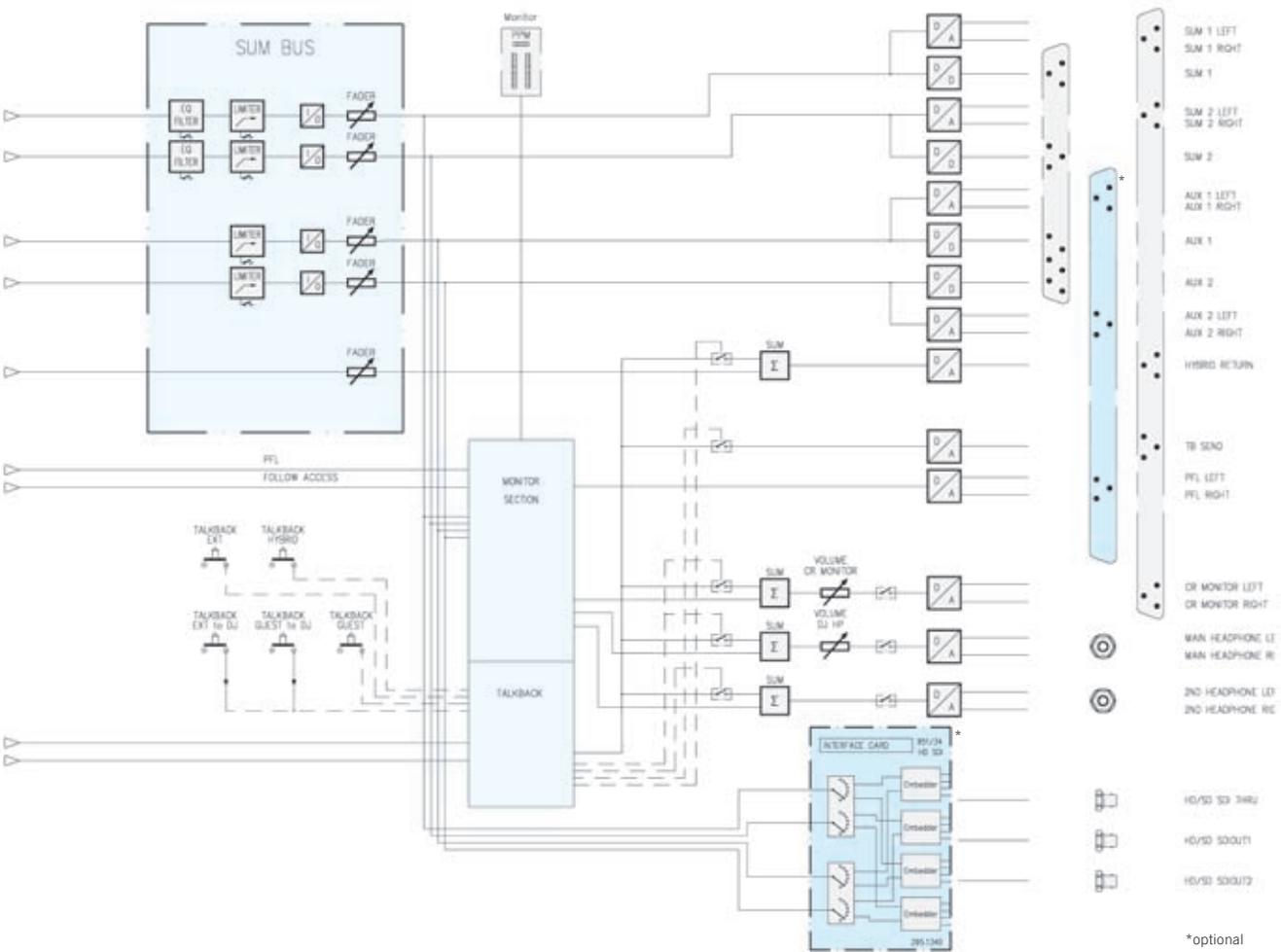
An enormous variety of requirements await you at the editing workstation. This is why the 'Edit Suite' standard configuration provides a host of pre-programmed settings that are perfectly suited to various applications in radio and TV. Thanks to four digital and six analogue inputs, a variety of feeds can be connected, and two microphone inputs allow additional contributors to be easily added to the content. And what if a telephone interview is called for?

Here too, the pre-prepared hybrid channel proves the practical suitability of user templates. And that's not all, directly from the console, without the use of external hardware, an optional SDI interface card enables the de-embedding and embedding of audio signals – in both HD and SD video formats. Naturally, the editing configuration leaves nothing to be desired in terms of talkback, signalling and listen facilities.



As individual as you want it:
crystal configuration.

The crystal is very convincing as a reliable everyday partner. For this reason, our standard configurations are arranged to fulfil most conventional requirements. But what happens if your specific application requires a special functionality? The crystal is already prepared for this eventuality. Besides operation with user templates, the console's flexible technology also permits modified configurations – and the consequent possibility of adapting the console to your personal requirements; if you'd like to know more, we'll be happy to tell you.



*optional

Technical data:

Everything at a glance.

Control surface

- Control surface variants with up to 16 faders
- Compact design with case height only 3 cm / 1.2"
- Dimensions incl. controls:
 - Height 4.9 cm / 1.9", depth 38.4 cm / 15.2"
 - Width 4-fader model 26.5 cm / 10.5"
 - Width 8-fader model 53.0 cm / 20.9"
 - Width 12-fader model 71.5 cm / 28.2"
 - Width 12-fader split 37.0 cm / 14.6" + 34.5 cm / 13.6"
 - Width 16-fader model 90.0 cm / 35.5"
- Long-life 100 mm faders with dust protection
- OLED displays (160° visible angle)
- Buttons with multi-colour backlight (RGB)
- Ambient light sensor for automatic brightness control
- Fully stand alone operable, opt. touchscreen software

System core

- Base Unit 19" / 1 RU with control system, signal processing and audio interfaces
- Depth: 39.4 cm / 15.6", incl. connectors 41.4 cm / 16.3"
- Integrated routing matrix (non-blocking) with up to 288 inputs and 292 outputs
- Active cross ventilation, system-controlled
- Integral wide-ranging power supply 100...240 V AC or alternatively 12 V DC connection

Signal processing

- Up to 16 fader channels with input gain and pan/balance
- Up to 128 definitions for sources and summing buses
- 16 Equalisers: 3 fully parametric bands and 2 filters (mono*)
- 8 Dynamics units: gate, expander, compressor (mono or stereo)
- 8 Limiters (mono or stereo)
- 4 Delays: up to 240 ms
- 24 Summing buses (mono* including PFL)
- 16 Minimixers (2 x 2 mixers for monitoring, stereo-to-mono, etc.)

(*Stereo coupling possible)

Control

- Programmable logic core (red light, fader start, broadcast button, talkback integration etc.)
- Integrated n-1/conference logic
- 2 PFL buses possible
- Serial interface for integration with radio automation systems
- Networking via TCP/IP

Synchronisation

- Wordclock input and internal generator
- Optional sync via MAD1
- 48 kHz and 44.1 kHz sampling rates

Interfaces

- 4 Analogue mic inputs (usable as line inputs)
- 4 Analogue line inputs
- 8 Analogue line outputs
- 2 Headphone outputs (stereo)
- 4 AES3 inputs (stereo) with sample rate converter (SRC)
- 4 AES3 outputs (stereo)
- GPIO (8 optocouplers, 8 relays)
- Optional MAD1 extension with 4 ports
- 2 slots for I/O extension with:
 - 8 Analogue line in/out
 - 4 AES3 in/out (stereo) with input SRC
 - HD/SD SDI embedder/de-embedder (4 x stereo)

Configuration and maintenance

- Software for system configuration and logic programming
- Integral web server for system diagnosis
- Dedicated SW tool for software updates
- Remote maintenance using VPN

VisTool (option)

- Software for the enhancement of the control surface, support of touchscreens
- Visualisation of DSP parameters, signal levels and states
- Additional functions and controls (e.g. timer, snapshots)
- Min. PC requirements: PentiumIII-800 MHz with 512 MB RAM, OS Windows® XP Professional, Ethernet interface
- Supported resolutions: SVGA, XGA, SXGA, SXGA+, WSXGA, WXGA, UXGA

Panels (option)

- Several panel variants (19"/1 RU) with illuminated buttons, LCD-keys, potentiometers and GPIO
- Control of logic functions and level adjustment for e.g. conferences, talkback and monitoring
- Connection of up to 15 panels via CAN-Bus (opt. TCP/IP)

Please note that certain system components and functions may require individual configuration, which may incur additional costs, depending on the respective service provided.

As of September 2008. No responsibility is accepted for printing errors.



Headquarters

Lawo AG
Am Oberwald 8
76437 Rastatt
GERMANY
Phone +49 7222 1002 0
Fax +49 7222 1002 7101
info@lawo.de
www.lawo.de

Subsidiaries

Lawo International GmbH
Wehntalerstrasse 58
8157 Dielsdorf
SWITZERLAND
Phone +41 43 38868 00
Fax +41 43 38868 09
info@lawo.ch
www.lawo.ch

Lawo North America Corp.
1361 Huntingwood Drive, #16
Toronto, Ontario M1S 3J1
CANADA
Phone +1 416 292 0078
Fax +1 416 292 0402
info@lawo.ca
www.lawo.ca

Lawo Australia Pty Ltd
Factory 2
2B Holmes Street
Ballarat
Victoria 3350
AUSTRALIA
Phone +61 3 5309 2647
Fax +61 3 8677 9973
info@lawo.com.au
www.lawo.com.au

Representative Offices

Lawo International GmbH
Singapore Representative Office
47 Jalan Pemimpin
#05-05A, Sin Cheong Building
Singapore 577200
SINGAPORE
Phone +65 9818 3328
Fax +65 6255 7651
boonsiong.tan@lawo.sg

Lawo AG Beijing
Representative Office
Room 1101, Block A, Luo Wa Plaza,
No. 203, Zone 2, Li Ze Zhong Yuan
Wang Jing, Chaoyang District
100102 Beijing
P. R. CHINA
Phone +86 10 6439 2518
Fax +86 10 6439 1813
francis.he@lawo.cn
www.lawo.cn